# Descriptive Approaches to Landscape Analysis[1]

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Abstract: Descriptive landscape analyses include various procedures used to document visual/scenic resources. Historic and regional examples of landscape description represent desirable insight for contemporary professional inventory work. Routed and areal landscape inventories are discussed as basic tools. From them, qualitative and quantitative evaluations can be developed although certain landscape attributes are omitted. Aesthetic evaluations and visual impact predictions for environmental impact studies can originate from landscape analyses. Scope and implications of needed research in visual landscape studies are discussed. Finally, landscape planning goals and landscape design policies are outlined as visual quality controls. The professional role of landscape architects and environmental planners is stressed in the paper.

## INTRODUCTION

Landscape analysis is the broad, sometimes fuzzy field which includes a set of different activities all concerned with visual resources. Included are inventories of physical-visual elements and their relationships, qualitative or quantitative evaluations (or assessments), landscape aesthetics reports for environmental impact studies, visual impact predictions, and the identification of planning and design goals as related to the landscape. In this paper, emphasis is in descriptive approaches and the professional roles that may be assumed by the landscape architect or environmental planner in visual analysis. Yet it is clear that many different professionals and academic disciplines have related interests in landscape analysis and aesthetic quality of the outdoor environment; their perceptions and capabilities are needed.

## LANDSCAPE DESCRIPTION: SOME HISTORIC BACKGROUNDS

It is ignorant to think that landscape architects have created descriptive landscape analysis in the last decade. There is a rich store of landscape descriptions from the past as well as the present. It comes from varied sources, but it can be useful to us in developing contemporary methods of visual analysis applied to landscape planning and design.

While the characteristics of landscape description may be as varied as different authors' purposes, that variation can suggest how complex landscape perception may be. Pragmatically, it is instructive to examine the language used in narrative accounts of landscape and to be aware of what artists such as Catlin and Moran have done. The field observations of others can improve our astuteness in the field. We should be acquainted with cultural or historic perspectives that landscape descriptions can carry and appreciate the potential usefulness of portrayals made at a particular point in time. Landscape elements and their relationships seized upon for description by various observers may confirm some common threads of perception, giving us guidance in selection of what to include in an inventory.

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Descriptions may take a turn toward evaluation. To avoid confusion, it is important to differentiate between direct description and the appearance of personal or professional values attached to the outdoor environment. What has been written or graphically represented can give clues about valued aspects that others have held from seeing the landscape; this is information useful in broadening our perspective on visual values.

Especially in the accounts of scientists and naturalists, there may be insight on how appreciation of the landscape may be linked to natural processes--how environmental factors may have ties to the nebulous world of landscape aesthetics.

A few personal selections of landscape descriptive examples follow. Some are contemporary. Some are from recent history. They represent diverse samples rather than any attempt to be comprehensive. They represent different relationships with the landscape, whether seeking its protection, fitting it into a life philosophy, using it as a background to a set of activities, making man-made changes compatible with it or simply enjoying it.

Sir Humphrey Repton, 18th century landscape gardener

Repton wrote more than 50 "Red Books." Each was a landscape description of an individual estate--its terrain, water bodies, and plant cover. Included were the "improvements" which he proposed. To help the client's visualization of improvements, Sir Humphrey introduced the device of slides--a simulation of "before and after landscapes."

His descriptive language was simple and direct--to this he adds:

> My habit of landscape sketching I have considerably improved by practice and this may be of great use in showing effects where descriptions are not sufficient. (Repton 1792, v.2)

Henry David Thoreau, 19th century philosopher-naturalist

Thoreau's year spent at Walden Pond is a philosophic connection between man, universe, and the landscape at hand. The philosophy is part Emerson, part Thoreau, but the graphic description of landscape is purely that of Thoreau the Naturalist. He says:

> The scenery of Walden is on a humble scale, and, though beautiful, does not approach grandeur, nor can it much concern one who has not frequented it or lived on its shore; yet this pond is remarkable for its depth and purity... It is a clear and deep green well, a half mile long and a mile and three quarters in circumference... The surrounding hills rise abruptly from the water to the height of forty to eighty feet ... They are exclusively woodland. All our Concord waters have two colors at least; one where viewed at a distance and another, more proper, close at hand. (p. 121) [Later the philosopher says] A lake is the landscape's most beautiful and expressive feature. It is the earth's eye; looking into which the beholder measures the depth of his own nature. (Thoreau 1960, p. 128)

William H. Brewer, 19th century botanist, agricultural scientist

For the period 1860-1864, William Brewer was the resourceful and diplomatic field director of the Whitney Geologic Survey of California. Traveling up and down the state for four years, living virtually all those years out in the open landscape, Brewer describes succinctly what he saw. He discards hearsay. First and foremost a scientist, he measured topography, took temperature records, geological and botanical specimens. He suffered from bad water, fought mosquitos and weather, and plowed his way through chaparral. In 1861, Brewer was in the Santa Cruz Mountains and said:

> Around us was the sea of mountains, every billow a mountain; deep dark canyons thread them, the form and topography very complicated, the geological structure very broken. Redwood forests darken the canyons on the west toward the sea, chaparral covers the ridge on the east. (Brewer 1966, p. 155)

Clarence E. Dutton, 19th century geologist, U.S. Army

Shortly after Major John Powell successfully explored the Colorado River, Clarence Dutton went to the Grand Canyon area to study its geologic history--"Erosion on a grand scale."--he says. He was accompanied by William Holmes whose extraordinary ink drawings of the Grand Canyon remain classics.

Through his description Dutton takes us on a trip across the Kanab Desert, the Kaibab Plateau and--"to the brink of the chasm, where we may contemplate its sublimity." There is accuracy of observation combined with scenic experience. The journey is a set of successive, linked encounters with varied landscape. He relates:

> When viewed from a distance, (the Kaibab) summit, projected against the sky, looks remarkably smooth and level...when we actually visit the plateau we actually find (it) ...to be really very rugged....Over the Permian terrace the Kaibab is in full view ... The light of the declining sun is upon it and the larger details stand forth in clear relief, displaying the openings of grand ravines and the massive faces of the intervening pediments.

Further on Dutton says:

> The desert before us is... (like)...the rolling prairie of Iowa but the range of vision is vastly greater.... In the prairie the curvature of the earth soon carries the surface out of sight.... (Here) we are constantly looking across a very wide but shallow depression--the earth's surface is here slightly concave instead of convex. [Toward the end of the day's journey, Dutton writes] As the sun nears the horizon, the desert scenery becomes exquisitely beautiful. The deep rich hues of the Permian, the intense red of the Vermillian Cliffs, the lustrous white of the distant Jurassic headlands are greatly heightened in tone and seem self-luminous. But more than all, the flood of purple and blue which is in the very air, (bathes) not only the naked rock faces but even the obscurely tinted fronts of the Kaibab and the pale brown of the desert surface... (Dutton 1882, p. 122-125)

Several more days of travel take us to the edge of the canyon. Dutton has provided a remarkable clear and graphic description of a remarkably rich landscape.

Aldo Leopold, 20th century forester, ecologist, game management biologist

One of the originators of wilderness in Forest Service lands, Aldo Leopold is intimately associated with the beginnings of American game management and the concepts of a land ethic--land use which is--"ethically and aesthetically right." Pithy critic of professors and short sighted practices leading to degradation of resources, he saw the ecological and aesthetic values of an unfragmented landscape. Gifted in his ability to describe the wholeness of landscape, he weaves together the feel of weather, the edge of stream and willow grove, the presence of animals--including his hunting dog --the sound of geese. Of a Wisconsin marsh Leopold says:

> A dawn wind stirs on the great marsh. With almost imperceptible slowness it rolls a bank of fog across the wide morass. Like the white ghost of a glacier the mists advance, riding over phalanxes of tamarack, sliding across bog meadows heavy with dew. A single silence hangs from horizon to horizon.
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> Out of some far recess is the sky a tinkling of little bells falls soft upon the listening land. Then again silence. Now comes a baying of some sweet-throated hound, soon the clamor of a responding pack. Then a far clear blast of hunting horns, out of the sky into the fog.
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> ... at last a glint of sun reveals the approach of a great echelon of birds. On motionless wing they emerge from the lifting mists, sweep a final arc of sky, and settle in clangorous descending spirals to their feeding grounds. A new day has begun on the crane marsh. (Leopold 1949, p. 95)

Sigurd F. Olson, 20th century ecologist, wilderness advocate

Biologist, north country guide, and steadfast spokesman for wilderness, Sigurd Olson expresses a philosophy reminiscent of Emerson and Thoreau, a scientific curiosity in league with that of Leopold, of Loren Eisley and Henry Beston. With long years of outdoor experience on the Quetico-Superior lakes, the backcountry of Canada and Alaska, Olson speaks knowingly of remoteness, the changing faces of the season, the loon's call in a moonlit night, an awareness of what is going wrong in the environment. For him, aesthetics of the landscape is a complex fabric of sight, sound, knowledge, time, and ethics. Turning to observation, he says:

> Swamps are particularly beautiful to me, for in them, I know, is true wilderness. I like them in spring when they are alive with redwinged blackbirds ... when black ducks explode around every bend in

> wild confusion as they climb for the sky. I appreciate them in the fall when heathers become coppery and even the spagnum is full of color, and the pitcher plants stand bold and tall as they change from summer's green to red. (Olson 1976, p. 85)

The foregoing examples of landscape description represent a variety of purposes. But from them we may develop better contemporary descriptions for application to landscape analysis and land planning.

## DESCRIPTIVE VISUAL INVENTORIES

Landscape inventories, based upon description, are rational documentations of observed landscape. They are the foundation for succeeding assessment and analytical interpretation. They are not assessments. Professionally prepared, they need to be objective representations of the landscape at a known point in time. What does objectivity mean in this instance? It means that base line information is provided, that the landscape is represented in a straightforward way as it may be seen, not as it may be judged to have particular values. It means that the inventory elements and criteria are clearly identified. Brewer's means of describing landscape may be useful here--he used simple unbiased language that provide clear images.

An objective inventory further means the observer identifies typical landform, vegetation, water, and land use elements that are characteristic for a study area. Visual patterns and relationships among these four elements are most important to identify. These may be represented from sampling and portrayed through photographs and drawings. It is not a visual inventory if it does not have graphic representation. Most landscapes will also have some atypical elements, such as landforms of unusual contour or scale, cascades of fast water, or coves of old, mature trees; these are the more distinctive things easiest to identify and record. While graphic examples represent what both typical and atypical parts of the landscape look like, a map and descriptive narrative give coordination to the inventory. Another way for the professional to maintain objectivity is to consider that the integrity of the typical or ordinary landscape combined with the atypical or extraordinary landscape is necessary to maintain overall scenic quality. The protection of only special or unusually scenic places --what ever they may be--would be to make the landscape a museum piece.

Descriptive inventories may be divided into two classes: routed and areal. The routed inventory uses a road, trail or stream as the location of a traveling observer, limiting attention to the landscape within the visual corridor. The visual corridor is the bounded area visible to the observer; it includes invisible pockets. In hilly or mountainous terrain, the routed inventory tends to have a restricted corridor in which intensive detail may be recorded. For example, the 15-mile inventory between Shaver and Huntington Lakes, Sierra National Forest, California, (Litton 1968) includes 37,500 acres in the visual corridor but three-fourths of that seen area is less than 3 miles from that road. Areal inventories may be of any scale or extent, hence they may contain detail varied to suit either broad planning purposes or those of intensive design. In three examples of area inventories, a Lake Tahoe study covers the 315 square miles of the lake watershed, a British Columbia study is of 10,000 square miles, and a Northern Great Plains visual study samples the landscapes within a 235,000-square-mile area. It is important to note that each of the area examples above are subdivided into subordinate parts or units.

Any inventory, routed or areal, becomes more useful and more representative of landscape variations if it is divided into visual units. Definitions of units depend upon spatial characteristics of land forms and vegetation or upon presence of a visually consistent (or homogeneous) set of elements. In an intensive research project combining landscape design, plant ecology, and silvicultural objectives,[3/] 200 acres of forested roadside are being manipulated and studied along 3 miles of highway; landscape units of the study consist of nine visual reaches or spatial segments of the road and its roadside. The Lake Tahoe inventory (Litton 1971) is built upon terrain enclosures with side spurs and cohesive skylines, upon conspicuous peaks or lake features, and upon distinctive or consistent vegetation mosaics; there are 20 visual units which vary in size from 4 to 40 square miles. The British Columbia visual resources study contains 125 units which are

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[3/] McDonald, Philip M. and R. Burton Litton, Jr. 1976. Landscape Management - Silvicultural Prescription for Enhancing the Scenic View from a Highway in the Mixed-Conifer Forest Type. (Study Plan Title) Pacific Southwest Forest & Range Exp. Stn., Berkeley, Calif. Project now in progress on the Plumas Nat. Forest.

topographic enclosures "Each with its own distinct visual character and degree of unity." (Tetlow and Sheppard 1977, p. 9), and in size they range from 12 to 275 square miles.

The Northern Great Plains study (Litton and Tetlow 1979) proposes a conceptual set of four different kinds of visual units. Two of them, called "continuities" and "provinces," are broad and generalized, use repetition of consistent landforms, water, vegetation and land use patterns for identification, and cover hundreds to thousands of square miles. The other two, called "units" and "settings," are based upon topographic enclosures and other landscape features; they cover a few to tens of square miles per unit.

## LANDSCAPE EVALUATIONS

Two kinds of evaluations may follow the visual inventory. They are professional judgments by landscape architects and environmental planners and the summation of preferences expressed by interested citizens, making use of public participation procedures. In both situations, simpler visual values (or relationships) are usually substituted for fuller and more complex aesthetic values. Yet it is very questionable that visual and aesthetic values can ever be entirely separated from one another. This question about the nature of values poses one of the most fundamental dilemmas of landscape assessment.

Criteria used in professional evaluation are fundamentally derived from design, aesthetics, and observational perception. The Visual Management System (USFS 1974) and the Visual Resource Management guides (USBLM 1976) both name line, form, color, and texture as criteria; but then they are exemplified by occurrences and relationships found in nature. My preference has been to use the aesthetic criteria of unity, vividness, and variety (1972), but I have tried to lend reality to these through interpretations of how they may exist in the landscape. It is absolutely essential that these abstract terms and others[4/] not remain esoteric and that they be expressed in tangible ways expressive of landscape values. Otherwise the visual assessment is not made intelligible to the reader. The abstract concepts of form, space, and color need, then, to be tied to landforms, vegetation, water, and land use patterns--the basic physical elements of visual landscape.

It is unfortunately true that visual assessments are prone to omit values that may be attributed to dynamics of the landscape. These are the long and short term changes of visual image (and of aesthetic impact) due to factors such as season, weather, animal life, or vegetation's successional progression. Descriptive literature suggests that seasonal aspects of landscape or its apparent modification by weather and light may indeed make the most indelible impressions upon the observer. Reference to the "ephemeral landscape" has been a personal attempt to recognize this idea (Litton 1968). Additionally, the sequential movement of an observer through the landscape, both in time and space, may profoundly alter a person's sense of scenic values. The reasons for omitting these several things from evaluations are simple enough. We do not know how to do it; or prospects for agreement are poor. Here is another set of interesting dilemmas about landscape evaluation.

Definition of visual inventory units, within the context of a regional landscape ("character type," "characteristic landscape," USFS 1974, p. 5-7) not only improves the inventory, but it is essential in making comparative qualitative assessments among units. It assures that systematic application of adopted criteria is applied to all area subdivisions. Visual sub-units have a greater tangibility than do a whole study area, especially if the area is large. Overall evaluation is more logically developed as a sum from tangible parts than emerging full blown from a total study area.

Qualitative and quantitative evaluations need comment. Professional evaluations are primarily qualitative even if quantitative means of assessment are applied. Qualitative judgments normally express the results of using criteria which are not themselves readily reduced to simple or precise numerical values. Quantitative procedures, particularly applied to different visual units, can systematically measure such things as relative relief, mosaic unit areas of various vegetation types, or numbers and coverage of water bodies. The results of such measurements are most useful in drawing systematic comparisons among differing components in different units; their rankings as

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4/ Line is also edge, contour or silhouette. Form includes space and shape. Color includes hue or chroma, brilliance and value. Texture is but one part of surface variance and patterns. Then there are relationships of scale-proportion-relative size, of dominance and subordination, of unity-harmony-discord, of richness-diversity-variety, of vividness-imageability-novelty, of contrast and of repetition, etc.

to visual value still call for qualitative judgment.

The use of arbitrary (or relative) numbers to represent visual/aesthetic criteria is common and useful. Assumed numerical values do not produce quantitative evaluations and they should not be so termed. They do (or should) produce comparative evaluations. Arbitrary numbers are merely labels which are no better than the criteria they represent or the reliability with which they are used. Where such numbers are weighted or multiplied, as opposed to being simply summed, they are especially apt to go astray.

The Northeast Coal Study Area of British Columbia (Tetlow and Sheppard 1977) is a good example of using relative ranking numbers to draw careful, methodic scenic comparisons among a large number of units. Their criteria are well identified, conceived in the context of the region, and final rankings are the result of professional judgment. The criteria and their representative numbers are used only by the professionals involved--the question of unreliability due to application by a different set of judges is avoided.

Community participation in identification of perceived values of landscape requires psychological or sociological analysis. Because of conflicting political views and administrative/legal restrictions, it is virtually impossible for public agencies to conduct social response studies on public land. As a consequence, most of this kind of insight must come from academic research; it is a restricted endeavor. Workshops, such as conducted by the National Park Service (1978) or by professional consultants, are currently the most prevalent means of soliciting citizens' opinions and seeking their preferences. Preferences are, however, generalized judgments; and include a complex of variables in which visual elements are elusive. It is more feasible to conduct workshops on management and design alternatives than it is for every problem of landscape quality evaluation.

Much work is needed to establish correlations between physical-visual landscape criteria used by professionals and perceptual values identified in public workshops or participatory testing. Reinforcement of visual analysis procedures would result as validity of criteria is cross-checked. It should be anticipated that participatory evaluations or research will reflect local values (Zube et al. 1974) which are not safely attributed to other regions. It is also a point of caution that participatory evaluations may change over time. Present opinions about landscape values should not eliminate choices to be expressed in the future.

After evaluations are made, whatever their origin, the question remains about what decisions are most appropriate for landscape units of different value. Where high quality is identified--and it is apt to be a rare thing--it is clear enough that special planning and design efforts are called for. But it would be an error to spend most of a planning-design-management budget to protect a relatively small piece of a large landscape. Because ordinary landscapes are regionally typical over broad sweeps of country, it seems most appropriate to put most of the planning and management effort into maintaining their kinds of visual integrity. Otherwise the landscape falls apart, losing overall aesthetic quality.

## LANDSCAPE INVENTORIES FOR RESEARCH AND MONITORING

The professionally prepared landscape inventory, properly done, represents work of a qualified and experienced practitioner--an expert's product. This same inventory with its supporting elements may also be considered as hypothetical, being subject to examination for validity or additional research. Landscape concepts of inventory elements such as landform features or spatial enclosures (Litton 1972) were the subject of perceptual validation by psychologist Kenneth Craik (1972); results showed a high level of agreement between the visual perception of lay persons and that of the professional. In another example of psychological research directed toward landscape displays, visual relationships of elements found in the riparian environment of the Connecticut River Valley are the subjects of perceptual response and evaluation (Zube et al. 1974).

Combined research between the disciplines of plant ecology and landscape architecture was referred to earlier (McDonald and Litton). In this project, landscape prescriptions to manipulate the visual relationships within the roadside forest landscape are being combined with silvicultural techniques. The research could be called "recreational silviculture." Inventories of

existing vegetation with sample plots and of visual landscape recorded the original conditions before either visual prescriptions or silvicultural treatments were developed. A "View Enhancement Plan" now represents the joint objectives. It is a detailed study along 3 miles of road. Being in the Sierra Nevada mixed conifer forest, the vegetative mosaic is complex. Already identified is a clear necessity for flexibility in how prescriptions may be altered or shifted for best compatibility to specific plant aggregations.

The landscape inventory with visual samples is a device for monitoring the appearance of natural and man-made change over time. Individual changes in the landscape may seem insignificant but their accumulation over time can be seriously degrading. No judgment about shifting changes in quality is possible without the visual base line of how the landscape looked at a specific time in the past.

This kind of record is also desirable for legal purposes where litigation seeks proof demonstrating a magnitude of degradation or loss of landscape values. Additionally, changes in visual character may provide initial clues that other less visible changes of environmental quality are taking place.

## ENVIRONMENTAL IMPACT REPORTS AND VISUAL IMPACT PREDICTION

Environmental analyses and associated impact statements require consideration of landscape aesthetics. The National Environmental Policy Act of 1969 calls for "... esthetically and culturally pleasing surroundings." (Sec 101(b)2) and insuring that "... presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking..." (Sec 102(B)). State environmental acts somewhat similarly make this a responsibility. Even so, environmental analyses and impact statements per se have contributed unevenly to the improvement of amenity resource analysis. Reasons for this are several. The problem is esoteric, and frequently the aesthetics sections of EIS's are mediocre. Professional inadequacy is a frequent cause of poor performance or a low priority is given to the amenity section by those responsible for the preparation of the whole environmental report. Public response, however, suggests that the matter of scenic quality and amelioration of impacts is of significant concern (Gallup 1978). Where the subject of landscape amenity within an EIS is treated in superior fashion, the report is not often readily obtainable and drops out of sight when the immediate purposes of hearings and review are satisfied. The opportunity is lost for the substantial amenity report to contribute to improvement of the analytical process.

The aesthetics resource analysis of the Upper Susitna River, Alaska, part of an environmental report (Jones and Jones 1975), is thorough and excellent. It is built upon visual analysis. Four proposed dams and reservoirs are the sources of developmental impact. River landscape units are identified and comparative visual evaluations are made within and among units. Aesthetic values are equated to visual values and relationships. Four criteria are used. They are vividness (memorability), intactness (relative apparent naturalness), encroachment (presence of degradation), and uniqueness (relative scarcity). Conclusions include a comparison of the visual-aesthetic impacts of alternative planning proposals. In summary, the report is a good indication that the abstract generalities of environmental aesthetics can be logically and tangibly developed through the use of visual landscape analysis.

Visual impact predictions are the fit or misfit between development alternatives and the landscape's visual vulnerability--its relative sensitivity to degrading change. Results of visual impact investigation may take one of two forms. The points and places within the study area can be identified where greatest visual alteration is expected--a "red flag" procedure. Or impacts may be portrayed by visual simulation; graphic or photographic images are made to represent changes as they may be seen in the context of surrounding landscape.

In environmental impact studies, generalized planning or design choices, such as alternative highway corridors or dam sites, mean that visual impact predictions must be approximations made in the absence of specific design and construction details. When the impact source is known in principle rather than detail, using the concept of visual vulnerability and "red flagging" seems a sensible approach. In brief, visual vulnerability evaluation (Litton 1974) makes use of three categories of information. They are: identification of special landscape compositions and landscape units of higher quality, sensitive places and locations in the landscape, and inherent condi-

tions and their surrounding influences. When landscape units have been qualitatively evaluated, protection of highly valued areas should be an obvious priority. Units of high visual quality may also include special compositions such as conspicuous "enclosed," "feature," or "focal" landscape types (Litton 1968 p. 26-35). Sensitive places and locations in the landscape include skylines, water edge zones, edges between contrasting vegetation types, open faces, and higher locations upon the terrain. Inherent conditions include factors such as steep topographic slopes, soil color contrasts, and degree of complexity of the vegetation mosaic. Surrounding influences include orientation affecting visibility and plant regeneration, climate, and differential responses to seasonal change. When visual vulnerability evaluation of visual impact is applied to a particular locality, criteria need to be modified to suit the circumstances.

Another way of considering relative visual impact is found in Jacob and Way's study of visual absorption capability (1969). Similar in some ways to the concept of visual vulnerability, visual absorption is the potential for developmental changes to be absorbed (or screened) by vegetation and topography. Set in the New England landscape, the relative visibility of typical houses is examined in the surroundings of young deciduous forest and low coastal hills.

Visual impact prediction carried to the level of visual simulation is possible when alternative design solutions are known in some detail and are applied to specific sites. One approach is to use landscape control points (Litton 1973). These are set viewing points from which a rather extensive landscape may be seen and from which drawings may be made to show proposed changes. Not only may the components of the proposal be altered to reflect different design solutions, but their visualization may be shown from several different control points. While this is a conventional device used by architects and landscape architects to show a client what proposed designs will look like, the idea can be applied to review by resource management, to professionals from different disciplines, or to public meetings to solicit the reactions of interested citizens. It is assumed that drawings will be reasonably accurate representations (in the sense of being professional and ethical). It is essential that several alternatives be prepared so that their display results in a useful interchange of positive and negative responses.

A much more sophisticated means of presenting alternative design solutions and their visual impacts is by use of the environmental simulator. One is in use at the College of Environmental Design, University of California, Berkeley, under the direction of Professor Donald Appleyard. In brief, a scale model of urban or rural landscape is made, including the modifications which represent a particular design solution, such as a freeway, park, or shopping center. Using a movie or video camera suspended from a carriage system, a movie is made from the viewing level of an automobile or a pedestrian, following any route desired. The degree of realism is remarkable, and the dynamic presentation simulates the way we normally see our surroundings. The simulator is a tool for basic research in perception. It has application to everyday design problems. Its visual products are being used to compare reality with simulation, lay perception with that of professionals, and also to present design proposals to public groups for their response. (Appleyard 1977)

## VISUAL CONTROLS IN LANDSCAPE PLANNING AND DESIGN

It is unfortunate that environmental impact statements and attendant landscape analyses carry the implication of single project--short term use. In a longer term view of the landscape and sustaining its varied qualities, landscape inventories and assessments of region and locality are tools to affect visual controls in landscape planning and design. Through monitoring and revision, landscape analyses should keep up with the dynamics of change, whether those of wildfire, insect infestation, or timber harvesting. Similarly, visual controls within resource planning and administration should be subject to refinement as time passes. Alteration of landscape policies should reflect better identification of priorities. In many respects we are only beginning to recognize that the whole landscape is a scenic resource--not just the rare and spectacular. The procedures now being developed to protect the landscape are still crude. Improvement is needed.

Visual controls can be categorized as general goals within landscape planning and design policies within landscape design. The two are interdependent because there is the chicken/egg relationship between planning at broader, regional scale and design at smaller, local scale. One is not more important than the other.

## Landscape Planning Goals

General goals are the expressed intentions to protect the visual qualities of a regional landscape. To address the visual integrity of a large area means to account for the landscape management intentions within a set of identified sub-areas or units. Control goals may be defined through the degree of change allowable with the domination of natural characteristics at one end of the scale and man-made domination at the other end. Some years ago (1972) I suggested that the following list of terms could be used to express this idea:

Preservation
Protection/Retention/Maintenance
Alteration/Modification
Rehabilitation/Restoration
Degradation/Deterioration/Destruction

Such words adopted as goals mean nothing without further elaboration. It is essential that they be graphically expressed, using landscape displays representative of different regional landscapes and their subordinate, local units. Even graphic displays need explanation because the visual image may not carry the same message to all viewers. National Forest Service landscape management (1974) has adopted general goals patterned after the list above, calling them "visual quality objectives" (p. 28). Discretion has led to omission of "deterioration" and "destruction" as responsible goals even if experience shows that these conditions are easily enough obtained.

## Landscape Design Policies

Design policies are built upon design solutions which appear visually most appropriate at specific sites within unit scale landscapes. All of the usual resource manipulations are the design subjects, including roads, power corridors, timber harvest, mining, vegetation type conversions, administrative centers, recreational facilities, mining, and water resources structures. Then there needs to be scrutiny of the visual interrelationships between individual site projects or manipulations and their adjacent neighbors within landscape units. In both space and over time, visual relationships need critical analysis if we are to improve visual management.

The landscape inventory/assessment again represents the physical components of the scenic environment. Tangibility of visual elements should be greatest at the site and unit scale. Compatible relationships between the visual components of the landscape and the components of site projects are then the source of design policies. Form, shape, space, color, line/edge, texture, mass and size are both landscape descriptors and design tools. Similarly such words as proportion, scale, pattern, location/dispersion, contrast, dominance/subordinance, weight/balance, and repetition express relationships seen in the landscape and those created in various design projects. Dynamic and temporal changes also apply equally to landscape and effects of design. It is re-emphasized that the abstract words of design do need interpretation to describe and fit the context of the local landscape.

Design policy concepts--expressive of compatible relationships--may be suggested by <u>combinations</u> from the following illustrative list:

Proportional similarity
Pattern emulation
Color contrast limitation
Dominant line attitudes
Scale replication/compatibility/
  subordinance
Shape/edge types and linkages
Location/dispersion pattern
Recovery/temporal phases
Form and shape complements

In theory, design policies which promote either conspicuous or inconspicuous man-made changes can be equally satisfactory; both can have high visual quality. In present wildlands, the more acceptable model is the one with changes held subordinate to surrounding landscape. Eventually, judging from European models and anticipating a time when planning and design are improved, more dominant man-made changes should become more acceptable. Some of our wildlands will then have become akin to rural agricultural landscapes.

## CONCLUSIONS

Descriptive landscape analysis is now serving a variety of purposes. Visual inventories and assessments, while in need of improvements by research, do contribute to environmental aesthetics, visual impact prediction, landscape planning goals, design policies, perceptual and other research. Landscape planning and management for the scenic resource is actively developing but will improve as experience and research provides improved foundations.

In summary, some ten major points of this paper may be emphasized.

Roots of landscape description especially relevant to visual inventories can be discovered in the literature of different geographic regions and of natural history.

Objectivity of landscape description and of related inventories is a professional responsibility. It rests upon astute field observation and straight-forward documentation of both typical and atypical landscape elements.

Landscape evaluations cannot be made without prior inventories. Evaluation criteria need to be clearly expressed and have to be tangibly related to the landscape being studied. Identification of visual units within an area assists the evaluation.

Quantitative landscape evaluations are frequently misnamed. Many visual elements and relationships can be measured and scaled, but resulting assessments are comparative rather than quantitative. Qualitative approaches are the norm for present landscape evaluations.

Preference evaluations of landscape quality expressive of public participation are extremely difficult to obtain for public lands. Expressions of preference also contain many hidden dimensions. Workshop procedures are successful in seeking public response to planning, design, and management alternatives.

Physical-visual landscape criteria used by landscape architects need to be correlated to perceptual values of an interested public. Values identified for a certain locale cannot be dependably attributed to other places. Perceptual values can also be expected to shift over time.

Descriptive visual inventories represent tools for several kinds of combined research in psychometrics, plant ecology, and resource management planning. Their use is not restricted to immediate problems of landscape planning.

Visual impact prediction, varying in degrees of generality or specificity, can be addressed through a variety of available techniques. Reliability of different prediction methods needs to be validated.

Visual analysis techniques provide a rational means of indicating aesthetic values within environmental impact studies. When such studies do contain a worthwhile treatment of aesthetics, they are not usually easy to obtain, meaning the loss or burial of potentially good analytical methods.

Descriptive landscape analyses have application to development of both general landscape planning goals and more detailed landscape design policies. Balance is needed since design and planning represent related parts of a single planning process.

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