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Proceedings of the

SECOND NATIONAL URBAN FORESTRY CONFERENCE

October 10-14, 1982
Cincinnati, Ohio

AMERICAN FORESTRY ASSOCIATION
1319 18TH STREET, N.W., WASHINGTON, D.C. 20036

PROCEEDINGS OF THE SECOND NATIONAL URBAN FORESTRY CONFERENCE

October 10-14, 1982
Cincinnati, Ohio

Co-sponsored by:

The American Forestry Association
USDA Forest Service
USDA Extension Service
The Ohio Forestry Association
Cincinnati Park Board
Ohio Department of Natural Resources

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and
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SECOND NATIONAL URBAN FORESTRY CONFERENCE

URBAN FORESTRY FOR LIVABLE CITIES: MAKING IT HAPPEN

CONTENTS

	Page
FOREWORD	v
General Session I. Urban Forestry: The Vision; The Reality; The Process; The Delivery	1
General Session II. Making Urban Forestry a Part of the County and City Planning Process	19
Session A. Success Stories from the City	33
Session B. Success Stories from the City Edge	57
General Session III. Organizing for Community Action	79
Panel on Building Urban Coalitions	109
Session C. Energy Conservation and the Physical Environment	117
Session D. Recreation and Wildlife	143
Session E. Products of the Urban Forest	165
Session F. Environmental Education and Interpretation	185
General Session IV. Legislating and Politicking for Urban Forestry	201
Session G. Legal Components of an Urban Forestry Program	225
Session H. Urban Forestry: Its Tie to Traditional Forestry	241
Session I. Urban Forestry and the Green Industry	253
General Session V. The Importance of Increased Plant Use in Urban Environments	263
Session J. Timely Topics in Urban Forestry	271
Session K. Funding Urban Forestry Programs	307
Session L. Where to Go for Information and Training	323
Appendix I. Author Index	337
Appendix II. Poster Session Abstracts	339
Appendix III. List of Conference Participants	369
Appendix IV. List of Conference Cooperators	385

FOREWORD

A conference is something that brings together people with common concerns and the desire to share information. In the constantly expanding arena of urban forestry, new ideas are generated rapidly. A national conference provides the necessary forum for the sharing of these ideas and resources.

The National Urban and Community Forestry Leaders Council and the American Forestry Association believed it was time to reconvene the nation's urban foresters. It had been four years since the first National Urban Forestry Conference was held in Washington, DC. The ideas, excitement, and energy of those that attended this second conference were a convincing demonstration of the grass-roots desire for the conference. The willingness of the sponsors demonstrates the depth of the urban and community forestry movement.

The proceedings of the Conference have been compiled in this volume in order to share the Conference with those that could not attend. We hope these pages will meet the needs of those that have called and written requesting printed material from the Conference.

The Conference and the proceedings replicate the life cycle of urban and community forestry. The planning process, success stories, grass-roots action, economic values, wildlife, recreation, education, and funding sources of the urban forestry movement are all captured in black and white. There is no way we can transfer the energy and excitement that were exchanged in the halls of the Conference. We do hope this printed outline captures your interest, assists you in your daily operation, and gives you enough desire to attend the next conference.

My personal thanks goes to all that made the Conference a success: attendees, sponsors, and speakers. A special thanks goes to those that took the time to write down what they said and those that worked so hard to edit and compile it in these pages.

Henry W. De Bruin
Director of Programs
American Forestry Association

SECOND NATIONAL URBAN FORESTRY CONFERENCE

GENERAL SESSION I

URBAN FORESTRY: THE VISION; THE REALITY; THE PROCESS; THE DELIVERY

Monday, October 11, 1982
8:30-11:30 a.m.

Conference Chairman:

Thomas Ripley
The American Forestry Association
Washington, DC

Speakers:

Thomas B. Borden Colorado State Forest Service Fort Collins, Colorado	Urban and Community Forestry - The Vision	3
R. Max Peterson USDA Forest Service Washington, DC	Urban and Community Forestry - The Reality	6
Rexford A. Resler The American Forestry Association Washington, DC	Urban and Community Forestry - The Process	10
Denzil Clegg USDA Extension Service Washington, DC	Urban and Community Forestry - The Delivery	13

URBAN AND COMMUNITY FORESTRY--THE VISION

Thomas B. Borden
State Forester
Colorado State Forest Service
Fort Collins, Colorado

Last April, when I was contacted about presenting this paper, I said, "Sure, I'll give it a try." Over these past months, I've thought a little bit more about it. What can I tell people that they don't already know? In fact, I felt so squeamish about this particular job, I put on a well-selected tie this morning, red on blue, that says, "I'd rather be playing golf!"

As I look at the program I see that the Chicago Cook County Forest Preserves will be a topic discussed tomorrow. It was on December 6, 1941, that I camped overnight in the Cook County Forest Preserves. The next day, about noon, I hopped on the Irving Park Boulevard streetcar to go back home. I couldn't figure out why everyone was so somber until I happened to see a headline that said, "Pearl Harbor Attacked." It snowed the night of December 6 in the Cook County Forest Preserves, but the main point is that was my first experience with forestry, and it whetted my appetite to become a forester. Then, two years with the Marines, primarily on a heavy cruiser in the Pacific, without seeing trees of any kind, reinforced the idea that forestry would be a desirable occupation.

I worked for several years in the central hardwoods area, and it is nice to be back. Incidentally, we cherish the Ohio Buckeye in Fort Collins. It grows very well in Fort Collins--though not on the plains or the high country. We have a unique area in Fort Collins for urban forestry; we have a complete variety of trees going in Fort Collins, and one of the better ones is the Ohio Buckeye.

I have been in the field 30 years, and forestry has come a long way. When I was a student, I can recall, there was nothing mentioned about urban forestry. It's only been about the last ten years that we so-called "Timber Beasts" have become interested in urban forestry.

My speech is supposed to be "Urban and Community Forestry: The Vision." Now, if you are going to give a speech, one of the things you have to do is take a look at your audience and see what kind of audience you have. We have arborists, foresters, urban planners, government types of one kind or another, and many, many interested, knowledgeable lay people. So, do you want me to try to impress you with the values of community forests or urban forests? Do you want me to tell you that a tree worth $500 in beautiful downtown Cincinnati is worth the annual yield of 100 acres of forest land in Colorado? I won't tell you that. Do you want me to tell you about shade benefits, air conditioning benefits, lower heat bills, the beauty, the holding of soil in place, the creation of oxygen? I don't think so, because you folks already know these things. So how can I create a vision to really do the job of impressing you more?

Well, do you need to be informed? Do you need me to educate you on community forestry? You have an excellent program, and I don't think that you need me to graphically portray or otherwise provide an image of this subject.

We have these visions--why won't they be realized? Why won't we succeed? Well, that is pretty negative. Perhaps it would be better to be a little more positive. So I wrote down this alternate title for my talk: Two Keys to Success for Assuring a Healthy, Viable, Productive Forest for Our Nation's Urban Population.

Do you know what the first four-letter word is that we learn as infants? It comes right after mommy, right after daddy; it's M-I-N-E, mine. My blanket, my bed, my place at the table, my wagon, my family, my school, my car, my job, my jurisdiction, my authority, M-I-N-E. It's perfectly normal. It is characteristic of the animal world of which we are a part.

We humans have this characteristic, but in our particular situation it is encouraged. Competition is encouraged in sports, business, and socially. We are taught to compete, we are taught to win. Keep up with the Joneses--better yet, beat the Joneses! Well, the antonym of competition is cooperation, and this has to be learned. There is a difference. We compete in a 50-yard dash, we compete in handball, yet we have to cooperate in a mile run, in football, in baseball, and many other sports, and in other human endeavors. Constructive competition can be good, but carried to extremes it can be disaster.

We see competition all over the country. We see it with police on the campus of Colorado State University. The campus police people say to the city policemen, "You stay off the campus, and we will handle our problems here on campus." The city police say, "You people out in the country, stay out of the city. We will take care of all the law enforcement problems we have in the city." The Sherrif says, "Okay, you people stay in the city, and you folks in the highway patrol, you stay off our country roads and out of our law enforcement." Very little cooperation occurs. Maybe in your communities it is better.

Take a look at the educational world. The universities, for instance Colorado State University, go to the state legislature, make an appeal for funds, and rarely succeed to the extent that they would like. The other school down the road, Colorado University, at Boulder, does the same thing, as does the Colorado School of Mines, as does the University of Northern Colorado, as does the Southern Colorado State University and a myriad a junior colleges around the state. If they would only get together into a common cause, and put together a united front, they would have much better success with the legislature.

We see competition in the Armed Forces, at least we used to see it in the 30's, when it was the Army with their tanks, the Navy with their battleships, and the Air Corps with their airplanes. They would openly fight each other until they became a part of the Department of Defense, and I don't need to tell you what the military budget is today, because I think there is a healthy level of cooperation. Fortunately, they are not in the same uniform.

Now you folks in the private world may be smirking, thinking of the millions of dollars that have been wasted in corporate takeover attempts. But when you don't have competition, you have problems. For instance, first class mail. In the parcel post arena, they are getting competition; yet, the first class mail is still pretty much a monopoly.

The development of a competitive, yet cooperative, spirit between all the parties in urban forestry will yield huge dividends to everyone, especially those who pay the bills--the public.

The second key to realizing the vision of urban and community forestry centers on the way we personally do business. In the West, a man named Earl Nightengale gives a very interesting radio program on all facets of the human condition. A few months ago, he quoted from a book by an author named Dr. Albert E.M. Gray, entitled "The Common Denominator of Success." Dr. Gray had been supervising people who wanted to be successful, and yet he didn't feel comfortable with his role; he didn't understand the mechanism that made people successful. Hard work was important. But some people

worked hard and weren't successful, and other people who didn't seem to be working quite that hard were successful. One thing Dr. Gray discovered--and it is so obvious in many respects--was that people who were successful had developed the habit of doing things they didn't like to do. Why? Because by doing the things they don't like to do, they accomplish the things they want to accomplish.

Dr. Gray decided that people who are successful look for pleasing results. The other people who are not successful look, for pleasing methods. By following the methodology, they are safe, they are correct, and whatever results is accepted because the method was followed. We see this in organizations. We all belong to organizations that at the last session of the meeting will pass a resolution. They will have the president attach a letter of transmittal, and the letter will be sent to a congressman or a committee or a state legislature or a governor. Everyone, upon sealing the envelope and putting a stamp on it, says, "Okay, let's go back to work and do something important." When they don't succeed, when nothing happens, or when they get a letter back that says, "Thank you very much for your interest in this subject, I want you to know that I will follow it up if it ever comes before me during the legislative session," they accept the results because a method was followed.

Another example: an individual club, an agency head, or a citizen group, will go before the city council--say, here in Cincinnati--and make a presentation by reading a budget request with all sorts of fact-filled information and documentation--and nothing happens. Then, it's the stupid city council that didn't react. Look at successful organizations. These are the ones with members who get involved; the United Way is one. They achieve their goals because they want the result of producing so many hundreds of thousands of dollars. The Audubon Sociey is another group that is very capable and does achieve many worthwhile results. They don't depend on others, they don't wish that things would happen, and they do the things that they don't necessarily like to do.

In summary, I acknowledge that you don't need to be sold on urban and community forestry. I've emphasized the two keys of success to realizing the urban and community forestry vision that we all share: first, understanding and overcoming the MINE syndrome--if we all cooperate, not half-way, but 55 percent, then we would have that mythical 110 percent effort; and second, having all parties involved in urban forestry setting their sights on the final goals and measurable targets with everyone working together in a "can-do" atmosphere to fulfill the vision.

URBAN AND COMMUNITY FORESTRY--THE REALITY

R. Max Peterson, Chief
USDA Forest Service
Washington, DC

In dark and bright times alike, the American Forestry Association has been an able catalyst for conservation and forestry. And the fruits of your stewardship are evident in the improved condition and higher productivity of forest lands throughout the nation. So I am proud to join with AFA today as it returns to Cincinnati to mark the bright centennial of the First American Forest Congress.

That earlier conference marked a critical departure of our nation from a history of forest exploitation and abuse to an ethic of land stewardship and conservation which continues strong today.

The First American Forest Congress in 1882 was truly the beginning of the forestry movement in North America. By most accounts, it was more than a gathering together of forestry knowledge. It established a strong organization and an organized movement to push for progressive forestry in the nation.

This 1982 conference, too, can be an important forestry milestone. And I hope that our five days together will result in more than just dialogue and discussion, that this Second National Urban Forestry Conference will mark the beginning of an urban forestry movement in North America, and that this gathering will someday be considered as historic a conference as those events in Cincinnati one hundred years ago.

We have a bright beginning for that hope in the representation at this conference. People of all backgrounds and interests are gathered here out of a common interest in urban forestry. A national and a state forestry association, two federal agencies, and a city parks agency are listed as cosponsors of this conference. And the program exhibits a healthy mix of professionals and involved citizens as speakers and moderators in the sessions ahead. We have people here from the public sector, the private sector, and the non-profit sector.

It is good that we are here together, because the realities of American political and economic life require cooperation in pursuit of change. We have to put our heads together, commit our resources, and work together if we are going to make these urban forestry programs happen, and thereby build the livability of our cities and communities.

What has always set our human species apart from others is our ability to shape our environments according to our needs or desires. We have multiplied and subdued the Earth. And, for any number of valid economic and social reasons, we have built our cities as centers of culture, commerce, and industry. We look to our cities now as symbols of our states, and as marks of our progress as a nation. And nearly 80 percent of our people live in these urban and suburban areas throughout the nation.

We embrace urban forestry for all of these reasons:

Because our cities and communities can and should be a source of local and national pride, a showcase for our culture;

Because human beings, wherever they live or work, have a fundamental and heartfelt desire for a livable and aesthetic environment, whether manmade or natural;

And because trees, urban parks, and greenspaces can contribute a great deal in shaping urban environments which are livable, which grace their surroundings, and which build community pride.

One parks superintendent from California has suggested that it is the urban forests of the nation which may well be our "undesignated national forests," because of the benefits they provide and because we Americans take pride in our communities. On that basis, the entire nation benefits when these forests are managed scientifically and used wisely.

Yet, we must avoid giddy self-congratulation for our good works in urban forestry and realize that we have only begun to make these programs happen. And if we are to do more than merely begin, we must face two emerging realities:

Reality one is, if we are to have and keep successful programs in urban forestry, the American people and their communities must make it clear that they want them and are willing to work for them.

Reality number two is that our urban forestry programs will wither and fail unless we relate them to people instead of trees--and unless they also attend to the larger concerns of city care; the problems of pollution, noise, unemployment, and crumbling physical plants with which cities must cope.

Let me address each of these realities in turn.

There are many organizations involved in urban forestry. And it's good that many of them are represented here, because there is considerable concern, in and out of government, over the proper role of these various institutions and how they work together.

The federal role in urban forestry has always been small, and its funding has been consistently inconsistent. The near-future looks little different. Though the Forest Service will continue to be an active and supportive partner in the urban forestry effort, the extent of our role must recognize the need to squeeze federal spending, at least in the near future.

We have been engaged in urban forestry research since 1970. Forest Service scientists have studied control measures for Dutch elm disease, developed trees which are adapted to air pollution, and studied the effects of trees on urban climates, home energy needs, and urban noise. We've examined some of the ways by which open space can be retained and serve useful purposes as a community expands.

Through technical assistance and extension programs, the results of this Forest Service research have been passed on down to urban foresters and parks superintendents throughout the country. In the past, we were also able to offer cost-share funding for community forestry--federal seed-money, distributed through the state foresters, which enabled more than 22 states to build progressive state programs in community forestry.

However, the federal role in urban forestry in shrinking, year by year, as federal spending is reduced, and the effects are being passed on to the state and local governments and to citizen groups. Some aspects of the federal role will continue, but others are being eliminated or transferred to other agencies. We expect to continue to provide some high priority research, as well as some technical assistance through the state forestry programs.

We place a high priority on important urban forestry research programs and expect to continue them over the next several years, though future budget cuts require us to examine our priorities continually.

The federal government is not alone, either, in assessing its priorities. State forestry programs also face difficult times, as state governments trim and adjust their budgets to address the pressing demands for other public programs.

Many state governments are in difficult financial shape. Roughly 20 states have laid off employees, 22 have raised taxes to obtain needed revenue, and 26 states have eliminated programs to cut state spending. Without exception, state forestry programs and urban forestry programs bear their share of these state budget cuts.

And cities themselves are facing serious times. Crime, unemployment, loss of industry, and crumbling roads and bridges are some of the many problems which cities must cope with, and whose demands for resolution compete constantly with forestry programs on the urban agenda.

Altogether, it should be apparent that the past sources of government support for urban forestry are endangered by the press of other needs. And so I come to that first reality I stated earlier--that we won't have and keep successful programs in urban forestry without the active support of the American public. I believe that the greatest hope for forestry programs in the cities and communities of the United States lies with the citizens themselves who live and work in these areas.

Across the country, the most successful community forestry programs have been nurtured from a kernel of grass-roots organizational effort, with technical assistance from Extension or other information programs. And I don't believe we have yet come close to tapping the full potential of the volunteer organizations and citizen groups in making urban forestry programs happen.

Yet, that is precisely what must happen. So I am pleased that the American Forestry Association has become a citizen-group catalyst for urban and community forestry in the United States, that it has been instrumental in the National Urban and Community Forestry Leaders Council, and that it is one of the active and progressive cosponsors of this meeting.

There are many dimensions to the urban forestry interest and experience at this conference, and urban forestry needs differ throughout the nation. So there is no reason to believe that we must all agree at this conference, that we must all move together in lockstep, or even that we must all follow the same path.

But we must all move forward together in urban forestry--sharing information, sharing ideas, and sharing our resources to make each of our programs happen.

And we must move forward with those who have other concerns about the cities and communities of the United States. Our care and stewardship of the urban forest must encompass a broader concern for our cities. That is the second reality I want to address here.

The problem we face in all of our communities is not simply one of greening them with trees and parklands, but of caring enough about these cities and the people who inhabit them to help solve their larger problems. We should be concerned about care and stewardship of people through best use of the living things which sustain them and brighten their lives.

There are two important reasons for this:

The first reason is because there is a whole body of scientific information--study upon study--which shows that urban forests can do a great deal to make our communities more

livable and enjoyable for the people who live in them. We know that trees reduce air pollution, reduce heating bills and air-conditioning costs, buffer noise, beautify communities, and have many other beneficial effects on people.

The second reason is because the realities of American political life dictate that people vote and trees don't. And urban forestry programs that ignore possible contributions to the larger matters of city care, and that focus on trees instead of people, will lack support and wither away when difficult choices among programs must be made.

Some of the strongest urban forestry programs in the nation are carried on as part of a larger process of urban rebirth and community revitalization. Baltimore, for example, is conducting a very progressive urban forestry program which is the source of a great deal of community pride and which goes hand in hand with other efforts to revitalize the downtown. The City of Balitmore is reaching out and involving citizens in this program by forming community associations.

What I think is necessary is that we who promote and practice urban forestry truly understand that it is people who matter, that trees and parks and urban forestry can matter to people, and that our urban forestry programs must be developed and carried out on that basis.

And when we understand that, then perhaps we can reach out and draw additional support for urban forestry programs from other institutions that care about livable cities. We see here the beginnings of that cooperation and coalition, but it is only a glimmer of what is possible.

We have mentioned that this is the Second of these National Urban Forestry Conferences, so it is perhaps too late to claim it as the beginning of the urban forestry movement in the United States. However, it is not far removed.

We have made substantial progress in urban forestry in recent decades. Our knowledge has grown and our interest has blossomed, and our cities and communities are the better for it.

But that progress represents only our first few steps on a long and winding path. And we have many miles to go before we can say that we have done with urban forestry all we could possibly hope to do to make our cities livable.

But our party grows, our pace has quickened, and we move forward now with purpose and vigor in our stride.

URBAN AND COMMUNITY FORESTRY--THE PROCESS

Rexford A. Resler
Executive Vice President
The American Forestry Association
Washington, DC

Welcome to AFA's annual meeting and the Second National Urban Forestry Conference. It is a distinct pleasure to be here in Cincinnati, the home of John Aston Warder, the founder of the American Forestry Association and of forestry in the United States.

The American Forestry Association is proud to be associated with the Urban and Community Forestry movement in this country. This development has many similar characteristics with the forestry movement of 100 years ago and has its roots in that historic time. Urban and community forestry is the scientific and systematic management of all natural resources in and near our cities. Urban and community forestry is an important educational link between our urban public and natural resource management and the rebuilding of our nation's conservation ethic. This is an important linkage as our city environments today have little in common with natural ecosystems or with pastoral, agricultural settings common during our early settlement days. However, everything we use in this city environment ultimately comes out of nature. To quote Rene Dubos, "We are still in nature, but no longer quite of nature." Urban and community forestry helps to bring us, as an urban society, more in touch with nature. In short, it is an idea who time has come. And in the words of Voltaire, "An idea whose time has come is stronger than all of the armies of the world."

As we all know, there are two magical ingredients in life: the spark of an idea and the leadership to drive that idea to its fulfillment. One hundred years ago, those ingredients were at work here, and we know what resulted. Today, they are all at work again. You have evolved the idea or concept of urban and community forestry, and you are the leadership element, each and every one of you. As individuals, you can make a difference in your own community and by working together, we can make a difference in society: making our national a better place to live.

However, to make a difference through urban and community forestry in your community and in our community of mankind, we all need to realize that there is a process involved in bringing the concept to its fulfillment for society. It won't just happen by accident or by wishing it so. Remember, first we have the idea, then the leadership. Next must begin a process of what those in religious circles call "exposure, involvement, and commitment;" exposure of people to the idea, involvement of people in the movement of that idea, and finally mental and physical commitment of people to drive the idea to its fulfillment. Out of that process comes delivery of action to make a difference in our daily lives.

Think about that process when each one of our speakers talks about his success stories. I believe that you will find these key ingredients in each and every presentation.

Exposure involves the communication of belief to your fellow citizens of what can be accomplished through an urban and community forestry effort in your community, state, or country. As you communicate, you will discover, by design or by accident (hopefully by design), that there are others who hold your same belief or at least are in agreement with you on a number of related issues. When you find your areas of agreement, you will find synergism and strength for the movement.

However, you cannot just communicate your ideas to people and leave it at that. You must also make them want to become a part of your vision and actively involve them in

bringing about the change that you see through your vision that by now is theirs and collectively "your" idea. And they must be actively involved if you ever expect to reach the third step in the process, that of commitment.

If there is one thing I have learned over my career, it is that people want to be involved, to be part of the action. You can't just do something for people and expect them to be grateful or to be committed to you or your idea. You have to involve people in working on that idea, whether it is designing the program, finding the funding, or planting and caring for the trees. People want to be actively involved in the work and want to feel a sense of accomplishment, a sense of pride in a job well done and one in which they have been an active participant.

When you have finally reached the commitment state, you will know it. People will want to know what to do next. They may even act on their own on behalf of you and your (by now, our) idea. And they will believe they are a part of the idea as well as the action. Where does that leave us with delivery or reality? You will find that once you have reached the commitment stage, the delivery, or making something a reality, is easy. You simply place the forces in motion to create the legislation, communicate with the public, find the funding, and do the tasks involved with on-the-ground delivery. You lead your team, delegate, involve, and systematically do what needs to be done.

Now, before you jump to the conclusion that this is a one-time process, let me assure you that the exposure, involvement, commitment process has to be ever-continuing, day-in, day-out, year-in, year-out. It never ends!

The American Forestry Association has gone through its own process of exposure, involvement, and commitment to natural resources and now to the urban and community forestry concept of managing natural resources. In fact, it may surprise some of you that that process goes back in time all the way to our early beginnings with John Aston Warder. This is evidenced by the initial and continuing planting in Eden Park. Again, in the 1930's, our "American Forests" magazine carried a continuing series on trees in the city written by A. Robert Thompson, the author of the famous National Park Service series on tree care.

Our recent involvement in the creation of the National Urban Forestry Leaders Council, the publication of our Urban and Community Forestry Newsletter, regular magazine articles, the development of "Spunky," and our role in bringing about this National Urban Forestry Conference are evidence of a rebirth and renewal of that commitment. All of these are happening because of ideas and leadership, and each is a part of the process of exposure to, involvement in, and commitment to the urban and community forestry concept.

On a national level, it is important that we in the urban forestry family (foresters, arborists, nurserymen and women, landscape architects, planners, horticulturalists, botanists, to name a few) need to use the same process for the betterment of our society through urban and community forestry. We know that natural resources are vital to those who live in our cities and to our society and our nation as a whole. We must work together to take our American public through the process of exposure, involvement, and commitment to the urban and community forestry concept. We need to work to find our coalitions to conduct the process to make these ideas reality. Urban and community forestry and public attention to the importance of managing all of our natural resources need to be back on the national agenda.

Again, be thinking about the process as you listen to the speakers over the next few days and be thinking of how we can work together to make the urban and community concept a reality in this country. The American Forestry Association is committed to natural

resource management for people in our cities and communities and in rural areas away from the city. We stand ready to work with you and to help you on the national, state, and local levels. Together, let's see what we can accomplish through unity of purpose and collective strength. After all, the idea is one whose time has come, and the leadership is present in this room. All we need do now is to unite and set the process in motion.

URBAN AND COMMUNITY FORESTRY--THE DELIVERY

Denzil Clegg
Associate Administrator
USDA Extension Service
Washington, DC

I appreciate the chance to share with you my thoughts on urban forestry. The people planning this conference have asked me to focus on the systems for delivery of urban forestry information. In particular, I will be focusing on the Extension aspect of that delivery.

THE CONCEPT OF THE URBAN FOREST

There are many ways of looking at forests. If we looked down from a high-flying jet, or perhaps, the space shuttle "Columbia," we might see three forests in our nation. We would see the natural forest of our heritage, the planted forest of our industry, and the urban forest of our cities and their environs.

It is this third forest, the urban forest, 69 million acres strong, that we are focusing on at this conference. Most of use here are familiar with the concept of the urban forest. But it may still be surprising to some to realize that this special forest includes not only tree-lined streets, but parking lots and school yards, downtown parks and riverbanks, cemeteries, and freeway interchanges. It includes everything from the dwarf dogwood tree we tenderly nurture to the huge oaks and pines of the natural forest at the end of the furthest suburban street.

We would all agree, I believe, that the urban forest needs management as an ecosystem, in addition to attention to individual trees. An increasing challenge, as I see it, is not only to enhance the aesthetic benefits, the recreational aspects, and the protection of soil and water that trees provide, but also to produce useful wood products.

"FORESTRY WHERE PEOPLE LIVE"

Before I continue, I want to define what I mean by urban forestry. I understand that a "definitive" definition for urban forestry is still being debated. At the risk of sounding simplistic, I offer this definition: urban forestry is "forestry where people live."

Forests where people live need the attention of people from many walks of life. Urban forestry embraces the work, from research through application, of many professions, including plant pathologists, arborists, entomologists, city planners, horticulturists, foresters, and others.

PEOPLE WANTING URBAN FORESTRY INFORMATION

We in the Cooperative Extension Service frequently define our role as "People helping people." With our research base, we can meet the needs of the three groups of people who want and can use our informational services. When they want information we do not have, we direct them to other sources. I see homeowners and property owners as the first group; urban foresters, arborists, nursery personnel, and other such professionals as the second group; and state, city, and local policymakers as the third group.

I'd like to talk about each of these three groups and about our involvement with them. Of course, we are only one source for these people. Many of you here represent the other sources of expertise on urban forestry.

One of our functions at the national, state, county, or local level is to make research recommendations based on information these three groups need. Another of our functions is to carry research results to these groups. The process is a continuous two-way information flow. Further, we, as coordinators and facilitators, bring various groups of people together to exchange ideas and to learn from one another's experience and training. These sources and methods work cooperatively. Let me give some examples.

In California, 10 percent of the revenue from timber sales on state forest lands is earmarked for urban forestry. This provides a fund for coordination of many sources and methods. One method is a contract between the state forester's office and the California Cooperative Extension Service to carry out urban forestry educational programs. This cooperation works! The program involves state and local government agencies, private industry, and professional and lay associations, and it uses citizen volunteers. It is impressive. You will have a chance to hear more about California's program later in this conference.

Another example is in Kansas. There, Extension faculty from Kansas State University join with the Kansas Arborists Association to train arborists to become certified. During the past seven years, 245 arborists from Kansas and surrounding states have been trained, and over 70 have become certified to practice arboriculture in Kansas. This program draws heavily on both public and private sources, and much of the teaching is done by professional arborists. The next result is a better urban forest environment.

A third example is here in Cincinnati. Urban forester Steve Sandfort skillfully uses the knowledge and resources of literally dozens of agencies and groups. I encourage you to join the tour on Thursday to see this firsthand.

Earlier, I referred to the three groups who want urban forestry information. Let's look at the information needs of the first group.

HOMEOWNERS AND PROPERTY OWNERS

Suppose that a homeowner or property owner wants information on planting and maintaining shade trees or on landscaping the property to prevent soil erosion and muffle noise from a nearby highway. Several sources would have the answers; for example, libraries, small businesses (including bookstores), forestry consultants, arborists, nursery staff, urban forestry related associations and organizations, and the Cooperative Extension Service.

If the homeowners call, write, or visit the CES office nearest them, they often obtain publications. Or, depending on the specific inquiry, they might consult with the county agent or the CES expert on the staff of the land-grant university or college. Here in Cincinnati, for instance, the county agent is Bobbie Davis. The land-grant university is the Ohio State University in Columbus, and there would be several staff members in the School of Natural Resources who could provide information.

For these types of questions, the home and property owners want practical, "how to" information. Often, their need can be met with a publication. Later, when they have specific questions, our county and state staff can answer. Or, as I mentioned before, they can refer the homeowner to some other source.

For example, Extension urban foresters in South Carolina are preparing a forest and shade tree report notebook of 15-18 fact sheets. Each sheet will cover a specific insect, disease, or cultural practice. County agents, other professionals, and practitioners will use these sheets to diagnose tree problems for landowners. Extension foresters conduct plant problem clinics in shopping malls, and they maintain a diagnostic clinic for problems that county agents and other professional are unable to solve.

URBAN FORESTERS, ARBORISTS, AND OTHER FORESTRY PROFESSIONALS

The second group consists of people earning their living completely or in part through urban forestry. They have different needs from members of the first group. The emphasis is on more technical information, in such areas as pesticides, plant materials, new cultural practices, new equipment, and other technical subjects.

These professionals will use the information to make decisions on trees and other vegetation in all aspects of the urban forest environment.

They often function as one of the information sources for the first group, and also for the third group, described next. To get their answers, these foresters, arborists, nursery staff, and others may rely on researchers at land-grant colleges and universities. Often, these researchers have a joint appointment in research and extension.

At this point, let me elaborate a bit on research. One of the fundamental ideas behind the formation of Cooperative Extension Service was to transfer, or extend, information gained through research at land-grant colleges and universities to people who could use it. While this idea still represents a key function, Extension draws on all applicable sources of research, public and private, to meet its clients' needs. Extension also identifies new research needs and feeds this information through the system.

STATE AND CITY POLICYMAKERS

Members of this group range from neighborhood associations and other special-interest groups to mayors to city council members to others responsible for budgets for city park and recreation programs. They want data on value, costs, engineering uses of trees and other plantings. They are often responsible for monies to spend on trees, and they rely on their professional staffs for budget expertise such as cost/benefit analyses. As mentioned, this group, like the homeowners and property owners, can go to the second group, the urban foresters and other professionals, for the answers.

We in the Cooperative Extension Services are using electronic technology to help these users. Computer inventories have been drawn up that list all public trees in a city, for example, and from which the data can be retrieved easily. The manager responsible for the trees can use these data to devise work schedules for county or city staff that depend on when and what type of attention the trees need.

Extension Service-USDA and Extension in many of the states use audio- and visual-teleconferencing to communicate with and train staff members and volunteers. Extension field staff members use cable TV to target information to a wide home audience beyond our previous clientele.

Producers and users of information have acquired stand-alone processors or computer terminals (with or without printers) which hook to mainframe computers via the standard telephone line. In the Green Thumb system prototype, users "download" data through a telephone link into a "black box." The phone is disconnected, and the data appear on the accessor's TV screen.

NARS DEVELOPED

Extension Service-USDA, in response to congressional requests, has worked with selected states in developing the conceptual design for an interactive computer-based data system. The objective is to enable quick response to external requests for information on the impact and cost effectiveness of Extension programs. Known as NARS, the Narrative Accomplishment Reporting System has been operating since 1979.

NARS provides electronic access to successful state Extension programs nationwide. It improves accountability, methodology, and transfer of information. The NARS data base is available online through a national telecommunications network.

Many states have provided and retrieve data from NARS without technical training. This year, Extension-USDA has asked states to use the NARS format to report on their accomplishments. This change will cut down on their burden of response while increasing the use of the most recent information on accomplishments. The national evaluation and accountability reporting system being developed will be based on this NARS concept.

OTHER ELECTRONIC TECHNOLOGY EFFORTS

The Extension Committee on Organization and Policy has formed a Computer Task Force with representatives from each of the four Extension regions, research, instruction, and Extension Service-USDA. Each of the regions is either studying or setting up regional computer centers or institutes.

Extension-USDA, in keeping with its identification of national issues, has establishing an Electronic Technology Task Force with representatives from each Extension Service-USDA program unit. The Task Force is developing a long-term plan of work. In the short term, it is providing expertise for the conducting of microcomputer clinics via teleconferencing and for electronic marketing training sessions.

AGNET--AMERICAN NETWORK FOR AGRICULTURE

Perhaps some of you have used AGNET, often called an American network for agriculture. AGNET is an electronic network designed to deliver management tools and information to individuals and organizations concerned with agricultural production. AGNET's library contains over 225 programs. They divide into three major categories: problem-solving or analytical programs; market information delivery; and electronic mail. Currently six partner states participate in AGNET--Nebraska, Montana, North Dakota, South Dakota, Washington, and Wyoming. The AGNET system is now accessed by 37 states, Canada, and other foreign countries.

FUTURE DIRECTION

Having looked at the types of assistance Extension provides, let me turn toward the future. In these times of continuous change, it is difficult to predict. Yet I feel fairly confident that certain issues in urban forestry will be with us tomorrow.

Energy needs continue--whether it is the use of trees as wood or as instruments to conserve energy.

Public and private involvement--who will do what in urban forestry?

Funding--where will funds come from to support urban forestry?

Our natural concern for the environment--protection of soil, air, water, vegetation. We will be looking for ways to balance competing uses in a manner satisfactory to as many of us as possible.

Where will we in Extension be involved with the urban forest? Funding will continue, though at a lower rate, so far as I can see. At the national level, we will continue to provide support to the states, and we will be involved directly as part of the National Urban and Community Forestry Leaders Council. Within the U.S. Department of Agriculture, the Extension Service will represent urban forestry needs in concert with the Forest Service and other involved agencies. And we will continue to expand our delivery capability through electronic technology.

Nationwide, the programs I've touched on and given a few examples from will continue--in each state. Extension will be involved because we are where people are. And urban forestry is "forestry where people are."

SECOND NATIONAL URBAN FORESTRY CONFERENCE

GENERAL SESSION II

MAKING URBAN FORESTRY A PART OF THE COUNTY AND CITY PLANNING PROCESS

Monday, October 11, 1982
1:00-2:00 p.m.

Moderator:

Gene W. Grey
USDA Extension Service
Washington, DC

Speakers:

Fred Bartenstein City Government Dayton, Ohio	Meeting Urban and Community Needs Through Urban Forestry	21
Margaret Thomson Washington, DC	Making Urban Forestry a Part of the County and City Planning Process: A Planner's Perspective	27
Ann Strong University of Pennsylvania Philadelphia, Pennsylvania	Making Urban Forestry a Part of the County and City Planning Process	*
John Bethea State Department of Agriculture and Consumer Services Tallahassee, Florida	Making Urban Forestry a Part of the County and City Planning Process in Florida	30

*Paper not included.

MEETING URBAN AND COMMUNITY NEEDS THROUGH URBAN FORESTRY[1]

Fred Bartenstein
Special Assistant to the City Manager
City of Dayton, Ohio

ABSTRACT

Urban forestry programs in cities do not compete well with other services especially in times of financial crisis. For urban forests to survive, a case must be made for their physical, economic and social contributions to urban dwellers. Programs must focus on needs and issues relevant to urban dwellers and not on the needs of individual trees. An urban forestry strategy should be based upon the contribution of the tree resource to the city's economic vitality, neighborhood vitality, and livability.

INTRODUCTION

I was glad to hear Chief Peterson note this morning that urban forestry programs will succeed if they stress the needs of people over the needs of trees. Mayors and managers think in terms of people, their citizens.

I disagree with the suggestion that foresters focus their attention on neighborhoods, small communities, and parts of cities. The future of urban forestry is being determined at a higher level. The citywide management environment is the key pressure point, and your story isn't being told loud enough there.

Mayors and managers often fall prey to the notion that once trees are planted they will take care of themselves, unlike bridges, sewers, streets and sidewalks. I don't have to tell you this is not the case. I also don't have to tell you the disaster a city faces after 10 or 20 years spent ignoring the trees. A second major misconception we allow to take root in urban policy forums is that urban forestry is an amenity program, somehow separate from the nuts and bolts of building and operating cities day-to-day.

Do you ever wonder why your voice doesn't seem to get heard at City Hall? The city official looks at forestry as one of a large and growing number of services local governments can provide to satisfy demands of taxpayers. Policing, street lighting, waste collection, libraries, fire prevention and suppression, building inspection, street maintenance, water, airports, correction, zoning enforcement and public health are but a few of the services that must be considered when divvying tax receipts each year.

When money is plentiful, city governments are in the position of being able to please almost everyone. When money is tight, there are two choices -- perform less service or manage more efficiently. The latter choice, management, implies prioritization. When citizens are asked to rank the importance of existing services, safety services (such as police and fire) invariably come first, followed closely by public utilities (such as water and streets) and environmental control (such as waste collection and housing inspection). Amenity services usually place last.

In order to manage with less and respond effectively to citizen needs, we have had to learn not to concentrate on the service organization, but on the end results. The Dayton (Ohio) City Commission hopes to achieve five results with its tax dollars. These are

economic vitality, neighborhood vitality, maintenance of Dayton's unique character, leadership in intergovernmental affairs, and preservation of the urban infrastructure. Budgeting for service delivery under these goals requires a rethinking of most traditional urban services and some evaluation of how well each service responds to the newly expressed needs. Let's look at urban forestry within this planning environment.

URBAN FORESTRY AND THE CITY

What is urban forestry? How did we get in this business? To what needs does it respond? City forestry practice has traditionally focused upon needs of the city's trees. When asked what the trees do for the city or its people, forest managers tend to respond with general statements about beauty and the backlog of citizen requests for tree maintenance. Given these responses, it has been easy for city policy-makers to justify passing responsibility for tree care to individual property owners --who appear to have the most benefits to gain from trees.

How did cities get into the tree business in the first place? I think there are two obvious reasons. One was to bring nature within reach of the urban dweller, who in many cases missed the scenes of a rural childhood. Second was to reduce the awful heat of cities in the summer, hence the familiar "Shade Tree Council."

Two developments in the 20th century greatly diluted the constituency for city trees. Refinement of air conditioning technology in the 1930s revolutionized the city's vulnerability to extremes of temperature and humidity. Mass production of the automobile provided the city dweller with the option to locate in rural and suburban environments with natural settings. The limited and expensive green elements foresters and landscape gardeners could import to the dense urban core offered little competition to the half-acre lawn.

Air-conditioning and widespread access to the automobile weakened the constituency for urban forestry and placed upon city foresters their "caretaker" role. As the cityscape changed under economic and social pressures, incremental decisions were made in which the existing urban forest began to slowly disappear. Urban renewal, street widenings, demands upon open space for active recreation, absentee ownership, and new municipal concerns for safety, operating efficiency and capital intensive maintenance, all caused removal of trees. As urban officials got better at managing resources for maximum productivity and cost efficiency, the urban forest became viewed more as a liability than an asset.

Municipal tree issues in the '50s, '60s and '70s pitted the "practical men" and "progress" against emotional, poetic, or downright recalcitrant bands of garden clubs, preservationists, and civic beautifiers. Despite occasional victories, the net result was almost invariably fewer trees in the city.

JUSTIFYING URBAN FORESTRY PROGRAMS

In order for urban forestry to survive, a case must be made for the contribution of urban forests to urban survival. This case must focus on needs and issues relevant to urban dwellers and not on the needs and difficulties of trees in the modern city. Like old buildings, trees stand the best chance for survival if their contributions to a city's physical, economic and social welfare are considered. These values must be understood and translated into costs and benefits before forestry can effectively compete for scarce tax dollars.

A modern municipality will probably not choose or be able to fully care for all the trees in the city. Given a set budget and forced by a lack of policy to spread it equally over a massive inventory of street and park trees, urban foresters are no longer even "caretakers" -- they are "morticians." Trees demanding first attention will be those that are dead, blown down, or overgrowing street lights, sewers and utility wires. With limited budgets, the rate of removal will almost invariably exceed that of replacement. A lack of care for the existing healthy stock only increases the death rate. Inexorably, our cities are moving toward the logical end of "no forest."

In order for urban forestry to survive, clear reasons for healthy trees to exist must be stated, in terms relevant to today's citizens. Furthermore, policies must be developed which permit forest managers to maximize benefits, minimize costs, and demonstrate how trees can compete with other urban services as an efficient response to the needs and desires of city dwellers.

With the assistance of the USDA Forest Service and researchers in the forestry profession, Dayton is developing a body of knowledge and strategy which would change perceived values and the management of our urban forest. Drawing upon the city's policy goals and the tools of cost benefit analysis, the Dayton Project is seeking to develop a comprehensive urban forestry strategy that recognizes the contributions that trees make to the city's vitality.

ECONOMIC VITALITY

A primary goal for most American cities is economic vitality. Trees will probably never be a major tool for economic development, but to the extent they attract jobs or residents, trees can play an economic role. The image of a community is an important aspect of its attractiveness to the investor. There has been almost no research into the impact of trees or tree programs on investor choice, nor has there been careful evaluation of the economic results of major landscaping efforts. However, if a city wished to use trees strategically to enhance investment, it might give first attention to the airport, interstate highway approaches, industrial opportunity areas, and the central business district.

NEIGHBORHOOD VITALITY

A second policy goal is neighborhood vitality. In view of a monumental investment in housing stock, public infrastructure, and public services, cities are fighting to keep their residential neighborhoods viable and competitive. Mature trees are an asset older city neighborhoods have which cannot be found in newly developing areas. Not only are these trees a public asset, in their contribution to resident evaluations of a neighborhood's desirability, attractiveness, and uniqueness, they are also a private asset to the extent they contribute to property values.

There has been little quantification of the contribution trees make to an urban dweller's satisfaction with his neighborhood, the effect trees have on decisions to live in a given place, or exactly what impact they have on property values or the willingness of financial and insurance institutions to support urban investments. As aging forests decline and begin to disappear, it would be useful to know to what extent dissatisfaction and disinvestment follow.

If a city were to attempt strategic management of its forest for neighborhood vitality, it might identify and concentrate on areas where a mature forest is the most distinctive element of a neighborhood's character. The city might also seek to link forestry

improvement with other programs targeted in a given neighborhood, or at least ensure that new efforts are not undermined by forest decline. A city might seek ways to get residents interested and involved in forest management decisions for their neighborhoods, perhaps to the extent of special assessments, or direct participation in tree care.

In some neighborhoods, trees are not valued, and may even represent a liability. In particular cases, trees may be disliked for their interference with architecture or scenic views. Senior citizens may find it hard to contend with leaves or the other litter trees generate. These preferences should be taken into account in forest management decisions. In some areas, reduction or even elimination of trees might represent a contribution to neighborhood vitality.

CITY CHARACTER

A third policy goal is maintenance of the city's unique character. Landscaping can enhance the appeal of the city's architecture, topography, landmarks, and distinctive natural features. Trees can draw the eye to desirable views and screen those which are undesirable. A well developed and managed urban forest can be an amenity asset without regard to its component parts.

Measurement of aesthetic appeal is a difficult prospect, as is development of management guidelines to maximize amenity values. A lack of aesthetic appeal in modern cities often reflects the difficulty of defining and managing for that characteristic.

Until more is known, the most a city can do to strategically enhance forest amenity is to ensure that its planners are equipped with design skills. A forest manager, in prioritizing resources for amenity, might concentrate on identified landmarks, the city's most distinctive features (such as downtown or the rivers) and views from high places and major transportation corridors. Special attention might also be given to trees which have acquired landmark status by their age, location, rarity, or role in history.

HEALTH AND LIVABILITY

A fourth policy goal is urban conservation, or the wise and efficient use of resources. The least understood benefits of the urban forest are those offered to city health and livability. In principle, we know urban vegetation is helping to moderate humidity, reduce the speed and volume of water runoff, reduce air pollution concentration, and absorb enough solar radiation to substantially reduce energy demand for space cooling. In addition, vegetation can contribute to the comfort of individuals by providing shade, windbreak, sound absorption, and an alternative to heat-radiating concrete and asphalt surfaces.

In Germany, the Netherlands and other parts of the world, the beneficial climatological effects of the urban forest are considered in land use policy. As land becomes more scarce and energy costs rise, citizens become more aware of the temperature and quality of air in cities. Cities in competition for economic development and residents are becoming more conscious of climate and its impact on their viability.

There is a growing body of knowledge on how the urban forest can best be managed for environmental benefit. Scientists tell us that more trees are better, and that for better air quality and reduced summer air temperatures, effort should be concentrated in the city's upwind sector. Cost-benefit ratios are not known, but it would be valuable to calculate effects of an urban forest on a city's energy budget, and for air quality planning, the amount of pollution reduction that could be attributed to the existing urban forest.

COSTS AND BENEFITS

I have identified four areas in which the urban forest can offer strategic response to urban needs. An entire city's budget could be spent in pursuing just one of these goals. The best way to defend urban forestry expenditures is to demonstrate how they achieve a desired result at less cost than alternative means for achieving that result. This approach cannot be pursued without the reliable data which has so far been lacking in the urban forestry field. We can, however, apply common-sense criteria when prioritizing urban forestry expenditures. The two most important questions, as always, are "Who pays?" and "Who benefits?"

Trees on private land provide the greatest benefit to property owners. It has traditionally been the property owner who chooses, installs, maintains, and replaces private trees. Public benefits, however, clearly result from these private investments. It might be far more efficient for the local government to provide educational information, technical advice, or even assistance in the purchase, planting, and maintenance of private trees than it would for a city to achieve equivalent results through the installation and permanent management of public trees.

Neighborhoods which desire a high level of tree care should be encouraged to create benefit-assessment districts which would provide shared or totally private funding through a management contract with the city or private tree service. The case for such assessment districts can be made by demonstrating the "new profit" a property owner can realize through contributions of trees to real estate values, and the savings in cost and effort available through the district.

There are resources that can be tapped to stretch the public dollar, or ensure continuation of an otherwise threatened forest amenity. These are the corporate and voluntary sectors, which stand to reap promotional or intrinsic rewards from "adopt a block," "adopt a tree," or "adopt a park" programs. Partnership with local government to ensure survival or enhancement of public landscaping is not a new idea. Frederick Law Olmsted's 1882 pamphlet, Spoils of the Park, documented New York City's failures to adequately repair drains, provide police supervision, control vandalism, and avoid the death and overgrowth of Central Park's vegetation. A private Central Park association has been active since 1902 in supplementing municipal maintenance of that priceless resource.

A cost-effective management strategy would also seek opportunities for the forest to help pay its own costs. Wood products such as firewood, Christmas trees, pulp, leaf mulch, and even raw building materials might be profitably investigated and developed by urban forest managers, depending upon local conditions and markets.

Control of management cost implies the design and redesign of vegetation systems to require the least possible maintenance for the level and type of benefit desired. Areas in which masses of vegetation are planted for their effect on air temperature or air quality do not require the level of care given to landscaping aimed at increasing economic vitality of a city's commercial core. Forest investments are typically long-term in their cost and benefit implications.

Enhancement of the local urban forest management environment is one of the greatest contributions researchers and state and federal governments can make to the control of urban forestry costs.

EXTERNAL COSTS OF THE URBAN FOREST

An urban forest management strategy which defines how trees can serve urban needs and how management costs can be controlled is still missing one very important dimension--control of external costs. Urban forest managers must develop the ability to anticipate, control and, in some cases, justify the costs trees impose upon citizens and other public services.

The most critical area of concern in controlling external cost is that of public safety. There can be no question that trees pose a hazard to the occupants of a speeding automobile. Under certain conditions, they can create a fire risk that would not otherwise exist. Trees and other vegetation can also reduce the ability of police to provide surveillance of public spaces or neighborhood streets. Urban forest plans, through anticipation and control of safety risks, can avoid conflict within city bureaucracies or in public forums, without substantial reduction in the many benefits the trees provide.

Similarly, in their cost-benefit calculations, urban forest managers must include impacts upon utility services, street sweeping, storm sewers, street lighting and other municipal service. Urban forest plans should demonstrate that benefits or income provided through the program offset costs elsewhere in the public service network.

Another element which needs to be considered in the control of external costs is the potential for negative impacts upon citizens and businesses. Blockage of signs, views, and architecture is one kind of negative impact. Also to be considered is the time and money spent in raking leaves, repairing windstorm damage, or repairing the utility services damaged by trees.

CONCLUSION

In Dayton and other cities, existing urban forestry programs can be evaluated for their contributions to the city's economic vitality, neighborhood vitality, unique character and livability. We can also evaluate how well existing programs control management and external costs. Calculations of cost and benefit, and the resulting prioritization of resources, at this point can only be educated guesses until more is known about the urban forest and its measurable impact. Educated guesses, however, should improve public satisfaction and our day-to-day management of the forest within existing resource constraints. Educated guesses and well conceived programs might even increase the number of dollars allocated to urban forestry.

1/ This address was adapted from "The Future of Urban Forestry," presented to the Consortium for Environmental Forestry Research on March 22, 1980, and is available in its entirety from The Pinchot Institute for Conservation Studies, P.O. Box 188, Milford, Pennsylvania 18337.

MAKING URBAN FORESTRY A PART OF THE COUNTY AND CITY PLANNING PROCESS

Margaret A. Thomson
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Washington, DC

ABSTRACT

Urban forestry is becoming a part of the city and county planning process. Yet, there are weaknesses in the planning process and problems inherent in dealing with planners. These are that: (1) planning is a poorly understood process, which does not stop when the plan is adopted; (2) planning is an incomplete process (it does not include the resource base nor interactions between the resource and the people); (3) planning is also a political process. The planning process attempts to resolve conflicts between people, places, and issues, and compromise is sometimes overlooked. In the final analysis, the citizen, not the forester nor the planner, must advocate urban forestry to the elected official who approves the plan.

Today, urban forestry is becoming a part of the city and county planning process. When the planning for this conference session began over a year ago, there was no evidence that planners and foresters were talking to each other except in their own communities. Today, there is a session on urban forestry and planning at this meeting, and in April 1983, there will be a session on urban forestry at the annual meeting of the American Planning Association, the organization I am representing today. Later this month, in Seattle, there will be an entire conference on land use planning and forestry.

As a planner, I am pleased with this progress. But I am also concerned that we be cautious and aware of not only the opportunities in making urban and community forestry a part of the planning process, but also of the weaknesses in the planning process and the problems inherent in working with urban and community planners.

First, planning is a poorly understood process. Secondly, planning is an incomplete process, and thirdly, planning is an inherently political process.

First, planning creates problems for urban forestry because it is not well understood. Planning has been misunderstood because its focus has been on producing a comprehensive plan. The plan is not the purpose of the process. It is only a snapshot of the city on the day the plan was adopted, not the reality of city life. Planning is a means by which the city assesses its built environment (buildings and streets), identifies common needs and values (like having shade trees), develops attitudes and beliefs, and coordinates land-use decisions.

The process is a continuous evaluation of, by, and for the community and does not stop when the plan is completed.

Making plans is not the purpose of planning, just as the purpose of urban forestry is not planting trees. Both are integral and necessary parts of urban forestry and urban planning, but making plans and planting trees don't make livable cities. People make cities livable.

As urban forestry becomes a part of the county and city planning process, urban foresters and forestry activists must be vigilant in advocating forestry interests throughout the planning process. We must insist on comprehensive planning that inventories city trees and forests, promotes efficient forest management, and permits attitudes toward trees which ensure opportunities for growth to healthy maturity. And when the plan is completed and adopted, we must maintain that vigilante approach to ensure plan implementation.

The second problem inherent in the planning process is that it is incomplete. Planning does not give adequate consideration to the land itself, nor to the interaction between the land and people. Planning does not give adquate consideration to land, the resource base, for two reasons. First, planning has historical roots in the City Beautiful movement, with its emphasis on beaux arts architectural styles. This emphasis has produced a bias among planners towards the structure on the land, rather than the land itself. A second reason for planning's failure to consider adequately the resource base--at least from the forester's point of view--is that the planner must also consider many other givens in the planning process. The planner must consider such diverse data as the city's population characteristics, and the age and capacity of the utilitiy systems. While resource data are included in the data base, it is only one type of data which must be considered in the increasingly complex task of urban planning.

Planning is also incomplete because it does not give adequate consideration to the interaction between the resource base and human behavior. While some consideration has been given in recent years to the interaction of the built environment with human behavior, the data are very scarce. We do not know with certainty, for example, whether trees encourage economic development in the city or whether they help to retain and maintain the vitality of an older neighborhood. As foresters and forestry activists, we know implicitly that trees influence city life. When Dutch elm trees die, we know instinctively that something more has been lost than just a tree. Exploring the attitudes of people towards trees is the first step towards using trees to foster legally and socially sanctioned activities on city streets.

The third problem in the planning process is that planning is inherently political. And, as in any political process, there are winners and losers. There are financial winners when land-use change produces a windfall profit. There are losers when the result of the change is a wipeout, not a windfall. There are social winners when the block grant for the park goes to your neighborhood, and social losers when the neighborhood gets the high housing project instead.

Resolving conflicts between potential winners and losers is the planner's role. Foresters are not trained to manage the resolution of these political conflicts and therefore can benefit from the planners' experience and thickened skin. On the other hand, planning tends to attract people who thrive on conflict and who may inadvertantly encourage confrontation when cooperation is an achievable alternative. Planners are also people who tend to be outsiders in relation to their own communities. They are often different, and because of their differences, not all of the planners' ideas will be readily accepted. Foresters should not become identified with the process, nor should they support planning proposals uncritically. A better approach for foresters is to wait for the community response rather than rush in before all positions on the planner's proposal are fully developed and understood.

These, then, are the problems inherent in the planning process: planning is a political process, making enemies as well as friends; planning is an incomplete process in relation to the land base; and it is misunderstood because of the emphasis on the product, not the process.

Planners do not have all the answers. Nor do foresters. To present the planning and urban forestry issues to the elected official, the only person who can provide the credible view is the citizen activist. The citizen has a unique role to play in advocating urban forestry against the other interests of one who lives in the city. The citizen, after all, is the one who pays the bill for the revenue impacts of changes in land-use. Planners cannot make cities livable, nor urban foresters. Voters will.

MAKING URBAN FORESTRY A PART OF THE COUNTY AND CITY PLANNING PROCESS IN FLORIDA

John M. Bethea
State Forester and Director
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ABSTRACT

Rapid population growth and urban sprawl are of concern in Florida. Legislation in 1971 allowed counties and municipalities to cooperate with the Division of Forestry in urban forestry programs. Initial efforts involved tree inventories, development of tree protection ordinances, and beautification programs. Legislation in 1975 called for communities to adopt comprehensive growth plans. This has allowed for greater forestry input into the planning process and development activities. Several specific examples of the activities of the Division of Forestry are presented.

INTRODUCTION

Planning is not new to Florida. The tremendous growth of Florida's population that began some 20 years ago mandated a serious involvement in planning at all levels of government; to not prevent, but to lessen the eventual environmental impact of 35 million visitors and almost 300,000 new residents each year.

Our urban forestry program had its beginning in 1971 in the midst of this period of rapid growth. That year an environmentally-conscious state legislature revised Florida's existing County Forestry Law to allow for counties or municipalities to cooperate with the Division of Forestry "to improve the beauty of urban and suburban areas by helping to create in them an attractive and healthy environment through the proper use of trees and related plant associations." The more specific objective of our urban program was "to provide the services of a professional forester, to assist and advise urban communities in planning and to assist in the establishment and management of trees and plant associations to enhance the beauty and livability of the urban environment."

As opportunities presented themselves, urban foresters were located in most of the major metropolitan areas of the state. Because of an early commitment to the philosophy that urban forestry must be a part of the planning process, these foresters were purposely located in county and city planning departments or in building and zoning departments. Initial involvement of the urban forester was with urban tree inventories, the development of tree protection ordinances, and community beautification programs.

URBAN FORESTRY PLANNING

Most of our experiences and involvement with the planning process, however, came about as a result of the 1975 Local Government Comprehensive Planning Act which required that all counties and municipalities adopt a comprehensive growth plan by July 1, 1979. Because a natural resources element was a required portion of each plan, we found an excellent opportunity to have direct input into the planning process, by invitation. We jumped in with both feet.

For over three years we preached comprehensive planning to our urban foresters and for over three years our people contributed plans and inventories, and more plans -- most of which were shelved and forgotten. And this is the point I want to make...Urban Forestry, to succeed, must be involved at the grass roots level of the planning process. However (and this is the clincher), there must be a commitment on the part of local government to implement the urban forester's recommendations.

We have since backed away somewhat from our previous total involvement in the planning process to reevaluate our program direction. Yes, we're still involved, but now we have increased emphasis on selling ideas to those involved in the planning process -- ideas which we feel are realistic and fairly easy to implement.

We have come to realize, for example, that one facet of planning with big "dividends" is the site review process. Prior to the initiation of construction on a development project, specially appointed committees in cities and counties examine the project proposal from many points of view. Impacts on the environment are often a major concern, and that's where our urban foresters fit in. The recommendations given by our foresters have already spared numerous unique natural areas from needless degradation or even destruction, and often through only minor changes in the site plan. We consider this type of involvement in the planning process to be productive because our foresters' recommendations are heeded, and their efforts in developing the recommendations result in a clear achievement "on-the-ground" -- in many cases, conservation of unique natural environments.

It is this "on-the-ground achievement" which we now strive for in all our planning efforts. No amount of words on paper can take the place of trees in the ground. After all, planting and saving trees is our number one priority -- not putting words on paper, unless of course, the words lead directly to more trees in the city.

Another example of what we consider productive planning involvement occurred in the Miami area. Dade County was once a region with a wealth of subtropical hammocks and numerous stands of South Florida Slash Pine. Most of these resources have been lost to the sprawling development common to the area, and the remaining remnant stands are severely threatened. In response to this alarming situation, our Miami-based urban forester has become involved in a plan which is reversing, to some extent, the trend toward the total destruction of the county's fragile natural environment.

Property taxes on those lands kept in a natural condition are significantly reduced if an approved management plan is adopted by the landowner and adhered to. It is now the role of our forester to provide the needed land management expertise. This is done through the evaluation of the properties in question, and the formulation of management plans. We have seen this program grow from the selling of an idea to actual implementation. To date, nine plans have been completed, three are being prepared, and five applications are pending.

In light of the success of Dade County, our Pinellas County urban forester has proposed a similar program of tax incentives in his county. The proposal is due to go before the Commissioners shortly, and implementation is expected.

We have a well-established urban forestry position in Indian River County, on the east coast of Florida. The Atlantic beaches in this area are of prime importance to the residents for a couple of reasons. First, they draw thousands of visitors each year who help bolster the local economy, and second, the dunes on the beaches serve as an important first line of defense against the dangerous storm tides associated with hurricanes.

Our forester in Indian River County is involved in a plan for beach park development and the restoration of sand dunes damaged by erosion and heavy foot traffic of beach-goers. Not only has he helped plan for the development and restoration of the coastal parks, but more importantly, he was instrumental in the actual implementation of plans -- directing and supervising the on-the-ground process. He got his hands pretty dirty in the process, but the results are a source of great pride for area residents.

CONCLUSION

By now, you are probably beginning to understand our philosophy regarding planning; planning is of no real value if it does not lead to implementation. Planning without implementation is tantamount to planning for planning's sake -- a pitfall that must be avoided at all costs.

We encourage our urban foresters to become involved in planning, but not at such a lofty level that our most basic objective of revegetating Florida's urban landscape is forgotten. Planning at the grass-roots level -- that's where we need to be.

SECOND NATIONAL URBAN FORESTRY CONFERENCE

SESSION A

SUCCESS STORIES FROM THE CITY

Monday, October 11, 1982
2:45-4:30 p.m.

Moderator:

Calvin Buikema
Department of Parks and Recreation
Baltimore, Maryland

Speakers:

Robert Skiera Bureau of Forestry Milwaukee, Wisconsin	Urban Forestry in Milwaukee, Wisconsin	35
Marvin Black Seattle Engineering Department Seattle, Washington	The Seattle Urban Forestry Experience	38
Harold Robson Parks and Forestry Lake Forest, Illinois	Urban Forestry in the Chicago Suburbs	42
H. Dennis P. Ryan, III Department of Parks & Recreation New York, New York	Forestry in the Big Apple	47
Gary Merrill Murray City Power Department Murray City, Utah	Energized Urban Forestry	52

URBAN FORESTRY IN MILWAUKEE, WISCONSIN

Robert Skiera
City Forester
Milwaukee, Wisconsin

ABSTRACT

The goal of the Milwaukee Forestry Bureau is to maintain the urban forest so as to increase the value of the trees and the real estate in the city. Research on species selection and planting is coordinated through the Master Shade Tree Program. Since the decimation of Milwaukee's street tree population from Dutch elm disease, the urban forestry program of planting, removal, and maintenance has benefited from the Community Development Block Grant program. Current research done in cooperation with the Department of Agriculture, the Department of Natural Resources, universities, and the Chevron Chemical Company, focuses on species development and the computerization of a street tree inventory system.

ORGANIZATIONAL STRUCTURE AND FUNCTION

Milwaukee's Forestry Bureau is one of eight line agencies functioning under the jurisdiction of the Commissioner of Public Works. The Bureau's Tree Division's goals are to continue to replant and maintain the urban forest, with all its environmental benefits, at a level which will increase the value of both the trees and real estate of the City of Milwaukee.

TREE PLANTING

Planting in Milwaukee is coordinated through the City's "Master Shade Tree Program." Tree species have been predetermined and charted for every two to three block area, utilizing the best available input from scientific research and previous successful tree growth information for each specific area.

Although the City's street tree population was decimated by the removal of over 125,000 diseased elms since 1956, an agressive, well-funded replacement program has kept the current planting backlog at less than 12,000 locations. With the assistance of Federal funding through the Community Development Block Grant Program, the Bureau has been able to plant more trees each year than it has removed.

TREE REMOVALS

In 1981, Milwaukee removed 6,563 trees, 926 of which were City-owned elms identified as having Dutch elm disease. Milwaukee's elm population is currently under 25,000. Given the relative age of the existing tree stand, the quantity and cost of removals are expected to continue to decline and eventually stabilize at approximately 5,000 per year.

TREE MAINTENANCE

For operational and budgetary purposes Milwaukee has two main categories of Tree Maintenance: Tree Pruning, including safety clearance; and General Maintenance, including disease and insect control, repair, fertilization, and root control.

Current pruning projections will place Milwaukee on a 5.6 year pruning cycle (55,600 trees). This is acceptably close to the Bureau's goal of a 5-year cycle. Table I is a chart of trees pruned over the last 12 years.

Maintenance other than pruning is scheduled at a level of 23,000 units per year. Current projections are for 5,000 units fertilized, 15,000 units sprayed, and 3,000 units of repair and root control. Milwaukee has made a firm commitment to the principles of integrated pest management related directly to early detection and appropriate treatment. Fertilization units will be increased in the areas of juvenile trees and trees under stress due to construction.

RESEARCH AND DEVELOPMENT

Current research projects involve several Wisconsin Universities, the Wisconsin Department of Agriculture, the Wisconsin Department of Natural Resources, the United States Forest Service, and the Chevron Chemical Company. Research topics vary from the use of chemicals for the control of Dutch elm disease and the development of superior Norway maple clones for urban environments to the use and culture of rapid-growing poplar species and the development of increasingly useful computerized street tree inventory systems. In addition, the Bureau of Forestry conducts its own internal research with a team headed by a full-time Forestry Technician.

TABLE I
MILWAUKEE
TREE PRUNING STATISTICS
1971-1982

YEAR	TREES PRUNED
1982	*55,600
1981	53,973
1980	55,216
1979	43,558
1978	37,934
1977	42,456
1976	38,418
1975	34,946
1974	29,130
1973	21,397
1972	19,520
1971	13,969

*projected

THE SEATTLE URBAN FORESTRY EXPERIENCE

Marvin E. Black
City Arborist
Seattle, Washington

ABSTRACT

In Seattle, Washington the responsibility for the city's trees is shared by many departments. Coordination between these agencies is imperative and has both advantages and disadvantages. The urban forestry program in Seattle is small enough to allow for innovation, excellent training for the work crews, and funding from a number of diverse sources. The program's long-range vision for the future ensures that Seattle is in the tree business for a long time.

RESPONSIBILITY FOR TREE MANAGEMENT

Management of city trees in Seattle is distinctive in several ways. No one city department has sole responsibility for city trees. Many departments are involved; a pattern which flies in the face of advice for managing trees from one central point. Decentralization requires coordination so that departmental policies are consistent. This is not always easy. The advantage that it offers is flexibility in solutions. Trees are an important thread woven through the operations and planning fabric of at least six Seattle city departments, and numerous boards and commissions.

The Water Department manages a large coniferous forest in the city's watershed. Regular timber harvest occurs, but with logging refinements that ensure higher quality runoff waters. The Lighting Department furnishes the city's electricity and contracts line clearance pruning to private tree companies.

The Parks and Recreation Department oversees the trees in the extensive park system; about half of it in large parks of native woodland. The other half includes a number of innovative parks like Freeway Park, which consists of five acres atop a freeway. Sometimes the department purchases a piece of property because it has an outstanding tree and creates a park for the tree. Dollar for dollar, few park elements are as inexpensive as large trees. How much is a large tree worth? What if Boeing could build a tree? They very nearly could construct and activate the various systems in a tree--they are good systems engineers. But if Boeing could build a large tree, what price would they sell it for? Now we can start rethinking what a large tree is worth.

Much of Seattle's natural greenbelt area is privately owned and clings to hillsides too steep to build on. Increasingly, this property is having its forest removed as construction techniques grow more sophisticated. With our greenbelt acreage shrinking markedly, the Parks and Recreation Department has a program to purchase more greenbelt area.

The Engineering Department, with which I am employed as City Arborist, has jurisdiction over Seattle's street trees and the trees on many miles of undeveloped streets. The city maintains only city-planted street trees, plus about 100 acres of landscaped medians. Thus, city crews maintain about 1/5 to 1/6 of the street trees, with the remainder being managed by the residents who planted them under a permit system for all planting, pruning, or removal.

The Department of Construction and Land Use gets into the tree business through its environmental section. City ordinances prescribe planting trees when building any large structure that will cause a negative environmental impact. This means, in practice, that nearly all large building projects are required to have street trees, and/or interior-of-lot or buffer plantings. Another ordinance prescribes trees in, and bordering, all city center parking lots.

Seattle Center, a separate city department, is a large civic center and park one mile from the city center. Planted for the Seattle World's Fair 20 years ago, it has matured into a major and significant green space (22 square blocks) in an area much in need of tree masses.

SMALL, FOCUSED PROGRAM

Seattle's 23,000 city-planted street trees (all but 1,000 planted since 1970) gives us a small program for a city our size. But when you drive Seattle streets, the impression is that of a normal street tree population, even though the city limits its efforts. By a very wise choice made 15 years ago, city plantings are concentrated on arterials and in business areas. There are two reasons.

First, we had traditionally found that, left to themselves, business areas sprouted relatively few trees, giving a half-hearted, bedraggled look. Trees downtown and in business districts have contributed to the city's effort to promote inner-city living. Areas with more trees inevitably have attracted more diners and shoppers who linger longer during the outings. Other factors, such as our free buses downtown, add to this trend. The plantings have helped counter and reverse the trend to suburban shopping centers, and trees are often requested by those in the neighborhood business districts throughout Seattle.

As to arterials, trees concentrated there, where most of our population drives, give a strong image of a city alive and caring. On these main routes that link our neighborhoods, parks, and scenic points, visitors are impressed by the plantings.

Second, a high percentage of Seattle homeowners have good looking gardens, and it's almost unpatriotic not to have trees in front of your house. Our residents have planted trees on their own in about half of all the potential tree spaces on Seattle streets. They also maintain them, which lets our tax dollars focus on the arterial and business district trees. The one exception to this pattern is a 5,000-tree planting on residential streets as part of a government-funded self-help program to upgrade a part of the city.

SMALL IS BEAUTIFUL . . . INNOVATIVE

We're small enough to be highly innovative. Having a small inventory, we can experiment with new ideas. Most have been successful. We do not use planting money on topsoil or soil amendments. Seattle soils are heavy clays, glacial rocks, and gravels, and the interface between improved topsoil and surrounding Seattle soil will turn our tree roots around and back into the pits, giving a potbound condition that ultimately girdles roots or causes trees to blow over in storms. We have proved this.

We stake trees by using a single 5/8-inch steel reinforcing bar driven into the soil. It's strong enough for Seattle gales and flexible enough to withstand wind. It is also reusable and virtually vandalproof. We've staked 15,000 trees this way and cut tree losses by over 50%.

We have experimented with many species and cultivars, over 100 in all, and we plant 35 species in quantity. We have learned to root-prune our shallow-rooted 20-year-old London

planes brutally. All roots in the top ten inches of soil are removed and replaced with a layer of crushed rock, then one of sand. New sidewalks of interlocking concrete pavers are then laid on the sand. Thus, in the future, we can reach offending roots. With most trees this would not be advisable, but it is working well with our 92 plane trees that had caused a million dollars worth of damage. We were therefore able to keep the trees and learn how to deal with them.

We train our crews intensively with good instructors and NAA slides. We are also working to computerize our tree inventories. We deliberately use the leverage of a mix of in-house maintenance by city crews and contracted maintenance, and change the balance according to where we get our best value. We have developed a city booklet on trees, giving city policies, lists of recommended and nonrecommended trees, where to get help, etc. A yearly "State of the Trees" report lists not just our triumphs but our losses and current problems, as well as strategies to solve them or prevent their recurrence.

MANAGEMENT CAN REACT QUICKLY

We are opportunistic and highly responsive to our citizens. When a local billboard company pruned 200 of our trees without permission, we took them to court. Their $40,000 check was deposited in the bank and earmarked to advertise our tree program. The money was used to furnish the city's matching funds for three USDA Forest Service urban forestry projects. One is the "Seattle's City Forest" booklet. Another is a poster display to inform our citizens about our program. The third project is a short movie now in production on Seattle tree management.

We accept help gladly. A local group donated $10,000 to plant a major downtown street. A Rotary Club matched one of our 60-tree arterial plantings with 40 more trees they purchased, planted, and donated to the city. The downtown merchants contributed $60,000 towards a tree planting. Volunteers maintain some small public plantings, and the City Arborist attends meetings in homes where neighborhoods organize their own street tree plantings. One such meeting netted 64 new trees in the neighborhood. We have over 50 organized neighborhood councils with which we work closely. One neighborhood conceived the idea of a Tree Bank. They voted $10,000 of their Block Grant money for street trees but said they wanted to keep administrative costs below 10 percent by minimizing government administration. We offered advice and access to the city's bid process when they purchased the trees. They organized themselves, polled their neighbors, and signed up those who wanted trees. On a given day the trees were delivered to a vacant lot. Residents came and picked out their trees, took them home, planted them, and will maintain them. Administrative costs were held to five percent; residents used the extra money to buy more trees and build neighborhood pride.

VISION FOR THE FUTURE

We try to keep our vision long-range. We project average tree life to be 80 years, and we balance the many trees of 25, 40 or 50 years' longevity with oaks, beeches, and ginkgos that may last 150 to 200 years. We're jealous of letting anyone remove good trees from our streets before their time. We want good trees, well cared for, growing in native soil. A decade ago, when we compared American cities on first-year tree losses, the answers ranged from 25 percent in Los Angeles, 10 percent in Washington, D.C., 4 percent here in Seattle, to San Francisco's low figure of 1 percent. The answer to the question, "how to get the percentage down" seems to lie in a long-range (20 years or more) program of good public relations for the street tree program. We work hard at that. One of my major concerns is to see that published tree news is basically good news. This spring I had a delightful breakthrough. I was given the chance to bring a slide program on "Trees in American Cities" to the Mayor's Cabinet and the heads of all city departments. It opened a lot of new doors and is winning some converts at a time when all our departments have

to go through the budget scramble for a slice of the same limited revenue pie. Trees aren't as cosmetic and frivolous in the eyes of Seattle officials as they once were. They are a vital part of keeping our city and its tax base healthy.

When large trees must occasionally come off the street to facilitate a heavy construction project (we've built about 25 new buildings over 20 stories tall in the past eight years), the city collects healthy compensation for the loss. Three sweet gums with trunk sizes of eight to 18 inches had to be removed for the two-year construction of a 76-story building across from City Hall. We banked the contractor's $15,000 check before the trees came out and plan to use it for replacements.

As is evident by the reports and booklets mentioned, posters and movies, tree talks, and a multitude of activities promoting trees, Seattle plans to be in the tree business for a long time.

URBAN FORESTRY IN THE CHICAGO SUBURBS

Harold Robson
Director of Parks, Forestry & Public Works
The City of Lake Forest, Illinois

ABSTRACT

Urban forestry programs in the Chicago suburbs provide services through contracts, in-house methods, and a combination of the two. The main element that guarantees a successful urban forestry program is community support through media public relations. Offering professional consulting services as a public service also promotes the necessary community support. Many programs in the Chicago area started as a result of the spread of Dutch elm disease, and it is imperative to maintain these programs after the crisis is over. Cocperation and an open forum between the various professionals working in the urban forest at different levels is another factor that aids in the continuation of urban forestry programs.

To set the stage for this paper on suburban programs, some statistical data seems in order. First, Chicago and its suburbs are composed of a six county area with a total population of 7,102,328. Of that number, 4,097,256 persons reside outside the City of Chicago proper, and approximately one half of that number reside outside the County of Cook. There are 253 communities represented in the six county area.

With over 250 communities it would seem that a large percentage of communities would have professionally managed forestry programs. This is not the case. About a dozen communities have a professionally trained urban forester in full-time charge of arboricultural operations. Of that number, half have been in existence for more than 15 years. Several communities rely on professional urban forestry consultants, on a part-time basis, for advice on programs. With this background, let us look at the programs in more detail.

PROGRAM VARIATIONS

The small number of professionally managed programs provide a relatively easy data base for analysis of program variations. The programs are handled by several different methods:

(1) Contractual;
(2) In-house;
(3) A combination of contractual and in-house.

All of the professionally managed urban forestry programs provide full scale maintenance services consisting of trimming, tree and stump removal, insect and disease control, planting, general maintenance, and wood disposal. The removal and planting services are normally contracted, while the remainder of the services are done either in-house or in combination with contractual services.

Urban forestry programs are normally a function of the public works department, whether professionally managed or not. Because of the special district legislation in Illinois, very few are a part of Parks and Recreation Departments. Data on the program variations for

eight cities are included in Table I. Two of the eight cities shown are managed through a Parks Department operation.

INGREDIENTS FOR SUCCESSFUL PROGRAMS

Without question, there is broad agreement that the public relations aspect of urban forestry programs is essential to success. The media must be aware of the forestry programs on a continuing basis, and a relationship must be established with them so they will be willing to publish newsworthy items about programs. Arbor Day programs, brochures, and other publications are necessary to tell the urban forestry story to gain and maintain support. A program to provide professional consulting services, as a free public service, can be a tremendous asset in selling the program. Resident contact is established, and the personal touch of providing hands-on information gives an image of service and professionalism which will be passed along to neighbors and friends.

Contact with garden clubs in the community is invaluable in establishing support for programs. They can also be a source of financial and maintenance support.

Other essentials are adequate funding, which comes from citizen, administration and elected representative support for the programs, a staff of well-trained personnel, and the ability of the urban forestry manager to promote his programs to the administrators and elected officials.

LEARNING EXPERIENCES

Many forestry programs in the suburbs were a result of the Dutch elm disease (D.E.D.) problem. Large blocks of elms were planted on suburban streets, and local officials were concerned about the devastation which would follow if professionally managed programs were not initiated. Communities with strong aesthetic concerns employed professionals to manage the D.E.D. control programs. From these programs have sprung more comprehensive efforts of tree maintenance than was contemplated at the time they were initiated. The experiences of those communities has provided some impetus for other communities to begin forestry programs.

On the negative side is the disproportionate share of funds spent on saving elms. Many of the programs have concentrated on the elm problem to the detriment of other species' problems. As the elm populations dwindle, the professional has an opportunity to increase services for other trees of more lasting value.

Tree planting programs are changing the streetscapes of many of our cities. Where once majestic elms stood, smaller trees are being used to replace them. Species of doubtful hardiness and cultural stamina are being introduced into the landscape. Our own experience was to use some species of questionable hardiness in our climatic zone in an experimental program, rather than using trees with native hardiness. The result is the failure of survival of some species over a long-term period. For example, in our area, the tuliptree does fairly well if in a sheltered area not too far removed from Lake Michigan, and the London Planetree suffers from severe frost crack and anthracnose. The new clones of native species are being used, but have not yet proven their long-range hardiness, susceptibility to disease and insect pests, or adaptability to streetscape conditions.

One of the major sources of support for the forestry program has been local garden clubs. We used them effectively to reestablish a Dutch elm disease spraying program several years ago. They used their funds to pay for the spray material when appropriated funds

were not available. Garden clubs can be the catalyst for change. Our most influential garden club was concerned about the size and spacing of trees replacing elms on the parkway. Our standard was 50 feet between trees for large trees, and a reduction for smaller trees with no fixed figure for the distance between trees. The garden club suggested that four trees be planted each 100 feet. We drew up a proposal for their consideration which established spacing requirements for large, medium, and small trees. These were considerably greater than the spacing suggested but less than the 50 feet we had been following. Discussions followed, and a compromise spacing policy, which was adopted as ordinance, was established. A benefit of this ordinance was the establishment of a tree preservation procedure for new subdivisions which saves trees during the installation of public improvements and new homes. The point here is that the manager must be willing to adjust his thinking to compromise--and yet not destroy his professional integrity. This will gain the support and acknowledgement of the citizen groups who can influence the success of urban forestry programs.

EVOLVEMENT OF PROGRAMS DUE TO CHANGING BUDGET DEMANDS

Most communities with strong citizen commitment to aesthetics are having very little trouble securing funding for urban forestry programs. What is occurring now is a reevaluation of existing programs to determine their need and how programs can remain effective but be more efficiently managed. The reassessment is forcing urban forestry managers in our area to look at the difference between contractual versus in-house methods for getting programs accomplished.

Is it more cost effective to contract trimming, removal, and planting work that is the heart of most urban forestry programs? The urban forestry manager is being called on more frequently to evaluate forestry programs on the basis of cost effectiveness, even though budget cuts may not be imminent. Those who are able to be innovative in their approaches, and show positive results in cost cutting, will continue to have support for their programs as long as the support of the community continues.

Utilization of personnel from other departments, divisions, or sections during the off-season will enable city crews to be productive with less personnel. The implementation of cross training programs will lead to reciprocation of assistance across department and division lines providing the citizens with the least number of city employees to deliver city services. Fleets can be reduced by using vehicles and equipment across department and division lines and by reductions in personnel.

Insect and disease programs will become less dependent on expensive toxic chemicals and more dependent on an integrated pest management approach. Chemicals will only be used as a last resort after biological alternatives have been explored and tested.

New approaches to wood disposal will be implemented to assist in solving regional disposal problems. Recycling centers will be developed either at government expense by private enterprise to reuse wood wastes rather than disposing of it in landfills. It is conceivable in the near future to have several regional wood recycling areas in the Chicago suburbs supported by several muncipalities.

The cost of disposal, lack of response by private enterprise, and travel distance for disposal due to lack of close-in space will force municipalities, counties, and the state to explore a solution on a collective basis. Garbage-waste disposal is currently being studied by several Northwest Chicago suburbs. Solutions for wood waste disposal will not be far behind.

MAINTAINING PROGRAMS THAT EVOLVED FROM BUDGET RESTRAINTS

There are no easy solutions to maintaining programs. As mentioned earlier, communities where citizens have a firm commitment to the maintenance of the aesthetic character of their areas will continue to have little difficulty maintaining programs. This does not mean the programs will be sustained without continual refinement to insure that efficiency and quality levels are maintained.

Communities having a low sense of aesthetic importance will not maintain programs in the face of budget cuts. Services for the maintenance of public safety and welfare of citizens will be first priority. If funds are left over, the urban forestry program will have to compete with parks, recreation, and other services considered to be nonessential in times of severe funding shortfalls. The urban forestry manager must be equipped to provide a strong case in order to receive a share of the available funds. Only programs such as tree removal may have a chance at funding because of its impact on the safety of the public.

SUMMARY

In summary, the programs in the Chicago suburbs are not that much different from those in other major metropolitan areas. Suburban programs are similar in design, with some variation in how they are administered and accomplished. We have a group composed of professional urban forestry managers and other people in allied fields who meet on a once-a-month basis to discuss mutual problems and concerns. These people learn from each other, and the group has established itself as the foremost urban forestry group in the state. We have been asked to provide expertise or training for urban foresters at the state level. There is still room for the growth of urban forestry programs in communities in the Chicago suburban area. Limited budgets and citizen disinterest in community aesthetics will be limiting factors. The urban forestry program, on the state level, can assist in increasing an awareness of the need for well-managed urban forestry programs in communities.

So far, in the State of Illinois, a program to satisfy the statewide community urban forestry needs has not been established. Currently, the Conservation Department is reevaluating its programs, and many of us hope a change will occur putting urban forestry at a high priority. Only through leadership at this level will there be a substantial chance for new communities to begin programs and sustain them. It does not have to be only financial support but, also, strong advisory assistance.

Finally, I am pleased to be a part of the new federal and professional group emphasis on urban forestry. I believe if all the resources of these groups are combined, it can make a difference.

TABLE I
SUMMARY OF SERVICES PROVIDED
COMPARISON OF CONTRACT VERSUS IN-HOUSE CREWS
8 CITIES

Service	Contract Cities	In-House Crew Cities	Combination
Trimming	1	3	4
Removal	2	2	4
Insect & Disease[1]	0	5	2
Planting	5	3	0
General Maintenance	0	8	0
Wood Disposal	3	2	3

[1]One community had no spraying of any kind.

FORESTRY IN THE BIG APPLE

H. Dennis P. Ryan, III
Executive Director
Forestry and Horticulture
The City of New York, Department of Parks and Recreation

ABSTRACT

The City of New York has approximately two million park trees and 600,000 street trees. Most of the Forestry Division personnel and equipment are used for street trees. Very little time is spent on park trees. The reason is that most of our work is reactionary. We are constantly responding to emergencies; this is due to our financial crisis of 1974.

Liaison activities with other city agencies, utilities, and private groups that are involved with trees are also an important aspect of forestry.

The future of the Forestry Division is brightened with several new approaches that are being either implemented or studied. They include the following: a more efficient inventory system, training of personnel, Integrated Pest Management, and contract work.

Trees are an important aspect of New York City life. We are now gaining back lost resources primarily as a result of concerned citizens of New York City.

INTRODUCTION

The City of New York has approximately two million park trees and 600,000 street trees. The responsibility for and management of these trees is under the direction of the Department of Parks and Recreation, Forestry Division.

STRUCTURE

New York City is, in reality, five cities (boroughs) and a multiple of small neighborhoods called community boards. Each borough is a unit unto itself, with its own character, problems, and budget. While each borough is a part of the city, each is distinct. For example, Manhattan is primarily high-rises, while Queens is mostly single-family residences.

The Parks Department is organized in a similar manner in order to serve the needs of its seven million citizens. Each borough has a forestry office and staff that attempts to keep up with the demands of that borough and the priorities set by the Borough Commissioner (Fig. 1).

The borough offices are under the direction of a Borough Horticulturalist who organizes and directs the work. Most of the personnel and equipment is used for street trees. Very little time is spent on park trees. The reason is that most of our work is reactionary. We are constantly responding to emergencies.

FINANCES

The reason the City of New York is in this reactionary position can be traced back to the financial crisis of 1974. It's very easy to cut money from the forestry budget, because most people/politicians do not realize the long-term adverse effects. As a result of the monetary crisis, personnel who left the department, for whatever the reason, were not replaced, and outside contract work was discontinued (Fig. 2).

The Parks Department is still having personnel and financial problems, but the Forestry Division is on the upswing with new personnel and equipment. With an increased capital budget, the purchase of new aerial lifts and chippers has been possible. The new equipment helps to speed up production, compensating in part for the reduced personnel.

The biggest problem with the new equipment is maintenance. Maintenance is under a very limited expense budget, and as a result it is sometimes difficult to keep equipment in service.

In addition to the borough offices, we have Forestry Central, which is responsible for overseeing all forestry activities. Central's responsibilities are primarily coordination of contracts, technical expertise, budgeting, management of the task force, and liaison activities with other agencies.

On September 1, 1982, the Department of Parks placed 27 new climbers on the street. This is the most significant increase in personnel in several decades. The 27 new climbers, along with three supervisors, make up the "New York City Forestry Task Force." These climbers have just finished a one year training program that was a joint venture between the Mayor's Office, DC_{37} (Union) and the Parks Department. The task force is now utilized on a rotation basis throughout the five boroughs to supplement borough forces. The majority of the work is done in parks or in emergency situations. For example, Shore Road Park has a severe Dutch elm disease problem. The task force was put on the job for eight days and removed 75 large elm trees. Eventually, the task force will be dissolved, and its members will be absorbed into each of the five boroughs.

Liaison activities with other agencies, utilities and private groups involved with trees are an important aspect of forestry. The Forestry Division is responsible for all trees on city property. Before any person or agency works on or near these trees, they must obtain a permit.

For example, whenever the Highways Department plans to install curbs or widen a street, we receive a copy of the blueprints. If trees are going to be damaged, then the Highways Department must pay for their replacement "inch for inch." For instance, a 20-inch pin oak that is removed will be replaced with eight 2½-inch trees in the vicinity.

This close association with other agencies is a necessary step in saving trees along our streets.

FUTURE

The future of the Forestry Division is bright with several new approaches being either implemented or studied.

The first is a more efficient inventory system. This is taking several approaches, based on various situations within the city; formal parks, woodland parks, and street trees.

The Central Park Conservancy has funded an inventory of all of the trees in Central Park. The results of this survey are now being tabulated and will be used to plan and schedule work. Hazardous trees will receive the first priority. The survey is also an important part of our I.P.M. Program.

The Central Park inventory is a pilot project and has been designed for use in any formal park.

A second inventory method is now being planned for our woodland parks. The New York State Department of Environmental Conservation is funding a pilot Urban Forestry inventory of Van Cortlandt Park. This inventory will result in a management plan for forest situations in the city environment.

A third, and probably the most complex, inventory will be for street trees. Hopefully, this can be started within two years.

TRAINING

The second area that is receiving a critical review is training. We have just finished training 27 new climbers, as previously mentioned, and are now studying ways of upgrading our existing forces.

Safety training is our paramount priority. The Director of Forestry and the Climbers Union President plan and present a monthly safety meeting in each borough. Much of the program is based on the Z-133 and the National Arborist Association's Education materials.

This winter we plan to run three one-day workshops dealing with pesticides and urban tree problems for our inspectors and climbers.

I.P.M.

I.P.M. (Integrated Pest Management) is another area we are moving into rapidly. In the past, areas were broadcast sprayed. Today, we cannot afford to spray everything, and pressure groups monitor us very closely.

I.P.M. fits into urban tree management because it reduces cost and is much more acceptable to the majority of the public. We have successfully used it for gypsy moth and Dutch elm disease. We are investigating the use of I.P.M. for mosquito and algae growth in the park lakes.

CONTRACTS

Contract work is the subject that needs the most attention. We cannot do preventive pruning with our in-house forces. We simply do not have the resources. We must start pruning a minimum of 60,000 street trees annually to put our street trees on a ten-year cycle. Although this is not ideal, it is better than nothing.

It is unrealistic to expect that the funds needed to pay for such work be taken out of the expense budget. We are now seeking a means of having tree pruning as capital money. This would insure the required money annually.

CONCLUSION

Trees are an important aspect of New York City life. The financial crisis of the 70's was extremely damaging to the Forestry Division and the parks as a whole. But we are now gaining back lost resources, primarily as a result of the concerned citizens of New York City. Hopefully, this momentum will continue, and the twenty-first century will be green in The Big Apple.

FIGURE 1
A Breakdown of City Trees and the Management Resources Available for their Care

Borough	Street Trees	Park Trees	Total	# of C & P	# Aerial Lifts
Queens	305,000	1,120,000	1,425,000	42	5
Manhattan	34,000	190,000	224,000	20	3
Brooklyn	127,000	120,000	247,000	23	4
Bronx	53,000	366,000	419,000	18	2
Staten Island	81,000	204,000	285,000	14	2
TOTAL	600,000	2,000,000	2,600,000	117	16

FIGURE 2
Outline of Personnel and Contract Money

Tree Climbers on Payroll

1955	326
1965	237
1980	120

Outside Contracts (money)

1973	2 million dollars
1974	2 million dollars
1975 through 1980	0
1981	1.5 million dollars
1982	0

ENERGIZED URBAN FORESTRY

Gary O. Merrill
City Forester
Murray, Utah

ABSTRACT

Successful urban forestry can depend on many factors, including organization, employee training, good publicity, and public involvement. The key ingredient common to all of these is enthusiasm. In Utah, Murray City's urban forestry efforts exemplify this principle. The Shade Tree Commission is a well-organized group of civic-enthused volunteers. The employees of the Forestry Division gain knowledge and enthusiasm for their work through a two-year Arborist Apprenticeship Training Program. Frequent publicity informs and enthuses Murray's general public and politicians, who control the budget. It also promotes public involvement, which converts enthusiasm into energized volunteers who labor to improve their home town. By these and other means, Murray demonstrates the concept of "energized" urban forestry.

The most important thing to remember is that energized urban forestry is future oriented. Programs enthusiastically planned and effectively executed in the present will ensure the urban forest for the future.

I have two goals I want to achieve. Number one, I want each and every one of you to know where Murray City, Utah, is! I doubt that many of you have even heard of Murray before. It's not a place you'd recognize by name, like Cincinnati, Milwaukee, or Seattle. And it's not Salt Lake City! But you would recognize it by sight, even on a first visit to the middle of the Salt Lake Valley, because Murray is AMERICA. I say that because cities of 10-50,000 people make up over 80% of all our cities of 10,000 or more (Geidraitis and Kielbaso 1982). With her 30,000 residents living west of the towering Wasatch Mountains, Murray well represents this urban/suburban majority of communities. And despite our land being reclaimed desert, and our trees being mostly man-planted, we have an urban forest, with trees, people problems, and solutions characteristic of cities throughout this country.

My second and most important goal for today is, through Murray's example, to get you excited, motivated, ENERGIZED, about urban forestry and its possibilities in your own home towns and cities. By showing you some of the inside factors that have made our program a success, I hope to fire your imagination, so that throughout the rest of the conference you won't simply think "Oh, that's nice." Rather, you'll be saying to yourself: "You know, we could do that," "Why didn't we think of that?" "We could do that," By Golly, we'll try it!" "Boy, wait 'til I get home!"

You see, urban forestry starts with ENERGIZED people. People who are not easily intimidated or discouraged; who are willing to challenge City Hall, to stretch tight budgets, to fight public apathy, in order to do something they know is right for the betterment of their communities.

People like that, like you, founded the Murray City Shade Tree Commission 22 years ago. They didn't have your advantage. They had never even heard of "urban forestry." But

they did recognize the need for an organized, informed approach to the planting and care of the city's trees. Their motto quickly became, and remains today: NOT A REVIEW BOARD, A GO-OUT-AND-DO BOARD. Their efforts have led to many accomplishments, including convincing the City to hire a professional forester six years ago, and the resulting development of the Murray Urban Forestry Program.

The Shade Tree Commission is a group of civic-minded, ENERGIZED volunteers appointed by the City Council. The current five members include a nurseryman, a homemaker, a health administrator, a nurse, and a landscape architect. They, and I as the City Forester, coordinate our efforts on special projects and management planning for our urban forest. This management planning, to maximize benefits and minimize detriments of the forest within our city, is the major difference between modern urban forestry and the simple plantings and maintenance of individual street trees.

The day-to-day labor, however, is accomplished by the five employees of the Forestry Division. "Energized" is a common term in our vocabulary, because we are a part of the Power Department, the city-owned electric company. One of our responsibilities is to take care of powerline interference with trees. Notice how I said that, "powerline interference with trees." A lineman would see it exactly reversed. But what Murray has done is to incorporate the utility line clearance work into the community-wide urban forestry program -- another context of "energized urban forestry."

Management plans are doomed to fail unless you educate the labor force expected to implement them. My men are trained to understand not only the requirements and hazards of their job, but the profound effect they can have on the health and beauty of a single tree, of a community of trees, and of our entire urban forest. They have learned to realize the lasting impact of their actions, whether they be conscientious or negligent. They are trained and motivated to be sculptors, not eliminators, of tree shapes.

How do we give such training? I have developed a simple two-year Arborist Apprenticeship Program. It uses inexpensive homestudy courses and slide/cassette programs produced by the National Arborist Association. Supplemental readings come from the International Society of Arboriculture, the American Forestry Association, and the Edison Electric Institute. Combined with this bookwork is goal-oriented on-the-job training, and adequate compensation for progress and completion.

Approved by the Utah State Apprenticeship Council, this program provides us with trained, tree-conscious, ENERGIZED arborists who are responsible for the planting, and maintenance of the 10,000 street and park trees as well as the utility line clearance work throughout city.

Have you tried working with your utility to coordinate line clearance work with the goals of urban forestry? Could you provide better training, incentive, and recognition to your labor force, to raise their pride in themselves and their work, and to improve the care of your urban forest? THINK ABOUT IT!

I've talked about energized volunteers, and about energized employees, but neither of them pay the bills. How do you overcome lack of knowledge and apathy to ENERGIZE the politicians who control most of the purse strings, and the public that, ultimately, controls the politicians? I can explain how with one word: PUBLICITY. Publicity means visibility, and visibility of "good works" will promote public and political interest, support, and involvement. Publicize up-coming projects, publicize projects completed, publicize the urban forest --its concept, its problems, its benefits and products. Inform the people about program goals, employee training achievements, proper species and site selection,

and why they are "proper." Take every opportunity for "good press" and you will gain the support you need.

In Murray, I have used the newspapers extensively to inform the public about nearly every facet of our program, from Arbor Day to borer infestations to firewood sales. We've used power bill inserts, Chamber of Commerce and School Board newsletters, and even T.V. on occasion. And I've spoken to school classes from kindergarten clear up to the college level, garden clubs, and business groups, all to promote understanding and support of the urban forestry program.

And I know the effort is paying off. The 1982 Arbor Day program drew over 200 people, with three newspapers covering the event. Arbor Day activities in all of Murray's 12 public and private elementary and secondary schools involved 4,000 children in urban forestry. Residents are constantly calling, sometimes to complain, but more often to compliment Division work or program results, to alert us to a problem needing attention, or to express a vote of confidence by asking questions about their urban forest. Many of the 800 street trees we plant each year are paid for by individuals who want to contribute to the Street Tree Planting Project. Our computerized inventory shows 3,000 suitable planting sites yet available to keep that project going.

I said that publicity promotes public involvement as well as interest and support. Each year the Murray High School football team successfully plants hundreds of street trees. The Boy Scouts are becoming involved in a similar project. P.T.A.'s, garden clubs, and nurseries donate trees for the schools, parks, and our city arboretum. Senior Citizens judge Arbor Day contests, businesses throughout the city buy and fly TREE CITY USA flags, and commercial tree firms seek our help to improve their tree care techniques. All these people have heard about the winning effort, and they want to be a part of it. By joining in, they are making the winning possible.

Have you taken your every opportunity to publicize urban forestry? Have you solicited the help of willing volunteers to encourage public involvement? If not, WHY NOT? Get Going! Get ENERGIZED!

ENERGIZED we are, perfect we aren't. In Murray's urban forestry program, as in anything, there's a frustrating gap between the conceptual vision and the practical reality. If Murray's program was totally successful, I'd be on a plane for home tonight. But I'm staying because we need help and new ideas, too. We sell salvaged firewood for partial recovery of our program costs, but we still take hundreds of tons of woodchips to the dump. Our Shade Tree Ordinance could be much more useable and effective. We are still working for better cooperation with the Planning and Zoning Board and the City's Engineering Department. These are but a few of our failures, or should I say challenges, yet to be met.

I've used Murray's present-day example to demonstrate a few facets of ENERGIZED urban forestry. But I want you to realize, as we have, that urban forestry is future oriented. I'd like to share with you a message I've written, that I hope distant descendants will be able to give to their children:

For us they fought, decades before
The year two-thousand one,
The war to keep the cities green
From "urban's" searing sun.

They tried to think of all impacts,
Both pro and con, of trees,
and sought to better urban life
With plant communities.

They planned, planted, and often wept,
Amidst the raging fight,
As trees grew up or toppled down
Opposing urban blight.

We live in forested splendor,
Countless tree-rings old,
Thanks to careful management
Begun by ancients bold.

Yet verdant beauty can't conceal
How tenuous is peace
We have kept the defense up;
Our efforts could not cease.

You, now, must perpetuate
This living legacy.
Be true, don't falter, keep the watch
With urban forestry.

You are the "bold ancients" in the field of urban forestry. Be ENERGIZED while you attend this conference, learn from it, take it home, use it, for your future, for our future.

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SECOND NATIONAL URBAN FORESTRY CONFERENCE

SESSION B

SUCCESS STORIES FROM THE CITY EDGE

Monday, October 11, 1982
2:45-4:30 p.m.

Moderator:

Fred Deneke
USDA Forestry Service
Washington, DC

Speakers:

Ron Coleman Parks & Recreation Department Ellisville, Missouri	Ellisville, Missouri: A Success Story From the Urban Edge	59
Ken Pardue McDonald's Corporation Oak Brook, Illinois	Corporate Involvement and Successful Urban Forestry Programs	65
Gary Moll Maryland Forest Service Mechanicsville, Maryland	Urban Forestry on the Urban Fringe	68
Ann Ziminski Reston Home Owners Association Reston, Virginia	Reston Home Owners Association Open Space Management and Development	71

ELLISVILLE, MISSOURI: A SUCCESS STORY FROM THE URBAN EDGE

Ron Coleman
Director
Parks and Recreation Department
Ellisville, Missouri

ABSTRACT

Ellisville, Missouri is a suburban community on the western edge of metropolitan St. Louis. During the recent period of rapid growth, the city aggressively pursued open space planning. Land use planning combined with ordinances to protect open space in new subdivisions has ensured the availability of natural areas and recreation for citizens. A Master Park Development Plan implemented in 1974 and judicious land acquisition by the city, combined with a trail system, have also served residents well. In addition, Ellisville has an urban forest management program and outdoor recreation and education programs designed around the needs of people. Therefore, public support for funding these programs has been enhanced.

INTRODUCTION

The City of Ellisville covers five square miles and is located on the western limits of St. Louis County, Missouri. It has an estimated population of 6,233 with some 1,871 households.

Ellisville was rural in character and considered well outside the urbanized area just 15 years ago. Since that time, development in the general vicinity of Ellisville and its sister communities of Ballwin and Manchester accelerated greatly. Growth is expected to continue during the 1980s, but at a lesser rate.

Ellisville is characterized by strip commercial and retail development on two major state highways that divide the city into four quadrants. Land use in the city is essentially single family residential subdivisions in the median to upper price range. The city also has several multiple housing units located within its boundaries. Ellisville has 10 park areas located within its city limits, and over five miles of paved off-the-road multi-use trail which it maintains. The city is located in the aesthetic countryside of West St. Louis County, with oak and hickory hardwood forest-covered rolling terrain. Much of the land to the west and south remains undeveloped. Within an eight mile radius of Ellisville, over 10,000 acres of state, county and local parkland has been set aside for the enjoyment of the general public.

RELATIONSHIP OF ELLISVILLE TO ST. LOUIS

In order to understand why Ellisville could be considered a success story from the urban edge, one should know something about the St. Louis metropolitan area of which Ellisville is a part.

The St. Louis metro area is comprised of the City of St. Louis itself, St. Louis County, and some 96 incorporated municipalities. Each of these jurisdictions has evolved from what we originally knew as St. Louis and today are in various stages of growth or decline in terms of population, finances, and other urban characteristics. When it comes down to

managing their urban environments, all governmental elements operate under their own laws, regulations, politics, and financial policies.

Like many other cities across the United States, over the past three decades, the City of St. Louis fell victim to the great rush to the suburbs as people sought to escape the highly structured environment of the big city in search of more elbow room and a higher quality of life.

As this exodus was occurring during the 1950s, 60s, and 70s, the regard for preserving many of our existing urban open spaces and forestry resources seemed to elude planners and other officials who may have had a handle on guiding the development of their respective communities; consequently, many of these valuable open spaces were lost.

Today there are a number of governmental agencies involved with the management of the remaining major urban forestry resources in the St. Louis metropolitan area. These agencies are the City of St. Louis and various incorporated municipalities, St. Louis County, the Missouri Department of Conservation, the Missouri Division of Parks, Recreation and Historical Preservation along with a number of private or semi-public institutions. Their missions vary from providing recreation services, facilities or historical places, to managing fish, forestry, and wildlife resources.

No recent data is available indicating the total amount of existing or potential public open spaces in the St. Louis area, nor do any current comprehensive tree inventories exist. A recent study by St. Louis County Parks and Recreation Department entitled Recreation Spaces-Community Places 1982-2000 did shed some light on the subject of parkland and public open space.

Data collected in 1980-81 indicated that the total amount of public open space managed by the various local, county, and state agencies in St. Louis County only totaled 23,222 acres in 1981 compared to 10,690 in 1965 (St. Louis County 1982). Twenty-three percent of this land was considered to be developed in an active state (i.e., ballfields, buildings, pools, etc.), while 77 percent remained in a somewhat more passive or undeveloped condition (Farrell 1982).

Significant as this growth may appear in terms of having preserved remaining urban open spaces and forestry resources, much more important work remains to be accomplished as our cities continue to expand.

BY CHANCE OR BY PLAN

Ellisville today is not much different from most middle class suburban communities located in the growth corridors of large metropolitan areas. However, if there is one area in which Ellisville excels, it is in the realm of environmental planning.

Ellisville's philosophy has been based on the premise that since it sits at the very threshold of some of the most beautiful undeveloped landscape in the West St. Louis Area, it cannot afford to neglect its responsibility in seeing that proper open space planning decisions are made for the future.

The Ellisville Parks and Recreation Department currently has 11 park areas totalling 163 acres, maintains approximately five miles of paved multi-use trails, manages numerous physical facilities (ballfields, pools, tennis courts, playgrounds, etc.), organizes and supervises a wide range of outdoor recreation programs, and handles the city's urban forestry and beautification activities.

The Department operates with a full-time staff of six people on a budget of $400,000 under the jurisdiction of an administrative-type Park Board. Some of the key ingredients in the success of the Ellisville program are as follows:

MANDATORY OPEN SPACE DEDICATION

Ellisville has maintained a minimum lot size of 10,000 square feet in new subdivisions. These subdivisions are required by ordinance to dedicate 10 percent of the entire subdivision tract as parkland, or, if the city chooses, pay 10 percent of the unimproved value of the land to the Park Fund (Ellisville Board of Aldermen 1976). This ordinance was first enacted in the early 1960s, and has been responsible for the dedication of over 60 acres of public open space and nearly $40,000 in development money to the community. As a result of this legislation nearly every subdivision in the city now has a park area within walking distance of each home. Land which may have otherwise been developed, has been preserved.

These neighborhood natural areas, or so-called "mini-wildernesses" (Tylka 1980), provide excellent habitat for wildlife, serve as buffer zones to screen out light and noise, provide cooling shade, clean the air, improve storm water control by slowing down the runoff, and enhance the educational opportunities for our youth by serving as convenient outdoor classrooms.

MASTER PARK DEVELOPMENT PLAN

Master Park Development Plans have often been criticized as being too costly and time-consuming, a venture for a publication likely to wind up on some bookshelf collecting dust. Smaller communities may view the Master Plan as a luxury reserved only for those larger and more financially capable municipalities or agencies. Thus, any attempt at long-range planning by smaller communities may be scrapped in lieu of more immediate goals or priorities.

Ellisville's need for a meaningful guide for future park development grew out of the expressed interest and concern of city officials and an environmentally conscious citizenry. In choosing to implement the Master Park Development Plan, which was completed in 1974, the city felt that it had made a long-range investment in the future which would pay off through the avoidance of haphazard and misguided decision-making.

The comprehensive planning that was incorporated into the Ellisville study allowed for a phased development program, over a 10-year period, geared to the financial ability of the community. Currently in the seventh year of the park development program, Ellisville has found its Master Plan not to be a "dust collector," but instead a "road map to success."

LAND ACQUISITION

Realizing that an accelerated rate of growth might fragment the city's available open spaces, the city has made key land acquisitions to augment its parkland inventory for the present and future. Portions of these acquired areas now accomodate a variety of recreational facilities, but the bulk of the land remains in a natural state.

MULTI-USE TRAIL SYSTEM

Much of the westward expansion of Ellisville has been along the two major state highways which divide the city into four sections. Both of these major arteries carry an exceptionally high volume of traffic through the city, are characterized by retail and commercial development, and are not conducive to pedestrian or bicycle traffic.

As early as 1974, the city fathers saw the need for better ways of getting from one point in the city to another. Better access from residential areas to both public and private facilities had to be achieved.

Pedestrians and bicyclists alike needed a means of reaching parks, schools, churches, the library, and shopping centers without having to contend with the hazards of busy Clarkson and Manchester Roads. Thus, a safe, enjoyable, and convenient multi-use trail system using existing streets, parkland trails, and easements became a goal of the city.

Since 1974, when the trail consisted of less than a mile of graded aggregate surface, it has progressed today to more than five miles of paved, eight-foot wide asphalt trail with bridges, culverts, and extensive signing. Over $200,000 in city, county, and state funds have been invested in the development of this system which provides residents the opportunity to exercise the most basic form of transportation (walking) to reach numerous community resources. The trail system is also used heavily for recreational pursuits and outdoor education/enjoyment.

URBAN FORESTRY AND BEAUTIFICATION

Foremost in our efforts to improve the quality of urban life has been the respect we have shown for our remaining forestry resources. Ellisville has a relatively young and small forestry program. However, the city has assumed responsibility for the planting of subdivision shade trees, improved upon the city's original shade tree ordinance, adopted site design requirements for plantings in the business district, instituted a brush chipping program for subdivisions, conducted annual spring and fall tree planting or maintenance workshops for residents, and recognizes Arbor Day each year through a planned community activity. Ellisville's 1981 per capita tree management expenditures totaled $28,696.80 or $4.60 per capita based on 1980 census figures (Coleman 1981).

Ellisville has also spearheaded efforts to create a Lafayette Area Municipal Forestry Commission with its sister communities. The intent of the Commission is to advise individual communities on such matters as legislation, tree planting specifications, inventories, and urban beautification. In 1981 Ellisville was recognized as a "Tree City USA" and is now being considered for the "Governor's Town Treescape Award."

ORGANIZED RECREATION AND FACILITIES

Ellisville has developed an outdoor recreation program along with many supportive recreation facilities to service its residents. Professional recreation leadership has initiated a well-rounded, non-duplicative outdoor recreation program to meet the leisure needs of local children and adults.

People are a key ingredient to the success of any program. Those participating in planned outdoor recreation activities can "spread the word" as effectively as a preacher delivering a Sunday morning sermon. A children's summer daycamp, adult tennis league, or open air concert set in the natural beauty of a city park serve to reinforce, in the minds of the public, the value of good open space planning and management.

FUNDING

Adequate funding to accomplish goals and sustain operations is essential. Over the past eight years Ellisville has been able to obtain well over a million dollars in funds other than general city funds. These monies have been used to acquire land, develop new park facilities, implement recreation programs, and support operational activities.

Sources of funding have varied greatly over the years. However, the majority of the dollars have come as the result of the passage of one bond issue ($350,000), several government grants, donations from individuals, corporations, and a close working relationship with local civic organizations and the business community.

A SUCCESSFUL BEGINNING

By now one should suspect that the goal to perpetuate environmental quality in Ellisville's urban design has resulted more by planning than by chance, though we have also had good luck along the way.

As positive as the Ellisville story may sound, I must project cautious optimism about the future of our open space planning efforts on the urban edge. Newer communities, like their older and established counterparts, are now starting to feel the impact of a depressed economy.

Traditional sources of funding, land acquisition and development, such as the Federal Land Water and Conservation Fund, have rapidly fallen by the wayside as "Reaganomics" has woven its way into the fabric of our society. In addition, "Taxpayer Revolts," such as the passage of "Amendment #5" or the "Hancock Bill" in Missouri in 1980, have restricted the ability of state and local governments to increase fees needed to sustain programs and operations.

A depressed housing market and auto industry in Missouri has prompted a record rate of unemployment; these coupled with higher cost of living and interest rates have resulted in a cost-conscious citizenry. Open Space planners and managers from the urban fringe, who once enjoyed the luxury of a rapidly expanding tax base and other funding sources to draw from for their programs, must be prepared to deal with reduced finances.

Programs, services, and land planning decisions are going to be more difficult to justify and sell to city officials. When times get tough, park, recreation and forestry budgets are targeted for intial budget cuts in lieu of other municipal services.

However, as visionaries in our respective communities, we must continue to dream about making our cities more livable places, while at the same time keeping our feet firmly planted on the ground and moving ahead toward achieving realistic community oriented goals when it comes to our field of endeavor. Unless we do so, a future surge in the economy linked with a new building boom on the urban edge could cause us to lose the opportunity for preserving our unconsumed open spaces and forestry resources.

In closing, I certainly hope that Ellisville's "success" is not as defined in the dictionary, "a satisfactory completion of something," but is rather "a satisfactory beginning of something."

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CORPORATE INVOLVEMENT AND SUCCESSFUL URBAN FORESTRY PROGRAMS

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ABSTRACT

When McDonald's Corporation acquired an 80-acre tract of land in Oak Brook, Illinois, on which to built its new headquarters, it was decided to position and design the buildings to maximize the benefits of the forest already existing on the tract. Using urban forest analyses and management principles during the pre-construction and construction phases, along with protection specifications (fines and penalties) outlined in a film shown to construction crews, McDonald's Corporation was able to retain those elements of the original forest it sought to protect.

There probably is not a person today that does not think of hamburgers when they hear the word McDonald's. Most large corporations believe their strength is in diversifying, putting their interests into many different areas. McDonald's philosophy is just the opposite. Ray Kroc opened the first McDonald's restaurant on April 15, 1955, in Des Plaines, Illinois, serving hamburgers -- and this year we will open our 7,000th restaurant worldwide. These include 5,700 in the United States and the remainder in 30 foreign countries. And still, our only interest is serving hamburgers and assorted fast food items.

In 1981, 21 percent of all fast food/limited menu sales in the United States were made by McDonald's. In other words, 21 cents of every dollar spent on fast food in America is spent at McDonald's.

In 1961, McDonald's founded Hamburger University, an international management training center for McDonald's franchisees, managers, and corporate personnel. Accredited by the American Council of Education, Hamburger "U" offers a number of college credit courses leading to bachelor's and master's degrees in Hamburgerology. More than 2,000 students graduate annually.

However, with Hamburger "U" in Elk Grove Village, Illinois, our creative services department in another location, and our corporate offices in Oak Brook, Illinois, all filled to capacity, our top management team felt the need for larger facilities that would house our corporate office, Hamburger "U", a 300-room hotel strictly for McDonald's use, and enough space to accomodate our growth rate of 20 percent per year -- all in one location.

McDonald's decided on an 80-acre tract of land in Oak Brook, Illinois, only a half-mile south of our present headquarters building and only 18 miles west of the loop in downtown Chicago. It is a unique piece of property, bordered by the Butler National Golf Course on the north, Salt Creek on the east, and the Oak Brook Village Hall on the southwest corner. However these were not the challenges. The challenge was a virgin forest of at least 1,500 oak trees of 10" and larger caliper, and many hundreds of trees less than 10" in diameter.

The widely respected Chicago firm of Fujikawa Conterato Lohan & Associates (F.C.L.) was selected to design the project. Sasaki Associates of Watertown, Massachusetts, was

selected to work with F.C.L. to do the landscape architecture and civil engineering. F.C.L. did a magnificent job in positioning the buildings to maximize the benefits of the existing forest. F.C.L.'s project architect, Joe Antunovich, hired Chuck Steward of Urban Forest Management to assist in evaluating the existing forest.

After all 1,500 trees over 10" in caliper had been surveyed, tagged and plotted on a map, Chuck Steward prepared a comprehensive forestry management program which included a very detailed list of pre-construction recommendations, a list of during-construction guidelines, and a maintenance program of sensitive care after construction. Chuck soon learned that F.C.L. (the architects) and Sasaki (the engineers) clearly recognized the importance of the "forestry management program," but he did not know how McDonald's would react to the program. He probably thought we would react not unlike many other developers do when they find out the cost of such a program -- that it just would not fit into our budget. However, that was not the case at all. McDonald's accepted the forestry management program totally, and we started almost immediately on the pre-construction phase.

With the design development of the project nearing completion and the pre-construction forestry program in progress, it was time to start planning the construction.

On the front page of Chuck Stewart's "Summary of Recommendations" he states:

> "The care and effort that has gone into the site planning to this point has been outstanding and reflects a genuine concern for the native vegetation. If the project is to be a long-term success, it is absolutely essential that this same level of care and control be extended to the construction and maintenance phases of the project."

During this pre-construction planning period we met with the project team many times to talk about ways to better control and protect our existing forest during construction. This project team consisted of the architect, the engineers, Chuck Stewart, Dr. George Ware of the Morton Arboretum, Dick Brickman of the Theodore Brickman Company (landscape contractors) and myself. From these meetings came the firm plans to:

1. Use signs to tell new people entering the site that they are entering an environmentally protected area,

2. Install 4-foot chain link fencing for the protection of the tree preservation zones, and

3. Change the construction specifications to include a section called "special site limitations" which outlined certain site restrictions such as preventing any subcontractor from dumping trash, paint pots, sheet rock, concrete and mortar in the wooded preserve areas, and prohibiting overhead cranes from swinging their booms into the tree areas.

The most important change to the specifications was the penalties and fines for violating the protected areas. Damage to certain specimen trees adjacent to construction areas would result in fines of $20,000 per tree. Any damage to any other trees on the property would be assessed at a rate of $200/inch caliper of the tree, and any contractor's unauthorized penetration of the tree protection fence would result in a fine of $1,000 plus the cost to repair the fence.

The project has been underway for 13 months and not one tree has been damaged.

When new employees are hired at the management level of McDonald's they must work in a McDonald's store for one week -- and I might add they didn't tell me this until after I was hired. The top management wants its management team to all be McDonald-ized. The first day on the job at the store, the store manager took me in the basement and showed me a 10-minute film on how to make french fries. That little film told me everything I needed to know about french fries, from unloading the truck to salting and bagging the fries. I said to myself, "Why can't we make a film on protecting oak trees?" So I called our production people and they were very excited about making the film since it was very different from the training films they were accustomed to making. The purpose of the film is to educate the workmen on the fundamentals of working around existing trees and to get our point across that we are very serious about protecting our trees.

Darwin acknowledged several times in his writings that two things had become dull to him as he got older. The first was his joy in the arts; and the second, his joy in nature. Dr. Francis A. Schaeffer in his book Pollution and the Death of Man, The Christian View of Ecology (1970), points out that he believes that what we are seeing today is the same loss of joy in our total culture as Darwin personally experienced. The death of "joy" in nature is leading to the death of nature itself.

> "What people do about their ecology depends on what they think about themselves in relation to things around them. Men do what they think. So, man's relation to nature must be a moral crisis. In other words, when the morals of man start to decline, so does man's view of nature."

Dr. Schaeffer very simply explains that nature and man are both created by God.

> "Yes, the tree is created like myself, and I ought to 'feel' a relationship to the tree as my fellow creation. This relationship should not only be for aesthetic reasons -- although that would be enough reason in itself, because beautiful things are important -- but we should treat each thing with integrity because this is the way God has made it. When you drive an axe into a tree, you are not cutting down a person, you are cutting down a tree. But while we should not romanticize the tree, we must realize God made it and it deserves respect because he made it as a tree. God treats his creation with integrity: each thing in its own order. If God treats his creation in that way, should we not treat our fellow creature with a similar integrity?"

If we at McDonald's meet this challenge, we will have met our goal.

REFERENCE

Schaeffer, Francis A. 1970. Pollution and the Death of Man, The Christian View of Ecology. Tyndale House Publications, Wheaton, Illinois.

URBAN FORESTRY ON THE URBAN FRINGE

Gary A. Moll
Chief, Resource Protection
Maryland Forest and Park Service

ABSTRACT

This paper discusses the urban forest as a system of natural elements that need to be managed as a unit. Foresters have training incorporating natural resources and people into one management plan. Urban development is viewed as a land use that can substantially benefit from the knowledge of foresters as land managers.

The Maryland Forest and Park Service has been involved in urban forestry since the beginning of organized forestry operations in the United States. As a result of a roadside tree law that was passed in 1914, the Maryland Forest Service has been responsible for supervising all trimming activities along public right-of-ways throughout the state of Maryland. Our involvement and prospective of urban forestry has been growing since this early beginning.

During the 1950's, a law was enacted which put the Maryland Forest Service in charge of licensing and testing tree experts in the state of Maryland. Presently, the state has approximately 300 tree experts. During the 1960's, our foresters started to work with communities designing street tree management programs. In the 1970's, we extended our efforts to the urban fringe through a program directed at land planners, land developers, and builders.

Our intention was to bring the knowledge of foresters into land planning activities and to work with developers and builders in demonstrating how to put our planning suggestions into practice. As a result of our operations in and around urban areas, we recognize that there are many professionals and professional groups working in the urban forest. We respect these professionals and attempt to promote their professional activities. Arborists, horticulturists, nurserymen, scientists, landscapers, landscape architects, and city foresters, just to name a few, are all professionals dealing with the urban forest.

Foresters are part of this team working in the urban forest. Foresters are not timber beasts stalking through the woods in search of lumber. A forester's training centers around management of forest systems. Foresters are land managers involved with management of all the resources connected with forest land. The major contributions of the forester to this group of urban forestry professionals is his management training. This training has historically involved the forester in coordinating complex forestry systems. Trees, shrubs, soil, wildlife, people, and industry have always been part of rural forest management plans. In this respect, the urban forest is much like our traditional forest management systems.

Regardless of the specific training of the urban forestry professional, their knowledge and efforts contribute to the overall urban forestry movement. The common element that brings all the professionals together is trees. Whether they are working with one tree, two trees, six trees, a street full of trees, or a forest full of trees, the work affects the urban forest system. This system is a web of ecological parts that needs to be viewed as a whole.

Unfortunately, when urban areas are designed, natural features, vegetation, and other naturally occurring elements take a back seat to structural and engineering concerns for human convenience. From a forester's perspective, it is foolish to disregard these natural elements of our ecosystem. Tearing down these elements of the natural system requires a considerable amount of energy. The final product of this redesign usually does not function in harmony with the surrounding natural system, and many valuable aspects of the system are wasted.

If you do not think of the urban forest as an interrelated system of plants and other natural elements, I ask you to observe your community from another perspective. Consider the view of the urban forest as you rise vertically over the area. The view from a hot air balloon reveals just how closely your neighborhood is affected by the surrounding territory. Extending this view from the balloon to an airplane and finally to the view from a satellite will reveal even more of this urban forestry perspective. In Maryland, when we take a view of a location southeast of Washington, D.C., houses and streets blend into subdivisions, highways, trees, forests, and rivers. Urban areas and rural forest meet, connect, and influence each other.

As an example of how these natural elements are connected, consider the movement of water and streams through any natural system. Regardless of the land-use in its path, the water flows downhill ultimately into rivers, lakes, and oceans. No matter how the urban area is restructured, the water will still flow downhill. As it flows, it reflects the quality of the system through which it passes. Forests produce clean, drinkable water; urban areas do not. Many urban people are dependent upon this flow of fresh water from the natural system for daily survival. The people of Baltimore City, for example, depend upon three forested watersheds to the northeast of the city. Without the clean water of these reservoirs, the people of Baltimore could not survive.

The Maryland Forest Service started a program to deal directly with land developers and builders in the mid 70's. We wanted to have a direct affect on the forest land that was being changed through urban development. The program started in three counties in Southern Maryland by assisting planning agencies in zoning, planning, and designing developing communities. At the same time, it assisted land developers and builders with specific construction techniques, detailed site information and design techniques for saving and protecting forest resources.

Our plan was to incorporate existing forest resources into these developing urban areas. We feel our techniques have been successful. We do not try to enact new ordinances or to enforce land development regulations. Instead, we attempt to show developers and builders how good design can be profitable for their business. We strongly promote the use of cluster development to save existing forest land. We promote detail development plans that include existing forest cover. Development usually does not include any information on the quality or type of forest cover. They usually include only basic topography and lot layout. The final quality of a subdivision can be considerably improved by including this forestry information. We have found that our foresters are frequently the only people to physically walk a proposed development, and we find that many elements that seem minor while reviewing the plan in the office turn into something much different after review in the field. We work with developers on a large and small scale in designating trees to be saved. We feel it is our job to try to structure our assistance to the operation of the company involved.

In summary, foresters should be involved in the early stages of the planning process. Saving existing soil structures in developing urban areas will set a productive foundation for the future of the urban forest. Natural phenomena operate with a total disregard for

man-made property lines. Natural phenomena, like water flowing downhill, erosion, Dutch elm disease, fire, and gypsy moth respond only to existing natural conditions. They do not respond to political pressures, nor do they operate in the way we would like them to.

People should learn to design with these existing natural features. No matter how much we disregard natural events, these events will continue. Even in the heart of many of our oldest cities, the natural succession of plant communities is occurring. Driving through downtown Baltimore, I frequently see buildings slowly falling to rubble. The concrete from which they were made is breaking up into small particles. Hearty vegetation, including trees, is taking root in these buildings, just as it does in the forest itself. What is perhaps most shocking is that this is taking place not only on the first floor but on the second and third floors of many buildings. What must be realized is that our ignorance of this process doesn't stop it from continuing.

RESTON HOME OWNERS ASSOCIATION OPEN SPACE MANAGEMENT AND DEVELOPMENT

Ann Ziminski
Reston Home Owners Association
Reston, Virginia

ABSTRACT

Reston, Virginia is a planned community of 40,000 residents in northern Virginia. A non-profit homeowners association owns and administers all common open space and community facilities for the use and benefit of residents. Funding is by automatic assessment of all homeowners. Current management involves 750 acres of open space and parkland. The common land is under an open space plan with set goals and objectives and a well defined conservation management plan. Environmental education is considered an integral management tool in open space management. Maintenance standards for conservation management are included.

BACKGROUND

Reston is a planned community in northern Virginia. Now 18 years old, almost 40,000 people live here. When completely developed there will be 23,000 homes and approximately 70,000 people.

The Reston Home Owners Association (RHOA) owns and administers Reston's open spaces and common facilities. The area administered is continually increasing as more land is deeded by the developer. The RHOA is chartered under Virginia law as a non-profit service corporation, to which each Reston residential property owner automatically must pay an annual assessment set by the board of directors.

Responsibilities are, "To operate and maintain, in neat and good order, and for the use and benefit of the inhabitants...all parks, parking areas, open spaces, streets, paths, and other facilities (such as pools and tennis courts, etc.)...conveyed by the developer"..."To assess, collect and disburse charges created by the deed"..."To enforce the covenants," which cover construction of additions, use of buildings for other than original purposes, tree removal, exterior lighting, trash storage, erosion control, utility easements, property maintenance, boat sizes and types used on lakes, and further subdivisions.

By 1983, RHOA holdings include some 850 acres of open space and parkland, 50 miles of pathways, 14 swimming pools, 34 tennis courts, 22 athletic fields, 15 multipurpose courts, 190 garden plots, storage for 156 boats, 24 tot lots, the 70-acre Nature Center, four community buidings, and a picnic pavilion.

OPEN SPACE PLANNING AND DEVELOPMENT

The land use plan, under which Reston is being developed by the Reston Land Corporation, sets aside "common land" in the form of large pieces of open space and small parcels for the enjoyment of residents. Common land is commonly-owned and maintained by the property owners of Reston through the RHOA. Common land or open spaces refers to wooded areas, open fields, disturbed areas such as rights-of-way, recreation areas, lakes, ponds and streams. RHOA's Department of Open Space Maintenance and Development manages, plans and develops common land.

Restonians live in a park. Unlike many towns, there is no formal entrance to the park. Sometimes the park is a neighborhood ballfield, or a wooded area down the street, or a narrow strip between two homes. Unfortunately, people often view this common land as an extension of their own yards, so they choose to mow it, garden it, dump on it or cut wood from it. On occasion, people wonder about RHOA's management. They ask, "Why are you letting our area reforest naturally and over there you've planted trees?"

Generally, the RHOA open space system has been well planned and maintained. This is accomplished by using the RHOA Open Space Plan, Patterns, and RHOA maintenance standards. As RHOA property holdings and usage increase, RHOA has begun devising ways to more aggressively manage the open space.

(1) Open Space Plan - Completed in 1974, this is a broad overview of common land with planning recommendations (e.g., density criteria) for pathways, outdoor recreation facilities, streams and forest cover. The Open Space plan is not a master plan, but more of an idea sheet indicating possible sites for future facilities and pathways. Usually, it is updated by a landscape architect. RHOA has begun using a standard inventory procedure to evaluate and plan areas immediately after land is deeded, without the usual time-lag problems.

(2) Patterns - a recent document for residents which outlines planning goals for different uses so that residents can plan and design community improvement projects. Patterns are precise statements that pose physical solutions in various situations. They are RHOA's guiding principles for design and development, and a way to exercise control over the form and use of open space.

(3) Maintenance Standards - These are general guidelines for maintenance, such as mowing or fertilizing schedules. Since many of the parcels are small-sized, eroded, exhibit poor growth or disease, or are disturbed by construction, proper management is essential to provide a healthy, functional landscape.

(4) Conservation Management Plan - This Plan establishes a routine procedure to avoid possible misunderstandings between residents and to insure quality mangement. RHOA could manage laissez-faire and let nature take its course and people do as they please. But proper management procedures ensure quality open space. When erosion, disease, poor growth, abuse or misuse, threaten the quality of open space, careful stewardship must be exercised.

RHOA has developed plans for each deeded parcel. Generally, a plan is flexible enough to allow for minor adjustments (day-to-day or year-to-year). The steps to managing an area are:

(1) Determine the goals for the particular parcel.
(2) Inventory and analyze the site.
(3) Make recommendations for short and long-range management and development.

(1) Goals and Objectives for Open Space

RHOA open space was set aside to provide the best living environment for Reston residents. The "best" living environment is subjective, but is interpreted as a healthy ecosystem that provides, in the long run, the most productive growth of vegetation and wildlife compatible with surrounding land use.

The goals of the open space system are:
(1) To attract birds and other wildlife.
(2) To provide a visually attractive community.

(3) To provide area identity or visual relief.
(4) To encourage use and recreational/educational activities.
(5) To prevent or reduce air and water pollution.
(6) To reduce noise pollution.
(7) To eliminate erosion.
(8) To conserve unique, natural features.
(9) To help maintain the mental, emotional, and physical well-being of residents.

A conservation management plan for each area of open space gives a routine method:
(1) To analyze and record present and long-range management decisions.
(2) To facilitate community planning and analysis of community improvement projects.
(3) For continual inventory and updating of management.

(2) Inventory

Before a decision can be made as to how to manage, the existing resource needs to be surveyed. An inventory describes the environment -- location, surroundings of the area, and the existing environmental features. These factors determine the suitability of the area for a particular use. After the survey, the data can be mapped and subsequently evaluated. This particular inventory:

(a) Surveys the potential open space uses that might be adopted: conservation; active or passive recreation.
(b) Focuses on habitat because: it identifies the ecological concept of community and the processes which take place (e.g., flooding), and it will be a mechanism to monitor change in a community over a period of time.
(c) Includes rational evidence based on soils, plant ecology, geology, hydrology wildlife, and other explicitly "cherished" areas of human value.
(d) Is simple enough to be used by RHOA staff after minimal training.

The inventory is intended to be used immediately after new property is deeded or as a preliminary before community projects are started, as well as to evaluate and monitor management over a long period of time.

(3) Making Recommendations for Short and Long-Range Management and Development

The final step in a conservation management plan is making recommendations based on present needs and future goals. The RHOA maintenance standard outlines procedures for the care of RHOA facilities and lands.

ENVIRONMENTAL EDUCATION

Environmental education is also an integral management tool for RHOA open space. Programs are aimed to: (1) encourage the use and enjoyment of amenities by initiating educational/recreational activities on or near RHOA open space facilities; (2) enhance the understanding and appreciation of Reston's natural environment and how it relates to the Reston "quality of life"; and (3) encourage the active involvement of all age groups in the maintenance and improvement of the community. RHOA believes that the more residents learn about the unique interaction of the man-made and natural environment of Reston, the more they will value the community and find it interesting, beautiful, healthy and something to preserve and use wisely.

The following list shows a variety of environmental programs which involve various age groups in the community. All of these programs emphasize RHOA's role in the community and how we manage and maintain open space:

(1) Interpretive Walks; brochures and trail guide - family.
(2) Natural history classes - adult.
(3) Ranger Rick program - 7-12 year old youths.
(4) Hug-a-Tree program - preschool, half-day summer camp.
(5) Junior Trailblazers program - 12-14 year old youths work program.
(6) Preschool program - sensory awareness activities.
(7) Community garden plots - rental space for gardening.
(8) Reforestation project - resale of tree seedlings, bulbs, wildflower seeds and prairie grasses.
(9) High School ecology club.
(10) Community service projects - youth groups, volunteer clubs.
(11) Campfire programs - family.
(12) Neighborhood Maintenance Program - family
(13) Environmental Youth Maintenance - 13-16 year old youth work program.
(14) Quest - 12-14 years high adventure program.
(15) Backyard habitat program (tree snags, bluebird boxes).

MAINTENANCE STANDARDS FOR WILDLIFE MANAGEMENT

Habitat refers to the particular association of food, water, cover and protection for growth and reproduction of different species. Improvement in the quality and quantity of habitat is a principal goal of wildlife management. The habitat inventory determines habitat quality and identifies areas to be improved or protected.

"Edge" is another key concept in wildlife management and refers to the transitory zone between two principal plant communities. Edges are important because they usually provide great variety of food plants and seeds.

Although the specific requirements for each wildlife species vary, the principal focus is to create diversity. The following are the most common conservation practices for various habitats.

WOODLAND TRACTS

Small wooded tracts can be managed for wildlife using forestry management methods to create as much edge and habitat diversity as possible.

(1) Protect and improve existing mast producing stands: oaks, hickories, walnuts, beech, gums, dogwoods and hollies.

(2) Practice selective thinning and pruning to encourage growth of more desirable mast and fruit pruducers. Use orchardist's rule.

(3) Create clearings -- up to 20 percent of the forested area should be open. Long narrow strips, 30-60 feet, running east to west are optimal. Pathways, road borders, equestrian trails, and utility rights-of-way can be used for this.

(4) Keep the area in several stages of vegetative growth. Approximately 25 percent in young trees, 25 percent pole timber and the rest saw timber. Understory should comprise 50-60 percent.

(5) Retain at least two den trees per acre for squirrels. Preferred are living mast trees with a 3.5" diameter entrance hole and a 2-3 foot cavity, 20 feet above ground.

(6) Retain 2-3 standing dead trees per acre for flickers, woodpeckers, sapsuckers, wrens and screech owls.

(7) Leave trees with grape, poison ivy, and honeysuckle vines as they are important food species.

(8) Establish hedgerows, fence rows and brush piles along woodland edges.

Harvest cutting for timber in urban areas is practiced to some degree in Europe. European forests are intensively managed for recreation and wildlife. Thinning and selective cutting to improve species composition is a common practice, as is removing some dead, dying, diseased, and damaged trees.

Timber stand improvement should be undertaken only after careful assessment of the need and the possible increase of runoff in the watershed. In areas where there is much streambank erosion, thinning has to be carefully evaluated. Although urban forests are not significant timber industries, potential products from woodlots -- wildife, aesthetics, recreation and timber --should be utilized and enhanced.

MEADOWS AND FIELDS

Fields with their abundant sunlight have potential to produce abundant and diverse wildlife food. The following are recommended practices.

(1) Provide food patches of small grains, grass and/or legumes to attract seed-eating birds and rabbits near field borders. Size may range from 1/10 to 1/2 acre. One long, narrow patch 15-20 feet wide per 20-40 acres is recommended. Half of the width of the strip should be mowed each year after the August nesting season.

(2) Establish fence rows, hedgerows or wildlife borders for feeding as well as perching and home sites for birds and travel corridors for small mammals. Low woody vegetation can be allowed to establish naturally along field borders and then pruned as tall trees appear. Or, shrub borders 20 feet in width can be planted, approximately 10 feet from the woods.

(3) Construct brush piles on field, wood, or marsh edges for cover and den sites. Crisscross logs or large limbs for a foundation or pile them over a large stump or log. Lay on the slash or "brush" so that the covert is 4-6 feet high and 10-15 feet long. Top with some heavy pieces so it will not be blown away, be kicked over, or otherwise disturbed. As it rots, vines, brambles and shrubs will grow, forming a thicket -- a "living brush pile."

(4) Mow fields every 1-3 years to prevent reforestation of woody growth. Each year, after nesting season, a strip from one-half to one-third of the field can be mowed to increase edge and vegetation diversity. To encourage a particular species of plant to reseed, or to release seed for wildlife, mow right after it has gone to seed. Mow before seed head ripens to discourage a particular plant.

WETLANDS

Marshes and wetlands are usually rich in a variety of plants because of the abundant water and nutrients. Soil nutrients are washed into low lying areas and frequently do not drain.

(1) Maintain a grass border around marshes and ponds with shrubs 25-100 feet beyond the edge.

(2) In areas over one acre in size, place loafing sites (rock piles, logs, etc.), 4-5 per acre in shallow water for waterfowl. Construct nest boxes for wood ducks and place adjacent to ponds or streams and in marshes.

(3) Establish food patches of millet and buckwheat or native plants.

LAND RESTORATION

Before approaching the restoration problem, each site should be evaluated for: safety hazards, present and future property damage, aesthetics, severity of erosion, impact on the area (e.g., sediment load), cost and manpower needs. While there are construction alternatives for streambanks and hills, the preferred alternative is to re-establish vegetation. The impact of rain, water velocity, poor soil nutrients, soil compaction, and slope can delay the natural regeneration of plants. Depending on the extent of the damage, the intended use of the area, and its relationship to surrounding areas, different strategies are employed.

- Some barren areas are left to recover naturally. No new plantings are made and the humus and underbrush are left undisturbed.

- Other areas are planted with seedlings, wildflower seeds and small shrubs native to the area, then left to regenerate themselves.

- Areas intended for formal use are landscaped with native plantings.

Before planting, review surrounding habitat and use. Then determine the type of habitat desired to create. The following are maintenance guidelines for re-establishing each type of habitat:

(A) Woodland - there are three approaches to reforestation:

(1) Stabilize with grasses, legumes, wild weed seeds, wildflowers or old hay, then wait as the site reforests itself. Seeds should be native or suited to the area. On banks or roadsides, erosion netting may be needed.

(2) Stabilize as above, but plant with seedlings from the Virginia Division of Forestry or with wild transplants. The original native variety of vegetation should be duplicated as closely as possible. Plant conifers for wildlife cover and deciduous trees for fruit and mast. Recommended ratio is two red oak to one white oak group to provide ample quantity of both fall and winter food.

(3) Landscape with large trees, shrubs, fertilize, mulch heavily and water to achieve an "instant" forest or formal planting. Landscape or planting plans should be filed and updated whenever changed.

(B) Meadows and Fields - Areas can be limed, fertilized and planted with native grasses, wildflowers, or legumes. Wildlife seed mixture can easily be assembled.

Shrubs from the Virginia Division of Forestry (Autumn Olive, Lespedeza, Bristly Locust) can be bought and planted 20 feet wide along field edges. Hedgerows can establish naturally by setting fence posts every 20 feet and stringing wire or binders twine between them for perches. These shrubs planted by birds grow quite rapidly.

(C) Wetlands - Native marsh plants will normally invade, thus planting is often unnecessary. Millet and buckwheat are excellent waterfowl food and will tolerate the moist conditions. Stabilize the edge with them or the preferred plant species. Planting a row or clump of shrubs 25-100 feet from the edge will add to the beauty and usefulness of the area.

Native wildflowers (such as Virginia Bluebells, Cardinal flowers, skunk cabbage, Blue Flag iris) and ferns usually will not re-establish and can be planted for variety and beauty.

SECOND NATIONAL URBAN FORESTRY CONFERENCE

GENERAL SESSION III

ORGANIZING FOR COMMUNITY ACTION

Tuesday, October 12, 1982
8:30 a.m.-Noon

Session Chairman:

Larry Biles
USDA Forest Service
Atlanta, Georgia

Moderator:

Nancy Wolf
Environmental Action Coalition
New York, New York

Speakers:

Gladys F. Waltemade International Paper Foundation New York, New York	Corporate Support for Educating Youth in Urban Forestry	81
Tom Chiosso Recreation and Park Department San Francisco, California	Mobilizing Volunteer and Community Support	83
Patricia Schrieber Pennsylvania Horticultural Society Philadelphia, Pennsylvania	The Philadelphia Experience: A City of Neighborhoods	86
Steve Sanfort Urban Forest Manager Cincinnati, Ohio	Our Thoughts on Urban Forest Management	89
Andrew Lipkis TreePeople Los Angeles, California	One Million Trees for the 1984 Olympics in Los Angeles	94
James Montgomery Southern Forest Institute Washington, DC	Communication for Urban Forestry: A Key to Success	103

CORPORATE SUPPORT FOR EDUCATING YOUTH IN URBAN FORESTRY

Gladys F. Waltemade
Vice President
International Paper Company Foundation
New York, New York

ABSTRACT

Through its Foundation, the International Paper Company, in cooperation with 4-H and the Cornell University Extension Service, has developed an urban forestry educational program for youngsters aged 8 to 12. Programs such as this and work with local community leaders help to build individual self-pride and self-esteem among many of the urban poor who have little opportunity to change other constancies of their lives.

Thank you for giving me this opportunity to tell you why International Paper Company Foundation believes that urban forestry is an important part of our commitment to our community. Over the last several years, we have supported a number of organizations whose goal is to improve the quality of life in our headquarters city of New York.

One such organization is the Environmental Action Coalition, which Nancy Wolf, our moderator, ably leads. Environmental Action Coalition, through its educational programs, makes a large impact on our city's environment. We see urban forestry as a way to improve the amenities in a concrete, soot, and traffic-ridden environment.

Urban forestry has made an incredible difference in the quality of life for the workers in the Avenue of the Americas neighborhood where our office is located. From the 43rd floor, I can look out and see patches of green and know that through the works of the Housing Conservation Coordinators, local residents (largely minimum wage earners) care about their neighborhood's appearance.

International Paper made a major commitment to New York City when it moved into this neighborhood two years ago. Formerly an area of porno shops and peep shows, this neighborhood is now starting to boom with new office buildings and legitimate retail stores. In realizing our responsibility to this neighborhood, International Paper management has focused both monetary and management commitment to building one of the finest outdoor plazas open to the public. A variety of trees, plants, and amenities such as food services and entertainment will open this spring for the visitors and workers in this midtown location. In addition, we have made commitments to improve Bryant Park located on 42nd Street. Formerly Needle Park, now a flower vendor replaces the territory of a drug pusher. I do not mean to paint a rosy picture. Problems still exist in our neighborhood. However, through the cooperative offers of the non-profit sector and the corporate sector, we have seen change that would never have come about without an open and continual dialogue.

But in addition to improving the city, we find that urban forestry offers something special to young people, often minorities and poor, who have little other opportunity to instill change in their lives. By participating in a program of tree planting and tree care, these youngsters are given a chance to see visible signs of their own power. The realization that an individual can brighten his block by pruning and nurturing trees instills pride and hope in a young person who has little opportunity to change the other constancies of life, whether they be lack of clothing, crowded living conditions, economic and family strains, or living amidst unchanging facades of concrete and granite.

Why is it important to International Paper Company to care about these things? By reaching out to young people and helping them to develop self-esteem, we hope to increase the educated pool from which we hire employees.

Now, lest you forget that International Paper Company's business is trees, I should like to tell you about a program we are especially proud of having supported. A few years ago, 4-H and the Cornell University Extension Service came to International Paper Company Foundation with a proposal we could not refuse. It was to develop an urban forestry curriculum tailored to youngsters aged eight to twelve. For over twenty-five years, our Foundation has sponsored a program of aid to public schools in our primary mill communities. Since the main thrust of the International Paper Company Foundation is pre-college education at the local level, we enthusiastically joined in the development of this educational material.

Booklets entitled "What's a Tree to Me," and corresponding leaders' guides were prepared, are now used throughout the 4-H system, and are available to schools all over this country. During 1981, over 11,000 copies were distributed. How do we know that it is working? If the letters I receive are an indication, we have to say it is going very well.

In summary, we support urban forestry because it helps us achieve two goals: it goes hand-in-hand with the Foundation's educational goals, and it is a part of the company's commitment to the urban revitalization in our headquarters' city.

MOBILIZING VOLUNTEER AND COMMUNITY SUPPORT

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ABSTRACT

The San Francisco Recreation and Park Department recently created a new position, The Coordinator of Special Projects. This office has three major goals in working with volunteers: (1) improving the quality of parks; (2) increasing public participation; and (3) linking volunteers with agencies. A case example of Mountain Lake Park demonstrates this partnership in action. Other current projects, including an Urban Forestry Program that utilizes a Mobile Training Van, are discussed.

INTRODUCTION

A "Plan for Action" provides the San Francisco Recreation and Park Department with a blueprint for enlightened management in the public sector. This Plan has served as a basis from which the San Francisco Recreation and Park Department has evolved a goal of shaping its existing programs to better meet the specific needs and aspirations of San Francisco's diverse neighborhoods. With the passage of Proposition 13, it is all the more critical that Recreation and Park programs be sensitive to the needs of residents. To achieve these ends, the position of Coordinator of Special Projects was created, with the primary responsibility of coordinating volunteer activities. Examples of these responsibilities are organizing volunteers to assume some duties in park maintenance and coordinating volunteers to augment professional staff in the various recreation centers. I also work with the Public Information Office in developing new techniques for marketing the Department's activities.

As Coordinator of Special Projects, I pursue three major goals: (1) improving the quality of parks; (2) increasing public participation; and (3) linking volunteers with agencies. A case example of Mountain Lake Park will help to demonstrate how these goals are achieved.

Mountain Lake Park is a Richmond District park, tucked away on the northwest edge of San Francisco, serving its neighbors, old timers and newcomers, walkers, joggers, sportsmen, and strollers. It is bordered by Park Presido Boulevard, the Presidio, and lovely old homes on Lake Street and 7th Avenue. Mt. Lake Park, in fact, occupies a site that has always been a vital part of San Francisco.

HISTORY

Juan Baptiste De Anza, the famous Spanish explorer, was among the first to appreciate Mt. Lake, camping there in 1776 during his pioneering journey through California to establish outposts in the New World. He described his campsite as being on the banks of a fine lake or spring of very fine water near the mouth of the Port of San Francisco. In fact, his group gave Mt. Lake its name, and all that fresh water convinced De Anza to locate the Presideo nearby. In those days, the Lake was much larger than it is today and was surrounded by bare sand dunes that stretched westward to the ocean. This fresh water source played an important part in the later development of truck farms and residential areas along the western fringes of 19th Century San Francisco. In 1874, the 14

acres surrounding Mt. Lake were designated by the City of San Francisco as a public park, along with land for Buena Vista and Golden Gate Parks. Most of the trees and shrubs that are present today were planted around 1910.

AT PRESENT

Today, Mt. Lake Park serves as the backyard that many residents don't have; as a place for a picnic, for jogging or walking, meeting old friends or making new ones, working out, or just stretching out. It is an unexpected oasis in an otherwise busy metropolitan area. But now that 70 years have passed since the park's first and only major planting, Mt. Lake Park is aging, and aging badly. The lake, once large, deep, and clean, is now shallow, dirty, and small. In fact, the Presidio owns the water and uses it to maintain its golf course. Many of the trees have passed their prime. Dense stands of old trees make new healthy growth almost impossible. The meadows, once green and lush, are brown, patchy and riddled with gopher holes.

The San Francisco Recreation and Park Department has done its best to maintain the park. But it faces shortages of personnel and equipment and therefore cannot keep up with maintenance problems. More than three years ago, some people who lived near the park and used it daily became concerned about its condition. At first, they talked to Park Department officials to see what could be done to help the park. They gathered more and more neighborhood support. Just this year, a non-profit organization was formed, The Friends of Mountain Lake Park. It includes more than 200 nearby residents. The Friends of Mountain Lake Park, working with the San Francisco Recreation and Park Department, have organized park clean-up days, collected trash and brush, cleared out overgrown areas, planted several new trees, and have raised money to help the park by holding garage sales and selling T-shirts. But we quickly realized that cleaning up the park was only half the battle. Mountain Lake Park also needed a masterplan--a report that would identify dying trees and shrubs and suggest new planting ideas. With such a plan in hand we felt that we could organize even greater neighborhood support and obtain additional help that might be available from public and private sources.

ASSISTANCE FROM THE CALIFORNIA DEPARTMENT OF FORESTRY

The Friends group successfully applied for a State Urban Forestry Grant to develop a management plan for the park. To help draft this plan, we enlisted the help of Dr. Joe McBride, Professor of Forestry and Landscape Architecture at the University of California, Berkeley. First, Joe planned and supervised a thorough inventory of all trees and shrubs and other vegetation in the Park. He trained Friends volunteers to do this. Together, we all worked to assess the condition of individual trees and to catalog all the vegetation in the Park. Joe spent many more hours collecting additional data and information, and he has now developed a long-term plan that includes specific recommendations for high priority, long-range projects, as well as on-going maintenance needs.

The vegetation in Mt. Lake Park is a mosaic of Monterey Pine and Monterey Cypress. Many trees have large branches which are a problem because they break off in heavy windstorms. There are areas of trees dying because they have reached a state of overmaturity. There are areas in which trees are falling because of the angle of lean and their heavy branches, and there are also areas in which no tree cover is growing up beneath the dark canopies of the Monterey Pine. These problems were addressed in the vegetation management plan, and there are solutions that will restore the quality of the Park. These include a thinning of less desirable understory species and an underplanting of species which can tolerate the shaded conditions created by the Monterey Pine. As they develop, the Monterey Pine overstory can be removed.

Another problem identified in the inventory is soil erosion that is exposing plant roots on steep hilsides and along trails. Combined with the soil erosion is a trampling of root systems along trails, at locations where heavy foot traffic is concentrated, and in areas where dirt bikes are used. A number of species were also identified in the inventory as being undesirable because of their competitive ability and the way in which they grow over other plants, or because of their rather poisonous nature. These can be controlled through heavy pruning or by eliminating them from the Park.

The beach area is a portion of the Park where the only naturally occurring vegetation may still be found. Here, one finds the Beach lupin and the Dwarf baccharis, two plants that grew extensively over the sand dunes where both Mt. Lake Park and Golden Gate Park were developed at the end of the last century. Soil erosion is a problem here as well, because of the heavy foot traffic of people going down to the beach. We have suggested the development of very specific approaches to the beach that would provide access to the beach and at the same time protect the area of the natural vegetation.

Around the lake, particularly at the north end, is a unique area of riparian vegetation, where an environmental education trail could be developed to provide an opportunity for people to see riparian plants in their native habitat. The solutions that have been proposed to these and other problems associated with the vegetation will provide for reclamation of the park and restoration to the conditions that prevailed in the park fifteen to twenty years ago.

Now that the management plan for Mt. Lake Park has been completed, it will be submitted to the San Francisco Park and Recreation Department for approval. Once adopted, the plan will become the official guideline for all future maintenance and reforestation projects.

Barney Barron, Superintendent of Parks, has expressed his support for this community effort: "As Superintendent of Parks, it has been a delight to have worked with the Friends of Mt. Lake Park over the past several months. I want to compliment the Mt. Lake community on the efforts they have put forward in clean-up projects throughout the Park and in generally trying to upgrade the Park. The Friends have most recently developed a vegetation management plan. Having received this plan, I look forward to working with the Friends of Mt. Lake Park, so that we might implement this plan and bring Mt. Lake Park back to the grandure it once had."

All of the Friends volunteers have devoted a great deal of time, effort and energy to help the park we love and use so much. More important, we have successfully demonstrated what concerted community action can accomplish.

FUTURE

The success of the Friends volunteers serves as a model for future community participation in urban forestry. Another program that will be coming on line soon is the Mobile Training Van. This program will be funded partially through an Urban Forestry Grant from the California Department of Forestry. The Van will give the San Francisco Recreation and Park Department the mobility to do outreach programs in many different settings throughout San Francisco. The goal of the program is to coordinate and enhance existing community involvement in urban forestry.

From my experience, community interest in urban forestry is high, but it is often unfocused and in need of skilled direction. Urban forestry volunteers need to be recruited, trained, organized, and utilized more effectively. The Van will be equipped for performing a variety of functions--everything from audio-visual presentations to educational exhibits. Material on this subject is available through my office at McLaren Lodge, in Golden Gate Park.

THE PHILADELPHIA EXPERIENCE: A CITY OF NEIGHBORHOODS

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ABSTRACT

During the past year, more than 100 new blocks participated in neighborhood gardening projects sponsored by PHILADELPHIA GREEN, the community gardening outreach program of the Pennsylvania Horticultural Society, a non-profit educational membership organization. PHILADELPHIA GREEN provides materials and technical assistance to organized groups living in low and moderate income neighborhoods in Philadelphia. These community groups are discovering that urban horticulture can effectively change their immediate environments in terms of neighborhood revitalization and expansion of the urban forest. By the conclusion of the 1982 spring season, there were new neighborhood garden clubs supporting 43 vegetable gardens, 17 garden blocks, 27 street tree/curbside planter blocks and 16 sitting gardens. A total of almost 650 groups have participated in community programs sponsored by the Pennsylvania Horticultural Society since 1974.

In the early seventies, the Pennsylvania Horticultural Society (PHS) established a series of community outreach programs. By 1974, school and teacher training programs in horticulture had already proved very successful in reaching a portion of the city's population. A pilot project, which began in late 1973 and expanded in 1974, provided the basics for starting community vegetable gardens to interested groups in low income areas within the city. By the spring of 1975, soil, fencing, vegetable transplants, and seeds had been delivered to a total of 35 PHS-sponsored community vegetable gardens. PHS then assumed responsibility for coordinating the Neighborhood Garden Block Program, started in 1953 by various Garden Clubs from the Philadelphia area. Over the next two years the combined community programs resulted in 100 new vegetable gardens and 75 additional neighborhood garden blocks where residents planted flowers in window boxes and tire urns. In the meantime, word continued to spread through the neighborhoods about PHS programs. The many community groups already involved in cleaning and greening their blocks showed added interest in developing small, low maintenance parks and planting street trees in their areas. In response, PHS staff designed an expanded, multi-faceted programs which added street trees and "sitting gardens" (small parks) to the existing vegetable gardens and garden blocks. The funding needed to carry out such a comprehensive horticultural program was provided by the City of Philadelphia's Office of Housing and Community Development (OHCD), PHS, and private foundations. The initial grant made by OHCD, as well as subsequent ones, amounted to three-quarters of the total annual budget for PHILADELPHIA GREEN.

That OHCD agreed to provide considerable funding in 1978 is especially significant since it was the first time that federal monies originating from the Department of Housing and Urban Development (HUD) were allocated to support such a broad-based horticultural program. As community activists from other parts of the country became aware of our funding resources, PHILADELPHIA GREEN became a model for those seeking federal support for similar programs.

Since the spring of 1978, staff members of PHILADELPHIA GREEN have worked with community groups on more than 300 vegetable gardens, 220 garden blocks, 100 street tree and curbside planter blocks, as well as 58 sitting gardens. The staff coordinates meetings in the neighborhoods to explain how a group might participate in the program and encourages the formation of neighborhood garden clubs. Details and designs for each project are later worked out with the members of each club. Once work schedules are established, materials are delivered by PHILADELPHIA GREEN staff. Each neighborhood garden club has submitted a petition and agrees to contribute some of the labor required to complete the project. In fact, all projects are cooperative ventures; the light garden construction, tree pit preparation, planter installation, and planting are all carried out by the members of each participating group with the help of PHILADELPHIA GREEN staff. PHILADELPHIA GREEN coordinators and garden assistants, present on all planting days, offer information and technical support to ensure the continued success of each planting project. As a result of all the hard work, each group is able to make a real impact on its community, introducing green space into an otherwise concrete and asphalt environment. Contact is maintained with each group after planting via monthly newsletters, periodic phone calls, and on-site visits.

Over the past two years more than forty community leaders already involved with PHILADELPHIA GREEN have contributed their individual expertise in community affairs as members of the PHILADELPHIA GREEN Advisory Board. Committees formed in the areas of public relations, garden space preservation and educational outreach meet regularly to consider new ways in which PHILADELPHIA GREEN might better serve the community. Advisory Board members host program activities such as the City Gardens Contest Awards Night and the annual Community Recognition Dinner, participate in various PHS Harvest Show Committees, act as PHILADELPHIA GREEN representatives at community functions, and spread the word about PHILADELPHIA GREEN and its programs to people in their own neighborhoods.

The Advisory Board also plays a key role in supporting PHILADELPHIA GREEN's annual requests for renewed funding from the City's Office of Housing and Community Development. Once the application has been accepted by OHCD, it is included as a line item in the OHCD budget, which must then be approved by City Council. Members of our Advisory Board, already active in their own communities, are usually well acquainted with their City Council representatives. Several months before budget hearings are scheduled, Advisory Board members contact their City Councilpersons to bring them up to date on PHILADELPHIA GREEN projects existing within their own constituencies. Through this close contact with City Council, many city gardeners have discovered that they actually hold substantial political clout. Fortunately for the program, most of the City Council is equally aware of this fact, and they enthusiastically support the continued funding of PHILADELPHIA GREEN.

In addition to our regular contact with OHCD and the City Council, PHILADELPHIA GREEN staff has had many opportunities to work cooperatively with a number of other municipal agencies. The Fairmount Park Commission, which has jurisdiction over an extensive city park system and more than 325,000 street trees, has worked with PHILADELPHIA GREEN to inspect all sites recommended for planting. This September, PHILADELPHIA GREEN and the Fairmount Park Commission's Street Tree Division cosponsored several workshops on street tree care for blocks planted by landscapers under contract with the City. Based on the high survival rate of trees on PHILADELPHIA GREEN blocks, Fairmount Park was willing to test the success of our teaching methods by inviting to these workshops representatives of 150 blocks that were planted with a total of

2600 trees. The participants were introduced to proper techniques of planting, fertilizing, watering, mulching, and pruning. In time, we will return to those blocks represented at the workshops to judge the efficacy of this cooperative program. We may yet see our own Philadelphia Street Tree Corps sprouting up, with the New York City Street Tree Corps as its model.

We have also developed a working relationship with the City's Water Department which regulates the use of all fire hydrants, and issues permits for the purpose of watering gardens. In early 1981, the threat of severe drought in our area brought representatives of the Philadelphia horticultural community together to work out how we might cope with the state-wide drought regulations. By early spring, an agreement was reached among the Water Department, PHILADELPHIA GREEN and Pennsylvania State's Urban Gardening Program, allowing controlled use of fire hydrants solely for the purpose of watering vegetable gardens. This cooperative effort prevented the loss of food crops that would have otherwise caused a hardship to the gardening population.

One of the most exciting recent developments deals with PHILADELPHIA GREEN's efforts in preserving garden space. Trees planted along city streets must contend with the many challenges to their well-being caused by pedestrians, animals, vehicles and environmental factors. Garden projects situated on once-vacant lots are often under serious threat of extinction due to land speculators and developers. Gardeners who originally obtained permission to use lots from various city agencies or private owners have no legal rights when faced with sheriff sales, sales by the Department of Public Property, or by private owners, and gardens have been know to disappear almost overnight. Recently, PHILADELPHIA GREEN has begun negotiations with the Department of Recreation to allow certain City-owned properties to be turned over to Recreation. The parcel of land would be held in the public domain, thus ensuring the preservation of the garden space.

OUR THOUGHTS ON URBAN FOREST MANAGEMENT

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and
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ABSTRACT

Urban forestry programs must take advantage of the fact that people love trees. Always talk positive. Use neighborhood volunteers to pay for and work for trees. However, trees must be treated exactly as any other city-"planted" fixture such as fire hydrants. Dollar values should be assigned to trees slated for removal, so that the city may be fairly compensated for the loss.

Urban forestry programs should not be funded from general funds. Budget competition with other city departments may be destructive in the long run. Special attention should be given to establishing a legally constituted special interest group for trees, with the specific responsibility of securing funding for forestry. The urban forester should be given as much discretion as possible to make professional decisions, with support of the authorized tree board.

In 1980, by a unanimous vote, the Cincinnati City Council created the first Urban Forest Management Division in the Queen City's history. "Big deal," you say, "Throw 'em a fish!" Also, by a 9 to 0 vote, a new city-wide special assessment was levied to provide the new division with an additional $500,000 annually for street work. You know, especially if you manage a city forest, that is something unique considering how tightly most municipal budgets are stretched.

This was accomplished by a coalition of hard-working people who presented their elected officials with some sensible plans and a sound forestry ordinance backed by sufficient public support. We hope to elaborate on some of the concepts which worked in Cincinnati and offer a few additional thoughts which might be worth your consideration if you are trying to enhance or develop a new urban forest management program.

Trees are an incredible resource. They are, by far, the nicest of all amenities planted along streets. Generally, people do not react about other street-side amenities such as boulevard lights, fire hydrants, traffic signals or signs as they do about trees. Most people cannot plant a fire hydrant for the public works department, but they will gladly plant trees for forestry. Always use this natural love of trees to your advantage. Always talk up the positives of trees and never mention the negatives. And, never fail to take advantage of your resource and the fact that people get emotional about trees. You are lucky not to be working with traffic signals. However, emotionalism must not be allowed to hinder the progress of forestry or other city departments. At times, trees must be coldly considered as just another type of street-side hardware which has its price during improvement projects.

The successful professional forester managing a tract of rural woodland never begins work on someone's land without first walking that land with the owner and discussing the owner's objectives. Since city residents and tax payers actually own the street tree forest (in the same way they own the streets, city hall, etc.), the successful urban forest manager must always discuss with city dwellers the expectations they have for their public trees. Very soon, because of their love of trees, you will have developed a source of free, talented labor. These neighborhood tree board members are usually the cream of the crop. They are a pleasure to work with. They are dedicated and imaginative. Their ideas and decisions are respected by others. Learn from them. Use them to inventory the forest, conduct tree planting surveys, plant trees, sign up property owners for front yard planting, and promote forestry. In a short time, you will have developed a strong, tree-wise political base which will accompany you to city council and budget hearings. They have cost nothing and will provide you with most everything.

When seeking money, however, stay as far away from your city's general fund as possible. Use your political base, with its love and knowledge of trees, to develop significant alternative sources of funding for forestry. Competing for general fund dollars with police, fire, roads, sanitation and other necessary services is very difficult and time consuming. If you are successful, you may antagonize those very city departments which did not fare as well, and with which you must cooperate to be effective. When was the last time you heard of a person endowing a city for the installation of traffic signals? For the planting of trees? Take advantage of your resource and go for the money!

One excellent method of planting trees is to purchase attractive, city-tough, easily handled trees at wholesale through a local non-profit organization such as a Soil and Water Conservation District, conservation organization, or civic or garden club, then rely on neighborhood volunteers for distribution and planting. A tree co-op, so to speak. Through rummage sales, bake sales, passing the hat and direct orders, neighborhood groups can generate the funds to pay the non-profit organization which shops for the trees and makes payment to the lowest bidding, local, high-quality nursery. Trees should be delivered to one central, secure location with a source of water. Volunteers then rally help with trucks to load, distribute and plant their trees following technical guidance and printed instructions provided by the urban forest manager. Local tree service companies or electric utilities could donate wood chip mulch. An unexpected plus that you'll probably realize is that volunteer planters achieve an excellect survival percentage, and their trees are vandalized less often by local "wildlife."

Managing the urban forest resource as thousands of individual trees, rather than several management units of many trees each, is traditional but is it cost effective, efficient or necessary? Knowing the condition and location (by address) of each street tree demands continuous record keeping but, more important, encourages management by crisis rather than by the more cost effective prevention method. Inventory your street trees by species, size and four condition classes (good, fair, poor, and dead) in reasonable management units, such as neighborhoods, political wards, census tracts, or geographic areas. Develop a priority list of management units by the number of dead and/or dangerous trees per street mile. Work first in the most dangerous units by pruning every tree worth keeping to Class II-Medium Pruning Standards of the National Arborist Association and removing all dangerous and/or dying trees. This prevention program should be budgeted to allow a rotation of about 6 years between prunings (or a more suitable span of years for the growth rate in your area) and will eliminate complaints, liability problems, and storm damage. It should also please residents and other city departments, because of increased visibility of signs, traffic signals and street lights.

When you know the location of each bad tree, the city administration will probably expect you to work on only those hazards. If you do this, you will never be able to get into a preventative program. For example, Cincinnati currently has on file citizen complaints concerning the exact locations of about 1,000 dangerous trees. We must immediately work, with all the problems of fighting spot fires, on eliminating those potential law suits. Yet, our neighborhood inventories show (not by individual addresses, thanks to good planning, but by neighborhoods) that there are 6,000 dangerous trees along 1,000 miles of streets. Our most hazardous community has 15 dangerous trees per street mile, our safest 0.5 per mile. Why spend your limited inventory time and budget developing a list of 6,000 "spot fires" when the public will give you 1,000 of them without your even asking? Instead, locate, attack and suppress the Head Fire first, which in urban forest management translates into the most hazardous management unit.

Contracting tree pruning and removing to professionals, such as Asplundh, Bartlett and Davey Tree Expert Companies, usually provides more tree work for your time and money than staffing, equipping, training and supervising city crews. Of course, you will have to write specifications, seek the lowest bids, administer the contracts, and supervise the work. However, you will get more tree work done for the dollar if you honestly consider all city costs and not just employee salaries. Quality of work will be high, and think of all the employee, equipment, training, and safety problems you will avoid by contracting. Most important, the urban forestry manager will have much more time to dedicate to the total resource and to secure funding necessary to carry out the work.

Most successful urban forest management programs have a legally authorized special interest group for trees. It may be called a shade tree commission, urban forestry board, beautification committee, or tree board. Some have total legal power over trees, and others are simply advisory. The most effective seem to be a blend of the two. A knowledge of trees is not necessary for the members; "Plant it green side up" is all they need to know. You can teach them about trees. Membership should be balanced among the green industry, public relations, labor, clergy, engineering and legal fields. It is hard to say which is worse, a tree board of nothing but "legal eagles" or one entirely of "tree nuts." The tree board's prime responsibility should be to secure funding for forestry while making everyone feel that they can't live without their tree program. It should use political action only when necessary. Its second function should be to assist with the planning of the forestry program and mediating the few disputes which may develop between the public and the program's activities.

Trees should be treated without emotionalism just like any other city-owned asset. But, be sure to take into consideration that trees grow and usually get more valuable each year until they reach the end of their service life when they begin to deteriorate, become a liability, and require removal. Has the city gained or lost during a road widening project if 25 healthy, well-shaped 18" diameter red oaks are removed and replaced with 25 healthy, well-shaped 2" diameter red oaks? Is it fair for an urban forest manager to arbitrarily tell one property owner not to remove a street tree for a driveway project but to tell another to remove a different tree for a similar project? How is your city fairly compensated for public trees removed or damaged by construction, vandals, or vehicles? In most cases the city is compensated fairly for the loss of fire hydrants, street lights, traffic signals, and other amenities "planted" on public property. During that road widening project, new traffic signals (better, more modern and less rusty than those removed) will be installed at a cost to the project. No one thinks twice about paying for equal or better signs, lights, sewers, hydrants, etc.! The dollar value of trees which face possible removal should be calculated by the urban forest manager following a recognized

method such as the "Guide for Establishing Values of Trees and Other Plants" which was prepared by the Council of Trees and Landscape Appraisers and is distributed by the International Society or Arborculture. Fair values are usually based on the species, size, condition and location of the trees in question. The person or project requesting tree removal should, as an integral cost to the project, guarantee the city that an equal dollar value of new trees shall be planted in the area or pay the forestry department the total dollar value up front to accomplish the replanting. Construction, performance, or guarantee bonds should be based on these values to cover trees to be "saved" during the projects. The city has thus been compensated for the equal dollar value of trees lost and not just the equal number.

Encourage profitable harvesting of trees growing on city land which is currently undeveloped or requires expensive maintenance. Surely your city has land on the fringes of parks, airports, sewer or water treatment plants, or in utility corridors where trees could be carefully harvested. The revenue could help offset the cost of other operations, and the remaining forest resources will be improved by sound silvicultural practices. Cincinnati spends about $60 per acre per year to mow interstate highway rights-of-way. We have selected areas not needed by the traffic engineers for visability, etc., and will plant them for $200 per acre with a mixture of black locust and European alder. By not mowing for twenty years the city will "save," in today's dollars, $1200 per acre and realize an additional revenue (after recovering planting costs) of about $400 per acre. We also feel that the stands of trees will enhance the aesthetics and buffer abutting neighborhoods from the sights and sounds of the "super slabs."

If you are creating a new tree ordinance or amending an existing one, keep in mind the ideas already discussed, such as establishing a city tree board and assuring compensatory payments for trees removed or damaged. Also consider the following:

1. Do not regulate trees on private property, even if needed, until the city has its own forest well planted and under good maintenance and the forestry program running smoothly. Lead by example.

2. Prohibit the city from throwing away wood generated during operations. This forces the tree board and forestry staff to find innovative uses and markets for the wood. The skyrocketing demand for firewood can be used to great advantage.

3. Enable the forestry department to sell wood and other forest products without competitive bids. Such bidding is necessary for high grade timber veneer or pulpwood sold from undeveloped city land but can be troublesome when the department wants to set up neighborhood or city-wide firewood or chip mulch sales.

4. Enable the forestry department to keep and control the use of all funds generated from compensatory payments and the sale of forest products. Allow none to go up for grabs in the general fund. This develops an incentive for doing an effective job. Keep the fruits of your labor.

5. Establish the right to enter onto private property and use any control measures necessary to stop the spread of epidemic and lethal tree pests such as sourthern pine beetle, gypsy moth, oak wilt and Dutch elm disease when such pests threaten public trees. Most property owners cooperate to the fullest. But what if the owner is indigent, cannot be located in time or refuses to help? The cost of the work should be recovered from the property owner.

6. Define "removal" as any act which causes a tree to die within 3 years. How many times have you seen trees "saved" during development projects only to be standing dead in several feet of fill dirt two or three years later? Trees usually do not just drop over dead. Performance bonds or deposits should guarantee the dollar value of public trees for 3 years after construction.

7. Enable the forestry department to use public funds to plant trees on private property when: (a) planting on the right-of-way is not possible because of too many conflicting utilities or too narrow a tree planting area, etc.; (b) the property owner signs a statement requesting the tree and holding the city harmless; and (c) the tree is planted "in full view of the street."

Trees planted in front yards usually have more room to grow, fewer problems, lower maintenance requirements, and a longer service life. People respect them more. They conflict less with utilities, sidewalks, pedestrians, vandals and traffic than trees located between the curb and sidewalk. Yet, visitors and residents still see tree lined streets. Best of all, public money has been more effectively spent since the city has not inherited long term maintenance responsibilities and front yard trees usually add more to the property value (thus, the tax base) than street-side trees.

8. Leave as much room as possible for your urban forest manager to make professional decisions supported by the tree board. Do not tie the department down to specific numbers or, for example, ceiling prices to charge for firewood. In a few years, when the ceiling price is ridiculously low, you may not wish to take your ordinance back to the elected officials for modifications for fear that some good, workable parts might also be tampered with.

There is just one more thing that we hope you will always remember: the urban forestry motto which states that, "A City without Trees Ain't Fit for a Dog!"

ONE MILLION TREES FOR THE 1984 OLYMPICS IN LOS ANGELES

Andrew Lipkis

ABSTRACT

TreePeople is a private non-profit corporation based in Los Angeles. The organization, which is comprised primarily of volunteers and non-forestry professionals, grew from one boy's dream of saving a smog damaged forest into a dynamic organization involving thousands of urban volunteers in tree planting, tree maintenance, and educational programs. TreePeople is currently involved in a massive effort to involve the entire Los Angeles area population in planting and maintaining one million new trees to help get the city ready for the 1984 Olympics.

In the late 1960's, the United States Forest Service announced that photochemical smog produced in the Los Angeles basin was traveling into the San Bernardino National Forest and killing thousands of trees. There were so many trees being killed each year that forest researchers feared that virtually the entire Ponderosa and Jeffery Pine Forest might be destroyed if the high levels of smog continued. The researchers suggested two possible solutions to save the forest: reforest with native species determined to be smog tolerant or clean up the air. At that time, budget constraints precluded any massive government sponsored reforestation program, and a timely solution to the smog problem seemed hopeless.

During summer, 1970, a group of teenage campers were told about the problem facing the forest, and they wanted to do something to help out. They decided to rehabilitate a small piece of the damaged forest within their camp; then set out on an ambitious project to remove the tar and oil soaked soil from the camp's truck parking lot and baseball field, and replace it with mulch and smog tolerant trees. The project was very strenuous but provided the teens with one of the greatest challenges of their lives. When the project was completed, a tiny piece of forestland was flourishing with new life, and the teenagers felt a tremendous amount of awe and satisfaction over the small but beautiful miracle which they had accomplished.

One of the members of that group was 15 year old Andy Lipkis. Until that summer he was a fairly typical California kid with ambitions of doing something to help improve the state of the world. Being a teenager, he was frustrated by the message society seemed to keep giving him, "Your ideas are just dreams, kid," and "Wait till you grow up. You're not old enough, and you don't know enough to do anything!" The summer tree planting exposure had a trememdous impact on his life--he learned that he could use his energy to have a positive impact and that the resulting feelings of accomplishment and satisfaction felt terrific. He decided that other people, especially kids, should have that experience, so he set out to build a program in which people could plant trees to help the forest and at the same time learn something very special about themselves and their ability to accomplish things.

Knowing next to nothing about trees or about business, Andy began building his program. It took three years of research, trying and failing before a viable program emerged.

During the process it had often been hard to find support, and many of the attempts to get something off the ground failed. Each failure became a lesson which ultimately led to the "Project's" successful start. In March of 1973, a prominently placed story in the Los Angeles Times entitled "Andy vs. the Bureaucratic Deadwood" detailed Andy's dream and unsuccessful attempts to involved both business and government. The article concluded with the fact that he needed fifty cents per tree to cover planting costs and gave a contact address for people who wished to help out.

The public responded with an outpouring of support. School kids send their milk money, businesses pledged their support, and in three weeks' time over ten thousand dollars had been donated. The average contribution was less than three dollars. A non-profit corporation was founded, and the name California Conservation Project was chosen for it. Andy then hired a small crew of college students who took 8,000 trees, shovels and two donated Jeep trucks to the mountains and began work.

The Project first worked with the kids in summer camps throughout the San Bernardino National Forest. The program consisted of an environmental awareness talk about the sources of smog and each person's responsibility to care for the environment. The talks were then followed by a tree planting training session and several hours of tree planting and watering.

Because of the enthusiastic response of both the summer campers and the public, the program was considered a success, and plans were made for its continuation. The original donors were given a progress report and asked to support the ongoing program. The donors again responded enthusiastically, and the program continued for several years with its summer operations. Word of their work spread, there was an ever increasing demand for a similar program in the city, and eventually the focus shifted to the city and the Urban Forest theme.

The original headquarters was Andy's old bedroom with the trees being grown in the backyards of several friends and staff members. Once the full time operation began in the city, more space was needed, and the TreePeople arranged for the City of Los Angeles to donate use of a 1920's vintage retired fire station located on 12 acres of wooded land, complete with nursery facilities. Using volunteer labor and donated funds they converted the fire station into their headquarters, tree nursery, environmental education center, and a public park.

Aside from activities at their headquarters, the program consisted of environmental education presentations in schools with follow-up tours and work projects at their center. Tree plantings were carried out both in the city and in the forest.

Now that TreePeople had established a several year "track record," they were able to attract some government money. Grants were awarded by the California Department of Forestry, Department of Energy, Department of Education, the U.S. Forest Service, and the U.S. Office of Environmental Education. TreePeople worked closely with the Atlantic Richfield Company (ARCO) in the development of their Growing Concern program. In the early stages of that program, thousands of trees were planted by young people in parks throughout Southern California.

At that time the group was still not very well known but was considered by those who were aware of it as a mild environmentalist organization. Although the official name was California Conservation Project, everyone who got involved called it TreePeople, and eventually TreePeople was integrated into the official name.

During the years of working with the camps and various organizations, TreePeople developed an especially effective method of recruiting, training and mobilizing volunteers. A philosophy of cooperation evolved and became one of the prime underlying themes of their work. Additionally, it was decided to remain completely non-political and not get involved in taking stands on public issues. These three qualities combined to catapult the TreePeople into a prominent position in the Los Angeles community when they were asked to help out in two major flood disasters. In the worst of the floods, TreePeople mobilized, trained, equipped and dispatched 3,000 volunteers who sandbagged, laid plastic, and helped clean up mud at 1,200 houses that were either damaged or threatened. TreePeople was also called on by authorities to help rehabilitate areas damaged in local brush fires. In each case, TreePeople assembled a diverse collection of volunteer groups including members of four wheel drive clubs, environmentalists, ham radio operators, and church groups. The disaster work created a tremendous amount of public goodwill and attention. TreePeople was then viewed as an important part of the community, and because of the diversity of people involved, it was seen as something for everybody rather than just a group of environmentalists.

The floods caused a major shift in TreePeople's thinking and direction. They had just successfully conducted a major disaster relief operation in one of the world's largest cities, and as a result had become famous practically overnight. Andy and other staff members began to look at what the organization had accomplished in the past eight years and what really needed to be done. At that point, more than 150,000 trees had been planted or given to people to plant, and nearly as many people had participated in their programs. But these seemed to have had little visible impact on Southern California. Much of the city crucially needed trees, and the population wasn't very aware of the impact they were having on the environment, nor their options for helping make improvements.

It was at that time, 1980, that Los Angeles was chosen to be the site for the 1984 Olympics, and Andy realized that there could be a great link between the benefits of Urban Forestry and the need to get Los Angeles in shape for the Olympics. During the floods, the TreePeople's work created a very special sense of community in Los Angeles, one that hadn't been experienced in decades. Because there were so many volunteers from all aspects of the community, and there was a lot of news coverage, the entire Los Angeles community got a sense that it was helping in the rescue efforts. Even the people who were sitting home watching the work on the evening news felt involved. Hoping to build on that spirit, TreePeople came up with the idea to involve the whole city in a major challenge; to plant and maintain trees throughout the city to beautify itself or "heal" itself before the Olympics.

Shortly after TreePeople began toying with the million tree goal, they received a call from the Los Angeles City Planning Department asking for their assistance in getting one million trees planted. The city had studied the climate management work of Dayton, Ohio, and Stuttgarten, West Germany, and then prescribed the planting of one million trees as an air quality improvement measure. According to their figures, the trees, when 20 years old, would filter as much as 200 tons per day of particulate matter from the air, bringing Los Angeles within 80% of meeting the Clean Air Act Standards for particulate smog. They figured that it would take them at least 20 years and $200,000,000 to plant all the trees. The TreePeople response was a pleasant surprise, "We'll do it in the next four years at a fraction of the cost."

THE PROGRAM

The various aspects of the program are best described in terms of the vision behind it, which encompasses both the goals and the philosophical underpinnings, and then the reality.

THE VISION

The vision behind the million tree program is that all residents of Southern California join hands to work together to "heal" their community. (There is an actual vision of the completion of the project: of a scene looking down at Southern California from space, seeing the population holding hands, swaying, standing in concentric arcs around a campfire at the coast. There is an air of quiet and peacefulness, and a feeling of satisfaction and unity coming from an even greater sense of awe over what they had all accomplished together. They feel like they were the real Olympic champions.)

The vision includes people planting and caring for their own trees, and working with their neighbors, community groups, and government agencies to rehabilitate or green various needy areas of their community. An awareness of, and caring about, the needs of the Urban Forest arises out of the planting and involvement. This awareness then leads to people helping maintain the city's trees and greater political support for municipal tree maintenance budgets.

Although the next part of the vision isn't exclusively related to Urban Forestry, the TreePeople feel it is a factor that's integrally linked. This part of the vision focuses on the role of the individual urban dweller, with the intention that the tree planting can be a beginning of the individual's connecting or reconnecting with the land/soil, and discovering one's own ability to contribute to society and make a difference in his or her life and the lives of people around them. It is hoped that many of the people who participate in the successful accomplishments of this dream will be empowered or inspired to begin actively pursuing their dreams.

Further, it is hoped that this project be relevant to cities around the world, because it relies on the contribution of human energy and relatively small budgets, making it achievable especially in areas where money is limited.

THE REALITY OF THE PLAN

The Urban Forest program revolved around a massive public education campaign, aimed at inspiring individuals to get involved. Other components include supporting community groups in neighborhood plantings and volunteers providing street tree maintenance.

The campaign is oriented at introducing Southern Californians to the concept of the Urban Forest and motivating individuals to plant and care for at least one tree. Through a full spectrum media campaign including television, radio, print ads, billboards, bus signs and posters, the public will be informed about the benefits of urban forestry. They will be encouraged to purchase a tree from their local nursery, or grow their own and then plant it and care for it. They are asked to notify TreePeople of the planting, so that their tree will be counted as part of the million.

The campaign focuses on four major benefits:

1. Energy Conservation - through shading of houses, parking lots and other buildings, resulting in a reduction of electrical consumption for cooling. With sufficient and proper planting it is possible to reduce peak hour energy consumption.

2. Air Quality Improvement - filtration of particulate matter and dilution of gaseous components.

3. Food Production - using a large variety of suitable fruit and nut trees.

4. Beautification of the entire community.

The public education campaign has a number of key components. One of America's largest advertising agencies, Doyle Dane Bernbach, Inc. (DDB), donated its services to develop the media campaign. Its introductory theme is "Turn Over a New Leaf L.A.--Help Plant the Urban Forest."

After many hours of discussion with TreePeople staff, DDB developed the creative materials for the entire campaign. Various corporations are donating in-kind services for the actual production. For example, General Telephone of California is producing the television spots with its inhouse T.V. crew and studio. In-kind donations are being sought as the first priority because corporations are able to make a prompt decision on the donation without going through the lengthy committee and executive process required for donations of hard cash. Money is being raised to cover the production costs when in-kind donations cannot be arranged.

Newspaper and magazine articles, as well as other news stories and talk show interviews, are playing an important role in the campaign. One of the key pieces of the campaign is a "How to do it" booklet that is being developed in a cooperative effort by TreePeople and the Los Angeles Times. An advisory team consisting of urban foresters, landscape artists, botanists, environmentalists, urban planners, nurserymen and others has been organized to develop the details of this exciting booklet. It will be aimed primarily at the individual living in a house, but it will also address apartment dwellers and neighborhood organizations. It will contain a number of inspiring designs and examples, as well as instructions on how to do actual plantings. There will be lists of appropriate trees keyed to a climate map for the entire region. Simple propagation techniques will be suggested as projects for the entire family. The booklet will address tree problems and problem trees, and discuss how to avoid or mitigate them. The booklet will end with a section on where to get various trees and supplies, and a list of tree sale events conducted by specialized groups such as the Californian Rare Fruit Growers Association. The booklet will be released in early spring, at the peak of the media campaign. It will be delivered to the homes of 1.5 million people.

TreePeople is working closely with the nursery industry, so each local neighborhood garden center will be equipped with a small display and urban forest information center. Along with information, the displays will have planting confirmation post cards.

COMMUNITY PLANTING

TreePeople is developing a special booklet to support neighborhood groups and community organizations in organizing and carrying out a planting. The booklet will be contributed to by the same advisory team as the Los Angeles Times booklet, but it will be oriented exclusively towards the needs of neighborhoods. It will even include details for the permit process required for any given type of planting, i.e., parkway, flood control channel, etc.

In addition to the booklet, TreePeople has been assisting groups in the actual planning and planting process. On planting days, TreePeople staff and volunteers bring needed tools and supplies, train the residents or group members, and assist them through the completion of the planting.

STREET TREE MAINTENANCE

When TreePeople first shared their plans with the Los Angeles Street Tree Division, the officials there expressed concern about their maintenance backlog and shrinking budget. Their maintenance program was approximately seven years behind. The result was the birth of an inspiring model of cooperation between a government agency and a community group: a volunteer street tree maintenance program. The program is aimed at the city's small trees that are in need of light pruning, removal of sucker growth and girdling wire ties, plus the clean up of weeds and trash from the base of the tree.

TreePeople staff and volunteers were trained by members of the City's crew and by a garden writer for Sunset Magazine. The city loaned a set of tools and provided a list of orders for trees and areas needing maintenance. TreePeople now conducts a community maintenance program on a bi-monthly basis. TreePeople recruits volunteer groups and invites all the neighbors of the project site to join in. Several demonstrations are given depending on the size of the group. Then the volunteers break into teams, each with a trained TreePeople supervisor. The work progresses at a fairly fast pace because the volunteers have fresh energy. Brush and tree wastes are transported via TreePeople pick-up trucks to a large city truck parked in a secure location nearby. The events are held on weekends when there are no city crews available, so on the following Monday morning the city truck is picked up, and the contents taken to the dump.

A SUCCESS STORY

One of TreePeople's most recent and exciting success stories comes from an area southeast of downtown Los Angeles know as 5ive Points. It is basically a low income area known as part of the "garment district" because of the clothing manufacturers and warehouses in the area. The area looks fairly depressed, with very little greenery and lots of graffiti scrawled on the walls. Gang violence is one of the significant problems facing the community. A few people from the area heard about TreePeople's urban forest program and approached them for help. TreePeople responded with guidance and assistance but had no money available to help purchase the needed trees and supplies. The group determined to get some trees in the ground and began collecting donations from amongst themselves. . . often only five dollars per month from families with very low incomes. After nearly six months of raising money and planning, they did their first planting. TreePeople contributed the tools, soil amendment, fertilizer, stakes and ties, all to help keep the costs down.

The first planting was successful, and the people of 5ive Points were encouraged to continue their work. Because of the investment of their personal money and time, they had made a very strong commitment to the trees and were very concerned with their survival. They actually contructed their own water trailer make from two 55 gallon drums strapped to a utility trailer. The trailer is towed by a car or pickup truck, and the water is gravity fed through a standard garden hose to the trees. As the program grew, members of local street gangs began to participate. In addition to just planting and caring for the trees, the group, including the gang members, have begun to paint out the graffiti. Colorful flowers have been planted in the tree wells, and the entire neighborhood has

taken on a new look and new feeling. The tree work has introduced many people to their neighbors resulting in a stronger sense of community, and confidence in their ability to successfully tackle problems. With their new found strength they have begun to work on other problems which have challenged or threatened their community.

SOME LESSONS

Beginning the work of the TreePeople without professional expertise taught the TreePeople staff a number of lessons. As the work has progressed, there are continually lessons learned by looking back and evaluating the past projects and revamping the strategies for the future. Following are the most significant areas in which TreePeople has had difficulties and learned the most:

1) Communication breakdowns with government agencies. Especially in the early years, many mistakes were made that stepped on the toes of personnel from various agencies, and at times made future progress very difficult. TreePeople, not understanding agency policies, politics and "turf" issues, caused a number of misunderstandings. Often TreePeople's intentions were misread by agency personnel, and not well communicated by TreePeople staff. On the other hand, agency personnel were often not trained or prepared to deal with volunteer groups. At times their actions led TreePeople to believe that their efforts were not wanted or appreciated. Once, after completing an approved plantation, the officials allowed a herd of cattle to graze through the planting.

   After several years, TreePeople discovered that much of the problem stemmed from two areas: lack of faith in the ability of volunteer groups, and a high turnover or transfer rate of agency personnel. Various agencies had often tried working with volunteer groups, but were often disappointed by the results or the low turn out of volunteers. In dealing with TreePeople, they naturally assumed that the same things would happen, and they therefore doubted TreePeople's ability to organize and deliver volunteers and have them get the job done well. This put TreePeople in a position of having to prove themselves, which was both good and bad. It served to keep the work performance high, but then TreePeople eventually, unconsciously, took on an attitude of "we'll show you!" This often only served to further irritate some agency folks. Then once a good relationship had been established, the agency staff usually transferred to another area, thus making it necessary to rebuild the relationship from the group up. This continued to happen over a period of many years, until TreePeople learned to deal with officials on a higher level who were less transient. TreePeople has also learned how to work with agencies in a more effective way, taking the time to build trusting relationships. It also seems very important that agencies prepare themselves to better deal with volunteer groups and the public. If agencies are more supportive of volunteer efforts and help supply guidance, training and leadership, they will find the community a very good resource to support them in their work, both politically and practically.

2) Survival rates. TreePeople conducts two types of plantings; plantations of small trees in parks or wildland, and specimen trees in the city. The survival of the specimen trees is very good, but TreePeople has had a mixture of experiences with the plantations. Some of the plantations are doing extremely well with survival rates in excess of 90 percent, others have been plagued with heavy losses due primarily to rodents and, in earlier days, to insufficient site preparation and planning. TreePeople has always relied on the forester or landscape architect from the agency whose land

they are planting to prescribe the tree species, planting style, site preparation, and follow-up maintenance. Unfortunately, the professionals have not always agreed on one prescription for any given site, and that has caused some problems. TreePeople has learned two important things from these experiences--allow more time for planning, and continue to get as much professional support as possible throughout the entire process.

3) Doing too much for a community group. In the early days of working with communities on street tree plantings, TreePeople would raise all the funds, recruit their own volunteers, rely on the local groups to organize their neighborhood, and get local volunteers to help with both the planting and caring for the trees. Under this process, the community groups expressed great interest in having the trees, but they rarely came through with much enthusiasm for the hard work of planting and maintenance. When the tables were turned, and TreePeople required the groups to raise their own money, and basically do the job themselves, the results were completely different. Now, TreePeople still provides the guidance, assists with the permit process and planning, then provides tools and volunteers to "back-up" the local forces. Under this style, the communities truly own their work and trees, and they are committed to taking care of the trees to keep them alive. The groups also get the most important payoff, the satisfaction and confidence of knowing that they can succeed in improving their community.

4) Over-commitment/Burn-out. Because the results of the work are so satisfying, and the challenge so exciting, TreePeople has tended to take on more than it can effectively handle. This has resulted in a greater sense of challenge but has cut down on the overall quality of the work. Often staff members and volunteers don't get to recuperate from one project before being fully involved in the next one. This usually takes its biggest toll in the areas of planning and acknowledgment. Not enough planning will take place before an event, and often it will cost extra energy in order to accomplish the task. The most important aspect to the continued success of volunteer and grass roots projects is acknowledgment of volunteers, donors and supporting agencies. In the times where this acknowledgment has not been sufficient because of the pressures of over-commitment, it has cost the TreePeople some of its vital support. The lesson arising from this is to do a better job with fewer projects. This requires a shift in strategies to enable the projects that are taken on to have greater impact, and still propel the organization towards the accomplishment of its greater goal.

THE FUTURE

The next two years are dedicated to the accomplishment of TreePeople's goal of involving the entire community in the planting of at least one million trees before the opening of the Olympic games in August 1984. TreePeople has just begun developing a new program that involves working with the Los Angeles Police Department, Hollenbeck Division (eastern portion), business groups, block clubs, schools, and youth gangs.

Currently the major thrust behind the Urban Forest campaign is to inspire and involve individual citizens to take action. As the campaign progresses, that focus will gradually shift to supporting community groups in becoming planting and maintenance organizations that will continue their work long after the Olympics have left Los Angeles. And if the goal is accomplished, Los Angeles will have an even more beautiful and healthy urban forest, with a high degree of involvement and caring on the part of the citizens, and strong citizen support for the professionals who are managing the city's forest.

ACKNOWLDGEMENTS

The success of TreePeople is due to the extraordinary efforts of a very committed group of people, including TreePeople staff members, volunteers, members, and donors. Further, the guidance and support provided by the California Department of Forestry, and the Los Angeles County foresters and Fire Wardens, Forestry Bureau played a vital role in developing TreePeople success.

COMMUNICATION FOR URBAN FORESTRY: A KEY TO SUCCESS

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ABSTRACT

Successful communication, whether for managed forests, urban forests, or any other interest, depends upon several principles: a well-defined message to be delivered; a carefully identified target audience; translation into the interest and language of the audience; delivery through carefully selected media to reach the audience; and finally, measurement to know whether the message was received and accepted.

American Forest Institute programs provide examples of principles which can be adapted to urban forestry programs. The Tree Farm system involves active participation by allied audiences who help extend the message of forest management and provide third party endorsement. Project Learning Tree, its education program, helps teachers guide students who must make decisions on resource related issues. A continuing program of tours and briefings assure a reservoir of media representatives who understand forest issues and their complexities. Opinion research tracks changing public attitudes on issues relating to forest management.

Most of my career has involved interpreting managed commercial forests which produce products for urban dwellers. This paper is on "Communications for Urban Forestry: Key to Success." There is potential for conflict between the two, but the principles of communication for both are the same.

In both cases there is great distinction between communication and the mere dissemination of information. Communication is not a one-way flow of data and ideas. It is a closed loop. Unless you deliver your message to your target audiences in terms of their interest and in their language and unless you get feedback that they have received and accepted that information, you haven't communicated. That one sentence holds the elements for the key to success: your message; target audience; their interest; their language; deliver message; received and accepted. If communication is the key to success in urban forestry, then those phrases are the keys to the key. Let's talk about them.

It seems awfully simple to say, "Know what you want to say." Unfortunately, many efforts to communicate fail or are inefficiently carried out because too little effort was given to defining the problem and developing the message content. What is it you want to accomplish? What do you want know? What do you want done? Without that kind of identification your communication efforts are likely to be diluted, if not counterproductive.

One of the first steps in planning a program is to analyze the local situation. Basically, this means determining: first, what audiences or community groups are important to achieving the goals of urban forestry, and second, what do these people really know, or not know, or misunderstand, about urban forestry?

To those who are directly involved in any activity, organization, or profession, there is usually a tacit understanding and agreement on what they hope to accomplish by communication. For example, it could be a broader coalition and more community involvement; it might be greater understanding on the part of the public; or perhaps just a bigger budget.

But the people you need to reach in your communication program are probably not on that wave-length. They will listen to you only as you define urban and community forestry in terms of its value to them, to their property, their community, and to the nation.

I asked Richard Lewis, who headed up American Forest Institute's (AFI) American Tree Farm Program for the past ten years, for his definition of urban forestry. He's been a strong supporter and believer in urban and community forestry for many years. Lewis told me, "It's the art and science of managing forest resources to produce goods and benefits for those who live and work in cities and towns." That sounds fine. It encompasses both tangible and intangible results.

But to find out how your audience defines it and how they feel about it, an objective survey is often best. The information you gather from the survey will be of help in two ways: (1) in structuring your communication program and the key messages that are responsive to the situation; and (2) as a benchmark to track your progress and evaluate how effective your efforts have been.

To reiterate, knowing your audience and what they think is important to them are critical factors in effective communication. Your messages must be framed with their perspective in mind. In fact, all successful communication begins with the perspective of the audience, not that of the communicator.

Don't be put off by the word "survey." If you can afford it, a formal, professionally designed survey may be a good idea. But other methods are available. Telephone calls, letters to the editors, informal conversations with representative citizens, and other "free" methods can give you an idea of what your audiences are thinking about. Keep your ears open.

Some call this process a "communications audit," and it follows this pattern:

(1) What do you want your audience to know or think?

(2) What does your audience know or think now?

(3) Measure the gap between desired and actual knowledge--that's what you need to do.

(4) What communications resources do you have now?

(5) What different or additional resources do you need to fill the gap? That's how you need to adjust your ability to communicate.

I recommend the audit approach to you, both as a means of organizing your communications task and or loosening the purse strings to gain budget support.

In the absence of formal studies about urban forestry, I asked Lewis what he thought some of the messages might be in a communication program for urban and community forestry. He listed three which, he said, were not in any special order of priority:

(1) Urban and community forestry is good for a community's physical and mental health--creating a more pleasing place in which people can live and work, with clean air, less erosion, buffers to noise, and habitats for wildlife.

(2) There is a dollar and cents value to communities. Businesses find it's easier to recruit to a community where the total living environment is well-managed and successfully incorporates many parts, such as back yards, street trees, stream buffers, open space, recreation, etc.

(3) For individual residents a properly managed urban and community forest can enhance property values, help conserve energy, be a source of community pride, and provide nearby recreation.

Those are excellent messages. They keep the audience's frame of reference firmly in mind. We could develop other messages without looking at the findings of a survey. But I believe that in order to know what misconceptions exist and which message is likely to be most effective, we need to respond to a survey of the real attitudes of people in each community.

At AFI we carry out a national communications program on behalf of the forest products industry. We've taken broad surveys for many years to learn what issues are critical. We learn what the attitudes of people are who can take (or cause) action on these issues.

In addition, we are particularly fortunate to have, in place, a regional organization of staff and industry members of communication committees in the Northeast, North-Central, Mid-Atlantic, South, and West. These regional organizations serve to extend our messages to the audiences we are trying to reach. They also provide feedback on what the real attitudes, issues, and opportunities are in each region.

Once past the situation analysis, audience, and message development stages, the really tough part of a communication program begins. In a nutshell, that's the problem of getting your message seen or heard amidst the din that bombards all of us daily. The estimate is that we are exposed to about 1,500 commercial messages each day on TV, radio, on signs, and in the media.

Under such conditions any communication is rough. You can send out a signal, but you can't be certain of being heard. Effective communication requires consideration of these elements:

(1) A focus or concentration on the most important theme or themes. You can't really tell much more than one story at a time.

(2) An effort to tie your story to an event or matter of current interest or debate. People seem to be attracted by either a parade or a fight. You can draw their interest to your message in almost direct relationship to how much of a controversy exists or how much entertainment or information value you provide. The social activists in this country have learned well the techniques of creating events to get exposure for their messages. Less dramatically, perhaps, you can use the same methods. Tree plantings, celebrity appearances, kids' activities, and contests are good examples. It's axiomatic in journalism that events are more newsworthy than announcements.

(3) Knowing the media in your community and working with them over time to establish your credibility is of key importance. For example, one of the more

effective efforts in our communications at AFI is our media tours. We have taken more than a thousand writers and editors on forest tours. We find that "show and tell" on the site beats almost any other technique in telling the forest management story. One of the pluses in building rapport with media is that a story on your program in a newspaper or TV station provides a third-party validation.

(4) Coordination of all elements of your program--tours, news releases, ads, public service announcements, brochures, position papers--so all are consistent with each other and support your goals and major theme.

Third party support adds both muscle and credibility to your efforts. Try to identify all the groups in your community who have some common interest in forestry, such as park users, neighborhood associations, bird watchers, lumber yards, and paper salesmen. They may have nothing more in common than an interest in trees, but they can be brought together to work for that common focus. Such coalitions need not be permanent, but they can be effective for specific needs.

AFI and the forest industry, for example, view you as allies. Your efforts on behalf of urban and community forestry can be very helpful in capturing attention and the support of people in our nation's cities for good forest management outside the urban sphere. Forest products companies, by and large, have their basic manufacturing operations in rural areas, close to the raw material. While lumber is made into houses and paper is converted into usable products, in the cities, forest management is often a mystery to city dwellers. In some cases commercial forestry is viewed as a threat to important non-product values. Values such as scenery, recreation and a sense of "knowing it's out there." Urban forestry programs can do much to translate the urban citizen's love affair with trees in a yard or in a park into a concern for proper management of the renewable resource which provides a roof over his head and his morning paper. Making that connection would certainly encourage more forest industry firms to be active in your urban forestry programs.

At AFI we look to communication as a key to success for the industry. We try to build a climate of public understanding and trust in which the forest products industry can operate profitably and in the public interest. We've learned that to do that, it is most cost-effective to zero-in on key decision-makers: opinion leaders (including media), government officials, landowners, and other potential allies.

If you want to go after the general public in your community, or nation-wide, it generally calls for big bucks to get your message out in advertising on the tube. Unless you have a budget to match a producer of a commercial product, it's probably best to narrow your target, focus on a key theme and tie all your efforts to that theme. The underlying principle is to be effective. All communications should be integrated and consistent with a central theme.

Let me cover another fundamental of good communication and offer a couple of our programs as examples. There's an old saying that "Actions speak louder than words." In the kind of world we live in, actions don't speak at all. They must be communicated. There must be positive actions first; actions that can be related to the audience's interest--but you absolutely have to communicate them. No one else will.

At AFI we have two primary action programs that help us communicate and build that "climate of public understanding and trust in which the industry can operate profitably and in the public interest."

One is the American Tree Farm System, now over forty years old and growing strong. The industry, through AFI and the Tree Farm program, demonstrates to private landowners an interest in them and in sound management of forested property.

We supply forestry information and welcome these private, non-industrial landowners to an action-oriented program. It's designed to help them manage their properties more effectively to reach their goals. There are presently more than 45,000 of these landowners in the U.S. who are certified as Tree Farmers, and they come from all walks of life, including quite a few celebrities.

These landowners help our overall communication effort by serving as examples to encourage others to manage their land. The system reaches far beyond the nucleus of Tree Farmers. Over 10,000 private, public, and industry foresters volunteer their time to the Tree Farm System. It is a unique gathering place for all of those interested in forest management.

In addition, there are active Tree Farm Committees linked to state forestry associations and other groups in all active tree growing states. The Committees sponsor forestry field days and demonstrations that are events we can capitalize on with media coverage. With the Tree Farm program, we can even go into major cities like Chicago, New York, and Boston with seminars for city dwellers who own forest land in the country. Those city dwellers who own rural forests can be allies for urban forestry, too.

In essence, the Tree Farm program provides a credible platform for communications which attest to industry's commitment to responsible forest management to the importance of wood and paper in people's lives and the economy and to the nation's capability for increasing productivity on private lands.

The other example of an action program is AFI's work with educators and young people whose attitudes toward business, the environment, and the economy are being shaped in the classrooms. The key effort in our educational program, Project Learning Tree (PLT), is now included in the school systems of over 30 states.

Basically, we know that teachers are not only opinion leaders in their own right today, but they are also the gate-keepers for molding the minds of tomorrow. We reach out to provide them with material they can use in their classrooms. PLT is an environmental education tool which teachers were asked to help shape and direct. It offers a complete curriculum work plan and guide for teachers to use for grades K through 12. June McSwain, director of PLT, covers the program in her paper, also included in this volume.

Both PLT and the Tree Farm Program illustrate the key ingredients of any successful action program in communication--that is, the program must be designed with the audience in mind, and with their input, and provide a service that is perceived as having personal value.

A bottom line function of a communication program, whether for urban forestry's success or anything else, is to develop an informed "constituency;" people that will back your position on an issue and help you achieve your organization's goals.

Building such allies is important in our AFI programs. We consider urban and community foresters, along with Tree Farmers, industry employees, state forestry associations, and public agency professionals as vital to our success in achieving the goals set for us by the forest products industry.

In brief, those goals are both supply and demand oriented--to help assure an adequate timber supply, expand markets for wood and paper, and help maintain the industry's positive reputation.

As measured by public opinion research, the forest products industry is today second only to agriculture in public approval of the management of its natural resources. The public no longer fears, as it once did, that we will run out of trees. To the contrary, there seems to be too little public concern over a possible shortage of wood and paper to meet our future domestic needs and to serve world markets.

More than eight Americans in ten now think that the industry harvests and grows trees in ways that are environmentally sound. And the number of people who feel the industry does a poor job of complying with water and air pollution regulations has been virtually halved since 1975, a better record than any other industry studied by the research firm of Yankelovich, Skelly & White.

Successful urban and community forestry programs help extend the message we in industry want to communicate. Sound forest management is important to the private citizen, the community and to the nation.

Our country is uniquely blessed in the world. Our lands are capable of growing enough trees to meet all our domestic needs and even help supply a growing world-wide demand. And we can do all that while maintaining the beauty, watershed protection and wildlife habitat we all want to preserve.

People in the cities need to know that. We count on urban and community foresters to help, and the best way is through "Communication for urban forestry--the key to success" for all of us.

PANEL ON BUILDING URBAN COALITIONS

Moderator:

Robert McNulty
Partners for Livable Places
Washington, DC

Speakers:

Tom Fox Neighborhood Open Space Coalition New York, New York	Neighborhood Open Space Coalition	*
Ruth Gravanis Friends of the Urban Forest San Francisco, California	Friends of the Urban Forest	*
Richard Reid Western Timber Association San Francisco, California	Building a Statewide Urban Forestry Coalition	111
Judith Stockdale Open Lands Project Chicago, Illinois	Building Urban Coalitions	114

*Paper not included.

BUILDING A STATEWIDE URBAN FORESTRY COALITION

Richard G. Reid
Vice President, Information & Environment
Western Timber Association
and
President
California Urban Forests Council
San Francisco, California

ABSTRACT

Coalitions in urban forestry evolve rather than happen spontaneously. The 14-year history of the California Urban Forests Council shows how statewide coalitions evolve. The Council is a nonprofit corporation composed of a network of the nation's forest products industries; Los Angeles city and county schools; federal, state and county forestry agencies; conservation groups; and individuals. The coaltion was built to its present size and scope through a variety of projects that directly involved a broad spectrum of the membership. Strong communications are needed to hold it together. Throughout, a sense of networking and sharing has been maintained.

Coalitions in urban forestry evolve rather than happen spontaneously. One does not say, "I'm going to organize a coalition in urban forestry," and go out and do it. The California Urban Forests Council is a good example of what I mean.

The Council is a nonprofit corporation composed of a network of the nation's forest products industries; Los Angeles city and county schools; federal, state and county forestry agencies; conservation groups; and individuals working together to improve the quality of life for all Californians.

That is where we are today, but it has taken 14 years and three names to get there.

ROOTS

The Council was conceived and organized in 1968, two years before the first Earth Day, by representatives of the Los Angeles city and county schools, the American Forest Institute (representing industry), the Los Angeles County Fire Department Forestry Bureau, and Universal Studios. We now have over 50 organization representatives in the Council.

At that time the Council was known as the Los Angeles Demonstration Forest and its purpose was to establish demonstration forests for the students of Los Angeles who might not otherwise have an opportunity to experience a forest environment. The first forest was established at Universal Studios' motion picture lot adjacent to the Hollywood Freeway. Other major urban forests for the same purpose are being established at Dodger Stadium and Baldwin Hills Recreational Park. These urban forests will provide more areas for environmental education to show the inter-relationships of forests, water, wildlife, recreation, and forest products.

The coalition began to grow after the establishment of the first major forest at Universal Studios and smaller plantings at school sites. Each time a new project was started, new people and organizations which could help were identified and brought into the loosely knit organization.

Once involved, most people stayed on; and as might be expected, new project ideas emerged.

FOREST INTERNS

In 1975, the American Forest Institute suggested that the Council participate in a forest intern program. The idea was to send high school seniors from southern California to the Pacific Northwest or the Rocky Mountains to live and work for a week with a practicing forester on a commercial forest. The interns, as part of their participation, agreed to share their experiences and new knowledge with others in their school and community.

The program has been a great success both in terms of the knowledge and understanding gained by the interns and also as a people-to-people project. The lives of some of the young people participating were changed completely. It also was successful in that it broadened the base of the coalition. About this time we took a more imposing name --The Southern California Urban Forests Council.

In the late 1970s, the rest of California began to discover urban forestry, and numerous neighborhood and city level organizations appeared. However, there was no one umbrella organization that was operating statewide. The closest thing was our Council which by now had members throughout southern California. We felt the Council could be the basis for a statewide coalition if we expanded the concepts that got it started in the first place. Again the name was changed, this time to the California Urban Forests Council, and members were recruited in northern California.

THE MONEY PROBLEM

However, it was still a loosely knit coalition and was not formally organized or funded. If we were to develop the kind of statewide coalition envisioned, it would be necessary to get substantial and assured funding.

About this time, the California legislature passed the California Forest Improvement Act. Included in its provisions was a grant program in urban forestry financed by the sale of timber from the state forests.

To qualify for this grant money, the Council organized as a nonprofit corporation. An application was made for a grant to implement projects which would enhance urban forestry statewide. This fit closely with the ideas of the program administrators who wanted to look at the broad picture and finance projects to react to statewide needs.

Since incorporating and qualifying for the grant, we have been able to expand our projects and membership.

NEW ACTIVITIES

For example, the Council actively promotes environmental education resource fairs, and the concept has spread through the membership network.

Urban tree nurseries are needed to provide not only educational centers and educational tools, but also growing stock for future urban forests. The first teaching tree nursery in California, a project of the Council, now is under construction at the Los Angeles Unified School District's Clear Creek Outdoor Education Center. When completed, the plans and accompanying curriculum materials will be available to other groups through the Council.

A major project funded by the state grant is the development of a seminar package which can be presented to urban leaders to show them how to plan and execute a comprehensive

urban forest management plan for their cities. The pilot program will be tested on three cities in Los Angeles County this fall. It then will be available to any city in the state through the Council.

Communication is the force which binds coalitions together, and to date it has been our major weakness. Another portion of the state grant is going to establish a statewide urban forestry newsletter. This will be a key element in our effort to expand and make effective a statewide urban forestry coalition.

In our view, the key to building and maintaining an urban forestry coalition is an array of projects that directly involves a broad spectrum of the membership or enhances member organization's programs. Strong communications are needed to hold it all together.

The California Urban Forests Council is an empirical example of how urban forestry coalitions and networks form, grow and become effective on a statewide basis. In the early days, there was no formal structure, communications were weak, and funding nonexistant. However, everyone worked together on projects.

Now we have assured funding, an organization, improving communications, and expanded projects. If we can maintain the original sense of networking and sharing, our coalition will remain strong and effective.

BUILDING URBAN COALITIONS

Judith M. Stockdale
Executive Director
Open Lands Project
Chicago, Illinois

ABSTRACT

Chicago's Open Lands Project is an urban coalition built to work among park districts, forest preserves, and the Illinois Department of Conservation; to combine ideas, funding, and political influence into an active urban forestry program.

Open Lands Project started in 1963, and although "coalition" was not a vogue word in those days, the intent was there. The project was begun because Chicago's provision of public open land for recreation, conservation, and education purposes was in short supply. It still is. Of the 16 largest metropolitan areas, Chicago ranks 16th in per capita acreage provision. (This is for both the city itself and the six-county SMSA.) Illinois as a whole does not do well either, ranking 47th or 48th of the 50 states. It has been hard to preserve land that is flat, fertile, buildable, and expensive. And perhaps preservation is also hindered by the general perception that the Midwest is boring -- spectacular landscapes occurring only in the East and from the Rockies west.

And Illinois' shortage of public open land is particularly acute in the Chicago region where only eight percent of the state's park lands are located, despite the fact that 70 percent of the state's population lives in this urban area. The effort in the Chicago region has been left to the local units of government for the most part. Each urban county has a forest preserve district which is designed to provide the larger, regional parks, and each municipality and/or township has a park district (separate special units of government) to provide playgrounds and local recreational facilities. Illinois has the largest number of local units of government in the country and the number of park districts in the Chicago metropolitan area reflect this and add to the complexity.

So it is small wonder that a "coalition-builder" was felt desirable by the group that established the Project. They felt that a privately-supported organization could do a lot to work among the park districts, forest preserves, and the State Department of Conservation.

Perhaps the Project's best role is as a gadfly -- it can flit among the political webs, pollinating an idea here or there, inflicting a sting now and again. But it is independent, has a certain objectivity and its only agenda is to help the "real world."

It is perhaps most helpful here to give you a clear run down of our range of work:

* Assistance to local citizen groups anxious to save a piece of property. Help to organize citizen organizations, to work with local governments, to raise funds, e.g., Prairie Path, Kennicott Grove.

* Assistance to local government structures, e.g., Burr Ridge Park District, McHenry County Conservation District.

* Bringing together of citizens and governments; or different institutions and local governments, e.g., MSD Land Hearings, Morton Arboretum, City of Chicago, and Chicago Park District.

Special Programs:

* Illinois and Michigan Canal National Heritage Corridor:
  A national model of a corridor park involving 100 miles of valley with economic development as a major component. It is a new park concept bringing together downtown renewal, historic and natural preservation, and industrial development. The program began in 1980 to make an inventory of the resources and develop the concept of a coalition park involving local governments, businesses, communities, regional agencies, state agencies, and the federal government. Also involved are environmental groups and politicians. It is a coalition formed to avoid the "one big decision" and replace it with many small orchestrated ones. Funding is through many sources both public and private.

* Friends of the Chicago River:
  A growing group of people interested in the river, in improving access and river bank aesthetics, and in maintaining businesses and neighborhoods. Here the coalition has worked with citizens, boat clubs, local businesses, and the City of Chicago. A waterways ordinance has been drafted cooperatively.

* Corlands:
  An affiliate of Open Lands Project that buys land and passes it on to public agencies; as in the Penn Central program. It is working with nine local governments and the Illinois Department of Transportation to broker an abandoned railroad right-of-way.

As these examples illustrate, Open Lands Project's very existence bespeaks a coalition. Our funding comes from Chicago-based corporations, individuals, and private foundations -- that's a coalition in and of itself. Coalitions are defined as temporary alliances of distinct parties for joint actions. The coalition offers solutions to cost problems in these days of cutbacks, and it brings together the spectrum of viewpoints and actors that is needed for successful action.

SECOND NATIONAL URBAN FORESTRY CONFERENCE

SESSION C

ENERGY CONSERVATION AND THE PHYSICAL ENVIRONMENT

Tuesday, October 12, 1982
1:00-2:30 p.m.
and
3:00-4:30 p.m.

Moderator:

Lee Herrington
State University of New York
College of Environmental Science and Forestry
Syracuse, New York

Speakers:

David DeWalle Pennsylvania State University State College, Pennsylvania	Energy Conservation Through Urban Forestry	119
Patrick Horsbrugh Environic International Notre Dame, Indiana	Designing for Urban Ecological Diversity	124
Rowan Rowntree USDA Forest Service Syracuse, New York	Evaluating Urban Forest Structure for Modifying Micro-Climate: An Overview of Results from Dayton Climate Project	136

ENERGY CONSERVATION THROUGH URBAN FORESTRY

David R. DeWalle
School of Forest Resources
and
Institute for Research on Land and Water Resources
The Pennsylvania State University, University Park, Pennsylvania

ABSTRACT

Planning, implementation, and maintenance of landscape vegetation to reduce home heating and cooling energy needs requires consideration of climate, vegetation, house, and occupant characteristics specific to the homesite. Attention to principles for use of vegetation to modify home heat exchange will result in development of a least-cost, maximum benefit home energy conservation plan.

INTRODUCTION

Since the First National Urban Forestry Conference held in Washington, D.C. in November 1978, interest, awareness, and information concerning the use of urban forests to conserve energy for heating and cooling buildings and general improvements of urban climate has grown steadily. Through efforts of the U.S. Forest Service, with research funding through the Consortium for Environmental Forestry Studies in the Northeastern Forest Experiment Station and in-house forestry research projects in several regions, our knowledge on this subject has gradually accumulated. Only recently has the Department of Energy funded reseach in this area.

Over the same period, our national energy situation has not changed relative to need for energy conservation, although we are somewhat less dependent on imported oil. The average homeowner still spends a major portion of his energy dollar on space heating and cooling. Interest in landscaping to reduce energy needs has not wavered. Inflation has depressed the housing market and placed renewed emphasis on conserving energy in existing structures. Electric utilities faced with expanding demands for energy, high inflation, public opposition to expanded nuclear power facilities, and further atmospheric pollution from new fossil plants are beginning to see landscaping as a way to reduce peak power needs for home cooling.

Within this general setting of growing demand for information and diminishing research funding, information must be assembled to provide guidelines for practitioners and to identify areas where more research is needed. In this paper the principles for use of vegetation to modify home heat exchange will be reviewed. A complete review of the literature will not be attempted; for this the reader is referred to Hutchison et al. (1982).

BASIC HEAT EXCHANGE CONSIDERATIONS

A few preliminary remarks are needed to review the basic mechanisms for home heat exchange and the potential role of vegetation. Heat exchange in a building takes place through three basic processes:

- heat conduction

- air infiltration
- solar radiation transmission

The influence of vegetation on heating and cooling energy needs depends upon modification of these three heat exchange processes. Modification of heat exchange could increase or decrease energy needs, thus care is needed when preparing a landscaping or urban forestry plan.

Heat conduction is the transfer of heat through solid building materials from the warmest to coolest surface; generally into the building in summer and out of the building in winter. Vegetation can be used to shade and cool outer building surfaces in summer and thereby reduce the rate of summer heat conduction into a house.

Air infiltrates a home through openings in the house due to wind pressure on the outside of the house. In this way cold winter air or hot summer air can enter a house causing an increase in heating or cooling energy needs. Vegetation can be used to reduce wind velocity and thus reduce air filtration.

Passive solar heating can also occur when sunshine is transmitted through windows, skylights, etc. and is absorbed within the building. Although such heating is often desirable in winter, summer passive solar heating can be excessive. Vegetative shade can be helpful in reducing the amount of sunshine reaching windows.

Another vegetation effect that can affect heat exchange in buildings is the large-scale effect of transpiring vegetation on air temperatures. Vegetation uses some of the sunshine it receives to evaporate water through the plant stomates, rather than using all the absorbed energy to heat the air and absorbing material. Thus the presence of vegetation in an urban area in summer can cause the air to be slightly cooler and more comfortable. It is believed that a large amount of vegetation is needed to noticeably cool urban air, but conceivably, trees could reduce air conditioning energy needs by generally reducing air temperatures over large areas.

PRINCIPLES FOR USE OF VEGETATION

Four factors control the effectiveness of vegetation in reducing energy needs for heating and cooling:

- climate
- vegetation
- building
- occupants

Climate influences the overall need for heating and cooling through variations in solar altitudes, solar asimuths, air temperatures, cloudiness, wind speed and direction, etc. Effects of local topography and other site characteristics on climate should also be considered. Vegetation is obviously important because the degree of climate control will depend upon the vegetative species, age, size, and arrangement. Less obvious, but also quite important, is the characteristics of the building which affects the proportion of heat exchanged by the various processes previously mentioned. Factors such as: building floor plan and height; leakiness to air; amount, type, and location of insulation; location and size of windows; materials used in construction; and orientation to wind and sun all can influence the importance of heat conduction, air infiltration, and solar transmission. Finally, the occupants of the structure must be considered. Their numbers and habits which control thermostat settings, frequency of opening doors and windows, etc. all influence heat exchange processes.

VEGETATIVE SOLAR CONTROL

Five basic rules to be followed when using vegetation to control solar radiation and reduce cooling energy needs are:

- know position of sun in summer and winter
- select proper plant species
- position tree to shade building
- shade surfaces which heat home
- provide winter solar access

Homeowners must understand the solar altitude and azimuth angles in each season relative to the orientation of their houses. Position of the sun in the sky, and thus the position of shadows, changes with time of day, season, and latitude. Shading by local topography, other homes, etc. may also affect solar patterns.

Plant species is important as it controls local habit (deciduous vs. persistant foliage), mature height, branch pattern, crown form and shape, growth rate, plant height to bole height ratio (for trees), and cultural requirements. All these plant characteristics can affect the size, shape, and location of shadows. Branch pattern affects the degree to which solar radiation is transmitted through deciduous plant canopies in winter. Generally, deciduous species are recommended. Plant needs for irrigation, spraying for insects or diseases, fertilization, cold protection, etc. should also be considered.

Once plant species characteristics and solar angles are known, the plant must be positioned to shade the house properly. Shadows should fall on house surfaces in summer, especially during times of day with peak air conditioning demand, e.g., mid to late afternoon. Avoid or minimize shadows on homes in winter where home heating is required.

Surfaces to be shaded should be those which heat the home in summer. Generally, east and west-facing walls on homes are major solar absorbers in summer. South-facing walls are often already shaded by roof overhangs in summer and only absorb major solar energy in winter at low solar altitudes. Mobile homes without attics and roof overhangs may also need shade vegetation along their southern perimeter.

In zones where winter heating is of major importance, and air conditioning of lesser importance, completely open southern exposures are desirable, even where this may require removal of vegetation. Shade in winter may more than offset summer cooling benefits. Even leafless deciduous trees can reduce solar radiation on houses by one-half during winter.

VEGETATIVE WIND CONTROL

In the use of vegetation to control wind and to reduce winter heating energy needs, the following principles are important:

- learn direction and velocity of prevailing winds
- use vegetation to trap still air near walls
- use windbreaks to reduce velocity
- vegetation can deflect winds to or from building

Obviously knowing prevailing wind directions for cold, high-velocity, winter winds is essential for location of windbreaks, shrubs to trap air near walls, and shrubs to deflect winds from doors and windows. All these practices can reduce cold air infiltration and

save winter heating energy. Shrubs can also be used to deflect cool summer breezes into living spaces.

Windbreaks are the major vegetative arrangements for reducing cold air infiltration and saving heating energy in houses. Windbreak design criteria which must be considered are:

- windbreak species
- number of rows
- length of rows
- spacing in and between rows
- orientation to building
- effective tree height
- distance from building

Conifers are generally used for windbreaks. Rapid growth of hardwoods, such as hybrid poplar, may make use of one row of hardwoods advisable as an initial planting, while a second row of conifers reaches effective height. Although several rows of windbreak plants will reduce wind velocities more than one row, one row of conifers is usually sufficient to reduce wind velocity by about fifty percent. Marginal effectiveness of increasing numbers of rows diminishes rapidly. Where space is limited, one row is sufficient. Tree spacings of 2-3 m within rows and 3-4 m between rows is normally suggested, with the lesser spacing producing quickest results if plants grow from seedlings. Rows should extend beyond the ends of the structure being protected and be located upwind from the structure in the direction of prevailing winter winds.

Effective tree height is generally considered to be the height of the house, and trees which will at least reach this height must be planted. Planting the nearest windbreak row at about 2-3 times the effective height upwind from the house is recommended. This places the trees relatively close to the home and is not advisable where large snow drifts commonly develop. If trees grow tall enough to significantly shade the house during mid-day in winter, they should be trimmed or removed. Windbreak trees shading the house at other times would cause no problem.

POTENTIAL BENEFITS AND PROBLEMS

The most obvious benefits from landscaping is a reduction in energy needs for heating and cooling. Estimates of saving vary widely due to the variety of experimental and estimation techniques used to arrive at vegetation effects on home energy needs. Shading based upon actual experiments with mobile homes reduced cooling energy needs by 50 to 75 percent. Estimates of shading effects from small model home experiments and calculations for conventional homes range from 17 to 98 percent reductions in cooling energy needs.

Windbreak effects on winter heating energy produces less savings than shading. Experiments with mobile homes and a townhouse show 3 to 15 percent savings are possible for heating during a winter season. Other experimental results using models of houses or calculations based upon wind tunnel studies show heating energy savings of 15 to 22 percent are possible with windbreaks.

Besides energy savings, landscape vegetation can also increase property values, improve aesthetic value of property, improve human comfort, provide habitat and cover for wildlife, and act as a barrier to noise, air pollutants, views of neighboring properties.

Homeowners should exercise caution when implementing a landscape plan. Attention must be paid to local government restrictions on planting in proximity to property lines and planting relative to solar access for neighbors, avoiding buried and overhead utility lines, creating unwanted snow drifts, causing shading of a garden, or blocking an aesthetically pleasing view. Vegetation is also accompanied by annual nuisance accumulations of leaves and occasional falling limbs.

CONCLUSION

Planning, implementation, and maintenance of landscape vegetation to reduce home heating and cooling energy needs requires consideration of climate, vegetation, house, and occupant characteristics specific to a site. Costs of any landscape plan must ultimately be compared to benefits to be derived. If the foregoing basic principles are followed, a least-cost energy conservation plan can be designed.

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DESIGNING FOR URBAN ECOLOGICAL DIVERSITY

Patrick Horsbrugh
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Chairman of the Board
Environic Foundation International, Inc.
Notre Dame, Indiana

ABSTRACT

For the first time, it may be argued that architectural and planning dogma is directly associated with profound moral obligations--the maintenance of conditions providing for the right to life of virtually everything. Vegetation must become an integral part of architectural design and serve as the ultimate surfacing material. To accomplish this, a new design discipline is required which takes its form and rhythm from the synecological principals of mutual benefits exchanged between different species living in harmonious community.

The fascinating process of assessing the variety and extent of the earth's resources by means of data from remote satellites has advanced sufficiently to restimulate the concept of environethics--the extension of ethical motivation beyond human associations. Expectations for an increased understanding of The Physical Environment by means of improved technological capabilities will reveal Other Aspects of the scene; the extent of the urban disarray will be revealed in ever greater detail.

We have inherited a fundamental cultural error in the concept of "town and country" as being different conditions to be planned as separate domains. The ancient necessity for defense from predators resulted in the fortified city, with an accompanying "inside-outside" psychology regarding the nature of "place." This obvious response to fear and the unexpected still remains to disrupt the realization that urban intensities must be complemented by rural tranquilities if livable cities are to be achieved.

The scale of the prevailing urban design misadventure is now so vast that only drastic changes in planning may reduce the effects of the greatest of all social hazards--the urban crisis. No longer can the city be considered as distinct from the ecological influence which enabled it to occur. The same topographical and ecological influences which facilitated the birth of a city are required, again, for urban viability, and foremost among these influences is, of course, forestry.

I am concerned, however, with other aspects of forestry in the belief that urban well-being is not a matter of trees alone, but is best achieved by vegetation in variety. In consequence, my subject is that of "Designing for urban ecological diversity." The significance of diversity as a principle in planning and architectural practice.

The evidence of ecological complexity must be accepted as the prime influence in urban economics. I plead, therefore, for the necessity of designing for urban ecological diversity in the context of this conference on urban forestry. Under pressure to modernize, the city has broken its bonds and invaded the fields, so in turn, under the

urgencies of scarcity, the fields must invade the city. This reversal of precedent can be realized by the application of synecological disciplines to the planning practice.

The all-pervasive practice of division between town and country, must be revised in favor of some coordination between the dynamics of vegetation and the statics of structure.

Why should not the forest be intermingled with the city when the citizen is so determined to escape to the forest for reasons of emotion, recreation, solitude and for revival of spirit?

INTRODUCTION

For more than a decade, The Environic Foundation International has promoted the concept of Person/Plant Proxemics in the belief that broader recognition must be given to the influence of vegetation upon the human psyche.

This influence goes far beyond the obvious dependence upon vegetation for food, fibre, and fabric. Psychological factors must now be recognized which stimulate social self-confidence and personal well-being. Participation in the processes of growth, demonstrating health and vivacity, contributes to environmental quality so essential for personal and cultural vitality.

The need for close proximity with vegetation is especially clear for the aged, and this benefit has long been acknowledged by the gerontologists and therapists. The relevance of such accumulative advantages must now be considered on an urban scale and regarded as a fundamental planning discipline.

The emergence of a gerontocracy makes such planning policy based on person/plant relationshipos imperative. As political control passes to the aged, due to increasing longevity, person/plant proxemics should become the prime professional obligation of the designer, the architect, and the planner, coordinated by landscape architects and foresters because of their particular practical experiences and their environic sensitivities.

SYNECOLOGICAL DESIGN DISCIPLINE

In the briefest terms, I advocate the closest combination of verdure and buildings. For basic reasons of energy economy, every structure, within reason, should provide accommodation for a variety of indigenous vegetation thereby encouraging the natural processes of energesis. The ecological, synecological, cultural, and aesthetic values which result will be obvious, though difficult to measure with our clumsy measures of social "vital signs" and statistics.

In practical application, such endeavors are beyond architecture, and require special definition as Synecotecture, wherewith structure (tectonics) may sustain verdant life, involving synecological influences as an essential part of routine building practice.

No longer can we afford to build only for human convenience. Henceforward, any construction must be designed to accommodate other species to ensure that those synecological interactions so essential to the maintenance of local ecology remain intact.

Every structure may be described as a trespasser upon the rural scene, and should, therefore, be designed to avoid the ecosystematic damage which it causes. Where

construction is incapable of providing the compensating verdant cover for the benefit of ecological consistency, other balancing benefits must be devised and planned as part of the project. Trees, by reason of their size, their superstructural form and volume, provide the greatest ecological compensation, while the forest, the sylvan landscape, is required to yield the energetic balance on an urban scale and to modify the heat-sink effects now radiating from the modern metropolis. Any review of the megapolitan scene will reveal the extent of the ecological imbalance and synecological deficiency, as well as the sociological stress that arises from artificial concentrations. Any continuation of conventional planning and construction practices can only increase the existing distress and prolong the disarray, with all the resulting social costs.

A recent visit to the vicinity of Manhattan's 125th Street convinced me that the obliteration of verdure has brought ecological retaliation within a century. Heavy is the hand of natural retribution, and vicious indeed is the human self-inflicted revenge when the relief of vegetation is denied. This area, like so many others in every city across the nation, is an eloquent commentary on the socio-environic consequence of life without leaf.

The use of synecological disciplines in architectural design and planning policy should receive attentionat this moment, when the current stylization is clearly at the lowest ebb. While the pundits squabble over design description and direction, the aesthetic results remain uninspired, giving the impression that each new structure is an inadvertent extension of a perpetual penetentiary. Modern architecture is inescapable in its monstrous monotony, its psychological oppression and aesthetic tyranny of grid, upon grid, upon gray-grid. Indeed, the prevailing fashion might now be described as the "style ubiquitous grim," the successor to the "international style" of yester-minds whose stringent arguments of logic have turned out to reveal that form follows folly! A change in scale and material is no excuse for defiance of ecological authority.

With all the hazards that beset us, domestic, political and economic, no previous generation has ever been in such need of environic change. The tectonic arts have been, and remain, the ultimate expression of inate human selfishness, achieved at the cost of ecological disruption. The planting of parks and street trees, represent token repentance. The scale of such an investment is pathetic, especially since the intention is to decorate an urban scene rather than to redeem a desert by ensuring an effective synecosystem whereby the vegetation can develop its own vitality and restore that refreshment so essential to human well-being.

We are no longer innocent of cause and consequence. We can anticipate condition and continuity. We can become masters of the human fate and fortune only by humble devotion to that by which we are sustained. We shall not survive alone. We must ensure that our historic obligations of stewardship are rekindled for the benefit of species other than our own, recultivating the vitality of those ecosystems upon which civilization depends.

My preoccupation, at this moment, is with the practical means by which forestry may become a self-sustaining component of the urban fabric, contributing as much to the ecological vivacity, consistent with regional characteristics and associations, as to the urban scene.

I respond to this design challenge, as an architect, city planner, landscaper, and environologist, with some years of service on the Committee of Regional Development

and Natural Resources of the American Institute of Architects, with the realization that the prospect of urban forestry represents a basic educational obligation, fascinating in operation, spectacular in effect, infinitely rewarding in result. This section of the Conference, devoted to Energy Conservation and Physical Environment, represents the focal issue of our urban dilemma, of our determined wastefulness. It addresses the fundamental condition that results from the self-limiting economy of building for human accommodation alone.

Any environment provides a moment by moment summary of the natural and human forces which have molded it throughout time, and which now impose upon it as a result of agricultural and industrial developments of recent centuries and immediate decades. As planners, we are at the very crest of the advancing wave of physical consequence, even as it breaks upon the particular ecosystem, and we must bear the responsibility for the consequences of victimizing the indigenous ecology. The essence of that economy is energesis, the chemical processes within the varied vegetation by which energy is released through catabolic action.

TRANSATLANTIC DIALOGUE IN URBAN DESIGN

This subject is not, however, particular to this country. European experience in urban ecosystem planning deserves review in the form of an extraordinary, century long transatlantic urban design dialogue between individuals in the United States and Britain.

This continuing exchange in planning ideology, from the 1880's to the 1950's, might now be described as the "green culture" in that it was firmly based upon sociological desire for rural relief to compensate for urban compression. As a result of this dialogue we may now celebrate, however doubtfully, the centennial of the concept and prospect of "suburbia."

This transatlantic dialogue on cultural ideas represents, I believe, the most important spontaneous planning exchange ever to have emerged between two nations. The language used was common and cultivated. The legal, political, and sociological circumstances were similar, and the urban experiences and anxieties were comparable throughout the period.

Silviculture has always been a feature of the American civic scene, as revealed in Savannah, Boston, Charleston, and in the obvious dramatic planning of the National Capital. Smaller towns have been consistently garlanded in street trees as a matter of pride and prudence.

The British contribution to this echo of European influences begins with Sir Ebanezer Howard, 1851-1928. His brief encounter with the horizons of Nebraska and the hectic winter confinements of Chicago convinced him of the need for rural relief for London inhabitants. Upon his return to London he formalized his concept of suburban planning by founding The Garden City Association in 1899. This organization stimulated public enthusiasm and produced practical real-estate results in the design and creation of the new town of Letchworth, 1904 and of Welwyn Garden City, 1924. The house, factory, and commercial street were coordinated amid selected greenery, where the luxuriance of the vegetation reflected the health of the community.

Simultaneously, the renowned biologist, Sir Patrick Geddes, 1854-1932, with experience in India rather than America, explored the similarities between urban life and ecological

community, conveying the idea that the city is indeed animate, and that its vitality depended upon its verdance.

On this side of the Atlantic, The City Beautiful concept was blooming by 1917, the year of the founding of the American Institute of Planners. This concept became a reality in the form of the series of "greenbelt" towns of the 'twenties and 'thirties. These in turn simulated the official British postwar new town policies as expressed by Sir Patrick Abercrombie, 1882-1956, in his Plan for Greater London, 1944, enclosed by a "greenbelt," beyond which the surrounding "new towns" were to be built.

The significant feature in each of these concepts was the use of greenery--trees, parks, and "open spaces."

These exchanges in "green" planning principles seemed to rely upon an unstated psychological desire for vegetation. Only recently, however, is this necessity recognized as a socio-psychic condition, as implied by the phrase Person/Plant Proxemics, and the imposition of a professional obligation upon the planner. The use of vegetation in the city, as in "urbs vegetare," meaning to animate, to impart life, to make alive, is now imperative if high-density, high-stress living is to be sustained. The subject of urban verdure has not received the social, medical, or psychological study it deserves.

Meanwhile, the cities have expanded, suburbs scattered, commercialization proliferated, and industrial developments are virtually irresistable. The result has been a disintegration of scene and circumstance--inevitable ecological disarray. Criticism is not intended, however, for we are all victims of avarice, personal, social and national. But we now hold collective responsibility for redeeming the degradations before we are overwhelmed by the accumulated consequences of this traditional disregard for the resources of the earth.

A new awareness of urban environics has arisen from the activities of the environmentalists. The work of these enthusiasts must be appreciated since they took the initiative in exposing our seemingly inate self-destructive impulse. This simple fact of politics must be recognized, with due humility, by both planners and foresters in our determination to restore professional prestige. Environology, the science and study of condition, must emerge as the basis of future professional collaboration for the continuation of this century old transatlantic "green planning" dialogue of which the "greenbelt" concept is the most recent evidence.

PERSON/PLANT PROXEMICS

The intense desire for close personal proximity with vegetation, as recognized by gerontologists, psychiatrists, and sociologists, justifies exploration as an essential feature of practical planning. The physical improvement of urban conditions, by means of appropriate vegetation, is the most simple, most effective, least costly form of environic rejuvenation. Never again can planting be considered as mere scenic embellishment.

I believe that the cause of urban forestry can be greatly assisted by innovative studies in personal reactions to vegetation in a variety of circumstances which should include phyto-psychotherapy, environics for the elderly, the handicapped, the imprisoned and for those in hospitals or in any form of urban confinement. Studies in recreology, the science of recreation, and in recreography, the nature of places which determine the form and extent of recreational facilities, are required for the better planning of urban resources.

A special survey is suggested to assess the cultural influences of such civic investments as the renowned Krone Conservatory in Cincinnati (22,000 square feet), and should include comparisons between the social effects of similar "green" features at Saint Louis, New York, San Francisco, Milwaukee, etc. The survey should include shopping centers which maintain horticultural displays as a permanent means of attracting customers, provided in compensation for the discomforts occasioned by the surrounding treeless tracts of concrete car-prairies.

Further, the therapeutic, psychological and social values of urban plots, vegetable and floral, require attention in any such review of person/plant proxemics. Since the foremost advocate of urban horticulture, Charles Lewis, is contributing to this conference, I need only emphasize, here, the importance of his experiences in humanizing the urban scene by means of vegetation.

The very expression, to "humanize," to make humane, benevolent, civilizing, by providing the influence of vegetation, is an extraordinary admission of cultural deficiency. Yet, the evidence of that deficiency and the need for urgent redemption is undeniable.

The essence of person/plant proxemics, phyto-psychotherapy, establishes the synecological design theme where vegetation supplements the particularity of urban forestry. Further investment in trees alone, leaving them to contend with the effects of pavements, walls, and roofs, is unlikely to improve upon the existing conditions. We are preoccupied with "forest," with all the implications of variety in verdure, not just selected species in a state of monocultural array.

HOLISTIC PLANNING

The concept of urban forestry must be reviewed in holistic terms. Trees must be provided with their supporting ecology, according to regional characteristics. Silviculture is not an isolated art but an interactive operation, in continuity.

It is not enough to embellish the streets with trees, parks with selected specimens, industrial wastes with massive plantings, or to scatter shrubs between structures, as space allows. Ecological design composition must be given, simultaneously, to the surrounding pavements, the walls, and the roofs.

The thermal effects from the combined interaction of all urban surfaces in the blazing heat of summer and in the chilling draughts of winter, can be modified by the judicious application of vegetation. Such provision will sustain, also, a variety of insect and bird populations which are not necessarily averse to urban conditions.

Indeed, the prospects of urban aviculture and urban apiculture are vastly improved as a result of urban forestry. The pioneering work of the Urban Wildlife Research Center in Columbia, Maryland, and the Tropical Audubon Society, in Tavernia, Florida, should be mentioned as relevant to the holistic planning concepts which I advocate. The conference challenge, "Urban Forestry for Livable Cities," does not state for whom urban habitability is intended. Our injunction for "Making it Happen" should ensure that the resulting action embraces species other than human, whereby the necessary synecological interaction is achieved.

The material differences between town and country, urban and rural, industrial and agricultural, should be reduced if rapid improvement of environic quality in air condition, thermal range, humidity and aesthetic result is to be effective and long-lasting.

For instance, the State of Nebraska has recently demonstrated the value of such positive thinking by creating the Nebraska Statewide Arboretum, thereby providing a sense of regional identity. It is not surprising that this initiative should occur in the State where the National Arbor Day Foundation was founded, and which was the home of the former National Arbor Day Foundation President, Maxine Morrison.

Through the annual Community Betterment Program, the small towns of Nebraska are encouraged to replant and reaffirm their arboricultural obligations. The streets of Nebraska's capital city, Lincoln, reveal the most significant replanting program for any city of its size and resources. Omaha is completing the largest urban park to be created since Olmstead planned Central Park, New York.

SYNECOTECTURAL DESIGN

As a planner, however, I am as much concerned with the practical details of design a I am with the policies of urban beautification. I am preoccupied with the surfaces as well as the spaces; the public parks, the private yards, the "wheel-preserves." I refer, particularly, to the pavements, walls, and roofs which compose so much of the urban fabric. Is it not strange that in the plethora of planning statistics, densities, quantities and acreages, there are no records of surfaces. The statistics for exposed surfaces must be examined and recorded for reasons of energy economy, and also for reasons of synecological design opportunity.

Wherever a building is constructed, it trespasses upon the vegetation originally in possession on the site, and the structure influences the ecological economy of the surroundings for as long as it may stand.

Any construction denies the routine photosynthetic processes and effects the microclimate in which vegetation survives. The incompatibility between buildings and biological production need not, however, be absolute. I plead, especially with architects, that walls and roofs should be so designed as to assist the growth of trees by being covered with selected indigenous vegetation, whereby compatible conditions are achieved which benefit all growth and modify thermal variations arising from the material and form of the buildings.

Architectural design is influenced by the effects of many new technological sophistications in belated response to the urgencies of energy conservation. Now the influence of that most vital of all substances, vegetation, must also be accepted as an essential part of any architectural composition. Henceforward, architectural design must provide for the client's requirements without denying livelihood to those species previously inhabiting the site.

In consequence, an intensified design discipline is required. Such a discipline must have an appropriate vocabulary to describe desired characteristics and distinctions which ensure that the traditional professional practices of planning, landscaping and architecture are brought together in ever closer accord. This requires the realization of a further design discipline similar to the fundamental authority of gravity. Any study of ecological interaction and, above all, of synecological services between plant and plant, and plant and animal communities, will confirmed as providing that design discipline.

The essence of such an architectural design refinement lies in the expanded areas, vertical and horizontal, which the structure can provide for selected vegetation. Meanwhile, that vegetation modifies the microclimatic conditions providing habitat for other species which are excluded by the presence of buildings. Moreover, threatened species can be attracted to return and to reconstitute their lives without inadvertent human interference.

This synecological discipline requires a definitive terminology since it is, in every sense, particular in the provision of human accommodation within an economy of mutual accord which sustains native vegetation, and affords avicultural habitation and entomological protection.

The term SYNECOTECTURE describes, exactly, the design intention and cultural obligation, while recognizing the particular difference between conventional architecture and the prime art/science of multi-cultural accommodation design, synecotecture. By combining the science of synecology, the study of dissimilar species thriving in mutually-sustaining community, with tectonics, the art of construction, in the traditional sense, that most urgent and logical design commitment of our time is identified.

This synecotectural design discipline applies, also, to the modification of existing structures, as in the case of covering blank walls with creepers indigenous to the region.

The application of synecological design principles to the treatment of pavements, sidewalks and parking-lots to reduce surface radiation effects scarcely requires emphasis. Walls and roofs are especially significant because they are so extensive and remain virtually unshaded. When clad in verdure, these walls and roofs complement trees, of whatever species, whenever synecotectural design principles are undertaken in the spirit of holistic commitment to environic planning.

VERDANT WALLS

Because of the visibility of vertical surfaces, the aesthetic results of applied verdure can be remarkable indeed. It must be emphasized, however, that much care must be taken in the choice of wall-climbing plants, other than ivies (hedera helix). Varieties of parthenocissus tricuspidata and nephrolepsis exaltata bostoniensis are obvious examples of creepers which do not damage structural materials by chemical reactions or by root penetration.

The fashion for wall-verdure was fully explored by English gardeners of the 19th century. These include roses, flower and fruit bearing vines, and pleached trees.

The height which such creepers can attain is astonishing. The example of a wall in downtown Toronto, where a height of 18 floors was climbed and covered in as many years, by the popular "Boston Ivy," is an eloquent example of creeping persistence. Other instances of creepers on high bridges in California confirm conditions which appear to represent a challenge to growth, and that certain creepers exhibit dendroic characteristics as their height increases.

VERDANT ROOFS

Meanwhile, walls may also be draped with plants grown on the roof. The covering of flat and low-pitched roofs with five inches of prepared top-soil offers a wide variety of

ecological opportunities for the encouragement of indigenous vegetation, prairie grasses, vetches, clovers, honeysuckle, buttercups, wild roses, flowering forbs, and certain modest shrubs. The thermal economy achieved from any combination of earth and vegetation from heat absorption or from heat loss deserves thorough comparative analysis.

The additional structural investment required to support earth-insulated roofs is compensated by the long-term reduction in maintenance costs due to the constant expansion/contraction stresses in the roofing materials. The permanent covering of roofs with water illustrates the value of such earth-insulation sustained by auto-regulating irrigation.

The double-dividend resulting from "green-roofs," micro-climatic regulation for the benefit of urban forestry and for thermal economy within the buildings, should provide measurable evidence confirming the value of verdure on walls and roofs. The additional benefits in wildlife habitat, aesthetic enhancement, noise absorption, and in phyto-psychotherapy represent supplementary arguments which deserve emphasis in this context of practical economy.

Vegetation sympathetic to wall materials and to street trees must be selected and designed as one synecological composition. Roofs may be regarded as glades between woods or, where the structures are higher than trees in maturity, as alpine pastures. They should be designed as part of conventional architectural practice.

The slope of walls and the pitch of roofs should be considered when using vegetation for thermal economy to ensure better exposure to light or to afford effective drainage as required by the particular species of plant.

Synecotectural refinements are an inevitable sequence in the development of architectural design conventions. This is especially obvious at this moment when the "style international" is so obviously in defiance of basic thermal economy, and when it is so clearly bankrupt in aesthetic conviction as to justify description as the "style arid."

While the ultimate design authority may be thought to be economic, in the urban context the authority is clearly ecological. And it is translated in terms of synecotecture in response to the need for energy conservation in the street no less than in the building. Economies achieved through ecological means are demonstrated, also, on a regional scale as illustrated by microclimatic data now available from remote-sensing satellites.

The synecotectural design disciplines, just described, also apply to the urban scale in respect to synecopolitan planning.

If ecological vitality is to be sustained, in part, by reason of variety of species, design policies must be on an urban rather than an architectural scale.

INTERNATIONAL CONFERENCE

No amount of attention to detail will redeem the whole if the scale of operations is insufficient. Our subject is on the scale of forestry rather than that of silviculture, and it involves the whole spectrum of ecological science. An exchange of experiences between cities now justifies, I believe, the organization of an international conference on urban forestry.

Observations made of street-tree planting throughout principal cities during my recent visit to China have convinced me of the value of an exchange of synecopolitan planning concepts on an international basis, which will reveal such varied silvicultural experiences as gained in Paris, New Delhi, Brasilia, Beijing, or London.

My Directors of the Environic Foundation International Inc. wish me to confirm and encourage such an enterprise, and to stimulate further initiative from those co-sponsoring this Second National Urban Forestry Conference. I suggest that the prospects for an International Conference on Urban Forestry be explored with the Executive Committee of the International Society of Arboriculture and the International Federation of Landscape Architects because of the obvious common interests involved and because global meetings and policies are routine procedure for these distinguished organizations.

Following the undoubted success of such an event, which could be held in a city selected for its most advanced program of urban forestry, such as Chicago, Singapore, Lincoln, Chandigarh, Dayton, Xi'an or Savannah, it would seem appropriate to organize and found an International Association of Urban Foresters and Planners, through which concepts of synecotectural design could be formalized.

Urban forestry is, essentially, a synecological subject, and consequently, it embraces urban wildlife, urban wilderness, urban fisheries, urban agriculture and urban horticulture and every subsequent ecosystem, silvicultural, avicultural and entomological. While this array of design obligations may sound improbable, impractical and even impossible, it should be reviewed in the context of an age of intra-cultural interdependence.

Under the rubric of Urban Forestry another range of essential conservation measures can be combined with those essential energy, ecological, and human obligations in a fundamental policy for high-density design.

An International Conference on Urban Forestry to be held under the auspices of the American Forestry Association could be an occasion to kindle interested professionals in medicine, psychology and the social sciences as well as architects, planners and energy engineers. Since the essence of the urban condition is energy, individual, social, and physical, it can be very simply symbolized by a tree--indeed the "tree of life."

While the convincing arguments presented by Professor David De Walle in his paper on "Energy Conservation Through Urban Forestry" are clear enough, the issue now is how to proceed in both plan and design to apply the evidence accumulated.

In a period when nothing is believed upon its own merits, but only in terms of proven "fact," and where only numerical calculation is accepted as "proof," the idea of synecological discipline as a design inspiration to promote betterment between differing species is refreshing indeed.

How can structures of any kind be designed or refined to accommodate selected vegetation (according to regional conditions) whereby buildings may no longer be trespassers upon the photosynthetic preserves? But, instead, turned into positive instruments of photovoltaic production/conversion/transmission in practical energy conservation.

The challenge lies with the planners, designers, and clients. It involves the whole range of ecology, silviculture, horticulture, and forestry.

No longer can we afford the arrogance of designing for human convenience alone. Our responsibility for mutual well-being among vegetation and wildlife is unavoidable if social sophistication is to continue, if humanity is to survive.

ECOLOGICAL RIGHTS

Forty years ago, the term "room" meant reservation, but now space is as endangered as living species. Henceforward, the "room" required must be made rather than reserved. This is a principle of survival, a design discipline and a cultural imperative that can no longer be denied. Buildings must now provide "room," on walls, roofs, and surrounds, designed to redeem the effects of their trespass upon both the wild or the cultivated landscape.

The making of room may not be so difficult as it sounds, for any review of the roofs of Manhattan will reveal a surprising variety of gardens, formal and incidental, which show what can be done by private endeavor in response to aesthetic desire. The making of urban room for urban forestry and its supporting vegetation should involve tax-delinquent property. This acreage is now large and growing, and could be used for stimulating public interest in the various aspects of urban forestry which I have already identified.

ENVIRONETHICS

Any investment in urban forestry implies respect and protection for the trees themselves. The concept of environethics is inseparable from the ecological design discipline for which I plead.

For the first time, it may be argued that architectural and a planning dogma is directly associated with profound moral obligations of absolute necessity--the maintenance of conditions providing for the right to life of virtually everything!

The recent publication issued by The Council of State Planning Agencies, America In Ruins (Chaote and Walter 1981), is certain to arouse urban anxieties yet further. It exposes the entire range of inevitable deficiencies, long obvious, which coincide with economic stringencies seldom previously endured.

The social prospects implied by this Report are appalling, and the planting of forests as an urban "band-aid" is an urgent obligation. It is also a logical and economic means of restoring vegetational hygiene and photosynthetic energies to the concrete wildernesses of waste that are to be seen in Gary, The Bronx, Saint Louis, Detroit, and in so many other locations.

Waste begets waste until all is wasted, and forestry represents the most realistic means through which we can respond to the scale of the task and to the speed of the desertization of the urban landscape.

SUMMARY

As the forests of the earth provide the essential ingredients for the aerosphere and now redeem, in part, the all pervasive pollutants that prevail, so urban forestry has become a planning imperative for the improvement of the local atmosphere.

Trees, however, are not self-sufficient, the entire synecological system is involved in sustaining the desired species and specimen.

The provision of supporting verdure in the city has received little attention, beyond the periodic park. The importance of undergrowth must be supplemented by the use of other surfaces. The walls, the roofs, and urban interstices must be induced to contribute to the general urban improvement and the particular social enlivenment.

Vegetation must become an integral part of architectural design, as the ultimate surfacing material, according to regional characteristics, and an essential part of urban planning practice.

In consequence, a new design discipline is required which takes its form and rhythm from the synecological principals of mutual benefits exchanged between different species living in harmonious community. Such application in architectural and planning concepts require particular definition, and the prevailing urgencies may presage the next stylistic genre, now based upon considerations of environic conditions and the maintenance of ecological vitality, rather than upon abstract ideas of form, function and practicality.

The health of the earth is so imperilled that moral issues enshroud every building operation. No longer can building be undertaken solely for human convenience. Henceforward, all construction must provide space and circumstance for other species as an environethical imperative for the sustenance of general well-being.

Synecological disciplines must form the basis of practical synecotectural design and synecopolitan planning whereby the urban scene may be sweetened by vital verdure, while the structural fabric of the city may contribute to the vitality of the forest.

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EVALUATING URBAN FOREST STRUCTURE FOR MODIFYING MICROCLIMATE: THE DAYTON CLIMATE PROJECT

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ABSTRACT

The City of Dayton, Ohio, is being studied to gain a better understanding of how the urban forest system operates to modify urban physical environments--air temperatures, air quality, and surface runoff. Based on the Dayton study, we present a twelve-step procedure that provides a way to better understand the configuration of urban land use and cover types that make up the structure of an urban forest system. Once the configuration and structure of the urban forest system is quantified, mathematical simulation models can be developed to predict changes in environmental values that result from alterations in the urban forest structure.

In 1978, the city manager of Dayton, Ohio invited the United States Forest Service's Northeastern Forest Experiment Station to use his city as a field laboratory to better understand how the urban forest system operates to modify the physical environment. The purpose of this joint effort was to develop scientific principles that could be applied to the management of urban forests in cities throughout the United States. Although the results of the research will have application nationwide, the city of Dayton had specific problems for which it wanted solutions: (1) Summer air temperatures in the City Center significantly exceeded those in the surrounding rural areas, placing a burden on power supply; (2) the U.S. Environmental Protection Agency was looking closely at Dayton's air quality problem and threatening to place strict constraints on metropolitan expansion and industrial operations; (3) surface runoff from rainstorms created problems for sewer systems and sewage treatment plants in addition to erosion and the washing of pollutants into the Miami River. These problems were individual thorns in the side of a Northern "snow belt" city trying hard to maintain itself as an attractive place to live and work.

A highly professional approach to Dayton's urban natural resource system was consistent with the pride they placed on their place in history as the location of the first full-time city manager, who planned for and ran the city on principles developed from a rational understanding of how the urban system worked and how it could be guided toward specific goals. In 1978, Dayton representatives attended the First National Urban Forestry Conference in Washington, D.C. and learned that a new science was emerging--the rational management of the urban environment through an understanding of the structure and function of vegetation systems.

In most cities and communities vegetation is a dominant and renewable part of the environmental system. It is the one component of the urban system truly susceptible to management and that affects all other components of the system--micro and meso climate, wildlife, soils, surface and ground water hydrology, low altitude air pollution, noise levels--to name only a handful of over thirty aspects of urban operation influenced by the kind, amount, and distribution of urban vegetation.

The Forest Service responded to Dayton's invitation and designated the Northeastern Station's reserach unit on the campus of the State University of New York College Of Environmental Science and Forestry at Syracuse, New York, as the lead group in the Forest Service portion of the study. The broader aspects of the Dayton climate project, which involved the participation and cooperation of other Federal, State, and local agencies, including the University of Dayton, Wright State University, Wright-Patterson Air Force Base, the Mead Corporation, Harvard University, Massachusetts Institute of Technology, and Antioch College.

The Forest Service research program focused on these questions:

(1) What is the structure of the urban forest system?
(2) How does that structure influence micro and meso climate, especially surface runoff and the urban heat island?
(3) Can modification of existing forest structure reduce problems of surface runoff and heat island efforts?

Our intent was to generate principles that could be applied to other cities in the United States. With the hope that results derived from our work in Dayton would be applicable elsewhere, it was important to have some idea of the range of conditions existing in American urban areas.

We know that cities are not all alike. Each city has its own personality. To test for differences in urban vegetation structure, we examined data for three cities in very different environments, relying on a classification of metropolitan areas derived from regional ecological characteristics (Sanders and Rowntree 1983): Dayton (in the "Eastern Deciduous Forest Province"); Syracuse, New York (in the "Laurentian Mixed Forest Province"); and Sioux Falls, South Dakota (in the "Tall Grass Prairie Province"). For those cities, we compared tree density (canopy coverage or crown density), which is an important dimension of urban vegetation structure. The results showed that average canopy coverage for the cities is very similar: Dayton, 22 percent; Syracuse, 24 percent; and Sioux Falls, 23 percent. This gave us hope that urban forest structures around the nation were at least similar enough to have a basis for generalization.

However, there are important differences, from one city to another, in the configuration of herbaceous and woody vegetation, and in the geographical distribution of land uses. To illustrate how different cities can be--even cities that are thought to be quite similar--we studied two places located in the same geographic area, having a similar natural setting, and sharing a common history of development and evolution: Syracuse and Rochester, New York. An analysis of these cities reveals that the pattern of vegetation--what we have called the "structure" of the urban forest system--is explained largely by the history of land use development in any city. And, the historical pattern of land use in these cities follows closely the development of transportation facilities. The historical geography of these two cities reveals successive impacts of the Erie Canal era, overlain by a period of railroad development, then intraurban trains and buses and, finally, of course, the heavy-handed imprint of the automobile. We found that these two similar cities have marked differences in vegetative structure.

For any city, the structure of the urban forest will be closely associated with the distribution of land uses and will display a configuration that reflects the history of interaction between two types of forces: those that tended to locate land uses in concentric rings and those that tended to locate land uses in radiating spokes out from the Central Business District (CBD). A detailed analysis of the structure of Syracuse's urban

forest shows this interaction manifesting itself as a fractured set of wedges and concentric bands.

Now that we know there are both fundamental similarities and important differences in urban forest structure among American cities, we will present a series of steps that can be used to understand the present configuration of land use and cover types that make up the structure of an urban forest system. Remember that our objective is to describe the present structure of an urban forest system and the extent to which it can be changed for the purpose of enhancing the human environment.

Step One: Divide the City or Community Into Subunits.

Units should be particularly suited to analysis, to management, or both. For example, census tracts offer an abundance of data that can be used to find relationships between measured vegetation characteristics and attributes of the population. But census tracts may not be useful as management units. In Dayton we used "neighborhood units" (which are about the same size as census tracts) that contained much of the socioeconomic information of census tracts but were already used by the city for planning and management purposes. The seventy-nine neighborhoods have political representation through seven "priority boards" which represent about ten neighborhoods each. These units were satisfactory for analysis and management and allowed implementation of policies emerging from this research.

Step Two: Acquire Air Photography.

If the resolution is good, if they are color, and if they are in stereo, a scale of between 1:12,000 and 1:24,000 will be adequate. If any of these criteria are not met, the scale should be 1:10,000 or larger.

We are experimenting with photographs taken at different times of the year. Wright-Patterson Air Force Base flew the photo mission over Dayton for us during the summer, when trees were in full leaf. This spring, we flew a mission over Cincinnati to test a method of interpretation that uses bare-tree images. After interpreting about two thirds of Cincinnati, we feel that stereo bare-tree photos can be accurately interpreted for canopy density and land use to give a full picture of the urban forest structure.

Step Three: Map Land Use Polygons Within Each Subunit.

Establish the boundaries of conventional land use classes by using mylar over the aerial photos. If a community has a land use map, this can be the base for transferring "polygons"--which are spatial units of homogenous land use--to the overlays of the photos. Several useful publications are available to aid in identifying and bounding land uses in the absence of an established land use map (Avery 1977; Pownal 1950). Polygons should be confirmed by ground identification if land use mapping is being done for the first time.

Step Four: Identify Cover Types For Each Land Use Polygon.

A "cover type" is simply the material seen on the air photo. Our procedure employs four covertypes that are easily identified: (1) woody vegetation (trees and shrubs); (2) herbaceous vegetation (in the city, lawns are the dominant form in this category; (3) artificial surfaces (roads, sidewalks, parking lots, rooftops); and, (4) unvegetated bare soil (occurring in construction areas, quarried, heavily used grasslands).

Step Five: Estimate The Area Each Cover Type Contributes To The Land Use Polygon.

Begin by estimating the percent coverage by trees, a value referred to as "canopy coverage" or "crown density." The common forestry scale employed in most air photo estimates of crown density can be used (Moessner 1977). It allows the interpreter to compare the area on the photograph with aggregations of dots at different densities, beginning with a class of less than five percent and increasing at ten percent intervals. If the polygon appears to have, say, twenty percent of its seen area covered by trees, that is the canopy density value. The remainder of the area will be divided among the other cover types.

Step Six: Calculate Stocking Levels For Each Land Use Polygon and Sum Them for Each Subunit.

Stocking level represents the percent of an area available for tree growth that is actually occupied by trees. It is calculated by first adding the percentages for tree cover, herbaceous cover, and bare soil, which, together, constitute the total area available for trees. To express stocking level as a percentage, divide the tree cover percentage value by the sum of the percentages for trees, grass, and soil. Stocking level quantifies the flexibility an urban forest manager has for increasing canopy cover. The stocking level average over the city of Dayton is thirty-seven percent. That means that sixty-three percent of the space that could right now contain trees, does not. To refine this figure, one can estimate the proportion of the artificial surface cover type that can reasonably be planted with trees (for example, sidewalks and parking lots). This increases the denominator (or divisor) and decreases the quotient, or percent stocking level. If this had been done for Dayton, it would drop the stocking level value from thirty-seven percent to something well below thirty percent.

Step Seven: Construct Summary Tables For Each Subunit.

A simple table with land use classes and cover types is an adequate summary for each subunit. Stocking levels can be inserted next to canopy cover values.

Step Eight: Develop Bar Graphs That Describe The Structure Of The Urban Forest System.

This step makes the tabular data more visual and, at the same time, provides an overview of the whole system. For each land use, a simple bar graph with the number of subunits on the vertical axis and percent canopy cover on the horizontal axis can be constructed to show average canopy cover values. Bar graphs of several cities can be compared to show the similarities in values within land use classes.

Step Nine: Calculate Surface Runoff For Each Subunit.

At this point, we begin to learn what a particular configuration of vegetation and land use is doing to the physical environment; in this instance, to the disposition of rainfall. No published method exists for accurately calculating how much and how fast rainfall will run off fromm areas having the characteristics we've been measuring in the previous steps. So, we've developed a mathematical model that does, using only conservative assumptions about the ability of woody and herbaceous vegetation (and, unvegetated soil) to intercept and store precipitation (Sanders 1982a).

As an example, we took a storm event that had a probability of occurring about once a year (1.8 inches of rain in six hours) and let it fall on the distribution of cover types around Dayton which we had measured using the preceding steps. For this storm event, we calculated that the present urban forest reduces runoff by seven percent under what it would be if there were no trees in Dayton. In more common and less intense rainfall events, the role of trees increases geometrically. Therefore, you can be sure that the urban forest--that is, just the trees--is responsible for reducing surface runoff by ten percent or more.

Step Ten: Calculate Changes In Runoff With Changes In Subunit Vegetation Structure.

Now that we know that the existence of trees reduces runoff by at least ten percent, it is important to calculate how that figure would change if one selectively increased the amount of urban tree canopy. Again taking the conservative approach, and using the one-year, 1.8-inch, six-hour storm, we increased stocking levels of trees in each land use in each neighborhood to thirty-seven percent the current city-wide average). This brings the reduction in runoff to twelve percent less than what it would be if there were no trees in the city. That is, the current forest structure reduces runoff by seven percent, and the slightly reconfigured forest structure reduces it by twelve percent. While we have not yet calculated what effects higher stocking levels have on runoff reduction, we are confident that for less intense (more common) storms, it will be shown that stocking levels between 40 and 50 percent will reduce runoff significantly.

Step Eleven: Calculate Air Temperatures For Each Subunit.

Air temperatures measured at eyeball height (roughly two meters) are determined by two things: the temperature and moisture of the regional air mass and the ability of the underlying surface--whether pavement, grass, or trees--to add or subtract heat energy from that two-meter high layer of air. How the ability of underlying surfaces to influence low-layer air temperatures is a complex interaction of a number of dynamic variables. Since we were primarily concerned, in the Dayton study, with the difference in temperature between the city and the country (i.e., the urban heat island phenomenon), we can simplify the problem for our discussion.

Generally, the subunits with a high proportion of artificial surfaces will create high temperatures than those with a high proportion of grass and trees. Trees raise the level of heat exchange to somewhere above the two-meter point. They also use a part of the sun's energy for evapotranspiration, energy that would otherwise go the heat the air. So, under stable air conditions, there is no doubt that vegetation, especially trees, maintains lower temperatures in the two-meter layer closest to the ground. We know there is about a seven to ten degree celsius increase in air temperatures at the city center over that of the surrounding countryside. On a map, the urban heat island is not perfectly round and may have little satellite islands sitting over areas with high proportions of artificial surface material. The main island will also shift downwind slightly from the city center in the direction of prevailing winds when wind velocities approach five miles per hour and will dissipate at higher speeds. The magnitude of the heat island is roughly proportional to the logarithm of the population. You can predict what the heat island will be by multiplying the log of your city's population by three, then subtracting six. Using measurements together with a mathematical model, weconfirmed in Dayton that the temperature profile of the heat island is similar to what other researchers have found: a shape like the top of Mt. St. Helens (Sanders 1982b). A stylized profile of air temperature at an elevation of two meters shows peaks in the Central Business Districts (CBD). The

CBD should be thought of as having two parts: a high-rise center surrounded by a broad zone of lower commercial and industrial buildings, with a large portion of this zone devoted to parking lots, truck-servicing facilities, and roads. It is in the doughnut around the high-rise where heat builds up and the challenge for urban forestry is the greatest.

Step Twelve: Calculate Changes In Air Temperature With Changes In Subunit Vegetation Structure.

To make changes in air temperature through reconfiguration of the city's urban forest, use these two guideposts: (1) look at the subunit stocking levels to find opportunities to increase canopy cover, and (2) look for groups of subunits with similar land uses and low stocking levels. We mention the grouping because it is in these parts of the city where major hot spots will develop. With breezes, the parcels of air heated over one subunit migrate horizontally and get heated even more over an adjacent subunit. This is the situation in the zone around Dayton's CBD. This zone is a prime candidate for afforestation for climate control, because it has very low stocking levels (around 15 percent), and with similar land uses, the urban forest manager can appeal to owners and users of the land through business and commercial groups such as the chamber of commerce or the downtown improvement committee.

Thus, the parking lots of the CBD became the focus of the Dayton Climate Project.An experimental, hollow concrete brick was used to surface one parking lot so that soil and grass were exposed to the lower air. On still, hot, summer days the air temperatures and infrared radiation loads over the "green parking lot" were significantly lower than thos over conventional asphalt lots.

Our model for predicting air temperatures from underlying cover types suggests that the urban heat island in most cities can be reduced by 25 to 50 percent by employing woody and herbaceous vegetation in the CBD.

CONCLUSION

Forestry is the management of a system of trees. Urban forest structure can be described and managed for citywide effects of significant magnitudes. Without a systematic approach, urban foresters will be hindered by a piecemeal comprehension of the total resource, and the effects of trees in the city will not be realized.

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SECOND NATIONAL URBAN FORESTRY CONFERENCE

SESSION D

RECREATION AND WILDLIFE

Tuesday, October 12, 1982
1:00-2:30 p.m.
and
3:00-4:30 p.m.

Moderator:

George H. Moeller
USDA Forest Service
Washington, DC

Speakers:

Thomas Franklin Urban Wildlife Research Center, Inc. Columbia, Maryland	Managing the Urban Forest for Wildlife	145
John Dwyer USDA Forest Service Chicago, Illinois	Challenges in Managing Urban Forest Recreation Resources	152
	Case Studies	
Richard L. Buck Forest Preserve District Cook County, Illinois	The Forest Preserve District of Cook County	157
David DeVoto City Forester Minneapolis, Minnesota	Multiple Use Forestry in Minneapolis, Minnesota	162

MANAGING THE URBAN FOREST FOR WILDLIFE

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ABSTRACT

There are sound ecological, economic, and social benefits that can be derived from the presence of wildlife in cities and towns. Many different species of wildlife can and do exist in urban and suburban areas. By evaluating the relative amount and distribution of food, cover, water, and space, in relation to the needs of wildlife and people, much can be done to plan and manage for even more abundant numbers and varieties of desirable wildlife species. Undesirable effects of wildlife can be overcome by evaluating these same factors. Urban resource managers are challenged to create and manage cities and communities in harmony with nature.

Wildlife is an extremely important component of the urban environment. It is part of our American heritage and is deeply engrained in our culture.

BENEFITS OF URBAN WILDLIFE

There are sound ecological, economic, aesthetic, and educational benefits derived from including wildlife in cities and communities (Leedy et at. 1978). From an ecological standpoint, the existence of a wide variety of wildlife species in residential developments is indicative of the ecological stability of the area. The ecological principle that ecosystem stability is proportional to its diversity holds true for cities as well as for wildland areas. Though it may not be apparent to the untrained eye, many species are required to make up the food webs and to help ensure the balance of nature.

A community well-endowed with wildlife also provides economic returns to the land owner through increased property values. In addition, open space management programs directed toward wildlife and taking advantage of natural plant succession frequently reduce management costs.

Living things have been a source of inspiration and beauty since civilization began. It has been demonstrated that communities in which wildlife is integrated are preferred by people. Many recreational benefits are provided by wildlife in residential areas. More and more, people are deriving enjoyment from observing song birds at their feeders, and bird-watching has become a favorite recreational activity of millions. In fact, a U.S. Forest Service study showed that in 1974 approximately one-fifth of all U.S. households purchase wild bird seed, spending about $170 million annually (Payne and DeGraat 1975).

Recent nationwide studies by Kellert (1980) have shown that Americans generally lack a basic understanding of wildlife conservation issues and know few facts about animals. Rural residents know more about animals, participate more in wildlife-related activities, and show more concern for conserving animal populations and managing their habitats than do urban residents.

Our citizens living in cities, suburbs, and towns constitute the majority of voters and have much power in determining whether bills for conserving fish and wildlife, protecting the environment, and adequately managing natural resources are enacted and enforced. Although their contacts with, and observation of, wildlife may be largely restricted to urban areas, urbanites can wield much influence on conservation affairs throughout the country, including wilderness and rural areas.

Fish and wildlife in an urban area can be used as a tool for educating both children and adults--in fact the education of school children can help educate adults. Children participating in urban forest management projects under the supervision of qualified personnel can get their parents interested in conservation affairs.

Based upon the 1980 national survey of fishing, hunting, and wildlife-associated recreation conducted for the U.S. Fish and Wildlife Service, 79.7 million persons 16 years and older engaged in observing, photographing, and feeding birds and other wildlife around their homes as a primary non-consumptive wildlife activity. The number of persons enjoying wildlife around homes on unplanned occasions was estimated at 80.5 million. Expenditures by nonconsumptive users for field guides, bird seed, bird feeders, etc. were tallied at $636 million and expenditures for binoculars and photographic equipment at $8 million. The extent to which people--a high percentage of them urban and suburban--observe, photograph, and feed wildlife demonstrates the great interest that exists in wildlife. This interest can be used in furthering people's knowledge of wildlife habitat requirements and the effects of man's activities on wildlife.

Through conservation education programs, the urban public's knowledge of the relationship of trees and other vegetation to wildlife, erosion control, and water quality can be increased. Urbanites can learn that by managing vegetation, preserving free-flowing streams, etc., they themselves function as wildlife managers. And with a better understanding of these relationships, urban residents can have more effective input into planning and decision-making, and in the formulation of environmentally sound conservation programs, not only in their own communities, but state-wide, regionally, and nationally.

Developers can have a major effect on the natural resources of existing and proposed communities. In fact, developers and planners can have more influence on wildlife than most individuals and do not have to know much about wildlife to do it. With a minimum of guidance from biologists, significant benefits for wildlife and the community can be realized. Studies show that homeowners and others appreciate having wildlife on their properties or in the areas where they live, play, or work, and they are willing to pay for it. In fact, there is a growing body of scientific evidence that interaction with the natural environment enhances physical development, and social and intellectual competence in children (Geist 1975). An urban community which is conducive to healthy fish and wildlife populations (because of good water quality, diversity of plants, and other characteristics) is a more healthy environment for people.

WILDLIFE ADAPTABILITY

Many different species of wildlife exist in urban and suburban areas--more than most people realize. Some are present because they have adapted to the urban environment, others because large areas of open space have been retained, whether intentionally or unintentionally.

Some species, such as the pigeon, house sparrow, squirrel, garter snake, toad, and opossum, are common in urbanized communities. Some species occur there because of strange coincidences of time and place. Others are present because planning efforts have been compatible with wildlife needs, not necessarily purposely, but fortuitously because of the type of environment provided.

City parks, cemeteries, and other forested urban areas, in addition to providing habitat for many different resident species, also act as oases for small birds during migration. Many visitors, such as cedar waxwings, woodcock, sapsuckers, thrushes, warblers, sparrows, and kinglets, can be observed at these times.

Other interesting examples of the occurrence of birds in cities can be cited. For example, although the peregrine falcon is now essentially gone from the eastern United States, a female is residing on an urban "cliff" provided by a high rise office building in the inner city and of Baltimore, Maryland.

Any urban/suburban complex contains numerous sites that are frequented by birds of different types. A concentration of gulls is likely to be found at landfills or where sewers empty into a bay or river. Shore birds may be found along the edges of reservoirs, along the shores of coastal cities, and on river or tidal flats. Waterfowl frequent many urban water supply areas or recreation lakes.

The species tend to vary according to the geographic area, quantity and diversity of vegetation, and types of housing developments. Some urban communities, particularly if they include reservoirs or other water bodies, may have more diversity of habitat than the areas they replaced. Often these urban areas contain more birds--if not more species--than rural agricultural and wooded areas.

Urban waterfowl can provide enjoyment to many people. More than ten thousand mallards and two thousand black ducks spend each winter in Massachusetts parks and urban areas (Heusmann and Burrell 1974). In the seven-county, Twin Cities, Minnesota, area, some 1,800 giant Canada geese in 12 major flocks now share their environment with more than two million people (Sayler and Cooper 1975).

Although generally not as conspicuous as birds, many mammals are also found in urban and suburban areas. The seemingly ubiquitous Norway rat and the house mouse may be present in large numbers in grain elevators, warehouses, and other places where sufficient food, shelter, and water are available.

Squirrels are probably the most common wild mammals in cities. Tree squirrels are found in forested portions of urban communities in much of the United States. Gray squirrels may become unusually abundant in urban situations, especially in the Southeastern states, where they may reach densities of five, six, or more animals per acre, actually exceeding the numbers typically found in the wild.

In the Northern states, especially where conifers predominate, red squirrels may live in urban areas. Fox squirrels are found in cities and towns of the Midwest, West, and South. Flying squirrels also may be present in urban woodlands, but due to their nocturnal habits they are not usually seen by city dwellers.

The gray squirrel is a good example of a game animal that has adapted to city life. High urban squirrel populations have been attributed, at least in part, to the existence of large,

mature, uncrowded, and productive mast trees with large canopies. These provide excellent squirrel food and shelter.

Raccoons occur widely in the United States and often are found in residential neighborhoods, especially in wooded suburbs. Although they den in hollow trees, the lack of which may tend to be a limiting factor in some areas, they are known to den in burrows dug by woodchucks, red foxes, badgers, and skunks; and they find shelter in rock dens. They have demonstrated their adaptability to urban environments through the use of garages, houses, drainage tiles, refuse dumps, and drain culverts for den sites. Usually, raccoons are found within a few hundred feet of open water.

Numerous other wild mammals may occur in urban and suburban areas. Among these are deer, rabbits, skunks, chipmunks, mice, moles, shrews, bats, and even the adaptable coyote. Their habitats and behaviors are diverse, as are their roles in nature and the out-of-doors. Certainly, life for many of us would be less interesting without them.

Although not as visible as other wildlife species, reptiles and amphibians also occur within urban areas. Urbanization, with its drainage of wetlands, degradation on streams, and removal of ground cover and brush, has generally decreased the populations of amphibians and reptiles. For some species, however, it may actually have permitted a population increase, at least on a local basis, through the creation of man-made breeding sites (ponds, water-filled sand-mining pits, abandoned reservoir sites, and stormwater basins) and through the elimination of natural predators.

Urbanization also brings the earthworms, rats, mice, and trash that provide increased food and cover for some species of snakes. Urban lighting attracts insects that serve as food for toads and other wildlife.

Some reservoirs, ponds, rivers and other water developments in urban areas have been used for fish production. Several cities have developed successful fishing programs (Leedy et al. 1981).

REDUCING UNDESIRABLE EFFECTS

Wildlife can, under some circumstances, be a nuisance to an urban dweller or to a community. Damage can be done to gardens or to property. There is some potential for wildlife to serve as a reservoir of certain diseases transmittable to man, although the likelihood of contracting disease from wild animals is remote.

Researchers have shown that diseases such as histoplasmosis and cryptococcosis are sometimes associated with accumulations of bird droppings at blackbird roosts, bat colonies, or pigeon nests near human habitations.

Rabies is causing increased concern in many residential areas. In the past, the majority of cases diagnosed were in dogs. However, since 1956, the majority of cases have been among wildlife. Public information campaigns should be initiated in areas where the incidence of rabies is increasing.

Gray squirrels, although providing enjoyment to many urban and suburban residents, may at times become nuisances because of their numbers. They can gnaw through lead telephone cables, tear up lawns and gardens, peel bark from ornamental trees, and can eat enough buds of trees and shrubs to cripple or kill the plants. They also can interfere with bird feeding by eating much of the food intended for birds.

As in the case of birds and squirrels, some residents provide regular food handouts for raccoons, which are adaptable urban dwellers. However, they have become nuisances in some areas. In addition to evening raids on garbage cans, raccoons occasionally inhabit attics and chimneys. Daily harassment will often persuade them to leave; poisoning or trapping is not usually necessary. Holes under the eaves of roofs and chimneys should be securely screened once the raccoons depart.

An animal control specialist or anyone available to the public on animal problems will receive a multitude of nuisance complaints ranging from the mockingbird that sings too long and too loud on moonlit summer nights, to mole damage in the lawn, to rabbit damage in the garden. Most of these problems are relatively minor, however, and many of the complainants, if faced with the alternative of killing the offending animal or paying the price for its presence--i.e., putting up with some inconvenience--would probably choose the latter.

The best way of avoiding problems with urban wildlife is, when possible, to prevent the conflicts through correct planning. For example, buildings should be constructed to exclude birds rather than to keep birds out after the buildings are completed, ponds should be built with muskrat-proof dams, and landfills should be kept away from airports. Programs for reducing populations of unwanted wildlife should be accomplished with authorization from respective local, state, and federal conservation agencies.

APPROACHES TO URBAN WILDLIFE MANAGEMENT

To survive, wildlife must have food, cover, water and space in which to live and reproduce. The principal objective in wildlife management is to satisfy these requirements for the desired species. Effective wildlife planning and management requires knowledge of the recent historical ranges and local occurrence of wildlife species, the status of existing wildlife in an area, the extent to which the requirements of the desired species are being met, and the potentials of the area for existing and other desired species.

The primary approach to wildlife management is habitat management, particularly as related to plants and water. If reconnaissance surveys of an area reveal that food scarcity is a factor limiting the presence or abundance of a desired wildlife species, the planting of food crops or the selection of shrubs used for landscaping, which are especially valuable as wildlife food, may provide the missing or deficient habitat component. If there are no den trees available for cavity nesting animals, nest boxes can be provided. If food and water are present but are separated by a wide expanse of closely clipped grass, establishment of hedges that serve as vegetative travel lanes from wildlife coverts to the water or food is likely to facilitate their use.

Research has shown that habitat diversity influences the diversity of wildlife. If food, water, and various kinds of vegetation are found in proximity to extensive edge habitat, conditions for wildlife are likely to be favorable, assuming that the area is not subjected to too much use by people and by free-roaming cats and dogs. Wooded areas that include ground cover, one or more layers of shrubs and saplings, and coniferous and hardwood trees of different ages, contain more species of wildlife than parklands or plantations characterised by a few species of uniformly tall trees, little ground cover and no shrubs or layers of intermediate foliage. The practice of using shrubs to cover narrow strips of urban open space is preferrable to the use of mowed grass. Also, parks and open space providing natural meadows and shrub and wooded areas, in addition to formally maintained areas, are highly desirable.

This kind of forest is much more valuable than the typical urban park vegetation which consists of mature woods and mowed grass.

Clean water, whether in the form of natural lakes, streams, canals, reservoirs or ponds, can add to the diversity of the habitat and hence the diversity of wildlife in urban areas. Productive natural areas should be preserved to the extent possible in developments; pollution should be controlled and consideration should be given to fish and wildlife values of man-made water areas.

In addition to the management of vegetation and water, other wildlife management approaches should consider the establishment or protection of natural areas to serve as wildlife refuges or sanctuaries, zoning regulations and restrictions on uses or areas, programs for controlling nuisance species, stocking of fish and wildlife, artificial feeding, and the erection of nest boxes and platforms for wildlife.

Requirements differ for each species, and opportunities and methods for management can best be identified and described by biologists. For municipalities and communities desiring to promote fish and wildlife as a part of nature conservation, it is important that biologists and ecologists participate from the beginning of the planning and decision-making process along with the city managers, economists, engineers, landscape architects, lawyers, and representatives of other disciplines. The biologist's participation should continue beyond the planning stage to include implementation, operation, and maintenance functions. It should be recognized that wildlife is different from other "site resources" such as soil and plants, because it is mobile and secretive. Some species occur in a given site only during migration, whereas others may hibernate during a part of the year.

Opportunities for incorporating wildlife considerations into site designs for new residential developments are greater than for urban renewal projects. With new developments, a stream, wetland or a unique biological community may still be present, and possibilities may exist for protecting the resource. In renovating an existing development it is likely that such sites will have already been disturbed. But in either situation the land will be very expensive, and there will be competing interests for the land. Space will be at a premium; hence, consideration must be given to the best use of available space for wildlife. Using a little creativity and knowledge, there are exciting and very real opportunities to improve conditions for urban wildlife.

If the needs of wildlife are provided through proper urban planning and management, positive people/wildlife interactions will be inevitable. The urban dweller who hears the song of a thrush in his backyard or catches a glimpse of a scarlet tanager against the green foliage of an oak will testify to the value of wildlife in the urban forest. In his classic book, Game Management (1933), Aldo Leopold described the value of wildlife in a community stating, "A pair of wood thrushes is more valuable to a village than a Saturday evening band concert, and costs less. What does it cost? A piece of woodland with undergrowth." The challenge is ours, as urban resource managers, to provide that woodland.

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CHALLENGES IN MANAGING URBAN FOREST RECREATION RESOURCES

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ABSTRACT

Urban forests can play an important role in meeting the recreation needs of urbanites. Significant changes in the urban environment pose important challenges to urban forest managers; but also offer opportunities to enhance the urban forest. Management efforts are complicated by the scarcity of funds, diverse resources, and numerous public and private groups; but especially by diverse and dynamic urban needs and preferences. It is essential that managers are aware of these needs and preferences and develop programs and projects that respond to them.

INTRODUCTION

Urban forest recreation opportunities are very important to urbanites. These "close to home" opportunities provide many urban residents with most of their forest-related experiences. And the urban forest provides the only contact with a forest environment for urbanites with limited ability to travel outside of the city--particularly the old, very young, handicapped, economically disadvantaged, and some racial/ethnic groups.

THE RESOURCE

Urban forests are diverse ecosystems characterized mainly by trees but also include plants, animals, climatic and soil conditions, and man and his works. They provide a broad spectrum of recreation opportunities ranging from hiking in the "wild" parts of forest preserves to studying nature in arboreta, conservatories, or zoological gardens. The urban forest includes an intricate network of corridors linking tracts of various sizes and shapes. It often occurs along city streets and sidewalks, river banks and transportation corridors, powerlines and pipelines; as well as in forest preserves, cemeteries, golf courses, nature centers, vacant lots and fields, arboreta, conservatories, yards and estates, and municipal watersheds. Each forest environment provides its own distinct set of opportunities for recreation; but forest environments throughout the urban system complement each other synergistically to furnish opportunities for recreation. Tree-lined corridors linking larger tracts provide a forest setting for increasingly popular "linear activities" such as walking, jogging, bicycling, and hiking. These same corridors allow wildlife to move through the system. The combination of open spaces and wooded areas creates "niches" for recreation--places for observing unique plants and wildlife, picnic sites with a mixture of sun and shade, and choice fish spots along secluded streambanks. The urban forest influences recreation in the neighborhood, where most leisure time is spent, by adding to the character of the local landscape and microclimate; screening out sights, sounds, smells, and substances; moderating sun and wind; and enhancing wildlife.

THE CHALLENGE

Urban forest recreation resource management involves the making and carrying out of decisions concerning the location, characteristics, and use of urban forest resources. This challenging process must match diverse urban needs with a wide range of forest resources. The management process largely determines the quantity and quality of urban forest recreation opportunities and has a significant influence on the quality of urban life. The success with which managers satisfy urban needs is a prime determinant of the funds and other resources that will be allocated for future management efforts.

With their prospects for experiencing recreation opportunities outside the city reduced by high gasoline prices and inflated costs, urbanites are increasing their use of urban areas that in many instances are already overused. They are also closely scrutinizing urban forest recreation resource management--thereby placing even more demands on managers. Many of the economic conditions causing the increase in the demand for urban forest recreation resources are also causing a decrease in the funds available for meeting these demands. So managers are forced to "do more with less." Under these circumstances it is essential that management programs and projects are targeted squarely on public needs.

Many changes in the urban environment have significant implications for urban forest recreation resource management. These include urban renewal, cleaning up rivers and waterfronts, new transportation developments, abandonment of railroads and other rights-of-way, creation of new residential developments, renovation of urban parks, and shifts in the composition of urban neighborhoods. The extent to which planners and managers are able to capitalize on the opportunities created by these changes will strongly influence the urban forest recreation opportunities available in the future.

Recreation preferences of urbanites have changed rapidly in the past, with a steady progression of significant "fads." These patterns are likely to continue in the years ahead, and managers should monitor them closely and be prepared to respond to them.

RESEARCH ABOUT USER PREFERENCES

Increased demand for urban trails poses new challenges that are often complicated by the diverse needs of urban trail users, who range from hikers seeking solitude and an opportunity to experience nature to groups of bicyclists and roller skaters interested primarily in exercise. In northern regions of the U.S., increasing demands for winter sports--such as cross country skiing, snowmobiling, and winter hiking pose significant challenges to managers.

Unfortunately, limited information about urban needs and preferences is available to guide management efforts. This is particularly troublesome when management must be on target, and opportunities to field-test various options are limited. The following observations about user preferences, based on initial findings of the urban forest recreation program of the USDA Forest Service, North Central Forest Experiment Station, in Chicago, are presented here to illustrate some of the aspects of urban preferences that managers must deal with.

Preferences differ substantially for urban forest recreation sites. Individuals also differ considerably, but broad patterns of preference seem to exist according to city, place of residence within a city (inner city/suburb), ethnic background (black, white, Hispanic), and

social class (income, education). In developing program and project plans, managers should carefully consider the characteristics of the population to be served, with particular note to differences along the lines mentioned above.

Residents of Chicago differ from residents of nearby suburbs in that Chicago residents are much more likely to prefer intensively developed and managed sites close to home where they can meet with others. Chicago blacks have especially strong preferences along these lines. Suburban residents, on the other hand, prefer natural undeveloped sites and the opportunity to get away from people. Suburbanites also tend to participate in a wider range of activities, travel greater distances, and devote more time to specific activities than do residents of Chicago.

Use of and preferences for selected urban parks in Chicago differ significantly according to the race and social class of users. Preferences and behavior of low income blacks are most likely to differ from those of other groups.

Forest resources contribute significantly to the quality of urban forest recreation environments, but it is not simply a matter of "more is better." Site location is very important, as is good maintenance and an absence of litter, vandalism, and fear of crime. The spatial configuration of trees, forests, open grassy areas, and water is also important to the quality of opportunities in parks, in forest preserves, along trails, and around multi-family housing developments.

Preferences for urban forest recreation environments also depend on the intended use of those environments. For example, users of trails in the Chicago area indicate that the trail surface, length, variability of terrain, diversity of vegetation, and distance from home influence their choice of a trail. However, the relative importance of these attributes varies with the intended activity. Diversity of vegetation and variability of terrain top the list for skiers and hikers, trail surface is most important to bicyclists, and distance from home is most important to joggers. This complicates trail management, particularly for multiple-purpose trails.

A CASE STUDY--THE ILLINOIS AND MICHIGAN CANAL CORRIDOR

The complexity of the resources, users, and interest groups that my be involved in urban forest recreation resource management is illustrated by efforts to enhance the 100-mile-long Illinois and Michigan Canal Corridor. The Corridor, which extends across the Chicago metropolitan area, contains significant historic, cultural, natural, and recreational resources. Seventeen towns are in the Corridor and more than 200 historical structures, as well as 37 unique natural areas totaling more than 6,800 acres. These areas include forests, prairies, wetlands, bluffs, canyons, and other resources.

One of the most striking characteristics of the I and M Canal Corridor is the variety of land uses. Located on the Corridor are: forest preserves, oil refineries and tank farms, State and local parks, agricultural land, a nuclear power generating station, gravel and silica sand quarries, strip-mined land, prairie remnants, unique geological formations, small businesses, and plants and offices of some of the largest corporations in the Nation. The variety contributes to the significance and uniqueness of the area but also to the complexity of its management and use.

"Grass roots" support is strong for stabilizing and restoring the I and M Canal. The Canal and its towpath are among the most obvious underdeveloped recreational resources in the

region, and strong public support exists for establishing an uninterrupted multiple-use trail along the Corridor. A number of private groups have undertaken efforts to improve and maintain existing trail segments. The Corridor has been the focus of numerous studies, but until recently little progress had been made toward restoring and maintaining the canal.

With strong efforts by the Open Lands Project (a private, nonprofit, open-space advocacy group), increased attention has been focused on the Corridor in recent years. Those efforts culminated in a "Conceptual Plan" prepared in 1981 by the National Park Service with the substantial involvement of local citizens. The plan labels the I and M as a "National Heritage Corridor." A traditional National Park was not suggested, because it was felt that the land should remain in local public and private hands with the goal of economic renewal for the surrounding area as well as protection of unique natural, recreational, and cultural resources.

An umbrella organization known as the I and M Heritage Corridor Commission has been proposed to provide a regional sense of direction and to coordinate the implementation of the Plan. It would be a catalyst for cooperation among historic, recreation, conservation, commercial, and industrial interest groups. A majority of the members would be private citizens living in the Corridor. The Commission would be supported by a professional staff with expertise in interpretation, historic preservation, architectural restoration, recreation planning, natural area protection, revitalization and marketing, financing, and fund raising. Staff members would be "on loan" from existing Federal and/or State agencies and the private sector, thus capitalizing on existing public resources rather than creating a new bureaucracy.

The I and M National Heritage Corridor represents a new concept in cooperation between the public and private sectors. The Conceptual Plan shows how, in a time of scarce public funds, new recreational opportunities can be created in urban areas without initiating major conflicts between recreational and industrial uses of a river corridor.

SUMMARY AND CONCLUSIONS

Urban forest resources play an important role in meeting the recreation needs of urbanites, especially for those with limited access to opportunities outside the city. The management of these resources can have a significant impact on their contribution to the needs of urbanites and the quality of the urban environment. Available evidence suggests that urban forest resource managers should give significant attention to the characteristics of expected users as well as the location of the site, the condition and character of the trees and related forest resources, the spatial configuration of associated open grassy areas and water, good maintenance, and the elimination of litter, vandalism, and fear of crime.

Significant changes in the urban environment continue to pose important challenges to managers, but at the same time, they present opportunities to enhance urban forest recreation resources. Management efforts are also complicated by the scarcity of funds and the diverse resources and public and private groups involved in projects and programs, but the greatest challenges faced by managers stem from the intense, yet diverse and dynamic recreation needs and preferences of urbanites. If management programs and projects are to be successful, managers must be on target in meeting those that are most important. Researchers at the USDA Forest Service, North Central Forest Experiment Station, in Chicago, have identified some of the diverse urban needs and preferences and

are beginning to develop guidelines for managers. It is important that managers keep in touch with urbanites' needs and preferences through a variety of means, including presentations by managers and researchers at this conference. The success of managers in meeting user needs will largely determine the extent of urban forest resource management in the years ahead, as well as the quantity and quality of future opportunities.

THE FOREST PRESERVE DISTRICT OF COOK COUNTY: THE SUCCESS STORY OF A MAJOR FOREST RECREATION SYSTEM

Richard L. Buck
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Cook County, Illinois

ABSTRACT

Established over 60 years ago, the Forest Preserve District of Cook County, Illinois, serves as a prime example of what can be done to preserve native flora and fauna within the context of heavy urbanization and development. Recreational development is intended to complement the natural environment. Facilities serve the widest possible spectrum of the recreating public. Recreation user fees are not employed as a way to control use; fees are only collected for swimming, golfing, and winter sports equipment rentals. The District's lands, facilities, and opportunities are held in great esteem and appreciation by the citizens of Cook County.

Where else can one find a natural wilderness in a city such as that found in Cook County, Illinois, the home of the Cubs and the Bears. I am being facetious about our Chicago sports teams being part of the wildlife; however, in this county of 5.3 million souls, 103 square miles or 10.77 percent of the land is devoted to recreational forest. The land is flat land, flood plan land, valuable buildable land, that if built upon would have choked up the streets with smothering traffic and the streams with urban flood hazards. The Cook County Forest Preserve District has acted as the major fabric for the planning and development of the 127 communities in the County. It lends spaciousness and dignity to what otherwise could have been an urban disaster.

The Forest Preserve District of Cook County, Illinois is a special purpose unit of government established under State statutes. The District has

> "the power to create Forest Preserves and has the power to acquire in fee simple and hold lands containing one or more natural forests or parts thereof or land or lands connecting such forests or lands capable of being forested for the purpsoe of protecting and preserving the flora, fauna and scenic beauties within such District and to restore, restock, protect and preserve the natural forests and such lands together with their flora and fauna as nearly as may be in their natural condition for the purpose of the education, pleasure and recreation of the public."

The Forest Preserve District is governed by a board of seventeen commissioners, ten elected at large from the City of Chicago and seven from cities, towns, villages, and unincorporated areas outside the City. They are elected as county commissioners, but also compose the Board of Forest Preserve Commissioners. The District is a separate and distinct municipal government, so the Forest Preserve Commissioners have no legal connection with the County. The Chief Executive Office is the President of the Board and the Chief Administrator is the General Superintendent.

The Forest Preserve District has had a Citizens' Advisory Committee since 1926. This Committee advises the Board of Forest Preserve Commissioners in matters of policy, land

acquisition, and financial problems. They are members for life and are changed only through death or voluntary retirement. It is a self-appointing committee which selects its own replacements with the approval of the President and Board of Commissioners.

The statutory limit for acquisition of Forest Preserve lands in the County is 75,000 acres. To date the District has acquired 66,169 acres of land. Three thousand six hundred and thirty-one acres (5.5% of the District's holdings) lie within the corporate limits of the City of Chicago. The remainder of the land is interspersed throughout the heavily urbanized County.

When the Cook County Forest Preserve District was established in 1916, the City of Chicago was already built up, making it impossible to acquire forest acreage close to the City center. The kinds of land available for Forest Preserve were traditionally wooded tracts along various waterways and local patches of woods in the otherwise prairie-like rural Cook County. In recent years a statutory modification has allowed acquisition of "lands capable of being forested." This has permitted the District to acquire farm land to re-create natural forest and meadow conditions.

The large Forest Preserve holdings are conceived as regional facilities, and acquisition is evaluated within a regional context. The Forest Preserve works closely with the Northeastern Illinois Planning Commission and has helped develop and support the goals and aspirations of the Commission. Open Space Plans and the State Conservation Department's plan, "Outdoor Recreation in Illinois," are also considered.

Unlike a State or National Park that has one or two entrances, with gate house control to enumerate users, much of the Forest Preserve visitation is walk-in. The Forest Preserve District is surrounded by and immediately accessible to the public from all sides. Because of this ease of entry, it is difficult to determine accurately the total volume of use. The District's current conservative estimate is 31 million visitations per year.

The Forest Preserve District does not attempt to serve all the basic recreational needs of the citizens of Cook County. Recreational functions are shared with local governments. Almost every city, village, and town in the area has its own independent park system that caters to sports and active recreational interests. The Forest Preserve, on the other hand, serves those passive recreational needs that require large spaces. Under statute, the District can furnish such recreational facilities as trails, picnic groves, fishing lakes, nature centers, and gold courses.

The District has 190 major picnic areas containing 2,200 groves and 202 picnic shelters, each grove suitable for a group picnic. There are 90 baseball fields; 36 miles of paved bicycle trails; 175 miles of equestrian and hiking trails; 34 fishing lakes, ranging from 10-500 acreas; nine rivers and streams; three swimming pools; nine golf courses, with 144 holes plus three lighted golf practice ranges; 14 snowmobile sites; 14 sledding hills; five toboggan sites; eleven boat ramps, with four boat rental sites; eight model airplane fields; and five nature centers.

The Forest Preserve does not program recreational activities at its facilities as is done by most park districts. The picnic areas, trails and other facilities are open and available to individuals, families and groups. No fees are charged. In order to avoid user conflicts at picnic groves and shelters, a five dollar deposit for groups of 25 or more is made at the time of permit application. This deposit is returned upon request following the event, if the area has been left in a clean condition. Picnic permits are issued on a first-come, first-served basis.

Fees are only collected for golfing, swimming and winter sports equipment rentals. Licenses are sold for horses and snowmobiles as a way to control use, rather than to produce revenue. It is the District's long standing policy that fees would not be used as a way to limit use of facilities. The fees, set by the Board or Commissioners, are purposely kept low. Swimming provides an example. The District has managed three swimming pools since the 1930's, when water pollution caused the cessation of swimming in the County's rivers and streams. The charge for swimming is 50 cents for adults 12 and over, and 10 cents for children. Free days for children under 12 and over six years of age are held on Monday, Wednesday and Friday, from 2:30 p.m. until 4:30 p.m.

The District's nine golf courses are extremely popular. The most recent was opened June 29th of this year. Five of the District's golf courses are located within or immediately adjacent to the City of Chicago.

One of the major successes of the District is economy of operation and maintenance. The secret to this is the very simple nature of the facilities themselves and the determination of the administrators and elected officials to adhere to the spirit of the legislative mandate to "preserve the natural forests and such lands together with its flora and fauna as nearly as may be in their natural condition for the purpose of the education, pleasure and recreation of the public."

The District's goal for basic development of its land for access and use is not to exceed 18 percent. This percentage of developed area includes all trails, parking and picnic groves, and golf facilities. The remaining land is kept in natural woodland and meadow that surround and are interspersed with developed areas.

Instead of huge parking lots that concentrate large masses of people, the District develops long, curvilinear drives with adjacent parking. This spreads the use load and also serves the visitors' desire to keep their automobile in view. We have also learned through experience that it is not necessary to place picnic areas in the forest itself. The adjacent meadow is quite acceptable to the sun worshiping public, and there are fewer insects and plenty of room for active games. Maintenance is easier in the open meadows, and turf recovery from heavy use is complete with just the sun and rain. Some of the District's early developments were built among mature trees. In these areas it is necessary to keep the grounds covered with wood chips to protect exposed roots and keep the public out of the mud.

Thought is given to permanence, maintenance and vandalism in the design of all Forest Preserve facilities. The cheapest design is not always the best design; quality of materials and good engineering, are essential and simplicity is important. For example, we have found that typical large, old lannon stone fireplace shelters are difficult to maintain because uncontrolled fires smoke up the stone work, with the result that picnicking can be like eating in a garbage burner. The new shelter design is simple; brick columns surround steel posts, with a concrete gable roof on steel framing and no fireplace. People prefer to bring their own charcoal braziers with them when they picnic, rather than depend on the availability of a fireplace or the sanitary condition of a public grill.

Another success is the flood prevention that has been accomplished in Cook County by the Forest Preserve District. This has been achieved through the purposeful acquisition of most of the natural waterways within the County. Keeping flood plain lands in a natural condition has eliminated untold millions of dollars in flood damages. Besides this passive

flood control, flood reservoirs have been built within the District that accommodate many thousands of acre feet of temporary flood water storage. These reservoirs are such that the flood storage is done over permanent recreational pools that are used for fishing and other water activities.

The District's Nature Education Program should be listed among the successes. This program, operated by the Conservation Department, consists of the operation of five nature centers, each representing a different habitat theme: an accredited camp for training teachers in methods of nature interpretation, distribution of nature study bulletins to each classroom in Cook County during the school year, and guest school lectures by the District's naturalists. This comprehensive program has been very effective in training the young and old in Cook County about natural phenomena. It is this universal understanding that is necessary for the very existence of the Forest Preserve and what it stands for. People destroy those things that they are afraid of or that they do not understand. In 1981, the nature education program reach some 1,303,091 people directly at the Nature Centers and countless others through 96 television and radio programs and the distribution of 1,022,724 pieces of printed material.

A success directly related to forestry, as practiced by the professional foresters of the Cook County Forest Preserve, is the magnificent deciduous forests that have been established through their efforts. It is common practice in the forest products industry and State and National Forests to reforest cut over lands, but most of these plantings are pine plantings. The District, on the other hand, grows only deciduous material, as these are our native species. We grow seedlings in our own nursery. These are mixed for each site and machine planted according to a plan at 8 x 10 foot spacing. The District has forested 6,573 acres of planting beds on some 20,108 acres of land acquired since 1962. The early tree plantings are now of sufficient size that recreational facilities are being developed in the adjacent meadows.

One of the dubious successes of the District has been the natural restocking of the native fauna. The annual deer road kill in the County is now between 400-500 animals, and we have several areas where herds of 50-60 animals can be seen regularly grazing in open meadows. In fact, one wooded area of 700 acres is entirely browsed up some four feet above the ground. Beaver have also been successful in making a comeback, and several roads have been raised to accommodate their backwater ponds. These successes do indeed become a problem, and the State of Illinois Conservation Department is currently conducting studies to see what special management programs will be needed in the future.

The greatest success of all is the esteem and appreciation that the public holds for the District's lands, facilities, and opportunities. The Forest Preserve has never spent a lot of money on research. Over the years, we have assumed the role dictated by a conservative interpretation of the legislative act and view ourselves as deliverers of recreational natural areas.

We are confident in the feeling that what has been accomplished is good. But it was only after some user survey work done by the University of Illinois in 1979, through John Dwyer and the North Central Forest Experiment Station, that we have a modern day computer report card of how the Forest Preserves are truly perceived. Quoting from the Survey Summary:

> "The users tend to be overwhelmingly satisfied with their visit to the Cook County Forest Preserve District. The most important part of this satisfaction comes from

> the sense of peace and quiet they get from their visits. Things that distract from that feeling were what they recommended for improvements or change. In many instances this was other visitors . . . The users believe the Cook County Forest Preserve District to be well managed and to satisfy most of their needs for a quiet natural area in a Metropolitan setting. The problems identified by the users and reported in this paper are not at this time a serious threat to those who presently use the preserves."

That is not a bad report card for a 60-year-old forest land agency set in a sprawling urban area of some 7 million people.

As stated by Charles G. Sauers, former General Superintendent, at a seminar on The Future of Northeastern Illinois, November 1, 1961, "These lands are permanent, and each year increases their relative value. When the loop has been rebuilt three or more times, there will still be the forests and meadows offering solace and delight and a more complete life to many millions over the years."

MULTIPLE USE FORESTRY IN MINNEAPOLIS, MINNESOTA

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ABSTRACT

The urban forestry program of the City of Minneapolis utilizes the concept of "multiple use" in planning and management of its urban forest resource. By-products of urban forestry operations are used for hardwood lumber and wood chips. A roadway tour of the "Grand Rounds" system of parkways surrounding the city reveals the degree to which urban forests can be managed and planned to provide high quality recreational and aesthetic experiences within a heavily urbanized environment.

"Multiple use," that's a term that was quite new back in the '50's when I was in forestry school at "old Mizzou." It was a new concept of interrelating people and forests. An urban forester, whether he realizes it or not, must deal with this everyday. Minneapolis, like all other large cities, has tall buildings with their "Crystal Courts," odd shaped buildings, old buildings, but most importantly, people. After all, people are the reason for our urban forests. When thinking about multiple use, what first comes to mind is utilization of forest products. In Minneapolis we utilize the by-products of our normal forestry operations. The wood from our removal program is ground (using whole tree chippers on the streets) into wood chips for use in mulching new trees. The larger logs are loaded and hauled to our recycling plant, jointly owned and operated with the City of St. Paul. Suitable logs are sold for hardwood lumber, much of the material (up to four feet in diameter) is chipped for pulp, and the remainder is used for fuel and cattle bedding. Material from our rotational pruning program is also chipped using small limb chippers.

Since I have mentioned tree removal, I feel obligated to relate the information that, due primarily to Dutch elm disease, we have lost over 81,000 urban forest trees since 1973. On the other hand we have planted more than 112,000 new trees to take their place and perpetuate the urban forest. As in any city, storms also take their toll, as did the 1981 tornado. Again, as with our normal programs, all but the uprooted stumps from devastated trees were utilized.

What I plan to do for the remainder of this paper is take you on a whirlwind tour of the Minneapolis Park System along what we call the "Ground Rounds." In Minneapolis, streets owned and maintained by the Park and Recreation Board are called Parkways, and these roadways make almost a complete circle of the city. The urban forest through which these roadways pass has been planned around what we are calling today "multiple use" of the urban forest--trees providing for people's needs.

We'll start our tour from a park in the northeast corner of the city (locally referred to as "Norway" or "Snoose Hill"). From here we can see downtown through the trees. As we travel, we pass joggers running inside posts and bollards that separate them and the trees from the traffic. Continuing west we cross the "Great Mississippi River" and can see small boat launching areas, built to provide access to the river, while at the same time not seriously interrupting the contiguity of the river's forested appearance.

Moving on, we come to a very formal part of the parkway system: Victory Memorial Drive. Here, stately rows of elms have been planted, each dedicated to a serviceman lost in one of our wars. Bronze crosses or Jewish Stars of David are placed at the base of each tree bearing the name of the deceased. This is an example of how urban trees are used to create a specific mood or design.

Very quickly, the parkway character changes from the formal to the free flowing to encompass the varying moods of the "people users." Here, random tree species and spacing create informality.

We next pass the Theodore Wirth Chalet, which services the golfers in summer and the skiers in winter. Wirth Park contains a variety of tree types and treatments from the typical landscape architect design to a forest style pine stand.

To the south, in the Eloise Butler wild flower garden, the "Friends of the Garden" wished to donate a nature center-type building. There was concern that it might detract from the natural forest setting. By very careful selection of design and extreme caution during construction, the building was "blended" into the forest canopy, so that it is almost unnoticed.

The parkway system then melts into the "Chain-of-Lakes" portion. It begins on the north end, with the small Brownie Lake maintained as a pristine "gem." Believe it or not, Brownie Lake is only 100 yards from the very busy U.S. Highway 12 running east and west through Minneapolis.

We continue on past Cedar Lake, with its canoers, bathers, and fishermen. It is named for the boundary of Eastern Red Cedars surrounding its shore.

If we travel by canoe, we can pass via a connecting tree-shrouded channel into Lake of the Isles. This was originally a shallow slew. It was subsequently drained and dredged with the dredgings piled into two islands that were planted in native species to create a very naturally appearing wildlife habitat. Again, the urban forest is being used to the advantage of people's enjoyment.

As we come upon Lake Calhoun, we pass the Boat Club "mast" with the floral design prepared by the Horticulture Division. Calhoun is a good fishing lake, and here along the tree-bordered shore we can see a fishing contest underway.

We meander along William Berry Parkway, which holds a blacktop walking path very gently placed among the trees in a wooded section of the park. We emerge onto my favorite area, Lake Harriet. This is the more natural of the lakes where both children and adults can enjoy the tree-covered shoreline. Or they can enjoy a bike ride along a paved pathway carefully placed among the trees.

On the northern end of the lake we again find the formal treatment in the perennial flower garden and rose garden.

Just south of Lake Harriet we cross famous Minnehaha Creek which originates some twenty miles to the west of the City and eventually empties into the Mississippi River in the southeast corner of Minneapolis. The creek meanders through our urban forest and is enjoyed by joggers, bikers, roller skaters, strollers, and canoeists. Along the creek, tree plantings have been used to screen unwanted infringements on its tranquility.

The creek flows past Lake Nokomis, noted for its sailing in summer and its famous speed skaters in winter, and past Lake Hiawatha and one of the six Park-Board-owned public golf courses. It then gently embraces the statue of Hiawatha (the hero of Longfellow's poem) carrying his princess, Minnehaha, across the waters to the park area and pavillion just upstream of the picturesque Minnehaha Falls. From here the creek flows about another quarter mile to the end where it merges with the "Father of Waters."

From here we turn north to follow the West River Parkway along the river to just south of the downtown area where plant-covered stone outcrops overlook the stern-wheeler showboat just upstream from where we cross over to the East River Parkway to continue on to our northeast starting place.

While I have given you a rather "travelogue" type tour, I hope I have emphasized the theme that, although all of these various activities take place in the Minneapolis Park System, it is all done within, and centered on, the urban forest and its many uses. As my final comment, I would like each of you, if you have a chance, to come and look at our program. Remember that in Minneapolis we have Friendly Trees!!!

SECOND NATIONAL URBAN FORESTRY CONFERENCE

SESSION E

PRODUCTS OF THE URBAN FOREST

Tuesday, October 12, 1982
1:00-2:30 p.m.
and
3:00-4:30 p.m.

Moderator:

H. Kenneth Cordell
USDA Forest Service
Athens, Georgia

Speakers:

James Geiger California Department of Forestry Sacramento, California	Utilizing Urban Tree Debris Today and in the Future	167
James Lynch Pennsylvania State University University Park, Pennsylvania	Urban Forestry and City Watersheds	175
	Case Studies	
Gerald LaRue Recreation and Parks Department Dayton, Ohio	Utilization of the Urban Tree: Dayton Case Study	179
Allen Sumrall Trees, Inc. Houston, Texas	Marketing Urban Tree Maintenance Waste Wood	182
Don Richter Urban Forestry Coordinator ODNR Columbus, Ohio	Utilization of Urban Wood Waste in a Small Community	184

UTILIZING URBAN TREE DEBRIS--TODAY AND IN THE FUTURE

James R. Geiger
California Department of Forestry
Sacramento, California

ABSTRACT

We are a long way from maximizing potential to utilize urban tree debris. As new technologies are developed and networking of existing information is improved, cities will capitalize on the opportunity to utilize more tree debris. Communities will benefit by having more products available in the form of manufactured wood products, soil amendments, landscape material, and energy. The majority of tree debris, however, will still require disposal. To achieve total utilization of urban tree debris, a new way of thinking will be needed. The urban tree debris problem must be recognized by politicians, and it must be considered as part of the total waste stream. Only then can new ideas like fiber management be implemented to begin making dramatic advances in urban tree debris utilization.

INTRODUCTION

For years now we have struggled with the problem of what to do with urban tree debris. During the height of Dutch elm disease, the debris problem reached epidemic proportions. Frantic attempts were made to turn the debris into traditional wood products, but most failed miserably. When the country was stricken with an energy crisis, new hope was felt as people and industry turned to this "new resource"--wood. But this, too, has become only an extremely limited use of urban tree debris.

What is the solution? Is there a solution? These are the questions that I want to discuss. I will discuss the potential and limitation of a number of different forest products, as well as management potential for producing these products in conjunction with managing for amenity purposes. The discussion will be limited to street, park, and private trees, since these are of immediate concern to urban and community foresters. However, urban trees are part of the total urban waste stream that should be of concern to all of us, and will be discussed later in the paper.

QUANTITY OF URBAN TREE DEBRIS

According to 1978 estimates (Carr and McGovern 1978), urban waste wood (trees, demolition lumber, and dunnage) totals 16.4 million tons and urban waste paper about 44.5 million tons--a total of 61 million tons of reuseable resources.

Tree debris constitutes a small (5 percent) but very significant portion of this urban wood and fiber waste--about 2.8 million tons annually. However, 85 percent (2.38 million tons) is disposed of in landfills or incinerators. Only 10 percent (280,000 tons) is used for energy and 5 percent (140,000 tons) is used for fiber or other traditional forest products.

This is not a satisfactory level of performance, knowing that our disposal sites and options are rapidly disappearing. We must do better. But in defense of the people who have

worked extremely hard trying to utilize the tree debris, there are some very good reasons why we are currently only utilizing 15 percent. Does it have to remain at this level? I don't think so. We are on the edge of some new frontiers in waste utilization, the potential being 100 percent utilization of urban tree debris.

RAW MATERIAL

Even though tree material is often referred to as a resource, it is first and foremost a waste or debris. It is a result of an activitiy that must occur anyway--thinning, pruning, or removal--and the quantity produced does not easily respond to changes in demand.

Tree debris comes in several different forms: leaves, twigs, and small branches under 6 inches, large branches over 6 inches, and logs of varying shape, sizes, and conditions. Most cities and private tree companies have the ability to chip everything under 6 inches on the street, with small portable chippers. Processing of the large material into a useable product depends on the quality of the material, its soundness, and lack of or presence of foreign material. Processing large material requires more sophisticated and expensive equipment.

PRODUCTS FROM THE URBAN FOREST

Because of the ingenuity and perseverance of many individuals that have viewed this waste material as a resource, quite a number of wood products have been produced from urban tree debris (Association of Bay Area Governments 1981). With recent innovations in the energy and solid waste industries, many additional products are now possible. Following is a list of possible end uses of urban tree debris.

WOOD PRODUCTS--MANUFACTURED

Lumber production involves an operation as simple as a chainsaw mill to a very sophisticated circle saw or band saw operation. It requires relatively straight, crotch, and stub free logs that are not contaminated with tramp metal, concrete, or other foreign material.

Composite wood includes such products as chipboard, particleboard, fiberboard, insulation board, and soundproofing tile. These industries use waste wood in large quantities and are usually located near sawmills and other primary wood operations. They generally need chipped wood that is of one species or a controlled species mix, and free of contaminants.

Paper products include low grade paper for craft and roofing felt. Restrictions on contaminants and percent bark in the chips could be stricter than for composite wood.

Presto-logs are usually made from sawdust and small chips and mixed with a binder or subjected to heat and pressure to produce a small fireplace log. Often located near an operation that produces a steady stream of material.

Craft and Specialty items are often produced for unique purposes such as large statue carvings, totem poles, carving trees, park furniture, and playground equipment. Requires debarked logs, in most cases, and either a weather-resistant or treated wood.

ENERGY

Firewood can be produced from almost any portion of the tree. Processing involves a lot of sorting and handling and is labor intensive. Demand is seasonal, allowing time for stock piling if space is available.

Live Steam. Direct combustion involves combustion of wood in water-walled boilers to produce live steam for processing or space heat. Some systems can accommodate whole logs; other systems require chipped or hogged material. Efficiency and reliability are reduced by high fuel moisture, contaminants, or variability.

Electricity. Cogeneration implies the production of steam, heat, and electricity using a wood-fueled boiler system. A reliable fuel supply is absolutely important and often systems are designed to accept other fuels. High fuel moisture and contaminants will reduce efficiency.

Combustible Gases, Oils and Char. Pyrolysis/Gasification/Hydrogeneration are new technologies that convert wood waste to combustible gases, oils, and char. They accept any type of wood waste. Generally it must be chipped or hogged and free of contaminants.

Methane Gas. Anerobic digestion is the biochemical decomposition of wood cellulose into methane gas, and a liquid fertilizer by anerobic bacteria. Wood debris must be chipped to increase surface area and must be free of non-organic contaminants.

Ethyl Alcohol. Fermentation is the destruction of wood cellulose into carbohydrates by the use of acids. Yeasts are added to produce ethyl alcohol and sludge. Wood debris must be chipped to increase surface area and must also be free of non-organic contaminants.

SOIL AMENDMENTS AND LANDSCAPE MATERIAL

Mulch and Compost result when wood chips are mixed with soil or spread on top to enhance soil conditions and promote healthy growth. Different species of wood have different pH's, and some may even have a toxic effect on the soil.

Sewage Sludge Compost is sludge from sewage treatment plants mixed (1:2) with tree debris in chipped form. The wood chips are used to aerate the sludge as it is composted. Approximately 50-75 percent of the chips can be reused in this process.

Animal Bedding requires waste either in the form of sawdust or fine shavings. Both must be clean and free of contaminants.

Landscape Material includes tree debris in the form of bark, log and branches, chips, or hogged wood. The material can be used as a decorator mulch, delineators for paths or parking lots, or for pathways.

POTENTIAL

The list of products does not suggest that one of these end uses is better than another for utilizing urban tree debris. All of the products have been successfully produced. Some with more success than others.

What is becoming very apparent across the U.S. is that there is not just one outlet for all tree debris. At least not yet. Neither private enterprise nor government is prepared to make that commitment. Diversification seems to have enjoyed the most success recently. The material is just too variable and unpredictable to make it economically viable to produce just one product.

A more popular method employs a number of different combinations of utilization options. There are numerous combinations possible. Some the possibilities are: leaves and twigs--usually composted and sold or given away; small branches--cut for firewood or chipped and composted with leaves or used as mulch or landscape material for pathways and playgrounds; and large limbs and logs--bucked and split for firewood, sold as sawlogs, chipped for fiber or fuel, used as is in the landscape, or left for the public to take.

For some cities these options have resulted in almost complete utilization of their debris. For others they are at least a partial solution to their disposal problem.

Selection of some options requires sophisticated equipment like a sawmill or chipmill which, in many cases, is beyond the capability of a local government. A nearby business or industry is often better able to handle the debris. If one is not available, the equipment that is selected should be as unsophisticated as possible, e.g., a chainsaw-mill, small dimension mill, brush chipper, or splitter. Beyond equipment requirements, a lot of additional problems will be encountered.

The choice of options will depend on each unique set of circumstances. Each city has a different political climate, different resources, and a different set of problems. Listed below are a few areas communities need to consider before selecting their options:

Cost or economic feasibility
Amount of debris
Kind of debris
Community resources or ability to fund chosen option
Type of local users or markets
Knowledge
Experience
Available space

LIMITATIONS

As noted earlier, the utilization options that cities have employed are currently using only 15 percent of the tree debris for some productive end use. A few cities have achieved complete utilization. The majority of cities are still disposing of over half of their tree debris in landfills or incinerators. It's not that this is the choice of these tree managers, but presently it is the most efficient and economical method available. In order for tree debris to join the market place, it will have to compete with the various reuse options which obtain more economical sources of wood and fiber.

Many attempts have been made to utilize tree debris but have subsequently failed. Reasons for failure can be categorized as either economic or political:

ECONOMIC

Debris is highly variable and consists of a mixture of logs, branches, twigs and leaves; logs and branches may have imbedded cabling, bracing and cement; butt logs may

have nails, screws, bolts, etc., and these may be short logs; rotted logs; and logs with excessive sweeps, croaks, crotches, and limb studs.

Additional equipment and personnel are required to sort useable material.

A separate operation must be sustained to dispose of debris with metal, debris that is of inappropriate size or shape, or debris that is unsound.

Excessive downtime for repair to equipment that strikes foreign objects during processing results in lost time.

Year round quantity of debris is not constant and does not lend itself to reliable predictions.

Debris is often composed of many different species.

Some utilization operations are very labor intensive, e.g., that for firewood.

Land to store debris or processed product often does not exist or is very costly.

User demand is often seasonal.

Debris usually has a high moisture content.

Some users require a low percentage of bark.

POLITICAL

Public resistance may be encountered to installation and/or operation of a utilization facility in a particular neighborhood.

The utilization facility, storage operation, or transfer facility may create excessive noise or air pollution.

Transportation of Dutch elm diseased logs may be prohibited across political boundaries.

Incumbents may not want controversial changes to occur during their term in office.

Tree ownership may not be properly established for street trees, i.e., homeowner or city ownership.

Public support for the utilization project may be poor because adequate public education is lacking.

The use of a new utilization option has not been properly "sold" to the administration.

The timing may not be right to compel political forces in the public and private sector to unite and initiate, or lobby for, a new utilization option.

Users do not feel responsible for society's problems and will be reluctant to accept tree debris unless it is profitable.

The issue of public liability regarding access to city property has not been properly addressed, e.g., firewood cutting.

MANAGING FOR END USES--THE REALITY

Beyond both the economic and political limitations of utilization is the real issue that is facing our profession today--is urban tree material a waste or a raw material resulting from production management? I contend that it is debris--waste material that is a result of activities that must occur anyway.

As urban and community foresters, our objective is to manage the urban forest for the greatest number of amenities and resultant benefits of urban trees. The products or end uses are just a result of that management. They are not our primary objectives, as in forest management.

It is unlikely that there are many urban forest situations (large metropolitan parks or open space) that will allow us to manage on a rotational basis. Most cities are faced with street trees and neighborhood parks. Can you imagine selectively cutting street trees or a grove of park trees because they have reached financial maturity? You'd have a lot of outraged citizens, to say the least. Citizens are not ready for that kind of progressive urban forest management.

Instead, we should be asking ourselves, how can we best manage the flow of debris? It is important to know:

How much debris you have now.

How much debris you'll have in the future.

Where the debris is now.

Where the debris will be in the future.

How to retrieve it.

Some of this information may already be on hand or can be satisfactorily predicted. Or an inventory may be needed. The inventory should include some factor that will help predict the approximate date of prunings, thinnings, and removals. Some sort of hazard rating or estimate of condition may also be needed.

This kind of information will facilitate better planning for planting, thinning, and removal activity and achieve a more homogenous uneven-aged forest. The flow of debris will then be fairly constant from all areas of the city and fairly uniform through the year. This will go a long way towards improving the efficiency and effectiveness of operations such as improving personnel scheduling procedures and reducing transportation costs.

By using this procedure, we have not lost sight of our objective (managing the urban forest to maximize the amenities and benefits of trees) without scheduling removal of trees prior to the end of their useful life. What we have done instead is smoothed out the flow of debris and made it more predictable. This in turn will create a more "competitive edge" in terms of marketing tree debris as political and economic problems are overcome and more utilization options become available.

FUTURE PROSPECTS

There are still some major problems ahead in terms of utilization of a greater percentage of the urban tree debris:

Profitability is still marginal, if not questionable.

Politicians do not view the urban tree debris situation as a problem.

Solid waste administrators do not view urban tree debris as part of the total waste stream.

We have a lot of "divided camps," and until we all (individual families, garbage collectors, mayors) start working together, we are not going to make much progress.

As a nation, we are in for some serious solid waste disposal problems in the future. Landfills are filling up rapidly, and new sites are scarce. We need to "get off the dime," and the name of that game is recycling. And I mean everything; but we have to think and act together. We need the expertise of the solid waste and cogeneration industries, and they need our expertise. It is beginning to happen, but until we all begin to think recycle--beginning at the neighborhood level--we are not going to see much progress.

What can happen? With fairly accurate debris flow predictions, we can begin talking about urban trees' debris as part of the total waste stream. As mentioned previously, we are on the edge of some new frontiers in the energy and solid waste industries. This may be the "spark" that is needed to compel the political forces to unite. New technologies would appear, and some of the nation's solid waste problems, at least, will be solved.

In the interim we will see several things occur:

A slight increase in urban tree utilization will occur. More options will be explored, and more options will be put to use. But a dramatic increase in utilization is not likely.

Wood will become more profitable for use as a fuel. Industry will convert to cogeneration facilities and accept clean chips or hogged material. Some may even process material at their site, combining your disposal with their utilization. A dramatic increase in utilization will not occur.

Landfill site production will increase. Landfill operators or other private contractors will produce all types of wood products from urban tree debris, manufactured wood products, energy, or soil amendments, and landscape material--or they will sell the material to appropriate primary producers. The type of material they produce will depend on local market conditions. The incentive in this case is that they are being paid to accept the material at the landfill. There operators will disappear as landfills are closed.

In the future, disposal options for solid waste will diminish, unity among political forces will occur, and public acceptance of new technology will be achieved. We will then be ready to attempt new ideas:

Fiber Management. The entire waste stream of wood and fiber will be managed by a new recycling technique called fiber management. Sorting will begin at the household or demolition site. The incentive will be either law or profit, profit being most desirable. The various utilization techniques that will be employed will depend on each city's unique set of circumstances but could range from lumber to energy to sewage sludge composting.

Satellite Utilization Facilities. These facilities will most likely be operated in conjunction with fiber management. They will be neighborhood facilities to produce steam or electricity for nearby industry or institutions. The facilities will be designed to have minimum impact on the neighborhood. They will accept the remainder of the waste, following separation from all recycled material. By locating satellite facilities throughout the city, transportation costs are reduced dramatically.

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URBAN FORESTRY AND CITY WATERSHEDS

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ABSTRACT

Urban and suburban encroachment upon forested watersheds is creating many new environmental problems. Additionally, demands for all uses of forested watersheds are increasing. It is now evident that in most of the U.S., water has become a scarce resource. Urban forest resources must be actively managed to ensure maximum water yield and water quality. The idea that "no management is the best management" on a municipal watershed in not only illogical but quite costly. But such management must provide for aesthetic, cultural, recreational, and economic benefits, not merely water supply.

INTRODUCTION

Throughout the U.S., surface water from forested watersheds serves as a primary source of domestic and industrial water supplies. Virtually all components of society are affected by these supplies. Not only is man's life totally dependent on an adequate supply of high quality water, but so is the basic structure of this society. Water quality and supply influence local and regional development and can exert a significant impact on the functioning of local communities and economies, especially where industries that use large quantities of water are involved.

Urban and suburban encroachment upon forested watersheds is creating many new environmental problems. This is particularly true where surface and ground waters come in contact with solid or hazardous wastes. In addition, recreational habits of urban populations are strongly water-oriented, with the conflict between water supply and recreational uses of water creating an especially critical area of concern. The incorporation of watershed land management as a basic and integral function of water resources planning and development is of primary importance.

OUR WATER RESOURCES

Before going much further, it would be appropriate first to look at our water resources. As a whole, the nation has abundant water resources. On the average 30 inches of precipitation fall on the conterminous U.S. each year. Of this amount, 8.3 inches, or about 1200 billion gallons daily, flows to the oceans or is consumed by domestic, agricultural, or industrial activities. However, our nation is less fortunate in the distribution and timing of the water resource. Only a portion of the potential 1200 billion gallons per day can be developed for beneficial use. With existing surface storage, and because of the effects of regional precipitation extremes that cause floods and droughts, only about 50 percent of our average annual streamflow is considered available for use in 95 out of 100 years. Excessive groundwater extraction and impairment of water quality by pollution further reduce the amount of water available.

With ever-increasing demands being placed upon our limited, and I must emphasize limited, water resources, it has become evident that in most of the U.S. water has become a scarce resource. Scarce in the sense that one use will affect other uses and that periodic shortages can occur. The frequency of these shortages will increase both spatially and temporally. It now must be recognized that competition for water is a fact, that trade offs must be considered seriously, that in some cases there must be restrictions on use and, in some cases, on urban development. Water is no longer the "free commodity" that once was taken for granted. Competing uses coupled with associated environmental and in-stream flow requirements have resulted in severe basin wide and local problems in many parts of the U.S. These problems can only intensify during the next couple of decades. If we are to avoid the harsh realities of dwindling water supplies and quality, and the resulting impact on economic growth, we must take action now. New sources of water may be made available by such techniques as cloud seeding, desalting of saline water, augmenting fog drip, creation of artificial ice fields, snow avalanching, and others. But these techniques offer no immediate solution; conserving existing resources does. One way conservation can be accomplished is by vegetation management of our urban forest to reduce evapotranspiration. I am by no means suggesting that forest management is our only answer. Forest management provides no cure-all. It is, however, a beginning.

The potential for managing municipal watersheds and the pressures for improved management differ widely across the nation. Nevertheless, our prime concern in managing municipal forests with respect to water is to increase water yields and to enhance and protect water quality. Both timber and water resources are hydrologically compatible with one another.

MANAGEMENT FOR MAXIMUM WATER YIELD

Research has shown that water yield from forested areas increases as evaporative losses are reduced; therefore, the maximum possible increases from forest cutting are obtainable by some form of clearcutting. First-year increases after clearcutting have ranged from 1 to about 18 area-inches. How long these increases in water yield persist depends of the rate of regrowth, which differs widely among regions and vegetation types. Nevertheless, it has been estimated that potential increases in water yield could meet projected shortages if all forests in the Northeast were managed on an even-aged system. Such a management scheme is highly unlikely; in fact, I can not recommend it, nor can I conceive of any situation (at least in the East) where we would completely harvest an urban forest watershed for the sole purpose of increasing stream discharge. However, forest management for maximum water yield may deserve major emphasis in snowpack zones, for there yields are high, as are the potentials for affecting the amount, timing, and duration of water yield. The snowpack zone is an important source of streamflow in both the Northeast and the West, but the potential for management to increase water yield is much greater in the West.

Another item that must be considered in managing for water yield is the timing of increased yield. Unless increased runoff can be delayed, as is done in some Western watersheds, or stored until periods of shortage, the management objectives will be unsuccessful. Furthermore, the amount of increased yield is closely related to the amount and distribution of precipitation. Consequently, the largest increases in runoff following forest management occur during wet years, when water shortages are unlikely. Conversely, during periods of drought, much smaller increases are likely, while the demands are greater. Considering these facts, the only sensible approach for managing

urban watersheds is one of multiple use. That is, the management of the forest simultaneously for timber, water, wildlife, recreation, and other uses while keeping in mind that the primary resource from the watershed is water. Research has clearly demonstrated that the timber resource can be managed without degradation of water resources. To ignore either of these resources is unwarranted. The idea that "no management is the best management" on a municipal watershed is not only illogical but also quite costly. In view of the economic conditions of many of our communities, it only makes sense that we utilize all of our available resources, including timber.

MANAGEMENT FOR MAINTAINING WATER QUALITY

Recent federal and state legislation has given top priority to management for water quality. A particular concern has risen about nonpoint sources of deterioration of water quality, such as might be associated with forest harvesting. Water quality parameters subject to management could be any or all of those listed in the drinking water standards, but the ones of most interest from a forest management point of view are turbidity, suspended sediment, nitrate, and temperature. It has been estimated that 80 percent of the deterioration in water quality is due to suspended sediment, mostly from soil erosion. Within a managed forest most of this sediment can be attributed to road construction, including skid trails and log landings.

Pollution from these areas can be prevented or greatly curtailed by simply applying the best management practices available. Such practices include the use of buffer zones along perennial and intermittent streams, restrictive logging during wet periods, proper road layout, and construction and retirement. The techniques are available, it is only necessary to apply them.

Another use of urban watersheds that is becoming more and more important is recreation. Although it is impossible to discuss all the potential ramifications of increased recreational use on urban watersheds, it must be recognized that these forests, by virtue of their geographical location with respect to urban communities, are viewed by recreationists as an oasis in a metropolitan area. Although recreational activities such as hunting, fishing, hiking, and picnicking are frequently allowed, public pressure to open these areas for water contact sports is great, as is the potential for adverse effects on water quality. Public water supplies should not be used for water contact activities. If they are, complete water treatment should be a minimum prerequisite. It is easy to say that when contamination occurs, the water purveyor can add to the level of treatment. But this assumes that the monitoring is frequent enough and that the treatment process available is adequate to handle the problem.

To maintain the character of the watershed consistent with its primary function and to safeguard public health, it is essential that arrangements be made to supervise recreationists properly, as well as to provide sanitary conveniences and garbage disposal. Management of the quality of water from our urban forests must rely on an appraisal of present and potential uses of water and on how these uses would vary with different characteristics of water quality. In addition, changes in water quality that can be achieved by alternative management systems and the value of resulting water uses must also be assessed.

SUMMARY

The concept of protecting our drinking water supplies by management of the source area is not new. However, it is often misrepresented by those who seek to equate this concept with isolation and inactivity in the watershed. It is obvious that isolation is impractical, with our large populations and the resulting demands for forest products and public access to forested areas. Urban forest managers, particularly municipal watershed managers, are going to have to provide these amenities, along with the basic water service. It is not enough to merely supply water; it must be supplied in a manner that maintains a quality environment where aesthetic, cultural, recreational, and economic values are concerned. The management opportunities and challenges are there; can we make it happen?

UTILIZATION OF THE URBAN TREE: DAYTON CASE STUDY

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ABSTRACT

The City of Dayton, Ohio truly utilizes the urban tree. Tree trunks that are of good quality are sold for veneer or saw logs, the limb wood, and defective trunks are split into firewood, the leaves are collected and composted, and small limbs and branches are clipped. Firewood is sold to the citizens at a nominal fee, and wood chips and compost are given away at no charge. Revenues are used to purchase needed equipment for forestry operations.

INTRODUCTION

During the '50's and '60's, the City of Dayton, Ohio burned the trunks and large limbs resulting from their forestry operations. This wood was transported to dumps located within the city limits. The smaller limbs and trunks were chipped, and the chips were piled at the Division office. The chips were given away to anyone who wanted them.

In the early '70's, the City was told that they could no longer burn the debris from forestry operations. The Forestry Bureau investigated the purchase and installation of a Smoke Destructor-type incinerator. At the same time, it was announced that the county was building two large incinerators, and that would take care of our problem. The city decided to pay a landfill company for dumping privileges until the county incinerators were completed. This decision increased travel time and reduced production time, but was relatively economical for dumping charges. The greatest problem occurred during heavy night storms when the dump was closed and we had to rehandle the debris.

In 1971, the Forestry Bureau was abolished due to an austerity program. The handling of emergency tree tasks due to storms, wind throw, and automobile accidents was contracted out to a private tree company. This company was responsible for disposing of the debris. The few limbs that were removed by Park crews were disposed of at a Street Maintenance dump and allowed to rot. The private removal contract only lasted about a year and a half because it was not successful. Limbs were lying in the streets several weeks after a storm, hangers were left in parks, and the costs incurred by the City were very high as compared to the earlier in-house operation. Consequently, the Division of Street Maintenance was given the responsibility for emergency removal of storm debris.

The Division of Street Maintenance again contracted with private dump sites to dispose of the wood. This was done to keep city landfill areas safe for future construction and to reduce travel time. Also, the county incinerators were not built to handle logs and limbs.

In 1974, the Division of Parks was allocated three positions to maintain the park and boulevard trees. This city park crew was removing trees which contained good wood, some of veneer quality. A decision was made to stockpile this type of material in the

winter months. It was declared surplus and sold to the highest bidder in the very early spring. The rest of the wood was still hauled to a private dump. By this time, the dump price has risen to $7.50 per ton.

In 1975 and 1976, a proposal was made by the Division of Parks to allow them to produce firewood from the wood being dumped. This firewood would be sold for a nominal fee. The Superintendent of the Division was told not to pursue the proposal. The wood was dumped at local private sites at a cost of $35.00 per load.

PRESENT SITUATION

In 1978, a new Superintendent was named to head the Division of Parks. The firewood idea was again proposed and, after checking it out, the Superintendent agreed to the project. He was given the authority to keep any proceeds to purchase forestry equipment, instead of returning the proceeds to the General Fund. Using a homemade wood splitter, welfare recipients and Division employees, on inclement days, split 200 cords of wood. In October 1978, the Division announced its first firewood sale. It was "hyped" as a family day outing to pick up firewood. The rules were simple: one cord per family, $50.00 per cord in cash or certified check; stand in line to get a ticket for purchase; pay before noon on sale day; pick up wood that weekend or during regular work hours the following week.

The tickets for purchase were to be given out starting at 7:00 A.M. At 6:00 A.M., the police had called the Superintendent to tell him that there was a massive traffic jam around his office. Cars and trucks were lined up for several blocks. At 7:00 A.M., the tickets for the 200 cords were passed out, and all the wood was sold by 7:10 A.M.

The people had a wonderful time in line and picking up the wood. They brought VWs, vans, pickups, trailers, and small sport cars that could only take a wheelbarrow load a trip. Everyone had fun and enjoyed the experience.

We have continued this project since then and have gotten over $60,000 for purchase of new equipment--a new wood splitter, chain saws, chippers, and some equipment for the other sections.

The use of Welfare recipients to produce the firewood, along with utilizing non-productive time of Division employees, keeps us in the black. The big plus is citizen satisfaction. They see us as saving their tax dollars in dumping fees and travel time, and giving them an opportunity to purchase firewood at a reasonable cost, all while having a good time.

The city continues its complete utilization of the urban tree by collecting leaves. These leaves are hauled to an area and dumped in long rows piled about 8 feet high. The leaves are allowed to decompose naturally over a two-year period. The resulting compost is given back to the citizens for use in backyard gardens, flower, and shrub beds. This project has been in operation since 1975. It is extremely popular; people have hauled off all the compost offered.

The limb wood too small for firewood is still chipped, piled, and given to the citizens. The Division still sells veneer wood if any quality trees are wind thrown or diseased and can be cut before they lose their quality.

RECOMMENDATIONS

The Division has gained useful knowledge during the firewood operation. I would like to pass on a few recommendations to anyone wishing to start such an operation:

1) Make certain that the firewood and possible income does not deter you from doing the primary jobs the citizens expect you to do.

2) Use free labor or non-productive time to manufacture the firewood.

3) Have crews save all wood big enough for firewood. They have a tendency to throw a lot of wood that could be split into the chipper.

4) Get an agreement with your Office of Management and Budget to keep any resulting revenues for equipment or other needs.

5) Sell the idea by highlighting its benefits: energy conservation; use of a renewable resource; citizen involvement; and satisfaction.

6) Don't sell more wood than you have produced.

MARKETING URBAN TREE MAINTENANCE WASTE WOOD

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ABSTRACT

A search for alternatives to the landfill disposal of urban tree residues by Trees, Inc. has lead to a consideration of feasible options. A cost/benefit ratio must be worked out for each option, but one conclusion is that the energy crisis in this country, combined with environmental constraints on landfill operations and increased property values, will make fuel wood chipping an attractive way of turning wood waste into a marketable product.

In the Houston area, Trees, Inc. had been disposing of the residues from its utility line clearing and residential tree care operations in a landfill that it owned and operated. As this landfill became filled, the company searched for alternatives to dumping the approximately 115 tons (30,000 tons annually) of residues to be disposed of daily. To this end, a study was funded by the Center for Energy and Mineral Resources at Texas A&M University. Researchers from the Forest Science Department of Texas A&M conducted the study to determine if chipping the residue and selling it for fuel was both economically feasible and energy efficient.

Trees, Inc. has been in the business of total tree care for 30 years and is the fourth largest tree care company in the United States, employing more than 1,100 people. In Houston alone, there are 125 crews involved in utility line clearance and residential and commercial tree work. It is the material generated by these crews that was to be considered by the project. C.L. Benge, owner and CEO of Trees, Inc., and myself as Manager of Special Projects, were instrumental in encouraging and developing the innovation that brought about this study and the successful completion of turning thousands of tons of wood waste into a marketable product.

Because Trees, Inc. had already purchased a 75 inch Log Chipper that was not performing to expectations, the options explored in the study were to:

1) Continue to chip but improve on the process;

2) Use public landfill;

3) Purchase and operate new remote landfill;

4) Explore use of this residue for other products.

The data were collected assuming the existing landfill site, now the Waste Wood Recycling Plant, would be the concentration site for material to be processed for each of the options.

A market for the processed chips as fuel was found at a paper mill 80 miles east of Houston. The mill contracted to buy all of the chips that Trees, Inc. could produce. Therefore, if production could be improved enough to stay within the boundaries of the 10 acre landfill site, this option would be more than sufficient.

Due to the cost of property for a new landfill site plus the increased mileage rates (based on greater fuel consumption and overtime for drivers), this option was proven to be unfeasible. The public landfill was also proven to be more costly based on fees alone, which would have run in excess of $250,000, more than the "inefficient" chipping operation.

It should be noted that all costs of whatever disposal method was decided upon would be absorbed by the local power company who assumes responsibility for disposal costs.

In conclusion, Trees, Inc. alternatives and selection criteria indicate that it is feasible, from both an economic and energy point of view, to convert urban wood waste to energy (fuel). As the nation's energy needs become more intense, and with environmental constraints on landfill operations and increasing property values, the fuel wood chipping alternative will become even more attractive.

Trees, Inc. is continuously studying and investigating improved machines for fuel wood production.

UTILIZATION OF URBAN WOOD WASTE IN A SMALL COMMUNITY

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ABSTRACT

Lack of disposal space and rules and regulations against open burning have made utilization of urban wood waste an important part of the urban forester's job. Although the increasing demand for wood fuel has created an opportunity for disposal, equipment breakdown, sorting unusable debris, and increased captial and operating costs must be evaluated before embarking on a debris disposal program.

The utilization of urban wood waste has become a very definite part of the urban forester's job. It used to be a fairly simple task where roundwood, trimmings, and stump debris were easily disposed of in landfills or by open burning. Lack of space, and rules and regulations against open burning, no longer permit easy disposal.

The increasing demand for wood fuel for energy production is currently receiving considerable attention in urban areas for several reasons: (1) Tree debris and other wood residues must be collected and therefore possess a negative value because of disposal costs; (2) Wood possesses fuel characteristics similar to coal, except wood contains less sulphur pollutants; and (3) Utilizing wood and wood wastes for fuel can use existing technology and commercially available equipment.

There are limiting factors, however, and these are brought about by the combined effect of: (1) Parkway tree characteristics; (2) Community impact; (3) Maintenance practices; and (4) Removal practices. The program which must remove the entire tree involves removing: (1) A mixture of logs, branches, and brush; (2) Debris with imbedded metal of all sorts (concrete, bracing and cabling, limb stubs, etc.); (3) Butt logs and top logs with sweep and crook; and (4) A host of other undesirable characteristics. The effects of these limiting factors create equipment down time, a need for sorting out unused debris, additional capital costs, lost time, and high operating costs.

SECOND NATIONAL URBAN FORESTRY CONFERENCE

SESSION F

ENVIRONMENTAL EDUCATION AND INTERPRETATION

Tuesday, October 12, 1982
1:00-2:30 p.m.
and
3:00-4:30 p.m.

Moderator:

Ruth Allen
American University
Washington, DC

Speakers:

June McSwain American Forest Institute Washington, DC	Process and Design for Successful Environmental Education Programs	187
	Case Studies	
Charles Lewis Morton Arboretum Lysle, Illinois	Nature City	192
Page Burt Cincinnati Nature Center Cincinnati, Ohio	The Cincinnati Nature Center	*
Henry Thomas Urban League Springfield, Massachusetts	The Camp Atwater Experience	196
Donna Szuhy Ohio Department of Natural Resources Columbus, Ohio	Project Learning Tree - Ohio's Success	200

*Paper not included.

PROCESS AND DESIGN FOR SUCCESSFUL ENVIRONMENTAL EDUCATION PROGRAMS

June McSwain
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ABSTRACT

Those who will be using environmental education programs should be involved in their development, design, and implementation. The users should be supported by subject matter experts and major segments of society -- citizen organizations, government, business and industry -- that have a strong interest in the subject.

To determine effectiveness, evaluation and monitoring strategies should be a part of the program material and implementation design. The process should be a spiraling one of continuous feedback, modification, revision, and change that allows for the program materials and implementation strategies to remain current.

INTRODUCTION

In 1973, American Forest Institute awarded a grant to the Western Regional Environmental Education Council for the development of a kindergarten through grade 12 comprehensive, supplementary environmental education program based on the forest resource. The process used to develop the materials and implementation strategy for the program, entitled Project Learning Tree, is basically patterned after the one included in the "Guidelines for Development and Use of Environmental Education Materials, Programs and Activities" of the Alliance for Environment Education. Although the process explained here is primarily for school systems, it can also be used successfully for programs designed for other audiences.

THE BASICS

As any program progresses through its embryo stages, the audience, goals, and objectives are defined and redefined. When these become clear and are agreed upon, and the program is seen holistically, audience (the users) should become an integral part of the program's development, design, and implementation. The scope of the program will, of course, indicate the breadth of the development, review processes, and implementation strategy.

If the program is designed for use in the classroom, outstanding teachers, curriculum subject area, grade level specialists, and university faculty should participate in the development and implementation stages. They are the most knowledgeable about the age level capabilities of children, relevant subject matter, and how students learn.

The final design of materials can determine the success or failure of a program. Educators can identify the best context for the content and identify specific information that should be highlighted for teachers and students.

Some materials may be unique and take special talents, but for most projects, authors can be found within the education system. Writing conferences and workshops are useful for developing rough manuscript material.

Administrators at the local level and at state departments of education can be helpful in identifying those individuals with a talent for writing for youth. They can also identify school systems and classrooms where new materials might be tested. Administrators, too, can encourage teachers to use new materials after they have been reviewed, tested, and revised.

Even though a program may be developed for schools or youth groups, chances are the topic will be of interest to some citizen organization, government agency, or business. Involvement of these segments of society can bring a broader range of viewpoints to the topic.

Acceptance and establishment of a network of people begins to take shape when schools, subject matter experts, interested organizations, government agencies, and people in business are involved in the development and design of programs, either directly or through the review process.

EVALUATING AND TESTING FUTURE PROGRAM MATERIALS

Regardless of the target audience, some program material evaluation should be done to determine the product's acceptance and usefulness before final production. Usually this calls for feedback from limited implementation and/or comments and reactions through a review process. The type and extent of evaluation and testing needed is best set in concert with the users. Usually, evaluation and testing is needed for both content and design.

If the method of evaluation is one acceptable to the user audience, and the results are positive or lead to basic changes to strengthen the program, the evaluation can be a valuable asset to acceptance and use by the target audience. Indeed, in the case of school systems, evaluation and testing is a "must."

REVISION

Evaluation and testing of content and design usually dictate changes to the copy and context of the material developed. Revision is a vital step to be taken before final production and full implementation of the new program.

IMPLEMENTATION

After the writing, evaluation, and production of program materials have been completed, implementation on a larger scale can begin. Implementation planning, however, should have been a part of the project from the very beginning.

Traditionally, in the United States, education is the responsibility of the states. If a program designed for school systems is broad in scope and is to have other than local use, the environmental education coordinator at the state department of education is one person that should assist in the introduction and implementation of an environmental education program. Certainly this person should be one of the administrators identified early-on as part of the project development team.

In these days of tight budgets, people identified as subject area specialists have, in some cases, had a change of responsibilities, but for the most part each of the states has someone in the department of education responsible for environmental education. Most environmental education coordinators are interested in good quality material to enhance the curriculum already in place in the classroom.

Administrators can be an important key to implementing programs in the school systems. If they have been part of the development, evaluation, and implementation planning process, they would, of course, already have knowledge of the program. In fact, they may by now be good "salespersons" for it.

The network of those knowledgeable about a program grows at each stage -- development, evaluation, and implementation. Generally, all those involved will have some degree of ownership in the program and an interest in being part of broader implementation.

THE SPIRALING PROCESS

Evaluation should be built into program implementation to allow feedback on effectiveness and acceptance of the materials.

Users should be encouraged to adapt the materials to suit their situations. Often they are eager to share these adaptations through a feedback system -- providing information such as: how they've used the materials; if the materials worked or didn't; if the implementation strategy helped them use the materials more effectively; etc.

In addition, users will often indicate new ideas that, if added, would enhance what is already available. Thus, information gathered from feedback provides input for another round of the process -- writing, evalutation, revision and widespread use -- so that the spiraling process continues to keep the program and implementation strategy process current, growing, and enriched. And keeping in touch with the audience who is using the program encourages its continued use.

Like anything that is worth doing, such a process can be exhausting and it is not problem free. But it can be fun and exhilarating as various people who are part of the network build a strong base of support for environmental awareness and, although their backgrounds may be different, become a team working together for a common goal.

PROGRAM CHARACTERISTICS

Programs, particularly those developed for school systems, are generally more acceptable if they supplement required textbooks and other materials used in the classroom -- that is, if they fit in, strengthen and enrich what is already being taught. Like all of us, teachers are busy people and they have difficulty finding time for another "course," but they may be open to new ideas and approaches. The materials developed should motivate teachers to teach and students to learn; they should be fun.

People learn in different ways. Some learn better if the subject matter is treated visually, some if it is treated verbally, some tactically, and, certainly, all are enriched by variety. Materials designed for any group should be in a form that is adaptable, allowing for individual creativity.

Often, the goal of those who design classroom materials, particularly those who are not regularly part of the education scene, is to impart particular facts to those who will be using the program. Even if the absorption of the facts results in an A+, most probably at

the end of 12 months the same material tested again would rate a failing, or close to failing, mark. However, if these facts are part of a process to develop skills in acquiring, communicating, critically analyzing and applying information to problems and then resolving those problems, even though the retention of the facts might not be any higher after 12 months, the skills and attitudes developed toward the subject studies would probably still be in the A to B levels. Thus, facts can be most useful as a means to an end, rather than an end in themselves. They should, of course, be a part of a learning situation that helps students learn how to learn.

To quote Rudolph J. H. Schafer, environmental education consultant, California Department of Education,

> "The most effective environmental education programs emphasize student interaction with the natural and social environment...The social processes through which people make and implement environmental decisions -- government, law, economics, communications and others -- are...best studied in the community where they operate, and educators are urged to make full use of such local learning resources." (Project Learning Tree 1977)

Interaction and experience with the world around them helps young people understand the way the world works biologically, socially, and culturally. Interaction and experience with new program materials in workshops helps teachers understand how these materials will work in the classroom.

Materials should be objective. If bias is involved, it should be clearly stated. This is particularly true of material for the classroom.

So, programs and materials should be:

- acceptable
- supplemental
- enriching
- motivating
- adaptable to a variety of teaching and learning styles
- assist people in learning how to learn, not what to learn
- full of involvement and experiences
- objective
- and fun.

There are those who argue that there will be differences between the future attitudes and values of America and the people who take part in our democratic experience. Ours will be a world of high technology and a society that is more caring about the planet and the quality of life.

Even now, decisions related to our environment are hard ones to make. Will it be use, will the use turn to abuse, can we tell now or will the telling signs come much later -- perhaps too late? Will it be preservation with resources basically locked away with limited acess, limited use, with perhaps the opportunity to study the world in a close-to-natural state? Or will it be somethere in between?

Decisions related to our planet become more difficult and more precious as resources become more scarce and the world's population grows larger. The hard resource decisions of the future will be made by those now in the classrooms. To be prepared they need information, but they also need skills to process that information and make reasoned

decisions that, in their judgement, will be the best for them and the planet--decisions based on information, rather than emotion.

A process for developing programs that involves future users, those who understand how learning takes place, can result in programs that can prepare students for these hard resource dicisions. The involvement of others in the community with an interest in the subject or resource can strengthen support for the program by sharing a diversity of viewpoints and sharing common concerns about the future of our planet.

REFERENCE

American Forest Institute. 1977. Project Learning Tree. AFI, Washington, DC.

NATURE CITY: TRANSLATING THE NATURAL ENVIRONMENT INTO URBAN LANGUAGES[1]

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ABSTRACT

Most school and youth groups that come to the Morton Arboretum are from surrounding suburban communities. The techniques used to teach these youngsters about the outdoors are not always effective with groups from the inner city. A number of approaches have been used by our staff and teacher-guides, including variations of the one described here, to serve this segment of the population adequately.

"Hey, man -- are there lions and tigers in there?"
"How about bears?"
"...or snakes?"

Twelve teen-aged boys looked apprehensively at the forest, not sure whether they wanted to enter. It was their first visit to the Morton Arboretum, and the formidable jungle they faced was a peaceable patch of woods on the West Side -- hardly cause for such uneasy feelings. But for these boys, residents of a nearby juvenile correctional center, the forest was not part of their common experience. The inner-city landscape with which they had grown up consisted mainly of asphalt, brick, stone, and concrete -- with only weeds, grass, and a few trees for vegetation. They knew and had learned to contend with the threats inherent in that environment, but the forest was unfamiliar; its dangers could only be imagined -- and feared.

When I joined the boys for their visit on this early June day, I had been thinking about ways to help them perceive something of the elements and systems at work in natural outdoor communities. Because their cultural frame of reference had been formed by the urban environment, I thought it might be effective to point out functional and organizational parallels between natural environments and the city, using familiar urban terms to identify elements of the natural landscape. Perhaps they could understand the natural world better by thinking of it as another kind of functioning "city." Not quite sure whether or not this approach would work, I decided to try it, letting the boys show me the way.

Even as the boys introduced themselves and shook hands with me, they began to teach me, for the handshake was different from any I knew. Instead of grasping the lower part of my hand with their fingers, they grasped the top part of my hand with fingers circling my thumb. I did the same. I later learned that this is the soul-brother handshake, a sign of friendship and solidarity in the black community. I must admit that it transmits a greater sense of personal contact than our more genteel way.

To ease our first meeting and to become better acquainted, I explained that I had come here recently from the East and asked them to help me become acquainted with their city. What was it like? Was it crowded full of tall buildings, or were there many parks? What were their houses made of? Was there any vegetation where they lived?

Next I began to ask about how things were transported in the city. How did they get water? The first answer was, "Turn on the faucet," but after a little further probing I learned that water came into the buildings through pipes that were under the streets. Was there anything else under the streets? "Other pipes." "Wires." "Tunnels for automobiles." What happened to water after a rain? "It goes down the sewer." "It goes down pipes." Where did the pipes go? "Underground." "To the sewage plant." What about garbage? "Goes into garbage cans." Then what happened to it? "Sometimes we knock the cans over." (Laughter) "The garbage man takes it away."

I wanted to know something about the communities in the city, too. Was the city all the same? "There are different neighborhoods." What made them different? "Other kinds of people live in them."

As other questions followed, the boys -- in providing my orientation -- focused their attention more and more on the physical aspects of their city. I recapitulated their description of the city -- what it looks like and how it works -- and thanked them for helping me understand more about where they live. Then I announced that we were going to visit another city: Nature City. After I assured them that we would encounter no bears, tigers, lions, or poisonous snakes in this "city," we set out.

Our first stop was a pond, rich with many forms of life. I asked the boys if they could figure out who lived in this pond neighborhood. They noticed the iris and the cattails around the edge, the many plants growing in the water, and the dragonflies. No one saw a turtle, and it took a concentrated search to locate the two eyes of a dark green frog, peering above the water. As soon as one was discovered, bedlam broke loose! "Can we catch one?" "Can we take him home?" Yes, they might catch one if they could. Take it home? Well -- I wondered aloud how they would like it if someone came into their house, took a look at them, said, "Hey, you look interesting. I'll take you!" and then grabbed them up and took them away. There was silence; the impact was obvious. I told them that many kinds of creatures lived in Nature City and, like the boys, wouldn't want to be taken away.

As the boys got the message, a rule was established: all things found in Nature City had to stay in Nature City. We could look at them, perhaps pick some of them up, examine them under a hand lens, but everything had to be replaced and not taken away. This seemed reasonable to the boys and was an effective lesson for the rest of our trip. I made a mental note: the pond neighborhood with its lesson would be the first stop on all future visits to Nature City.

Next we followed a path into the woods, and looked overhead at the lush foliage of oaks and maples. I asked the boys what happened to the leaves on the trees in the fall. "They fall on the ground." Did anyone take them away? "No." Well, if they fell on the ground every year and no one took them away, why weren't they piled up higher than our heads? What had happened to them? Again there was silence. Did they remember what they had said about garbage in their city? Well, then, did Nature City have garbage men? If so, who were they and were would we find them?

This was quite a question. I suggested we begin finding out by examining the layer of leaves on the ground, removing leaves one by one. Soon we discovered some leaves with holes in them. How did the holes get there? "Bugs ate them." "And worms!" We continued removing leaves, and we began to find insects. "Man, look at that bug!" "Kill it, quick!" I stopped the execution. Wait a minute -- why should we kill it? Was it hurting us? What was it doing? There was a thoughtful pause. "I guess he is eating the leaves and stuff on the ground." So, who was he in Nature City? "The garbage man!" came the chorused reply.

From that point on, everyone's eyes were focused on the miniature world found on the forest floor, where we discovered a whole host of nature's garbage men working in leaves, twigs, and rotting logs. We picked up many of them and examined them closely through a hand lens. The magnified world provided an endless source of interest, and by the boys' own initiative it soon became routine procedure to look at everything new through the hand lens. The person given charge of the hand lens was recognized as having a position of status!

At about this time a subtle shift in emphasis took place. I found that I was no longer asking most of the questions, because the boys were exploring everything they could find, asking their own questions, and leading me. In the forest neighborhood they wanted to know why some trees were fat, others thin. A brush with unseen wild onions brought the comment, "I smell something cooking." We stopped to find and taste the plant and to learn, indeed, what was "cooking." A discovery was made when crossing a stream: in Nature City pipes aren't always necessary for delivering water to various neighborhoods. But how did water get to the tops of trees? Were there pipes in trees?

Along the path we stopped to compare the surface we were walking on with the woodland floor next to it. What were the differences in appearance, and why? "There aren't as many plants on the path." Is it easier to poke a stick into the path or into the woodland soil? "Woodland soil." Why? Thus we learned about compaction and some of its effects. What were those wooden things that looked like steps on the path? We found they were exposed roots, and we guessed why they weren't underground. We dug a little deeper into the woodland soil to find out what is below ground in Nature City. Not pipes, electric lines, or cars -- but roots, worm tunnels, and bugs.

At the edge of the woods, we moved out into a more open field where wild geraniums were in bloom. Immediately someone asked, "Where do they come from?" My answer was to ask who had planted them. In chorus, the boys shouted, "Mother Nature!" Where did she get the seeds? No answer. "Did she get them at the store?" came a questioning reply. There was general agreement that she hadn't gotten them at the store. We looked around and spotted some old narcissus that had finished blooming. There were suspicious swellings at the tops of their stems, and we opened these up and examined them with the hand lens to find our answer. What was inside? "Seeds." How had the seeds gotten in there? To find out, we looked at some of the geraniums which had a few remaining blossoms but were also developing long, thin seed pods. We examined the flowers under the hand lens to see flower parts, and we looked at the developing seed pods to learn how nature's "seed packets" are produced.

I wanted to know who, besides flowers, lived in the field neighborhood. "Grasses," "weeds," "bushes," were the boys' answers. Anything else? We began to search and soon found small trails in the high grass. The boys wondered what they were and who had made them. I told them it was probably a meadow mouse. Several boys expressed disappointment in not seeing any wild animals, and I explained that animals were frightened away by all of the noise we made.

Next we visited a lake neighborhood that had been created by damming a stream. How was this like the pond neighborhood we visited earlier, and how was it different? Again, their curiosity pointed the way. "It's bigger." "There aren't as many weeds in the water." "There are fish." And there were frogs, which this time they caught, examined, and returned to the water. The dramatic flow of water over the dam accentuated the fact that the water was moving through this neighborhood and was not still, as it had been in the pond. What would happen if the dam were removed? The boys were surprised to realize that the lake would disappear.

The last neighborhood we visited was a dense, quiet grove of tall spruce trees: an evergreen neighborhood. Again, we wanted to find out who lived there and compare the neighborhood with the oak-maple forest we had seen. "More low branches in the other forest." "More things were growing on the ground." "It wasn't so dark." "This one smells different." I asked the boys what cones were all about. Why did some of them have all their scales gone so they looked like corncobs? What had happened to them? Had something eaten them? "Yes." Who? "Maybe squirrels." "Or birds." We were reminded that Nature City provides food for all the kinds of creatures who live there. Someone asked, "Are all these pine trees?" We talked about the fact that there are many kinds of evergreens, and that not all were pines. These were called spruce.

Now our trip was coming to an end, and as we left the cool spruce grove we talked about all the neighborhoods we had visited in Nature City -- who lived in them and what was special about each one. We realized what a great number and variety of residents --plants and animals --lived in Nature City, yet how well they all got along and how each one contributed something important.

When the boys climbed onto their bus for the trip back to the youth center, they wanted to know if they could come back to Nature City again, and I knew they had enjoyed their visit as much as I had.

What is the key by which we enter Nature City? It begins with the realization that things familiar to us may be quite unfamiliar to someone else. If we can see natural areas through another person's eyes, in another cultural context, perhaps we can begin to translate what we know into understandable terms. We are, in a very real sense, "interpreters" and we need to understand other "languages" to be effective. For an inner-city youth, natural habitats become more comprehensible when presented as a familiar concept: neighborhoods in a city.

Perhaps the urban youngster who visits Nature City will not have learned the name of even one tree, flower, shrub, or animal, but he may have gained a general idea of the organization of natural systems. Hopefully, he also may have discovered that a place which, to him, was filled with imagined terrors is, instead, a benevolent, lively, varied, and interesting place to visit. Once his interest is aroused and his perception focused on the special minutiae of a natural area, his innate curiosity -- like that of youngsters everywhere -- takes over, and you find that he is leading you through Nature City, giving you the rare privilege of seeing it for the first time through his eyes.

[1]Based on an article originally published in The Morton Arboretum Quarterly, Vol. 11(2), Summer 1975, pp. 17-22.

THE CAMP ATWATER EXPERIENCE

Henry Thomas
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ABSTRACT

Camp Atwater is a program for 6-16 year old campers designed to achieve specified behavioral objectives, skills, and abilities by their participation in challenging outdoor activities. In developing a sense of relevance to campers' daily lives, the program includes opportunities to apply the skills and new understanding in urban environments.

Camp Atwater is a national summer residential camp for youngsters between the ages of six and 16 years. It is located in North Brookfield, Massachusetts on beautiful Lake Lashaway. The camp includes 67 mainland and three island acres. There are 24 buildings, all basically sound from an engineering and architectural standpoint, capable of accommodating 250 people. This allows Camp Atwater to serve nearly 1,000 youngsters per summer.

Camp Atwater is accredited by the American Camping Association and, as of April, 1982, is listed on the National Register of Historic Places. The American Camping Association gave Camp Atwater a 90 percent rating on its program and a 100 percent rating on the facilities. The majority of campers who attend Atwater are black and from urban areas across the country.

There is much I could say about Camp Atwater. One of the most significant features peculiar to Atwater is the geographic diversity of our campers and staff backgrounds. Participants come from Los Angeles, California; Greenville, Mississippi; Atlanta, Georgia; New York City; and several African countries, with the bulk of our campers coming from the northeast region of the country. Atwater has an alumni population of over 20,000 people and many of them have distinguished themselves in this country. Coleman Young, Wade McCree, Clifton Wharton, and Sam Pierce are all Atwater alumni.

Diversity is not limited to our camper and staff population. Our program also enjoys this distinction. We offer choices in program activity to our campers in tennis, archery, swimming, African history, soccer, dance, drama, arts and crafts, horseback riding, sailing, waterskiing, racquetball, tutoring in math and English, counselors-in-training, and, by the way, environmental education. For our 1983 camping season, we are adding a computer awareness program made possible by a contribution from the Xerox Corporation.

Our campers eat, sleep, recreate, and learn together. Our challenge to campers and staff is to come explore new things about self and environment, discover what's here, and take care of self and the camp environment.

Camp Atwater is the only national black residential camp in the country. At this point, the logical question is how does environmental education fit into our scheme of things, particularly when everyone knows that black people have no interest in the outdoor environment -- it's boring, irrelevant to black people's struggle for equality, there's

certainly no money in it, and, despite its value, it is not a priority concern of black people. Everyone knows that blacks think working and studying in nature's outdoors is reminiscent of slavery and may cause us to break out in hives.

The above are myths that perpetuate the lack of minority participation in the environmental field. The real problem within the black community is the lack of exposure. We at the Urban League understand that it is the responsibility of all of our citizens to understand, appreciate, and act on our understanding of our environment. Blacks as citizens, although not always treated as such, are not precluded from this responsibility. However, like any responsibility, it is a learned response. One does not automatically become responsible in regards to parenting, paying bills -- some of us never learn this one -- or taking care of a pet. These are all learned responses. Likewise, caring and stewardship of our environment is a learned response.

There has been little deliberate educational thrust in the black community toward environmental education. Hence, too few black people have developed a significant understanding and appreciation of urban and rural environments. The Urban League of Springfield shares in the widespread concern over the lack of minority participation in decision-making and careers related to environmental and natural resources planning and management. Studies related to this concern indicate that one probable cause of this lack of participation is insufficient exposure of minority youth to environmentally oriented activities and natural resources career role models. The National Urban League recognized and addressed this problem in its 1979 City Care Conference, co-sponsored by the Sierra Club, the Urban Environment Conference and Foundation, and the federal Departments of Housing and Urban Development, Interior, Energy, Agriculture, and Transportation.

To respond to this problem, in the summer of 1981, the Springfield Urban League and the State University of New York, College of Environmental Science and Forestry, funded by a grant from the USDA Forest Service's Northeastern Forest Experiment Station, implemented and evaluated a pilot program in environmental education/natural resources management at Camp Atwater.

Camp Atwater was temporarily closed in 1973 because of serious vandalism. The camp was renovated and reopened in 1980. We opened with 235 campers, and during our 1982 season we serviced 530 campers. Approximately one-third of the campers receive financial aid to attend. Campers select either a two- or four-week program. The camp has two sessions; the first for boys and the second for girls.

The pilot environmental education/natural resources management program was introduced as one component of Camp Atwater's total camp program. The objectives of the pilot program were to develop environmental awareness, environmental appreciation, and a recognition of the need for and value of careful manipulation of human environments to meet social needs.

Our challenge was to achieve these objectives in a relatively natural environment with youngsters whose primary environmental experience had been urban and who may not have perceived any direct relationships between environmental values and their personal needs. The challenge was heightened in that the objectives were to be met within the context of a traditional summer camp, of which the environmental education/natural resources program was only one of many daily experiences.

Evaluation of the summer 1981 pilot program revealed a need for further work in the following areas:

* Administrative refinements to further facilitate integration of the environmental education/natural resources program into the overall camp program;

* Recruitment to attract junior staff interested in natural resources management and environmental education. Minority youth interested in these fields would thereby have the opportunity to acquire valuable experience. Their exposure to the environmental education/natural resources program would put them in contact with professionals in these fields. Such interested counselors would be likely to reinforce the program to campers and serve as role models;

* Training of camp staff in principles of environmental education and natural resources management. This, we thought, would reinforce the environmental education/natural resources management program and enhance the overall effectiveness of all camp programs through their integration;

* Articulation of an environmental quality/education policy for Camp Atwater. This, we thought, would provide a framework for camp decision-making and enhance all its programs;

* Further development of campers' and staff's awareness of employment possibilities in environmental/natural resources fields.

Our 1982 season was an effective one, in that we built onto the 1981 season's lessons and foundation. In addressing the need for training camp staff in the principles of environmental education/natural resources management, we conducted and evaluated a planning workshop for program directors and senior administrative staff. Our goal was to further familiarize senior staff with principles of natural resources management and environmental education, to aid staff in developing an explicit environmental quality/education policy for Camp Atwater, and to plan specific ways to integrate programs with one another in the context of this policy.

We developed a sequence of environmental education activities that have had past success with all campers, particularly with the 7-12 age group. Some of the more successful activities were those involving water studies, decomposing trees, soil sampling, tree boring, hiking, bird watching, and pond exploration. Those activities that involved active use of investigative tools -- magnifying lenses, soil testing kits, compasses, field guides, maps, microscopes -- were most enthusiastically received by all campers.

We developed a pilot series of workshops and talks for counselors and appropriate staff on environmental education/natural resources management topics, including career possibilities. This series began during orientation and continued throughout both camp sessions.

Few models exist for environmental and natural resources management education within the context of a traditional residential summer camp program. Camp programs that do address this type of education do so in an intensive manner through camp programs that deal only with these activities. Examples would be 4-H forestry camps and the Outdoor Challenge program. Work at Camp Atwater has application not only for residential summer camps wishing to establish an environmental or natural resources management program element, but also for non-residential interdisciplinary camps and schools, or other educational institutions whose curricula involve short-term camping learning experiences. Although the work has strong implications for minority youth programs, these implications are relevant to all youngsters whose primary orientation is urban.

The Camp Atwater goal over the years has been to build character and leadership. This experience is enhanced by having role models who represent these qualities. These role models are found among our staff and alumni.

To build on our tradition and to go further, it is our thinking that if Atwater maintains an environmental education effort integrated throughout its program there will undoubtedly be genuine benefits yielded to the variety of local communities where our campers reside.

Our plan is to capture the imagination and interest of our campers so that they will recognize the value in possessing a sense of stewardship for natural resources. In addition, we want them to understand the competing values and balancing of interest that are inevitable when dealing with diverse environmental issues. Further, we think it is important that our campers are knowledgeable of the career opportunities available to them in the environmental and natural resources field. Historically, Camp Atwaterites have pursued careers as doctors, lawyers, judges, politicians, educators, etc. It is reasonable to assume that this tradition will continue. Let's add environmental and resource management fields to the list of career choices. This country cannot afford a lethargic and apathetic attitude toward its urban or rural environment. Camp Atwater is on a new horizon of joining in the collective effort needed to raise our levels of consciousness and appreciation of the urban environment. We are a small part of the family, but a large part of the dream.

PROJECT LEARNING TREE - OHIO'S SUCCESS

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ABSTRACT

Project Learning Tree, as developed by the American Forest Institute, is a success in Ohio because of workshops for potential leaders, seed money being provided for workshops, and a communication network for leaders.

Project Learning Tree (PLT) was developed in 1977 by the American Forest Institute to encourage use of the forest resource in teaching environmental education. The following seven major principles guide PLT:

1. environmental awareness;
2. diversity of forest roles;
3. cultural contexts;
4. social perspectives on issues;
5. management and interdependence of natural resources;
6. life support systems;
7. lifestyles.

The PLT books include 88 activities for elementary grades and 89 activities for secondary grades.

Ohio received a grant of $9,000 in 1981 and set up a State Planning Committee composed of representatives from the Ohio Department of Education, a County School System, the Ohio Department of Natural Resources, and a graduate student in environmental education. Three leadership workshops were scheduled in which 118 educators were introduced to PLT. In turn, these educators have participated in over 50 local workshops training more than 1,200 fellow educators. A leadership workshop is scheduled for March of 1983.

The success in Ohio is due in large measure to the enthusiasm for the PLT program, as well as the design for implementing PLT in the state. The following are the three guidelines that have contributed to its success.

1. Teams of at least two educators are required to attend the leadership workshop. This provides balance and a sense of confidence when the team plans a local program.

2. Distribution of an updated list of all PLT leaders encourages communication among the leaders and those educators who want to attend a local program. Often educators invite a leader to put on a program in their system.

3. Each team of leaders is offered $75 to help cover the first workshop expenses. This small amount can be used for supplies, donuts and coffee or other miscellaneous expenses. Usually leaders enjoy doing the program and willingly conduct workshops without monetary inducement.

SECOND NATIONAL URBAN FORESTRY CONFERENCE

GENERAL SESSION IV

LEGISLATING AND POLITICKING FOR URBAN FORESTRY

Wednesday, October 13, 1982
8:30-10:00 a.m.

Session Chairman:

John Gray
Pinchot Institute for Conservation Studies
Milford, Pennsylvania

Moderator:

Denice Lobel
Cooperative Extension Service
University of California
Berkeley, California

Speakers:

Henry DeBruin The American Forestry Association Washington, DC	Legislating and Politicking for Urban Forestry at the Federal Level	203
Donald Willeke Attorney at Law Minneapolis, Minnesota	The Springtime of Urban Forestry	207
John Staley Grand Forks Park Board Grand Forks, North Dakota	Legislating and Politicking for Urban Forestry at the Local Level	215

LEGISLATING AND POLITICKING AT THE NATIONAL LEVEL

Henry W. DeBruin
Director, Special Projects
American Forestry Association
Washington, DC

ABSTRACT

Everyone plays the game of politics at one time or another. We in urban and community forestry have all the ingredients necessary for a successful national program. We just need to hook all the ingredients together. But to get urban and community forestry on the national agenda, the "rules" of the game, as outlined in this paper, must be understood.

Politicking might be called "the oldest profession," for it is the art of negotiating acceptable and successful compromise. I imagine Adam and Eve may have been the first practitioners. It is a pleasure to share with you some personal observations about something I both enjoy and respect. That doesn't mean I'm particularly successful in the process, or "game," of politics, just that I enjoy being a stage hand in the theater that is our nation's capital.

You don't have to go to Washington to learn the process. During this meeting we have been able to watch the action happening right here. We saw a local Congressman and his family shaking hands, and making the "rounds" on Sunday. We saw a Bureau Chief in constant conversation in the hallways, at breakfast, dinner, and supper - the "game," the action, the challenge never ends. This is a good chance to observe the process. The process involves people, power, money, and, in our case, natural resources.

Not everyone enjoys the game! At least, that's what they say. Yet everyone plays, at one time or another. So it's good to know how "politicking," the art of negotiated compromise, and legislating, getting the compromise written in "stone," is accomplished.

As an example let's say that our goal is to get and keep urban and community forestry on the national agenda. Keep in mind that public sentiment is everything, with public sentiment anything is possible, without it nothing can succeed.

First we need to have a "grass roots" power base, support structure, or organization that will work up local support and visibility. Then, we need an economic base; jobs and budgets which contribute to the well being of all citizens. At least we must be able to present our subject so the average person can realize it is important to them. And equally important is media visibility that people can relate to personally.

Without "grass roots" interest, support, and visibility it is very hard to keep any subject on the national agenda. Often, this grass roots structure is first developed to meet local disaster and then grows into a permanent support group from this action. Some examples are fire management, the spruce budworm epidemics, the gypsy moth infestation, the "dust bowl" of the '30s, etc. We in urban and community forestry have all the ingredients necessary for a successful national program. We just need to hook all the elements together. We have outstanding programs in many cities. We have done very well with urban and community forestry in several states - now we need to hook all this together to work at the national level. We can do it - but some ask why?

The reason urban and community forestry is so important to every citizen is because it affects the quality of living of every person in our nation directly or indirectly. A program done well means beauty - quiet - urban birds and animals, cleaner air, clear water, good smells and a gentling of the soul and spirit. In a nutshell, it relates to man - the creator - and the world of nature and local economics. The trees tell the stories of the seasons and give hope and joy in an often drab man-made world - and at the same time they are a measurable economic asset.

So we have a reason to work hard at developing our abilities to work at the national level. We have mostly young people at this meeting. For that reason, I want to share what I have learned. I wish everyone here would say "let's go, I want to help." Much of what I'm about to share will be very basic, and the "rules" are generally the same at the local state, and national level, but woe to you or me if we ignore even one of them.

If we want to get urban and community forestry on the national agenda, here are my thoughts on how we must play the game.

Let's examine some of the "rules" of the game at the national level.

1. Know your subject - At the national level there are winners and losers and you can't be a winner if you haven't done your homework regarding your subject, i.e., urban and community forestry. This generally means many nights of studying the records, the federal register, and other documents.

2. Study the other players. Get to know all you can about the other players. At the national level there is considerable information available on every person - their value system, special interests, family and background. This record gives you a look at an individual's past performance and builds expectation.

3. Have specific objectives. The more finely tuned you can have your objectives, the better your chances of accomplishing them.

4. Write your personal "statement" - Tell why your objectives have merit and should be heard and adopted: be factual, be brief, be honest.

5. Know your competition - At the national level there is competition for every dollar and every issue.

6. Learn how the game is played. Who is the leader? Why? Who are the other players? Most of the work at the national level is done by staff people. These individuals and groups can help or hinder. It is very important to be visible and effective before the decisions are made. By the time "public hearings" are scheduled or the action becomes "public," many preliminary recommendations and procedural decisions will already have been made by staff.

7. Develop a strategy - There are no quick victories at the national level. Budgets are worked on one to two years in advance. Legislation often takes several years to perfect and pass. There are exceptions. My point is that patience and persistence are excellent virtues in the game at the national level.

8. Work out a timetable. Everything at the national level has "process." Who has to be contacted, when are the hearings, when will conference committees be named, etc. There are times when you can get in the "game" and there are more times when you've done all you can and you become an involved spectator, planning your next move.

9. Study the history of related legislation. If you have time and contacts, gain a "sense" of the possible by how it was done in the past. Tradition has considerable clout at the national level.

10. Learn how to get information - fast! At the national level, information is power. Effective players have developed ways to gain information ahead of the pack. Generally this is based on past sharing and established trust relationships.

11. Find out who is accessible to you. A Congressman or Senator always takes time to see people from his home state once or twice. However, day to day work contacts are generally handled by staff. Get to know everyone from the receptionist to the legislative assistant, if you can. Each person can help you sometime. Get to know the staff of each office.

12. Develop a network and coalition - Many old timers will act as "mentors" if you ask them. They will help you and others who feel as you do, and from this you should be able to develop a "block" or "coalition" of people who will help in information gathering, strategy sessions, and monitoring the action.

In summary, politicking and legislating at the national level, and at every other level I suspect, is exciting, hard work - if you enjoy the "game."

* There are rules.
* There are players.
* There is excitement.
* There are rewards and penalties.
* There are winners and losers.

Let's look at dollars, often called federal funding. At the national level, "power" is often more highly valued than dollars. But nevertheless, for most of us the dollars and budget items are focal points. I have developed 12 truisms about funding at the national level.

1. Federal funding is highly competitive.
2. Federal funding is a long term process.
3. Federal funding demands an intimate knowledge of the whole budget/political process.
4. There will always be federal funding under our form of government.
5. Federal funding is often used on a "one shot" grant basis to support or stimulate state and local actions.
6. Federal funding is used as a penalty or reward in certain political situations.
7. Federal funding is often the (hidden) lifeblood of many state educational and service institutions.
8. Federal funding is often based on "reaction" rather than long range planning or inspired vision.
9. Federal funding can be purposefully hidden or obtuse. It may be attached by amendment to non-related legislation, it may be rushed through at the last minute, or it may be hidden in supplementals.
10. Federal funding often reflects "grass roots" concerns. Sometimes funding bills are passed with no real intention of funding them, and there is an additional process called recision.
11. Federal funding often results from political trade-offs and may not make sense unless these trade-offs are recognized and understood.
12. Federal funding is highly political and responds to perceived power.

Legislating is the result of good and effective politicking. It takes legislation to get funding; it is all part of the same process. The main differences at the national level is that the stakes are higher, there are many more players, and it is much harder to keep track of the action than at the state or local level.

This is a very short course because of time considerations, but be aware that there is also the social/political game which is equally or more complex and where "power" is the primary goal. This also affects directly what we have been talking about.

We can put urban and community forestry on the national agenda and keep it there. We have barely started. Please consider this a personal invitation to join in a most worthy and rewarding effort. Your help and involvement are needed.

THE SPRINGTIME OF URBAN FORESTRY

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ABSTRACT

Urban forestry takes much money. In Minnesota since 1975, the state has appropriated over $60 million in municipal grants, and municipalities have spent another $70 million. Dutch elm disease has been controlled in many areas and 740,000 urban shade trees have been planted. Tree-loving Minnesotans capitalized on urban forestry crises, got the media interested in the problem by cultivating reporters, lobbied politicians in traditional fashion, including attending fundraisers and working with staff members, and are preparing to do it again when the fiscal crisis eases. But this is inconsequential if national and local leaders don't care about the environment.

It is perhaps fitting on a gray and damp October day that we talk of springtime -- a time of warmth and green: the color of trees and of money.

The relationship between money and trees does not stop at the green color they both share here in the United States. It is a sad but true fact of history that great feats of arboriculture generally, and major plantings of urban trees, are almost always the work of a strong government acting to implement a grand plan on a comprehensive scale. Occasionally, magnificent displays of arboriculture will be achieved by individuals, such as the private plantings by some of the Dukes of Great Britain and by Bismarck in Germany, but even these exceptions prove the rule, for these men were governments unto themselves.

It is another sad fact that great feats of arboriculture and of urban forestry are rarely accomplished in hard or evil times. In times of economic scarcity, people put off planting trees. In times of war, they cut them down. In good times -- times of hope and peace -- people plant trees.

What can you do at the state level to harness the engines of government so that when good times come again we in this country will plant trees in great profusion throughout the cities and towns of the land?

I will draw on the Minnesota experience to try to set out some lessons on this subject. I can only relate a little bit of what happened in Minnesota, for the tale is long and complicated.

THE MINNESOTA STORY

Six years ago Minnesota's extensive, beautiful and mature urban forests were threatened with near total disaster. The twin plagues of Dutch elm disease and oak wilt disease began to hit us with a vengeance. The Twin Cities (Minneapolis and St. Paul) are covered with a mature stand of oaks and American elms planted, in many cases, nearly a century ago. That majestic urban forest, upon which nearly every visitor comments, was quite close to being destroyed.

Dutch elm disease had started on the deadly curve that almost everywhere else resulted in a greater and greater incidence of the disease until nothing was left.

Oak wilt was spreading rapidly, largely because of the lack of knowledge that Man, by wounding oak trees, is the greatest cause of the rapid spread of this disease, which apparently has been around for many centuries in a fairly limited way.

When this disaster was perceived, a number of far-sighted citizens demanded state action. They also pushed their communities to act.

Now this is not unusual. Citizens demand action in every conceivable area of public concern. Normally, little is done. But in Minnesota it was different. Cities rapidly established shade tree disease control programs after a requirement for such was passed by the legislature, even though it was not funded on the state level initially.

As the losses grew to alarming proportions in 1976 and 1977 (Minneapolis, for example, lost about 15% of its mature elms in 1977 -- some 35,000 trees), the legislature acted to set up a grant program. Between 1976 and 1982 approximately $60 million in state funds was appropriated to assist cities, on a matching grant basis, for their activities in urban forestry. The matching grants were not specifically linked to dictated forms of activities, but instead left to individual Minnesota communities (which vary greatly in size and in the make-up of their urban forests) to decide how they wished to spend their money on tree disease control (mainly sanitation removal of diseased elms) and on replanting. Then the state reimbursed designated portions of the municipal expenditures. The only specific grant provisions were that communities of under 1,000 in population could receive 90% of the cost of planting their first 50 trees as an added incentive to small towns where there is not such an established governmental structure and where state grant programs might otherwise be ignored.

The results of the program have been stunning!

With state and local programs, approximately 690,000 public and private diseased trees have been removed and rapidly destroyed.

Cities like Minneapolis and Duluth have suppressed Dutch elm disease to the point of near invisibility (which, of course, is a problem in and of itself). Minneapolis has cut its losses from about 35,000 trees per year in 1977, to approximately 2,000 trees in 1982. The 120,000 mature American elms remaining in Minneapolis are as healthy and stately as ever. Other cities and towns have had similar success in slowing the losses while redeeming the time by planting new street trees.

In terms of plantings, approximately 740,000 (that's three quarters of a million!) new shade trees have been planted in Minnesota's cities and towns. In Minneapolis alone (which occupies only about 7% of the Twin Cities metropolitan area), 120,000 new public trees of about 25 varieties have been planted in our city parks and on the boulevards of Minneapolis' residential and commercial neighborhoods in accordance with a comprehensive city plan which had been printed and distributed throughout the city. This planting required major planning and logistical efforts because in the planting season over 1,000 caliper-size street trees are often planted in a single day.

In sum, Minneapolis and the rest of the communities of Minnesota have planted more trees than they have lost. Indeed, Minneapolis has had to cut back on street tree plantings --not for a lack of funds, but because it lacks spaces to plant new street and park trees.

It is a great pleasure for all of us active in this work to see those newly planted trees growing and taking on a very visible presence in the landscape architecture of our cities and towns.

In this magnificent effort, the cities and towns of Minnesota have spent nearly $70 million, thus making the state and local efforts exceed $130 million in the last decade in Minnesota.

Much of the credit goes to dedicated and exceedingly hard-working public servants like David F. DeVoto, the Minneapolis Director of Forestry, who also established the remarkable program used by Evanston, Illinois, to save its great elms. Great credit should also go to people like Ray Carson, Director of Parks and Recreation in Duluth, where elm losses have been cut to nearly zero; to Jonathan Steigler, Forester of Robbinsdale, who has done a remarkable job of preserving mature trees and planting new ones on a limited budget in an older Twin Cities suburb; to Glenn Shirley, Forester of the large suburb of Bloomington, Minnesota, which has hundreds of thousands of elms; and to Kirk Brown, President of the Twin Cities Tree Trust, a not-for-profit corporation which has creatively used $8.5 million of foundation, CETA and State Youth Employment funds to plant several hundred thousand shade trees using a CCC-type of youth employment approach.

But much credit also goes to dedicated volunteers and able public servants who worked to get the state program going. How was it done?

A state coordinating body, known as the State Shade Tree Advisory Committee, was formed from interested governmental, scientific and community participants, and a master proposal was developed. This proposal, renewed and reworked for each legislative session, was endorsed by the Department of Agriculture, the Department of Natural Resources, the University, the League of Municipalities, and many other groups. It was read and reported upon and editorialized about by members of the print and electronic media. It was circulated to the Governor and the legislators, and it was largely adopted. It dealt with public relations, disease control, replanting, wood disposal and research.

The proposals made by the State Shade Tree Advisory Committees were carefully tailored to gain maximum political support from diverse groups, and a united front was presented to the Governor and the legislature. Without false modesty, I can say that some aspects of that unity may have been due to my occasional strong-arm tactics as Chairman of the Advisory Committee, for which I have been both praised and condemned.

In a word, standard lobbying tactics were used for once to achieve a great public good, rather than to fatten the pockets of one group or industry.

I wish I had time to tell you many of the "war stories" of our battle, but I do not have that luxury, and so you are spared.

LESSONS FROM THE MINNESOTA EXPERIENCE

I wish, however, to draw some general lessons from the Minnesota experience, in the hope that they will be applicable across the country in many ways and in many areas which are different from the Minnesota situation. These simple lessons work very well, and I believe they are relevant not only to laypersons and newcomers to the urban forestry effort, but also to professionals in urban forestry, who too often appear to have forgotten them.

LOOK FOR (OR INVENT) A CRISIS

First of all, you must remember what Winston Churchill said about the English-speaking people. He said, "They are much better at dealing with disaster than at preventing it."

Thus, you should look for a disaster happening or impending if you wish to move the people and their government. Crisis is only a spark, but it is a vital spark. If you do not have the spark of crisis to create a flaming presence for your issue, it will be lost in the hurly-burly of today's constantly frenetic society.

Therefore, the first lesson I would give is: Capitalize on a Crisis. Find one, or invent one, or tree planting and tree maintenance will be deferred while other "crises" are attended to by the public and their governments. Pick your favorite crisis. The choice is large:

* Disease. Dutch elm, palm yellows, oak wilt, gypsy moth, or whatever. Talk it up.
* Vandalism. Destruction of the "future urban forest" is an increasingly common phenomenon.
* Storms. A tornado took out 2,000 mature trees in Minneapolis last year. The city and the local communities responded beautifully -- of course, they had been well trained.
* Old Age. Many communities are urban arboricultural geriatric wards.
* Pollution. Why should the Sierra Club get all the headlines when 85% of us live 95% of our lives in cities and large towns?
* Uncontrolled Development. Demand that developers plant trees.
* Decay of the Urban Infrastructure. Get trees on the list of problems in this new area of governmental concern. This is the new "Crisis of the '80s."

If you pick your crisis carefully, you can ignite a very beneficial "controlled burn" in your urban forest.

FEED PUBLIC OPINION

The second lesson is: Feed Public Opinion. How do you do that? Well, think of newspapers, radio and television reporters as you would think of young trees. They need to be cultivated; sometimes they need to be transplanted to new areas of interest. They need to be pruned and shaped; and, most of all, they need to be fed and watered (although the working press is notorious for blossoming on a somewhat more potent liquid than ordinary tap water). Take a reporter to lunch.

When the able and dedicated lawyer, Alan Scarth, Q.C., who is trying to sound the Dutch elm disease alarm in the city of Winnipeg, Canada, asked me what was the most important thing he could do, I responded, "Take a reporter to lunch; pump him full of the facts and get some stories written."

Pick your reporters, like your tree species, for their suitability to the environment in which you wish them to grow. Note the by-lines and television tag lines of reporters doing environmental stories. Ask city desks of newspapers and television stations who is covering environmental matters. Those are the people to cultivate. Don't be cheap. Spend a few bucks on a decent restaurant. You are likely to be remembered.

Bring simple, clear materials for the reporters. Television and newspaper people work on deadlines and have to do short, pithy stuff that attracts an audience. Otherwise their own medium will wither.

When we started our crusade in Minnesota, we took members of the working press to a private dinner in the finest restaurant in town and made a presentation to them. It worked. We got loads of coverage.

Forget letters to the editor. One front-page story, or one good editorial, or one lead evening news story is worth a thousand letters to the editor in terms of impact.

So remember -- feed public opinion, by feeding the people who make it.

DRINK WITH A POLITICIAN

The third lesson is: Have a drink with a politician.

Whether your tastes run to the hard stuff, or to the wonderful Catawba Grape Juice of Ohio, find a way to go have a drink with a politician. Where? Where politicians usually drink -- at fund-raisers.

So many tree people think that because they are doing "the Lord's work" they don't have to engage in traditional lobbying techniques. They should remember Edmund Burke's dictum, "All that is necessary for the triumph of evil in the world is for enough good men to do nothing." Willeke's corollary to Burke's dictum is, "All that is necessary for the triumph of evil causes over good ones is for the partisans of the good causes to think they do not have to get down and dig in the political dirt." When we were starting our effort in Minnesota, a learned and distinguished urban forestry professional cautioned me that I was in danger of making city trees "a political issue." "That, dear Sir," I replied, "is precisely my intention."

One of the best ways to convince a politician you are serious is to buy a ticket to one of his or her fund-raisers and then at the appropriate moment, when you are getting the audience for which you have paid, say, "Now, Senator (or Representative), I think it is high time you focus on the shameful way our state is letting all the trees die. I believe your opponent strongly favors a sensible program for renewal of our urban forests according to a thought-out plan, and I hope you are giving some thought to this issue. I would like to talk with you about it very soon, since a lot of people think this is an environmentally sound, energy conscious way to improve our cities greatly at little cost. Besides, who can be against trees?"

There, that took 30 seconds, but the acorn was planted. Sometimes an oak grows.

You can write letters, make appointments to see politicians in their offices, present them with petitions, and do all the rest of that stuff. Does "Big Oil" do that? Maybe it does, but I can tell you for sure what "Big Oil" does. Its representatives are seen at the right fund-raisers, and its Political Action Committees (PACs) make contributions to the right representatives -- of both parties. That is a sure signal to politicians that the person doing the talking is serious, and not just another one of the flakes that a long-suffering politician deals with day in and day out. The Scriptural advice is applicable here: "Go thou and do likewise." If your position bars you from "politicking" yourself, make sure that at least one tree-loving private citizen from each party is actively participating in political fund-raising and in lobbying local legislators.

STRIKE HARD WITH A STAFF

The fourth lesson is: Strike hard with the staff.

It is not for nothing that legislators and other politicians have aides who go under the general title of "staff." A staff is something, usually cut from a tree, upon which you can lean. If you do not have a good one, you can fall over and look foolish. A good stout staff is a defensive weapon against which little but firearms and the sharpest swords could prevail.

So, find ways to talk to a politician's support staff. Our successes in Minnesota came when we convinced key members of the Governor's staff, and the staffs of the chief legislative committees, that something had to be done.

The usually hard-working and dedicated assistants to major politicians appreciate materials that are well thought out and well presented in a short time. Then when their bosses ask about that subject, they can look good and make their politicians look good to the press and to the people.

It takes a little work and a lot of dedication to find out just who the key staff members are, but it is vital that you seek them out and talk to them. If you think that Washington lobbyists do not concentrate on the staffs, you are hopelessly naive. All but the lowliest of politicians have key staff members these days upon whom they rely heavily. So concentrate on the staff.

REMEMBER THAT SPRING ALWAYS FOLLOWS WINTER

The fifth lesson is something that every dedicated gardener and tree lover knows. The seasons follow in their usual pattern -- spring, summer, fall, and winter and then spring comes again. And wise men and women know to work in the winter for the inevitable coming of spring.

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I wish I could tell you that all is well in Minnesota. But, alas, the Minnesota Miracle, of which much was made in the national press, has come to an end. Three years ago, the People elected as Governor a political nincompoop, who with poor staff work, and even poorer personal judgment on the issues, has run out State's finances into the ground by giving huge but invisible tax cuts in one area, only to have to raise taxes in another area. This political equivalent of Al Capp's famous character, General Jubilation T. Cornpone (well known for his famous battles: "Cornpone's Retreat," "Cornpone's Rout," "Cornpone's Disaster," and the rest), has been disowned by his own political party and is now retreating to the modern equivalent of a monastery to spend the rest of his days in well-deserved oblivion.

As a result of our present Governor's policies, funds for education, for health, for research and many other terribly important areas were cut. A casualty, as well, was the State Shade Tree Program, in keeping with my earlier remark that in hard or evil times urban forestry is not a high priority.

But even this cloud has a silver lining. The cities and towns of our state were helped over the "hump" of the Dutch elm disease and oak wilt crises, and those diseases have been brought under control in many crucial places, while three-quarters of a million new trees continue to grow. Our Governor could not find a way to take that away from us.

Minneapolis this year will be spending $5 million protecting and renewing its urban forests, and large expenditures continue throughout the state. Minneapolis will continue to trim mature trees on a three-year cycle and young trees on a one to 1½ year cycle.

Many other Minnesota cities continue to have strong programs. The state aid got us over the crisis, and there is a large cadre of educated workers, in and out of government, who know of, and are sympathetic to, the great work of urban arboriculture. These seeds in the ground, these limbs with no monetary green on them, are waiting for the spring.

I do not doubt that they will be renewed when our spring of good economic times comes again.

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Thus, we in Minnesota are applying the first lesson of horticulture to our urban forestry programs. Against that day many of us are continuing to work -- to shape and prune and fertilize and guard what we have worked for in the past and what we know will certainly one day be green and glorious. When hard times hit your programs, do not despair. Work to keep your programs alive through your fiscal and political winter.

I hope that these lessons will be applicable in your own political arbor and that your stewardship there will produce growth even finer than that in my green and beautiful land of Minnesota.

CODA

Now I must add a few personal words to this great Conference.

Like my hero, Benjamin Disraeli, I can say, too, that "I have a passion for books and trees--I like to look at them." I have seen--a century after his death--the grand and beautiful Cedars of Lebanon which Disraeli planted at Hughenden Hall, his home in the hills north of London, and they are worthy testaments to his passion.

I have two more passions in addition to books and trees. I like English bulldogs, and I am passionate about the music of Franz Josef Haydn, who was born 250 years ago this year.

At the end of his most thoughtful compositions, Haydn (who is both the father of the symphony, as we know it, and of the string quartet) would often add what is called a Coda. In the Coda, Haydn would synthesize and restate in a new and final way the most important ideas he had set out in the development section, or in the variations with which he had constructed the movement of his symphony or string quartet.

I should like to follow Haydn's example and give you my Coda to the lessons I have tried to set forth here today.

It seems to me that one thing above all must be observed and understood by all of us who love trees as we watch what is happening across our country today. That understanding--which I believe to be inescapable--is that no matter how hard we work, lobby, curry favor, contribute to political campaigns, talk to staffs, or whatever, it is all wasted effort if the top leaders, in our state or in our nation, continue to be men who do not know of, or care about, the urban environment.

If those leaders' care is just for their wealthy friends who rarely plant trees, save on their own great estates . . .

If their care is for the great corporations who seem to know nothing but how to close plants and to try to gobble each other up in great, tangled, costly takeovers . . .

If their care is not for the poor, the old, and the handicapped, who rarely see any trees, except those we plant in our sadly decaying great cities . . .

Then, if our top leaders are like that, all our work in the arbor of urban forestry is, as St. Paul wrote to the Corinthians about those who were devoid of charity itself, only "as sounding brass, or a tinkling cymbal."

If we are led by men who think that trees cause pollution . . .

If we are led by men who think it is their bounden duty to cut down the trees "before the Lord returns," so that He will be greeted by ravaged hills instead of the glory of His Father's world . . .

If we are led by a man who has said of God's most magnificent creation that, "If you've seen one Redwood, you've seen 'em all" . . .

Then our work in urban forestry today, and in the years to come, will be nothing more than trying to stop a new Ice Age with an ice pick.

If, as I have contended, we need a crisis to bring together the forces necessary for success in urban forestry, then we have it. We have it in Washington today!

And the first order of business for each citizen is to insure that the environmental wasters and the short-sighted old man they work for are told in unmistakable terms that their vision is not what Americans want.

But we must work desperately through this cold political winter to protect those concepts which we plant and which we cultivate here today.

And when the chill winds of environmental ignorance have been countered by the heat which you stewards of our urban environment can certainly create, then -- certainly then -- will come the springtime of urban forestry.

LEGISLATING AND POLITICKING FOR URBAN FORESTRY AT THE LOCAL LEVEL

John Staley
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ABSTRACT

Behind every successful urban forestry program stands a professional urban forester with astute political abilities who is capable of promoting the public and legislative support necessary for that program's survival. Through theoretical models and a case study of Grand Forks, North Dakota, this presentation explores both the academic and practical applications of political science that urban foresters need to make to insure professional survival and produce a better product to serve society as a whole.

Throughout the history of professional forestry we have tended to concentrate our studies on the scientific, technical aspects of our profession. From this we have made great strides toward developing cultural practices of managing and producing forest products. Beyond developing cultural practices of tree growth, we have also studied the economic business environment in which we produce forest products. Due to a variety of problems and, indeed, threats to our profession, we have in recent years begun to recognize that government creates an important environment in which we also produce our products. It is understandable that only now have we begun to recognize the role of government, because only in the last few years of our profession, relatively speaking, has government grown to play such a large role in society itself.

We increasingly read in our professional literature of the newfound "people" aspects that are now being discovered. I believe this trend is occuring because we are beginning to recognize the fact that for forestry to play a role in government, and indeed in society, we are going to have to cultivate political support in the form of votes. To recognize the need to compete for limited government resources is to recognize the need to study political science. It is imperative that we recognize that political science is the substance of governmental operation, and in order to function in government, we must study and understand the political science environment, just as in the past we have studied the economic environment. We should study political science not only for the reason of professional survival, but also because the people aspects of political science, of which we will learn, will also help us to do a better job of producing our product and serving society.

There is a great deal of data being assembled today concerning the benefits of trees to society. The climatological studies being conducted in Dayton, Ohio are excellent projects and good examples. Many of these benefits were previously thought to be intangible and now are being described in a more quantifiable form that the public can understand. I offer a caution in the use of these data. My concern is that we learn what to do with it in terms of promoting our profession, or it will all go to waste. I feel that it is the wise utilization of the principles of political science in combination with these tree benefit data that will provide our profession with the promotion we desire.

As an urban forester working at the local government level with a defined target population, I have been able to utilize and recognize the importance of political science in promoting my urban forestry service. I suspect that behind all successful urban forestry programs are professionals who have astute political abilities, or else their programs

would not be as successful as they are. The local level of government offers a good source of knowledge concerning the use of political science in promoting forestry programs because it is at the local level where governmental decision making is closest to the people and the workings of political science is the most recognizable. I would like to add that from locality to locality situations differ greatly because individual cities have unique internal circumstances and characteristics. We cannot assume that what works in one city will work in another. We can only study the subject from an abstract sense to discover trends from which we may gain knowledge.

I would like to offer what I have learned of the role political science plays in urban forestry from two perspectives: an academic perspective and a practical perspective. The academic information is offered with the intention that others might gain an abstract understanding for which they could then adapt suitable techniques for application to their own particular uses. Later, the successful campaign waged in 1981 to fund our forestry program will be presented as a case illustration of political science principles utilized to promote an urban forestry program. We were able to receive, by an 82.4 percent favorable vote, an ongoing five mill property tax levy to be used solely for the urban forestry program in our city. This will provide us with $13.22 per tree for maintenance and planting, which averages $6.92 per capita for our community.

To gain voter approval for this funding program, we had to wage a campaign that was founded on the political science principles to be presented. I think it is important to recognize that if we are to learn of political science, we must first develop a set of abstract principles on which we can base our knowledge. This is similar to the importance of developing a scientific nomenclature for plant life designation. We will be lost on a case by case basis without stating some of these principles in an academic manner.

Our study of political science and its relationship to urban forestry should begin with a description of government. We eventually want to define and describe politics as practiced in government and finally relate the role of the urban forester to the governmental process.

A good conceptual scheme of the governmental political system was developed by David Easton (1965). This systems model involves the interaction among identifiable units to achieve (in the case of politics) the purpose of allocating values for society. It features inputs, a conversion unit, output units, and a feedback mechanism. The two input units are demands for services and supports, such as taxes, that are needed to make the system work. The conversion process involves making decisions about public policy. The outputs include decisions and policies that are then formed into programs consumed by the public. The program results cause feedback which in turn can cause new inputs.

Other than understanding that government is to take inputs and outputs in the form of services, the key element in this model for our discussion is the "Political System." This is the phase of decision making concerning the use of limited resources. Although there are various concepts, most political scientists today define politics as "the most inclusive process by which social conflict is managed" (Schultze 1974). They hold that governmental policy is determined when the political system decides between various conflicting demands presented by various competing groups. Most of the time conflict is resolved through mediation.

To develop further this concept of politics, let us examine some background material. Anthony Catanese (1974) explains that the root of conflict in our system of government was instilled from the beginning with the tripartite government structure. This structure calls for a system of checks and balances among a legislative branch that enacts policy,

an executive branch that administers policy, and a judicial branch that arbitrates legal disputes. Because of checks and balances, a system of stress is created in which government decision making is stretched over long periods, involves more people, but guarantees checks on power. The only way for the three roles to work and produce is compromise. In general, our system of government becomes quite cumbersome in the policy formulation process. However, it also provides that everyone has a chance to be considered, and when there is conflict, there should be compromise to the extent that all parties are partially satisfied.

For the purposes of our discussion the definition of politics is helpful, but it really does not tell us much about how the political system operates. To gain a better understanding of how the political system operates on a day-to-day basis, we should look at two different concepts of our democratic political system.

We have traditionally viewed democracy from an individualist standpoint. This individualist model conceives the individual voter as being the basic actor in the political system. Political parties, each with different and contrasting philosophies of government, would be formed around separate ideologies. The individual voter would choose the party with whose philosophy he most identified. Candidates, once in office, would vote on policies in a manner that was consistent with their party's ideology and philosophy. Government policies would reflect the philosophies of the majority of the citizens, because the party that represents the majority would be in power.

The above individualistic model of democracy is probably the description of government that most of us remember learning in grade school. Today, however, this concept of democracy is being rejected by political scientists. A new concept has been developed to explain more accurately the manner in which our political system functions. Observations of our modern day government have led political scientists to form a new concept called Pluralism.

Pluralism concludes that in today's society the basic unit is the group. We express ourselves individually through the groups we join, because they represent our beliefs. The groups that represent us are professional organizations, trade unions, national wildlife federations, etc. One need only observe the tremendous growth of lobbying groups in Washington, D.C. to witness not only their presence but their ever-increasing influence in government.

The pluralists have observed that political parties do not follow a particular philosophy when elected. Instead they support any philosophy on a case-by-case basis depending on the number of votes they are able to earn. The political parties' main objective is to win. The public decision maker takes things case-by-case and makes decisions based not on party philosophy but on the presence and strengths of the groups with competing interests in regard to the particular issue. The public decision maker will side with the group interest that best enhances his or her political base.

We have discussed a variety of perspectives that political scientists have studied to develop a definition of politics. I believe that by combining these perspectives one can derive a concept of government and politics that is accurate and meaningful to the urban forestry profession, as well as to others who participate in the system of government.

One starts by simply describing government in terms of the system model that was presented earlier. Inputs are converted to outputs. The conversion process in the middle is where we find politics. Politics is the resolution, mediation, and, in general, the decision making that takes place concerning how resources are to be used to provide

policies, services, etc. to the citizenry. Individuals form groups around common interests. On any one issue different groups will hold opposing views depending on what they can lose or gain.

There are many different groups who become active in the political system. One group is the hired professionals who administer government services. They participate when they introduce programs and lobby for them. Other groups known as political action groups are ongoing in nature and will always be represented when issues that concern them arise. Groups such as real estate developers, labor unions, and professional organizations are considered political action groups. Ad Hoc groups are those who form around one issue (such as a tax referendum), rise and promote their interest, then disband when the issue is settled. William Schultz lists the following groups that are commonly active on the local scene: businesses, professionals, bankers, building contractors, government improvement groups, taxpayer groups, neighborhood improvement associations, public employee unions, and ethnic organizations (1974). Interestingly, he classifies the news media as having the same interest as business. If business is prospering, then their advertising revenue goes up. If business if not doing well, then the newspapers face financial problems. Therefore, one will likely find editorials that favor business interests.

Though the same concept applies to all levels of government, the urban forester needs only look at his own city government to witness this never-ending political interaction process. The city forester is almost always involved in the process. When a city forester wants a special tax increase for his program, he is likely to compete for those revenues with another city department that also needs them. Or he may have a citizen group that is opposed to his proposal because they are against increased taxes. The astute city forester will have cultivated a citizens group favorable to his request and willing to lobby for his program. The opposing group will present arguments for lower taxes or better use (in their minds) of the tax revenues. The city commission, according to our definition of politics, will make a decision based upon the side that is most likely to result in their future reelection. (The nature of our system builds in this motive.) If both sides are equally powerful (control of votes), the commission may give the city forester half of what he wants as an effort of mediation. However, if one group is significantly more powerful than the other, the decision will follow the power.

Traditionally we have felt that elected bodies should make decisions based on facts and in the best interest of the long-term public interest. This still happens, as there are many public policy decisions made in which political interests are not prominent. In these cases, the Congressmen tend to vote in accord with their philosophy of best long-term public interest.

However, if there is special interest involved, they will be doing everything possible to make their motives appear to be in the interest of the public. The bottom line is, the first job of the politician is to get elected and stay elected. Vocal interest groups mobilize votes and the politician has to follow suit, or he will not survive. The job of the administrator is to judge from issue to issue which groups, if any, have interest and then predict if the issue will be political and, if so, to what extent.

In summation, we can define politics as the mediation among conflicting demands in which democratic decisions are made concerning the use of resources toward the distribution of government services. The urban forester would obviously like to have most of the government resources converted into urban forestry service. However, others would also like to have most of those same resources. Therefore, the nature of our system dictates that the name of the game is conflict and competition. We should understand that no one is wrong. We all have the right to our beliefs.

This brings us to the discussion of the bureaucratic role of the urban forester. Having defined politics and reviewed some background on various concepts of political influences on government, we should be able to place the role of governmental forestry into perspective. Let's begin our discussion with some background on governmental administration.

At the end of the nineteenth century, city governments were frequently run by what has been called a boss system. With the boss system, cities were controlled by a mayor who ran the city government based on his own political needs. Government services were handed out, not on the basis of objective need but on the votes that would be obtained. City governments were regarded as corrupt.

The reform era was then initiated by other government groups to run the bosses out of office and replace them with "decent efficient government." The new reform governments were based on the concept that government policies should be determined by objective judgments of a trained professional. The goal was to eliminate politics from local government. To provide for these reform type governments, new systems such as Council-Manager governments, non-partisan election, and at-large elections of councilmen were adopted.

As a part of the reform movement, a certain concept of government administration arose. Woodrow Wilson, who became president, promoted the concept that elected officials should decide policy and the hired administrators should implement policy (Starling 1977). Administrators would recommend policy, but in theory, the elected officials would be making the value decisions. Administrators would only make decisions that pertained to the technical questions involving service delivery.

This philosophy of administration is very prominent today, and I think city foresters widely hold this philosophy. In such a system, city foresters only have to make decisions that are based on scientific data and professional procedures. Such decisions are safe and relatively dependable. The problem with this philosophy is that in real life, government just doesn't operate in a manner that lends itself to this type of role playing.

In reality, city foresters are going to have to compete in the pluralist political system, or they will not get any resources to operate their programs. In government, we have two general types of decisions that are made during the conversion of the input into the outputs. A moral, value decision is made by elected officials concerning where resources are most needed in terms of city services. The other type of decision is the professional decision concerning how best to perform the services once the resources have been received. The latter decision is based on scientific principles and usually lies in the domain of the professional. This type of decision is the one that foresters most often prefer. Yet much observation, study, and analysis of the real political system has revealed that the successful administrators are those who learn the political system and how to operate in it to gain the resources for their programs. They enter into value decisions by lobbying for resources in the same manner as the other groups who participate in the pluralist system.

One could justifiably argue that the value decisions should lie solely in the hands of the elected officials who supposedly are elected on their beliefs. Such a concept, patterned after the individualistic form of democracy, is based on the assumption that the elected official would follow his publicly stated beliefs and vote in favor of his interpretations of what is best for the public interest. The city forester's role would be only to design and explain objectively his program to the elected officials, then to allow them to make their decisions without other effort on his part.

The problem is that the reality of government is contrary to this simplistic conception. Because of the system, elected officials make decisions based on what is best for gaining votes for their reelection. It may appear to be different on the surface, but such an appearance of concern for the public interest is usually only a justification for their personal motives. It comes down to the fact that the city forester must learn to make his programs attractive to politicians in terms of votes these officials may receive. This is why the city forester must be knowledgeable of politics.

The professional administrators get involved in the political (value) decisions by proposing policy and by promoting their policy proposals. Though elected officials have to respect technical factors, professionals make most of the technical decisions. Political decisions are those which determine whose street trees are to get pruned first in light of limited resources. Technical decisions would concern how the trees were to be pruned (i.e., heavy, medium, light).

The theme of this section has been to advocate that city foresters play a political role in the performance of their jobs. The extent to which one initiates political activities in getting programs created will depend on many factors. The form of city government in which one is working, the extent of diversity of the socio-economic characteristics of one's city, and the amount of political conflict that takes place in one's city are just a few of the factors that must be taken into account before choosing what role to play.

For the administrator to play the game, a variety of strategies are available. The basic goal is to build a politcal clientele. To do this, one can perform a number of public relations activities. Some of these activities should be ongoing programs such as a weekly column on plant care published in the local newspaper, as well as yearly Arbor Day programs. Other public relations programs should be those that take advantage of single events that portray urban forestry departments in a good light. The astute urban forester should always be thinking in terms of public relations activities and be ready to take advantage of favorable situations.

Other strategies to build clientele support involve locating existing groups in the community and cultivating their support by involving them in the program and in public service projects relating to forestry. Individuals that make contributions to the program tend to become very supportive of the program. These groups will likely be available to display support for forestry issues when controversies arise.

Citizen participation activities employed when and where appropriate serve to involve citizens in the decision-making part of the program. This tends to educate them on urban forestry while improving their esteem for the department. Favorable impressions of the department will then be passed on via the best media possible, person-to-person.

There is a host of fundamental knowledge relative to the discipline of political science that is valuable in promoting an urban forestry campaign. Studies of voter behavior, for instance, help us understand how to formulate proposals to achieve maximum voter approval. Relative sociological principles regarding the way different public attitudes are formed and who is likely to present opposition or support are helpful in meeting the public directly, as well as in conducting political campaigns. The principles of conducting campaigns and forming public opinion are helpful in determining themes, images, and media appropriate for gaining voter support.

The last strategy to be mentioned, although there are more, is that of carefully formulating program proposals with politics in mind (Wildavski 1974). This involves identifying who and how the program is going to affect when it is implemented. The

forester then reassesses the design of the program to gain support and minimize opposition. Though one would never plan bad arboricultural practices, one might have to include an additional neighborhood to appease a group that supports an influential city councilman or postpone work in a neighborhood likely to oppose the plan. Since compromise is the root of the political system, it certainly makes sense that we learn to compromise to get some things done rather than accomplish nothing at all.

The extent to which an urban forester should play politics is certainly a debatable question. If, however, the urban forestry profession is to increase its influence in the political system, we must strive to learn more about political science. As we have discussed earlier, the nature of our governmental system involves groups competing and promoting their own interest. Not to participate is to be left out.

Grover Starling's definition of a good public administrator applies to the urban forester. To Starling, a good public administrator is one "who can mobilize support for his programs and, in short, get things done" (Starling 1977). Within the urban forestry profession, the spirit of Starling's definition seems to be felt by many. In the many discussions that I have had with city foresters, I have found that we value building programs and getting things done.

If our profession is to build, we will have to do it for ourselves. We cannot expect the political system merely to hand us its resources while we sit and spit technical details at it only when called upon. We are going to have to compete in the political system if we are going to get our share of the resources (learn to play the game).

In the city of Grand Forks, we quickly realized during 1976 that if we were to gain funding for our forestry program, we would have to consider the political science aspect of urban forestry. As a result of our public relations programs, we improved public opinion, and in 1981 the voters of our city approved an ongoing five mill property tax levy. This did not happen by accident, as certain measures were taken to build public support. As an example of utilizing political science principles to improve an urban forestry program, I would like to offer the case of Grand Forks.

Grand Forks is a city of 42,000 people located in a rich agricultural region of North Dakota. The city borders the state of Minnesota and lies sixty miles south of the Canadian border. The semi-arid climate and cold winter temperatures limit the tree species adaptable for planting. The natural climate vegetation is a mixture of tall prairie grasses. Treescapes that exist in the region are shelterbelts planted on farm lands, natural woodlots lining major rivers, and trees planted in the cities. In a prairie region such as ours, trees are more difficult to culture, which makes the necessity of professionally managing trees more evident. Grand Forks is recognized as having a nice treescape due to the efforts of its citizens, as well as its park district forestry program.

The urban forestry service is a department of the park district, which is a separate unit of government from the general city government. Park districts in North Dakota are regulated by five elected at-large commissioners and have limited powers determined by state code and charter. Other than owning and managing park property, park districts may regulate tree care on city street boulevards. Unfortunately, the property tax levy for parks is limited by the state to only ten mills, even if the local voters were to desire more revenues for the park district.

The forestry program got its start in 1917, when the park district first took legal control of the boulevard trees. Since then it has gone through quite a metamorphosis. Until 1957, tree planting and care of the boulevards was performed by the park district, but only on a

property owner call-in basis. From 1957 to present, the department has acquired professional employees, along with rather specialized units of forestry equipment to administer on a full time basis a comprehensive city-wide tree-planting and maintenance program.

In Grand Forks we take a broad spectrum view of urban forestry to conceptually include the management of all urban vegetation for the benefit of its citizens. Trees are planted on the boulevards only by the forestry department as tree lawn vacancies occur. All boulevard and park trees are pruned regularly on a scheduled rotation basis with small trees pruned every two years and large trees pruned every five to seven years. The department also performs a variety of other services, such as tree surgery, pest control, a wood utilization program, a homeowner consulting service, and a role in the planning of city developments. The service goes so far as to offer free removal of diseased elms on private property, which has been a contributing element to the success of the Dutch elm disease control program. As a result of the tree program, the city treescape which includes privately and publicly owned trees is generally uniform, well maintained and attractive.

All has not always been rosy. The forestry program's funding methods have also been through a bit of a metamorphosis. Until 1976, funds were allocated to the forestry department from the park district's general fund. Receiving an annual budget of $70,000 in 1975 required the forestry department to compete with the parks department and other demands for general fund resources. With inflation causing expenses to rise and the impending threat of Dutch elm disease, it was decided to find another source of revenue for the forestry department. Since the mill levy of the park district is limited by state law, the special assessment system was the only conceivable method available for raising funds.

A five year program was devised that provided for the cost of yearly street tree work to be assessed to owners of property adjacent to the boulevard. Based on a block-by-block plan, the actual tree-maintenance cost was averaged throughout individual neighborhoods where the work was performed. The plan was technically sound in terms of arboricultural and forestry standards. Tree planting and tree maintenance was planned and performed per city street block throughout the city over the entire five years.

Unfortunately, the special assessment funding method does not take into consideration sociological and political aspects of a community. When implemented, our plan was met with a great deal of opposition from the community. People were affected quite adversely, and the reputation of the department was very negative throughout the city. Protest hearings were held, the office received many adverse phone calls, negative editorials were published in the paper; all of which made most of us feel that voter opinion would never favor a forestry program in the future. We would never have guessed by 1982 the department would have a permanent funding base yielding $291,000 annually.

Realizing that we had five years to implement the special assessment program also meant that we had time to change public opinion and plan a new funding system. Our first step was to conceptually design an ideal forestry system for the city via our interpretation of social and political circumstances while including technical treescape needs. We then embarked on a five-year campaign to seek support for the ideal forestry system. It should be pointed out that changing public opinion is not an overnight activity that can be attempted one year before an election. It took the whole five years.

We began by lobbying along with other urban forestry groups throughout the state for a change in state law. The state did approve a bill to allow cities and park districts to raise

five mills of property tax to fund urban forestry programs, if approved by city voters. Throughout the five years, many public relations activities were implemented to build the esteem of the forestry department. Successful accomplishments and beneficial services of the forestry program were given media attention periodically throughout the five-year campaign. Tree care articles were published in the local newspaper to provide homeowner assistance. Also visits to homes for tree problem advice certainly helped improve the forestry department's image. In new neighborhoods, where boulevard tree planting were installed for the first time, citizen meetings were held to receive input from the citizens regarding their tree preferences. (This was done within sound arboricultural guidelines.) This served to educate the people and to employ their support.

Throughout the year that preceded the election, a number of steps were taken to alert and focus voter attention. For study groups that were formed, service level options were developed to initiate objective thought and study. The proposal that was finally taken to the voters was formulated with political science realities in mind. Such considerations, as who actually votes and how can "yes" votes be mobilized without also mobilizing "no" votes, were included. Campaign funds were raised with the thought of soliciting voter support.

The results of our efforts were successful. At a special city election to determine the single forestry funding issue, 82.4 percent of the voters approved the proposal. The proposal granted the park district the perpetual authority to levy annually up to five mills of property tax for only urban forestry purposes. The money may be used for urban forestry purposes in any manner seen fit by the five-member elected commission based on the advice of their hired professionals. The proposal also granted powers to assess newly annexed neighborhoods for the initial street tree installations performed by the forestry department. Because the forestry department now collects property taxes, it is eligible to receive its share of state and federal revenues that are distributed to cities. Revenue sharing is one example.

Our funding campaign would have ended unsuccessfully if we had not realized early on that political science is a major part of urban forestry. Our success, however, was not based solely on public relations. The key to success in obtaining voter popularity relates to the statement made in the beginning of this paper concerning what we must do with data on tree benefits once developed. Our forestry program sold because it was arboriculturally sound. We focused the voters' attention toward the benefits and accomplishments of the program in a manner that correlated to political science principles. Had the program not been technically sound, no amount of public relations would have sold it.

Many measures were taken throughout the five-year campaign that just simply could not be mentioned here due to space restrictions. Things said at various meetings, the focus of public attention through comments made via media news events, images selected and protrayed that related specifically to popular ideals of the Grand Forks community are just a few of the many measures taken to focus public attention.

For others to benefit from our experience, I would recommend they not necessarily look at the specifics of our campaign. Instead, they should look at the abstract principles and apply them to their own situation. Whether in a large city of a small community, though specific administrative measures would be different, the application of abstract political science principles to promote urban forestry programs should be regarded as a necessity. It is this concept that should be learned from the Grand Forks experience.

The intent of this paper was in part to educate, but more importantly to challenge the reader to think. Whether one agrees with the concepts presented is not particularly important as long as thoughts are stimulated in the minds of individuals involved with the profession. It is the results of these thoughts that will create innovation and collectively propel the profession forward.

In closing, in accord with the spirit of challenging thought, the following two proposals are presented for consideration by the profession:

1. Forestry college graduates should be exposed to social science, political science, and governmental principles, as well as the standard natural science background. If they are going to do forestry in a governmental environment, they certainly are going to have to know how to play the political game.

2. As a profession, we should devote more attention to learning the political science aspects of our profession through literature and convention programs. This will hopefully help us collectively promote forestry throughout the nation.

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SECOND NATIONAL URBAN FORESTRY CONFERENCE

SESSION G

LEGAL COMPONENTS OF AN URBAN FORESTRY PROGRAM

Wednesday, October 13, 1982
10:30-11:30 a.m.

Moderator:

John Evans
Ohio Forestry Association
Columbus, Ohio

Speakers:

Charles C. Weber Alabama Forest Service Huntsville, Alabama	Developing a Successful Urban Tree Ordinance	227
Phil Hoefer Colorado Forest Service Fort Collins, Colorado	Negotiating Successful Contracts and Agreements	233
Robert Felix National Arborist Association Wantagh, New York	Certification and Licensing of Arborists	238

DEVELOPING A SUCCESSFUL URBAN TREE ORDINANCE

Charles C. Weber
Urban Forester, District 1
Alabama Forestry Commission
Huntsville, Alabama

ABSTRACT

Trees might seem non-political, but tree ordinances affect so many individuals that they soon force politicians, homeowners, realtors, contractors, and developers either to take interest or take sides.

The best recommendation one can make is to broaden your support base so that no interest can feel left out of the decisions. Invite representatives of every commercial, governmental and educational agency that could have a stake in the outcome, plus anyone else--Sierra Club, garden club, Rotary Club--to attend meetings, contribute, and to listen.

Borrowing other cities' ordinances may not work. In developing an appropriate ordinance, choose sub-subcommittee members well-versed in the topic areas, not necessarily sympathetic ones.

Consider the four basic forces which interact: (1) Nature, (2) Ethnic tradition, (3) Political-economic climate, and (4) Legal framework. Consider regulation versus education, permits versus pamphlets, protection versus management, and work for compromises (areas of agreement) rather than provoking an impasse. See that your ordinance makes people want to have and care for trees.

As non-political as trees might seem, tree ordinances can be very divisive issues. Though everyone has a personal stake in urban trees, there are many sides to the question. Consider a list of the people whose jobs or property would be affected by a tree ordinance: arborists, realtors, developers, the mayor, homeowners, building contractors, nurserymen, horticulture teachers, utilities engineers, the city attorney, city council members, an urban forester, a public works manager, and many others. Each has distinct ideas about what a tree ordinance should be--and which trees should be included--but to write one acceptable for all is another matter. Usually the people in the vanguard of a tree ordinanace movement are strong-willed and uncompromising. In most cities, however, compromise is the only route to an ordinance that truly addresses serious tree problems.

Faced with such diversity, how does one start? Huntsville, Alabama began with a few Beautification Board members, appointed (after a decade or so of hesitation) to draft a tree ordinance for City Council approval. This project was undertaken only two years after public objections watered down and nearly killed a parking lot landscaping ordinance, and less than six months after a tree-ordinance proposal was crushed in Alabama's capital city. They turned to me, as the urban forester for a seven-county district of the state forestry commission, for ideas, precedents, and technical information.

The best single recommendation I made throughout the whole process was my first: to broaden our support base so that no interest could feel left out of the decisions, whatever else happened. We invited representatives of every commercial, governmental, and educational agency that we could imagine to have a stake in the outcome, plus anyone else--Sierra Club, garden club, Rotary Club, individuals--anyone willing to talk . . . and to listen.

The Committee's first question was, "What is a tree ordinance?" The process of answering that question set the pattern for all else that followed. Clearly, the 32 members of the full Committee could not work efficienty, so the Chairman selected an "inner committee"--seven persons with the time, resources, and inclination to correspond, study, write, and negotiate, and then report to the remaining 25 for reactions and eventual concurrence.

The inner committee gathered copies of other cities' tree ordinances, but the approach of comparing any one of them against the others failed. We reviewed at least 37 ordinances plus several general studies about tree ordinances. The process of parcelling them out to committee members to read, summarize, and report on for comparison turned out to be tedious and meaningless. To avoid such a dead end, I cut these ordinances apart and sorted the pieces by topic, in order to reflect the diversity of approaches on any given subject:

LEGALITIES
- Statements of purpose
- Tables of contents
- Statements of the value of urban trees
- Definitions
- Changes to other ordinances
- Severability clauses
- Effective dates
- Sanction by higher government bodies (e.g., state legislatures)

ADMINISTRATION
- City forestry departments
- City tree boards
- City arborists
- Funding
- Promulgation of rules by the city tree agency
- Interference with the city tree agency
- Penalties for tree-related offenses
- Appeals and administrative review

STANDARDS
- Permits and inspections
- Planting and maintenance standards
- Public and private tree-maintenance responsibilities
- Damage to trees
- Miscellaneous technical standards

LICENSING

OTHER SUBJECTS

These subjects were assigned to sub-subcommittee members, picked for their familiarity with the topics--not necessarily for their sympathies. They compared various approaches, noting any that related to our situation--both those that might work and those that seemed especially inappropriate. These topic headings bore a strong resemblance to the headings of our ordinance as finally adopted:

I. GENERAL ARTICLES
II. ADMINISTRATION
III. TREE-MAINTENANCE AND PROTECTION
IV. WORK STANDARDS FOR TREES ON PUBLIC AND SEMI-PUBLIC LANDS

As they worked, the members of the inner committee viewed each issue from their own perspectives; yet they soon cultivated a feeling for the limits that conflicting interests might accept. Few moments of controversy, or even bargaining, arose; while biases were in the open, an unexpected but welcome spirit of conciliation marked the discussions, so that the inner committee was practically unanimous when the draft was reported for the consideration of the full committee. Few technical or philosophical objections were encountered before going to City Hall.

There was one incident, however, which almost proved to be fatal for the entire effort. Among other ordinance models reviewed was one apparently composed by members of the Chattahoochee Group, Georgia Chapter, of the Society of American Foresters, in response to a request by the Atlanta Regional Commission. The urban forestry section chief in my own organization's state headquarters had borrowed this model, had written in "Alabama" in place of references to Georgia, and then had circulated it among the urban foresters in our district offices. One of the models that our 32-member committee saw at the initial organizational meeting contained several serious traps:

It was long, detailed, and highly regulatory.

It set up a Tree Commission and a paid Municipal Forester, clothed with police power (and presumably with an office staff) to administer a flock of permits and regulations governing not just public and right-of-way lands, but also practically all privately-owned lands as well, including those to be developed and those already developed.

It was undoubtedly meant to solve some very real tree problems, but it was not attuned--philosophically, psychologically, politically, financially, or any way--to reality in a conservative Southern city with strong real-estate interests in its government . . . and especially during a time of deepening economic trouble.

This was essentially the same model crushed the year before in Montgomery when it was proposed by a group of concerned citizens who failed to consult with diverse parts of the public before they approached their City Council.

Little wonder, then, that our real estate and construction interests sensed a conspiracy, even though none existed! We survived--but only because we quickly acted to set the record straight as soon as we saw the trap that we had fallen into.

We see a close parallel between this process and the "Areas of Agreement" that the American Forestry Association adopted in mediating natural resource disputes on a national scale. A few suggestions include:

(1) Meeting times and places are important. Convenience and regularity affect the members' attitudes, and "neutral turf" helps moderate people's biases and suspicions, at least at the outset. Our work sessions were held in Huntsville Utilities' conference room. The timing of meetings affects those who can attend. A lunch meeting at a restaurant may serve well for reports from the inner committee to the full committee, but work sessions go better late in the regular work day or just after work when members are looking forward to supper. Momentum is important, so drafting an ordinance in summer risks absences or postponed meetings, as members vacation.

(2) The chairman must: coordinate and constantly encourage; remain open to ideas from all sides; never let the monkey sit on his shoulders for more than a moment to maintain member interest; and sense individual involvement.

(3) Someone on the committee other than the chairman--preferably some professionally unbiased individual--must work out details of the final product. It takes time, technical background, and willingness to gather, synthesize, and record the ideas of the members. I was able to visit other members individually between meetings, coordinate with the city's attorneys and engineers, and otherwise serve as the committee's legs.

The fundamental direction of the ordinance will probably determine its success or failure--in the committee, in the City Council chambers, and on the streets. Practically any elected official will vote for and support a city improvement ordinance, if (1) it is within the city's financial means, and (2) it is in keeping with the current local philosophy of government.

Here is some background: The "appropriate" tree ordinance is shaped by four basic forces, which interact in strange ways:

(1) NATURE. Climate, soils, native species distribution, insect and disease problems, the existing condition of the city's tree canopy (if you can count this as a part of Nature), and related factors will largely determine what ought to be done. Nature helps decide whether the soil between street edge and right-of-way edge is a beautification zone, or whether it must be carefully managed as a snow-disposal strip with its complement of salt, abandoned cars, wrecks, etc. And Nature forces the people of a Dust Bowl city to govern themselves in ways that might seem overly protective in the Coastal Plain or the Appalachian Piedmont.

(2) ETHNIC TRADITIONS. Without documentation, I sense distinct differences in the attitudes of various groups and nationalities toward regulations, requirements for permits and inspections, etc. What is it in the psyche of Pennsylvanians or Michiganders that allows regimentation on a scale that we rednecks find both surprising and threatening? I'm sure this ties in with natural demands, in many ways, but if you look, you will see the trends.

(3) POLITICAL-ECONOMIC CLIMATE. Environmental work is basically a political process that takes its cue from economic conditions: when we feel reasonably affluent, we protect our grandchildren's heritage, but when things get tough, we mortgage our future quality of life in favor of immediate prosperity.

(4) LEGAL FRAMEWORK. Adding to the complexity are some legal facts of life which can be turned to good use, such as Connecticut's state law supporting local

tree-management activities. Some have, unfortunately, missed opportunities, such as Alabama's law excluding pruning, right-of-way clearance, and tree removal from the list of activities requiring a state tree-surgery license. Others are simply facts of life that you must adapt to, such as Alabama's legal precedents supporting landowners' claim to trees on rights-of-way adjacent to their property.

These circumstances boil down to decisions about fundamental approach--regulations versus education, or permits versus pamphlets. A good regulation must have:

A reasonable purpose
Sound technical foundation
General public support
Money, manpower, equipment, and administrative support
A policy of uniform enforcement, with balance between vigor and mercy

In short, enforcement is a fairly expensive form of mandatory education, with the potential of doing good--or harm--to the cause at hand. An alternative is a purely educational approach, including:

Continuing, aggressive work
Good, readily-available materials
High visibility
Dependable benefits to the public
A cost low enough to be affordable but high enough to command attention

There are gradations between these extremes, and different approaches may be appropriate for different parts of your tree-management program.

However you solve this question of fundamental approach and carefully tailor your ordinance to the community's psyche, some individual will judge it by the first few words--the title. About halfway through our drafting process, and just about the time when we saw that we must win back the homebuilders' understanding, we recognized a glaring misnomer in our ordinance: though we had worked long hours to de-regiment the ordinance--emphasizing planning, standards, and education instead of permits and inspections--we awoke to the fact that the ordinance was still titled "Tree Protection Ordinance." We quickly changed this to "Tree Management Ordinance"--a positive term that includes protection but provides a more appropriate glimpse of the contents. It is impossible to know exactly what value this had. I'm certain it was prudent, but it may have been crucial. It has also helped our Tree Commission to maintain the proper perspective toward their job.

Local limitations may suddenly change; when Dutch elm diseases or gypsy moths arrive, or gradually, as the economic outlook darkens or brightens. Be sure that your tree ordinance is flexible, so that in good times your tree program can grow without overstepping its authority, yet survive the hard times. Leave room for innovations: ties to AFA, ISA, NAA, the National Arbor Day Foundation, and other sources of help and information; cooperative work such as IPM, in conjunction with the Extension Service, SCS, federal and state forestry services, educational institutions, local businesses, civic associations, clubs, and individuals.

In summary, any group setting out to write a tree ordinance for its community needs to keep in mind several fundamental principles:

Gain and keep a broad support base.

A workable compromise is better than any impasse in which each side feels justified in having nothing to do with the other.

An ordinance does nothing in itself; the process of writing an ordinance starts motion, for better or worse, and success lies in channeling that momentum properly.

While substance is important, don't underestimate the role of terminology--including buzzwords--that create first impressions among potential supporters or opponents.

Finally, the right ordinance for any community is the one that makes its people want to have and care for trees.

NEGOTIATING SUCCESSFUL CONTRACTS AND AGREEMENTS

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ABSTRACT

Contracting for specialized equipment and personnel services is becoming a most important aspect of both government and private operations, especially as the cost of equipment is too high to justify its purchase outright. Bucket trucks, tree spades, or lawn care services are examples which, when contracted, often prove more efficient and economical.

An in-depth examination of contracts and contracting illuminates the essential elements of a contract, the main written parts, the importance of clear communications, and the importance of the necessary follow-up procedures to assure contract compliance and completion.

Most importantly, know all the parties with whom you are contracting. The most brilliantly negotiated contract can't save you if you deal with someone who is dishonest.

The concept of "contract" is one of the most important institutions in modern society, both in government and the private sector. The cost of specialized personnel and equipment is often too high to justify employment or purchase, and contracting for these necessary services is becoming more popular. A community may not be able to justify the expense of a bucket truck or tree spade when its use is limited to only a few operations each year. Contracting with a private concern may be more economical. Private corporations often contract with major lawn and tree care companies rather than hire and maintain their own personnel and equipment. Even the "jack-of-all-trades" homeowner now finds contracting for a variety of services more efficient and economical.

Let's take a look at contracts and contracting; their essential elements, their main written parts, the importance of clear communications, and follow-up procedures to assure contract completion.

Contract is a concept supported by society. All of us have the ability to incur obligations (exchange promises), and such obligations will usually be enforced by society. In other words, if you and I mutually agree on work to be completed, with proper consideration and legally allowed, society (our courts) will enforce the contract. I do not want to get bogged down in the complex legal background of contracts. The references listed at the end of this paper should prove helpful in understanding contracts.

A lawyer friend of mine told me, "You don't need a lawyer to negotiate and prepare every business contract. If everyone got a lawyer for every contract they entered into, the business world would suffer a major breakdown." He also said I would know when a lawyer was definitely needed.

Before discussing a contract's essential elements, a brief word must be said about the Uniform Commericial Code. The Uniform Commercial Code is an important document to review if you are dealing in commercial transactions. Standards of business transactions

are established in this code and can be found in your State's Statutes. Commercial arborists should follow these codes. Municipalities must be aware of the standards.

Essential elements of a contract are mutual assent, valid consideration, legal capacity, and legal subject matter in writing (if required by law).

Mutual assent is a two-part element--a valid offer by one party acceptable to another party. This sounds rather simple and in most cases few problems occur; however, people occasionally use different definitions. They don't always remember the same things from the same discussion. What is said is not always what is meant. Clear communication is extremely important.

Consideration is the method of payment or exchange. In other words, the inducement to contract. A legally binding promise must have sufficient consideration. This element usually doesn't create much of a problem with the types of contracts entered into by or with municipalities. A service is given in exchange for a certain amount of money.

Legal capacity concerns a person's right to enter into a contract. Generally, any adult has the legal capacity to enter into a contract. Incompetency, minors (usually under the age of 18), fraud and duress, or other such matters usually bring into question the capacity of parties to enter into contracts. Suppose you enter into a contract with a 17-year old to do some lawn and landscape work during the summer. The "contract" is actually invalid and therefore unenforceable.

Legal subject matter is an element that needs attention. If the agreement relates to some unlawful act or violates statutes, public policy, or other laws, it is not valid or enforceable. Be alert to any transactions that may be contrary to zoning laws, permit requirements, consumer protection acts, or any other applicable laws.

Finally, the writing. This deals with the statutes of fraud and requires certain contracts to be in writing. Generally, oral or verbal contracts are valid, legal and enforceable. Reducing all contracts to writing and having them signed by both parties is a good business practice and one which communities should follow. When dispute arises, you are always in a better position to support your case if the "best evidence" is in writing.

Mutual agreement, consideration, legal capacity, legal subject matter, and writing are essential elements of the contract. Make sure these elements have been considered in every contract you negotiate, whether oral or written.

When writing a contract, the format should include a variety of parts to help with the process of understanding and completion. Most of these need little explanation, and general formats can be found in legal books at the library. These actual parts are:

(1) Document name;
(2) Introductory remarks;
(3) Recitals;
(4) Operative provision;
(5) Closing;
(6) Witnesses;
(7) Acknowledgments.

The document name is not an essential part, but it can help clarify ambiguities. Select a name that fits the work being completed. For example, "Agreement For Diseased Elm Tree Removal" makes it easier for everyone to understand what is in the body of the

contract than the title "Agreement" would. It is common practice to use the latter, so use a little thought and create a meaningful title.

Introductory remarks give the names of the parties involved in the contract, the date, and the statement that this is an Agreement. Each party should be accurately named and described, so there is no doubt as to who does what. Make sure all spellings are correct and the names coincide with the signatures. Often names are abbreviated, such as "The CITY OF COLORADO SPRINGS, hereinafter referred to as CITY," or "NORTHERN NEW MEXICO TREE SERVICE," hereinafter referred to as ARBORIST or CONTRACTOR." Any designation is allowed as long as it is completely understood by the parties.

The recitals are the "whereas" statements, which state certain facts pertinent to the contract. A simplistic example is:

> "WHEREAS, the CONTRACTOR has the expertise to provide vegetation maintenance;
> and
> WHEREAS, the CORPORATION desires to enter into a contract for vegetation maintenance services as described in this agreement."

Where all of the fact recitals are carefully stated, and where both parties agree to be bound by them, such recitals operate to insure lasting validity of the contract.

Operational provisions are the part of a contract that describe what is expected by each party. A conscious effort should be made to make a statement of consideration in this part. Normally, this takes place without much thought, since a promise by one party is consideration for a promise by the other. The payment of money by one party supports a promise by the other. Many pre-printed contract forms recite the phrase "In consideration of one dollar and other goods and valuable considerations . . ." That covers the aspect of payment to make a valid contract.

Most of the operational provisions contain promises made by each party. What is going to be completed; when will the work start; what is required by the person or company performing the work; when will the contract expire; what are the consequences of failure to perform; and so on. Every effort should be made to state the undertaking accurately. Time and effort on this part will prevent headaches, frustrations, disputes, and lost time and money later. Here is where the communication and negotiation process is truly tested.

Once the provisions are agreed upon, signatures (the closing), witnesses and acknowledgments can be completed. Be sure the person signing the contract has authority to do so. Witness and acknowledgment signatures are not required on most contracts.

The essential elements and written ingredients of contracts can be perfect, and still confusion may exist. A successful contract requires complete communication, knowing the outfit with which you are dealing and a good deal of trust. As I mentioned earlier, "What is said is not always what is meant." I heard this recently put another way: "I know that you believe you understand what you think I said, but I'm not sure you realize that what you heard is not what I meant." In contracting and in all forms of communication, make sure the correct message is being transmitted and received. Ask questions. Make the person receiving instructions repeat them back to you. Do what is necessary to insure the right job will get done. Most everyone has a story or two about the wrong tree being removed, or trees that were topped rather than slightly trimmed, or where the brush wasn't removed when it was expected to be. Communicate!

One extra method of communicating for municipalities as well as others is a "Notice to Bidders." This pre-bid document defines and explains the work to be completed. It is an invitation to bid and enter into a contract. It usually includes Instructions and Specifications. One Notice for each specific operation works best, such as Spot Trim or Tree Removal. The Instruction portion of the Notice should contain the following items:

(1) Who is requesting bids;
(2) Where to send the bid;
(3) Deadline time;
(4) "Earnest" money or bid deposit;
(5) Bonding requirements, if any;
(6) Arborist license requirements, if any;
(7) Insurance requirements, usually $100,000 per person and $300,000 per accident, property, and bodily injury;
(8) How to bid, i.e., by tree, by diameters, by total, or whatever;
(9) Penalties for failure to perform;
(10) Liability disclaimer of the contractee;
(11) A statement that gives the right to reject any or all bids;
(12) Date, time, and location of pre-bid meeting;
(13) Equal Opportunity and Affirmative Action requirements;
(14) Any other statements legally required by your community or company.

The Specifications define the work and the conduct of operation. This is where it is important to communicate clearly. A pre-bid meeting is a must to clear up any misunderstanding of specifications or standards. The following items should be emphasized at the pre-bid meeting:

(1) Definition of work--i.e., what needs to be done to how many trees;
(2) How the work will be coordinated;
(3) Inspection process;
(4) Safety procedures in barricading, lighting, etc.;
(5) Operational procedures--i.e., specific technical information on how the job is expected to look upon completion. Also, debris disposal and cleanup, noise limits on equipment, public relations, etc.

    The National Arborist Association has developed standards for several arboricultural operations. The more these are used as a single standard of operation, the better the communication, e.g., coarse trim will mean the same to all of us, and the need for additional specification details can be reduced greatly;

(6) Billing procedures.

A set of Specifications for each type of job works best. It's confusing to incorporate spraying, pruning, tree removal, etc. into one Specification.

Public Relations. Most all arboricultural work is performed publicly. Keep the public informed. There seems to be an inverse relationship between their knowledge and the number of phone calls to the city or company. There are numerous methods to keep the public informed. Colorado Springs uses both door hangers and news media to keep the public informed.

Inspection was also mentioned in Specifications. Inspection is often thought of as a negative process, but without it much can go wrong. A good contractor welcomes

inspections, knowing that inferior and dishonest arborists are usually eliminated from future contracts. If inspections aren't made and some of those "low bid," dishonest contractors continue getting bids, the prospect of having good contractors bid in the future is less likely. Take time to inspect. Make sure the pre-bid communication process was interpreted correctly.

Know your contractor! The most brilliantly negotiated contract can't save you if you are dealing with a crook.

Negotiating successful contracts need not be difficult. If you have legal advisors readily accessible to assist with any contract you need, you should realize that lawyers are not arborists or foresters. They need your input to complete the most important part of a contract--the operational provisions.

SUMMARY

If any specific item would guarantee a successful contract, it is communication. Tell and show thoroughly what needs to be accomplished, and don't overlook the public. They, too, determine whether your contract will be successful. Follow the contract with inspections. Keep it a positive part of contracting. Few contracts are without problems, but to minimize problems, maximize communication.

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CERTIFICATION AND LICENSING OF ARBORISTS

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ABSTRACT

The value of certification or licensing is largely in the eyes of the beholder. Improved quality or performance of responsibilities is not always a result. Certification requirements vary greatly from state to state. Rigid enforcement of these laws is rare, as numerous loopholes exist.

The truly professional arborist provides the best possible service regardless of licensing requirements, for they keep current with new pesticides, equipment, and technology. They also are fully insured and observe all safety regulations.

Others might acquire licenses, even pass examinations to satisfy a law, but they provide unreliable--even dangerous service. Certification may just be an ego trip, since it provides instant credibility (if you advertise)--but offers no guarantee in and of itself.

Nor is unfair competition eliminated, for some consumers will always choose the cheap job over the proper job. Others learn only too late that you usually get what you pay for. Enforcement of specifications, standards and legal requirements is the key to improved performance.

The value of certification and/or licensing of arborists is all in the eyes of the beholder. Improved quality, performance, and responsibility is not always a result.

At least 12 states still have certifications requirements, as do a multitude of cities. At least one state, New Hampshire, has allowed their arborist-licensing law to succumb to the sunset requirements of that state's legislative process. The New Hampshire Arborist Association has retained certification on a voluntary basis. Connecticut, which has the most comprehensive and effective licensing requirements for arborists, may lose its certification law for the same reason.

Compliance in four states is voluntary. This means that the state arborist association offers examinations on a periodic basis. Certain prerequisite qualifications and successful completion of these tests may result in certification. There is no legal requirement for a practitioner to have such certification in these states.

In at least three states, compliance is discretionary, which means that certification through state administered examination is available but not required in order to practice arboriculture. Although New Jersey has a discretionary law, many municipalities require that only New Jersey-certified tree experts can be awarded municipal contracts for tree care. This requirement may not be enforced.

In the remaining states, and in many cities, certification and/or licensing is mandatory. However, loopholes and budget restrictions make enforcement difficult. Most people are unaware of such requirements or too busy to complain. Even when a complaint is filed, it may be difficult to obtain compliance.

In Connecticut and Maryland compliance and enforcement have been adequate. Under Connecticut law a complaint may be readily enforced, particularly in view of the fact that a commercial pesticide applicator's certificate, as well as a general tree care certificate, has been tied into the arborist license. Recently, an unlicensed Maryland practioner was charged and convicted of advertising as a tree expert without a Maryland arborist license.

A truly professional practitioner will provide the best possible arboricultural service, certified or not. These are responsible individuals who remain up-to-date on technology, equipment, and techniques, and observe all safety regulations. They are fully insured and provide proper service to their clients.

Others in the field could have a handful of licenses and pass any number of examinations, but their operations are unprofessional, unreliable, and may even be dangerous. Where there is a will to cheat, there's a way. Some may not even realize that they're doing something wrong. Others only pay lip service to quality performance.

Certification may be an ego trip, providing instant credibility (if one advertises). Certification is no guarantee of competence in the field! Some examining boards work diligently to make the certification tests as difficult as possible. Some individuals reflect a feeling of omnipotence among their peers that the examiner is higher than all the rest.

One perceived benefit for the legitimate practitioner is the belief that unfair competition is eliminated, and uninsured or incompetent individuals will be prohibited from operating. Such is rarely the case. Often consumers try to buy a cheap job, rather than a proper job.

Some tragic results may occur; for example, during the summer of 1982 in Cincinnati, a well-to-do homeowner asked his yard maintenance man, a college student, to prune a large multi-leader tree that blocked his view of the Ohio River. This amounted to creating a vista through the removal of some very large limbs.

This inexperienced young man rented a chain saw, climbed the tree without benefit of rope and saddle, and proceeded to try to lop off a 16-inch leader. Unfortunately, the leaders were bounded together by a heavy vine, and when the cut was made, the leader couldn't fall. It swung into the crotch where the man was standing and pinned him to the tree.

Emergency help was summoned. The paramedics arrived on the scene and quickly realized that they could do nothing unless that limb was removed. When this was broadcast over their two-way radio, a local professional arborist heard the call, came to the scene, cut the leader away, and rescued the young man. Unfortunately, this took over an hour, and the victim lost an arm and a leg. It is doubtful that any certification and licensing could have prevented the arrangement which resulted in that injury. This incident is a living example of what could happen if Mr. Haller's famous bottoming techniques were to be attempted by anyone less than a professional arborist.

Licensing and certification do not eliminate uninsured and unqualified competition. The better professional tree service firms rarely view these levels of competence as competition. Such firms have clients, not price shoppers. They don't have to advertise that they are licensed or certified. Their reputation is spread by word of mouth. New business comes from recommendations. The Yellow Pages serve as a reference source for someone who can't remember a name or phone number.

Many well-meaning legislators or city officials feel that licensing protects the public. This may be true, but only when there is strict enforcement. In cases where arboricultural licensing requirements have been enforced (which is the exception, not the rule), unless somebody registers a complaint, it is often difficult for any enforcement official to know what is happening to trees in someone's back yard. Even where public trees are involved, requiring licensing or certification of a contractor is no guarantee of anything other than the fact that the contractor may have passed a test, paid a fee, and perhaps has adequate insurance coverage. Without enforcement, certification, voluntary or legislated, is worthless.

Enforcement is the key, not licensing, certification, ordinances, or legal jargon. There must be specifications, standards of practice, and requirements to enforce. Licensing only suggests that the competence exists but doesn't guarantee performance. The following recommendations apply to residential and institutional buyers of arboricultural service, as well as government agencies.

(1) Qualify your bidders. (2) Ask for references. (3) Check similar completed jobs. (4) Ask for a list of equipment that will be used on the job. (5) Require certificates of insurance with minimums of $500,000 or $1,000,000. (6) Write meaningful specifications that meet industry standards and can be enforced. The National Arborist Association has standards for pruning, fertilizing, cabling, and bracing, pesticide applications, and lightning protection installation. These standards are universally accepted. Use them. (7) Insist that all requirements of the Z-133.1 standard of the American National Standards Institute be followed. (8) Most important, inspect the work. If a given level of performance has been contracted for, insist that it be achieved. All too often there are cases where the specifications from municipal tree care call for fine pruning or medium pruning, and the contractor makes all his cuts with a chain saw, removing obvious dead wood only. That's theft.

In contracts for tree removal, all safety precautions must be taken. We see evidence where trees are felled with as few cuts as possible, without lowering lines and with considerable damage to adjacent properties. This can be avoided with proper enforcement of the specifications. The license, alone, is insufficient. Don't be the victim of a low bidder who doesn't perform, licensed or not.

SECOND NATIONAL URBAN FORESTRY CONFERENCE

SESSION H

URBAN FORESTRY: ITS TIE TO TRADITIONAL FORESTRY

Wednesday, October 13, 1982
10:30-11:30 a.m.

Moderator:

Richard Lewis
American Pulpwood Association
Washington, DC

Speakers:

Theodore Curtin Cooperative Extension Service University of Illinois Urbana, Illinois	The Urban Absentee Landowner	243
Karen Knapp Westvaco Corporation Covington, West Virginia	The Urban Forestry - Rural Woodlot Connection	246
Thomas Smith Spring Grove Cemetery Cincinnati, Ohio	Forest Resource Management in an Urban Cemetery	249

THE URBAN ABSENTEE LANDOWNER

Ted Curtin
Illinois Extension Forester
Urbana, Illinois

ABSTRACT

More and more forest landowners live and work in larger cities rather than on their rural forest holdings. These absentee landowners control a considerable portion of the resource. This resource is large and generally unmanaged. Illinois has developed a Forest Owners and Users Conference which is held each spring in the Chicago Metropolitan area. The objective is to reach and motivate absentee landowners to manage their lands. Four other states now cooperate in this educational effort. Though residing primarily in the Chicago area, attendees have represented ownership in 17 states.

INTRODUCTION

The urban absentee forest landowner is a pretty common person. So ordinary, in fact, that he or she is somewhat obscure. We do know, however, that this landowner lives in villages, large cities, and away from the forest property. Many studies have attempted to identify this person, but the more we learn, the more confused we get.

We generally consider the individual absentee landowner as a part of a large group known as private, non-industrial landowners. The 278 million acres of commercial forest land that the USDA Forest Service says belongs to this group is divided among one million farmers and two million non-farmers.

This "people resource" is important and Illinois is blessed with its share. Because we have this tremendous people resource and our neighbors have the natural resources, it is logical to promote interstate extension programs.

THE COOPERATIVE EXTENSION SERVICE AND THE ABSENTEE LANDOWNER

One chief concern of the Cooperative Extension Service is the Chicago absentee landowner owning timberland in the adjacent, more forested states. This owner may be retired, an active professional, or a blue-collar worker in the city or in the suburbs. Collectively, this group is large and potentially powerful. It owns thousands of acres of forest.

Too many absentee-owned acres are unmanaged, unproductive and undeveloped, like a neglected lawn or garden. Our philosophy in Extension is to help others help themselves. And with this in mind, we have developed the absentee landowner's conference, known as the Forest Owners and User's Conference. With this, the traditionally rural, on-site woodland management meeting moved "downtown."

THE CHICAGO LANDOWNERS CONFERENCE

The participants at our Forest Owners' and User's Conference have been alluded to earlier. Their makeup and interests are broad and varied, with one exception. Nearly all

are seeking advice on the management of their land. Some have such simple goals that they are happy to see things stay as they are and seem upset to learn that all living things change and are never static. Basically nearly all of our most popular programs deal with the aestetics, such as the wildflowers and the wildlife, and the "in-depth" business propositions that cover management and taxation.

Camp directors, teachers, and our female audience show particular interest in subjects such as "There's More to the Woods than Trees." Each year, we offer a program on the recreational or enjoyment aspects of the forest.

On the other side of the ledger, we try to persuade forest owners to manage their properties for the highest values. Two topics presented last year were "Income Tax Management for Woodland Owners," by John Gunter of Michigan State University, and "The Role of Timber in the Individual Investment Portfolio," by William Hoover of Purdue University.

We find that the size of the ownership is varied. We have regular attendees who proudly list their five-acre tract on our registration forms. Others may list thousands of acres, while the most common forest holding is probably close to 100 acres.

This forest owners' and user's conference has been held in the Chicago area on a Saturday in March since 1975. In developing this conference, I called on my neighboring colleagues and explained the tremendous people resource we have and suggested that because Chicagoans owned land and vacationed in their states, we should combine efforts to reach this group. Consequently, Minnesota, Wisconsin, Michigan State and Purdue Universities joined with Illinois as co-sponsors and major contributors to the conference.

Our major problem is reaching the prospective participants. We do not have a list of forest land owners. One suggestion was to use the American Forest Institute Tree Farm list. These are the more progressive and informed individuals. They have already been helped. However, our goal is to contact those who have had no previous help and to introduce them to concepts of forest management and suggest where they can get assistance.

These unidentified people are most difficult to locate. We have used radio announcements, newspaper advertisements, and early morning television. Our biggest hurdle is the metropolitan media. A forestry meeting can only make the want ads in the big city newspapers. Wire services occasionally pick up our advance publicity and on occasion we will attract someone from many miles away. One of the suburban newspapers, in an attempt to help, ran, on the first day of our original conference, a story headlined "Timber Barons to Learn How to Do It." This was not the image we were seeking.

We do have a mailing list of past attendees and by word of mouth others find us. Each year, however, we find we have inadvertently missed some people in our advertising campaign.

Facilities capable of handling an audience of 300-500 people are not easy to locate. We have used college campuses, a hotel, and a county office building. They all have their advantages and disadvantages, but perhaps the greatest need is cooperation and hospitality.

Our speakers are generally from the cooperating universities, but are not necessarily foresters. We also have relied on help from outside the "ivory towers" and have heard

from attorneys, an Assistant Secretary of Agriculture, a dentist, and many others with a forestry-related message.

The topics are varied. We have discussed "Rights and Liabilities of Ownership," "Experiences on My Tree Farm," "Maple Syrup Production," "How to Improve Your Forest," "Managing and Marketing Practices," and always a wildlife or wildflower topic.

Over the years we have had attendees from nine states, representing ownership in 17 states. The total forested acreage this entails is well over a hundred thousand acres. However, 99 percent of our attendees reside in the northeastern corner of Illinois.

Packets of printed materials relating to the management of natural resources were distributed at the first four conferences. The difficulty of obtaining sufficient quantities of quality, new materials each year became worse. Occasionally, Smokey Bear even crept in. Budgets began to tighten, and many organizations were less anxious for us to distribute their materials. Because of this, in 1979 we began to print a proceedings and distribute it at the registration desk. This was one of the best additions we made, because it provides the conference speakers with the opportunity to have their paper printed, and it allowed the attendees to scan the proceedings to determine what sessions interested them the most. Sometimes when conflicts of interest prevailed, it offered the opportunity for them to read about the session they could not attend.

Perhaps the greatest benefit of the proceedings is that it offers another avenue to disseminate our message. After each conference, I write to those on the mailing list who did not attend, explain that they were missed, and offer them the proceedings at a nominal charge of $1 to $1.50, depending on our cost. Usually, we sell about 200 copies.

This program of landowner conferences is the rewarding approach to selling forest management. Other known urban programs are now being held in New York City, Detroit, Milwaukee, and other large cities around the country. The only other multi-state forest owner's conference I know of is the Delmarva Forestry Seminar, a joint venture of Delaware, Maryland and Virginia. We have a new program scheduled for this December at Quincy, Illinois that will be a cooperative venture with the Extension Services of Missouri, Iowa State University, and Illinois. The 1983 Chicago conference will be held in Wheaton, Illinois on March 12.

THE URBAN FORESTRY-RURAL WOODLOT CONNECTION

Karen Knapp
Westvaco Corporation
Covington, Virginia

ABSTRACT

Trees and people are the common denominators of urban forestry and the rural woodlot. Urbanites owning rural forest land are not necessarily motivated to management on the basis of wood production. Wood demands are projected to double over the next 50 years. Privately owned woodlots, if properly managed, can contribute substantially to future wood needs. For this reason, the attitudes of individual woodland owners, many of whom are urban dwellers, are of concern to the industry. In this paper, Westvaco's landowner assistance program is described, and conclusions are given regarding urban owner attitudes about forestry.

INTRODUCTION

The most obvious common denominator between urban forestry and the rural woodlot is trees. Both in the city and in the forest, trees are valued for their beauty and utility. They contribute in many ways to the quality of life we enjoy.

However, the real urban forestry-rural woodlot connection is people. People who live in an urban setting and own and manage, or don't manage, rural forestland; people who, though separated from the productivity of the land by supermarkets and building supply stores, make political decisions about the use of that land.

FOREST INDUSTRY INTERESTS AND CONCERNS

From the forest industry standpoint, it is important that these people relate the value and use of trees to the many forest products they use. It is also important to instill within these people a positive attitude concerning resource management - an attitude about action rather than inaction or reaction. These are objectives that apply equally to the management of trees in the city and trees in the forest.

The trend since the 1950s has been a decrease in rural populations; 73 percent of all Americans lived in metropolitan areas in 1980. Along with the decrease in rural populations has come a decrease in farmer-owned forestland. These lands are being sold to non-farm owners, an increasingly larger percentage of them urban dwellers.

They are buying this forestland for recreation, investment, retreat from city pressures, and various other material and philosophical reasons, few of them dealing with the productivity of the land.

This is what concerns the forest industry. The urban owners of rural forestland are part of a larger group, known as "Non-industrial Private Landowners" that control somewhere around 60 percent of U.S. commercial forestland. Non-industrial private landowners include individuals, estates, and corporations not affiliated with the forest products industry. These lands have always been a major supply of trees for the production of wood products. In 1980 they provided 42.3 percent of the nation's timber supply.

Forest Service projections show a doubling of demand for wood products by the year 2030. The forest industry would like to see these products come from U.S. forestlands rather than from foreign sources. The land has the capability of such a production increase, if the intensity of forest management is increased. The management of the private non-industrial sector has, unfortunately, been generally poor. Their size, plus their potential for increased productivity, indicates that management of these lands can greatly affect the nation's future timber supplies. For this reason the attitudes of private non-industrial landowners, many of them urban dwellers, are of concern to the industry as a whole, and to Westvaco in particular.

WESTVACO'S LANDOWNER ASSISTANCE PROGRAM

As a commitment to increasing the level of management on private lands, Westvaco offers free forest management advice and assistance through our Cooperative Forest Management (CFM) program. Through our four major mills at Luke, Maryland; Charleston, South Carolina; Wickliffe, Kentucky; and Covington, Virginia, we assist close to 1,200 private woodland owners with the management of 885,000 acres of forestland.

Our CFM program offers landowners advice for the long-range, multiple-use management of their forest land. Our services include a complete examination of the property, a forest management plan, timber marking services, assistance in obtaining contractors, sales assistance, and, in some places, at-cost site preparation and planting by company crews. Because of the variations in woodland characteristics and landowner goals, each forest management plan is tailored to the individual's situation.

Of Westvaco's 1,200 CFM landowners, 433, or 37 percent, live in urban areas (population of 20,000 or larger). They own 32 percent of the CFM lands with the average ownership being 650 acres. These numbers do vary with locations. The Covington CFM program, with which I work, consists of 46 percent urban owners holding 36 percent of the CFM land. The average holding is 985 acres.

Urban landowners come to our CFM program by referrals from state and federal agencies, through other CFM landowners, through Westvaco foresters to whom they wish to sell timber, and through advertising. In Virginia, we also contact landowners who have participated in Westvaco's Matching Seedling program, a reforestation incentive program whereby Westvaco matches the pine seedlings the landowner purchases from the state nursery. Any landowner within Westvaco's operating area is eligible for the Matching Seedling program, which essentially cuts the landowner's cost of seedlings in half. Another method of identifying landowners is county tax records. But by and large, the best referral is the one a satisfied CFM landowner gives to his friend or co-worker.

OBSERVATIONS ON THE ABSENTEE LANDOWNER

In preparation for this talk, I requested observations from our 30 CFM foresters concerning the urban owners with whom they work. I must preface these remarks with the clarification that there is a tendency to enter cooperative agreements with people who are already receptive to the forest management message. Therefore, these observations may not necessarily reflect a representative cross-section of urban owners of rural forestland.

One conclusion is that the urban landowner is generally unfamiliar with the workings of natural systems. Perhaps this is because of their limited personal exposure to such working systems. A mid-70's survey of the general public by the forest products industries disclosed that a surprising number of people were of the opinion that trees do not die -

that, if left alone, they would live forever. As far as I know, our landowners aren't quite so uninformed, but they do have preconceived notions about forestry that are not exactly accurate - like the landowner who called to ask if he should rent a truck to come pick up his 5,000 one-year-old loblolly pine seedlings, which would fit into the trunk of an average-sized car. These preconceived notions sometimes lead to distrust, over-protective attitudes, or impractical expectations.

Urban owners are also generally unfamiliar with their land. I've been out many times with people who had no idea where their boundary lines were. But that is not nearly as sad as the urban dweller who took one of our foresters to view his land, only to find, when they got there, that all of the timber had been cut several years before by a still unknown timber trespasser.

However, the urban owners we work with seem to have a higher level of education than the non-urban owner, making it easier to "sell" them forest management on its merits. Professionals, in particular, seem to be willing to seek and use the help of foresters as professionals in forest management. Working with urban owners, however, often requires a lot of explanation of underlying principles. But once they grasp these principles, some urban owners really get "turned on" to forest management. Once "turned on," they are generally more active than non-urban owners. Possibly they are in a better financial position to make the necessary investments and/or their motivations may tend to be more social and altruistic.

CONCLUSION

That's probably enough picking apart of the urban landowner. The fact is that the forestry industry would like all elements of society to have a better understanding of natural systems, of how they relate to our economic system, and of the role that forest management can play. To this end, the forest industries, at the national level, sponsor the "American Tree Farm System," a recognition and informational program for private woodland owners; Project Learning Tree, a multi-disciplinary environmental education program now available in the public schools of 40 states; and various types of media advertising.

On the local level, Westvaco supports and co-sponsors landowner tours, tax workshops, and information programs for the general public. We also, of course, work with private landowners through our CFM program, and publish CFM newsletters to keep these owners up-to-date on the forestry world.

However, the task is monumental and our exposure to these landowners is often restricted, geographically or conceptually. Urban forestry, on the other hand, literally reaches these people "where they live." Urban forestry programs have the potential of increasing public understanding of how natural systems work; of demonstrating to 73 percent of the U.S. population that trees are a resource to be managed. Urban forestry has the potential of "turning people on" to the concepts of forestry and referring woodland owners to state agencies, industry foresters, or consultants that can help them with the management of their resource.

The resource may be with us in the woods, but many of the decision-makers, the people, are in the city. And they are the urban forestry-rural woodlot connection.

FOREST RESOURCE MANAGEMENT IN AN URBAN CEMETERY

Thomas L. Smith
Associate Superintendent/Horticulturalist
Spring Grove Cemetery
Cincinnati, Ohio

ABSTRACT

Spring Grove Cemetery, a private non-profit cemetery in Cincinnati, was established in 1845 with an intent toward maintaining a certain portion of the forest resource in a natural setting. However, where clearing did occur for cemetery expansion, very often the trees were removed and not utilized. In addition, harvesting was prohibited at one time. Questions raised in the 1960's asked how Spring Grove could best utilize its natural resource. In 1974, a 303-acre woodlot was recommended for forest management. Revenue from timber sales were set aside in an endowment fund to purchase new plant material. Since 1974, management has been intensified and a number of successful timber sales have been conducted. Hence, within the confines of an industrial city, a tract exists where traditional forest practices prevail. In addition, education programs have been incorporated to expose the public to best management practices.

INTRODUCTION

There have been many changes in Spring Grove since Rule 7 was written in 1845 stating that, "horses must not be left without the driver or fastening the same." Perhaps one of the greatest benefits to the community has been the "opening of gates" to visitors who are not owners, but who also appreciate the beauty and educational opportunities of Spring Grove. For almost 100 years, owners were permitted to enter only by presenting tickets for themselves and their guests. In recent years, however, owners and the public alike have become aware that natural and man-made beauty should be shared and cherished by all.

HISTORICAL DEVELOPMENT OF SPRING GROVE CEMETERY

Within 30 years from the landing of the first settlers on the banks of the Ohio River, Cincinnati had grown to be incorporated by 1819. In the next 25 years of rapid growth, many of the 23 church-owned cemeteries had to be abandoned as the city extended northward from the Ohio River.

Leading citizens, including several members of the Cincinnati Historical Society, discussed the need for a "rural" cemetery for the people of Cincinnati; a public cemetery which would be permanent, worthy, and dignified. In 1844, they organized an association of owners of the proposed cemetery. The grounds selected were a portion of the old Garrard homestead in the valley of the Mahketewah (Indian name for Mill Creek). The original area of 166 slightly hilly acres was purchased for approximately $16,000. The numerous springs and ancient groves of trees suggested the name Spring Grove.

Fifty-two additional parcels of land have since been purchased or donated. Now, 733 acres exist, of which more than 400 acres are developed. The balance of the acreage, which is a part of the largest non-profit cemetery in the U.S., is composed of a hardwood stand.

The state of Ohio granted a charter in January, 1845 to "the Proprietors of the Cemetery of Spring Grove," a non-profit association. A board of directors, elected by the owners, establishes the rules and regulations and is responsible for the management of the property. Through the years, the directors have been horticulturally oriented and guided by the original premise, "let us then employ some of the funds in rendering the place where our beloved friends repose, attractive and consoling at once to the eye and the heart not only for the present but also for the future."

This original premise has held and was undoubtedly the reason for the establishment of a third ecosystem within Spring Grove. In addition to the developed and undeveloped grounds, a 15-acre parcel of land, surrounded on all sides by developed grounds, was allocated in the late 1800's to be left for natural beauty and educational purposes. This parcel was set aside with strict guidelines that it would never be utilized for cemetery use per se or for the harvesting of timber. Thus, within one continuous 733-acre tract there exists an almost paradoxical situation of having 415 acres of highly maintained land, 303 acres of undeveloped mesophytic hardwood, and 15 acres of a climax forest which will not be disturbed except at nature's will.

Before the development of large earthmoving equipment and mechanized cemetery equipment, sections within Spring Grove were developed with minimal change in topography. For the most part much of the desirable woody plant material was allowed to remain. Thus, earlier sections were developed around many of the native tree species. Efficiency today necessitates the use of large mechanized equipment as sections are developed resulting in significant topographical changes. These changes involve the removal of nearly all of the existing plant material and subsequent relandscaping of the area once the grade changes are accomplished. The rate of encroachment of these undeveloped acres has been estimated at 15 acres every 20 years.

This rate will probably be reduced in the years ahead because of more efficient land usage and other trends and concepts in the cemetery industry. Ultimately, most of this undeveloped area will come into direct cemetery use. But whether 300 years or 1,000 years elapse before this area is totally developed, it is of prime importance that we maximize our gains from the woodlot through the practice of good forestry principles rather than simply encroach on the land at a certain rate.

DEVELOPMENT OF A FORESTRY PROGRAM FOR SPRING GROVE

When sections were developed, even as recently as the 1960's, most of the native trees succumbed to the path of the bulldozer and were either burned or pushed into hollows. No significant attempt was made at that time to salvage the desirable logs.

No timber had ever been marked or sold from the undeveloped woodlot prior to 1974, though on occasion, timber had been removed for use within the cemetery property. Casual walks through this most serene and picturesque woodlot sometimes brought mixed emotions. On the one hand, it was comforting to know there was an undisturbed niche within Spring Grove where the natural beauty of 100 year old trees stood. On the other hand, it was disturbing to see some of those same 100 year old trees lying on the forest floor in a semi-decomposed state. From these trees there would be no utilitarian gains, unless one rationalized that nutrient recycling itself was inherently utilitarian.

These woods raised questions about how Spring Grove could best utilize this renewable natural resource. After consultation with service foresters of the Ohio Department of Natural Resources, the management of Spring Grove recommended to the Board of Directors that good sound forestry management principles should be followed with this

303-acre woodlot. Additionally, it was recommended to the Board of Directors that an endowment fund be set up from the proceeds of these sales; the endowment to be used exclusively to purchase new plant material for the developed grounds. Under these guidelines the management would be following the ideals of the original premise to care not only for the present but also for the future. After considerable thought, the Board of Directors accepted the recommendation and approved the first timber harvesting within Spring Grove.

TIMBER HARVESTING IN SPRING GROVE

The initial sale consisted of 28 black walnut trees that had been recommended for harvest by the service forester. Of these, 10 were in the higher diameter class of 22 inches and up. The remainder of the trees, although smaller, were either defective or incapable of producing much salable wood fiber. During the marking process each tree was given a number to insure that only these trees were harvested and that none of the younger remaining walnut would be mistakenly removed. Approximately 25 invitations to bid were mailed out and the timber sale contract was signed after sealed bids had been received. The proceeds from the sale marked the establishment of the endowment fund. The significance of this endowment has probably had an even greater impact in the last three years with the decline and necessary removal of many of our large and mature specimens within the developed grounds. It is a satisfying and rewarding feeling to know that monies for new plants are being generated from a self-sufficient fund.

Three other sales have since taken place. During January 1982, 145 invitations to bid were mailed out to prospective individuals in regard to our fourth timber sale. This represented the largest total volume mixed species sale (68,940 int. scale) to date. Specifically involved were 223 trees of 13 species. The contract for this sale was signed in April 1982.

Choice of the timber marked and sold thus far has been based upon recommendations of the service foresters representing this county in Ohio. Their recommendations in turn have been based upon prescribed forest management practices for woodlands within this part of the United States. Even with their practiced judgement, considerable fortitude is required to remove a 100-year old monarch that nature has taken such time to grow. Fortunately, this feeling is eased by the realization that trees are taken only at the point of decline and many great trees can be left standing for their seed.

LESSONS LEARNED

Since selling timber was a new venture, many do's and don'ts have been learned during the course of these sales. The monetary return from the sale should not be the only factor in deciding which bidder is to receive the contract. The skill of the logger is equally as important. New loggers with whom we have not dealt must provide references and locations of areas logged. It has also been most helpful to have a Spring Grove representative on the job site at all times.

PUBLIC EDUCATION AND INVOLVEMENT

The logging concept has temporarily excited ecologically concerned citizens. Hundreds of interested visitors including forestry classes, garden clubs, national conventions, and county and city park board personnel have toured our logged areas. They have been able to see areas which have not been logged since 1845, and varying stages of ones which have been logged in the past eight years. The regeneration of areas logged in 1974 is now obvious. The visual proof that properly managed woodlots do have rapid regenerative

capacities seems to be a soothing medicine to many of the scars that naturally take place in any timber harvest. It is Spring Grove's feeling that many attitudes have changed after people are able to see the "before and after." Other individuals are impressed that there does exist within the confines of an industrialized city a 300+ acre tract of land where traditional forestry practices prevail.

Several corollaries of this forest management practice are now being exercised in our daily maintenance of the developed lands. No longer does any burning of woody plants take place. No longer does a bulldozer push valuable tree species into deep hollows. All of the tree tops of our tree species which must be removed from within the developed grounds are completely utilized for either wood chips or fuel. The boles of these same trees are either used for our own lumber needs or they are sold to others. Once again, monies from these sales provide additional funds for the living tree fund.

CONCLUSION

In conclusion, it should be mentioned that nearly any forest resource management plan which involves timber harvest temporarily leaves scarred areas. Slash piles and tree tops may not be aesthetically pleasing, but this condition is temporary and the comfort one realizes in seeing healthy new growth regenerate itself for the future is enough compensation.

It is our function as forestry professionals to educate and promote the concept of traditional forestry, whether it be in an urban or rural situation. Undoubtedly, there are many woodlots in both the public and private sector where no forest resource management is being practiced and hence maximum potential gains are not being realized. At this point in time, green plants are the only biological entity which have the capability of storing solar energy. Forested lands are one of the top two ecotypes expressing this capability. If we do not manage and harvest these areas we have essentially cast aside one of our most precious resources -- energy.

SECOND NATIONAL URBAN FORESTRY CONFERENCE

SESSION I

URBAN FORESTRY AND THE GREEN INDUSTRY

Wednesday, October 14, 1982
10:30-11:30 a.m.

Moderator:

Robert Bartlett, Jr.
Bartlett Tree Expert Company
Stamford, Connecticut

Speakers:

Steve Clark Urban Forestry Consultant Magnolia, Texas	Selling Urban Forestry to the Private Developer - The Role of the Consultant	*
John Hendrickson Hendrickson Tree Company Chicago, Illinois	Municipal Tree Care and the Private Sector: Keys to Success	255
William Owen General Tree Service Clackamas, Oregon	Industrial and Residential Tree Care in the Private Sector: Building a Successful Firm	260

*Paper not included.

MUNICIPAL TREE CARE AND THE PRIVATE SECTOR: KEYS TO SUCCESS

John R. Hendricksen
Hendricksen Tree Experts
Wheeling, Illinois

ABSTRACT

An exceptional individual willing to invest an initial hundred thousand dollars and 60-70 hours each week can still build a successful professional tree care business.

No one is ever finished in the educational process even if surrounded by experts. We have yet to effect a major change in the way that taxpayers, their elected officials, or decision-makers perceive the tree care industry.

Numerous timely suggestions are offered to tap into the hundred million dollar tree management market and build a successful industry in the process.

First, some background from my experience as a private commercial arborist doing a signifcant portion of our work for various municipal organizations throughout the Chicago area. This will give you some perspective as to my point of view as it relates to a limited area of the Midwest and to various local governments and their approach to arboriculture.

Our firm was established in 1964 by my older brother and myself. He had graduated from junior college, and I was still in high school. Our first capital acquisition was a 1952 Ford pickup, purchased for $175.00 from the proceeds of my income tax refund. Our first job with that truck and a rented chain saw earned us enough to purchase 3 used chain saws. My brother and I lived at home and plowed all proceeds back into the company. Our first influx of outside capital was in 1966, when we borrowed $1,800.00 from our parents to purchase a used dump truck and chipper. Prior to that, we stacked brush and logs on a $150.00 used stake body truck that had to be unloaded by hand. All future financing has been either internal or through bank loans.

Our firm grew rapidly until the early seventies, when due to philosophical differences my brother and I separated and now run friendly but competing tree services in the same geographical area. My brother's company has six to ten full-time employees. The original company, of which I am president, has approximately forty, year-round employees, thirty-five vehicles, and does approximately $1.5 million in sales. Hendricksen Tree Experts basically operates five bucket trucks, nine chippers, four stumpers, five sprayers, some off-the-road equipment, and a small equipment sales and service business.

I never worked for another tree service, and I've learned most of the tree care techniques from the men we have hired or through professional seminars, workshops, or trade journals. My formal training is not in this field, as arboricultural training was not available then as it is now.

In the Chicago metropolitan area, most cities or suburbs have either a village board or a city council that makes decisions. They have a mayor or manager to make financial decisions and administrate those actions. Some communities try to maintain a rural

atmosphere with no walks, curbs or gutters; most have a parkway planted with deciduous shade trees. Most communities assume the responsibility for these parkway trees. Although the communities with no curbs, gutters, or sidewalks usually do not. Parks, schools, counties, and townships are separate taxing bodies. They generally provide minimal tree care service.

Our first major municipal job was a negotiated contract to clean up after a tornado. Every available tree service in the area was enlisted to clear the streets; however, we were the only ones asked to stay on to repair the damaged trees, probably because we resisted the temptation of "buzzing" in backyards on the city's time. After several bad experiences with other tree services, that community remains a solid customer of my brother's firm on a negotiated basis.

During the early years of our company, the majority of our work was for various municipalities. I believe that was due to an interest on my part to do the work as opposed to selling arboriculture. Our early bidding philosophy was:

1) What is our competitor's price?

2) Was he successful?

3) Can we work a little harder and bid the job a little cheaper?

Initially this wasn't too bad, because with only a few employees and few other responsibilities, my time was my own and not so valuable. This is a poor long-range solution, since it leads to a downward spiral in prices that ultimately squeezes your profit and the ability to replace equipment or pay your workers properly. Your competitor's mistakes become your own when you let him set the prices.

My feelings toward municipal work are bitter-sweet ones. They provide a large market where someone with minimal sales ability can build a business. A great deal of our initial success was due to such crises as Dutch elm disease, tornados, and ice storms. There is no long-term benefit after the crises are past, and prices return to low levels with the inevitable glut of tree removal specialists.

During the mid-seventies, I made a change in direction for the company. I hired several graduate foresters, trained them in the techniques of arboriculture, and hoped that the private or commercial market places would respond to our ability to care for their trees on a professional basis. I trusted our customers to buy our professionalism rather than our price. Today I employ ten foresters and two ornamental horticulturists. The percentage of our total annual sales for municipal work has declined from approximately seventy-five percent to thirty percent. Of that thirty percent, approximately half is on a negotiated or one-bid basis due to the specialized nature of the work or to the lack of qualified competitors. The growth of the company has occurred in other areas, while our municipal services remain at approximately the same level.

This is unfortunate. The problems I perceive in municipal contract services are indicative of the problems of our entire industry, regardless of whether you call it arboriculture or urban forestry. The fact is that, as an industry, we haven't been able to sell our ideas or beliefs to the decision makers. We are essentially the only ones that know the importance of what we do.

Many times I have been frustrated by a city council's decision to award a contract to the low bidder! Usually I knew this bidder would not perform properly, and, true to form, he

did not. The next year, the same turkey would be allowed to bid. Why? Usually because the city doesn't realize what constitutes a proper job. The majority of our current city contracts are supervised by graduate foresters. Those communities believe enough in the value of having a staff position to oversee what I consider to be the single most important value--the aesthetic value of the mature tree.

The council, however, often fails to listen to this individual. What is the first service to get cut? Forestry. "The trees take care of themselves" is the usual response. How many times are the city fathers afraid to award to the lowest qualified bidder! They often don't know what "qualified" means. They usually don't realize what costs they may incur down the road due to substandard work. This happens because we can't "sell" those decision makers on the importance of our industries' standards.

Most decisions to award a muncipal contract are based on, "Why shouldn't we give this bidder a chance?" rather than "Why should we award this firm the job?" You wouldn't ask a garage builder to construct City Hall or a Court House, no matter how reputable. Yet I've seen $150,000 municipal contracts for complete tree care awarded to firms whose largest previous job was a $12,000 land-clearing job. We have standards upon which to judge performance, but we can't seem to sell them to our customers. Do the taxpayers know how important their trees are? Shouldn't their elected officials know?

In the Chicago area there seems to be a resurgence of interest in contract municipal services. I believe that as the cities became frustrated by incompetent commercial arborists, they put their efforts into their own forestry departments. That effort has matured as municipal unions have flexed their authority, and civil service makes discipline difficult. As productivity goes down and costs go up, contract services become more attractive. Arborists must use this opportunity to work together.

I offer the follow solutions:

First, municipal arborists must influence public opinion. Get the ear of your customers--the taxpayers. Use the media and your personal contacts to sell the importance and value of a comprehensive program. Speak at the garden clubs and conservation groups, write articles, promote trees, and then, when the decision makers consider trees, they will have to consider your ideas and thoughts in perspective. Meetings like this conference are great to keep abreast of current ideas and techiques, but we need to talk to people outside our field as much, if not more, than we need to speak to each other.

Consider the value of contract services. They require no capital outlays or personnel training. You avoid responsibility for the day-to-day operational problems--labor problems, equipment breakdowns, etc. That's all someone else's worry. When the job is complete, so is the cost. You don't have to think up something else for the crews to do. Specialized services and equipment can be contracted as needed. For example, the heavy capital expense of tree removal equipment can be shared by a number of municipal customers, as opposed to each having his own. We provide urban wood waste disposal through the use of a Morbark model 18 chip harvestor to approximately seven communities. This operation has an equipment replacement value of approximately $300,000 (more than any individual community could justify). Contractors have more flexibility in their operations than do municipalities. For example, our firm sells the chips from the wood recycling operation without going through the often ineffective competitive bidding process municipalities are required by law to use.

The specialized training and abilities of arborists can be utilized throughout the year without having to worry about them being pulled off something "more important" (such as snow plowing).

Contractors can serve as a buffer between the residents and the city. Often citizens make unreasonable demands upon public works employees that can be avoided by the fact that such services may be outside the scope of the contract.

Once the decision is made to seek outside contractual services, consider the following:

Choose the lowest qualified bidder. Don't tolerate any foolishness from contractors, but don't put anything in the specifications that you don't sincerely believe is necessary. Don't specify National Arborist Class I pruning standards when Class II standards are acceptable. Make regular inspections and point our discrepancies early, so a contractor can make an adjustment early.

Consider multi-year contracts. The capital expense for a minimal municipal forestry operation is upwards of $200,000.00. It is difficult to ask a contractor to make that investment when someone can knock him out next year just by slightly lowering the bid price. Utility companies have recognized the value of multi-year contracts and the use of multi-company contracts for contract tree services. Contractors need more than a year at a time to guarantee continuity in trained and qualified personnel.

Don't consider profit to be a little extra for the contractor. Profit is critical to a contractor to provide for the long-term continuity of his company. Profits provide the incentives that public employees don't have. Profits support the investment in equipment and personnel necessary to do your job properly. Squeezing the profits out of a job by getting a low bid, substandard job will sooner or later eliminate all the reputable contractors, and you will be back to doing the job yourself and losing the credibility of your program.

Compare costs fairly. Often I have seen municipalities compare their costs as being the marginal labor costs against the total contract price. Obviously this is incorrect, as everything is in the contract price: depreciation, return on investment, repairs, overhead, training, supplies, etc. Using labor costs only is not a true cost.

Develop realistic standards to be applied consistently and fairly. Nothing points out the costs of a job to a contractor more than accurate and consistently enforced specifications. Prequalify your bidders, before bidding, as to proper equipment, personnel, and experience. Do you want someone training on your job? If you have developed the credibility with the decision makers as I noted earlier, this should be easier. If you let just anyone bid, your task of convincing the city fathers will be more difficult, since saving money is obviously a priority.

Our firm provides contract services to municipal organizations having tree service budgets from less than $1,000.00 to over $500,000.00. Our range of services goes from providing consulting services, in addition to the actual work, to merely sharpening chipper blades. Our job is easiest when working for a professional who has an understanding of the work that is required. I believe it is inappropriate for the contractor to provide the consulting services and then to do the work. Communities that cannot afford a full-time forester should avail themselves of a consulting urban forester. Once these communities understand the value of a comprehensive tree care program, there is a greater potential for such a position. As it is now, many smaller communities do not provide for their trees' well-being until it is too late and removal is the only alternative. Until we get our

message across to these groups, the potential for consulting municipal foresters will be low.

To those of you who might consider commercial arboriculture and the potential market provided by municipalities, there is no doubt that more qualified contractors are needed in this sector. Beware of the pitfalls previously mentioned. Know your operational costs. Don't do work you can't be proud of; rather, seek out those communities that appreciate good work in return for fair compensation. Experience demonstrates that communities that employ a professional forester are more apt to be convinced of the importance of quality tree work.

It is no easier to be a success in the municipal market place than any other. If anything, it is harder at this time because of the high capital investment required in a tenuous situation where price consciousness takes priority over the value of quality service.

It is especially difficult at this time of high capital costs to be successful in the municipal market. Remember that the interest (@ 20 percent) alone on a $200,000.00 investment is $40,000.00 after operating expenses. Insurance and liability are also ever-increasing concerns to anyone attempting to build a business of any duration.

Owning a commercial arboriculture business means devoting approximately 60-70 hours per week to the job. It's like working two jobs at the same place. After years of hard work, the successful owner or manager is usually comfortable, but not wealthy, and has the opportunity to do some of the things he postponed doing earlier.

Business experience and training are certainly important. Municipal tree care has larger dollar amounts and small margins than private tree care, so a good knowledge of costs and their control is essential. Remember, losses on each unit can't be made up in volume. Getting a job by cutting the other guy's price only lets your competitor set your price and is a short term solution to a complete lack of work, with no other alternatives available. Good sales ability and training will prevent your getting into that fix.

Take advantage of professional organizations. I consider the single most important factor in the growth of our company to have been our membership in the National Arborist Association. In addition to the business and technical training provided at seminars, the interaction with firms more successful than our own has given me the confidence to attempt more. Our membership in I.S.A. has shown us many of the technical aspects of proper arboriculture and opened many of the doors to gaining new techniques. Local groups have provided training for many of our employees.

I would estimate current contracts in the municipal tree care market to be worth hundreds of millions of dollars. If the trend toward more contract services spreads as our industry expands, the potential is in the multi-billion dollar range. To fill that need, we will need more reputable contractors, but just as importantly, we need customers that can recognize the value of quality service and are willing to pay a fair price for that work. It is our responsibility to see that happen.

INDUSTRIAL AND RESIDENTIAL TREE CARE IN THE PRIVATE SECTOR: BUILDING A SUCCESSFUL FIRM

William L. Owen
Consulting Arborist
Clackamas, Oregon

ABSTRACT

The elements of a successful tree care operation are based upon the use of the best techniques and equipment applied by technically competent people. The task is completed based on strict application of tree care standards resulting in work which is horticulturally and arboriculturally proper and aesthetically pleasing. It must also prove acceptable to the client. The essential ingredients of success are: 1) Technical excellence, 2) Hard Work, 3) Attention to Detail, and 4) Perseverance.

Skilled people are needed at all levels in a company; both the office staff and the field crews. Motivation, instruction, continued training, and daily person-to-person contact are of great importance to everyone in the company.

It is essential to plan and budget properly to earn the maximum gross dollars. A key role of proper personnel management is to emphasize to all employees "why" each activity, each rule, and each regulation is observed. Loyalty and longevity are built on two-way communications based on 100 percent commitment from both management and labor.

Proper marketing and sales efforts are absolutely essential, with specific plans, targets, and advertising to support each effort. Successful operations in today's marketplace must be monitored to be certain these efforts remain on track.

All techniques of operation must adhere to the proper National Arborist Association Standards. The landscape must be viewed as an environmental entity, or "whole," considering the needs of the plant: fertilizing, pruning, chemicals used for insect and disease control, and the resultant growth. Integrated Pest Management must be a part of arboricultural service.

Proper planning of work loads, staff duties and assignments, routing, and management according to set standards should be the assignment of one person within the company, not only for work assignment purposes but also to monitor quality control.

An annual review of the company's performance by qualified consultants should be welcomed as a "physical examination." This is necessary to measure proficiency. If done in-house, such inspections just tend to be exercises to rationalize or justify whatever is not up to standard.

Success can be measured in many ways: 1) Black ink on the profit and loss statement for the year's end; 2) Satisfaction or employees involved in a job well done; 3) Satisfaction for personal goals set and realized; and 4) Responses from non-clients affected by company performance in some "feed-back" activity. This may occur as an invited garden club talk, annual conference paper, school classroom talk, Arbor Day presentation, etc. All these factors are measures of success and all should be considered by the truly professional person as a measure of successful performance of arboricultural service in the urban forest environment.

Personal integrity is the first necessity of one who aspires to be a professional in the practice of arboriculture. Personal standards, goals, and methods of achieving those goals all fall under the professional ethics umbrella in considering day-to-day performance. Success boils down to people performing tasks on a proficient level, to rigid, self-imposed standards met gladly because they represent the measure of personal integrity of the persons involved. Dollars count, but people count more, and the trees, which are the common denominator of all considerations in arboriculture, should respond the most. We are workers in the vineyard who should be glad to serve and proud to have done well.

Should any reader wish to explore this subject more fully, the author welcomes inquiries by letter or phone to any specific point and will respond in detail.

SECOND NATIONAL URBAN FORESTRY CONFERENCE

GENERAL SESSION V

THE IMPORTANCE OF INCREASED PLANT USE IN URBAN ENVIRONMENTS

Wednesday, October 14, 1982
1:00-1:30 p.m.

Moderator:

Richard Pardo
The American Forestry Association
Washington, DC

Speaker:

Robert Lederer
American Association of Nurserymen
Washington, DC

Importance of Increased Plant Use in Urban Environments 265

IMPORTANCE OF INCREASED PLANT USE IN URBAN ENVIRONMENTS

Robert Lederer
Executive Vice President
The American Association of Nurserymen

ABSTRACT

The urban foresters of this country can acquire assistance from the private sector to ensure successful urban forestry programs. The American Association of Nurserymen (AAN) can help with their educational and informational packages developed for use by the public. These programs publicize the benefits of a green environment, such as stress reduction and energy conservation. AAN's Green Survival City, USA project recognizes communities which have organized to improve their surroundings. Due to our similar objectives, all of the professionals dealing with urban forestry can work together to improve the environment and enhance the quality of our lives.

The ancient Chinese had a proverb or wise saying to cover just about anything--and here's one I like:

> If you would be happy for a day, kill a pig; if you would be happy for week, take a wife; if you would be happy for a lifetime, plant a garden.

I think that may be a reason why all of us are here for this conference. We share an ambition to restore some bit of the "garden" environment to our cities.

We share an understanding that mankind was created in a garden world, and we just were not programmed to thrive in surroundings of asphalt, glass, and steel alone.

Of course, you urban foresters are at the front line in the effort to promote forest and related vegetation management in and around the nation's communities. That's where you have been ever since the Urban Forestry Assistance Program was funded in 1978.

And you face enormous challenges. According to the 1980 National Census, nearly 80 percent of the nation's population lives in urban/suburban areas.

Most of your urban forestry programs are underfunded, because they have to compete for a share of tight city budgets. There's an old saying: "When people think of the next generation, they plant a tree, but when politicians think of the next election, they pave the streets."

Because of the funding situation, a study conducted for the USDA Forest Service by the Syracuse University Research Corporation showed that most urban forestry programs have to be primarily occupied with day-to-day operational activities--chiefly tree planting and tree removal. That deserves a very high priority. For example, in Cincinnati, Ohio alone they need to plant 5,000 trees per year, and 3,000 a year require maintenance attention.

But that sort of problem means you often have to give less consideration to other valuable parts of a well-rounded program; such things as public motivation and information activities, and other needs you would like to meet.

I'm writing to remind you that you don't have to do it all alone! Back in 1972, when the Urban Forestry Assistance Program was authorized by Congress, an important line appeared in Section 1 of the Act. "The provisions of this Act," it said, "shall be carried out in such a manner as to encourage the utilization of private agencies and individuals furnishing services of the type described."

For well over a century the American Association of Nurserymen has been on your side in recognizing the vital role of trees and other living plants in our lives. But a most interesting, significant development began about 14 years ago. Let me tell you the story.

There was a great deal of concern, back then, for the apparent deterioration in the quality of our environment. There were jokes to disguise the concern, naturally. Like the three firemen who were overcome by smoke poisoning--and they were just on their way to a false alarm. Or the man who said he filters his water, boils it, then just to be safe he drinks beer.

But behind the jokes and the doomsday predictions there really were serious problems with our ecology.

So that was the situation back 1968, when a massive demonstration was held in Washington. It was called "Earth Day," and it is remembered for a number of reasons.

Those of us who commute to Washington remember it because it attracted over 100,000 demonstrators, bringing traffic to a standstill. The U.S. Park Service, responsible for the maintenance of Washington's public space, remembers it because the monumental mess that was left cost a quarter-of-a-million dollars to clean up. One city newspaper the next day summarized the effort with a headline that said, "So what."

They expressed a feeling that was pretty universal. So what? After all the marching and speeches and all the rest, there still didn't seem to be much any individual could do to solve the problems.

But the day that "So what" headline appearred, a new program was born at the American Association of Nurserymen. We called it "Green Survival." "Don't despair," that new program said. "There are small steps with large consequences each person can take to protect and improve the quality of our lives. With each of us taking those steps, this world will survive! And as it has been from the beginning, survival will be dressed in green."

Let me tell you some of the ways "Green Survival" comes into play in our lives. (By-the-way, this brings me to the subject of my paper, "The Importance of Increased Plant Use in Urban Environments.")

The AAN's "Green Survival" program tells people how trees and other living plants contribute to a cleaner atmosphere. Foliage from a single mature tree can remove up to 20 percent of the gaseous pollutants from the air as they fall to earth. One tree in its green period can consume the carbon dioxide emissions of 800 homes and return them to the air as fresh oxygen. People need to know that--and we're helping.

A two-and-a-half-acre stand of beechwoods--one of your urban parks, for example--can extract four tons of dust from the atmosphere and return it to the earth. If we can help get that message to some of those coughing, wheezing city budget directors, your job might be easier.

Here's another expression of "Green Survival." A hundred-foot-wide belt of trees properly planted can absorb six to eight decibels of urban noise pollution. How important is that? Human hearing begins to be damaged by prolonged exposure to more than 85 decibels of sound--but traffic noise was measured in one large city at 90 decibles. Think of it, noise pollution that is six percent above the danger line! And trees could help.

We ought to take this seriously. Some researchers at the University of Miami, School of Medicine compared two pairs of monkeys. One pair was placed in a fairly quiet environment; the other pair listened continuously to recordings of the same sounds that many urban workers are subjected to. All four monkey's began the experiment with similar blood pressure readings, but the blood pressure of the noise-exposed monkeys soon rose 25 percent higher than those monkeys living a quiet life.

Air, earth, water, sights, and sounds--they all require the presence of nature's green, growing gifts. And here's another expression of "Green Survival"--one that is becoming more and more recognized these days--Living plants are an important therapeutic tool.

One recent study looked at "stress" in people. Individuals suffering from stress were shown slides picturing either urban scenes without any vegetation or scenes dominated by trees, shrubs, and other plants. Measurements were taken of the individuals' emotional states before and after the slide presentations. The results were that stressed persons felt better after viewing the planted scenes, and those exposed to the urban views without vegetation were worse off.

That seems like just common sense, but it's amazing how few people act on that common sense. The John Deere Corporation did, though. They discovered increased creativity and productivity among employees in their Administrative Center, where plants are so much a part of the building design that no employee is more than 45 feet from vegetation.

So trees and other plants in the environment can be "preventive medicine" to reduce stress, boredom, and some other problems of daily life. But they are also being used successfully in the treatment process to overcome specific emotional conditions and help improve the life quality of an individual with problems.

Our friend Diane Relf, on the faculty at Virginia Polytechnic Institute and State University, is a moving force in the National Council for Therapy and Rehabilitation through Horticulture. She has a treasury of fascinating case studies involving the effectiveness of horticulture in the treatment setting. Relf emphasizes its importance as a work substitute for those excluded from employment and its use to develop responsibility, creativity, and frustration tolerance.

I recognize that you and I aren't in the business of making sick people well, but all the same, it is useful to know that, as one researcher said, "moments of crisis are reduced to manageable dimensions when seen from the perspective of enduring nature."

All those expressions of "Green Survival" I've been talking about are crucial to life on this planet, but let's face it, your average citizen is just going to say, "Okay, what's in it for me?" These days, you have to aim for the pocketbook. Let me do that.

Trees and shrubs in the urban environment can cut energy bills and save money. This is a good check-book argument. The National Bureau of Standards reported that a windbreak of evergreens, strategically placed on the windward side of a building, has the potential to cut winter fuel bills 20 percent or more. Shade trees have been shown to reduce exterior wall temperatures by eight degrees on a hot summer day, reducing the work load of an air conditioner by as much as half when the house is fully shaded.

A scientist at the University of Florida, Dennis Buffington, approached this subject in an interesting way (Buffington 1979). He decided that measuring the effect of different landscaping designs on actual building structures was inefficient from the standpoint of the time and money that would be required in constructing or finding comparable structures with the various features. And even if similar buildings were found, the differences in life-styles among the people in those buildings would make the research suspect.

So Buffington programed a computer to solve the problem. A description of the "control building" was fed into the computer along with the "comfort conditioning" needs that had been calculated.

With those facts in the program, 13 different landscaping modifications were computerized to discover what impact each different landscape modification would have on the energy costs for heating and cooling the building.

The computer reported that the building with what Buffington called the "low energy landscaping design" had about 20 percent less expenditure per year for comfort conditioning than ones with "high energy" landscaping.

Summarizing his study, Buffington said, and I heartily agree, "The most effective way to educate people of the need to conserve energy is to convince them how they can save money by saving energy."

Let's approach that money question another way. A forestry economist has calculated the real worth of a 50-year-old tree. The figures are astonishing.

First of all, the tree would produce about $31,250 worth of oxygen in its lifetime, $62,500 in air-pollution control, $31,250 in soil benefits, $37,500 in water recycling and humidity control, $31,250 in wildlife shelter, and $2,500 worth of protein. A total for its 50 years of nearly $196,250.

One more "Check-book" point. Dr. Brian Payne of the U.S. Forest Service made a study of the difference trees on a property can make in the selling price of a home. His report (USDA Forest Service n.d.) said that trees around the house can enhance the property value by as much as twenty percent.

These are some of the things we're telling America's urban people, and ways we are working with you to accomplish our shared objectives. I have still another story to tell.

Several years ago, one of our AAN members in Raleigh, North Carolina, decided he was going to tell his whole city the kind of facts we've been sharing here today. He discussed the subject with influential members of the City Council and talked it over with his Mayor. The Mayor introduced him to a number of people who were interested in improving the environment of Raleigh, and our small businessman told them all about "Green Survival."

The idea caught fire. People who were interested in cleaning up the streams running through the city banded together with those who wanted to create bike trails. They were joined by youth groups looking for ways to help. Business people came aboard, and the whole effort was established when the City Council publicly endorsed the entire idea. The first Green Survival City, U.S.A. was the result.

That was about the same time the Urban Forestry program was begun, and now there are "Green Survival Cities" all across this country--twenty of them.

In Burlingame, California, the Rotary, Lions, Kiwanis, Soroptimists, Women's Club, Garden Club, and the Chamber of Commerce united to spearhead a $35,000 city entryway project with no city government funding. Other groups donated time and money for other planting activities. The grammar and high schools and the Scouts regularly conduct "Green Survival" litter and tree-planting programs. Burlingame is pround to be a "Green Survival City."

At the other end of the country, Niagara Falls, New York established 50 neighborhood sections with each one represented by a community volunteer organizing his neighbors to implement short and long range "Green Survival" projects.

The City Council of Minneapolis, Minnesota adopted a ten-point "Green Survival" program calling for increased tree planting, attention to Arbor Day by public and private sectors, development of educational programs, children's gardens, and more.

In these places, and in the many other "Green Survival Cities," dedicated people in the nursery industry have acted as catalysts to bring about change.

There are other exciting things happening. In the fairly small town of Lynchburg, Virginia, for example, there were 13,000 trees on public land back in 1955; in 1981 there were only 5,700. To reverse that trend the citizens devised "Operation Plant-A-Tree"--a planting program that utilizes money from recycling glass, aluminum, and newspapers to underwrite the cost of replacing city trees.

In Portland, Maine, folks who want more green in front of their homes are invited to take part in the city's cooperative tree program, in which the homeowners buy the trees from a local nursery, and the city's forestry crew plants them for free. The trees are planted in belts, esplanades, or even on private property as long as they remain visible from the roadway. The Chief Arborist there says, "In the high-stress urban environment--with vandalism, air pollution, road salt, and limited moisture--young trees need all the help they can get." He's right. And what's true in Portland is true almost everywhere.

There's even a very interesting program that involves school children in this country teaming up with children in Japan. The Japanese youngsters are collecting one million flowering cherry tree seeds to send over here--to increase the vigor and add new species of cherry trees in the U.S. In exchange, our youngsters are collecting seeds and budwood from flowering dogwood trees to send to Japan. We're delighted to be a part of the new group, Friends of the National Arboretum, that is sponsoring this "exchange program."

You need to know about all that is going on--and how you can "tap into" the resources available to you for assistance. One recent development is called METRIA--the Metropolitan Tree Improvement Alliance. It is, as the name indicates, an "alliance" of organizations concerned with urban trees. The AAN is pleased to be a part of the group, and one of our key administrators is on its Executive Council.

The purpose of the Alliance is to provide, through education and research, opportunities for collaboration in developing better trees for metropolitan landscapes. Membership is open to all persons willing to work in the organization or otherwise support it.

Another resource you should know about is a listing which the AAN publishes covering local independent landscape, retail, and/or grower organizations; a directory which can

help you locate the allied landscape industry people who are available to assist you in your efforts in your own local area. Our own AAN membership directory can also be a valuable source of information for you.

So you see, we're all here. All of us in the private sector which make up the allied landscape industries are available to be a part of the team working with you for progress in America's urban condition. Let's keep working together.

The point of all I have said is this: The American Association of Nurserymen, its member firms, and all the other organized groups of individuals and companies sharing your concerns are here to help you in accomplishing your objectives. They are our objectives, too. We can all help to take that series of small steps (we call them "Green Survival steps") to enhance the quality of our lives.

REFERENCES

Buffington, D.E. 1979. Economics of landscaping features for conserving energy in residences. Proc. Fla. State Hort. Soc., 92:216-220.

USDA Forest Service. no date. Trees could make a difference in the selling price of your home. N.E. Forest Exp. Sta. Photo Story 26, 4 pp.

SECOND NATIONAL URBAN FORESTRY CONFERENCE

SESSION J

TIMELY TOPICS IN URBAN FORESTRY

Wednesday, October 14, 1982
1:30-3:00 p.m.
and
3:15-4:30 p.m.

Moderator:

Robert Nobles
Saugatuck, Michigan

Speakers:

Edward Gilman Bartlett Tree Company Pineville, North Carolina	Establishing Grass, Shrubs and Trees on Completed Sanitary Landfills	273
Dave Shaw Monmouth County Shade Tree Commission Freehold, New Jersey	Gypsy Moth Problem as a County Arborists Sees It	282
Pam Bone Cooperative Extension Service University of California Sacramento, California	Master Gardener and TREES: The Volunteer in Urban Forestry	287
T.R. Hall International Journal of Arboriculture - Urban Forestry Oxford, England	Urban Forestry in Britain	292
James Kielbaso Michigan State University East Lansing, Michigan	Fitting Urban Forestry into the Organizational Structure	297

ESTABLISHING GRASS, SHRUBS AND TREES ON COMPLETED SANITARY LANDFILLS

Edward F. Gilman
Bartlett Tree Research Laboratory
Pineville, North Carolina

ABSTRACT

The conversion of landfills for recreation uses is increasing steadily as urban populations grow. There are many advantages and disadvantages to landfill conversion. This paper provides guidelines for planting on completed landfills; including site preparation, planning, selection of plant material, and maintenance. All of the solutions are still not known, but an understanding of the complexity of development on landfills has begun to emerge.

INTRODUCTION

As urban populations continue to grow and landfills are closed, we can anticipate greater stimuli for converting former landfill sites into recreation areas. Communities may be persuaded to turn these former unused wastelands into parks, golf courses, and nature centers. The advantages of converting former landfill sites into attractive recreation areas are: (a) inexpensive land acquisition, (b) proximity to urban centers, (c) landfills can accomodate rolling landscapes which are frequently desirable for parks and golf courses, (d) value of land will increase after reclamation, and (e) could provide a local recreational hunting ground.

The list of disadvantages for converting former landfills into parks is long: (a) frequently soil cover is thin, (b) cover soil is compacted by the soil spreading equipment, causing severe restriction of root growth, (c) soil nutrients and soil moisture levels are quite low, (d) irrigation requirements are greater on landfill areas than on nonlandfill areas, (e) surface irrigation is difficult because of uneven refuse settlement, (f) settlement causes breakage of permanent irrigation and other underground service lines, (g) settlement will cause undulating fairways and greens on golf courses, (h) landfill gases may migrate into soil cover and kill plants, (i) soil oxygen may be forced out of the soil atmosphere by landfill gases and asphyxiate roots, (j) several heavy metals become more available to plants under anaerobic soil conditions and this can lead to poor plant growth, and (k) trees (plants) tend to produce shallower roots (Flower et. al. 1978).

Despite the apparent difficulties encountered in vegetating completed landfills, they have been overcome in a few instances within the United States. At these sites, those charged with designing and maintaining the vegetation project were aware of several of the obstacles. However, the majority of reclamation programs were designed by individuals who were unaware of the special problems associated with growing plants on completed dump sites.

This paper will provide guidelines for planting grass, trees and shrubs on a completed landfill. Most recommendations are based on the results of a six-year research grant funded by the Municipal Environment Research Laboratory of the USEPA. A more comprehensive and detailed manuscript is being developed for publication by the Environmental Protection Agency and should be available from EPA in Cincinnati or NTIS by the spring of 1983.

GAS GENERATION AND BARRIERS

The gases of anaerobic decomposition (primarily methane--CH_4 and carbon dioxide--CO_2) may migrate from the refuse layers into the cover soil and/or adjacent property (Flower et. al. 1978; Leone et. al. 1979). Gas contamination of the cover soil will not be uniform over the entire landfill site. Some areas will contain relatively high carbon dioxide (25%) and methane (40%) concentrations, and consequently low oxygen (2%) content; whereas other areas will be influenced very little by the underlying refuse material. These gases are best controlled by specific activities which should take place soon after the final layer of refuse is spread. However, it may be best to allow refuse to settle awhile before control measures are initiated.

There is no doubt that combustible gases must be kept from the root system in order for vegetation to survive (Leone et. al. 1979). The provisions which will ultimately lead to a desirable root gas environment are likely to function best and cost less if they are installed prior to spreading the final cover material. These precautions should consist of the selection of a barrier material which is both relatively gas-impermeable, flexible, and durable (should last for decades and withstand settlement). This gas barrier material should be placed over the final layer of refuse. This should keep much of the gas away from the cover soil placed over the barrier.

If the gas is prevented from traveling vertically into the cover soil, it is likely to move laterally into adjacent properties. In this case, gas migration control measures should be installed around the periphery of the refuse fill. There are a variety of systems currently available (Emcon Associates 1980).

Impervious liners used to control gas flow include plastic, rubber or a similar synthetic membrane, natural clay, and asphalt. Polyvinylchloride (PVC) has been the most widely used synthetic membrane because it can control gases, has a high resistance to deterioration, and is relatively inexpensive. However, PVC will reportedly lose its plasticizer (and perhaps its effectiveness) after a few decades. Hypalon^R, chlorinated polyethylene (CPE) and other membranes are preferable when the synthetic material must maintain its performance standard for fifty-plus years. Natural soil barriers, such as water saturated clay or bentinite lagoon liners, may be highly effective if kept saturated. Otherwise, cracks will develop as the material dries and the refuse settles. Dry clay or bentinite is not an effective barrier.

There are two approaches to installing barriers. One is to cover the entire landfill with the material and the other is to place the barrier only in areas where deeper rooted vegetation (trees and shrubs) will be planted. Settlement is likely to cause cracks or breaks in the seals used in either of these approaches, allowing gas to penetrate the cover soil.

An alternate method of gas exclusion consists of mounding soil in specific areas where deeper rooted vegetation is to be planted. The mound may be underlain by a clay layer or membrane at least 20 mil. thick. At least 90 cm. of soil should be spread over the barrier in areas where trees will be planted.

COVER SOIL

DEPTH

Numerous investigators (Billings 1938; Pritchett 1972; Gilman 1980) report that 60-80 percent of tree root volume can be found in the top 20 cm. of mineral soil. The remaining

portion is located at varying depths (from 30 to 90 cm.+) depending on species and soil characteristics. Although a 30 cm. landfill cover soil may accomodate a good portion of the root volume, it would dry out quickly during seasonal dry spells. Because of the excessive cost of covering the entire landfill with deep, rich soil, consider spreading 90 cm. only in those areas where trees are to be planted. This need not be composed entirely of topsoil; however, topsoil should be incorporated into the top 20 cm. since this is where most of the feeder roots will be growing. At least 60 cm. should be spread in areas where trees will not be planted, since this complies with government regulations.

TEXTURE

The texture of cover material will necessarily vary depending on availability. Generally, if no gas barrier has been installed, it is best to first spread soil with a high clay content and cover with a highly organic soil. The deepest organic soil should be placed in areas where trees will be situated, such as a parking lot island, a clump planting on a golf course, or any other group planting. Where a membrane gas barrier has been installed, sand should first be spread on top of the barrier followed by a loamy textured soil capable of supporting plant growth. The sand will serve as a drain so that water will not accumulate above the membrane and asphyxiate roots growing in this region. The sand also serves as a protective buffer between the tires or tracks of soil spreading equipment and the membrane.

SPREADING

One should strive for a soil bulk density of 1.3 to 1.5 g/cc in a loam soil. A slightly higher bulk density (1.6 g/cc) can generally be tolerated in a coarser soil. Cover soil is frequently deposited with an earthscraper. A layer of soil loosely spread from the scraper box may be compacted to half its original thickness by the passage of the rear wheels of the machine over it. Bulk densities in the order of 2.0 g/cm^3 in the wheelings are common compared with 1.2 g/cm^3 in loosely spread soil (Baver et. al. 1972) between the wheels. The end product of such spreading is a series of horizontal layers of more or less loose soil, with intervening compacted zones. These have been shown to restrict penetration by roots and the downward movement of water.

Avoiding or eliminating these compacted layers is vital to good soil reclamation. Soil should be spread only when it is dry, using alternative earth moving machinery to the normal earthscraper. Dragline excavators, bucket-wheel excavators, forward acting shovels, and dumper trucks have been proposed but entail costs considerably higher than earthscrapers (McRae 1979). But until we are prepared to accept these greater costs, earthscrapers will continue to be the most common tool used and other means will have to be used to overcome the compaction they create.

If several different soils are to be used in the final cover material over the clay layer, they should be mixed together and spread as a unit, not in separate layers. Spreading soil in a thick layer will promote less overall compaction than spreading in several thin layers. Water movement and root growth will also be less restricted by the former method.

If soil must be spread in the conventional manner and bulk densities are above 1.7-1.8 g/cm^3, the following procedures should be considered to promote better root growth and soil water flow, thereby ultimately providing a more successful reclamation project.

PREPARING COMPACTED SOIL FOR PLANT GROWTH

The destruction of the compacted layers by means of sub-soiling or deep-tine ripping, after the full thickness of soil cover has been placed, is not usually completely effective because the available machinery cannot draw the tines deep enough or close enough together, or the operation has been performed at the wrong soil moisture (McRae 1979). There has been some success with ripping each layer after it is spread and with the use of specially designed subsoilers. A vibrating subsoiler and the double-digger may be useful, but they are now only being tested for their usefulness in aiding landfill reclamation projects (Berry 1979).

Soil structure can also be improved by establishing a grass or ground cover (e.g., tall fescue, rye grass, crown vetch) for several years before planting trees and shrubs. The processes of freezing and thawing, rainfall, earthworm activity, soil and insect activities, percolation, and leaching will also help increase soil porosity and promote more desirable soil physical properties. This process of re-establishing the network of pores and fissures by which the soil drains may take many years. Thorud and Frissel (1979) report that after artificially compacting a sandy loam from 1.14 to 1.45 g/cc bulk density, in the 0-7.5 cm. depth, recovery to original bulk density occurred within 8.5 years, but no recovery was recorded for deeper layers.

Organic amendments are beneficial to the physical, chemical, and biological properties of most cover soil. Addition of these materials will reduce the soil strength and increase water filtration and retention. Some organic materials provide an energy source and improve the environment for beneficial soil microorganisms and other fauna. These organic materials may include humus, peat moss, manure, crop residues, composted sewage sludge or refuse compost.

FERTILIZING AND LIMING

Soil tests for pH and the major nutrients (nitrogen, potassium and phospherus), soil conductivity and, where possible, for the other macro- and micro-nutrients, should be made in a number of areas within the proposed tree planting site. Samples should be collected from a 0 to 20 cm. deep soil column over a large area in a cross or zig-zag pattern. Heterogeneity in soil can be overcome by collecting several (Pritchett 1972) sub-samples over an area and pooling these to form a single composite sample. Replicate composite samples should be collected at each location. For routine soil nutrient-level surveys, any of a number of soil auger types may be used to obtain samples. The State University will help to interpret the results and make recommendations for the addition of fertilizer and/or lime. However, where trees and herbaceous species are seeded together, the rapid vigorous growth of the herbaceous vegetation in response to fertilizer may suppress or prevent establishment of seeded trees.

HEAVY METALS

Soils which contain high concentrations of zinc, copper, manganese, iron, cadmium, or lead should not be used for cover material unless this situation can be corrected by increasing the pH to a level not exceeding 7.0. There are several publications which discuss metal contents of soils in relation to plant growth (Chaney 1973; Proceedings 1980).

SOIL MOISTURE

Soil moisture content of landfill cover soil will be considerably lower than the same kind of soil on a nonlandfill area (Gilman et. al. ; Leone et. al. 1979). The factors contributing to this include thin cover soil, low organic matter content, lack of established capillary pore space, extreme micro-climates of most landfills, higher leaf transpiration rates than in nonlandfill areas, and less infiltration of rain and irrigation water due to the highly compacted nature of the soil and, in some cases, sloping ground. Drought resistant tree and shrub species frequently seed themselves on completed landfills and can also draw more moisture from the soil at low moisture contents than drought sensitive species (Kozlowski 1976; Brady 1974).

Many different types of organic matter listed in a previous compaction section will increase water holding capacity of the soil. Mulching with wood chips, bark, saw dust, grass clippings, or plant debris can help control evapotranspiration by reducing soil temperatures, weed growth, and evaporation from the soil surface. More irrigation water will be required to maintain plantings on a landfill than on a nonlandfill area, even if these policies are implemented. An above-ground irrigation system will require less maintenance than an in-the-ground system which will require continual maintenance because of breaks caused by settlement.

EROSION CONTROL WITH HERBACEOUS SPECIES

Mixtures of annual and perennial species are best suited for quickly stabilizing soil and protecting against erosion on disturbed land. The annual plants provide a quick temporary cover succeeded by a more permanent perennial species. Grasses and legumes should be selected on the basis of local climate and desired end use. Seeding rate recommendations should be followed carefully for the quick cover species because higher rates could produce dense stands that prevent or retard establishment of the permanent species. It is best to test many species on a closed portion of the landfill to determine which are best for reclaiming that particular site.

LOCATING AREAS UNSUITED FOR VEGETATION

One or more years prior to the time when trees are to be planted, a ground cover sould be seeded to provide protection against erosion, as well as to indicate where it would not be advisable to plant deep-rooted plants. Suggested species for the eastern United States include weeping lovegrass, Kentucky bluegrass, and perennial rye grass. These should be seeded with perennials such as tall fescue, birdsfoot trefoil, or crown vetch. The ideal time for seeding disturbed areas is in the early spring or fall. In most cases, if the grass cover with its shallow roots dies or fails to germinate because of the influx of gases from the landfill, one can be certain that other deeper-rooted vegetation will not thrive either at these locations.

The easiest and quickest method of locating areas which are unsuited for plant growth is to observe existing vegetation patterns. The CO_2 and CH_4 concentrations are likely to be high and limiting to plant establishment in areas where the soil appears thin or the refuse is exposed. As a general rule, one should avoid planting trees and shrubs in areas that are devoid of ground cover.

Poor soil conditions for tree growth may be encountered even in places where grasses and other ground covers are thriving. Anaerobic soil or soil high in CO_2 or low in O_2 concentration may be present in the tree root zone, which usually extends below the root zone of grasses. Table 1 points out several differences between aerobic soil which is

likely to support tree growth and anaerobic soil. Even though an area has been chosen based on the above criteria for a planting location, differential settlement and varying gas production rates may cause gases to channel into a portion of the cover soil previously uncontaminated and kill existing plant material.

Table 1. Guide for Evaluation of Landfill Soil Gas Problem

Characteristic	Anaerobic soil	Aerobic healthy soil
odor	septic	pleasant
color	darker	lighter
moisture content	higher	lower
friability	poor	good
temperature	higher	lower

Refuse and soil settlement, caused by loss of refuse material through decomposition, will create an undulating surface causing water to pond in low spots during rainy and/or irrigation periods. Vegetation in flooded areas may eventually die if water remains for extended periods; whereas, plants on the unsettled higher areas may suffer from drought. Avoid planting in such low spots.

SELECTING TREE AND SHRUB MATERIAL

SLOW-GROWING VS. RAPID-GROWING SPECIES

There is evidence that slow growing trees are more tolerant to landfill conditions than rapidly growing trees (Gilman 1980). Fast growing trees generally draw more moisture from the soil than slow growers and would, therefore, require more irrigation in order to maintain growth comparable to that on a nonlandfill area. However, if you are not concerned about how rapidly the trees will grow on the landfill compared to a nonlandfill area, then a faster growing tree may be more desirable, because it will generally provide a vegetative cover more quickly.

SMALL VS. LARGE PLANT MATERIAL

Trees planted when small (1 m. tall) show significantly better growth on landfill than those planted when larger than 2 m. tall, regardless of species (ibid). Data show that this is related to the ability of a small tree to adapt its root system to the adverse cover soil environment by producing roots closer to the surface (i.e., away from the higher landfill gas concentrations deeper in the soil). Roots of larger trees, on the other hand, start at a much deeper level and sometimes cannot develop adequate surface growth before being killed by landfill gases. Our data (ibid) indicate that by the time the larger tree adjusts to the landfill by producing a shallow root system, the smaller specimens, which started with a shallow root system, can actually grow to the size of the larger trees and, in some cases, surpass them. If trees taller than 1.5 m. are necessary, plant them on a raised bed to allow for shallow root development.

VOLUNTEER SPECIES

Although we have not specifically studied early successional volunteer tree species on landfills, they are generally very adaptable to poor soil conditions and frequently establish themselves on complete landfills. Information on volunteer species can be found in several texts (Harlow and Harrar 1968; Fowells 1965).

NATURAL ROOTING DEPTH

Tree and shrub species which have shallow root systems were found, in our studies, to be significantly more adapted to landfill sites than species requiring a much deeper root system (Gilman 1980; Gilman et. al. 1982; Gilman et. al. 1981). The deeper roots are subjected to higher concentrations of landfill gases and lower concentrations of O_2. Some species can avoid this adverse gas environment by producing a shallow root system; other species grow poorly because they are unable to produce shallow roots. Observations at the South Coast Botanical Garden in Palos Verdes, California, a former 87-acre landfill site, also showed that shallow-rooted plants seldom were affected by landfill gases, but on some occasions there had been root damage to the larger, deeper-rooted trees and shrubs (Flower et. al. 1978). Several texts showing natural rooting depth of woody species are available (Harlow and Harrar 1968; Fowells 1965; New Jersey Shade Tree Commissions 1974), but this information is based on crude observation, is incomplete, and, therefore, should be used with great care.

The fact that trees growing on landfills generally develop shallower roots than the same species growing off the landfill emphasizes the need for more frequent irrigation of landfill soils planted with woody vegetation than comparable nonlandfill areas. In our studies at the Edgeboro Landfill in New Jersey, species excavated for extensive root studies on the landfill had a significantly larger portion of their root system in the top soil layers than in the deeper layers. However, roots were much more evenly distributed vertically on trees growing in the nearby nonlandfill control area (Gilman et. al.) Deep-rooted vegetation can grow well on a landfill only if landfill gas does not migrate into the cover soil where trees are growing and if adequate soil (90 cm. or greater) is supplied.

FLOOD TOLERANCE

Our field data indicate that the changes produced in landfill covers by gases are similar to those imposed by the flooding of soils; however, the high moisture content is lacking in the landfill cover soil. Therefore, species which are resistant to "wet feet" (flooding) conditions may do well on landfills only if they are supplied with adequate water. Dry site species should be planted if water will not be readily available on the site.

SIZE OF PLANTS AT MATURITY

Another factor to consider when selecting species for landfills is size of the tree at maturity. If the cover soil is relatively shallow (30-60 cm.), then choose a tree which remains relatively small at maturity or you will risk tree toppling during high winds. If a deeper soil cover is used (1 m.), the risk of windthrow will be diminished because the root system has adequate soil space to provide anchor roots, provided landfill gases are kept out of the cover soil and the trees are irrigated. There are a number of publications available which contain information on tree height at maturity (Fowells 1965; New Jersey Shade Tree Commissions 1974; Pirone 1978). Local nurseries, landscape architects, and the State University can provide information for your particular locality.

MYCORRHIZAL FUNGI

Mycorrhizal fungi in association with plant roots have been shown to greatly increase water and nutrient uptake by plants (Marks and Kozlowski 1973). This symbiotic association has been successfully used in coal strip-mine reclamation. Mycorrhizae may also aid in successfully establishing vegetation on completed dump sites, since landfill cover soil frequently has a poor capacity for holding nutrients and water. Spore and mycelium inoculated soil has been tested for its ability to promote mycorrhizae

development on trees in landfill cover soil. Results indicate that both forms of inoculation may be viable alternatives to planting trees in uninoculated soil (Sherwood and Klarman 1980). More study is needed in this area to better understand this relationship.

PATHOLOGICAL (DISEASE AND INSECT) CONSIDERATIONS

The selection of trees, shrubs, or grasses should be based on the ability of the species to withstand attack by damaging diseases or insects common to the given area. The State University can frequently provide valuable practical information concerning disease and insect-resistant plant material, optimum planting time, proper fertilization, and other soil amendments critical to a pest control program.

GAS EXTRACTION

Extracting gas from within the refuse fill by an induced exhaust system, as is currently being practiced in several states and abroad, should aid in plant growth by reducing the quantity and pressure of the landfill gas generated in the refuse. Extraction should be compatible with establishing vegetation on completed landfills. However, commercial extraction operations are likely to end before the generation of gas has ceased, because extraction will become economically unfeasible after a few years of operation. Even so, it may be desirable to continue running the extraction equipment, since there is likely to be enough biodegradable material left in the refuse to generate gases in concentrations harmful to plant growth. Undoubtedly the plants have established themselves in soil which most likely had a very low landfill gas content during operation of the extraction equipment, and, if the pumps are turned off, the gas content in the root zone environment may increase sufficiently to cause plant death.

CONCLUSION

Landfills are being converted into parks, golf courses, and recreation areas. It is our duty to disseminate what we know to the engineers and planners, and to convince them that there is more to reclamation than haphazard guess work. We certainly do not know all the answers yet, but we have begun to understand the complexity of developing on completed landfills.

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THE GYPSY MOTH PROBLEM AS A COUNTY ARBORIST SEES IT

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ABSTRACT

An effective gypsy moth program includes an educational package using such informational techniques as films, slide presentations, brochures, and open public forums.

The gypsy moth program in Monmouth County, New Jersey consists of a coordinator, two survey crews, and the helicopter pilots. The surveys are checked and certified by the New Jersey Department of Agriculture.

A very important part of the program is the timely and efficient notification of the residents in the spray area. This can best be done through the mass media. Special attention needs to be shown to particular individuals such as pregnant women and beekeepers. The Monmouth County program's success is exemplified by the fact that 50-60 percent less spraying is proposed for 1983.

INTRODUCTION

In 1969, we first became aware of the gypsy moth infestation in Monmouth County, because of the many gypsy moth complaint calls received in our office, in the Extension Service, and in the Board of Freeholders (our governing body) offices. Our Commission approached the New Jersey Department of Agriculture and requested information on what the county could do to help rid our trees of the gypsy moth infestation. The New Jersey Department of Agriculture was very cooperative and explained the gypsy moth problem and the control measures available at that time to our Commission. They informed us of the cooperative cost-sharing program they had with the U.S. Department of Agriculture and their own department, which was equal to 75 percent of the cost of aerial spraying. They explained that surveys were done in each community requesting aid and what the priorities were that qualified a community for an aerial spray program.

The Commission then went to the Board of Chosen Freeholders and explained the problem and the control measures. After a thorough explanation was given, the Freeholders agreed to enter into a program in 1970 and pay the 25 percent the municipalities would be responsible for and to contract for additional spraying if needed. We hired six men as Gypsy Moth Inspectors to help the state by making an egg mass survey throughout Monmouth County.

During the early 70's, the New Jersey Department of Agriculture had a trailer in Monmouth County to help collect egg masses and rear the parasites. Since we were always interested in a biological-chemical approach in the control of gypsy moth, we supplied them with several of our employees to help with egg mass collection and rearing of the parasites. We also helped in releasing parasites throughout Monmouth County where gypsy moth infestation was found to be in our forested areas. We continued to work with the New Jersey Department of Agriculture until they moved their laboratory to Trenton.

We then decided that an educational program throughout Monmouth County was needed. We contacted the U.S. Signal Corps and found out that they would make a film using their classes at Fort Monmouth. The Commission made the film called "The Stripper," which was completed in 1972 and has been shown extensively throughout the U.S., especially in the East and Canada. This film explains the problem, homeowner control measures, and the integrated pest management controls implemented by the Federal and State Agricultural Departments and the Monmouth County Shade Tree Commission.

We made a slide presentation immediately for use at school systems, civic organizations, garden clubs, Boy and Girl Scouts, governing bodies, and various committees and commissions that would be involved with the gypsy moth program in Monmouth County. For several years, we spoke on programs during the day and evenings to explain the gypsy moth problem and how residents can help themselves. We drafted a brochure, which is still used today called, "Mr. and Mrs. Resident--Know Your Enemy and Save Your Trees." We studied the effects of parasites on the gypsy moth in Monmouth County and had field trips with representatives of the press in areas where parasites were establishing themselves. We had brochures on these parasites available at our office. We hold two forums per year (spring and fall), in which we discuss the gypsy moth problem in Monmouth County. The Spring Forum is used to display our proposed gypsy moth program for that particular year. In the Fall Forum, we touch on how successful the program was and on other topics pertaining to arboricuture.

Each person that calls our office is placed on a survey sheet and has their property evaluated for the number of egg masses that are found. We also evaluate the type and size of the trees to determine if aerial spraying may be necessary. Each person is given a brochure to advise them on how they may help themselves. If they are to be in a spray block, they are properly advised. In one year, we had over 8,000 phone calls during our spray program. In 1982, we had over 6,000 phone calls in regard to our gypsy moth control program. In 1982, we sprayed nearly 28,000 acres by air and nearly 7,000 acres with the use of our mist blowers.

Our office currently has two gypsy moth survey crews and a coordinator to evaluate the gypsy moth infestation. When the surveys have been completed by our department, the New Jersey Department of Agriculture rechecks our evaluation and certifies its accuracy. They eliminate areas that they feel should not be considered in an aerial control program and areas not in their domain; such as recreational areas, sparsely residential forested areas, and small blocks of less than 50 acres. The county then designates these areas as being in the aerial spray program. This year, the State's selection criteria only includes areas that had been heavily defoliated in 1981. We extended our program into the areas which are heavily infested and were not stripped last year, but heavy feeding and defoliation is expected in 1982.

During the aerial spray program, we had an infestation that was not picked up during the survey period. This could have been caused by blow-ins after the program had started or by migration from adjacent wooded areas where it was difficult to survey. We have added new aerial spray blocks where the infestation is heavy enough to cause extensive defoliation during the program year.

Some of the state parks were not sprayed in 1980, and a heavy gypsy moth buildup occurred. During the hatching of the gypsy moth in late April and early May, we had frequent windy days and the gypsy moths were blown into many lightly infested areas and new locations, causing a severe problem. We finally have a stabilization of the surrounding areas, after two years of aerial spraying.

BEEKEEPERS

Because we use Sevin 4-Oil in our gypsy moth control program throughout Monmouth County, we survey all bee hive locations. We have a number for every beekeeper and a location on a separate map of where every hive is located, using the beekeeper's predetermined number. When the spray blocks are layed out, we also place them on the beekeeper hive location map. If a hive is within one mile of our aerial spray block, the beekeeper is notified about one month before spraying is done. He then can move his hive to a location where we are not spraying. For the beekeepers who wish to use the pollen traps, designed by Jacob Matthenius, the State Beekeeper Expert, which lessens the chance that contaminated pollen could be brought back to the nurse bees in the hives, the county supplies these pollen traps free.

During the program, all beekeepers are notified the day before we will be spraying a block close to their hives so that that they will have time to place the pollen traps on their hives before spraying begins the next morning. When we cannot locate the beekeeper, these spray blocks are usually put off until the next day.

OBJECTORS

In 1982, we had 90 objectors to our gypsy moth program who were in spray blocks when we started our program. Seventy-one more objected after the program started because not only were their trees being defoliated, but their gardens were being destroyed. We had additional petitions handed in later, but only a few were in spray blocks, which we then did not spray.

Some of those who signed petitions not to be sprayed this year have requested spraying in 1983. We had about 75 pregnant women that wanted to be notified before spraying in their locations, which we did. They all wanted us to spray their trees, but they wanted to be notified in advance.

THE PROGRAM

After all surveys have been completed and the State Department of Agriculture has determined what they will spray, we hold a Municipal Coordinators Meeting. At this meeting, representatives for the New Jersey Department of Agriculture are present with our county representatives. The entire gypsy moth program is then explained, including the state and county aerial spray blocks system. We include a packet for each municipal coordinator with instructions on what their responsibilities are and what the county will do. Each municipality must advertise in the paper that they will be discussing the gypsy moth control program for the year and then will pass a pest nuisance resolution. Each municipality is responsible for the notification of the residents within each spray block. The County of Monmouth publishes all public notices, monitors the entire program in conjunction with State representatives, keeps all records, sprays where needed when the State program is not involved, and pays the municipalities' share of the cost in the State and County programs.

Before we do an aerial spraying, we check to see if school children are present in the area. If so, we delay spraying until the block is clear, or spray the next block. We have three methods of radio communication to our pilot to eliminate any misspraying errors.

Each morning we notify the police in the towns we are spraying. During the day, we notify the radio station as to where we will be sprayaing the next day and what we had sprayed that day. Weather problems, such as rain, fog, heavy dew on leaves, heat, and

wind may cause us to postpone spraying for several days. We also have mechanical problems with spray equipment and aircraft, and occasionally a pilot will oversleep.

We have a swamp truck to carry chemical and fuel for our two helicopters. We use three vehicles in the field with a Kojak on top to help determine where the helicopter spray blocks are and to keep the pilot in constant communications during his spraying. We move from one end of the aerial spray block to the other before he sprays, so that he is acquainted with the exact area to be sprayed.

Our spraying begins at about 5:30 a.m. and usually lasts until 9:00 a.m., weather permitting. If it starts to get warm, the pesticide will raise, and in some instances, we have to shut down around 8:00 a.m. On several cloudy days, we are able to spray until 10:30 or 11:00 a.m. We rarely spray after 12:00 noon.

Over the years, we have helped chemical companies with testing various pesticides for gypsy moth controls. In the early years of gypsy moth control, we aerially tested "BT" (bacillus thurengiensis) at various formulations with generally poor results. BT works well by ground application but has an erratic control by aerial application. Orthene was used in our mist blowers and acquired its label from our test in Monmouth County. We also did some orthene aerial spraying last year. We did the experimental work on tree injections using bidrin and meta-systox-R with good to excellent control. This is too costly for a program such as ours. It could only be done on an individual basis. We have also tested several other materials with mixed results.

All in all, I feel we have an effective gypsy moth control program and that we adequately protect our forested residential areas from heavy tree mortality.

We spray with Sevin, a chemical, until the gypsy moth population is at a level where parasites can stabilize the area for four to six years before we have to consider spraying again. We only spray forested residential areas and recreational areas and leave the forest areas for biological buildup and gypsy moth collapses by the virus. The parasites can overflow into the residential areas with a lower gypsy moth infestation and be stabilized for several years. After this past year's control, we feel that our program was highly successful, and at least 50-60 percent less spraying will be considered in 1983.

1982 had the most successful gypsy moth program ever conducted by the Monmouth County Shade Tree Commission. Regardless of the adverse weather conditions, we were able to get 95 percent control of foliage protection in the residential forested areas.

The residential forested areas were top priority, and therefore parks and recreational areas were not aerially sprayed last. We did have some defoliation in some of the parks and recreation sites.

Our survey was 99 percent accurate, with only one small area that had not been placed on our original spray program. Many calls came into the office, but they were generally already in an aerial or mist blower spray block.

We sprayed 16,439 acres by fixed wing aircraft as part of the New Jersey Department of Agriculture State aerial spray program. With our helicopter, we sprayed 11,195 acres during the seven weeks of aerial spraying. With our four mist blowers we were able to spray 7,350 acres. We sprayed 34,984 acres with Sevin 4-Oil during the program. Our mist blower operation lasted nine weeks.

During our helicopter aerial spraying, we were ready to spray seven days a week and did spray on Saturdays, Sundays, and Memorial Day. Our biggest problem was weather. Even though it may look like bad weather, we had to be ready just in case it turned clear. Rain, fog, wind, and heavy dew caused 21 days of unsprayable conditions. There were many mornings that fog caused us to stand by until 9:00 a.m., and then shut down by 10:30 a.m. because of winds.

In my opinion, even though we encountered adverse weather conditions, it may have been advantageous. The gypsy moth may not have fed as vigorously as it would have if weather had been warmer and more pleasant. This may have caused them to be weakened and more easily controlled during our spraying. Also, defoliation was not as great as it would have been if weather conditions were more favorable.

We anticipate a greatly reduced aerial spray program in 1983. Many of the areas sprayed this year will not need any spraying next year. We may, however, have some new infestation that may have to be considered for aerial spraying.

We want to thank all the local gypsy moth coordinators personnally for the work they did to get the notices out. They were the unsung heroes in their communities, and they all did a super job.

This year, the New Jersey Department of Agriculture is reimbursing us for 23,439 acres at 25 percent of $7.95/acre. We will, therefore, anticipate a return of $46,588 from the Federal cost sharing program. The State sprayed 16,439 acres and took an additional 7,000 acres from our helicopter program to make up the 23,439 credit for Federal cost sharing.

We received no funds from the New Jersey Legislators, although a State cost sharing of $2.00/acre had been considered. Due to budgetary problems in New Jersey, this proposal was dropped in June.

PHEROMONE TRAPS

In closing, I must make a comment on the pheromone traps that are being advertised for gypsy moth control. In my opinion, they were not meant to be used in a gypsy moth control program of high infestation. They are usually not for this year's control anyway, because they only attract male adults after the defoliation has already occurred. These traps do not attract females, who can't fly. The males are known to mate more than once, and therefore, in my opinion, those males not trapped would probably fertilize nearly all the females present, anyway.

MASTER GARDENER AND TREES -- THE VOLUNTEER IN URBAN FORESTRY

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ABSTRACT

Increased urbanization has caused a dramatic change in the type of information requested from county Cooperative Extension agents in California. In order to meet this demand for horticultural and gardening information, rather than the traditional agricultural information, the Master Gardener program (patterned after a Washington state model) was begun. Master Gardeners are local community members trained by Cooperative Extension experts in the area of plant science. In exchange, Master Gardeners volunteer their time to the Cooperative Extension office. Another volunteer program, TREES, trains individuals in the principles of urban forest management and tree maintenance. Both of these programs have increased service to the users of Cooperative Extension information, added to individuals' self-fulfillment, and provided tremendous benefits to the urban forest at a large cost savings.

Cooperative Extension has traditionally worked with farmers and their families. With increasing urbanization it serves a greater number of people who no longer have links to the farm, but whose interest in horticulture and gardening is increasing. The University of California Cooperative Extension in Sacramento County has experienced a tremendous increase in the number of telephone and visitor requests for information, and existing staff has had a difficult time responding to this demand.

MASTER GARDENER

A program called the "Master Gardener" began in Washington state in 1972 as a way of handling the increasing demand for horticultural assistance placed on their Cooperative Extension county agents. A feasibility study was conducted in California, and the recommendation was that a Master Gardener program should be tried here. However, funds were not available within Cooperative Extension to hire someone to administer the program. Thus, in 1979, a grant proposal was submitted to the California Department of Forestry to develop a pilot Master Gardener program. Funding was received from the Department of Forestry, and in the fall of 1979 the first Master Gardener program in California began.

What exactly is the Master Gardener program? Master Gardeners are members of the local community who are trained by Cooperative Extension experts in different aspects of plant science. In exchange for instruction, people who become Master Gardeners spend time as volunteers working through the Cooperative Extension office.

The Master Gardener program is now in its third year in Sacramento. The program is divided into three phases: recruitment and selection; training; and volunteer service. Recruitment is done in the fall using radio, TV, and newspaper coverage. The response in the first year was quite good -- we had 90 applicants. In subsequent years, interest in the program has increased dramatically. In 1981, 300 people requested applications, and 160

returned them and were given individual 20-minute interviews. From these, we have to select only 60 for the program. One elderly woman, when asked why she should be admitted to the program over other applicants, replied, "because I won't be here very much longer, and they will." She was accepted. The selection of the volunteers is difficult. One member of the advisory board said it was like taking final exams. In selecting a potential Master Gardener, we look at their plant and gardening background, their community involvement, and their ability and desire to volunteer.

The selected volunteers receive a 50-hour training course. The in-depth, practical training includes subjects like introduction to horticulture, soils and plant nutrition, disease and insect control, pesticide safety, culture of fruit trees, vegetable growing, ornamentals and turf, and the selection and maintenance of landscape trees.

Upon completion of the course, and the passing of a comprehensive final exam, the volunteers become certified Master Gardeners. The first year we trained 40 Master Gardeners. We currently have 102 Master Gardeners, half of whom have been with the program for more than one year.

Master Gardeners range in age from their mid-twenties to mid-seventies. We have people from all walks of life; a dentist, teachers, a physician, homemakers, a radio disc jockey, two TV newscasters, landscapers, three lawyers, retired Army and Air Force people, and many who work for state and local government.

In exchange for their training, Master Gardeners are required to give 50 hours of volunteer time to the Cooperative Extension. In 1980, when the first class of Master Gardeners began volunteering, they put in over 1,600 hours and contacted 4,600 people. In 1981 they volunteered over 4,000 hours and contacts exceeded 10,000. It is projected that in 1982, Master Gardeners will spend 7,000 hours in volunteer projects and that 24,000 people will have been helped directly. This figure does not include the many hundreds of people reached through radio, television, and newspapers.

Master Gardeners volunteer their time in numerous horticultural projects. One aspect of the program we have stressed is to have them in the office to handle phone calls and visitors. We have someone in to answer phones every day from 9 a.m. - 12 noon and 1 a.m. - 4 a.m. During the busy gardening months of March through October they answered questions from 250 people a week; 55 percent of these questions dealt with urban forestry. Having Master Gardeners answer phones has freed farm advisors to pursue other activities. In addition to answering phones, we have a Master Gardener speaker's bureau that provides speakers on request. Master Gardeners also write answers to plant questions for a local newspaper; appear on a radio garden talk show once a week; staff plant diagnosing and information clinics at shopping malls, farmers' markets, the state fair, and other community events; and run pruning clinics for the public at private residences. The Master Gardeners are also involved in setting up and working with community gardens.

In addition to the Master Gardener program, grants from the Department of Forestry enabled our office to begin other urban forestry. A newsletter called "Tree Talk" was started and is now sent to 500 people who make their living working with trees. Urban forestry meetings are held for a similar audiences. Topics covered in these Landscape Tree Forums include mistletoe controls, oaks in the landscape, use of urban forestry byproducts, and insect borers and their control. Two slide sets have been developed on "Selection and Identification of Landscape Trees" and "Insects of Trees." With all of the urban forestry work we are now involved in, I have become known as Sacramento's Urban Forester and, consequently, I have been fielding questions from all over the state on the care of trees in the urban environment.

TREES - TRAINED RESIDENTS EXTENDING EDUCATIONAL SERVICES

To further expand our urban forestry education efforts, we started another volunteer-based program called TREES (Trained Residents Extending Educational Services). Its purpose is to train individuals from selected communities in the principles of urban forestry and tree maintenance. The TREES volunteers can then conduct urban forestry programs in their neighborhoods.

We selected two diverse neighborhoods from which to recruit the volunteers and do the training. One was a white, middle to upper-income area with a near-monoculture of trees -the Modesto Ash. These trees were suffering from a number of problems, including mistletoe and anthracnose, and were on the decline. The other area we chose was a low-income, mixed-race neighborhood. The trees in that community were either non-existent or in a deteriorated condition. Through education of these neighborhood residents and their subsequent activities, we hoped to see a positive change in the two areas' tree population.

Because we had fewer people to recruit from, the number of people applying for the program was less than the number we had applied for the Master Gardener training. However, 20 people completed 27 hours of classroom instruction and hands-on field trips covering such subjects as anatomy of a tree, tree identification, identifying and controlling insects and diseases of trees, soil, water and fertilizer requirements of trees, pruning landscape and fruit trees, and planting and staking.

Upon completion of the course and the passing of a take-home exam, the residents are certified as TREES volunteers. They are then required to volunteer their time to urban forestry projects in their communities.

After certification, the next step is to identify tree needs within the community. The TREES volunteers from the low-income neighborhood decided on a project to plant trees where there were none. We made an agreement with the City of Sacramento Tree Services to provide trees free of charge to the TREES volunteers for planting in the yards of residents who did not have a front yard tree. The TREES volunteers advertised the free tree program in both English and Spanish newspapers and received a good response. The volunteers made visits to residents to determine eligibilty for trees and to select what kind of tree to plant. The trees are then picked up from the city growing yard, transported to the planting site and planted by TREES volunteers, with the help of residents. After explaining how a tree should be planted and the care of a young tree, brochures are left detailing watering, fertilizing and other care practices. In the first six months of this program, 50 residents received and planted trees.

TREES volunteers in this neighborhood started a column on tree care in their community newsletter. They also planted trees at a neighborhood center in conjunction with Arbor Day, and worked on an ordinance to protect a native stand of oaks scheduled to be destroyed when new housing was built. One of the volunteers from this group has put in hundreds of hours helping to establish The Sacramento Tree Foundation -- a new non-profit organization that brings together members of the community to encourage strong public support for the planting and preservation of trees and which promotes education leading toward greater enhancement of the urban and rural forest. The Sacramento Tree Foundation has TREES volunteers on its board and works closely with the Cooperative Extension, Master Gardeners, and TREES volunteers in all of its planting and education projects.

TREES volunteers from the areas with the troubled ash trees approached the problems in their community a different way. There wasn't a need for trees to be planted, so they made themselves available as tree consultants. Through advertising, they let the community know that they were trained in urban forestry and tree maintenance and were able to make home visits and phone consultations. The phones started ringing and haven't quit yet. The volunteers have given many hours of assistance to individuals with tree problems. They also give talks on tree selection and care for community groups upon request, run tree care and diagnosing clinics at community events, and write articles on the proper care of ash trees for both community and Sacramento newspapers. Two of the volunteers have spent over 300 hours helping our Science Center and Junior Museum establish a nature area. They have recruited volunteers from various organizations and trained them in the planting and care of trees and shrubs. These additional volunteers have now planted nearly the entire nature area and are seeing that the trees are watered and cared for during Sacramento's extremely hot summers. The list of projects the TREES volunteers have been involved with in the past two years could go on and on.

TREES/4-H YOUTH URBAN FORESTRY PROJECT

Our success with using volunteers to extend urban forestry information to the community through the TREES program led us to develop another urban forestry program -- The TREES/4-H Youth Urban Forestry Project. Sacramento's 4-H youth program was trying to find new approaches to reaching children from the inner city and low-income neighborhoods. Many of these areas do not have a 4-H program. We felt an urban forestry project would be ideal. It would introduce children to 4-H and to the world of trees. By fostering an awareness and appreciation of the needs of trees in the urban setting, we would be establishing a generation of tree conscious individuals.

Last fall another TREES training program was given to residents selected from throughout Sacramento. They were given training on the stipulation that their volunteer work would consist primarily of implementing the 4-H Youth Urban Forestry Project. Forty volunteers are now available to work in the youth urban forestry project; 27 who were trained as TREES volunteers and an additional 13 from the Master Gardener program.

In January, 1982 work began on the urban forestry curriculum. Six 45-minute lessons were developed: What is a Tree; How Trees Grow; Tree Reproduction; Tree Identification (in two parts); and Trees Are Important. The lessons were written for children in the fourth, fifth, and sixth grades.

This spring the program was taught on a pilot basis to 66 fifth and sixth graders at an inner city school. It was met with immediate success. The children wrote letters and drew pictures, which they sent to the TREES volunteer, describing what they had learned and thanking her for teaching them so many wonderful things about trees. The teacher called and asked the TREES volunteer to return in the fall to teach additional classes.

A brochure was sent out at the end of the school year to a select group of elementary schools in primarily low-income neighborhoods asking if they would like to have the 4-H Urban Forestry Program brought to their school in the fall. Eighteen schools representing 62 classes have requested the program.

Although the curriculum is not yet in final form, it has been taught to 150 children through summer school programs and is being taught at three elementary schools this fall.

FUTURE OF THE VOLUNTEER PROGRAMS WITHIN COOPERATIVE EXTENSION

The urban forestry grant money that has supported the Master Gardener and TREES programs the past three years ended August 31, 1982. We knew from the beginning that the grant money would only be available for a short time, so after the volunteer programs proved to be an effective way of disseminating horticultural information for the Cooperative Extension, we planned for the time when Cooperative Extension would absorb these programs.

The job description for the environmental horticulture farm advisor has been rewritten as a community education advisor whose responsibilities include the Master Gardener and other urban forestry programs. The University is funding my position until the community education advisor position is filled, so there should be no loss in continuity of the programs.

Our experience over the past three years has shown that the paperwork and administration of both a Master Gardener and TREES program is cumbersome. To increase efficiency the two programs will be combined under the Master Gardener title. This decision is based on factors other than just ease of administration. The Master Gardener program has greater name recognition and prestige, and therefore attracts a larger number of volunteers. The Master Gardener program also gives the volunteers a more broad-based learning experience. Seventy-five percent of the TREES volunteers went on to become Master Gardeners for the additional training, volunteer options and recognition it gave them.

When the Master Gardener program first started, its emphasis was not urban forestry; that is no longer true. Master Gardeners now receive eight hours of their 50 hours of training on trees. I have developed a trees outline for use in a Master Gardener program that I will be teaching at four other Master Gardener training programs in northern California. The Master Gardeners are involved in as many urban forestry programs as are the TREES volunteers and because of their more extensive plant training can provide more help on other plant and gardening problems than the TREES volunteers who are not trained in these other areas of plant science. Continuing education in trees and urban forestry will be given to Master Gardeners who want to commit most of their volunteer time to urban forestry programs like the 4-H Youth Urban Forestry Project.

The volunteer, as an urban forestry and horticulture educator, has proven himself in California. Three years ago we had no idea of the thousands of people these volunteers would help and the multitude of ways they would benefit the community. Now the entire state is experiencing the positive results of the volunteers -- the Master Gardener program has spread to 12 other counties, with more being added each year.

URBAN FORESTRY IN BRITAIN

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ABSTRACT

In Britain, the concept of urban forestry does not have wide acceptance. Traditionally, foresters were solely concerned with trees as a timber crop, and horticulturalists had dominion over street trees. Trees in or near urban areas were seen simply as amenities. The Arboricultural Association, formed in 1964, obtained recognition for arboriculture as an essential skill and has served to further the holistic concept of urban forestry in Great Britain.

In retrospect it is difficult to determine exactly when the term "Urban Forestry" first made its impact on professional foresters and arboriculturalists in Britain. There is no doubt that by the 1960's, urban society was becoming increasingly aware of environmental degradation; contributing factors being greater affluence, greater mobility, and greater amounts of leisure time. Atmospheric and riverine pollution by industrial effluents were no longer tolerated, and the unsightly tips of mineral tailings were no longer acceptable. The tree component of the environment came under popular scrutiny, and in Britain, the epidemic of Dutch elm disease which has ravaged the southern part of Great Britain since 1968 has concentrated attention on the trees in the landscape. This is the only bonus to emerge from the catastrophic loss of elms. Up until this time, foresters at both the craft and professional level were trained in the growing of a crop of trees to provide timber, and it was left to the horticulturist to look after the individual trees in the landscape, or the shade or street tree decorating towns and cities. The forester did not wish to be involved unless he had a special interest and inclination or when aided and abetted by his master, the traditional landowner whose family, for generations, had indulged in a tree collection or arboretum. Unfortunately, the horticulturist, in looking after urban trees, had, as often as not, to be subservient to the city engineer or architect whose ideas of tree maintenance were to produce trees which looked like hatstands in the winter or lavatory brushes in the summer. Pre-war housing developments seldom included tree planting, despite the fact that countless trees had been destroyed to make way for a concrete and brick jungle. Developments were alleviated, perhaps, by a few pathetic Japanese cherries, even though the housing estates rejoiced in such names as Acacia Avenue, Chestnut Crescent, Oak Walk, or Lime Street. The dual carriageways that sometimes constitute city ring roads were occasionally planted with trees, mostly elms that have now succombed to Dutch elm disease.

In 1964, the Arboricultural Association was formed by a group almost entirely from local authority parks administrators who, by their perseverance, were responsible for obtaining recognition of tree care as essential, and of arboriculture as an identifiable skill for which training is necessary. They also demanded and obtained tree care legislation in the form of Tree Preservation Orders which entered the statute book in 1974.

There was nothing equivalent to America's "Trees and Forests in an Urbanizing Environment" (Little and Noyes 1970) symposium, which produced guidelines for future research in urban forestry, except perhaps the enabling act 92-288 of 1972, that aimed to

protect and improve established trees and shrubs and had similarities to the British Tree Preservation Order regulations. The need for research was also identified in Britain with the need for training. Eventually, research facilities within the Forestry Commission, the central government forest authority, and existing applied plant sciences research institutes, university and polytechnic departments were, and still are, being utilised to investigate the multitude of problems and phenomena which have emerged. Formal training to diploma level was provided at horticultural colleges.

Despite the fact that urban forestry was identified by 1970 in North America, its full impact was not fully appreciated in Britain and the Continent of Europe until ten years later. Arboriculture, however, used to embrace all aspects of forestry in Victorian and Edwardian times. For example, Grigor's Arboriculture (1868) is now understood to cover the care of individual trees (and may be synonymous with tree surgery and daring young men doing high wire deeds with a chain saw) and woodlands, whose primary or sole function is to provide an amenity or decoration. Amenity woodlands have long been a feature of the British countryside; shelter belts, spinneys for game coveys, and the decorative landscapes of Repton, Brown, Bridgeman, and Louden. Their genius influenced such American landscapers as Downing, Vaux, and Olmstead. Davey emigrated from southern England, bringing with him the principles of tree care and laying down the foundations for tree surgery in North America.

Andresen (1976) highlighted urban forestry and, through his published works, influenced European attitudes. Professional visits by European foresters and arboriculturists to the U.S. in the late seventies brought these ideas back across the Atlantic. It became obvious that prevailing social opinion on the care and maintenance of trees and the silvicuture of woodlands, especially within urban areas and on urban fringes, were moving in the same direction, but there was a reluctance in Britain to accept the term. In Britain the term "forestry" is identified by many people as the monoculture of exotic conifers over extensive areas of upland Scotland, Wales, and Northern England, and the displacement of broadleaves on lowland areas by exotic conifers. From a personal point of view, urban forestry seems a more appropriate term to define and encompass the management of trees, either as individuals or in woodlands or forests, within the compass of urban populations. Horticulturists and others in applied plant sciences still persist in discarding the concept.

Distances and areas within Britain may appear insignificant by North American standards. Size and scope are immaterial, since, proportionally, the problems are the same. Burgess and Sharpe (1981) have brought together papers that are highly pertinent to the concepts of urban foresters. It was quite a surprise to learn that in one township in S.W. Wisconsin, the forest area decreased from 8724 ha in 1831 to 318 ha in 1950; a pattern of destruction leading to fragmented woodlands which is a familiar scene in Britain today. Similar destruction of the forest is reported from other parts of the United States, which led Loucks (1970) to conclude that transient natural disturbances did not materially affect the natural stable landscape. However, a combination of human influences, land use patterns, and social forces brought about fundamental landscape changes, some of which are almost irreversible, thereby altering the whole character of natural landscapes.

To digress, let me explain the forest estate of Great Britain--the central government Forestry Commission was set up in 1919 to create a national timber reserve and is now the state's tree authority. The private landowners have always traditionally been owners of forests, but now local authority and institutions like the National Trust, financed by private donations and with the status of a charity, are responsible for the management of large tracts of woodlands and forests. Government agencies, the Countryside Commission, and the Planning Departments of local administrations are also concerned.

While the Forestry Commission and the private landowners adopt silvicultural practices to produce a timber crop, the National Trust and the local authorities are more concerned with the provision of a recreational facility and amenity. Planning authorities meddle in the control of felling, even though this is a function of the Forestry Commission in their administration of felling licenses. For example, one local authority demanded the replacement of thinnings removed in a thinning exercise as a condition of authority to proceed. If planners had their way, they would like to control all forestry operations. Such arrogance ignores the fact that foresters have been planners long before the term "planners" blighted the English language. Working plans have been essential for forest management for well over a century, and are therefore a fundamental tool that should be adopted for those woodlands where amenity is the management priority. The basis of forest management is the relationship between the Current Annual Increment and the Mean Annual Increment curves and, where they coincide, the perpendicular to the base line provides the length of the economic rotation. When trees are allowed to remain beyond this age, an economic loss can be expected, and the principles of sustained yield are in jeopardy. Where timber production is not the main object of management, the crop of trees maintained beyond the economic rotation sustain the amenity. The question must therefore be posed, "If the aim of management is sustained yield of timber, is there any reason why the same principles cannot be applied to attain a sustained amenity?" The cost of retaining trees beyond their economic rotation could be regarded as the cost of the amenity or recreational facility provided and so can be regarded as a legitimate charge on the community, to be recouped in local rates and taxes. There is some indication from the Forest Recreation and Amenity Account of the Forestry Commission for the year ending 31 March 1981 that a policy of this nature is evolving. The total expenditure for the year was just over four million pounds (this figure includes over 150,000 pounds for the building of forest cabins, etc.). An income of 618,000 pounds was generated, and the balance of 3.385 million pounds was provided as a subsidy. The commercial recreation trading account, however, provided a surplus of 270,000 pounds (Forestry Commission 1982). This hypothesis is therefore presented for discussion in the hope that the forest economist can present the cost which society has to pay for the amenity provided--the "bottom line," if you like.

In Britain there is not one vestige of natural forest remaining. Forested areas that exist today are entirely man made. If management for amenity is not accepted, then the recreational facility will be destroyed. In many cases this is already happening. Small woodlands on urban fringes have been allowed to degenerate and very quickly become littered with the cast-off consumable durables (i.e., frigs, bedsteads, electric and gas cookers, etc.) and other forms of refuse.

In Britain the commercial forests provide countless amenity facilities and provision for recreation and education such as nature trails, forest walks, bird watching, orienteering, camping, fishing, game sports, picnicking, etc.

The use of forests by urban populations present a user problem. On holidays the exodus of the town dweller to the countryside is the same proportionally in Britain as it is in North America. Except for the North of Scotland, the urban populations do not have to travel more than 75 miles to enjoy extensive woodland areas. A measure of the use of woodland recreational facilities can be found in Leisure and Recreational Statistics, 1981-82 Estimates (Salter 1981): 26,350 activity days per year per 1,000 population, compared with 4,540 in outdoor sports, 15,580 for entertainment (theatre, cinema, etc.), and 20,000 for indoor sports (darts, squash, boxing). Milton Keynes in Buckinghamshire allows 500 pounds per day to support a Leisure Centre which accommodates primarily the needs of indoor sports. Subsidies are also provided for outdoor sports (football, rugby, cricket, etc.). The figure of 26,350 for outdoor activities compared favourably with that for

entertainment/cultural activities--dancing, discos, cinema, and theatre (15,580/1000 population), but dwarfs that for outdoor sports (4540/1000 population). All these activities are subsidised, especially theatre and cinema. So why then should outdoor recreation be a "poor relation"? It does not take an accountant to see the relationship between the increment curves and the usage pattern or to use these relationships as a basis to demonstrate that amenity and recreational demands of the urban forest should receive the financial support commensurate with the demands and desires of society. Such demands present a peculiar problem over visitation. The pressure of people's feet and the disturbance they make all require additional funds to minimise the effect. On the other hand, incidental income from recreation has always been a source of revenue. Once again, subsidies (or subventions) seem a legitimate and reasonable demand. The subsidies need not be extortionate, if the products of the forest are used to provide revenue, and the only way to provide revenue is to manage for production. That means some form of exploitation--anathema to the "eco-freaks." A full appreciation of these considerations makes the term "urban forestry" appropriate.

So much for the urban fringe woodland. What about the tree in the built environment? The mature trees in British cities were established long before tarmacadam (asphalt), concrete, and shopping plazas. Today's urban foresters are expected to establish trees in the most inhospitable conditions, with builders rubble or fill being defined as soil, while there is hardly a square foot of permeable surface around the base of the tree. Is it any wonder that the word "stress" crops up with monotonous regularity in forestry and arboricultural journals? What is the point of selecting trees for their suitability for the streets of towns and cities, when a suitable level of nutrition cannot be provided for survival, far less growth? In Britain, industrial waste-land disfigures the environment. Professor Bradshaw of the University of Liverpool, amongst others, has demonstrated that if trees are to be established, they must have adequate supplies of nutrients, nitrogen and phosphorus, especially.

Would maple decline in the Eastern U.S. be such a problem if adequate supplies of nutrients were available? Weed growth around the base of young trees, especially, can have a limiting effect on growth, because of moisture and nutrition competition. There are many suitable materials that can be used to restrict weed growth--old plastic bags or even pieces of cardboard from outer packing cases which are biodegradable.

So what is urban forestry? I have not answered the question. After discussions with Philip Barker of the U.S.D.A., Forest Service, Pacific Southwest Forest and Range Experiment Station, it would seem that the final definition has yet to be decided. In Britain and Europe the philosophy of sustained yield is still the main foundation of forest management. Historically in North America, forestry has been an engineering exercise to extract a raw material as economically as possible. According to Professor Erik Jorgensen of Guelph University, arboriculture has been a means of introducing to North American society the concept that trees are a renewable resource. If sustained amenity can be seen as synonymous with sustained yield, then urban forestry can be associated with the conservation of the urban environment, provide the timber requirements for man's creature comforts, and at the same time create a facility to restore tranquility of mind. Urban forestry also provides for the co-operation of other professions and disciplines, and it is hoped the engineer will bring his skills together with those of the forester, as have Donald Grey and Andrew Leiser in their very welcome publication "Biotechnical Slope Protection and Erosion Control" (1982).

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FITTING URBAN FORESTRY INTO THE ORGANIZATIONAL STRUCTURE

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ABSTRACT

Tree care management information based on the 1980 Municipal Tree Care in the United States Survey is presented. Only 22 percent of respondents accurately know the number of city street trees in their jurisdiction. The bulk of city tree budgets are designated for streets, 61 percent, and parks, 24 percent. By specific activities, planting, 15 percent, trimming, 28 percent, and removals, 28 percent account for the greatest expenditures. There are about 50,000,000 street trees in the United States valued at about $15 billion.

Based on criteria assumed to identify desirable qualities in a tree care program, evaluations of manager titles and tree care management unit designations are made. Conclusions from the data are that the programs having the highest level of management have the person in charge identified with a title of Forester or Forestry Foreman, followed by Consultant, Department of Public Works Foreman, and Landscape Architect.

Similarly, the programs having the highest level of management have the management unit with a designation of Forestry, followed by Forestry within Parks, and Trees within Parks, followed closely by Trees within Department of Public Works.

For the maximum benefit to trees, it seems imperative that Forestry and/or Trees be identified in the unit name and/or the tree manager title.

This report is based on data collected in the survey, "Municipal Tree Care in the United States - 1980." Portions of the data have been reported earlier by Giedraitis and Kielbaso (1982) and by Kielbaso, Haston and Pawl (1982). This report evaluates several aspects of tree care as related to the title and position of the tree care units in the organizational structure.

As background for proper understanding, several facts from Giedraitis and Kielbaso (1982) must be considered. In 1980, 1,534 questionnaires were returned from 2,861 surveyed cities for a response rate of 54 percent. The distribution of returns by population category and geographic region are presented in Table 1. Table 1 also presents data on the percentage of responding cities which manage trees systematically. Systematic management was not defined, but rather left to the discretion of the respondent.

Tree managers were also queried regarding budget information so that we could calculate dollars spent per tree and per capita. Only 22 percent know, with a satisfactory degree of accuracy, how many trees they have, although more are able to estimate. These estimates are not included in calculations. Since it is much easier to maintain a count of street trees than park or river basin trees, this is the data that was requested. Table 2 presents data on dollars per tree and dollars per capita related to population categories and geographic region. Since so few managers actually know the number of street trees,

the budget per tree is based on smaller returns than the budget per capita; average and median data are presented.

Budget data was analyzed by both location on public property, and by various work account divisions. By location, tree budgets are divided as follows: streets, 61 percent; parks, 24 percent; cemeteries, 2 percent; nurseries, 2 percent; public grounds, 7 percent; and "other," 3 percent. By the various work account activities, the tree care budgets are divided as follows:

Supervision	9%	Nursery	1%	Storm work	3%
Office	1%	Spraying	4%	Repair	3%
Planting	15%	Fertilization	3%	Stump removal	4%
Trimming	28%	Watering	3%	Miscellaneous	2%
Removals	24%				

Over 70 percent of all city tree care budgets are devoted to the three categories of planting, trimming, and removal, including stump removal. There are few differences of any magnitude across population and regional categories. Larger cities spend less for planting and removal and more for nursery care. Cities in the Northeast and North Central regions spend considerably more for removal, greatly influenced by Dutch elm disease, and less for trimming. Cities in the West spend much more for trimming (43%) and watering (9%), and much less for removal (10%) and planting (10%).

It has been estimated from returns that there are nearly 50,000,000 street trees in the United States based on the mean numbers of trees by population category and the total numbers of trees in the size categories. Details may be found in Kielbaso, Haston, and Pawl (1982). If these nearly 50,000,000 trees are conservatively valued at $300 each, then the standing resource would be $15 billion.

During the survey period, an urban forester from a southern state agency requested a copy of the survey form to use as a check list for evaluating city programs. In keeping with this concept, and in an attempt to evaluate programs using comparable scales, we have developed a series of 13 yes-no criteria and seven mumerical or percentage criteria. They are as follows:

Yes-No Criteria
Systematic management
Responsible for street trees
Aware of federal aid
Records kept
Records computerized
Official trees by block
Small tree trend
Maintain a nursery
City tree ordinance
Preservation ordinance
Monitor pests
Emergency plan in place
Participate in research

Numerical or Percent Criteria
Number of full time employees
Trees planted in 1981
Tree budget as percent of city budget
Dollar per tree budget
Percent response to budget per tree
Dollar per capita for tree care
Number of trees maintained per employee

The above criteria were compared using two different categorizations: (1) title of tree manager and (2) location of tree care unit within the organizational structure. The titles are rather standard, but there are 401 respondents classified as "other," which testifies to the great diversity of titles of those managing city trees. The organizational structure

was equally difficult to categorize; allowing for three levels of nine possibilities each, 198 different combinations of organizational structure were identified and then combined to produce 13 categories, including "other." Tables 3-6 present the data comparing the several criteria by the categories of title and organizational structure. A basic assumption is that each of the criteria in some way relates to the quality of a tree care program. Some people may argue that some of the chosen criteria are not appropriate, but it is believed that most would accept these criteria as appropriate. In Tables 3-6, where a criterion is exceeded by 10 percent, it is underlined once; where exceeded by 20 percent, it is underlined twice. This is followed only when meaningful. Also, it is reversed when considering trees per employee which should be a smaller number in order to demonstrate a higher level of management.

A review of Tables 3 and 4 reveals that, utilizing these criteria, the "Forester" (which includes "Arborist") title exceeds the average by at least 10 percent in 18 of 20 criteria. The "Forestry Foreman" title exceeds the average by at least 10 percent in 15 of 20 criteria. The "Consultant" category exceeds in 13 of 20 criteria. The Consultant category is, however, quite small in actual numbers of respondents, and therefore is not greatly emphasized. The "Department of Public Works Foreman" and "Landscape Architect" each exceed in 6 of 20 criteria.

The data in Tables 3 and 4 lead to the conclusion that, where exceeding the averages is a desirable goal, the Forester title is associated with the highest level of management. "Forestry Foreman" would be the next preferred title. "Public Works Foreman" and "Landscape Architect" would be next, although far less desirable.

It is not possible to draw a conclusion if the title somehow produces the positive criteria measures, or are a result of some other factor influencing the criteria.

In a similar way, Tables 5 and 6 present data relating the criteria to the urban tree management organization structure. When the management of trees is in a unit designated "Forestry" it exceeds the criteria by more than 10 percent in 18 of 20 criteria. When the management unit is either "Forestry within Parks" or "Trees within Parks," the criteria were similarly exceeded on 16 of 20 criteria and a "Landscape" unit exceeded 9 of 20 criteria.

Based on data from Tables 5 and 6, it may be concluded that for the care of trees, the highest level of management is attained in a "Forestry" unit. "Forestry within Parks" or "Trees within Parks" are the next most effective tree management units. "Trees within Public Works" and "Landscape" units follow in order.

Again, it is not possible to determine if these are cause or effect relationships. What is clear is that when the care of trees is concerned, a unit with the designation "Forestry" or "Trees" in its name will exceed other units in the management of trees.

The units that receive low ratings based on these criteria would be Department of Public Works, Streets Department, Parks Department (not further designated), Parks within Public Works, Streets within Department of Public Works and, surprisingly, Tree Commission. The former are not too hard to understand, since they are agencies whose main responsibility does not include trees; but the last was not expected. However, realizing that a tree commission is most likely made up of volunteer citizens formulating policy, but not likely to have jurisdiction over public employees, it is not so surprising that "Tree Commission" rates low on these mostly action-oriented criteria. That these volunteer citizens are not committed is not a question, but the scope of their responsibilities is not usually adequate to effect the most positive tree care program.

When considering tree manager titles, those least likely to rate high for tree management would include City Manager, City Engineer, and Department of Public Works Director, as well as Parks Director and Tree Warden. Based on their normal background, training, and experience, it is not unexpected that, for the former, trees would not rate high in their priorities. It seems a small surprise, though, in the case of the Parks Director whose normal responsibilities often include the care of trees and other plants. The low rating for a Tree Warden is also surprising, except that tree wardens often have very low salaries, suggesting that they are often volunteer positions and not likely funded as a unit manager for an action program.

In conclusion, it is not possible to derive an ideal tree management unit for a city, but it is possible to suggest some broad generalities. The tree care unit should somehow have the term "forestry" or "tree" associated with it. The title of the manager would most ideally be "forester" or "forestry foreman," or possibly consultant. For the greatest satisfaction of these tree care criteria, trees or forestry must be identified. This is not to say that any of the organizations or titles cannot perform at high levels, but rather that the likelihood based on 1,534 returned questionnaires is low.

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Kielbaso, J. J., G. Haston, D. Pawl. 1982. Municipal Tree Management in the U.S. 1980. Journal of Arboriculture 8(10): 253-257.

Table 1. Survey Response Rates and Cities with Systematic Tree Care by Population and Geographical Categories - 1980.

Classification	No. of cities surveyed (A)	Cities responding % of (A)	Cities with Systematic tree care programs % of responding cities
Total, all cities	2,861	54	50
Population group			
Over 1,000,000	6	83	60
500,000 - 1,000,000	18	72	62
250,000 - 499,999	34	79	67
100,000 - 249,999	105	77	65
50,000 - 99,999	258	66	65
25,000 - 49,999	590	58	55
10,000 - 24,999	1,484	50	45
5,000 - 9,999	166	39	28
2,500 - 4,999	200	45	36
Geographic region			
Northeast	843	46	47
North Central	834	60	52
South	729	49	40
West	455	68	63

Table 2. Average and Median Annual Expenditures in Dollars for Tree Care in Cities, By Population and Region; 1980.

Classification	PER CAPITA		PER TREE	
	Average	Median	Average	Median
Total all cities	2.19	1.28	10.78	6.28
Population group (thousands)				
over 1,000	1.42	.53	11.03	5.28
500 - 999	1.58	1.17	7.78	1.55
250 - 499	2.42	1.08	11.05	4.79
100 - 249	2.11	1.59	6.55	5.23
50 - 99	2.51	1.93	11.89	7.50
25 - 49	2.52	1.53	11.56	7.34
10 - 24	1.98	.85	11.23	4.62
5 - 9	1.59	.70	3.19	.10
2.5 - 4.9	2.09	1.06	11.17	1.50
Geographic region				
Northeast	1.31	.70	5.91	4.17
North Central	3.06	2.01	13.47	6.73
South	1.19	.57	8.07	2.15
West	2.66	1.86	10.84	7.68

Table 3. Urban Tree Manager Title as Related to Several Program Criteria.

	Systematic	Responsible	Aware of Aid	Records Kept	Computer Records	Official Tree	Small Trend	Nursery	Ordinance	Preserve Ordinance	Monitor Pests	Emergency Plan	Research
TREE MANAGER TITLE													
Forester (218)[1]	73	86	75	81	16	34	51	45	85	12	67	36	34
Forestry Foreman (54)	78	92	31	63	3	45	61	31	88	12	76	41	14
Park Director (263)	57	68	47	35	3	26	53	24	55	10	35	25	16
Tree Warden (80)	60	92	51	46	0	14	53	20	47	5	57	25	14
DPW Foreman (44)	64	88	28	49	4	38	60	21	61	17	41	29	7
Other (401)	56	72	32	46	10	32	56	21	64	14	42	29	15
City Mgr. (45)	47	59	28	16	9	13	55	7	45	17	23	34	8
LA (28)	53	81	52	54	9	31	44	24	67	18	45	32	26
City Engineer (34)	44	85	35	27	0	19	56	0	65	3	12	19	3
DPW Director (199)	44	82	70	18	7	19	51	10	46	9	23	30	9
Consultant (8)	75	89	67	44	50	50	56	50	75	13	56	14	38
OVERALL	58%	77%	43%	45%	9%	28%	54%	24%	62%	12%	43%	30%	1%

[1]Numbers in parentheses refer to number of respondents to first criterion, but not necessarily others.

Table 4. Urban Tree Manager Title as Related to Several Numerical Criteria

Tree Manager Title	Fulltime Employees FTE	No. Planted 1981*	% Tree Budget City Budget*	Dollar Tree*	Percent Response to Dollar/Tree	Dollar Capita*	Trees Employee
Forester (188)[1]	9.0	1258 /400	1.34 /.67	13.16 /8.19	34	3.56 /2.63	4,975
Forestry Foreman (49)	7.4	1034 /150	1.11 /.57	8.06 /5.62	24	2.84 /2.55	5,326
Park Dir. (209)	2.1	314 /150	.60 /.22	10.47 /5.40	16	1.82 / .75	7,360
Tree Warden (39)	2.6	100 / 60	.63 /.25	3.64 /3.33	06	1.47 / .91	16,617
DPW Foreman (32)	3.1	236 /100	1.22 /.57	4.36 /2.55	09	1.82 / .91	9,450
Other (278)	3.4	357 /175	.68 /.47	9.65 /5.88	23	2.16 /1.39	6,552
City Mgr. (21)	1.4	178 / 50	.53 /.19	1.71 / .10	04	1.81 / .68	8,696
L.A. (21)	2.6	969 /240	.27 /.22	6.21 / .61	18	1.21 / .73	15,916
City Engineer (23)	1.4	145 /100	.55 /.22		03	1.19 / .65	44,348
DPW Director (136)	1.5	357 /100	.59 /.25	17.91 /4.15	07	1.42 / .69	11,173
Consultant (4)	1.4	492 /450	.91 /.10	4.75 /2.50	50	3.04 / .48	16,569
Overall	3.3	574 /190	.81 /.40	10.78 /6.28	19	2.19 1.28	8,845

*Double column figures present average and median data: average/median

[1]Numbers in parentheses refer to number of respondents to first criterion, but not necessarily others.

Table 5. Urban Tree Management Organization as Related to Several Program Criteria

MANAGEMENT UNIT	Systematic	Responsible	Aware of Aid	Records Kept	Computer Records	Official Tree	Small Trend	Nursery	Ordinance	Preserve Ordinance	Monitor Pests	Emergency Plan	Research
DPW (220)[1]	60	88	39	38	5	28	55	17	67	14	42	32	13
Streets (33)	36	73	27	27	21	13	56	3	58	3	27	30	9
Parks (268)	56	65	41	40	4	34	56	27	54	9	39	23	18
Forestry (39)	77	95	68	67	19	41	57	37	79	8	76	39	30
Parks/DPW (59)	49	76	29	35	9	25	56	26	49	16	50	32	9
For/Parks (97)	75	90	74	88	18	27	52	48	93	7	64	35	32
For/DPW (79)	73	91	65	71	7	32	50	33	75	11	63	33	18
Tree Comm (38)	66	82	41	54	0	18	50	19	95	8	38	33	14
Street/DPW (31)	55	97	21	24	15	22	42	3	58	3	19	32	9
Tree/Parks (31)	65	83	60	77	4	40	75	47	77	17	66	45	36
Trees/DPW (33)	79	97	43	90	17	48	69	33	73	16	58	31	23
LA (15)	93	86	36	53	20	50	47	47	71	7	60	33	53
Other (72)	64	82	45	51	32	39	58	15	66	16	53	32	20
OVERALL	62%	81%	47%	51%	9%	31%	55%	26%	67%	11%	48%	31%	19%

[1]Numbers in parentheses refer to number of respondents to first criterion, but not necessarily others.

Table 6. Urban Tree Management Organization as Related to Several Numerical Criteria

Management Unit	Fulltime Employees FTE	No. Planted 1981*	% Tree Budget City Budget*	Dollar Tree*	Percent Response to Dollar/Tree	Dollar Capita*	Trees Employee
DPW (168)[1]	2.6	321 /120	.63 /.25	10.75 /4.50	19	1.87 /1.04	12,850
Streets (22)	1.7	310 / 80	.61 /.15	11.15 /11.43	15	1.23 / .35	24,725
Parks (225)	2.5	391 /190	.54 /.22	8.82 /5.22	16	1.63 / 76	7,429
Forestry (29)	10.5	1262 /200	1.67 /.78	29.84 /7.50	31	4.47 /2.51	3,380
Parks/DPW (54)	2.5	631 /100	.40 /.25	4.68 /3.33	14	1.55 / .53	5,317
For/Parks (97)	8.5	1343 /500	1.03 /.62	8.94 /6.28	46	3.43 /2.77	3,832
For/DPW (71)	4.5	461 /250	1.72 /.84	17.69 /9.86	32	4.04 /3.31	6,897
Tree Comm. (10)	2.3	111 / 90	.40 /.21	9.07 / .28	11	.67 / .48	n.a.
Street/DPW (29)	3.8	590 /100	.38 /.20	6.98 /5.18	19	1.59 /1.15	5,855
Trees/Parks (28)	8.0	954 /400	1.22 /.68	6.95 /5.35	35	3.42 /1.93	4,638
Trees/DPW (30)	10.8	927 /250	1.30 /.95	7.13 /6.11	48	3.33 /2.99	3,702
L.A. (13)	4.8	929 /200	.33 /.08	9.68 /6.46	27	1.49 /1.14	3,550
Other (51)	2.5	454 /100	.76 /.48	6.24 /4.05	26	1.87 /1.23	7,686
Overall	3.3	574 /190	.81 /.40	10.78 /6.28	28	2.19 /1.28	8,845

*Double column figures present average and median data: average/median

[1]Numbers in parentheses refer to number of respondents to first criterion, but not necessarily others.

SECOND NATIONAL URBAN FORESTRY CONFERENCE

SESSION K

FUNDING URBAN FORESTRY PROGRAMS

Wednesday, October 14, 1982
1:30-3:00 p.m.
and
3:15-4:30 p.m.

Moderator:

Roger Hoeksema
Michigan Department of Natural Resources
East Lansing, Michigan

Speakers:

John Rosenow National Arbor Day Foundation Lincoln, Nebraska	Community Funding Sources	309
Gene Ownings ARCO Los Angeles, California	What Givers Are Looking For	*
Marion Agnew McLean, Virginia	Planning Parkland Acquisition and Preservation as Part of the Urban Infrastructure	312
James Nighswonger Kansas State University Manhattan, Kansas	Urban-Community Forestry, Any Which Way You Can	317

*Paper not included.

COMMUNITY FUNDING SOURCES

John Rosenow
Executive Director
The National Arbor Day Foundation
Lincoln, Nebraska

ABSTRACT

Many cities, towns, and communities are finding new, innovative ways to fund their urban forestry programs. The attainment of Tree City USA status can aid these programs immensely. Those cities with professional, visible forestry programs are generally successful in acquiring appropriations from their city's general fund. Citizen involvement, through the media, increases public awareness and the success of the program. Some cities have special taxes earmarked for urban forestry programs. Civic groups can host fund-raising projects which can create proceeds for urban forestry. Community volunteer efforts and donations, if well publicized, can finance urban forestry programs in these times of tight budgets.

It's been said that gold is where you find it. I'll be talking about where Tree City USA communities have found the gold to fund their urban forestry programs.

For those of you who are not familiar with the program, Tree City USA is sponsored by the National Arbor Day Foundation in cooperation with the U.S. Forest Service, U.S. Conference of Mayors, the National League of Cities, and the National Association of State Foresters. The staffs of the State Foresters actually provide the direct assistance and technical expertise to communities.

To be named as a Tree City USA, a town or city must meet four standards. First, it must have a legally constituted tree board or department responsible for the management of the city's trees. The second standard is a community tree ordinance guiding the planting, care, and removal of trees on public property. Standard three is an active, comprehensive community forestry program supported by a minimum of $1 per capita. And finally, the community must have an Arbor Day proclamation and public commemorative tree planting each year. Communities complete the Tree City USA application which is then reviewed by the State Forester. If they meet the standards, the application is forwarded to the Foundation. If not, the State Forester's staff can assist the community in upgrading and strengthening their program.

The National Arbor Day Foundation produces the recognition materials which are presented by the Governor or State Forester to the winning communities. Tree Cities receive a flag, a walnut-mounted plaque, and signs to place at community entrances. To encourage continuing involvement in the program and continuing management, we provide maple leaf additions to the signs and the plaques for each year communities meet the standards. And a five-year award is presented to communities that have met the standards for that length of time. The Foundation promotes participation in the Tree City USA program, and support of urban forestry, through its Advertising Council-approved public service advertising, and through its other communications channels.

Since one of the standards is that $1 per capita be spent on community forestry, the Foundation is exposed to a number of funding schemes, some very basic and some quite innovative. Probably the most common funding source is a straight appropriation from the city's general fund. Some communities are successful in receiving several dollars per capita. The most successful cities are the ones that have highly professional, highly visible community forestry programs. These cities are generally successful at getting citizens and the media involved in and aware of their urban forestry efforts. The promotion of Arbor Day helps focus the media's attention on trees. The Tree City USA Award can give a local forestry program a tremendous boost. We've had a number of cities that barely met the standards the first year, but because of the interest in trees generated by the Tree City USA publicity, the funding and the magnitude of their programs increased dramatically.

A number of cities have special taxes which go for urban forestry. Ohio state law allows for a special annual assessment of property owners based on linnear foot of street frontage which can be assessed by cities to support urban forestry. Here in Cincinnati this tax has a potential of generating about half a million dollars annually for its urban forestry program.

The city charter in Lincoln, Nebraska allows for special taxing districts for street landscaping and improvements, including the planting and care of trees. The law states that businesses with over 50 percent of street footage in the proposed improvement district must approve the tax before it goes into effect. At this time the law is subject to a legal challenge of the voting formula for determining when a district is created.

Smaller communites, especially, have found unique ways to bring about citizen involvement and to raise funds for city trees. Many civic groups have special fund-raising projects for this purpose. Wise tree boards have project ideas on the shelf that can be implemented on short notice if a service club comes forth to volunteer.

Wheatridge, Colorado has had a program of cooperation between the Chamber of Commerce and the local nursery which donated 10 percent of the purchase price of nursery stock to the city. The city raised several hundred dollars in this way for the landscaping of a new park.

In Milford, Pennsylvania the Freebird Inn celebrated its first year in business with a gala presentation of big name country and bluegrass singers. The proceeds, over $500, were presented to the Milford Garden Club for the planting of street trees.

There are also a large number of ways to bring about improved tree planting and care without any money going to the city. The tree boards in a number of Kansas communities sponsor advertisements in local newspapers selling trees for street tree use to local residents. The tree board can insure that proper varieties are being planted and arrange for volume-price purchases through local nurseries. In many cases the tree board actually does the plantings as well.

The Broken Bow, Nebraska tree board has a similar program to accomplish its Forestry Plan, except that the tree board delivers the trees which are planted by the people or organizations purchasing them. It also brings about additional local involvement by having the advertisements sponsored by local merchants. Smaller communities in the Broken Bow area can also purchase trees at the same time. By the way, I see little evidence of cooperation between communities in urban forestry efforts, such as joint tree purchases. However, I suspect there would be many economies if they did.

Murray City, Utah saved thousands of dollars in tree-planting costs by having the high school football team plant street trees as a fund-raising project. The city bought a major piece of football equiment at a cost much less than it would have paid to hire the work done. So the football team had a public service project and helped its own cause. A local restaurant contributed lunch for the football players free of charge.

This sort of volunteer effort is certainly not restricted to small towns. Minneapolis has a sophisticated "Adopt a Tree" public relations program. When the city plants trees on the parkway of private homes, it attaches a tag to the doorknob of the house. The tag has the name of the tree, provides step-by-step instructions on how to take care of the new tree, and lists the forestry division's phone number in case the tree is not doing well. It also notes that "there will be no special tax levies against your property or your neighborhood for this new tree."

Some cities, such as Wooster, Ohio, have ordinances requiring that trees be planted within and around larger parking lots. Wooster law also requires trees to be planted when new homes are built or when residential buildings are altered. The nature of the required tree planting varies from a single family home to a larger apartment building.

Any time a tree board can get a citizen to spend a dollar, or put forth a dollar's worth of effort planting or caring for trees, that's the same as a dollar added to its urban forestry budget. Of course it's vital that this work is done properly and that it's part of a continuing, comprehensive, tree-care program. These Tree City USA's have found a number of places to find the gold for their urban forestry programs, and there are many approaches which I haven't mentioned. I have a listing of the city forestry contacts in each of these cities and would encourage any of you who are interested to obtain more details from them about the local problems and successes of these funding efforts.

One thing needs to be emphasized. The most creative taxing or funding approach will never work until there is citizen support for trees. Public relations efforts need to be aggressive and on-going. People need to be continually reminded of the value of trees and the importance of tree care. The public must be involved in tree-related decisions and dedications, and it must be listened to. Involvement of the media during special dedication ceremonies and special events such as Arbor Day celebration and Tree City USA presentations is vital. With hard work and creativity you can find the gold for the urban forestry program in your community.

PLANNED PARKLAND ACQUISITION AND PRESERVATION

Marian K. Agnew
McLean, Virginia

ABSTRACT

Urban development is creating severe pressures on existing community owned forested parkland, and de facto park use areas will soon disappear under concrete or buildings. In the future, additional land for forested parks will become increasingly difficult to obtain because of escalating costs and low local priorities. "Surplus" land (steep slopes, flood plains, wetlands), unused for building in the past and the major source of existing forested parkland, will probably become unavailable because modern engineering has made it usable for development. Two politically and fiscally acceptable ways to preserve and acquire parks are suggested here: special legislation authorizing issuance of bonds passed by referendum and amortized by a local service area; and setting aside forest, open space, and recreation areas as part of a land treatment sewage system to provide a low-cost means to remove wastewater nutrients and to provide a reliable water source at minimal cost to the community.

INTRODUCTION

Funding for parkland is always a problem. The 1977 Clean Water Act Amendments, S.1952 amending P.L.92-500, provided that "innovative alternative" (I/A) sewage treatment processes, such as land treatment, were eligible for a greater share of federal grants, 85 percent instead of 75 percent, until 1984. After 1984, if the legislation remains in place, the federal share for I/A will be reduced to 75 percent, while conventional treatment plant construction will be funded at only 55 percent. It seems reasonable that with proper planning, measured amounts of sewage could be effectively treated, both as to pollutant removal and to cost, by the soil filter under urban parks and recreation areas. Both streams and forests will benefit from properly recycled nutrients. Moreover, it is becoming clear from a succession of General Accounting Office reports that conventional sewage treatment is not removing enough nutrients from sewage plant discharges. Local communities will, therefore, either have to restrict capacity, invest in extremely expensive retrofit facilities which have dubious efficiency, or downgrade uses of receiving waters, so they can lower water quality standards.

Offered a cost effective and community enhancing alternative, such as golf courses, urban forests, or recreation areas, local officials could become highly interested in the land treatment I/A alternative as the solution to both problems; cleaning up streams by treating illegal sewage discharges and providing essential forested park and recreation facilities.

CASE EXAMPLES

BURLING PARK, VIRGINIA: A CONTROVERSIAL ACQUISITION

In the climate of the early 1970's, acquisition of park land by public referendum was possible. When developers purchased the 336 acre Burling tract, an oak hickory climax forest with holly understory, on the Potomac River, citizens moved quickly to have it

purchased by the Fairfax County Park Authority. This was already a very popular de facto park, used by thousands. It was the only public access to the river in that area. Local landowners also wanted it kept in open space in order to prevent townhouse cluster development in the area.

$1.5 million in matching funds was obtained from the U.S. Department of Interior's Land and Water Conservation Fund. After a great deal of public agitation and education, citizens in the surrounding area voted to tax themselves for the remaining cost of $1.5 million. Controversy created before the referendum continued after acquisition. The bonds were never sold. The County decided instead to pay the developers cash over a five year period. Therefore, tax bills were far higher than originally anticipated for some years. People were very angry. Yet, the park was a bargain. It is the only large park in the area. The Audubon Society holds its annual bird count there. Whether the acquisition effort could be duplicated today is questionable. Other alternatives may be more productive.

REID (RANDOLPH) PARK: A MUNICIPAL GOLF COURSE IN TUCSON, ARIZONA

By 1973, the City of Tucson faced two serious problems. Its main sewage treatment was overloaded and discharging pollutants into the groundwater, and its sewer mains in a developing part of the city were too small to allow proper conveyance to the plant. A less serious immediate problem to the City, but a more serious problem to the Chamber of Commerce, was the City's main golf course in Randolf Park. It was beginning to look scraggly because water price increases were beginning to curtail the budget.

The solution to both problems seemed to be to tap 1.5 million gallons per day of sewage off the main sewer line, treat it at a small facility with a storage lagoon, and plug the effluent into the golf course's spray system after chlorination. Facilities were built to conform to the park's architecture. The lagoon was groomed to look like another lake on the course, and the sprinkler system was connected. Today, Reid Park's golf course (the name was changed in 1980) is probably the finest in the Southwest. It also has one of the lowest budgets, and green fees are very reasonable.

Moreover, in that part of the city where development pressures could overwhelm that large tract at a later date, Reid Park is forever locked into the City's infrastructure as a necessary component. Developers know well that without sewage capacity and proper treatment, there can be no development. This model serves as a real-world example of a solution benefiting both natural adversaries in the land acquisition battle, the park proponents, and the developers.

THE LANDIS SEWAGE TREATMENT PLANT: A FOREST PRESERVE IN AN OLDER COMMUNITY

Vineland, New Jersey, is the model of an older community needing to upgrade its sewage treatment facilities. A brief description of the activities at Vineland carried out by the Landis Sewage Authority are outlined as follows:

> After developing a traditional sewage treatment plant plan, it was discovered that the energy costs to operate the new facility approached the annual operating budget of the Landis Sewerage Authority.
>
> An Amendment was sought, and a resource management or land treatment system viewing sewage as a resource to be managed and used was planned. The result was an integrated system that included the following:

Settleable solids are removed from the incoming sewage;

Solids go to an anaerobic digester to produce methane gas that powers an engine-generator producing electricity for sale;

Liquids go to rapid infiltration basins;

Filtered liquid with its dissolved nutrients is irrigated on cropland;

An intergovernmental agreement was worked out with the adjoining township in which a portion of the irrigated land is located;

Corn grown is used as feedstock for a still;

The waste heat from the engine-generator is used as an energy source for the still;

The waste slurry from the still is added to the anaerobic digestion system and increases gas production by 30 percent;

The brewer's mash is used as a cattle feed;

The alcohol produced is used as a fuel (cost-effective when produced from wastes);

Digested sludge is used to improve the soil;

Hay grown on periphery of the site is sold;

Clean water that filters through the cropland is returned to the waterways as a byproduct of a resource management system;

Overall, a stream of benefits--$1.2 million per year at today's prices--will be realized.

The traditional sewage treatment plant would not have produced any of the foregoing economic benefits. A cost-effectiveness analysis of the two systems showed the traditional system to cost 69 percent more than the positive approach to wastewater management that was used.

HAMILTON LAKES: ACCOMMODATING NEW GROWTH IN ILLINOIS

The Hamilton Lakes project in Itasca, Illinois, illustrates how new urban growth can be accommodated in a cost-effective, environmentally sound plan. A brief description follows:

The 274-acre site will ultimately accommodate 4.5 million square feet of commercial and office space, plus a luxury hotel (the hotel and two office buildings are now occupied);

Water-conserving plumbing is being used throughout the complex;

Five retention lakes have been developed on the site with the capacity to absorb runoff from a 100-year storm. They have a release rate of only 0.05 cfs/acre. Natural runoff from undeveloped land is estimated to be 0.15 cfs/acre;

Urban runoff is treated by overland flow to protect the quality of the lakes;

Two on-site wells provide the water supply;

Used water is collected, treated in two on-site aerated lagoons, filtered, disinfected, and used to irrigate and fertilize the lawns surrounding the buildings and lakes;

The purified water returns to the aquifier and lakes;

Solids are stored on the bottom of the lagoon where they anaerobically digest;

The irrigation mains and pumps, along with the five retention lakes, make up the fire control system for the entire complex;

The entire site is forested and landscaped to maximize its visual beauty.

The economics of this privately financed integrated system were shown to be cost-effective over a plan to expand existing equipment. In addition, time was critical. The program was planned, designed, constructed, and made operational in slightly more than three years. It is important to note that the economic advantages are dependent upon the synergism developed in the planning process. Thus, the Hamilton Lakes development has solved its water management problems.

GODLEY: RECYCLED WASTEWATER TO IRRIGATE CROPS IN TEXAS

Godley, Texas is an example of a small town having waste treatment problems. Godley has a population of 500. Its sewage treatment plant consists of an oxidation ditch followed by a lagoon discharging into a stream. The system did not meet standards. Thus, a planning grant was obtained and a $28,100 study undertaken. It proposed a $115,580 solution. Only 25 percent of these costs would be paid by Godley residents directly. These costs, however, would still be a burden to the community.

As an alternative, the Mayor and City Council took a bold approach. They developed a plan for an irrigation recycling system in cooperation with an adjoining farmer. The system was engineered for $1,500; total construction costs are estimated to be $33,500. Of the combined total, $13,000 will be paid by the town. The overall cost is only 20 percent more than the cost of the original study and less than a third of the cost of the earlier proposal. Moreover, the recycled nutrients will be used to produce crops. Savings in operating costs can finance the local share of this resource management approach. The recycling program will also help reduce operation and maintenance costs for local residents.

SUMMARY

Land treatment approaches can be used in a wide variety of ways to solve both land use and water quality problems. They can be initiated by foresters to create interesting urban forestry projects. Most, if not all, land treatment systems can be designed to use trees or shrubs as a major crop or landscape feature. Needless to say, the varieties of trees planted will depend on the amount of water passed through the soil filter.

It is clear that land for urban forests can be acquired to build parks, recreation areas, open space, and cropped forests into the urban infrastructure. In fact, unless state and local governments intend to lower water quality standards, thereby endangering water supplies and denying citizens the use of streams and lakes for water contact recreation,

land treatment will have to be used to treat excessive pollutant discharges from malfunctioning conventional sewage treatment plants. Uptake into a living root system is the only feasible method currently known to remove nearly all nutrients effectively and economically.

Where and how do you start? First, from your local sanitation authority, learn about problems in the sewage treatment plant. Each plant operator must report performance and violations of permitted effluent limitations to EPA. The reports are public records.

Second, write the U.S. General Accounting Office, Document Handling and Information Services Facility, P.O. Box 6015, Gaithersburg, MD 20760, and ask for Report No. CED-81-9, November 14, 1980, "Costly Wastewater Treatment Plants Fail to Perform as Expected." GAO will send you five free copies. This report lays out the costly failures of conventional sewage treatment plants all over the country and suggests that nutrient removal should not be required because it is not cost-effective. What the report does not say is that the valuable nutrients discharged as pollutants, which do so much damage to aquatic ecosystems, are really resources to be used within forested lands to the advantage of the community.

Third, suggest to local planners that an I/A forested alternative might be the best and most cost-effective solution to the sewage problem, creating urban parkland, recreation space, and open space as well. Either you or your local sanitary engineer can find out how much money is available for I/A to your state from EPA.

Fourth, note that every well-designed system must incorporate the following principles:

1. The amount of forested open space, parkland, and recreational area planned within a community to be used for recycling must be determined by a ratio between numbers of people and the amount of land needed to redistribute and recycle wastes, so they do not migrate and contaminate other communities or overload the system.

2. Pollutants are economic resources that are misplaced.

3. Pollutants must be carefully controlled so that they do not migrate.

4. Proper resource management, recycling water and pollutants and reusing chemical energy in a synergistic way, is a net economic benefit to the community.

When planners, elected officials, and citizens have been convinced that a forested land treatment system will be the best solution to both sewage treatment problems and community park and open space deficits, encourage them to choose an engineering firm to design the system. My experience convinces me that most sanitary engineering companies simply do not have the expertise in hydrology, soils, plant vegetation, and general landscape design that is needed.

There are, however, several firms which have developed their staff to design systems in a holistic way to produce synergistic benefits. To insure that your community benefits from the most attractive, cost effective, and useful system, investigate the resources of the firms asked to bid, interview potential project managers to determine the extent of their creative ideas, and finally, visit projects they have built and talk with community leaders about the process and the product.

URBAN-COMMUNITY FORESTRY, ANY WHICH WAY YOU CAN

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ABSTRACT

With substantial investments in trees, it becomes imperative that urban forests be managed to protect those investments and to enhance their values to the public. The challenge is how to accomplish needed management in times of budget cuts and program reductions. The urban forest manager must rely on volunteer efforts to accomplish needed goals. This paper suggests how a successful volunteer program operates in a rural Kansas town and outlines the ingredients for success in any program that relies on volunteer organization. A list of a number of successful concepts from which any community may draw ideas is included.

Kansas's community forests represent 1,150,000 acres in which 1,600,000 people live and work. Thus, our urban, or community forests, as we prefer to call them, improve the quality of life for over two thirds of our state's population. Statewide, our community forests are valued at over $963 million, or $1.5 million for the average Kansas town.

With this kind of investment in trees, coupled with the benefits they provide to so many people, it is imperative that our community forests be managed to protect and enhance their values. This need for management does not diminish just because budgets are being cut or priorities are increasingly directed toward areas other than tree care.

The challenge, then, is not how to reduce Community Forestry programs in Kansas but rather how to find new and innovative ways of getting them accomplished.

Many approaches are being tried--some involve new revenue sources, but others, especially in small communities, involve innovation in working with people. In this short paper, I will report on one or two successful approaches we're using in Kansas and follow up with a list outlining several other approaches.

At first, an urban or community forest manager might correlate pending or actual budget cuts with program cuts or reductions in services provided. But in reality such cuts in operating funds, if not too severe, may actually benefit the program. With less money, the manager must look for ways to involve the people who will benefit most from the program--the local citizens or neighborhoods.

For example, in Hays, Kansas, a town with a population of 17,500 and a community forest value in excess of $5,740,000, a residential area tree planting program operates where the city pays half and the benefited neighborhood pays half of the tree purchase cost. Here is how it works:

Step 1: Conduct Neighborhood Meeting

(1) Organize and select a committee to represent the neighborhood, and elect a spokesperson.

(2) An extension forester/tree board representative presents information as to recommended species, design principles, tree care, and city ordinances.

(3) Exchange ideas: what the potential is, what needs to be done, and how it can be accomplished.

Step 2: Plan Preparation

(1) Extension forester prepares conceptual planting design for area to be developed.

Step 3: Conduct Second Neighborhood Meeting

(1) Present plan for approval or revision as necessary.

Step 4: Let Bids--Stake Tree Locations

(1) Invite nurseries to bid on plant materials. Stake specific locations for trees with committee--visit with individuals on whose properties trees will be located.

Step 5: Award Contract and Select Planting Date

(1) Notify nursery of contract award.

(2) Arrange for pick up or delivery of plants.

(3) Determine planting date--notify neighborhood.

Step 6: Planting Day

(1) Organize neighborhood volunteers into teams.

(2) Conduct training session on planting.

(3) Teams plant, irrigate and stake trees, supervised by tree board members and Extension forester.

Step 7: Send Mailer on Tree Care

(1) Send instructions to property owners on how to care for their new trees.

This approach can be modified in any number of ways, but the more of these steps you include, the greater your program success will be. While the Hays, Kansas approach seems to embody most of the desirable characteristics of a good tree-planting program, a similar procedure will prove successful in any community forestry operation you may need to accomplish, such as tree removal, tree inventories, pest control, or wastewood utilization.

Organization, not money, is the key to success. When funds are limited or non-existent, your ability to organize, motivate people, and be creative will determine whether or not you get the job done.

A SUCCESSFUL COMMUNITY FORESTRY PROGRAM--

In any approach you develop, certain standards must be met. A successful forestry program:

(1) Is Cost Effective--monies available for tree programs can go much further when matched by local neighborhood dollars and supplemented by volunteer labor.

(2) Involves People--involve those who will benefit from the program. They have a role to play throughout the process. It is their program, and property owners should have a say in what is planted and where it's located.

(3) Provides Incentives--cities support via: matching funds; community involvement; and "outside interest" (extension forester, local tree board).

(4) Requires Personal Investment--each property owner has a monetary investment in the project and an investment in labor. He or she will appreciate their trees and will be inclined to follow through with after-planting maintenance.

(5) Stimulates Pride in a Community.

(6) Allows for Good Planning--provides for an organized operation. Allows for professional planning regarding tree species and location. Results are professional, and mistakes are avoided.

(7) Is Educational--provides a "hands-on" educational experience for homeowners in community organization, tree selection, planting design objectives, planting techniques, and proper tree care.

The material that follows outlines additional ways to accomplish community forestry programs with limited funds. In any approach, however, the key to success will be to include as many of the principles I've presented as possible.

URBAN FORESTRY FUNDING ALTERNATIVES

Most Kansas urban or community forestry programs are operated in one of two ways:

(1) The town or city assumes full responsibility for the program and all of its parts, including inventories, tree removal, planting, pruning-repair, and wastewood utilization.

(2) The program is operated by a tree board or commission usually appointed by the mayor or city manager. This "citizens group" may have only an advisory role to the city government or may be given partial or full responsibility for program operation.

Method (1) above is often employed by larger cities and metropolitan areas, while (2) is the most frequent method used by smaller towns and communities.

General tax revenues that finance urban forestry programs in cities are only occasionally available to fund programs in small communities. Thus, other methods of producing revenue must be found. Even then, funds are usually limited, and successful community forestry programs rely heavily on "volunteer" people that have an interest in community forestry.

The following examples illustrate several successful methods of accomplishing community forestry activities without general tax revenues.

PAGANICA INC.--A 527 HOMESITE DEVELOPMENT, HUTCHINSON, KANSAS

This new residential development has published a homeowner's guide book prepared by an area extension forester that deals with such subjects as: protecting native trees during home construction, landscape planning, "urban" wildlife attraction, selection and use of trees/shrubs, and extensive guide-lines on maintenance of the community forest to enhance property values and climate modification. Each lot owner receives a copy of the guide book at the time a building permit is issued. Thus, he has pertinent information to guide decisions and protect his investment in native vegetation throughout the home construction process and afterward.

The homeowners' association is in regular contact with the area forester who provides specialized information at association meetings and through individual visits to property owners.

SOUTHWEST HOMEOWNERS ASSOCIATION, HUTCHINSON, KANSAS

This residential community has a big investment in large American elms subject to Dutch elm disease infestation. The residents organized a "team" of association homeowners who received training in chemical injection for DED prevention and control. They "assess themselves" for the purchase of injection equipment and chemicals, with each homeowner being charged for the chemicals necessary to treat his trees and a pro-rated portion of the injection equipment cost. The "injection team" provides their services free of charge.

ESTABLISH A FRONT-FOOT TAX ASSESSMENT--

The community assesses each property owner (residential, commercial, or industrial) a set fee such as 5¢ per foot of street frontage, annually, for tree planting and/or maintenance.

BENEFIT DISTRICT ASSESSMENT--

Neighborhood groups, block groups, or homeowners' associations establish a "benefit district" where a self-imposed tax for the purpose of tree planting, maintenance, removal, etc. is levied.

WASTEWOOD PRODUCT SALES--

Instead of burying dead trees in the landfill, turn them into income producers by converting to wood chips, fuelwood, and sawlogs. Stump grindings are also excellent as a soil amendment or compost material. You will find a ready market for one or more of these "by-products" in your community.

BUILDING PERMIT ASSESSMENT--

An ordinance provides a set aside of $25 from each building permit issued for new residences to be applied toward a street tree planted in front of the new building after the owner moves in. If the owner prefers not to have the tree, it is planted in a city park.

TREE TRUST--

Establish a non-profit organization that solicits funds for a Trust by encouraging residents to donate the cost of purchasing a tree in honor of special occasions such as birthdays, anniversaries, memorials, and holidays. Also seek donations from corporations, local businesses, and other institutions. Funds obtained can be used for planting and maintenance.

CIVIC AND SERVICE ORGANIZATION PROJECTS--

Tree-planting projects can be successfully accomplished by Rotary, Lions, Kiwanis, and other similar service clubs, especially when handled as a one-day special project and given proper guidance. Tree maintenance does not lend itself to a "one-time" approach and should not be encouraged as a civic or service group project.

SOLICIT DONATIONS TO BEGIN PROGRAM

Successful examples include:

--a tree survey financed by a Chamber of Commerce contribution of $500,

--a public information brochure concerning a town's inventory findings and management needs published by a local power and light company. The brochure was distributed by the water department, and a second printing was financed by a county chapter of the Izaak Walton League of America.

ESTABLISH A "NEIGHBORHOOD INITIATIVE" PROGRAM--

Neighborhoods compete for limited public funds with competitive project proposals and private dollars to match public monies.

ESTABLISH "ADOPT A BLOCK" OR "ADOPT A PARK" PROGRAM--

A specific area is adopted by a civic or service organization, corporation, business, or volunteer sector, which receives promotional and intrinsic rewards for its support. Its contribution may be in money, donated labor, or both.

FOREST PRODUCT SALES FROM A TOTAL COMMUNITY FOREST MANAGEMENT PROGRAM--

Kansas is considering program development to manage the total forestry resource of a community, i.e., all of the publicly owned forest land, including parks, recreation areas, street side property, drainage and watershed lands, plus other public lands whether improved or not for the income-producing forest resources available thereon. We are looking at management of native stands of walnut, oak, hackberry, cottonwood, ash, and other hardwoods as a timber resource plus the installation of plantations of walnut, Christmas trees, and fuelwood species on suitable public lands.

The concept of community forest land management to produce income, while maintaining the more traditional recreational and aesthetic values, should be popular with city administrations.

This concept will place a new and different emphasis on the value of community forests. It should generate more support for good community forest management and provide a new revenue source for cities and towns.

SECOND NATIONAL URBAN FORESTRY CONFERENCE

SESSION L

WHERE TO GO FOR INFORMATION AND TRAINING

Wednesday, October 14, 1982
1:30-3:00 p.m.
and
3:15-4:30 p.m.

Moderator:

Robert B. Redett
Ohio Department of Natural Resources
Columbus, Ohio

Speakers:

Gary Nugent Cooperative Extension Service Ohio State University Columbus, Ohio	Public Information	*
Greg McPherson Utah State University Logan, Utah	A Community Forestry Manual and Case Study	325
Richard Abbott Davey Tree Expert Company Kent, Ohio	Practitioner Education	*
Robert Dewers Texas A&M University College Station, Texas	Urban Forestry in Undergraduate Education	334

*Paper not included.

A COMMUNITY FORESTRY MANUAL AND CASE STUDY

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ABSTRACT

This paper describes how ideas regarding community forestry planning and management were field tested in a case study community. A needs assessment was conducted to provide a focus for the technology transfer package. The proposed planning process was then formulated and implemented. The results were a city tree ordinance, Arbor Day planting, and application for Tree City U.S.A., which demonstrates that planning and technology transfer are bearing fruit in one local study area.

BACKGROUND

In Utah and Southern Idaho only a few communities have a population greater than 30,000. Most communities are small, rural, and separated by long distances. Community forestry, rather than the more popular term "urban forestry," would best describe tree planting and maintenance activities in this region. The following definition of community forestry from Gallaher (1981) was used for this project, "the planning, design and management of vegetation on public lands in and around communities to maximize their visual, social, economic, and environmental contributions to the well-being of the community."

Planting trees in cities and towns in the Intermountain West is a tradition that began with the first Mormon pioneers. Unfortunately, in recent years, old age, neglect, and thoughtless tree removal have taken their toll. Community forests are declining. Westerners have forgotten that forests in this part of the West were created, not found. These forests must be managed if succeeding generations are to enjoy their benefits.

The interest in community forestry in most Western communities occurs at the local level. Shade Tree and Beautification Committees are responsible for maintenance and renewal of the community forest. Most members of these volunteer organizations have little training in tree care, planting, or design. Although technical assistance is available through various state and federal programs, relatively few communities request information and assistance. As a result, many community forests are in jeopardy.

OBJECTIVES

Five research objectives were identified as follows: (1) Assess the need for regionally specific information to help promote and guide community forestry programs; (2) Define a community forestry planning process that provides a logical sequence of actions for lay shade tree commissions; (3) If need is shown, design an information transfer package to meet the needs of shade tree commissions in this region; (4) Test the effectiveness of this information package by applying it to a local case study community; and (5) Evaluate its effectiveness.

RESEARCH DESIGN

Research was conducted by a team of faculty and graduate students from the Landscape Architecture and Environmental Planning Department at Utah State University, and guided by an Advisory Board consisting of state foresters from Utah and Idaho, two city foresters, and a community forestry management specialist from the U.S. Forest Service.

The phases of project development were:

Phase One--Assess the need for a technology transfer product.

Phase Two--Develop and document a community forestry planning process.

Begin work on the technology transfer package if warranted.

Phase Three--Initiate the case study based upon work completed in Phase Two. Integrate lessons learned from the case study into the final technology transfer product.

METHODS AND RESULTS

NEEDS ASSESSMENT

A process was developed to assess state, federal, and local needs for information to guide and direct community forestry programs. The research team also decided to assess the status of community forestry in the Intermountain Region. The process included the following procedures:

1) Field investigations were conducted in communities with active community forestry programs.

2) Questionnaires were sent to 25 selected community foresters in Utah, Idaho, and adjacent states.

3) Requests for information were sent to extension foresters in all 50 states.

4) An extensive literature review was conducted.

5) Three working sessions involving the research team and advisory board were held.

Field observations were compiled, and questionnaires were analyzed. Community forestry information received from throughout the country was evaluated. An extensive bibliography covering all aspects of community and urban forestry was developed. Analysis of these data resulted in the following conclusions:

1) Only 1 percent of the cities and towns in the region have professional foresters employed on their staffs.

2) Both Utah and Idaho have excellent Community Forestry Assistance Programs administered through state and federal agencies; however, only 10 percent of the cities and towns in both states have active programs.

3) The reasons most commonly cited for not having a community forestry program were tight budgets, lack of support from elected officials, and poor educational and promotional efforts.

4) The key behind every successful community forestry program was an active committee of local citizens.

5) Shade tree commission members expressed a need for sound, comprehensive, understandable, and readily accessible information on the subject of community forestry.

6) State, community, and extension foresters throughout the region expressed a strong desire for a publication that would integrate existing information and relate it to conditions in the region.

7) A wealth of information on the subject of community and urban forestry is scattered throughout numerous publications, periodicals and books. Much of the information is highly technical and difficult for members of lay tree boards to assimilate or use.

8) With the notable exceptions of Arnold (1980) and Beatty (1977), there is little information about visual and spatial design of the community forest, nor is there much information about the potential relationship between the physical pattern of the community and the community forest.

9) Not a single reference attempted to organize all the various elements of a community forest program into a logical process for establishing and maintaining a program.

The research team and advisory board found that there was a significant need for current and comprehensive information describing techniques for planning and managing the community forest. This need was sufficient to warrant moving into Phase Two of the project.

COMMUNITY FORESTRY PLANNING PROCESS

The absence of any published urban or community forestry planning process required innovation from the research team. The goal of the proposed planning process was to integrate all aspects of community forestry that are essential to a successful program into a logical sequence. A community could then enter the process at the point most appropriate to its situation and follow the process through its course. Although the basic components of the process do not differ significantly from other problem solving situations, certain elements are unique and will be described in greater detail later in this paper.

The purpose of each process component is as follows:

Foundation building. The purpose of foundation building is to provide a long term organizational framework to support and direct community forestry efforts. Program success and continuation is largely dependent upon effective foundation building.

Data collection. The collection of information concerning the community forest and community pattern is essential to the subsequent development of planting and management guidelines.

Analysis and evaluation. Collected data is analyzed and evaluated to provide recommendations for future tree planting, maintenance, and removal. These guidelines should reflect decisions made during foundation building, such as program goals and objectives, as well as the data collected.

Implementation. Program success is usually contingent upon implementation of established guidelines and regulations. The frequent consequence of expedient implementation is creation of a broader base of support for a program.

Numerous feedback loops result in a dynamic process wherein new information is periodically generated and used to keep the entire system in balance with constantly changing conditions. In this manner, a program can adapt and evolve to meet the challenges of the future successfully.

INFORMATION TRANSFER PACKAGE

After the needs assessment study, the research team and advisory board decided that a Community Forestry Manual was needed to help guide and promote community forestry in the region. Follow-up materials such as slide-tapes and annual workshops also seemed necessary.

It was apparent that if the publication was to succeed, it would have to be comprehensive. The Manual had to contain information relevant to local municipal officials as well as to city foresters and arborists, since both play important roles in planning and managing the community forest. Written and graphic materials also had to be easily understood by the layman. Also, technical information had to be accurate and current to meet the needs of professional foresters.

Organization of the eleven chapters in the Manual parallels that of the community forestry planning process just described. The last chapter is a case study that gives an overview of the entire process--from foundation building to implementation--for the hypothetical community of "Sagebrush." The Appendix includes sources of technical assistance, lists of tree species tolerant of different types of environmental stresses, tree inventory instructions and tally sheets, and a sample municipal ordinance and permit.

Each chapter of the Manual is separated by a tab containing the chapter title and an outline for easy access. The pages and tabs are contained in a ring binder so that supplemental materials can be appended as they become available.

Distribution of the Manual will begin in the Fall of 1982. Copies containing cover letters from state forestry directors will be hand-delivered to the mayors of approximately 300 cities and towns in Utah and Idaho by state, federal, and extension foresters. Utah State University Extension Services will sell the remaining copies at cost.

CASE STUDY

In the Fall of 1981, the city council of Wellsville, Utah asked the Department of Landscape Architecture and Environmental Planning for assistance in developing a tree improvement program and preparing plans for the town square and nearby recreational complex.

Wellsville (population 1,800) is a rural community 15 miles south of Logan, Utah. It has a historical ambience that reflects the imprint of early Mormon settlers on the landscape. Like most communities in the region, the community forest consists primarily of mature

or senescent trees planted 50-100 years ago. Management of the forest resource has occurred only when a crisis situation has required action. In terms of demographic and political structure, Wellsville also typifies the small rural Mormon community. For these reasons, and because of their willingness to participate, Wellsville was selected as the case study community.

Prior to involvement of the research team, Wellsville had a twelve member Beautification Committee. This Committee's responsibility was to organize the "spring clean-up." Although they had no previous experience with community forestry, they agreed to work in the test application of the concepts contained in the Manual. A draft copy was provided by the research team as a working reference. It was decided that research team members would attend Beautification Committee meetings to provide technical assistance, but the team's primary role was to evaluate how effective the planning process and Manual were was a technology transfer package. Since space will not permit a complete description of the case study only, those aspects of the community forestry planning process which represent innovative contributions to the current body of knowledge will be highlighted.

Foundation building. Responsibility for community forestry planning and management became that of the Beautification Committee, and their title was subsequently changed to Shade Tree and Beautification Commission. Two program goals were established: (1) Develop a Community Forest Plan; and (2) Receive a recognition as a Tree City USA.

Data collection. Data collection consisted of completion of a community survey, computerization of a previously conducted tree inventory, and development of a community pattern inventory.

Questions concerning the community forest were included in a survey that was designed to provide local officials with information on the public's perception of their community. Results indicated that the majority of residents wanted more trees on city property. In addition, 74 percent of those responding indicated a willingness to contribute $1 per capita annually to support the beautification of Wellsville.

Data from a 1980 tree inventory were modified and coded into a computer program developed by the research team for the Manual. This work was done by the research team.

The Commission members also conducted a community pattern inventory. The purpose of this inventory was to identify significant landscape features that contribute to the overall character or personality of the community. Once these features were recognized, future plantings could be designed to enhance the visual and spatial qualities important to community attractiveness. A second purpose of the pattern inventory was to identify physical factors that pose constraints to, or opportunities for, tree planting. Every community spends large amounts of money to reduce conflicts between trees and power lines, and to repair sidewalks and curbs damaged by trees. If constraints to tree selection and location such as these are identified prior to planting, significant savings may result through judicious plantings of appropriate tree species. Opportunities for developing planting patterns that differ from the traditional linear arrangements may also exist. Identification of where these opportunities occur may result in plantings that have greater visual and ecological diversity. The premise upon which the community pattern inventory is based is one that many urban foresters have neglected; the visual and spatial quality of any community is primarily a result of its trees.

Commission members in Wellsville began the Community Pattern Inventory by describing the landscape character around their town. Significant elements that were noted include: (1) the Wellsville Mountains to the west; (2) the geometric agricultural fields leading from the edges of town up and into the mountains; and (3) the heavily wooded riparian corridors winding through town that were seen as important links between the mountains and valley bottom.

The group then broke into three teams. Each team began mapping community pattern elements on town base maps. All the teams were in one room, to facilitate easy interchange.

On the first map, all significant visual, social, and cultural landscape features in Wellsville were shown. These included special places and spaces such as churches, schools, parks and historical buildings. Existing tree masses and distinctive tree species and groves were located. Also mapped were the locations of significant topographical features (steep slopes and water bodies) as well as desirable and undesirable views.

Streets dominate the visual quality of most Great Basin communities. They set the pattern and scale and are the corridors from which the community is perceived. The street pattern in Wellsville was recorded on a second map. Major streets, the widest and most heavily travelled, were identified and graphically differentiated from minor streets and unimproved roads. Areas where the street pattern varied from the traditional grid to curvilinear alignments typical of new subdivisions were noted. Above and below ground utility lines, planting strip width, and available planting areas were also recorded on this map because of the limitations and opportunities they present for tree planting.

The third team prepared a land use map of Wellsville using traditional land use categories. In small communities, such as Wellsville, juxtaposition of land uses has a significant impact on community pattern. Architectural scale, materials, setback, spacing, and pedestrian and vehicular use patterns vary with land use. Each of these characteristics of land use affects tree planting opportunities, potential planting arrangements, and species selection. Therefore, such characteristics need to be carefully analyzed.

Completing the Community Pattern Inventory was an easy task for Commission members; small town residents know their town intimately. Each map was field checked for errors. The three maps were then combined to create one composite map. The Community Pattern Composite map identified the Wellsville community pattern as well as opportunities and contraints to tree planting. The Composite map, along with the landscape character report, became the base material used by Commission members in preparing the Wellsville Forest Plan.

Data analysis and evaluation. Analysis and evaluation of collected data resulted in a Community Forest Plan Report. The report contained the Wellsville Forest Plan map and also documented decision criteria used to create the map, program goals and objectives, and program priorities.

The purpose of a Community Forest Plan map is to provide guidelines for future planting. In so doing, communities may reduce tree care costs and enhance community attractiveness. Planting guidelines embodied in a forest plan map are shown as various tree-type categories for planting sites throughout the community. Each tree-type category defines the desired planting pattern (formal, informal, or mixed) and tree size (large, medium, small, or combination). A list of tree species that meet these criteria for each tree-type category is included in the map's legend or in the report. For example, a Formal large tree-type category requires that planted tree species have a mature height

greater than 40' (large), and be positioned in a linear fashion with approximately equal spacing between each tree (formal). A list of tree species for this tree-type category may include Red Maple, Green Ash, London Plane Tree, Littleleaf Linden, etc. Thus, the forest plan map provides guidelines which assure that a high degree of visual and spatial unification will result from new plantings. At the same time, it facilitates individual expression through tree selection within the established guidelines. Ideally, the homeowner or forester will select tree species from the tree list based upon a careful evaluation of the growing conditions in the planting strip as well as other plant attributes. Forest plans that specify exactly which species will be planted on each city street deny the homeowner this freedom and, since growing conditions can vary dramatically along the same street, may result in the use of a tree species that is not well adapted to its specific site conditions.

The Wellsville Shade Tree and Beautification Commission began preparing a series of design studies by placing tracing paper over the Community Pattern Composite. With assistance from the Manual and research team, these studies were compared and resolved into a final Community Forest Plan map. A brief explanation of the four tree-type categories used in the final plan follows.

Formal planting pattern--large trees were proposed for use around the town square and adjacent north and south blocks. The trees will reflect the importance of this central area, which is the hub of Wellsville. This category was also suggested for use along both sides of the major street entering town.

Formal planting pattern--medium trees were primarily used as transitions between large and small sized tree-types, particularly at intersections. They were also proposed for use along minor streets without overhead wires.

Formal planting pattern--small trees were suggested along streets with overhead wires and narrow planting strips. They were also designated along both sides of major streets, if wires were present, to maintain a formal appearance. If wires were present on only one side of the street, they were used under these wires and opposite medium sized trees.

Informal planting pattern--mixed trees were proposed along riparian corridors as a transition to pasturelands at the edges of town, and for the interior of the town square and community park.

Tree species were selected for each tree-type category. Trees selected were hardy in Wellsville, relatively free of insect and disease problems, tolerant to the general growing conditions and low in maintenance requirements.

The Community Forest Report served a dual purpose of describing the Community Forest Plan map and promoting the program. The report was laid out in a six page tabloid format by the research team. The Wellsville Youth Council hand delivered a copy to every household. The tabloid was very successful in providing information about local community forestry efforts and generating interest in the upcoming Arbor Day planting and clean-up.

Implementation. Prior to completion of the Forest Plan Report, the research team and Commission developed a tree ordinance for Wellsville. Because of the conservative, anti-regulation nature of Wellsville politics, the ordinance had to carefully balance the level of regulation it required with a pragmatic concern for enforcement. Since Wellsville did not have a city forester, enforcement of the ordinance rested with the Commission. With this fact in mind, the Commission decided to regulate only tree planting (to be done as per the

Forest Plan) and tree removal from public property (through a permit system). The most controversial section required developers to purchase and plant new trees in the public right-of-way in accordance with the Forest Plan. The ordinance was initially tabled by the City Council. However, strong public pressure and the support of the Mayor lead to the passage of the ordinance two weeks later. Since the effectiveness of the ordinance would depend largely upon voluntary compliance, it was necessary that the citizens know of its existence. A copy of the tree ordinance was printed on the last page of the tabloid, which was then distributed to every home in the city.

Both the Commission and the research team were gratified with the passage of the ordinance but felt that it was necessary to "get something in the ground" if public support was to remain behind the program. The Commission decided that the two areas needing immediate attention were the town square and a nearby recreational area. Both sites were noted as significant places in the Community Pattern Inventory and were highly visible to residents. Plans were laid for an Arbor Day planting and clean-up.

A site analysis was conducted for each area. The visual and spatial character of each site were assessed. Physical and biological factors such as soils, slopes, utilities, and microclimate were mapped. Needs for screening, climate control, noise abatement, and other functional concerns were noted. Using design guidelines outlined in the Manual, a planting plan and schedule were prepared. Forty trees were ordered from local nurseries.

The day before Arbor Day, seven large, diseased and physically damaged trees were removed from the town square. At the same time, the new plants arrived. All the trees were inspected using criteria specified in the Manual. Stakes were driven into the ground to show where each tree was to be planted.

Over fifty residents turned out to help with the Arbor Day activities. At noon, the Mayor conducted a commemorative tree planting, and the area forester explained the history of Arbor Day. All the trees were planted, watered, and staked. At the conclusion of planting, the Mayor signed and submitted Wellsville's application for Tree City U.S.A. The Commission was proud of the fact that they had met both of their original program goals and, in just nine months, gone from a town without a program to a community whose program would be recognized by the National Urban and Community Forestry Leaders Council as a model for other cities and towns in the Intermountain area.

CONCLUSION

The Wellsville case study proved to be an instructive test of the community forestry planning process and technology transfer package as a whole. Evaluation of the case study led to modifications of the Manual. For example, in the original draft of the Manual, three instead of two criteria were used to create the community forest plan map. Three types of tree character (formal, semi-formal, and informal) were used in addition to planting pattern and tree size criteria. The reason for inclusion of tree character stems from its importance as a visual feature that can either accentuate or detract from the desired visual/spatial effect. Trees of informal character arranged in a formal planting pattern is an example of how tree character may be incorrectly used and as a result, detract from the desired effect. In Wellsville, it quickly became apparent that tree character would have to be eliminated because of the confusion it created among Commission members. It was necessary to sacrifice this criteria to insure that the process would be simple enough for non-designers to implement correctly.

Evaluation of the Manual's effectiveness will continue as its recommendations are applied by communities in the region and evaluated by other experts in the field. A series of

Appendices are planned to expand upon portions of the Manual in response to post-publication evaluations. Although our evaluations to date are based upon only one case study, several preliminary conclusions can be made.

1) There is a definite need for comprehensive, regionally-specific information about community forestry in Utah and Southern Idaho. The results obtained in the Wellsville case study would have been more difficult to achieve without the aid of the Manual.

2) The various elements that constitute a community forestry program can be organized into a planning process that is understandable and useful to lay tree advisory groups.

3) The community forestry planning process, as outlined in the Manual, introduces efficiencies that reduce the time commitment of shade tree commission members and, in the long run, reduce total cost for the program through proper planning.

4) Organizing a community forestry program and preparing a tree inventory, community pattern inventory, forest plan, and tree ordinance is not beyond the capability of lay people serving on shade tree commissions if those people are provided with "how to" information and some technical assistance.

5) Community forestry must be promoted on the basis of the total spectrum of benefits it can provide to the community if it is to be supported by elected officials. Several of the promotional ideas outlined in the Manual, such as the tabloid report, proved to be highly successful in gaining support for the program in Wellsville.

The Community Forestry Manual provides municipal officials and federal, state, and local community forestry specialists with a valuable tool for promoting stewardship of a most important resource--our community forests.

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URBAN FORESTRY IN UNDERGRADUATE EDUCATION

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ABSTRACT

Curriculum selection preparing students for careers in urban forestry includes arboriculture and urban forestry as required forestry courses. Ornamental horticulture, park administration, and urban planning are required. As electives, this leads to a "major" in forest management with a "minor" in urban forestry.

Since 1973, only a few students have selected the urban forestry option even though jobs outnumbered the graduating seniors.

An urban forester should first master typical land management courses of silviculture, mensuration, ecology, economics, and harvesting, in order to manage urban resources properly. Missing from the curriculum have been city administration and political science courses. These are areas of deficiency for many practicing arborists and urban land managers.

HISTORY

An urban forestry curriculum was approved by the state of Texas and established in 1973 in the Department of Forest Science at Texas A & M University. The first "Urban Forestry" student graduated in December 1976.

To establish our curriculum, we drew on the experiences of John Andresen of the University of Toronto, Jim Kielbaso at Michigan State, and Gene Grey at Kansas State. We found that each state has its own particular needs and background. Texas A & M University had some unique challenges:

(1) Most of the forestry undergraduates in Texas pursue their baccalaureate degree at Steve F. Austin State University, a sister school.

(2) The Forestry Department at Texas A & M had just been established in 1970, and the major thrust was on graduate programs--thus, there was only a small base from which to draw potential urban students.

This meant that urban forestry students had to come from a small pool of forestry students or a large pool of non-foresters who had not yet solidified their career objectives or entering freshmen.

Most students do not make serious specialty decisions until they enter their junior year. Personal contacts and presentations appear essential. A mail recruiting promotion to 96 Texas high schools in 1978 was a complete failure. We've been unable to predict year-to-year enrollment. Our urban forestry graduating seniors have been few in number. With few exceptions they've found urban forestry-related jobs. Our women graduates have been placed. We've had more potential jobs than graduating seniors.

PROGRESSION

One interesting development is that horticulture, landscape architecture, and recreation and park majors have fit our arboriculture and urban forestry courses into their curriculum. For example, in the spring semester 1977, of the 29 students enrolled in our senior urban forestry course, 18 were landscape architects, 8 recreation and park majors, 1 horticulturist and 1 (female) urban forester. During 1982, we had only 5 urban foresters in the class. This may not be unique to our University. Other universities may have had similar experiences.

Some forest management majors also shift toward urban forestry--perhaps because the job market is so tight. This has led to an informal major in forest management with a so-called "minor" in urban forestry. Within the past two years, we have found more and more of our traditional forestry students taking arboriculture and urban forestry courses along with ornamental horticulture courses, park administration and urban planning.

IMPROVEMENT

How would we improve our program? An urban forester should be a forester first--a land use-land management person with basic silviculture, mensuration, ecology and management courses and knowledge of forest economics and harvesting. No discipline gets a more solid background of resource management. This can be applied to the urban forest in most situations. Also useful are some business-related courses such as computer science, accounting, and business management electives. Maintain the arboriculture, ornamental horticulture, and landscape architecture courses and a capstone urban forestry course. The weakest area is that which deals with how the political system functions--courses in urban planning, city administration, parks and recreation, and politcal science. Foresters need to learn how to talk to city managers and to work with city councils. Our urban forestry course requires that each student prepare a master street tree plan for a chosen Texas city. This means contact with a city official. All too often, students only get to talk to an assistant park supervisor instead of the park director. It may be the park superintendant in smaller cities, when it should more properly be the city manager or the city planner. We should guide each urban forestry class through city hall to learn how a city really functions. To city administrators we can discuss our knowledge of land use management and of trees as a valuable resources to the city. We are the experts in ecosystem management relating to land resources. We should be familiar with social, economic, and political problems that are the primary responsibility of city officials. And we must teach our students to work together with the city.

CONCLUSIONS

Now to the bottom line: jobs. I believe it is the responsibility of today's urban forestry professor to promote jobs for our graduates.

Urban forestry education will continue and grow as long as there are jobs. The day of the idealistic ecology student may have seen its zenith in the 1970's. We must now translate urban forestry education into jobs with city and state governments, with utilities, and with private business. The most fertile field for future urban foresters, I believe, lies with city government. Kielbaso and others have demonstrated the deplorable condition of the tree resource in most of our cities. Much work needs to be done to salvage and expand our urban tree inventory. We're years behind! When we can crack the budget barrier at city hall, this profession will flourish. We can do this by impressing city fathers with bright, informed young graduates who can work with the urban system.

APPENDIX I

AUTHOR INDEX

Name	Page
Abbott, Richard	*
Agnew, Marion	312
Bartenstein, Fred	21
Bethea, John	30
Black, Marvin	38
Bone, Pamela	287
Buck, Richard	157
Burt, Page	*
Chiosso, Tom	83
Clark, Steven	*
Coleman, Ron	59
Curtin, Theodore	243
De Bruin, Henry	203
De Voto, David	162
De Walle, David	119
Dewers, Robert	334
Dwyer, John	152
Felix, Robert	238
Fox, Tom	*
Franklin, Thomas	145
Geiger, James	167
Gilman, Edward	273
Gravanis, Ruth	*
Hall, T.R.	292
Hendrickson, John	255
Hoefer, Phil	233
Horsbrugh, Patrick	124
Kielbaso, James	297
Knapp, Karen	246
LaRue, Gerald	179
Lederer, Robert	265
Lewis, Charles	192
Lipkis, Andrew	94
Lynch, James	175
McPherson, Greg	325
McSwain, June	187
Merrill, Gary	52
Moll, Gary	68
Montgomery, James	103
Nighswonger, James	317
Nugent, Gary	*
Owen, William	260
Owings, Gene	*
Pardue, Ken	65
Reid, Richard	111
Richter, Donald	184
Robson, Harold	42
Rosenow, John	309
Rowntree, Rowan	136
Ryan, H. Dennis P.	47
Sanfort, Steve	89
Schrieber, Patricia	86
Shaw, David	282
Skiera, Robert	35
Smith, Thomas	249
Staley, John	215
Stockdale, Judith	114
Strong, Ann	*
Sumrall, Allen	182
Szuhy, Donna	200
Thomas, Henry	196
Thomson, Margaret	27
Waltemade, Gladys	81
Weber, Charles	227
Willeke, Donald	207
Ziminski, Ann	71

*Paper not included.

APPENDIX II

POSTER SESSION ABSTRACTS

Tuesday, October 12, 1982
7:00 - 9:30 p.m.

INDEX

Poster Session Co-ordinator:

Curtis Johnson
Pinchot Institute for Conservation Studies
P.O. Box 188
Milford, Pennsylvania 18337

PRESENTORS		TOPIC	PAGE
Dr. T. Davis Sydnor Associate Professor Department of Horticulture Ohio State University 2001 Fyffe Court Columbus, Ohio 43210	a	The effects of five species of shade trees on the interception of summer and winter insolation	346
	b	Comparison of the growth habits of five cultivars of gleditsia triacanthos inermis honey locust	346
	c	A comparison of the growth habits and growth rates for five cultivars of pyrus calleryana Callery pear	346
David R. Smith Senior Planner City of Dayton 101 W. Third Street Dayton, Ohio 45401		An experimental lawned parking lot in Dayton, Ohio	347
Ena Adam Publisher A B Academic Publishers P.O. Box 97 Berkhamsted Herts, England HP4 2PX		Arboricultural Journal: The International Journal of Urban Forestry	348
Bradley O. Parks Michael T. Lambur Research Assistants Department of Resource Development 323 Natural Resources Bldg. Michigan State University East Lansing, Michigan 48824		Vegetation resources in human settlements and developing regions: An index of practical graduate research work	348

PRESENTORS	TOPIC	PAGE
Carl P. Wiedemann Associate Forester New York State Department of Environmental Conservation Room 414 50 Wolf Road Albany, New York 12233	New York State Department of Environmental Conservation urban forestry program	349
Robert W. Miller Professor of Urban Forestry College of Natural Resources University of Wisconsin - Stevens Point Stevens Point, Wisconsin 54481	URFOR SIMULATION/GAME: An urban forest management computer simulation/game	350
Gordon M. Heisler Research Forest Meteorologist Northeastern Forest Exp. St. 104 Academic Projects Bldg. University Park, Pennsylvania 16802	Models of tree shade patterns as tools for designing tree arrangements to save energy	351
Mary K. Reynolds Urban Forester Urban Forestry Center NH Division of Forest & Lands 45 Elwyn Road Portsmouth, NH 03801	Small forests for small communities	*
Harold Rosner District Coordinator Philadelphia Green 325 Walnut Street Philadelphia, Pennsylvania 19106	Philadelphia Green	351
James Abusamra Staff Technician Utilities Division Osmose Wood Preserving Co. of America, Inc. 980 Ellicott Street Buffalo, New York 14209	The function and application of the Shigometer	352
Howard G. Halversen Research Forester David R. DeWalle, Professor William E. Sharpe, Ass't Professor USDA Forest Service 104 Academic Projects Bldg. University Park, Pennsylvania 16802	Seasonal variations of precipitation, stemflow, and throughfall chemistry in a suburban area	352

PRESENTORS		TOPIC	PAGE
J. Allan Wagar Project Leader Pacific SW Experiment Station P.O. Box 245 Berkeley, California 94701	a	Computing placement of trees to reduce residential energy costs	353
	b	Control of root damage to sidewalks	354
Philip A. Barker Plant Physiologist Urban Forestry Research Pacific SW Experiment Station P.O. Box 245 Berkeley, California 94701	a	Solar-energy related traits of deciduous trees	354
	b	Sidewalk tree plantings selection by root system	354
Joseph E. Range Extension Forester 101 Plant Industry, E. Campus University of Nebraska Lincoln, Nebraska 68583-0814		Nebraska PLANT TWO--TREES PROGRAM	355
Mike Grosjean Urban Forestry Program Coordinator Utah State Lands & Forestry Prison Road Draper, Utah 84020		Urban forestry in Utah: A different approach	355
Oliver D. Diller, Chairman Wooster Ohio Shade Tree Commission 1368 East Wayne Avenue Wooster, Ohio 44691		Urban forestry in a small Midwestern city	356
Dave Mooter Urban Community Forester Douglas County Extension Office 8015 West Center Road Omaha, Nebraska 68124		The greater Omaha Tree Council school project	356
John Rosenow Executive Director National Arbor Day Foundation Arbor Lodge 100 Nebraska City, Nebraska 68410		Tree City USA	*
Nina L. Bassuk Assistant Professor of Horticulture Physiology Urban Horticulture Institute Cornell University 20 Plant Science Building Ithaca, New York 14853		Water stress in street trees in the Northeastern USA	357

PRESENTORS		TOPIC	PAGE
Robert Felix Executive Vice President National Arborist Association, Inc. 3537 Stratford Road Wantagh, New York 11793		Educating arborists	*
Richard G. Reid President California Urban Forests Council 211 Sutter Street, Suite 200 San Francisco, California 94108		The California Urban Forests Council Commitment	357
Thomas E. Chiosso Coordinator of Special Projects Recreation and Park Department McLaren Lodge Golden Gate Park San Francisco, California 94107		Urban forestry mobile training center	358
Peter R. Stein Vice President The Trust for Public Land Northeast Regional Office 254 West 31st Street New York, New York 10001-2802		The urban land program of the Trust for Public Land	358
James Sturdevant USDA US Geological Survey EROS Data Center Sioux Falls, South Carolina 57101	a	The feasibility of mapping urban vegetation with small scale aerial photographs and Landsat remote sensor data	359
	b	The development and applications of a county-level geographic data base	360
Dr. Ralph A. Sanders Dr. Rowan Rowntree USDA Forest Service Northeast Forest Experiment Station SUNY - CESF Syracuse, NY 13210		Comprehensive management procedures for the urban forest ecosystem	*
Dr. Robert O. Brush USDA Forest Service Northeastern Forest Exp. St. SUNY - CESF Syracuse, New York 13210		Managing for scenery on private woodlands	360

PRESENTORS		TOPIC	PAGE
Dr. Rowan Rowntree Jack C. Stevens USDA Forest Service SUNY - CESF Syracuse, New York 13210	a	Correlation of urban vegetation structure with land use and type	*
	b	International studies of the urban forestry ecosystem	*
Ann N. Titus Dr. Rowan Rowntree Department of Geography Syracuse University Syracuse, New York 13210	a	Geographic information system for urban forestry management	*
	b	Alternative method for mapping forest structure and land use	*
Dr. H. Ken Cordell Project Leader USFA - Forest Service Lab Carlton Street Athens, Georgia 30602		Urban forestry makes sense (and dollars too)	360
Dr. Raymond P. Guries Assistant Professor of Forest Genetics Department of Forestry The University of Wisconsin Madison, Wisconsin 53706		Building better elms: The Wisconsin elm breeding program	361
Stephan A. Wood Urban & Community Forester UNH Cooperative Extension Service 45 Crescent Street Claremont, New Hampshire 03743		Street tree maintenance: Making a good thing better	361
Arthur C. Costonis Systemics, Inc. 138 Mill Street Westwood, Massachusetts 02090		Computers and trees	362
Dr. Phillip J. Craul School of Forestry State University of New York Syracuse, New York 13210		Urban forest soils	362
Michael Simini Department of Plant Pathology P.O. Box 321 Martin Hall Rutgers University New Brunswick, New Jersey 08096		The contribution of de-icing salts to urban tree decline: Direct vs. indirect effects	362
Dr. Valentine SUNY - CESF Syracuse, New York 13210		Verticillium resistance testing in maples	363

PRESENTORS	TOPIC	PAGE
Jim Klein Jones and Jones 233 SW Front Avenue Portland, Oregon 97204	Open space management	364
Dr. Eijiro Fuju School of Forestry SUNY Syracuse, New York 13210	Urbanization of relationships between rural forests and local people in Japan	365
David P. Dalrymple 3110 Capitol Annex Salt Lake City, Utah 84114	Urban forestry in the arid West	*
Dr. Eileen Brennan Professor Dept. of Plant Pathology Rutgers, P.O. Box 231 New Brunswick, New Jersey 08903	Assessing air pollution injury to vegetation in the urban environment	365
Ken Mills School of Landscape Architecture SUNY - CESF Syracuse, New York 13210	The influence of vegetation on solar retrofitting an urban neighborhood	366
Dr. James R. Clark Assistant Professor Center for Urban Horticulture University of Washington Seattle, Washington 98195	The development of a center for urban horticulture	366
Erica Prince MAGIC, Inc. 302 College Avenue Palo Alto, California 94306	Community-based urban forestry	367
B.A. Hutchison Atmospheric Turbulence & Diffusion Laboratory P.O. Box E Oak Ridge, Tennessee 37830	Vegetative alterations of urban energy budgets for space-conditioning energy conservation in buildings	367
Dan Herms Ohio State University 2001 Fyffe Court Columbus, Ohio 43210	Insect pests of two common shade trees	367

PRESENTORS		TOPIC	PAGE
Steve Sandfort Urban Forester 2654 Briarcliffe Avenue Cincinnati, Ohio 45212		Urban forestry in Cincinnati	*
James Herman 3800 Bryant Avenue S. Minneapolis, Minnesota 55409		Trees and the Minneapolis Parks Foundation	368
Senne Fisher Urban Forester 952 Lima Avenue Findlay, Ohio 45540		Ohio chapter of I.S.A.	*
Deborah B. Hill Department of Forestry University of Kentucky Lexington, KY 40546-0073		Forest island patterns and their future in central New York	368
Margaret Thomson 4156 36th Street S. Arlington, Virginia 22206	a	Urban forestry	*
	b	Career corner	*

*Abstract not included.

THE EFFECTS OF FIVE SPECIES OF SHADE TREES ON THE INTERCEPTION OF SUMMER AND WINTER INSOLATION

Dr. T. Davis Sydnor

Five species of ornamental trees were examined for their ability to intercept total light between 380 nm and 1100 nm with an Eppley black and white pyranometer. The data are expressed as percent shading. Trees were selected for varying forms, branch and canopy densities. Mean percent shading for the fully foliaged and branchless canopies, respectively, were: Pyrus calleryana 'Chanticleer' 75 percent and 43 percent; Acer rubrun 'Red Sunset' 69 percent and 25 percent; Zelkova serrata 'Village Green' 61 percent and 24 percent; Gymnocladus dioicus 60 percent and 15 percent; Gleditsia triacanthus inermis 'Morain' 56 percent and 21 percent. No correlation was observed between total light intercepted and photosynthetically active radiation, pathlength silhouette area, or volume of the trees. Growth habit did not significantly affect shading capacities.

COMPARISON OF THE GROWTH HABITS OF FIVE CULTIVARS OF GLEDITSIA TRIACANTHOS INERMIS HONEYLOCUST

Dr. T. Davis Sydnor

A bewildering array of named selections of honeylocust crowd nursery catalogs in the United States. This poster presents the characteristics of five of the more popular cultivars of this popular, environmentally tolerant shade tree. Because of honeylocust's tolerance to city conditions, it has been planted quite extensively. This plant has good branching structure and habit. Its foliage density is light. This allows us to have greater flexibility in plants which are grown under for foliage canopy of honeylocust. This is a relatively unusual characteristic, and one that can be made to serve in the urban environment.

Branching structure and habit of the plant enable an informed observer to identify three of the five cultivars easily. Two cultivars, Shademaster and Skyline, have fairly similar outlines as 15-year-old plants. Graphic representations are presented for each cultivar, both summer and winter. Drawings are to scale and side-by-side to allow comparison of the five cultivars. This technique will also allow for comparison of growth rates among the five cultivars. Heights after 15 years in the landscape range between 25 and 35 feet. The width of the five cultivars tested is reasonably similar. Thus, by choosing the proper plant, one is able to reduce maintenance costs for this environmentally tolerant tree.

A COMPARISON OF THE GROWTH HABITS AND GROWTH RATES FOR FIVE CULTIVARS OF PYRUS CALLERYANA CALLERY PEAR

Dr. T. Davis Sydnor

During the last 17 years, Callery pear has enjoyed increasing popularity. Today more than 15 cultivars have been named and introduced to the nursery trade. Many selections are quite new and have not been out long enough for evaluation. This poster will evaluate five of the older selections of Callery pear in the comparisons of height, spread, and caliper after 15 years in the landscape.

Callery pears are upright to oval trees with characteristically narrow crotch angles and high branch densities. Branch densities range from 26 to 50 branches in the first 5 feet above the lowest branch. The number of crotches less than 25 degrees ranges from 1.5 to 4.3. By selecting plants which have lower numbers of narrow crotches and reduced branch density, it is possible to select trees for maintenance costs, still enjoying the plant's tremendous tolerance to urban situations. Graphic representations for five cultivars are presented and drawn to scale to allow direct comparisons of the various cultivars. Both summer and winter characteristics are presented.

AN EXPERIMENTAL LAWNED PARKING LOT IN DAYTON, OHIO

David R. Smith

The City of Dayton, Ohio has been involved in a unique program of research and technology transfer known as the "Dayton Climate Project." Since 1976, the city has been looking at ways to reduce air pollution, water pollution, noise pollution, and wasted energy through urban forestry. One technology discovered by Dayton that has been implemented by European countries in order to reduce urban temperatures, air pollution, and stormwater runoff is "lawned parking lots," consisting of concrete grid pavements. Such an 80-space, lawned parking lot was installed in downtown Dayton during 1980.

A grant from the Heritage Recreation and Conservation Service allowed Dayton to engage the Environmental Systems Laboratories of the College of Architecture from Virginia Tech to evaluate this parking lot. The outcome of the evaluation was four reports that related Dayton's experience with the lot to potential public and private sector users. The reports are summarized below.

1) The Project Description includes background and design of the lot, information on specifications and bids, construction procedures, choice of plant materials and costs.

2) The Performance Evaluation showed that when compared to an asphalt surface, a lawned parking lot substantially reduced ambient and radiant temperatures, and runoff quantities. The results of the thermal analysis point toward the cooling benefits that lawned lots could have on the urban heat island if used in concert with other types of greenspaces around the city. Furthermore, water infiltrating beneath the lawned lot appeared not to be contaminated with runoff pollutants. Also, the users of the lot approved of its driveability and concurred with pedestrians that it was a beautiful contribution to downtown Dayton.

3) The Maintenance Evaluation documents the care and durability of the pavement, trees, and grass over a six-month period and includes recommendations for future maintenance.

4) The Life Cycle and Energy Use report compares the costs and energy consumed in the production, installation, maintenance, and recycling of both asphalt and lawned parking lots. Grassed lots have higher capital costs but substantially lower maintenance costs that makes them cost competitive with asphalt over a 20-year life cycle. Grassed lots also require less energy to produce and install than asphalt ones, because of the labor intensive (and not machine-energy intensive) nature of their installations.

There are two additional reports from this project. One is a brief overview of the history, types, and applications of grid pavements. The other is an in-depth discussion of park and recreation applications.

ARBORICULTURAL JOURNAL: THE INTERNATIONAL JOURNAL OF URBAN FORESTRY

Ena Adam

The Arboricultural Journal is a long-established and respected journal which has gained a wide reputation as a leading journal dealing with arboriculture and amenity forestry. Such is its standing that the number of papers submitted from all over the world has grown to the extent that publication frequency has been doubled. While the journal continues to be the official journal of the Arboricultural Association, it is published by A B Academic Publishers. In order to reflect its international coverage, an international editorial board has been appointed, and the journal has been subtitled The International Journal of Urban Forestry.

The Editor is Dr. T.H.R. Hall, South Lodge, South Parks Road, Oxford, and the Editorial Board includes Professor J.W. Andresen, Dr. A. Bernatsy, Professor A.D. Bradshaw, Dr. I.R. Brown, Dr. J.E.G. Good, Dr. C.P. van Goor, Dr. D. Heth, Professor E. Jorgenson, Professor F.T. Last, T.R. Noel Lothian, Alan Mitchell, Derek Patch, Dr. H. Tabois, and Professor T.A. Tatter.

Recent contents have included "A New Non-destructive Method for Determining Internal Wood Condition and Decay in Living Trees," "The Long Ashton Clonal Selection Scheme for Trees and Shrubs, Urban Forest Management in the United States," "Tree Pests," "Trees in Botanic Gardens - 8: Royal Botanic Gardens, Melbourne," "The Role of Deciduous Woodlands in the Economy of Rural Communities," "Two Promising Seedlings," "Safety Guide for Tree Roots," as well as book reviews, publications received, and other notes.

Submissions to the Editor may include original research papers, review or survey articles dealing with progress in a branch of science relevant to arboriculture, and notes on matters likely to have an immediate impact on the advancement of arboriculture.

VEGETATION RESOURCES IN HUMAN SETTLEMENTS AND DEVELOPING REGIONS: AN INDEX OF PRACTICAL GRADUATE RESEARCH WORK

Bradley O. Parks
Michael T. Lambur

The purpose of this work is best described at two levels. The immediate purpose at the outset was to identify and organize the often ignored but increasingly important research literature produced by graduate students on the subject of vegetation in urbanizing environments. One objective in doing this was to organize conceptually and describe the relationship of the vegetation sciences and plant resources to the full range of nonagricultural land planning and land management issues.

At a second level the purpose has been to address the needs of managers, decision makers and interested parties who have concern for urban vegetation matters and who must deal

with reduced funds for program planning and operations, management, or research. Our objective here has been to identify for these persons the scope and nature of research already conducted by graduate students and in doing so, to suggest an economical means by which unmet agency research and problem-solving needs may be filled, thus also providing sources of practical, researchable problems for graduate students. A feedback device will be incorporated in the presentation which will allow us to solicit descriptions of research needs or opportunities which community leaders may wish to bring to the attention of graduate researchers. These descriptions will then be announced in a periodical newsletter now being planned.

Results

The publication described and the information exchange device planned for the presentation will prove useful to community leaders, resource managers, agency officials, and specialists in the vegetation sciences and allied fields. The direct utility to those above and to others is threefold and is best expressed in the following research objectives:

1) To foster a better understanding of the interrelationship of vegetation-related issues in urbanizing environments by producing an "index" of existing specialized literature organized to describe the full range of approaches to thinking about, and using, plants in man's near-environment.

2) To develop a cross-disciplinary listing of graduate student research which is organized by vegetation-related issues, thus making such works readily accessible to persons concerned with a broad range of environmental problems and facilitating the identification of critical problems and the more accurate assessment of research needs.

3) To create a reference tool for community leaders, environmental planners, and others that will both popularize and make more accessible, the data and research findings of graduate student investigators, thereby encouraging community leaders with researchable problems and graduate students to undertake mutually supportive research.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION URBAN FORESTRY PROGRAM

Carl P. Wiedemann

The DEC Urban Forestry Program was initiated in 1978 with support from the U.S. Forest Service. The program provides technical forestry assistance to communities and managers of urban trees and greenspace. The objective of the program is to encourage better management of urban forest resources.

The objective of the exhibit is to increase awareness of the benefits of managing urban forest resources. The exhibit also provides information on resources--both technical and professional--which can be utilized in urban forest management programs.

URFOR/SIMULATION: AN URBAN FOREST MANAGEMENT COMPUTER SIMULATION/GAME

Robert W. Miller
Michael S. Marano

URFOR/SIMULATION is a computerized urban forest management simulation/game designed to model a street tree population. The program utilizes street tree data collected for UW/SP URBAN FOREST computer inventory system and removes, prunes, plants, grows, and kills street trees over time. The program user inputs management plans for planting, pruning, removal rates, and associated management costs. The simulation runs on an annual basis for the number of years specified by the user. Program output describes the impact of management plans on the street tree population, calculates the value of the trees, and summarizes management costs. More intensive street tree management yields higher net tree values when compared to management costs.

Game Function

The simulation may be used as a game by the introduction of the following random events:

1) Wind storm: Increased mortality of large trees for one year.

2) Ice storm: Increased mortality of all trees for one year.

3) New disease: A prominent species will have its mortality rate increased in all subsequent years.

4) Drought: Planting mortality is increased for one year.

The game user makes management decisions and runs the program on an annual basis. A year is randomly selected once in each five-year period for one of the events described above to occur. The user must alter management plans to compensate for tree losses.

Game Package

Early in 1983 URFOR/SIMULATION will be available as a game package for educational use. This will include:

1) A street tree inventory for the fictional city of Forestpoint.

2) CONST/URFOR: A computer program designed to create and store a street tree inventory for an individual student.

3) URFOR/SIMULATION: Urban forest management simulation/game.

4) User Manual.

The program was developed on a Burroughs 6930 in FORTRAN, and is adaptable to other systems.

URFOR/SIMULATION has been used for the past two years as an educational tool for urban forestry students at the University of Wisconsin/Stevens Point. Results have been very favorable. If you are interested in obtaining the Game Package, contact:

College of Natural Resources
University of Wisconsin, Stevens Point
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MODELS OF TREE SHADE PATTERNS AS TOOLS FOR DESIGNING TREE ARRANGEMENTS TO SAVE ENERGY

Gordon M. Heisler

Studies have shown that trees and forests can have a large impact on fuel or electricity used for heating and cooling buildings. In one study, shade of a forest reduced electricity for air conditioning a mobile home in Pennsylvania by a seasonally-averaged estimate of 75 percent. However, even buildings not designed for optimum use of solar energy derive significant portions of their heat energy from solar radiation, and tree shade in winter may increase fuel energy needed for heating. While deciduous trees provide less shade in winter than in summer, winter shade is significant. Trees that reduce radiation by 85 percent in summer may cause a 50 percent reduction without leaves. Fortunately, the differing path of the sun during the year provides an opportunity to maximize shade in summer and minimize it in winter by carefully designing and managing landscape trees and other vegetation. This requires knowledge of tree shade patterns on buildings throughout the year. A technique for using simple physical models as tools to determine shade patterns and a method for estimating average radiation reductions in the shade will be presented. An illustration of results will indicate how the recommendation, so often seen in popular literature, to plant deciduous trees on the south of a house can be in error if the trees are not carefully located. Optimum landscape design for energy saving depends on structure of the particular house and window placement. But in general, shade trees on the east and particularly on the west are beneficial, as are trees on the south if they overhang the roof and have lower branches removed to allow solar access to the south wall in winter.

PHILADELPHIA GREEN

Harold Rosner

PHILADELPHIA GREEN is the community gardening outreach program of the Pennsylvania Horticultural Society, a private, non-profit education institution. The program assists well-organized moderate-to-low income neighborhood groups in Philadelphia to plan and implement a variety of horticultural projects: conversion of vacant lots into community vegetable gardens or sitting gardens; greening of streets and sidewalks with street trees and shrub-filled curbside planters; and window boxes and urns overflowing with flowers. In 1981, 145 groups participated in PHILADELPHIA GREEN-sponsored greening projects, bringing the total of Society-involved projects to near 650 since 1974.

The purpose of this program is to educate, assist in community organization, and to help residents make urban neighborhoods into more liveable places. The Society provides the materials for the project, and the community provides the work force to plant and maintain.

This comprehensive approach to community gardening plays an important role in urban forestry. Photographs of community gardeners, accompanied by their perceptions of PHILADELPHIA GREEN's impact on their neighborhoods, will be used. Supplemental materials will include a survey of woody ornamental plant material that is hardy in demanding locations, and fact sheets describing program history and procedures. Our presentation will focus on the dual role that PHILADELPHIA GREEN has in both neighborhood revitalization and the extension of an urban forestry ecology.

THE FUNCTION AND APPLICATION OF THE SHIGOMETER

James Abusamra

The Shigometer is an instrument that sends out a pulse electric current and measures the resistance to that current. The name Shigometer comes from one of its originators, Dr. Alex L. Shigo of the U.S. Forest Service. Using various probes and probing techniques, the Shigometer gives information that can be used to detect discoloration and decay in trees and also determines relative tree vitality.

As wood decays, ions such as potassium increase in concentration. This increase in ion concentration results in a decrease in electrical resistance. Since the Shigometer measures electrical resistance, a sharp decrease in meter readings indicates decay.

Hazard tree detection is the single most important use of the Shigometer. Arborists use the Shigometer to determine exactly where decay is located. Once this is established, the arborist uses his professional judgment to decide if the tree needs to be removed or what treatment should be followed.

Using a different type of probe, measurements in the cambium region can be made to determine relative tree vitality. As electrical resistance increases, tree vitality decreases. This technique has been used as a guide to thinning forest stands and roadside trees. An extremely high electrical resistance may indicate potential mortality. Electrical resistance measurements have also been used to predict some diseases, such as Dutch elm disease, before visible symptoms can be observed.

SEASONAL VARIATIONS OF PRECIPITATION, STEMFLOW, AND THROUGHFALL CHEMISTRY IN A SUBURBAN AREA

Howard G. Halverson
David R. DeWalle
William E. Sharpe

Precipitation, throughfall, and stemflow chemistry were studied at one urban site to more fully understand the role of urban trees in cycling atmospheric deposition. The site was occupied by a boxelder (Acer negundo L.) tree. Samples of precipitation, stemflow, and throughfall were analyzed for NH_3-N, NO_3-N, TKN, P, K, Ca, SO_4, Fe, Na, and Cl concentrations. Determinations were also made for pH and specific conductance. Thirteen individual storms occurring between July 1980 and June 1981 were sampled to identify seasonal trends. Results showed that stemflow and throughfall were always enriched, with stemflow always more enriched than throughfall, regardless of ion or season. Enrichment ratios, when compared to precipitation, averaged about 7 for

throughfall and 11 for stemflow, so there was significant enrichment for all ions. There were some seasonal differences in ion exchange. Concentrations of NH_3-N, NO_3-N, TKN, SO_4, and Na were more enriched during the dormant season, when the tree had no leaves. However, P exchange was greatest during the growing season. The other ions, K, Ca, and Fe were highly variable with no apparent seasonal trends. Concentrations in precipitation did not exhibit similar seasonal trends. The average pH of precipitation was 3.99, while throughfall averaged 5.46 and stemflow 6.49. The pH increases were statistically significant, so the acid nature of rain was moderated by interaction with the plant canopy in all seasons. Specific conductance of throughfall and stemflow samples followed the same pattern with conductances exceeding precipitation specific conductance. Limestone operations in the area may contribute fugitive dust that raised pH and conductance.

COMPUTING PLACEMENT OF TREES TO REDUCE RESIDENTIAL ENERGY COSTS

J. Alan Wagar

Trees in the right positions around a home can reduce costs for heating and cooling. If insulation is adequate, control of sun and shade is most important for windows, and we have developed procedures to determine optimal tree placement for such control.

For each window, up to four "canopy-limit" surfaces are computed. These define where a canopy must be to give maximum shade in summer and maximum sun in winter. The position and shape of each surface depend on latitude, window dimensions and orientation, and a critical date. Two critical dates define extremes:

* The summer date on which a window is to be dependably shaded all the way to the top edge. The most difficult case is June 22, when the sun reaches maximum height for the year.

* The winter date on which any shading of the window's lower edge is to be avoided. The most difficult case is December 21 when the sun's midday height is lowest for the year.

The other two dates define transitions:

* The last summer or early autumn date on which the shade is desired all the way to the bottom of a window.

* The earliest autumn date on which sun is desired all the way to the top of a window.

Because the sun's angle is continually changing and shade from all parts of a canopy must be considered for all parts of a window, computations are somewhat complex. The SOLAR PLOT program was therefore developed to automate computations after the user enters latitude, window dimensions and orientation, and critical dates. Canopy-limit surfaces are represented as contour lines in the computer output.

To control transitions from winter sun to summer shade and back, both proper canopy position and changes in leaf cover are required.

CONTROL OF ROOT DAMAGE TO SIDEWALKS

J. Alan Wagar
Philip A. Barker

Because damage to sidewalks by tree roots costs cities millions of dollars annually, we have initiated three studies designed to help understand and reduce this damage. The first study relates damage for 763 trees in the East Bay cities of California to tree size and species, planting strip width, and soil texture. Most of the damage accounted for is explained by tree size and species, with surprizingly little explained by planting strip width and soil texture.

A second study examines the effect of plastic barriers and planting depth on the development of roots and near sidewalks. Preliminary results suggest that sidewalks may actually attract the roots of some trees by warming underlying soils.

A third study is being established to measure sidewalk effects on soil temperatures and moisture levels and to test procedures for controlling root development through control of soil temperatures.

SOLAR-ENERGY-RELATED TRAITS OF DECIDUOUS TREES

Philip A. Barker

Benefits from either passive or active solar heating systems of houses and other small buildings can be increased by surrounding the buildings with trees that leaf out late in spring and defoliate early in fall. Because leafing-out and defoliating traits differ among trees of the same species, as among tree species themselves, cultivars can be selected for desired periods to be in leaf. Two other critical solar-energy-related traits of deciduous trees are dense foliage to provide maximum shade in summer and sparse branches to provide minimum shade in winter.

SIDEWALK TREE PLANTINGS SELECTION BY ROOT SYSTEM

Philip A. Barker

Eight 25-year-old Chinese hackberry (Celtis sinensis) trees growing along a California highway were each evacuated to a 15-inch depth in an area of four feet radius from trunk center. The exposed roots were mapped, measured, and photographed, and the soil replaced.

Results will be presented by photographs and statically-analyzed data to depict variability among the trees in root mass at incremental depths and cardinal quadrants within the excavated area, in relation to nearby highway improvements and the prevailing wind. The results suggest the potential merit of root-system selection as one way of reducing the damage of tree roots to sidewalks and other street improvements.

NEBRASKA PLANT TWO--TREES PROGRAM

Joseph E. Range

Nineteen eighty-one was the first year for Nebraska PLANT TWO--TREES PROGRAM. The concept is to have local people select and encourage tree plantings that they are most interested in and meets their needs. It is a statewide program not of any specific organizations. It is a Nebraska program, one that unites civic, fraternal, government, urban and rural groups in a common interest: to turn around the depletion of our tree resource and go back to basics--plant trees to restock the resource.

The PLANT TWO--TREES PROGRAM received wide media and editorial coverage and served as a catalyst to create a lot of interest in trees. There was a significant increase in tree planting in 1981 over 1980. Natural Resource Districts reported an increase of 6 percent for rural plantings and 102 percent for urban plantings. A promotion campaign is being organized for 1982. There is no state money designated for the program. Several groups and organizations have donated time, services, and money to initiate the program. We have recently gained tax exempt status which we hope will encourage foundations and other donors to provide support to promote PLANT TWO--TREES.

URBAN FORESTRY IN UTAH: A DIFFERENT APPROACH

Mike Grosjean

The Utah Division of State Lands and Forestry has had an Urban Forestry Program for five years. There have been 58 projects involving 40 communities, three major universites, and the Utah State Association of Shade Tree Commissions that have been completed or are underway.

Different approaches and projects for initiating or improving community forestry programs are:

* Contacting mayors and leaders and stimulating their interest in developing projects and in having trained tree care for employees and volunteers.

* An annual state-wide tree care workshop has helped Utah cities and towns. Three workshops have been held with 57 persons trained from 36 communities. There is special treatment of attendees and use of the National Arborist home study course as the workshop base.

* Support has been provided the State Association of Shade Tree Commissions in terms of speakers, technical assistance, presentations, and leadership.

* Support has been given for development of a community forestry manual that will help communities develop or improve their forestry program.

* Utah will be investigating need of urban and community forestry curriculum for technical and professional training for both the public and private sector in arboriculture in the Intermountain West.

* A project will make the work of the state's arboretum available to communities in Utah for their use in the design and planting of streets, parks, farmsteads, and farms.

URBAN FORESTRY IN A SMALL MIDWESTERN CITY

Oliver D. Diller

The Wooster Ohio Shade Tree Commission was organized in 1953 with an appropriation of $500. Public support for urban forestry in this community of 20,000 has steadily increased to the current annual appropriation of $34,600 or $1.73 per capita. A shade tree ordinance patterned after the model ordinance of the International Society of Arboriculture has been in effect since 1954.

Wooster has been designated a Tree City USA by the National Arbor Day Foundation each year since 1976.

The city maintains a shade tree nursery on city-owned land with an inventory of around one thousand trees and a wide range of cultivars. Street tree planting, trimming, and removal is done under contract with a professional tree service company in cooperation with the city maintenance department.

Since 1956, the Commission has cooperated with the Wooster Lions Club is distributing potted flowering dogwood seedlings to all first grade pupils in the city schools on Arbor Day. This has totaled over 15,000 trees. As a result, Wooster has been designated the dogwood city of Ohio by the state legislature. Since 1978, each fifth grade pupil has received a sweetbay magnolia seedling from the Junior Women's Club on Arbor Day. The chairman of the Shade Tree Commission has served as the coordinator of these projects since their inception.

THE GREATER OMAHA TREE COUNCIL SCHOOL PROJECT

Dave Mooter

The Greater Omaha Tree Council was formed in December 1981. The Council was formed to create an active awareness of trees in the Omaha and Douglas County area. The Council consists of thirteen people who represent neighborhood groups, schools, media, industry, local government, and the general public.

The Council wanted to begin a project that would have a lasting effect on urban forestry awareness in the Omaha area. The decision was made to work out a program for the elementary schools that would be attractive to the teachers and the students, with the capability for follow-up to reinforce the concepts being presented. Fourth grade level was targeted for 1982. Expansion into fifth and sixth grades was planned for 1983 and 1984, respectively.

The program developed by the Council involved a visit to the school by a volunteer from the Council to present a 40-minute program about trees. At the school's request, the volunteer will return during Arbor Week to plant a tree with the fourth graders. The schools are responsible for the purchase of the trees at a cost of about $10.00. It was hoped that the Council could get into 10 or 12 schools in the first year of this program.

The package was finalized and presented to several schools. Twenty volunteers were recruited to present the program. Within a few weeks, 30 schools had been signed up for the program (maximum participation). These schools represent more than 1600 fourth graders, or about 25 percent of the schools in the county.

The cooperation that was necessary for this concept to get moving was critical, and everyone came through with flying colors. KMTV TV Station and the Omaha Public Schools worked with the Council to get video tape copies of the film that was used in the presentation. The Nebraska Forest Service provided administrative back-up and coordinated the program. In addition, the NFS purchased several copies of the film to be used and provided more than 1500 litter bags and an assortment of hand-out material for the students and teachers. The Omaha City Forestry Division helped with program coordination and also provided over 1600 wood cross-sections that were also used in the presentation.

We feel that this is not the usual approach to school programming, since we provided a complete package to the schools that required a minimum investment for the school with a maximum return. Lesson plans were provided, so that the schools knew exactly what the Council intended to do and what was expected of the school. School administrators and teachers were impressed with the neatness of the package and that it dove-tailed so nicely with what was being taught at the fourth grade level.

WATER STRESS OF STREET TREES IN THE NORTHEASTERN USA

Nina Bassuk and Thomas Whitlow

Urban street trees are subjected to many stresses caused by their environment. Because of inadequate rooting space, increased heat load from pavement and buildings, barriers to water infiltration, and high winds these trees are often exposed to chronic water deficits. Plants vary in their ability to acclimate to these conditions and also in the way in which they accomplish acclimation. The response of Cornus racemosa, Cornus kousa, and Gleditsia triacanthos to water deficits are expressed in terms of cell membrane integrity with a view towards finding a technique which will rate cultivars for their ability to survive under drought-stressed conditions.

THE CALIFORNIA URBAN FORESTS COUNCIL COMMITMENT

Richard Reid

The Council's commitments are:

* To promote the understanding that urban forestry is directly related to the "quality of life" in our cities;

* To design and implement effective programs and projects that will increase the functional and social benefits of planting trees in our urban centers;

* To increase urban awareness of the benefits of trees as a renewable resource;

* To develop tree management plans, appropriate city ordinances and policies to regulate open space effectively;

* To involve elected and appointed officials in planning and encouraging maximum citizen participation in the development and management of urban forests;

* To promote public appreciation and respect for trees in terms of air pollution control, noise abatement, climate modification, oxygen production, community welfare, recreation, community wood supplies, scenic beauty, erosion control, water, and wildlife habitat;

* To organize volunteers for the purpose of developing urban forests and greenbelts that will improve our style of life;

* To improve communications between educators, foresters, and industry for the purpose of providing more effective education programs and service for people.

URBAN FORESTRY MOBILE TRAINING CENTER

Tom Chiosso

The primary goals of the Community Mobile Training Center project are to: improve the quality of urban life by uniting the community in successful urban forestry projects; increase effective volunteer participation in the development of urban forests; and insure the future of urban forests by building an integrated and continuing community effort today.

The Community Mobile Training Center is designed to coordinate and enhance existing community involvement in urban forestry in San Francisco. While community interest in urban forestry is high, it is often unfocused and in need of skilled direction. Urban forestry volunteers need to be recruited, trained, organized, and utilized more effectively.

The Community Mobile Training Center is a specially equipped multi-media van designed to bring urban forestry to the community. The Center travels to diverse groups throughout the City, both to promote the need for urban forestry and to facilitate existing volunteer forestry efforts. The Center, designed in response to identified community needs, will be equipped to perform a variety of functions. Equipment includes audio visual presentations, laboratory equipment, educational activities, and planting tools.

In addition to responding to specific community needs from audio visual informational programs to technical assistance with planting projects, the Center functions as a focus and impetus for an ongoing Community Urban Forestry Network. Throughout the project's operation, the Program Monitor recruits and trains volunteers to promote and utilize the Mobile Center as an effective and innovative means of coordinating community involvement.

THE URBAN LAND PROGRAM OF THE TRUST FOR PUBLIC LAND

Peter R. Stein

Community residents have been involved in the design and planning, development and construction, management, maintenance, and ownership of open space projects. The participation of community residents in the provision of open space often produces facilities that are more responsive to the needs of the people who use them and enables those involved to acquire skills useful in developing self-reliance and political awareness.

One innovative approach to increasing neighborhood participation involves the transfer of ownership of vacant land to the community. This makes the community group responsible for developing and maintaining the property. This approach has been pioneered by the Trust for Public Land, a national land conservation organization. Its Urban Land Program has transferred over 120 publicly or privated held sites to community control in Newark, New Jersey; Oakland, California; and New York City by assisting residents in establishing neighborhood land trusts, not-for-profit corporations formed to hold land jointly, and to provide for public benefits through this community ownership. Community organizations in these areas have used the nonprofit land trust mechanism to secure title properties in their neighborhoods, usually at prices substantially below fair market value. Through ownership, these communities have successfully restricted or eliminated market pressures on properties in their neighborhoods, and, in turn, have used this land for public open space purposes. The 1979 National Urban Recreation Study, prepared by the National Park Service of the U.S. Department of the Interior, cited land trusts as a viable option for open space protection.

The poster displays the techniques which TPL has successfully used in order to insure the preservation of urban open space resources.

THE FEASIBILITY OF MAPPING URBAN VEGETATION WITH SMALL SCALE AERIAL PHOTOGRAPHS AND LANDSAT REMOTE SENSOR DATA

Frank G. Sadowski
James A. Sturdevant

A high-altitude, small-scale color infrared aerial photograph, two Landsat images, and Landsat digital data of Syracuse, New York were analyzed to determine the potential of each type of data for acquiring vegetation information in urban areas. The photograph, acquired on August 20, 1972, at a scale of 1:130,000, was enlarged to a scale of 1:32,500 for analysis by photo-interpreters. The Landsat scene, for which analysis was conducted in both iamge and digital formats, was acquired on August 19, 1972. The two Landsat images included a standard color infrared composite and a brightness/greenness composite, each prepared to an image scale of 1:50,000. The Landsat digital data were analyzed as three separate combinations of spectral channels that included the inherent Landsat bandwidths and several spectral transformations of brightness and greenness.

The aerial photograph, Landsat images, and Landsat digital data were each subjected to two tests of performance: (1) stratification of variations in the type and spatial distribution of urban vegetation; and (2) discrimination of woody and herbaceous vegetation classes within defined strata.

Results indicate that objective and consistent stratification of urbanized areas according to their dominant vegetation characteristics was difficult to achieve with any of the data types tested. However, when defined strata boundaries were placed onto the urban area, interpreters of the aerial photograph discriminated woody, herbaceous, and non-vegetated surface classes with a high level of consistency. Landsat data were shown to be well-suited spectrally for discriminating these vegetation classes; however, the utility of such data in urban areas is greatly reduced by the coarse spatial resolution of the data and the spatially complex scene detail.

THE DEVELOPMENT AND APPLICATION OF A COUNTY-LEVEL GEOGRAPHIC DATA BASE

J.A. Sturdevant

The purpose of this poster is to document the collection of land use data by remote sensing techniques; the incorporation of land use, soils, and slope data into a geographical data base; and an application of geographical data base techniques to a county planning problem. Land use data were successfully interpreted from aerial photographs and incorporated in a geographical data base along with digital slope and soils data. All data were registered to a common map base and rasterized to 50- by 50-meter grid cells. Data combination procedures were applied to the data base to produce an image depicting areas of relative suitability for dwelling unit construction. This image can be used for planning future urban development. However, the limitations of this suitability image, which have been introduced through data resolution, data combination techniques, and subjectively made decisions, must be considered by data users.

MANAGING FOR SCENERY ON PRIVATE WOODLANDS

Robert O. Brush

A slide program and narration has been produced that is directed to an audience consisting of urban-based forest owners who are primarily interested in scenery, recreation, and wildlife rather than timber production. The message is intended to show that more of these intangible benefits can be produced through forest management and that many of these benefits can be produced along with timber firewood and other wood products. Research findings show that forest management can produce stands of trees that forest owners rated as highly attractive.

URBAN FORESTRY MAKES SENSE (AND DOLLARS TOO)

Harold K. Cordell

Since its inception in 1978, the USDA Forest Service's Urban Forestry Research in the South has devoted its effort to quantifying the benefits of urban forest vegetation and management programs, and to researching management practices that can enhance the cost-effectiveness of municipal forestry budgets. Working cooperatively with scientists in southern universities, and with the state forestry commissions, the research has undertaken a wide range of topics, including assessment of the economic consequences to builders of preserving trees during home construction, determination of savings of air conditioning costs due to shade trees in the southern summer, effects of landscaping with trees on home sales prices, improving the effects of less desirable urban land uses by vegetation, and effects of vegetation on perceived environmental quality. Studies of the effects of mulching, and of inoculation with beneficial root fungi, and a survey of major insect and disease problems in the South have been undertaken to explore ways of improving urban tree survival and growth, thus adding to the effectiveness of municipal dollars spent on urban forestry. The most dramatic finding to date stems from a survey of tree damage in Savannah, Georgia, following hurricane David. The survey crew found that practicing sound urban forestry techniques, including inventorying municipal trees and proper selection of species for different urban sites, could have resulted in a 75 percent reduction in the damage done to trees and, subsequently, to property and utility lines.

BUILDING BETTER ELMS: THE WISCONSIN ELM BREEDING PROGRAM

E.B. Smalley
R.P. Guries

During the past century, elms have been one of the most widely planted ornamental trees in the United States. This preference is easily understood, as elms possess many characteristics desired by municipal arborists, such as their tolerance of atmospheric pollutants, soil compaction, and drought. In addition, elms possess many attractive features, including a wide range of crown forms and leaf sizes, a variety of bark textures, and summer and fall leaf color that ranges from dark green through golds and maroon.

A major constraint to the use of elms, especially the American elm, is their susceptibility to Dutch elm disease. The protection of disease susceptible trees is far too costly to justify their planting, with the result that we are losing a durable, attractive, and versatile feature of our municipal landscapes.

Elms need not be eliminated as a landscape component of our cities and towns. Genetically-based disease resistance has been successfully used in the Netherlands to return elms to their former level of usefulness in landscaping. Unfortunately, the Dutch trees were developed in a more moderate climate, and many have proven to be non-hardy in much of the United States.

Since 1957, a program of germplasm collection and screening for disease resistance has been conducted at the University of Wisconsin. This collection is the most extensive in the United States and provides the necessary genetic base for further disease resistance and ornamental breeding work. This program includes American elm, but emphasizes an Asian gene pool, especially Japanese and Siberian elms.

Seasonal susceptibility testing procedures have now identified at least twenty-two elm clones with good to excellent ornamental characteristics and very high levels of resistance to Dutch elm disease.

STREET TREE MAINTENANCE: MAKING A GOOD THING BETTER

Stephan A. Wood

Too often, an urban forestry program ends soon after the trees have been planted. As a follow-up to the effort that many communities have made in establishing trees, we have located four shade tree care demonstration areas throughout the state to emphasize the maintenance that should be practiced on existing trees. The areas have been established geographically so as to be viewed by as many communities as possible. Each area shows how proper pruning, mulching, and fertilizing can result in healthier, more attractive trees.

COMPUTERS AND TREES

Arthur C. Costonis

SYSTEMICS, INC. has developed a multidisciplinary approach to tree preservation. We recognize that the majority of tree problems result from human activities. Accordingly, we bring together the expertise of scientists, engineers, chemists, biostatisticians, and city planners to co-ordinate and define these problems of human-plant interactions to develop a program that is biologically and ecologically sound, while being cost effective.

The program provides long-range planning (five-year increments) based on a Computer Technology Inventory System. This system results in an inventory process that is always current and gives you data instantly for each tree under your care.

A healthy tree population results in lower maintenance cost with increased ecological and aesthetic values. For example, a summary of tree species would have tabulated the average health, growth, and maintenance needs of the most prominent species. These data are used to determine which trees should be planted or avoided in the future. Graphic displays of variables are available to aid planning, such as computer-printed maps depicting pockets of unhealthy trees or showing profiles of landscape quality along streets.

URBAN FOREST SOILS

Dr. Phillip J. Craul

Many soil problems are commonly encountered by the urban forester, landscape architect, planner, and homeowner in the establishment and maintenance of urban trees. These problems include compaction, poor drainage (lack of aeration), nutrient deficiencies and toxic chemicals, inadequate root and crown space, and overall soil management considerations. These problems, and their solutions based upon present technology, will be discussed, and a publication, "Urban Forest Soils - A Reference Workbook," will be displayed.

THE CONTRIBUTION OF DE-ICING SALTS TO URBAN TREE DECLINE: DIRECT VS. INDIRECT EFFECTS

M. Simini
I.A. Leone

Urban trees are subjected to de-icing salts which run off into the root zone and are sprayed onto the buds, stems, and leaves by passing traffic. Salt runoff may result in a change in the soil characteristcs, causing reduced water and nutrient uptake and severe decline. Airborne salt can enter trees directly through leaves and buds, resulting in extremely high chloride levels and severe leaf necrosis.

Field studies showed that salt runoff raised the sodium and calcium levels, pH and bulk density in soil surrounding sugar maples, resulting in severe branch die-back. Similar trees across the road which were not subjected to runoff were not injured. Soil surrounding the latter trees had significantly lower calcium and sodium levels, pH and

bulk density than those on the runoff side. Following a snowstorm, the slush from the runoff side contained significantly greater chloride and total soluble salts than the mounded side. Bud and stem chloride concentrations were not significantly different between sites and did not change following salt application. The saline runoff probably had an indirect effect on the trees by altering water and nutrient uptake.

Soil surrounding a white pine stand adjacent to a heavily salted highway had unusually high calcium, sodium, and pH levels. Lead tissues contained significantly higher chloride concentrations after the salt was applied than during the summer months when no salt was used. Symptoms appeared in late February following several snowstorms. Leaf necrosis appeared only on the side of the trees that was facing the road and foliar chloride was significantly higher on this side compared to the side facing away from the road. Necrotic tissues contained significantly higher chloride levels than healthy tissues. Direct ion toxicity appeared to be the major cause of injury in the white pines.

VERTICILLIUM RESISTANCE TESTING IN MAPLES

F.A. Valentine
P.D. Manion

Verticillium wilt is a serious disease of urban Norway and sugar maple. We are evaluating resistance to this disease by testing progeny from open-pollinated seed collections of randomly selected street trees in Syracuse and Rochester, New York. Tree ratings are based upon progeny performance following root inoculations with Verticillium dahliae during transplanting from nursery to lining-out beds.

Results indicate: (1) Genes for resistance to this pathogen are wide-spread in Syracuse and Rochester; and (2) Considerable variation is present among parent trees, based upon disease frequencies which vary from 20 percent to 100 percent in progeny families. Most families were 60 percent or more diseased. Average disease incidence was greater than 80 percent among two-year-old seedlings of both species tested with high inoculum concentrations (2×10^4 microsclerotia and 5×10^6 conidia per ml.) and about 60 percent when tested with low inoculum concentrations (1×10^4 microsclerotia and 2.5×10^6 conidia per ml.). Both inoculum concentrations produced about 68 percent disease in one-year-old Norway maple; (3) The best diagnostic symptom of infection is an olive-green to bluish vascular discoloration; (4) Seedling responses to infection were early death, crown dieback followed by basal sprouting, and foliage necrosis; and (5) differences among families in the "mode of response" to infection were observed that may be indicative of the parent tree's genetic potential for resistance. Rapid death predominates in most families, with few or no progeny surviving. In some families, slower host responses predominate, namely crown dieback with basal sprouts that may remain disease-free and minor to severe leaf necrosis from which some plants may recover. Families in which the predominant responses could lead to "recovery" may be indicative of genes for disease "tolerance." Families with low disease incidence suggest genes for "resistance" that either prevent infection or quicly compartmentalize the pathogen so that the diseased condition isn't detected.

OPEN SPACE MANAGEMENT

James Klein

In order to more fully understand the suburban environment and the future implications of its growth and development, it is important to become familiar with the physical characteristics of future environmental change. Physical characteristics are often described in terms of the four components of any landscape; landform, water, landcover, and land use, as well as the historical patterns of land settlement. Once this underlying character is defined, the directions and characteristics of potential changes to that environment can be interpreted through careful analysis of both the physical environment and existing plans and policies for its use.

New programs for land management in the suburbs are dependent on the ability of the members of a neighborhood to organize amongst themselves and develop physical solutions to environmental resource conflicts. This organization could take many forms including anything from an elected conservation commission to a private, non-profit open land foundation. Whatever the organization, people at the edge of expanding cities must begin to identify new ways to manage suburban land which provides a range of both public and private benefits. This new land ethic can work towards resolving potential environmental resource conflicts and conserve the character and quality of the environment. Most of all, a well planned open space system can conserve community character in the face of increasing pressure for urbanization. As city and county governments close parks and stop maintaining open land, resource conservation and open space management provides the opportunity to develop new ways to conserve and enhance the underlying environmental aesthetic values right in our own backyard.

Urban development in the form of sprawl has caused a serious erosion of our natural resource base. Farmland is lost at the rate of 12 square miles every day to non-farm uses. Prime forest lands are threatened by vacation home communities and land divisions which render these forests economically useless. Massive clearing of natural vegetation near our cities for new urban developments has destroyed the character which makes them liveable in the first place. Roads become jammed at rush hour when thousands of motorists clammer to get home to the country. The very reason that people have escaped the city, the deterioration of the quality of urban life, is fast attacking the suburbs.

Many smaller communities at the edge of expanding cities are facing tremendous developmental pressures due to their proximity to metropolitan cities as well as the need to meet state and regional housing needs. This pressure can cause rapid aesthetic and environmental changes in the character and quality of these smaller communities. Now is the time to begin finding new ways to conserve and enhance the underlying aesthetic and environmental value while managing future suburban landscaping change.

While statewide goals and guidelines take the first step in beginning to conserve and enhance underlying environmental and aesthetic values as well as managing future environmental change, it seems appropriate at this time to suggest an elaboration of these goals and guidelines that may be applied on a more regional or sub-regional level. One such concept is especially appropriate for smaller communities at the edge of expanding cities. This concept involves developing a broader understanding of these underlying values and suggests new methods for land management which conserves and enhances those values.

In order to solve problems of the magnitude we are facing today, a new kind of physical and social framework based on some of this early work in the field must be developed.

This new kind of framework must allow people to participate directly in resolving environmental resource conflicts. Such issues as stormwater runoff management, air and water quality, soil erosion, reforestation, and visual quality can best be addressed by forming Resource Conservation and Open Space Management Districts.

URBANIZATION OF RELATIONSHIPS BETWEEN RURAL FORESTS AND LOCAL PEOPLE IN JAPAN

Eijiro Fujii

In Japan, rural forests had been so indispensable to farmers as a source of fuel, feed, and organic fertilizer as well as timber, that the forest floor had been overused and underscrubbed. However, with the popularization of gas as a fuel, and the increase in the availability of agricultural machines and in the number of part-time farms, the rural forests came to be used less, and as a result, progressed in their succession.

Vegetational investigations have shown that the structure of floor layers of the rural forests indicate changes of underscrubbing, and that the stands with underscrubbing were distributed in the upland farming areas, and conversely, the stands without underscrubbing were distributed in the urban areas and lowland farming areas.

Next, the determining factors of these regional characteristics of the structure of floor layers were studied using statistical data, hearing method, and historical analysis of each hamlet sampled from the lowland farming areas, the upland farming areas, and the urban areas. So, the uses of forests as farm forests are firstly determined by the area of upland field and secondly by the ratio of part-time farms.

That is, the uses as farm forests are divided into the lowland type and the upland type by areal differences of upland field; and the changes of the two types may take either the modernization course or the urbanization course, depending on the ratio of the part-time farms. In the urbanization course the uses of the rural forests as farm forests decrease, and the floor layers progress in their succession, and finally the woodlands are diverted to urban lands with the increase of part-time farms. Conversely, in the modernization course of the lowland type the uses of the rural forests as farm forests decrease, and the forests, almost all Pinus densiflora forests, are diverted to Cryptomeria japonica forests with the modernization of agriculture and farmer's life style. In the modernization course of the upland type the uses of the rural forests as farm forests decrease, and some of the woodlands are diverted to arable lands with the modernization of agriculture and farmer's life style. Other forests are underscrubbed, and only the litters are used as nursery bed material.

ASSESSING AIR POLLUTION INJURY TO VEGETATION IN THE URBAN ENVIRONMENT

Dr. Eileen G. Brennan

On May 29, 1980, a storage tank containing acetic acid (CH_3COOH) exploded at an industrial plant in Central New Jersey. A 100-foot plume of acid gas traveled one mile downwind at approximately five to seven miles per hour. The vegetation which lay in the path of the gas cloud was severely damaged. The foliage of all herbaceous plants and all

deciduous trees species exposed to the acid was entirely brown and necrotic. No injury occurred on the leeward side of mature trees or to plants that were sheltered by buildings or other vegetation. Mature evergreens at the site were not injured. However, young, recently planted pine and spruce species suffered varying degrees of needle necrosis. All of the damaged vegetation showed signs of recovery within several weeks of the incident. Therefore, no long-term growth effects were expected to result from the accident.

In a situation such as this, the urban tree manager is concerned with diagnosing the cause of the injury, observing the condition of the street trees and associated vegetation at the site, and assessing the severity of the injury. Diagnosis can be difficult if the source or means of exposure is not immediately apparent. It is helpful to note that individual pollutants often cause specific symptoms on the leaves of a certain group of "indicator" plants. If pollution damage is suspected, indicator plants can be observed for symptom development to confirm the diagnosis. It is also important to rule out injury due to other factors, either biotic or physiological, before a successful diagnosis can be made.

THE INFLUENCE OF VEGETATION ON SOLAR RETROFITTING AN URBAN NEIGHBORHOOD

Ken Mills

This study presents a process for measuring the influence of vegetation on solar retrofitting an urban neighborhood for domestric hot water. Three components of vegetation influence are considered: solar penetration of defoliate vegetation; public vs. private ownership of vegetation; and block orientation. A hybrid physical/numeric model is used to represent a complex set of neighborhood forms, simulate solar geometry during a design period, and calculate potential solar radiation available to rooftop collector surfaces. The decision rule for determining solar feasibility is based on the local utility company's solar audit program. The solar fraction potentially available to the study neighborhood is presented as a function of the four vegetation conditions (no vegetation, private only, public only, and full vegetation) for both N-S and E-W block orientations. The sensitivity of solar potential to vegetation penetration values is presented for each condition. The results of this study have implications for research in radiation penetration of vegetation and for community vegetation management policy.

THE DEVELOPMENT OF A CENTER FOR URBAN HORTICULTURE

Dr. James R. Clark

The University of Washington has established a Center for Urban Horticulture for the study of the functional use of environments. Seattle is a logical location for this Center because of its favorable climate for growing plants, support from enthusiastic horticultural societies, the presence of progressive commercial industries, and the presence of a good university.

The Center is developing a strong academic program in research, graduate education, and public service, with undergraduate teaching to follow. Program areas of the Center include horticultural physiology, plant materials and plant introductions, environmental horticulture, continuing education/public service, urban pest management, landscape ecology, and horticultural psychology.

COMMUNITY-BASED URBAN FORESTRY

Erica Prince

The Evergreen Park Neighborhood Urban Forestry Project was initiated in 1979. Although volunteers in many communities have planted and watered street trees or contributed to development of government policies through advisory committees and public hearings, a few groups of citizens have independently drafted and implemented a comprehensive management plan. The Evergreen Park Management Plan, produced by twelve citizens without specialized training in forestry or related fields, includes: (1) outlines for educational and organizing activities to engage citizen volunteers and supporters; (2) evaluations of the environmental constraints, both natural and human-imposed in our area; (3) five management objectives and the reasons for their selection; (4) well-defined forest standards and the purpose each serves; (5) an inventory format and forest status analysis; (6) three basic management principles we want applied in Evergreen Park; (7) management practices like siting, species selection, planting, maintenance, removal, and disposal; and (8) a plan for the division of responsibility among government, private property owners, and other parties which will bring maximum resources to urban forest management in our community. The Evergreen Park Management Plan has been instrumental in the hiring of a City Arborist and the appointment of a citizen Tree Task Force to collaborate with the Arborist in drafting a management plan for the entire city. Already, ideas from Evergreen Park have been incorporated into the citywide plan and into the policies of other communities.

VEGETATIVE ALTERATIONS OF URBAN ENERGY BUDGETS FOR SPACE-CONDITIONING ENERGY CONSERVATION IN BUILDINGS

B.A. Hutchison

The energy budgets of vegetated and non-vegetated urban areas are contrasted, and the use of vegetation in the form of landscaping to favorably modify the various components of the energy budget is discussed. Studies of energy-conserving landscaping indicate that cooling-energy savings up to 100 percent are possible through shading of buildings by trees in summer and that heating-energy savings from three to thirty percent may be realized with tree windbreaks around homes or other structures. The conversion of radiant energy to latent heat through the transpiration of large vegetated areas is noted, and the possibilities for city-wide landscaping to offset the summer urban heat island phenomenon is discussed.

INSECT PESTS OF TWO COMMON SHADE TREES

Daniel Herms

Honeylocust and London planetree represent two common members of the urban forest annually assaulted by insects. Honeylocust pests include the honeylocust plant bug, the honeylocust borer, the honeylocust pod gall midge, and the mimosa webworm. Insect pests of London planetree include the sycamore lace bug, the sycamore plant bug, and the Japanese beetle.

The presence and abundance of these insects were monitored during 1981 and 1982. This information will be correlated with physical symptoms and physiological damage and used to develop aesthetic and physiological injury levels. Cultivar resistance is also being evaluated.

The information gained will be used to develop control strategies and action thresholds for pest management specialists operating in the urban forest.

TREES AND THE MINNEAPOLIS PARKS FOUNDATION

Jim Hermann

The Minneapolis Parks Foundation was established in 1977 as a means to solicit funds for special park and neighborhood projects. Trees continue to be a major part of this solicitation effort and to date have accounted for nearly $100,000 of the Foundation's work. Such activities as trimming, removals, and planting to replace those trees lost to Dutch elm disease, as well as injecting selective elms, have all been accomplished through the Foundation's efforts. Contributors range from corporations seeking to "Adopt-A-Park," to the individual wishing to simply "plant a tree in memory of a loved one."

FOREST ISLAND PATTERNS AND THEIR FUTURE IN CENTRAL NEW YORK

Deborah B. Hill

Both historical and current land use practices have fragmented a forest resource, once covering virtually 100 percent of Onondaga County, New York, into small isolated forest habitat islands. An inventory of current forested areas, isolated by agricultural, industrial, and urban development showed that many of these forest islands are so small and so isolated from areas of similar types that they may degenerate to a non-forested condition. Because of their small size, many of these islands do not have economic value in terms of timber production. Their ecological value as protectors of watersheds and soil stability, and as gene pools for plant and animal species, however, is considerable. Fragmentation into small islands (less than 0.2 hectare) may, for example, threaten the ability of these forested areas to provide clean and abundant water to local human populations. The implication of forest resource reduction or fragmentation should be considered by land-use managers and planners.

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SECOND NATIONAL URBAN FORESTRY CONFERENCE

APPENDIX IV

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Thanks to the following organizations that assisted in the Conference in a variety of ways, including publicity, speakers, and follow-up.

American Association of Nurserymen
American Forest Institute
American Planning Association
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International Society of Arboriculture
Metropolitan Tree Improvement Alliance
National Arborist Association
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National Urban and Community Forestry Leaders Council
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