Visual Impacts in the Urban-Wildland Interface[1]

Arthur W. Magill, Rowan A. Rowntree, and Robert O. Brush[2/]

Abstract: The urban-wildland interface is treated as a place where extremes meet--where it is difficult to maintain a visually appealing transition from country to city. Problems are identified in relation to stable cities, urbanizing areas, and developing resorts in the wildlands. The visual problems of urbanization are also discussed in relation to physical impacts such as unstable soils, flooding hazards, and wildfires.

INTRODUCTION

Visual resource management is severely challenged where cities and rapidly urbanizing areas adjoin wildlands. The problem involves the meeting of extremes. At one extreme is the hustle and bustle of our urban society and the metropolitan life support systems which it demands--systems that are usually not designed to blend with the landscapes they are invading. Often urban activities add chaotic visual experiences which may contribute to a sense of environmental deprivation. At the other extreme is the relative quiet and calm of wildlands and farm or ranch lands which are generally prized, not only for the crops and other resources they provide, but for the esthetic and pastoral values which contribute to our physical and spiritual well-being.

Thus the problem is to accommodate some degree of urban development where it impinges on wildland and pastoral environments. Landscape managers need to demonstrate to public administrators and private developers how to achieve necessary urbanization while preserving the visual integrity of our national landscape. However, violations of landscape amenity must be identified before they can be corrected or avoided. It is our intent to sort out many of the visual problems inherent in urbanization. And, while we are pursuing this goal, we expect to uncover criteria which will help all of us to decide what visual integrity really is.

The urban-wildland interface may be likened to an ecotone. An ecotone, in plant ecology, is the transition zone between two plant communities, and generally contains plants characteristic of each community. Similarly, the urban-wildland interface defines the critical zone separating various intensities of urban development from the surrounding unurbanized landscape (fig. 1). This zone generally includes the outer edges of cities and their suburbs where they intermingle with remnants of wildlands--the open spaces. The interface may be very narrow (sharply defined) or quite broad (indistinct), or may lie somewhere between these extremes.

The viewer's perception of the character and composition of the urban-wildland interface is determined by factors falling roughly into three categories: (1) the landscape elements juxtaposed along the interface, for example, residential tract devel-

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[2/] Principal Resource Analyst, Pacific Southwest Forest and Range Experiment Station, Berkeley, Calif.; Project Leader, Northeastern Forest Experiment Station, Syracuse, N.Y; and Research Landscape Architect, Northeastern Forest Experiment Station, Amherst, Mass., all of the Forest Service, U.S. Department of Agriculture.

Figure 1--The urban-wildland interface is that space in which cities and towns merge with farms, forests, and ranges.

opment against pastureland; (2) the position of the observer relative to the interface; (3) and the various dimensions of the regional physical geography, such as topography and climate. (An important fourth category exceeds the scope of our analysis: the various meanings different people assign to the visual characteristics of any particular urban-wildland interface).

The severity of the visual problems perceived by the viewer as affecting the physical resource base thus depends on the interactions of these three groups of factors. The landscape elements at the interface include landforms (hills or mountains), water bodies (lakes, rivers, or bays), vegetation (grass, crops, or forests), and built forms (bridges, homes, or factories). Vertical masses of buildings, trees, and landforms obscure background elements and restrict the area of landscape seen.

The extent of the landscape seen is affected by the position of the observer--on a ridgetop or in a valley, at street level or on the 17th floor of a building. Similarly, important changes occur in the landscape as an observer walks, drives, sails, or even flies. The observer's sensitivity to seasonal or diurnal screening or tonal changes, aspects of the physical geography, also influences interface perceptions. For example, deciduous foliage responding to seasonal changes has the dual effect of extending and constricting the seen area. In parts of the country subject to snowfall, many signs of urbanization are strongly highlighted by the white blanket, but they do not afford the same strong contrast, when snow is not present. However, this is not always the case, for snow may also mute many urban influences. Even arid lands may be altered by the vivid contrasts covered by seasonal changes. Certain colors, such as brown, gray, and yellow, tend to dominate these landscapes until the infrequent rains work their magic. Then, for a relatively short period, green replaces or combines with brown and yellow in sharp contrast.

Atmospheric conditions--fog, smog, haze, and smoke--also tend to alter optical-visual characteristics. These sky conditions, in conjunction with the aspect of urbanized land and with seasonal and diurnal lighting, may strongly influence visual perceptions at one time and not at another. Cities in which overcast days are frequent tend to look dull and lack the sparkle and texture created by direct sunlight. Another and more extreme example is experienced by people new to Los Angeles who may be awe-struck by the nearness and beauty of the San Gabriel Range when the wind occasionally blows away the shroud of smog.

It is the job of resource managers to respond creatively and effectively to present needs, and more importantly, to seek signs foretelling the cost ahead of tomorrow's problems and find solutions today. Some problems we perceive are suggested in the following discussion.

We identify three urban forms as influenced by a few land use elements and various aspects of observer position, region, and season. Urban forms are defined as (1) urbanized areas--core cities with populations of 50,000 or more and their surrounding closely settled territories (as defined by the U.S. Bureau of Census); (2) urbanizing areas--rapidly growing cities of less than 50,000 inhabitants and also second-home or remote subdivisions; and (3) rapidly expanding resort developments. Each form tends to impinge on its interface in a slightly different way; a way that tends to reflect intensity of development of the urban form in contrast with degree of remoteness or open space associated with it. At the interface of each urban form with the wildland, there are various combinations of the following built forms: residential, industrial, commercial-institutional, and transportation facilities (fig. 2).

URBANIZED AREAS

Urbanized areas are large metropolitan areas or stable cities. At their interfaces are large residential suburbs or "bedroom communities," commercial-institutional de-

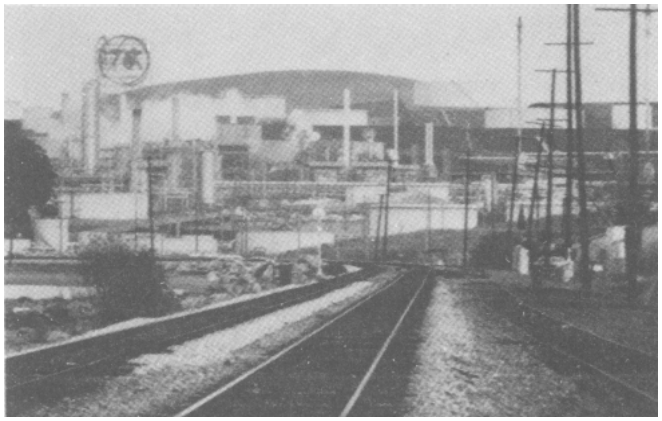

Figure 2--Homes do not create the most noticeable impact at the interface. Design of visually acceptable industrial development is a complex problem.

velopment, and various transportation facilities which may impose strong visual images.

In the West, compulsive urbanization is radiating into our diminishing open spaces as hills are flattened, valleys are filled, and farms and ranches are subdivided. The sprawl is particularly noticeable where lands are expansive and open, where the landscape is dominated by hills and mountains, and where there is little forest to cloak it. Thus, in the process of building homes in natural or pastoral landscapes, we often destroy the very scene we sought.

A major dilemma of Western suburbanization is the choice between ridges or fertile agricultural valleys for home building. Here we have a problem. in part, of viewer position. Would urban dwellers prefer to live on hills and look down into valleys, or would they prefer to live in the valleys and look up to the hills? Although they may not realize they are concerned about "observer position," people pay premium prices to live where they have a "superior view" (fig. 3). And, ignoring the loss of food productivity but not pastoral amenity, we might address the issue of "superior view" in another way, and ask: Shall we build where we can view valleys blessed with crops or view ridges with trees, grass, and cattle? Here we set aside the issue of losing food productivity to gain pastoral amenity.

Where forests cloak the landscape, urban sprawl has a different visual impact. In the coniferous forests of the West, a sharp interface may evolve if the land is completely cleared before any construction begins. This evolution may be more common where lands are rolling or hilly and the forest cover is not too heavy. In such locations, developers have tended to remove trees and shrubs and alter the entire landform to conform with their development plans. Such an approach is particularly undesirable where the relief is quite variable because clearings are more easily seen.

The relatively level landscapes of the East may be better adapted to the "developer-clearcut" because developments and observer viewing positions on flat lands are in the same plane; openings in the forest are less easily seen except as foreground. On the other hand, clearcut approaches to development are probably much less common, because level terrain is less in need of grading. Unfortunately, the deciduous forests which screen eastern developments during part of the year allow considerably more exposure after the leaves have fallen.

Both light and heavy industry, industrial waste deposits, and transportation systems may prove more visually offensive because of scale and obvious structures, than the consequential expansion of large cities and even small towns. When such developments coincide with large or even small bodies of water, they can be especially devastating to the visual integrity of urban areas. What might be done to reduce the impact of oil refineries, steel or paper mills, or other such overpowering industrial complexes at the edge of a bay, lake, or river? What are the options for locating industry where it is not visually offensive, for improving facility design, for developing screening, or for devising less offensive methods of waste disposal? And, if innovative planning and design fail, what legal action, might be taken to pre-

Figure 3--This was prime ridgeland for subdivision, but the view which the homeowners sought is likely to be destroyed by subsequent construction in the valley below.

serve a pleasing visual interface between city and open spaces that include water? Legal case histories already document the precedents for action to prevent inappropriate location of industry on esthetic grounds.[3/]

It is not our intent to imply that cities are visually distasteful. Urban areas and wildlands have contrasting beauty, but in each there are misfits--those elements which seem to violate visual integrity. We are merely identifying some of the sources of the urban misfits that occur when the two landscapes merge. We are attempting thereby to create awareness of the urban-wildland interface as an area where strongly contrasting land uses may come in contact. Such awareness may encourage others to develop alternatives that offer visually pleasing contrasts--sequential experiences that provide an enriched transition between wildland and city (fig. 4). Also, we need to know under what conditions are sharp transitions either readily evident or barely noticed by viewers. For, if sharp transitions are unacceptable to viewers, then more gradual ones must be designed.

Freeways, railroads and switching yards, power transmission lines and substations, pipelines, maritime facilities, and airports are necessities which through strong linearity or sheer massiveness may be perceived as visual intrusions in urban landscapes. Highways across wildlands have been of visual concern to natural resource managers. Those same highways, as they approach cities, often become massive freeways which are then the concern of urban resource planners and managers. How can freeways be constructed without overpowering the urban-wildland interface--a zone where auto pathways are more difficult to hide than in the inner city with its massive buildings? How long before we have the technology to put high voltage powerlines underground economically, and what can be done to restore waterfronts lost to decayed pilings and ancient piers? How might hangers, large enough for wide-bodied jets, or long-established railroad yards and rusted old rails be screened from those who are visually offended by them? From a different view, however, railroads and airports, old docks and powerlines, may fit someone's esthetic value system. How might we manage to reconcile such divergent public value systems? How can the urban-wildland interface be treated in ways that please a large cross-section of users as they travel between cities and hinterlands?

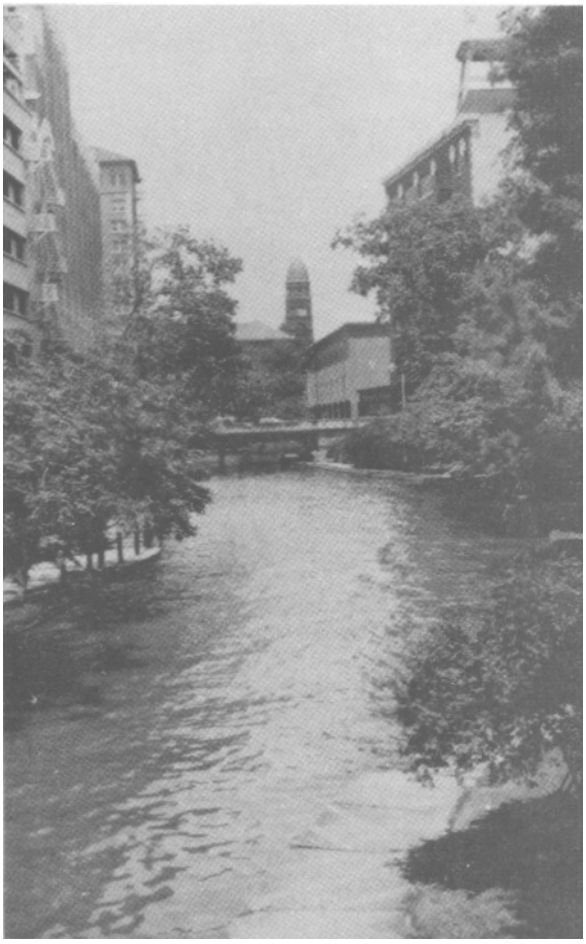

Figure 4--Urbanizing should not be thought of as necessarily distasteful to view. The object is to build in pleasing contrasts between elements of the city and the country.

URBANIZING AREAS

Many Americans, to the extent they can afford to, prefer to live in or near natural or pastoral landscapes. The first persons to move into such relatively undeveloped settings are usually pleased with the surroundings. It is only when many others follow suit that the wild or rural character of the landscape changes to reflect urbaniza-

3/ Richard C. Smardon. 1978. Law and aesthetics or when is the pig in the parlor? A legal/policy overview of legal factors influence on visual landscape policy. Dep. Lands. Arch., Coll. Environ. Design, Univ. of California, Berkeley. 155 p.

tion--the very condition which the first migrants were fleeing. The problem then is one of accommodating some degree of urban development with a minimum of change from the natural or pastoral condition.

Subdivisions at the fringe of expanding towns, or second-home subdivisions established as isolated tracts in wildlands, are a serious visual as well as environmental concern. The first few homes built in developments are usually widely spaced and not very obvious except in open country--land with little or no forest cover. Essentially, homes are masked by the forest, but as more are built the forest cover dwindles and the homes are ever more visible. On heavily timbered lands, lot size and tree removal restrictions may favorably influence the esthetic character of urban sprawl and second-home subdivisions. The forest can screen homes from view when lots are fairly large and only hazardous trees are removed along with those on the building sites.

The rapid growth of once-small communities and second-home or remote subdivisions may create contrasts which are acceptable in urbanized areas but visually at odds with wildlands. Golf courses, for example, frequently appear in urbanizing areas and resorts. People with homes along the abrupt ecotone between forest and golf course are usually pleased with their environment, but, nonresidents may regard such development as a strong visual intrusion, as turf is not typical of most forest landscapes. As an extreme example of such intrusion, golf courses have been built in nonurban desert settings creating an environmental anomaly. Even if turf can be maintained, the vivid green is in sharp contrast with the gray-brown tones of the surrounding rock and sand.

Expansion of small towns in relatively open country, or even where small trees such as pinyon and juniper provide the only cover, may lead to severe visual impacts. People may recognize and accept the development as a necessary part of an existing rural community, but would probably be more pleased with less visually obtrusive alternatives, if such could be offered.

Occasionally, all lots in second-home subdivisions may be sold but the purchases are primarily speculative and buyers have little or no intention to build. Roads, sidewalks, utilities, street signs, and even street lights are usually installed by the developers, but home construction does not follow. Consequently, these premature or remote subdivisions became visually evident even though there are few or no houses to be seen. Naturally, the visual impact is greatest where there are few trees or shrubs.

In the past, a few remote subdivisions were fraudulently sold for speculative purposes when development was not seriously intended. Lots were sold at inflated prices, the developer was unencumbered by legal controls (although this situation has changed), and purchasers did not have the advertising power to resell their land even at a loss. Whether failure to build was the purchaser's volition or the consequence of fraud, the outcome of nondevelopment is the same. The visual impact created by unused utilities and roads can only be remedied by removal--a costly process.

RESORT DEVELOPMENT

Wildland areas which have been developed for recreational sites or resorts may sometimes urbanize. Fortunately for the homeowner, such developments generally occur where an excellent view is available. But unfortunately the transient public also gets a view--a view with houses as the foreground of spectacular scenery. Is it possible to allow wildland homeowners to have an outstanding view without spoiling the scene for visitors to such areas?

Some resort developers may provide pleasing building designs and lots which are appropriately situated and spaced within forested areas or on relatively open lands. Visual sensitivity may not be violated at such locations; however, even attractive buildings may prove objectionable to some segments of the public if the buildings are carelessly exposed. Excessive removal of trees may contribute to overexposure. Compounding the problem are trees that are hazardous to life or property. Care should be taken to remove hazardous trees before they cause damage, but if' such trees are numerous, their removal may also produce an overly exposed site.

Sleepy mountain resorts may suddenly become popular and erupt as rapidly urbanizing communities. Even support facilities, such as airports, may start small and grow out of proportion. And though attractive buildings may be constructed, the visual consequences of urbanizing resorts can be devastating, whether viewed from the air or the ground. Aerial views, though not common in the experience of most people, provide a

broad insight--a preview of emerging problems.

Environmental Impacts As Allies

Visual impacts often suggest the presence of deep-seated environmental problems. A thorough analysis of the visual resource problem at the urban fringe should include consideration of more serious environmental impacts such as air pollution, landslides and avalanches, flooding, and wildfires. The impingement of cities on ecologically unstable natural landscapes produces important interactions between the physical characteristics of both natural landscapes and urban environments, and the visual attributes of urban fringes. In many places, the nonvisual environmental impacts may provide sufficient justification to prevent development which may also be visually undesirable. Landscape managers should use these allies when the violation of a landscape's visual integrity is insufficent cause for preventing or limiting undesirable development.

The sickness of our cities--air pollution--may totally erase visual problems. For who can be concerned about visual violations at the urban-wildland interface if they cannot be seen--when they lie submerged in an ever-deepening sea of pollution. Though curing this illness may not seem to be their concern, landscape managers should support remedial efforts because air pollution not only damages our health, but also destroys the esthetic value of the landscape.

The "visual sensitivity" of a site may be insufficient reason for denying approval for home construction or other forms of urban development, but development can be prevented if the sites are subject to the threat of unplanned land movements. Although areas of unstable soils can be identified before buildings are constructed, soil conditions are often ignored, to the eventual horror of unsuspecting homeowners. And even when the rubble from destroyed homes is removed, what can be done to rehabilitate the resource--not just to prevent continuing erosion, but to restore visual attractiveness? In a few cases, recreational developments on visually sensitive sites might also be precluded by the threat of serious hazards. In the steep terrain of the West, for example, it may have been 50 or more years since an avalanche roared downhill, and spread across an alluvial fan, but that does not mean it will not happen tomorrow or the next day and the next! So, when violation of visually sensitive space is insufficient justification to prevent the construction of recreational facilities or homes, the presence of hazards to life or property may settle the issue.

The problem of wildfires at the urban-wildland interface is of great concern, particularly in Southern California where homes are mingled with the chapparal. Thus, we must learn how to manage vegetation into which homes, often quite expensive ones, have been introduced. The technology to manage for fire protection and to provide suppression is available, but design concepts are needed which will reconcile fire management requirements with the esthetic desires of urban homeowners. A much greater concern, however, is the need for more knowledge about public perceptions and desires for homes built in the interface; methods must be found to induce-- even force--homeowners to design and manage their property so as to reduce home losses while preserving esthetically pleasing home sites. Means need to be identified or developed for more effectively and rapidly rehabilitating areas to satisfy esthetic as well as social and technological goals after fires strike. Once again the problem of building homes in dense wildland vegetation has been emphasized by the recent 27,000 - acre Kanan fire in the Malibu area of California. Estimated loss was $15,000,000!

In conclusion, the urban-wildland interface has been identified as a place where extremes meet--where built misfits may violate the visual integrity of both city and country. We have sought to establish an awareness of how some built forms, including residential areas, industrial complexes, commercial--institutional facilities, and transportation systems, may at various times and in various geographical contexts constitute a problem for visual resource management of large cities, rapidly growing towns, or expanding wildland resorts. Severe environmental problems, such as air pollution, landslides, and wildfires, were suggested as allies for achieving visual objectives where visual amenity could not independently justify restrictive or costly management. We have offered little else to define possible solutions for the associated visual transgressions. However, the talent is available and the technological strength is growing. And these developments should lead to more sensitive visual management of the urban-wildland interface--management to retain some of the serenity and visual gentleness characteristic of less urgent and chaotic times.