VISUAL QUALITY

AND THE COASTAL ZONE

Proceedings of a Conference/Workshop

29-30 May 1975

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Visual Awareness, by project staff. An illustrated publication describing the diverse visual character of New York's coastal zone. For a general audience. To be published in 1977.

A handbook for coastal planners: methods and techniques for assessing and managing coastal zone visual resources. To be published in 1978.

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PROCEEDINGS

CONFERENCE/WORKSHOP ON VISUAL QUALITY AND THE COASTAL ZONE

CONTENTS

PREFACE

Critical public issues emerge, grow, coalesce proponents and opponents, achieve partial solutions, and evolve into new issues. Two recently growing issues in this country concern the protection of visual quality of our landscapes (including coastal areas), and achieving a balanced use of our coastal zone resources (including visual resources).

Recent public concern for visual quality can be seen as a spin-off of the broader environmental quality movement. Consciously or not, we often attribute visual quality to environmentally harmonious features of our surroundings and attribute ugliness to products of environmental degradation or pollution. Our evaluation of visual quality is strongly influenced by the extent to which the high-rise, the tree, the sign, the beach is perceived as an integral, functioning part of its surroundings. As with most public outcries, the visual quality issue has been most stimulated by the negative aspects--the unsightly and ugly. They tell us something has gone awry. Our threshold of tolerance for ugliness is surpassed. We have bemoaned the loss of visual quality and eventually turned our attention toward positive action--how to improve unsightly scenes and how to protect attractive areas from visual blight.

The coastal zone issue, for its part, has emerged in response to growing and often competing demands for the finite resources of the coast. The coastline is a fine line indeed, the edge between two strikingly different and complementary environments. Such an edge, an outstanding example of the ecologist's ecotone, provides access to a richness of resources unavailable on either land or water alone. Hence, its attractiveness for many uses, particularly recreational on one hand and industrial and commercial on the other. Whether we go to the beach to return to the womb of our earlier evolutionary habitat, or merely to cool off on a hot summer day, greater mobility and leisure time have increased demands for recreational facilities, second-homes, and a multitude of supporting services. At the same time, increasing exploitation of biological and mineral resources of the sea, generation of power, transfer and storage of goods and fuels transported by land and water, and related activities have added more stress to the coastal zone.

Where the two issues of visual quality and coastal zone resources intersect, the critical nature of each is augmented. The Federal Coastal Zone Management Act of 1972 specified that aesthetic values of the coastline should be given full consideration, yet little attention seems to have been focused here to date. The need for action is clear, but defining, evaluating, and managing the vulnerable visual quality of our coastal zone is highly elusive. Hence this Conference/Workshop.

This Conference/Workshop was intended to promote the interchange of ideas and experience among those who have a variety of concerns and questions and those who have some potential solutions regarding visual quality along the coastline. It focused on the theories and practical applications of identifying, evaluating, and managing visual resources of our coastal regions, with particular attention to New York State: the shores of New York City, Long Island, Lake Ontario, and Lake Erie.

That this subject encompasses much scarcely trodden territory is well indicated by the diversity of disciplinary borders crossed by the explorers (and settlers?) represented on the conference program. Three keynote speakers and eighteen other participants represented researchers in landscape architecture, geography, geology, recreation, sociology, and economics, as well as private planning and design consultants, an artist, and public planning and regulatory agencies. Presentations covered an equally wide range of approaches from literary to statistical, from theoretical to politically pragmatic. Appropriately, most were also highly visual. Unfortunately, only a taste of that visual character can be presented in these proceedings.

Although some of the presentations addressed more than one area, we grouped them into three sessions, each responding to a basic question: (1) What is visual quality? ("Attitudes and Perceptions"); (2) How can we evaluate visual quality? ("Assessment Methods"); and (3) How can we protect and enhance it? ("Visual Quality Planning")

The workshop sessions on the second day involved registrants in small group discussions focusing on specific case studies of visual quality/conflict situations typically found along the coast. These sessions provided an opportunity for expression of personal attitudes, exposure to others' conflicting attitudes, and an incentive to seek compromise and understanding in reaching for resolution to these conflicts, drawing on ideas generated by the conference papers.

From these two intensive days of interchange, let me draw a few of my own summarizing observations. First, it is apparent that visual quality assessment and management efforts on our coasts are few and far between. We are becoming aware of the problems, but remedial action is only just beginning. On the other hand, some very effective methods of both assessment and implementation are emerging. Visual assessment methods of great variety have been evolving for different landscapes, occasionally coastal ones. Certainly, some can be adapted to the coastal zone, although the linear nature of the shoreline and the extensive presence of water call for special refinements. We clearly need to know much more about the perceptions and attitudes of the various coastal user groups.

Another gap yet to be filled in considering visual quality of the coastal zone is the need for integration of diverse efforts, particularly the adaptation of theoretical methodologies to the

immediate needs of coastal decision-makers. Both the conference and workshop sessions clearly demonstrated this need, which might be simply stated as the need to dejargonize, to rework these methods as far as possible for application by lay persons.

Finally, I see one of the most useful outcomes of this Conference/Workshop as the opportunity it provided for a diverse mixture of researchers, public agents, private practitioners, coastal residents, and other coastal users to get acquainted, rub elbows, exchange views, and begin the process of mutual dialogue. These proceedings will hopefully enhance that dialogue and extend it to a wider audience.

By way of explanation, this Conference/Workshop should be seen in the broader context of visual quality research of which it is a part. In November 1974, the National Oceanic and Atmospheric Agency (NOAA) Office of Sea Grant, through the New York Sea Grant Institute, awarded a two-year grant to the School of Landscape Architecture, State University of New York (SUNY) College of Environmental Science and Forestry, Syracuse, New York, to investigate the issues of visual quality pertaining to the coastal zone of New York State. The long range objective is to provide practical methods by which coastal managers can evaluate visual quality and integrate these findings into land use decisions. The project's initial steps have included the preparation of four background papers, compilation of an extensive bibliography, broad classification and photography of the State's visual coastal regions, a pilot survey of coastal users' attitudes, and the sponsorship of this Conference/Workshop.

David B. Harper, Research Associate
Conference/Workshop Coordinator
Syracuse, New York
September 1975

Thanks-

We extend our gratitude to a host of people whose efforts contributed to the success of this Conference/Workshop.

Foremost thanks must go to all the participants on the conference panels, and in the workshop sessions, as well as to those who attended and contributed their questions, reactions and suggestions.

In addition, vital support came from many directions: from the staffs of the College's School of Continuing Education, the Educational Communications Unit, Publications Office, and students of the School of Landscape Architecture. Our sincere thanks to all of you.

WELCOME TO THE CONFERENCE

Dean Bradford G. Sears

Bradford Sears, Dean of the School of Landscape Architecture, began by acknowledging the sponsors of the Conference/Workshop, introducing the coordinators and assistants, and welcoming the participants. Stressing the complexity and interdisciplinary focus of the issue of visual quality, Dean Sears pointed out the appropriateness of such concerns to the College's active involvement in a broad spectrum of complex environmental problems. He then introduced President Palmer.

President E.E. Palmer

Edward E. Palmer, President of the S.U.N.Y. College of Environmental Science and Forestry, opened the Conference by extending greetings to the participants and remarking on the significance of the conference inquiry. After a brief review of some of the milestones in intellectual history dealing with classical theories of knowledge and some of the problems they have produced, he concluded his remarks by recommending the conferees bear in mind that the basic problem is not so much the visual quality of the environment as it is the quality of vision through which we arrange and view our environment.

CONFERENCE
SESSION ONE:

29 MAY 1975
9:30-12:00 A.M.

VISUAL ATTITUDES AND PERCEPTIONS

Professor Christopher W. A. Macey
Chairman

VISUAL ATTITUDES AND PERCEPTIONS

INTRODUCTION

Prof. Christopher W. A. Macey
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Before the phrase "visual quality and the coastal z . . ." is out of our mouths, we are bombarded with the insistent question, from our own minds if not from a host of others: "What in the world do you mean by 'visual quality'?" Words and phrases come to mind--"perception," "image," "aesthetics," "attractiveness," "sense of place," "personal interpretation," and so on. And if we throw the question back to others, we are deluged with a confusing diversity of responses, of perceptions of what constitutes visual quality.

The landscapes we view are dynamic, changing instantaneously as we move or as clouds come and go, changing daily and seasonally with human activities and familiar climatic cycles, and changing more subtly but inevitably through geologic time. Even more dynamic is the human mind which interprets images of the landscape in the context of immediately preceding sensations and motivations, lifelong memories and learning, and a continually evolving cultural milieu.

After the first recoil from this infinitely complex morass, we straighten our shoulders and attempt to find some sort of order in at least a corner of it. Much of the discussion and debate surrounding the search for a definition of visual quality grapples with the extent to which it can be defined. Where exactly do our evaluative responses to visual stimuli fall on the scale between the anarchy of totally independent personalized values and the determinism of universal aesthetic principles? Few adhere to either extreme. Most agree that there are basic attributes such as harmony, contrast, and symmetry to which we universally respond, while also agreeing that two individuals rarely find identical visual value when confronted with the same scene. A vast expanse of perceptual terrain still lies within the boundaries of this agreement, however, inviting exploration.

Students of visual quality themselves come from many and varied backgrounds, as the speakers in this session clearly exemplify. This trend is not only predictable as desire for understanding of a poorly comprehended area grows; it should be welcomed as an opportunity for healthy cross-fertilization of viewpoints and concepts. Jay Appleton (a geographer) in writing The Experience of Landscape identifies himself as an "amateur" in the arena of landscape perception and contends that all who enter this arena must be amateurs:

> To find an aesthetic philosophy which cannot only be sustained theoretically in terms of generalizations and abstract concepts but can also be applied practically in the comparative study of real landscapes, we must invade many fields and, as soon as we stray from the disciplines we profess, we become amateurs in somebody else's territory.
>
> Even here the amateur may have one advantage over the professional. Extreme familiarity with any field of study tends to condition

> the mind in such a way that it places newly acquired information into an established framework of conceptual thought.[1]

From each other we can learn to enlarge and modify our own conceptual framework to better accommodate the complexities of visual quality perception. In this process, however, we may ask, with Heisenberg, to what extent our observation, measurement, and description of visual quality perception and our subsequent dissemination of this information, in fact, may alter not only our own but the public's perception of visual quality. The objective observer, wittingly or not, influences the observed.

We respond that to the extent that this influence increases our sensitivity to the range and intensity of perceptions we can experience, providing us with a greater range of choices, it can only be commended. The papers which follow present a tantalizing sampling from a varied spectrum of approaches to defining visual quality and do indeed help expand our fields of vision.

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[1] Jay Appleton, The Experience of Landscape (London: John Wiley and Sons, 1975), viii-ix.

KEYNOTE ADDRESS:

NOT AN EDGE, BUT A DELICATE INTERPENETRATION

Alan Gussow

NOT AN EDGE, BUT A DELICATE INTERPENETRATION

Alan Gussow
Artist
Congers, New York

Abstract

The visual environment is seen not as a passive backdrop to human activity but as a stage on which people move. Visual quality relates primarily to human, appreciative perception. Ecological thinking -- a vision across boundaries -- encourages viewers of coastal zones to experience interconnections with a geological, biological, historical and personal past.

Microbiologist Rene Dubos observes that water is of interest to man because it is one of those natural influences "that have shaped human life and thereby created deep human needs." Dubos goes on to say "the pathetic weekend exodus to the country or beaches (testifies) to the persistence in man of biological and emotional hungers that developed during his evolutionary past, and that he cannot outgrow." Any consideration of Visual Quality and the Coastal Zone must deal with biological and emotional hungers, for the visual environment is not merely a passive backdrop to human activity, it is a stage on which we move. The forms and objects on that stage shape our actions, guide our choices, restrict or enhance our freedom and in some mysterious way even predict our future.

To discuss visual quality is to invoke the idea of esthetics. George Santayana, in a landmark series of lectures The Sense of Beauty, defines esthetics not only as theory of perception, but as a theory of susceptibility, what he refers to as "appreciative perception." Santayana discusses judgements of value which are instinctive and immediate, always emphasizing pleasure. He understood the human element, the emotive, noting that if consciousness was merely accessory to life and not essential to it, then "we might have acquired all the arts necessary for survival without possessing a single sensation, idea or emotion." In a mechanical world, he says, "there is no element of value...in removing consciousness we have removed the possibility of worth..." In other words "there can be no value apart from some appreciation of it and no good apart from some preference of it before its absence or opposite."

The appreciation of the beauty of place, the beauty of coastal zones, is a kind of value. Our approach to an understanding of this value, however, must not be overly intellectual. What is the use of coastlines; what is it that we value about them? Until we can identify those values, we cannot begin to

take the necessary steps to preserve and protect visual quality in coastal zones. The key factor, it seems to me, is that visual quality relates to human use. Visual quality cannot be considered apart from human response.

In 1958, Theodore Edison, conservationist and son of the inventor, wrote a preface to the certificate of organization and by-laws of Monhegan Associates which eloquently sets forth a series of values prompted by coastal zones. Said Edison in his foreword, "...the fact that Monhegan is surrounded by the ocean offers some hope of insuring its perpetuation as a place where immensity and solitude can be found within short walking distance of an attractive, informal community -- and if Monhegan can maintain its present patterns of life, it is bound to become increasingly alluring to many people who are rapidly losing contact with permanence, immensity, peace and solitude elsewhere."

"Contact with permanence"--a sense of the history of the earth itself, is one of the values we turn to coastal zones for. Althought tidal actions suggest rhythmic changes, the larger actions and the still larger settings reveal aspects of permanence. Painter Reuben Tam, writing of the importance of place on his work, speculated "My work as a painter, my most personal concerns, my obsessions and interests and involvements all these have their origin and substance in the spirit of place. I was born on Kauai, northernmost of the Hawaiian Islands, an island of towering volcanic mountains, deep canyons, lava headlands and beaches. The sea was all around, intimate and vast. I wanted to walk the shores of the world. Geology was always the most compelling study for me and geomorphology especially. To be aware of the origin of land, the revisions of the earth's crust, the imminent changes of the coastline, the cycles and surprises of weather and climate..."

Accepting the notion that land yields a "cultural harvest" (as Aldo Leopold has written), then coastal zones offer us a way to connect up with something permanent in our own history, a place where events and actions co-mingle with the site. One of the most poetic descriptions of how rivers move us spiritually from past to future was contained in the will of Prime Minister J. Nehru of India. In part, Nehru wrote in his will as follows: "I have been attached to the Ganges and Jumna Rivers in Allahabad ever since my childhood and, as I have grown older, this attachment has also grown. I have watched their varying moods as the seasons changed, and have often thought of the history and myth and tradition and song and story that have become part of their flowing waters. The Ganges, especially, is the River of India, beloved by her people round which are intertwined her racial memories, her hopes and fears, her song of triumph, her victories and her defeats. The Ganges has been to me a symbol and a memory of the past of India, running into the present, and flowing on to the great ocean of the future..." Nehru's view of the river, unfolding, intertwining, is that it is essentially a cultural repository, and hence permanent.

Projects such as the proposed Hudson River Expressway, which would destroy shorelines, alter context and most damaging of all, modify scale, ultimately deny to future generations a chance to "experience" the past and, therefore, make it impossible to establish a connection with a part of our cultural heritage.

Theodore Edison's list of coastal values also included immensity, peace and solitude. People turn to coastal zones to find a vantage point, to gain distance-both real and emotional-from the often cramped and boxed in daily life. Coastal zones are where we find release into daydreams. The influence of one's immediate environment on one's feeling of well being or one's behavior is usually very subtle, but it is definite and may be profound. Our place, our neighborhood, not only relects our character, but it influences our moods. Now we have learned what happens to people who are deprived of their nocturnal dreams. They become restive, agressive, nasty, strangely bad-tempered. I think the same might be said of us when we are denied the chance to dream by day, when we are prevented from having unfocused, mind-wandering, unstrung relaxed, free-associative moments-moments which are often found in coastal zones, on a jetty of rocks looking out to a river or sea, or lying out in the sun on a deserted beach. These places permit us our daydreams without which we become jumpy, aggressive or sullen. I believe there is a deep need for such daydreams, a time to find ourselves at equilibrium with the earth and waters.

Not included on Edison's list--but essential nevertheless--is the value of play. We are all children in coastal zones--gathering shells and nests, the debris of tides, digging holes, making sand castles--all explorations of profound sensory importance.

Yet, perhaps the primary value of coastal zones is that such places are where we can most readily gain an ecological viewpoint. Paul Shepard once wrote "ecological thinking.....requires a kind of vision across boundaries. The epidermis of the skin is ecologically like a pond surface or a forest soil, not a shell so much as a delicate interpenetration. It reveals the self ennobled and extended rather than threatened as part of the landscape and the ecosystem because beauty and complexity of nature are continuous with ourselves." The visual field can contribute to this ecological perspective. If the visual circumstances are right, experiences in these coastal areas will allow individuals to establish connections with geological, biological, historical and personal past times. Where the visual field is not arbitrarily broken or interrupted, we can more readily experience the delicate interpenetration to which Shepard refers. Aldo Leopold once wrote, "land is not merely soil...it is a fountain of energy flowing through a circuit of soils, plants and animals...a sustained circuit, like a slowly augmented revolving fund of life." The ecological viewpoint is responsive to this circuitry, this interconnection and interpenetration.

The choices we make about how the coastal zone is used, about what it permitted to be placed there, determines in great measure

whether or not those watery areas can provide what they provide so beautifully, and what, if they do not provide, may be denied to people. The question which follows is: how may coastal zones maintain the values of permanence, immensity, peace, solitude, play and the ecological view?

In brief, I see four critical areas for action. Of primary importance are strategies of preservation and restoration. The key questions are, what is essential to the coastal zone, what kinds of operations must necessarily be placed in such areas and perhaps, more to the point, are there present facilities in coastal zones which could be moved back from the water's edge? Many facilities--oil tank farms, coal dumps, granaries--could be effectively operated inland, linked to ships by pipelines and conveyors. Residential construction, too, should be severely restricted in coastal areas in order that the shoreline might serve its biological functions on one hand, and to provide continued public access on the other.

Access is the second area of concern. Visual access to coastal zones must be maintained, and this refers to both near and far viewing. Citizens must be able to see the shore; they must be able to see from the shore; they must have tactile as well as visual access.

It is not sufficient merely to see the shoreline. The landscape itself must be a place of high visual quality. To pollute means to defile; to pollute visually means to defile and degrade what we see in the landscape. Yet, a pollutant is not a pollutant simply because it is intrinsically ugly, nor is it a non-pollutant simply because it is intrinsically beautiful. A visual pollutant is a misplaced element. Whether or not something is misplaced depends on context and context has to do with the character of a visual field as a whole at any one place. One power generating plant placed in a scenic river valley may be so galvanizing in its visual insistance that it effectively dominates and destroys the entire setting.

The visual field is fragile. Single misplaced elements can destroy whole vistas. Billboards along a sprawling roadside strip may almost work, preparing the driver for the arrival of a commercial district, announcing that stores, bars, motels and eateries will be coming up. Such billboards are a preview of coming attractions. However, a billboard placed along a scenic river road, much as a television commercial inserted in fine film, will probably have an effect well beyond the time it is actually seen.

The fourth area of concern is context, or fit, in the landscape. A proper context does not require the exclusion of all non-conforming elements. A landscape which possesses visual clarity may comfortably absorb forms and objects which in themselves are non-conforming. Conformity becomes a visual pollutant

when sameness dulls the landscape and our ability to respond to it. Non-conforming elements--the unexpected and surprising juxtapositions of man-made with the natural (I can think of the often beautiful harmony of bridges and rivers) do not necessarily constitute visual pollutants. If the non-conforming structure is sensitive in scale and character to the existing landscape, the viewer may be helped to readily sense the consistent quality of the place.

The struggle against visual pollution is, therefore, essentially an effort to preserve the integrity of the visual environment. And, integrity brings us back to wholeness, the sense of continuity, the interconnections, and finally back to the ecological viewpoint, that profound interpenetration. Because of the special, dynamic element of water in coastal zones, the rising and falling of tides, the longer horizons, the issue of context becomes absolutely critical.

I have been reflecting on values and strategies related to visual quality and the coastal zone. Perhaps a better title for the conference which brought us together would have been "human quality and the coastal zone" for it is not alone what we see that counts, but how what we see makes us more fully human. We all began as swimmers, swimmers in our mother's womb, swimmers carrying within our blood a taste and memory of salty beginnings centuries ago. We live in part as travelers and wanderers. Coastlines are perhaps the ultimate playgrounds, places where our nature and nature's own apparent randomness co-exist, permitting us to wander along unmarked ribbons, walking in and out of waters way. The seas and rivers in all their varying moods remind us of our limits. The places where we tread and leave marks are soon obscured by charging tides. The houses we build too close to waters edges fall, in time, victims to the patient, inexorable movement of the earth's waters.

The tides wipe clean our human markings. There is nothing more virginal than a morning beach, freshened by the working of a night tide. The freshness of the beach, it seems to me, is what we must preserve. Yet, not the beach itself, but the capacity of the beach for its own renewal, its ability to cleanse itself, and most important, to remain a landscape of potential, a place where those who follow on another day, for daydreaming, for reconnecting with events of other times, a place to rediscover the elusive beauty of humility.

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VISUAL BLIGHT - A REPORT

AND ITS RECOMMENDATIONS TO THE STATE OF NEW YORK

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Abstract

A fourteen month study of visual pollution suggests a typology of macro- and micro-spatial patterns and social processes which actively create and sustain landscape blight. Criteria for judging aesthetics viz the landscape are presented and argued to be judicially appropriate for inclusion in coastal land use legislation.

Introduction

The landscape of New York State is a mosaic of social, behavioral, perceptual, and natural images. Each, in some way, is unique. Each, as Alan Gussow has so eloquently stated, is a "place." At the same time, each is a subset of a larger whole. The "coastal zone" is one approach to areal definition. There are, of course, many other ways of setting up a typology of regions for the state. In our fourteen month study of the visual environment of the State of New York, we defined a set of arenas, settings, and processes. Any typology is but an heuristic device which is only as useful as the insights it may give to the problem under review. We feel that our arrangement is helpful in understanding some of the social mechanisms at work in changing the present-day visual environment.

Blighted Empire - the visual environment of New York State was commissioned by a grant from the State's Council of Environmental Advisors. Its initial purpose was to aid the Council in setting legislative priorities for the Governor and the State legislature in the environmental field. As it evolved it became a statement advocating increased public understanding. Our particular concern was defining "visual pollution" and making suggestions for its curtailment. Our first step was to describe the landscape mosaic of the State and the social processes which work to create, modify, and perhaps to uglify this visual environment. We began by assuming, in other words, that landscapes are not static entities in and of themselves, but are visible indicators of ongoing social processes.

Socio-Spatial Typologies

Arenas

Arenas are defined as those generalized areal arrangements where human activities differ as to their density and intensity. These include the rural, suburban, small town, and urban spaces. Each is in some way different from the other, in both demographic and land use characteristics, and in its presentation of self - that is, in its meaning as portrayed by its visual landscape.

Thus defined, the rural landscape is approximately 61% of the State, within which approximately 14% of the population lives primarily in dispersed homesteads. The suburban landscape is in many ways visually similar in its spatial arrangement, for its visible homogeneity, and its subsequent visual (and perhaps social) dullness. Small towns are not dying in this State: there are at least 378 villages, hamlets and unincorporated areal units between 2500 and 25,000. Each has its own uniqueness, although many are losing their sense of place to the spread of urbanization. The urban realm, where over 85% of the State's population live, have their own positive visual elements, primarily in the diversity and density of their artifacts and social activities.

Arenas are nevertheless but a first approximation, for each is perceived and used by different social, ethnic, age, and sex groups in a variety of ways. We termed these behavioral spaces

"settings," which operate at varying scales as micro-social environments. Six settings were defined: residential, occupational, institutional, recreational, commuter, and background.

Settings

The residential setting is composed of the dwelling units, clusters, and associated surroundings. The home environment is the one setting which is the landscape of everyday life for most people most of the time. The occupational setting includes places of work and their service facilities. The institutional setting is where customers or patients are serviced - - this university is such a setting for the students involved. The recreational setting is where amenity resources are located. This setting, in particualr, contains specific resources which may be destroyed or damaged by the proliferation of the artifacts of commercial development, such as billboards and hotdog stands. The commuter setting is linear space between other nodal settings; it is the journey to work or shop, the line or route of movement. The background is composed of the "natural" environmental areas, the parks or wilderness sites.

Processes

The cultural landscape, which can be subdivided into its constituent areas or settings, is in constant change due to ongoing social processes. Three processes which seemed particularly pertinent to a study of the visual environment are circulation, consumption, and communication. Each functions independently - such as in the movement of goods or people, the use of increasing amounts of energy or packaging materials, or the expression of information through graphic, verbal or symbolic methods - to change the landscape. At the same time, they usually work together, thus overwhelming the totality of the visual environment. In this context, the visible blight of the "strip" is a function of all three processes acting, cumulated, upon the landscape. As blight in a linear space, it may also be a rather unsettling precurser of the coastal zone.

The functioning of social process is perhaps most easily seen in relation to specific examples within the State. We chose as example for the study of blight in the landscape, skyscape, and townscape. Billboards are a visible expression of communication. Like all signing, billboards are a graphic presentation of information, but they are designed to sell rather than index the environment. In terms of the landscape's integrity, indexing is a legitimate function of signing, while selling is not. The growing demand for the consumption of electricity is shown by the growth of transmission lines across the skyscape. Meanwhile, the townscape is losing its image through the ooze of development and the loss of internal nodes and external edges. Each example is also an example of the integration of the three processes sketched above as well.

Typologies of spatial arrangements or social processes are not enough, however, if our major concern is to argue for a concern for the visual environment. Since each may be seen as unique, and since each person or social group may perceive them differently, how is one to argue the case for "beauty"?

Aesthetic Judgement

Criteria

There are several criteria which are as useful in landscape criticism as in art criticism. In general we can say that too much visual stimulation leads to a chaotic aesthetic environment, while too little to a dull and boring one. In either case the critic would not judge the presentation very highly. The better approach, it seems, is somewhere in the middle between the two extremes, where complexity brings excitement to the milieu, yet is not lost in a melange of conflicting images. René Dubos (1974) has spoken eloquently for the need of such diversity in the cityscape, while Amos Rapoport (Rapoport and Kantor, 1967) argues for "ambiguity" in design, by which he means both uncertainty and multiplicity of meaning. Environmental complexity is necessary, Rapoport insists, for the fullest development of "perceptual richness" (Rapoport and Hawks, 1970, p. 110). A.P. Parr perhaps says it so well for us: "Our predicament arises from the accelerating displacement of the rich diversity of natural surrourdings by the repetitive uniformity of human artifact, in a process compounded by limitations upon human skills and individualities imposed by false economic doctrines and false esthetic dogmas." (Parr, 1972, p. 39)

The critical aesthetic judgement of landscape is in many ways analogous to art criticism in general: patterned order must be established without monotony. Objects or particular areas within a setting, whether on a canvas or in a landscape, should be able to show an integrity of their own; in other words to contrast with other elements. Often this is done by the use of color or texture. But too much contrast among elements may overload the visual field so that gradation is necessary in order to establish a gradual transition from one quality to the next. A unity is established by the artist or the natural landscape which incorporates a variety of points, lines and surfaces. This design principle of "theme-in-variation" allows the underlying pattern to be manifested in numerous ways, enhanced by moments of visual excitement, yet with a sure sense of restraint in the use of these arresting effects.

These principles are appropriate to the critical judgement of whole landscapes (whether a completely man-made urban fabric or a relatively natural scenic view) as well as to parts of the whole. Judgement is an on-going process, since the cultural landscape is in constant change. Each artifact (building, road, or sign) may be judged independently on these criteria, while at the same time it is even more important to judge the effect of this change on the total landscape. There must be a relationship among all the elements in the cultural landscape - a relationship that is as ecologically sound and aesthetically pleasing as that found in a healthy natural environment. A proper relationship provides a context for the preservation of identity. Elements within the environmental image of a place are unique and often their preservation gives an added dimension to the visual scene. Historical and social dimensions are necessary in defining the aesthetic of a visual composition. In many ways whole towns or villages may argue for a statement of uniqueness as set distinctly in the grain of a larger landscape. Or alternatively,

whole scenic vistas such as a rural farming river valley or a stretch of coastal wilderness may have this elusive quality of identity.

The coast of Maine has been described as a unique resource using many of these dimensions (Eliot, 1967: 1 - 3):

> I am sure that we all agree that Maine's greatest asset is its varied and beautiful shoreline...But what good is it? What is the 'value' of scenery and natural beauty? ...Fortunately, tastes differ and different kinds of natural beauty appeal to different groups. While some find the sea and rocks cruel and menacing, others respond to the challenges of adventure and the far horizon. Some prefer safe harbor and refuge from the storms. Some look for the flights of wild geese or the nesting places of rare visiting birds, while others seek to lose themselves in the great open spaces.
>
> Whatever their tastes, more and more people find the natural beauty of the Maine coastline provides satisfaction and re-creation for their inner selves, yet more and more they are met with tall fences blocking the view of sea and shore, or with NO TRESPASSING signs instead of a welcome mat....
>
> The coast of Maine should be better known and treasured not only for its natural beauty but also for the associations which attach to that scenery from man's activities in the area... In these and many other happy associations there are many values comparable and complementary to those of natural beauty. Again, they are subjective values which cannot be measured in terms of quality or cost. Like the qualities which distinguish natural beauty, we need inventories and appraisals of these historical associations so that more people will appreciate them and share the responsibility for their protection.

The coastal landscape of New York State is no less unique in its natural, historical and social aspects. And, the scenic view is even more endangered. It is precisely the aesthetic values of the Hudson River Valley, Long Island Sound, and Lake Ontario shorelines that must be preserved.

Legal Aspects

The criteria for aesthetic judgement as outlined briefly here have been systematically surveyed for both scenic (natural) landscapes and urban centers (Lowenthal, 1968; Lynch, 1960). They can therefore be judged by the scholar, but can such criticism be upheld in the courts? Judicial review of zoning laws and sign

ordinances suggest that such decisions can be made even though the "precise definition" of beauty may not be able to be made (Dukeminier, 1955). If courts can decide on such multiordinal words as wealth or justice itself, then why not on beauty? (Anonymous, 1971). Most early decisions were based on concepts of health and safety. The public welfare later stretched to include aesthetic concerns, as in Justice William O. Douglas' brief in the Supreme Court ruling on Berman v. Parker (1954). By 1964 New York State had accepted the legitimacy of aesthetic considerations in legislation designed to promote health and welfare (People v. Stover). It can now be accepted that, according to People v. Goodman (1973), aesthetics are a valid subject of legislative concern. If properly conceived and drawn up, then, legislation which attempts to preserve coastal beauty or promotes the elimination of coastal blight should be acceptable. Also, legislation which deals with the control or use of land along the coast can therefore have an aesthetic or visual component.

State control over coastal shorelands, and I would submit over the water as well, can and must include considerations of the aesthetic impact of any change to that land- (sea-) scape. Environmental impact statements which are mandated for certain Federal or State projects can do more than they are now doing to support this concern. Admittedly the visual analysis of a seacoast is a bit more tricky than the chemical analysis of industrial effluent, but the criteria proposed above can be used as a starting point. Such criteria can be effectively and judiciously coordinated into a Visual Quality Index, which can be the working tool to analyze visual impacts of landscape change (Flad, 1974).

Impact of the Report

Concern about the processes which create and sustain visual blight was the basic purpose of Blighted Empire. Specific legislation was not analyzed in detail, nor were model ordinances presented. But the message is clear: a beautiful State is being uglified; but there is yet time and opportunity to rectify the situation.

Reviewing the report, The New York Times (Webster, 1975) noted the potential for just such an approach to alleviating the rapid uglification of the State's landscape. In a later editorial (Economics, 1975) the paper forcefully presented the issue as a fundamental question in land use control:

> There is a need for competent evaluation of growth and change. A visual impact statement should be a routine part of any environmental impact statement, or the assessment of impact is incomplete.
>
> ...This is more than window dressing. Visual blight is not a surface symptom; in terms of physical form and function, it is an indication of urban health and a livable environment.

In such attempts at raising the public consciousness and in stimulating the emergence of citizens' visual environment committees designed to have input into the local planning and decision-making process, the report has been moderately successful. When the State becomes committed to solving the problem of blight enough to publish the final version of this report, it may prove to be an important starting point for all those interested and committed to preserving the character or planning the design of the changing landscape.

Relevance to Coastal Zone

The recommendations of the report were based primarily on the problem of overall landscape blight throughout the State. Nevertheless, there are at least five major points which can have direct relevance to the concern for the visual quality and assessment of the coastal zone:

* Aesthetic judgements can be made.

* Legislation and legal precedent exist.

* The coastal zone can be considered a unique social and physical environment which has its own identity and "sense of place."

* Change is a constant process of the coastal environment, and any attempt at preservation or control of this linear space must take into account the social processes which create distinctive behavioral settings in this milieu.

* The concern for visual quality must become an important and necessary input into the planning process of of coastal zone management by all levels of citizen, professional, and legislative action dealing with the coastal environment. There is a need for social consciousness to be raised to include aesthetic resources.

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PERCEPTIONS OF ENVIRONMENTAL QUALITY

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PERCEPTIONS OF ENVIRONMENTAL QUALITY

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Abstract

A general measure of environmental quality has been developed as part of a study of environmental beliefs. The basic theory and operationalization of the instrument is discussed here. Field testing of the instrument in a pilot study is reported elsewhere. The instrument is readily adaptable to measuring visual quality of the coastal zone.

For the past ten years there has been a great deal of discussion concerning environmental degradation. But what do we mean when we say an environment is degraded? A related concept, quality of life, also has come prominently into public discussion. Here again, what do we mean by "quality of life"? Large public programs and, possibly, total judgments about the performance of governments are based on implicit definitions of the meaning of these terms. It is the purpose of this paper to offer a conceptual and operational definition of environmental quality which is reliable and valid, which is sensitive to life-style differences, which can be used in a number of cultures, and which can be used for comparisons across time.

It is not intuitively obvious why measures of environmental quality are useful and hence why it might be important to develop them. We see three important kinds of uses. First, as implied above, they can be an important indicator of system performance. Nearly all public management systems aspire to a high level of environmental quality. Presumably that is an essential element for a high quality of life. Environments which insult or injure the humans who live in them necessarily detract from quality of life. Measurements of environmental quality, taken at regular intervals, provide a useful indication of how well a political system is performing in this regard. Perhaps more importantly, they can indicate in what respects the efforts of a system are succeeding and in what respects they are failing.

Secondly, environmental quality measures can be used as a tool for social planning. Social planners need indicators of the relative urgency of various social needs so that they can assign priorities to action programs. The measure of environmental quality which we propose here contains judgments about the importance of various environmental elements in a person's

total quality of life. Aggregated judgments for a given community can suggest to social planners which aspects of the environment citizens believe to be most important for their life quality. Equally useful is a measure of the imbalance between what people feel to be important and their judgment about its pleasingness or satisfactoriness. If many members of a community believe that an environmental element is important and also that it is in very poor condition, planners have a clear signal that the community wishes them to do something about it.

Thirdly, quality of environment measures are useful, even necessary, variables in models of environmental systems. At the present time numerous scholars are modeling environmental systems in order to better plan how they may be maintained or improved. Nearly all such models require some sort of judgment about environmental quality. It follows from this that the more validly and reliably it becomes possible to measure environmental quality the greater the accuracy and usefulness of the models that are developed and used.

Conceptualizing the Measurement Problem

The potential for solution to the problem is inherent in its conceptualization. We begin with the assertion that there are no objective measures of environmental quality; quality is inherently subjective. This assertion will be shocking to most current designers of measures of environmental quality since most are using collections of objective indicators. We believe that there is a conceptual resolution to the dispute between advocates of objective and subjective measures of environmental quality.

First, let's recognize that objective indicators of environmental conditions are extremely useful. If impurities in air or water can injure persons or give them diseases, then it is important to measure their presence and attempt to eliminate them. We have learned over the past twenty years that many of these insulting substances in our natural environment are not detectable by our ordinary senses and could be injuring us while we fail to notice any injury. Subjective indices would not be useful for such detective purposes and we strongly advocate the development and use of objective indicators of the condition of our environment.

But let us make a clear distinction between environmental conditions and environmental quality. High scores on objective measures of environmental conditions will not ipso facto lead to a high quality environment. Quality, rather, lies in the eyes of the beholder. It is a perception or a feeling that something is good or right or enjoyable. If a person believes that his home environment is of high quality, it is, for him, of high quality no matter what may be asserted about it by "objective" observers. If a person believes that his water is

clean and that his food tastes good, it is for him of high quality even though, unknown to him, it contains impurities which may injure him. Later when the injuries set in, he will perceive that his quality has been diminished. But, if our objective is to measure quality, per se, then we cannot escape the recognition that quality can only be measured as the person himself is experiencing it.

Some will assert that we should avoid subjective measures because they are very difficult to develop and to make reliable and valid. Admittedly, they are difficult but there are even greater difficulties with so-called "objective" measures. They are subject to the same reliability and validity problems that plague subjective measures. The greatest difficulty which we see, and it disqualifies them as measures of quality for us, is that one cannot validly infer a subjective experience of quality from an objective statement about a condition. In our judgment, attempts to measure quality of environment using only objective indicators is a false trail leading up a blind alley. We should be careful not to use the word "subjective" in a pejorative comparison to "objective". When objective measures are inappropriately used to infer life qualities, they are less scientifically valid than subjective measures.[1]

Critics of our subjective approach may object that the same physical phenomenon will be judged at different levels of quality by different observers; or, it may be judged at different levels of quality at different points in time by the same person. Our response is that quality is a phenomenon that we should not expect to be in a fixed relationship to physical things. Quality is not definable in terms of a specifiable quantity of any one or several physical entities that remain stable over time or from place to place. Hence, it is in the nature of quality as a phenomenon that it may shift with observers and shift over time. The measurement target is not the physical phenomenon, but quality itself; it is necessarily subjective in its basic character.

A further aspect of our basic posture is that it is possible objectively to study subjective perceptions of quality of environment. People can report in fairly straightforward ways how they evaluate the quality of various elements of their environment. These evaluations can be scaled and compared across environmental factors for an individual, aggregated for an individual, aggregated for communities, compared across communities, and compared over time for individuals or communities. Before describing the theoretical and operational details of developing such a measure, we must decide what to include in our definition of environment.

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[1] Andrews (1974) has extensively reviewed many facets of the subjective-objective controversy within the community of scholars working on social indicators.

Definition of Environment

Quality of life investigators who take a subjective approach often ask respondents for a single overall judgment of their life quality. Usually they also investigate specific domains of life for their quality and compare these domain scores with the overall judgment of life quality. We could not use this approach for our investigation of perceptions of environmental quality because environment does not have a widely recognized constant meaning in the population of this or any other country. Environment is really many things and, rather than seek an overall judgment about it, it is more valid and useful to seek judgments about specific elements of it.

A second consideration in not opting for a single overall judgment about environmental quality is that perceptions of environmental quality necessarily involve evaluations. Dillman and Christenson make the point in a recent article that values are more general in nature than attitudes and that they suggest hierarchical order. These two considerations should be borne in mind as one devises a strategy for measuring or assessing values. Because of this they opt for a strategy of asking respondents to evaluate a wide ranging set of broadly stated concerns relative to each other (Dillman and Christenson, 1974, pp. 206-221). Our own multi-element approach produces differing levels of evaluation across environmental elements. When these evaluations are compared, useful inferences can be drawn. An overall evaluation is much less useful.

Given our strategy to measure the quality of many elements of an environment, how broad a net should be cast? Environments are, most obviously, physical. There is land, vegetation, and possibly water. The physical environment also includes the air we breathe, the water we drink, the wildlife that lives in the area, and the topography of the land. Another physical factor is the overall climate or weather for the region.

Man has generally added some physical structures to the natural physical environment he inhabits, such as buildings, roads, and so on. The most important of these structures is his dwelling; it has such characteristics as beauty, comfort, privacy, security, convenience of location, and neighbors. All of these characteristics have qualities which are reacted to by the people who inhabit a given dwelling.

Persons also have activity in environments outside their home such as the places where they go to school, work, for recreation, and so forth. All of these activity environments have physical characteristics to which people react, as well as interpersonal environments which people find nourishing or insulting. Both the physical and interpersonal characteristics of these activity environments must be included in an overall definition of quality of environment.

Finally, there are some broader, general characteristics of the community, or country, in which a person lives that must be considered as part of his environment. Communities differ in beauty, convenience for getting about, the availability of cultural, recreational, educational, and job opportunities, the availability of goods and services, and so forth. Communities may also be characterized by moods, such as a sense of friendliness, or pride, or excitement, or freedom, which nourish or insult the people who live in them. In our judgment all of the above must be included as essential elements in any attempt to measure environmental quality.

While the reader can see that we have cast a rather broad net, it is fundamentally a definition of environment and is not a full definition of the components that should be included in a definition of life quality. For example, we did not cover the domain of loving human relationships with family and friends; yet, these are probably the most important set of qualities making up overall life quality. Many quality of life investigators cast their inquiry in terms of personal or psychological well-being. We believe that direct measures of well-being are important and germane for measures of quality of life but not for a measure of quality of environment. We believe that a high quality environment might lead to a sense of well-being but it cannot be identified with a sense of well-being in the same way that it is possible to identify a sense of well-being with quality of life.

Theoretical Premises Behind the Operationalization

As we thought about the task of conceptualizing and measuring such a complex set of qualities, we had several theoretical premises in mind. It seemed to us that every evaluation of quality had two components; the first is valence toward the environmental element. That is, is the person attracted or repelled by the element and what is the extent of that attraction or repulsion? The second component of quality is importance. Environmental elements are not all of equal importance to an individual; some he may consider essential while toward others he may feel indifferent. The more important may then be given higher priority for action and assigned greater value than the less important in any overall calculation of environmental quality.

A second major premise behind our work is that the scales which measure valence and importance should be identical across elements. This would enable the comparison of qualities across them, it would enable a summation of qualities for a given individual, and it would enable comparison of qualities across individuals, across time, and across communities when the qualities of individuals are averaged for a community.

If scales are to be identical across elements, and used for comparisons across communities, some of which may be in different national cultures, it is necessary that they be fairly simple. They should not be dependent on highly subtle word phrasings which are extremely difficult to make equivalent across social classes in a given culture. The scales, rather, should be based on very simple and straightforward daily types of judgments with which everyone is familiar, no matter what his culture or class.

The basic valence and importance scales need to be supplemented, on certain elements, with scales enabling respondents to make semifactual judgments about the characteristics of their environment. These semifactual scales are specially designed for each environmental element with the purpose of facilitating a correct interpretation. For example, if we ask people if they are pleased or displeased with the level of crowding in their residential neighborhood, we still do not know if they are pleased because the residential crowding is relatively low or if it is relatively high. In this case the supplemental scale asks for their perception of crowding as relatively low or high and follows with a scale inquiring if that level is too low, about right, or too high.

A final premise underlying operationalization of our measure of environmental quality is the advantage of displaying the scales in a visual-spatial representation. The presentation of scales in five equally-sized and -spaced boxes gives the visual impression of equality of intervals. Such a presentation allows sparse use of words and places more emphasis on the spatial representation of the scale's dimensions and meaning. In addition to the advantages of this format for cross-cultural comparisons, it allows the presentation of these stimuli in a self-administered module which requires less time to complete. For example, the module we have prepared for measuring perceptions of environmental quality has one hundred seventeen scales and requires approximately one-half hour to complete. That is almost ten minutes faster than would be required for oral presentation of each scale followed by the soliciting of an oral response.

The Instrument Development Process

Our first developmental task was to select the elements that we would wish to include in our definition of environmental quality. The theoretical categories set forth above -- natural physical environment, physical environment of the dwelling, activity environments, and characteristics of the community -- were the general categories with which we worked. Articulation of these general categories produced a list of approximately seventy specific elements. We then scanned the relevant literature seeking further ideas and more complete coverage. Seventy to eighty items proved to be far too many to cover within a reasonable time of administration in an interview and therefore

the list had to be culled to manageable size. Sometimes this could be accomplished by using a somewhat more general element to represent two or three specific elements. Questioning of respondents in pretests disclosed that certain elements were generally considered to be of lesser importance and these were dropped from the list. During this culling and conceptualizing process we also experimented with different wordings and pretested extensively to make sure that the wordings communicated to others the meaning that we intended. The specific environmental elements were finally reduced to thirty-seven, a more manageable number.[2] The specific items and their wordings are shown in Table I.

At the same time that we were experimenting with item selection and wording we also experimented with scale format and wording. For the valence scale we sought a format which would be readily comprehended cross-culturally and would have the potential of showing both positive and negative valence. Our experimentation showed that a format of five boxes using simple plus and minus symbols was readily understood across cultures and classes.

The selection of polar adjectives to characterize the opposite ends of the scales also proved to be problematic and important. The theoretical statement that best represented our intentions was a scale running from "nourishing" on one end to "insulting" on the other. We conceived of an individual living in an environment in which he receives nourishing or insulting stimuli. The total of such stimuli for a given individual, summed algebraically, might constitute a statement of his environmental quality. Unfortunately, the terms "nourishing" and "insulting" were not readily understood by some respondents and had to be abandoned. We experimented with several other polar adjectives, such as good - bad; pleasing - displeasing; satisfying - dissatisfying; etc. We finally settled on "pleasing" and "displeasing" as polar adjectives because they were fairly close to our initial conceptualization of nourishing and insulting and also were readily comprehended by respondents from all kinds of backgrounds.

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[2] Readers desiring a copy of the full instrument should write to the author.

TABLE I

Items included in the quality of environment module

1 Variety of wildlife (birds, animals, etc.) in your community
2 Natural outdoor recreation (skiing, hiking, swimming, fishing, picnicking, camping, etc.)
3 Unspoiled nature
4 Quality of the water we use for recreation (swimming, boating, etc.) around here
5 Quality of water used in your household
6 Level of cleanliness of the air around here on most days
7 Overall weather (climate) for this area: consider the weather for the whole year
8 Topography (flatness or hilliness, lakes and rivers) of the land around here
9 Relations among groups (racial, religious, political, ethnic, class) in your community
10 The overall mood of your community – community feeling or spirit
11 Level of excitement in your community (exciting places to go)
12 Job opportunities around here (general job market – not just for you personally)
13 Freedom you have to live where you want
14 Freedom you have to move or advance from job to job or class to class
15 Educational opportunities around here
16 Public information media (from newspapers, radio, TV, etc.)
17 Products available in your community
18 Food available around here
19 Medical care in your community
20 The level of crowding in your residential neighborhood
21 Isolation of your community
22 Man-made environment (buildings, landscaping, roads, etc.) around here
23 The collective transportation system (mass transport or public transport) in your community
24 The collective transportation system (mass transport or public transport) for long distance travel
25 The level of traffic congestion in your community
26 Physical conditions of the environment where you work (indoors and outdoors)
27 Physical conditions of the environment where you go to school (indoors and outdoors)
28 Relations with fellow workers
29 Convenience for getting to other important places (for example, to work, to shop, etc.) from your home
30 Relations with your neighbors
31 Mechanical helpers in your home (electrical appliances, tools, etc.)
32 Security of your home
33 Beauty of your home
34 Comfort of your home
35 Privacy in your home
36 Noise level in the home setting
37 Public services:
   electricity
   telephone
   gas
   garbage collection
   postal system
   public water system
   police protection
   fire protection
   sewage disposal

The importance scale also had to be carefully worded. A simple scale running from very important to not important at all had the disadvantage that pretest respondents tended to score nearly every item as very important; this was to be expected since we had already selected out for inquiry those items that we considered to be most important. In order to "stretch" the scale we added a box labeled "absolutely essential". This tactic worked well in that only a relatively few elements were judged as absolutely essential by most respondents. Figure I illustrates how the stimuli were visually presented to the respondent.

Another basic part of our developmental plan was to carry the instrument development process through several iterations of conceptualizing, operationalizing, pretesting, analysis of pretest results, and reconceptualizing. The instrument was carried through at least four iterations (though it is sometimes difficult to tell where one iteration ends and another begins) of development over a four-month period. The data analysis from these simple pretests was necessarily fairly superficial. To obtain more elaborate data, the instrument was tried out on approximately three hundred persons in a sizable pilot study and a much more extensive analysis of data has been performed. On the basis of that analysis we are in a position to recommend further consolidation and shortening of the instrument, though we are pleased with the basic format and wording of the scales.

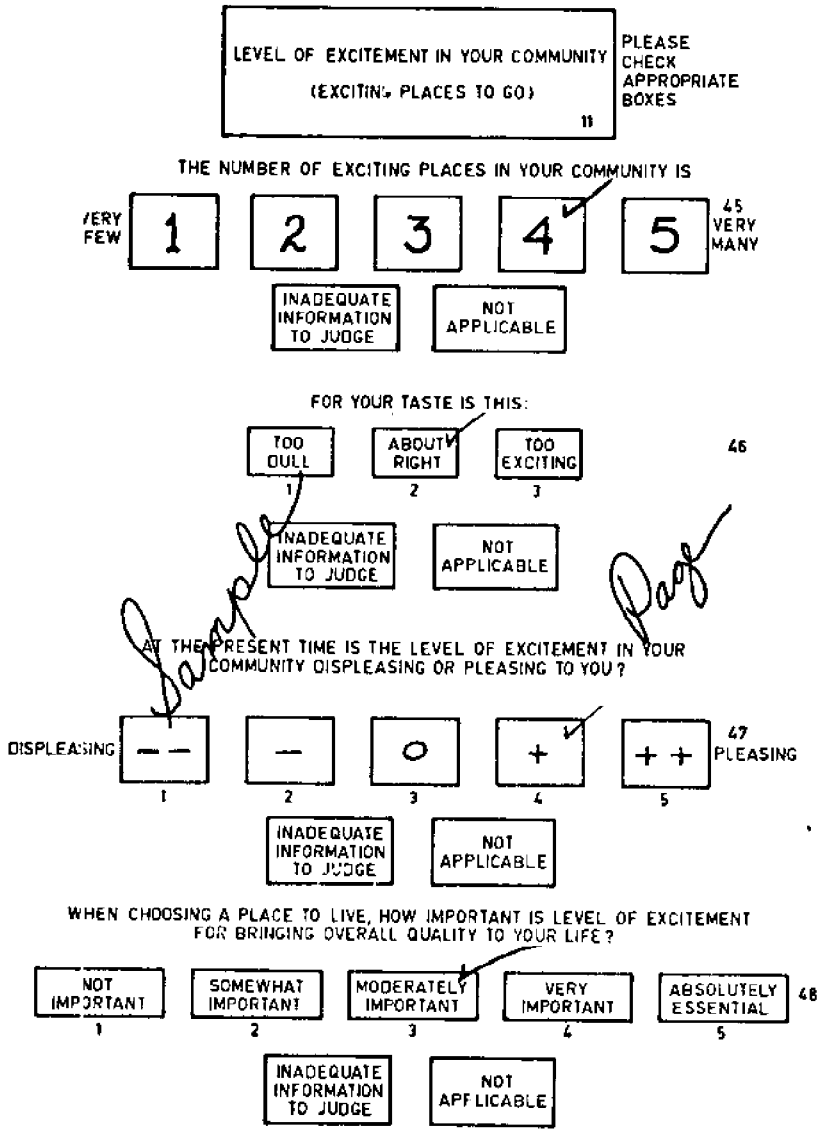
Empirical Examination of the Quality of the Instrument

The pilot study was conducted in Erie County (the county surrounding Buffalo, N. Y.) and Hamilton County (in the Adirondack region of New York State). The counties were chosen to provide maximum contrast in physical and environmental conditions. The pilot study was designed to provide a thorough field testing of the research instruments that we had been developing. Space limitations do not allow me to develop fully here the findings from that pilot study. [3]

By and large, we are pleased with the performance of the environmental quality module. It produced reliable and valid data. It showed clear life-style differences between the populations of the two counties. It showed that even though people in the two counties had different life-style preferences, persons living in Hamilton County generally got more of what they wanted out of life than did people in Erie County. The instru-

[3] A thorough statement of the pilot study findings with respect to the environmental quality module, and an examination of how well the instrument worked, can be found in "Perceptions of Environmental Quality" by Lester Milbrath and Robert Sahr, Social Indicators Research, Volume 1, Spring 1975, pp. 397-438.

FIGURE I


LEVEL OF EXCITEMENT IN YOUR COMMUNITY
(EXCITING PLACES TO GO)
11
PLEASE CHECK APPROPRIATE BOXES
THE NUMBER OF EXCITING PLACES IN YOUR COMMUNITY IS
VERY FEW
1
2
3
4
5
45
VERY MANY
INADEQUATE INFORMATION TO JUDGE
NOT APPLICABLE
FOR YOUR TASTE IS THIS:
TOO DULL
1
ABOUT RIGHT
2
TOO EXCITING
3
46
INADEQUATE INFORMATION TO JUDGE
NOT APPLICABLE
AT THE PRESENT TIME IS THE LEVEL OF EXCITEMENT IN YOUR COMMUNITY DISPLEASING OR PLEASING TO YOU?
DISPLEASING
— —
1
—
2
O
3
+
4
+ +
5
47
PLEASING
INADEQUATE INFORMATION TO JUDGE
NOT APPLICABLE
WHEN CHOOSING A PLACE TO LIVE, HOW IMPORTANT IS LEVEL OF EXCITEMENT FOR BRINGING OVERALL QUALITY TO YOUR LIFE?
NOT IMPORTANT
1
SOMEWHAT IMPORTANT
2
MODERATELY IMPORTANT
3
VERY IMPORTANT
4
ABSOLUTELY ESSENTIAL
5
48
INADEQUATE INFORMATION TO JUDGE
NOT APPLICABLE

ment showed for example, that people assigned high priority to certain environmental elements which they perceived to have very low quality. In other cases the quality was perceived to be very good but the element was not very important. In a few cases, for example quality of air in Hamilton County, the element was perceived to be very important and was considered to be of very high quality. Generally, the findings made good theoretical sense and were very revealing of differing environmental qualities in the two localities.

Usefulness of This Approach

The environmental quality module was shown in the pilot study to be very effective for comparing environmental quality elements across communities. It would be equally valuable for comparisons across time for the same community. The instrument is sufficiently simple and unculture-bound that it could be used for valid comparisons across national cultures. A very important feature of the instrument is its ability to show gaps between the importance that people assign to an element and the quality that they perceive for that element. This is a clear signal to public policymakers that those environmental elements with wide gaps should be given priority for improvement. Validity checks conducted in the pilot study showed that these gaps are reflected in priority assignments.

The instrument does not make policy; that can only be done by policymakers. Rather, it provides information of considerable value to policymakers as they decide on priorities for community action to improve environmental conditions. While the instrument is a valid measure of environmental quality, it is not a valid measure of environmental conditions. These environmental conditions should be measured by normal scientific physical measurement techniques. It is important that analysts and policymakers distinguish measures of environmental quality from measures of environmental conditions and use both in their policymaking processes.

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SOME FACTORS IN ENVIRONMENTAL PREFERENCE

Prof. Roger S. Ulrich

SOME FACTORS IN ENVIRONMENTAL PREFERENCE

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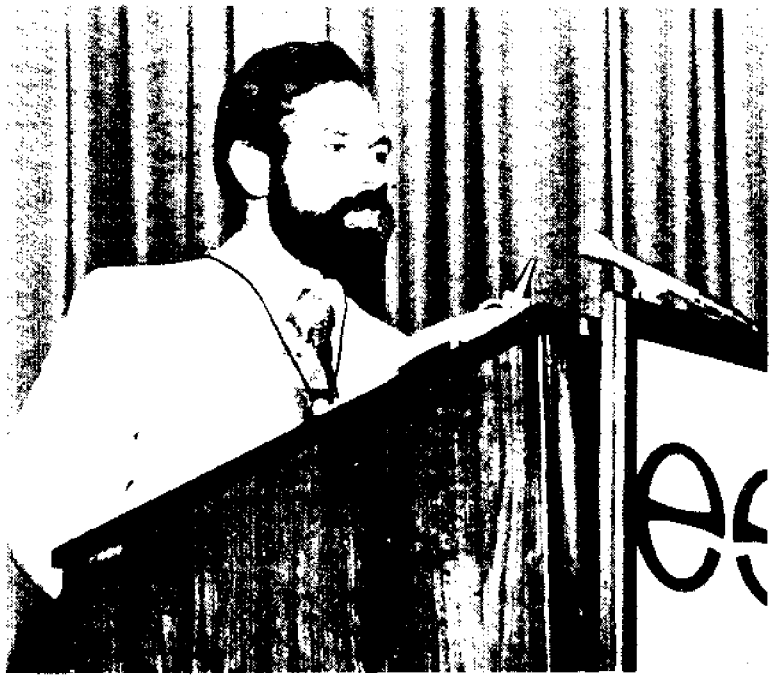
Abstract

Recent research has identified a number of variables that relate to human information processing capacities and are present in both natural and urban visual environments. Underlying this vein of research is the view that humans are profoundly motivated to acquire visual information about their environment; in this perspective, preference is related to the informational characteristics of environments. The variables thus far identified fall into two general categories: (1) those affecting the case with which a scene can be identified or grasped, and (2) those which convey to the observer a sense that additional information could be gained by entering the scene.

The present paper evaluates the effectiveness of these variables in terms of the data from several studies. The studies, which utilized subjects living in Michigan and Delaware, encompass both natural and urban landscapes. The results generally support the efficacy of the variables in predicting preference for visual environments. Findings are also reported from a study using Swedish subjects which suggests support for the effectiveness of the variables in a cross-cultural context.

Editors' note: Unfortunately, a full text was unavailable when these proceedings went to press.

RECREATIONAL USE OF THE COASTAL ZONE:
EFFECTS OF CROWDING AND DEVELOPMENT



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RECREATIONAL USE OF THE COASTAL ZONE: EFFECTS OF CROWDING AND DEVELOPMENT

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Abstract

There is growing evidence that esthetic factors, such as the number of people sharing a beach or marina design, have an important influence on choice of recreation facilities and over-all user satisfaction. The limits of tolerance are not precisely known, but people tend to select those places with lower levels of crowding and development. In many areas of high use and during seasons of peak recreation use, the conflict of providing a quality recreation experience to greater numbers of people has produced a severe management dilemma. The need to optimize user satisfaction and resource use has led to the adoption of new management practices such as restricted use, controlled access, and reservation systems. Additional knowledge of user groups and their capacity to tolerate various levels of use will improve approaches to planning, design and management of shoreline recreation resources.

The Problem

The competition for shoreline use, especially in the more densely populated urban areas, has put a premium on the availability of bathing beaches, boating facilities, and other facilities for marine recreation. Along with decreased opportunities for expanding the number and size of areas for recreation, there has been a continuing increase in the demand for existing sites. The net effect has been overcrowding and the construction of parking lots, bath houses, boardwalks, marinas and other facilities that frequently detract from the natural character of the coastal landscape. These conditions lead naturally to questions related to the esthetic impact of these on recreation users' area preferences.

In recreation, the problem has always been to measure quantitatively those variables that are qualitative in nature. My colleagues with a penchant for the empirical way of life smile skeptically when I argue for the study of beauty and happiness as components of the recreation experience. Even so, and understanding too well the ancient and incontrovertible antagonism between science and metaphysics, I believe that these are the ultimate endpoints of our professional enterprise.

A former classmate of mine, flushed with enthusiasm by his graduation and emancipation from graduate school, once proposed the construction of a recreation "price list" whereby dollar values would be assigned to various forms of recreation experience. While none of us were entirely certain of his method, the impression was that through some form of statistical alchemy swimming would turn out to be worth something like a dollar sixty-five a day. Presumably, adjustments would be made for off season rates, weekly specials and fire sales. After a considerable period of effort and some frankly uncivilized criticism from his associates and former friends, the project was abandoned in a state of intellectual prostration.

As fruitless as this exercise turned out to be, it was, nonetheless, a response to the cost-benefit gymnastics of the Army Corps of Engineers and the environmentalist's lamintation, "How can you put a dollar value on a sunset?" The rational response is, of course, that we shouldn't try. But the question of beauty and happiness as part of the recreation experience persists, and we are finding that they can be studied pragmatically through an understanding of human values, perceptions and preferences.

The Recreation Landscape

The recreation landscape, in this case the coastal zone, consists of a set of identifiable and measurable variables. In the past few years, several good efforts have been made to quantify esthetic features of landscapes. Notable among these are investigations by Elwood L. Shafer and his associates (1969) and by Luna B. Leopold (1969). In the first case, Shafer divided landscape photographs into zones consisting of sky, several levels of vegetation and non-vegetation, and three kinds of water--streams, waterfalls and lakes. By determining the preferences of people for various landscape scenes, he was successful in isolating those landscape variables that contribute most to user preference.

Leopold defines esthetic quality not so much in terms of user preference as in the uniqueness of a landscape resource. By evaluating selected physical factors, such as river width and depth, factors related to biology and water quality (e.g., water color and turbidity), and a third set of factors related to human use and interest (e.g., trash and littering), he was able to rank order river valleys on the basis of their uniqueness. The rationale that underlies this system, as stated by Leopold, is that, "Landscape that is unique either in a positive or a negative way is of more significance to society than one that is common." (Leopold, 1969, p. 40).

Both of these systems rely heavily on the presence or absence of natural landscape characteristics and the availability of desired resource endowments. My own interests lead me to ask questions about people and man-induced conditions as "un-natural" components of the landscape and the effect of these on the satisfaction derived from outdoor recreation activity. The basis for this interest lies primarily in the observation that the factors which have contributed to the increase in demand for outdoor recreation--increased leisure, income and mobility among others--are also responsible for a general increase in the levels of crowding and development of outdoor recreation facilities.

These conditions of crowding and development are especially compelling in the coastal zone where recreation supply is best and most meaningfully measured in terms of length rather than area. The coastal zone is a rigidly limited resource but one that is desperately sought for recreational use. The most heavily used public beaches in the United States are those within a two hour drive of a metropolitan center, with increasing use closer to the city. (Outdoor Recreation Resources Review Commission, No. 4, 1962.)

What this means in a place like New York's Long Island or Florida's Miami Beach is that virtually every foot of the shoreline is in the prime use zone. And those of you who have witnessed the process know that when suburban man hits the beach he cannot resist building his castles in the sand to say nothing of hot dog stands, boardwalks, cabanas and parking lots.

In a study of people and man-induced conditions as units of recreation landscapes and the effect of these on user preference, I arrived at three major findings. (Carls, 1974.) Although the study was conducted in the Midwest, about as far from an ocean as you can get in North America, the findings are relevant to the coastal zone, and they will serve as a focus for the remainder of this discussion.

The Desirability of Water

In the first place, it was found, to the surprise of no one, that water is a highly desired attribute of the recreation landscape. This follows one of the major findings of the Outdoor Recreation Resources Review Commission, reported in 1962, also pointing to water as a focal point for outdoor recreation activity. These results have been supported repeatedly in subsequent investigations, and it seems to make little difference whether the activity depends directly on the availability of water or not.

In a study of campground use in Minnesota's Superior National Forest, U. S. Forest Service researchers found that seventy-seven percent of all campers wanted waterfront campsites. Of that group, over ninety percent said they wanted to camp by the shoreline because of the view it offered. (Lime, 1971, p. 13) The esthetic force of water seems to be just as strong whether the activity depends directly on water for participation or is simply enhanced by its nearness.

The Effects of People

The second major finding of my study showed that as the number of people in a landscape scene increased, preference for that scene decreased. In comparing scenes with no people and those with only a few people--a family group, for example--the reduction in preference was minimal. As the number of people increased to obviously crowded conditions, however, the decrease in preference was both pronounced and statistically significant.

In a separate study of recreation behavior and the site characteristics of beaches, Hecock (1970) found that an escape from crowds was a reason frequently given by respondent for selecting one beach over another. In Rhode Island, Spaulding (1973, p. 14) found similar results. Hecock also found, however, that teenagers preferred beaches where their peers were located, and we are led irreversibly to the conclusion that the preferred alternative to crowding is not necessarily the absence of all people.

Man is a territorial creature, responding endlessly to changes in available space and the intensity of outside stimulation. Edward T. Hall, author of The Hidden Dimension, observes that, "Man's feeling about being properly

oriented in space runs deep. Such knowledge is ultimately linked to survival and sanity. To be disoriented in space is to be psychotic." (Hall, 1970, p. 17) In terms of recreational use of the coastal zone, we transform this concern for mental health into questions of user satisfaction and quality of the leisure experience.

It would be wrong to conclude that no people is a preferred condition. As our knowledge increases, we will find that the need for personal space varies from time to time, from location to location, and from person to person. To cite Pulitzer Prize winner and Professor Emeritus of Rockerfeller University, Rene Dubos:

> "Little is known concerning the density of population or the intensity of stimulation that is optimum in the long run for the body and the mind of man. Crowding is a relative term. The biological significance of population density must be evaluated in the light of the past experience of the group concerned, because this experience conditions the manner in which each of its members responds to the others as well as to environmental stimuli and trauma." (Dubos, 1970, p. 207.)

Recognizing the potential effects of crowding, the task is to examine in detail the nature and dimension of the problem. Are urban dwellers, because of their greater conditioning to high density living, more tolerant of crowded beaches than people who live in rural areas? Do surf fishermen need more space than charter boat fishermen, and are fishermen, in general, less tolerant of crowding than swimmers? These suggest a whole complex of hypotheses that invite study in an attempt to better utilize the recreation potential of the coastal zone.

The Effects of Development

Finally, my study showed a negative relationship between landscape preference and the incidence of man-induced conditions or, broadly speaking, development. Development, like crowding, has a variable effect on preference. Developments that conform to the natural character of the landscape and contribute to the recreational use of an area do not reduce preference in any consistent way. In fact, hiking trails, boating facilities, picnic tables, mowed fields and the like may enhance preference. It was found, however, that major departures from the natural landscape and developments that did not contribute to the recreational amenities of the area, such as industrial or commercial development, had a major effect in reducing preference and presumably user satisfaction.

There are group differences in responses to development, and it is interesting to note in this context the findings of two Northwestern University researchers in a study of Lake Michigan beaches. They found two groups with distinct beach preferences. The first and largest group was attraced to scenic beaches with trees, natural vegetative growth and no crowds. The second and smaller group actually preferred city swimming beaches, and they were more sensitive to sand quality and the attractiveness of surrounding buildings. This group was not bothered, however, by crowding or the lack of vegetation. (Peterson and Neuman, 1969 , p. 237.)

We do not understand clearly why some developments are perceived as rustic and therefore desirable backdrops to the recreation experience while others are seen as shabby and undesirable. Neither do we know or understand differences in taste that may exist between various user and activity groups. In both cases, however, our approaches to providing recreation services will be improved with additional information.

Implications for Planning and Management

What does all of this mean in terms of planning and managing the coastal zone for recreational use? It means, in the first place, that we can expect a continuing growth in the demand for coastal recreation areas and facilities. On Long Island, the most popular outdoor recreation activity is swimming, and a simple accretion in population will produce a substantial new demand for swimming facilities. Based on projections made by the New York State Office of Parks and Recreation (1972), the forecast calls for a half million new swimmers from New York City by the year 1990 and another 800,000 from Long Island. Add to this the expected growth in sport fishing and boating, and the prospects are staggering.

Secondly, and finally, it means that planners and managers of coastal recreation areas will have to be more sensitive to the nature and quality of the recreation experience, including the effects of crowding and development. Having spent sweltering August weekend days both in the Bronx and at Jones Beach, I would have to say that Jones Beach is a better bet. Nonetheless, sitting elbow-to-elbow and blanket-to-blanket with my back against a parking lot does not score very high on my index of user satisfaction.

The day is gone when the solution to every recreation problem was to add another park. New park acres are non-existant on the most intensely used shorelines and usually too far away from the people who need them most where they do exist. The need is clearly for greater innovation in using what we already have and providing high quality, satisfying recreation activity.

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VISUAL ATTRIBUTES OF THE ESTUARY:

AN EMPHASIS ON DYNAMICS

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VISUAL ATTRIBUTES OF THE ESTUARY: AN EMPHASIS ON DYNAMICS

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Abstract

The gross morphology of an estuary is initially employed to identify static visual attributes. Two aspects of change are discussed as they relate to visual character: long-term evolution and the tidal cycle. Static and dynamic attributes of an estuary combine to produce a legible image through patterned complexity.

As we begin to look at the coastal zone more closely in terms of visual analysis, we'll be asking questions about the attributes of each of the various features: bluffs, beaches, rocky headlands, estuaries. This paper advances some preliminary notions about the visual character of estuaries. Being new to the field of visual analysis, but having had some experience with estuaries, I was struck by the fact that most landscapes are treated as static forms. To see the estuary as static is perhaps to overlook its most fundamental attribute, that of change. So in this paper, I will first identify some static aspects of estuaries. Then, I will discuss what I consider to be some relevant ideas about the dynamic qualities as they are manifested in visual character. By "dynamic" I simply mean the capacity for change.

The Morphologic Units of an Estuary as Principal Visual Components

The estuary or lagoon has three morphologic units. These units can be justified using biologic, hydrologic or visual criteria. They are (i) the intertidal marsh, (ii) the mudflat, and (iii) the channel (Fig. 1).

The Intertical Marsh: From the line of Mean High Water (on the Pacific Coast, Mean Higher of High Water), down to the lower edge of intertidal vegetation we find several plant communities lying side-by-side in clearly discernible zones determined mostly by elevation and tidal submergence. The upper boundary, between the intertidal marsh and the adjacent terrestrial (or "high marsh") vegetation, is not well delineated often showing a "diffuse" edge (the visual terminology used herein is from Litton, et al., 1974). Within the marsh the boundaries between communities are either "digitate" or "butt." These fairly clear lines of demarcation are due to the physiology of the dominant species, especially with respect to salt tolerance and the ability to withstand submergence.

The most important visual consideration in the marsh is the distinction between those estuaries with a predominately Salacornia marsh as opposed to those with a Spartina marsh. In many of the world's estuaries, the marsh is dominated by the low pickleweed, Salicornia. This is a matted, bunchy cover. By contrast the fields of tall cordgrass, Spartina, undulating in the shore breeze present an entirely different visual display (Fig. 2).

The Mudflats. The unvegetated zone lying between the marsh and the channel can be called mudflat or tidal flat. At first encounter, one could easily mistake this zone for a visually barren component of the estuary. Yet much of the action takes place here. Loaded with benthic organisms, the mudflat becomes a supermarket for shorebirds. They take worms and ghost shrimp from the mud as the tide goes out and cull young fish from the first incoming waters of the flood tide. Furthermore, this is the zone of active marsh invasion, the region where fingers of vegetation reach out to claim the rich substrate.

The Channels. The remaining portion of the estuary below the Mean Low Water (on the Pacific coast, Mean Lower of Low Water) line can be termed "channel." At low tide these winding incisions in the estuary bottom will still be full of water. There is a complex of tributary channels technically lying above the MLW elevation that, together with the main channels, constitute the estuary's circulatory system. The complete network forms a sinuous branching pattern that is one of the estuary's more predominant visual characteristics. While some of the channels may shift their location from year to year, the pattern is essentially a permanent one. And, it is given visual emphasis by the galleria of shorebirds waiting along the channel banks on each incoming tide to pluck the first precocious fish from the shallow waters.

Changes in Morphology and Visual Character During Estuarine Evolution

The life cycle of an estuary begins when a coastal depression is flooded by rising sea levels. Its ontogeny is complete when, under stable sea level conditions, the embayment is filled with sediments. How long does this take? Sea levels began their rise at the end of the last glaciation some 10-15 thousand years ago. During the time of general sea-level stability beginning 2-3 thousand years ago, estuaries have grown more and more "mature" as they evolve to coastal meadows.

During the period of man's habitation of the watersheds and littoral zones of the world's estuaries, sedimentation rates have increased somewhat due to land use. Generally speaking, as long as sea levels remain roughly what they are today, and there is no evidence that they will not, we will see many estuaries and lagoons entering the last phases of their life within the next 50-100 years. In some cases, the speed with which they grow old will be influenced by man--increased in some cases, decreased in others. This section will suggest some changes in morphology, and visual character during an estuary's life cycle, but will not be concerned with visual changes after extinction when an estuary becomes a coastal meadow and terrestrial succession begins.

During the life cycle the most visible changes will be the creation of extensive mudflats, the constriction of channels and the expansion of marsh finally spilling into the channels to clog the circulatory system with vegetation. We can refine this picture and speak in more specific terms appropriate for the coastal planner, the question being: Can changes in the morphologic composition of an estuary have predictable visual consequences.

Visual consequences of morphologic change can be termed "direct" and

"indirect." The direct consequences will be the changes in the relative extent (the areal ratio) of the three morphologic units. The indirect consequences will follow upon these direct changes in the form of changing speciation and numbers of visible biota (birdlife, primarily) resulting from changes in the lower strata of their food chain, the non-visible organisms inhabiting each morpholgic unit. I have just begun to approach the problem of characterizing morphologic evolution (Rowntree, 1973) and have not yet developed a satisfactory method for extrapolating to changes in the food chain.

Present Morphologic Status of Estuaries. In order to get some perspective on the present state of estuaries, we can divide them up into simple Davisian categories of "Youth," "Maturity," and "Senescence" (Table I). For illustrative purposes, I've done this with some California estuaries using the simple criterion of percentage of total estuarine area classified as "water." The raw data for Table 1 were taken from an unpublished survey of coastal wetlands in California. The acreage estimates were made from air photos by the Department of Fish and Game and I should point out that the definition of "water" does not conform to my definition of "Channel." However, the tidal stages in these photos were roughly the same from one estuary to another so the data will suffice for our purposes.

Because our objective is to suggest visual attributes of estuaries in different stages of evolution, we'll forego any discussion of the true geomorphic status though this is an intriguing problem in itself. In Table 1, the most "youthful" estuaries have a high percentage of water and a low percentage of both mudflat and marsh. They are seen primarily as water bodies by the observer. At the other extreme, Elkhorn Slough near Monterey is 97% marsh and categorically in the late stages of senescence. Viewing this estuary from the perimeter road one would see only a flat plain entirely covered by low, greyish Salicornia marsh. The banks of the channels are steep as they have been stabilized by vegetation and tend to be undercut during tidal flow. Between the extremes of early youth and late senescence many visual combinations exist. Humboldt Bay has a very high areal ratio of mudflat to marsh even though I've classed it as being in late maturity. (This points up the need to weight the initial criterion--percent water--with some factor representing the ratio of mudflat to marsh.) There the marsh does not seem to be expanding rapidly and the gross visual character is relatively stable. The high ratio of mudflats to marsh predominates in mature and senescent estuaries (with only one exception), according to Table 1. In the youthful category, the opposite is true for the Klamath and Smith River estuaries (more marsh than mudflat) but not for San Francisco Bay which has had a significant area of marsh reclaimed for salt evaporation ponds.

Describing Morphologic Change. The question of changing morphology and visual character can be approached in another way, by watching an estuary change over time. Redfield (1972) did this for the Barnstable Marsh on Cape Cod but his time frame is 3 thousand years. This gives us a good picture of long term changes. Using a shorter time span, I reconstructed as best as possible morphologic change at Bolinas Lagoon in California. Figure 3 shows how the lagoon changed during a period of slightly more than 100 years. Table 2 indicates that there wasn't much change in the areal ratio of the morphologic units comparing 1859 with 1969. The lagoon got smaller, just as at Barnstable, but the relative extent of marsh, mudflat, and channel is much the same in

1969 as it was in 1854. (Note that the 1969 percentages for Bolinas Lagoon differ between Table 1 and Table 2.)

It must be explained, however, that Bolinas Lagoon is somewhat of a special case. Lying on the San Andreas Fault, I believe the lagoon was "rejuvenated" (set back in its evolution) when, during the 1906 San Francisco earthquake, the lagoon muds were compacted and the elevation of the lagoon bottom was depressed. By looking at the sequence of morphologic change depicted since the earthquake by the 1929, 1939, and 1969 surveys, however, we might get a picture of "normal" evolution. The marsh unit has expanded, during these thirty years, from 6% to 13% of the total area of the estuary. The area of mudflat has increased at the expense of the channel unit from 58% in 1929 to 70% in 1969. Marsh expansion has not been able to keep up with the creation of mudflats.

At Bolinas Lagoon one would expect to see in the next 25-50 years the area of channel remaining stable, the marsh expanding to produce a concomitant decrease in the area of bare mudflat. This is the picture for one estuary. In order to predict morphologic change in another estuary we would have to know (i) it's present stage of evolution, (ii) how much sediment is being deposited in the estuary and where, and (iii) the species of marsh vegetation acting as primary invaders. The stage in evolution is simple to calculate from a good set of air photos and it is quite helpful to have historical surveys in order to set the present morphologic state in its proper historical sequence. Sedimentation rates are very difficult to come by and involve a series of surveys of the estuary's bottom done over a number of years. Even with these data, sedimentation rates may change as a result of changes in land use, natural erosion rates, or the hydraulics of sediment transport. Thus, gaining an understanding of the changing visual character of an estuary requires both an interest in historical morphology as well as the capacity to monitor estuarine processes from year to year.

The Expanding Marsh

Resulting Changes in Birdlife. For a given estuary, with a given number of acres to divide among three morphologic units, the more marsh, the less mudflat. Unfortunately, the mudflat is where the food is for the medium sized and smaller shorebirds (Fig. 4). They are primarily diggers. The swarms of Sandpipers, aggressive Willets, Dowitchers, Dunlins, and Oystercatchers are squeezed out as the ratio of marsh to mudflat increases. The mudflat is also a stage of prime visibility, a dance floor on which the trophic ballet is repeated with each tidal cycle. In the last stages of evolution when the marsh abuts the estuarine channels, those smaller birds that still inhabit the estuary will be hidden from view. The large birds--Herons, Egrets, and Cranes--have the capacity to remain with an estuary after the mudflat unit has disappeared (Fig. 5). They can stand knee-deep in the channels and feed, though they too will often be hidden from view as the channels become narrow and constricted.

The Primary Colonizers. The kind(s) of plants invading the bare mudflat help to determine the visual character of the estuary in both static and dynamic terms. In both respects, the major distinction is between two common invaders, Salicornia (pickleweed) and Spartina (cordgrass). On the west coast

of England, Salicornia is the dominant colonizer. Along the English Channel Spartina (the aggressive hybrid, S. townsendii) has within several decades changed the visual character of a large number of estuaries. Spartina foliosa, a cousin of the European species, actively expands onto the lower elevations of selected California estuaries (Fig. 2). Spartina alterniflora covers the marsh in estuaries along the Atlantic,and to a lesser degree on the Gulf coast of the United States (this species is also prevalent on the east coast of South America and in the English Channel). Spartina is generally absent from the estuaries of Oregon and Washington.

There is a marked visual difference between marshes boasting the tall (3-5 feet), wheat-like Spartina and those having a low (6-10 inches) mat of Salicornia (Fig. 6). The thick, shiny-leafed cordgrass undulates in the shore breeze, presents a clear edge to adjoining communities and to the bare mudflat. It browns in winter whereas the pickleweed remains a greyish-green. A common display is of circular groves of cordgrass standing amongst the extensive pickleweed mat or along the lower edge of the mat in a distinct band 10-20 yards wide. These are the static attributes of Spartina and Salicornia communities. What about the dynamic aspects.

It is my contention that Spartina is the more aggressive colonizer and once it is introduced to an estuary we expect to see rates of morphologic change increase there. The cordgrass is able to withstand longer periods of tidal submergence, consequently it extends itself farther down on the mudflats than the pickeweed. Like other pioneer vegetation, the cordgrass seems to thrive on disturbance. It is common for Spartina to invade tidal channels (Fig. 7) and these aggressive plants are often torn out by the rushing water of a heavy rainstorm occurring at low tide. If they are not removed in this way, the cordgrass-clogged channels are often dredged to restore the flushing action of the estuarine circulatory system. In either case, the broken but viable Spartina rhizomes float off to sprout new colonies elsewhere. Many estuaries in central and northern California, for example, have heretofore had only moderate amounts of cordgrass, but these colonies are expanding and in the near future will probably dominate these landscapes.

Dynamic Visual Attributes of the Tidal Cycle

The second type of change making the estuary a dynamic visual feature takes place continuously and is cyclic. An observer may have in his mind the image of an estuary as a placid body of water. Confronting the estuary in reality he may be disappointed to find at low tide what looks like a drained reservoir. To visually characterize the estuary as a body of water is simply a technical error. As shown by the tide curves in Figure 8, the estuary is full only 20% of the time and empty only 20% of the time. During flooding or ebbing ("midstage" in Fig. 8), the mudflats, as mentioned before, are teeming with birdlife. Thus, to overlook the visual attributes of a half-filled estuary is to neglect the most common as well as the richest stage of its tidal cycle.

The Tides as a Unifying Medium. In the tidal cycle we can find a solution to the old conflict between visual complexity and visual unity. Litton, et al. (1974) identifies three critical aesthetic criteria for the evaluation

of environmental stimuli: unity, vividness and variety. "Unity is that concern or expression whereby parts are joined together to a coherent and single harmonious unit" (p. 105). But, he goes on to say, "Variety does have a potential conflict with unity" (p. 107) unless there can be found some cohesion in diversity. (As others have, I shall use the terms "variety," "diversity," and "complexity" synonymously to denote the array of elements in a landscape display) To see unity in a static landscape, the observer must infer some degree of structural cohesion or coherence among the parts. To see unity in the dynamic landscape of the estuary, the observer witnesses the repeated linking of morphologic units by tidal action. These units are the visible components of the estuarine system. Tidal flow is the dynamic medium that unifies them by immersion. This unifying process is given visual elaboration by the action of shorebirds at each tidal stage. As the incoming tide begins to join channel with mudflat, mudflat with marsh the diggers scurry about poking in the mud for worms and small crustaceans while the egrets and herons stand in deeper water and wait for fingerlings. As the birds flutter back and forth between channel, marsh and mudflat the observer can with ease see the estuary as an integrated whole comprised of distinct parts.

Because perception of unity in this sense is dependent on the emergent qualities of a visual entity over time--rather than on the structural attributes of static composition--one might rightfully ask, does the observer have to sit through a six-hour tide change in order to perceive the unity thus described? Admittedly, the degree to which unification of an estuary's parts is comprehended by the viewer is determined by either how long he waits out the tidal cycle or how much he knows about the role of the tides in estuarine ecology. At Bolinas Lagoon, California, observers invested a significant amount of time in the visual exploration of the lagoon, thus allowing themselves the opportunity to observe the tidal waters' "capacity to provide connection in the landscape" (Litton et al., 1974, p. 107). Many viewers, on the other hand, were observing the lagoon under constraints that were potential barriers to comprehension. These were time constraints, limits to their patience and interest, poor location for viewing, or problems with weather, to name but a few. A public education program at the lagoon, supported by the Audubon Society and a local community college was an important vehicle in overcoming some of these barriers using indoor photographs with explanations of estuary dynamics.

A Final Comment on Legibility

In his paper in this symposium, Roger Ulrich suggests that observers prefer landscapes that display "ordered or patterned" complexity and show low preference for those that display unordered or random complexity. Said another way, landscapes with pattern are highly legible. If this is so, and the supporting research certainly indicates that it is, then we must ask what constitutes a pattern as opposed to a random display of information. I suggest that a pattern is a recognizable display; recognizable in that the visual structure of the display is not entirely new to the observer. This definition does not require the observer to have previously viewed the structure in the specific landscape context under consideration, only that he be familiar with the fundamental attributes of the structure from previous experience. (This conforms to the common definition of pattern as a form repeated and imitated in one or more contexts.) Let me exemplify this using the case at hand.

I've proposed above that the one thing that holds the parts of an estuary together visually is the direct observation of the tidal cycle or, in the absence of direct observation, an elementary understanding of the tidal cycle. The weakness in this proposal lies with the fact that observers may not be able, due to a number of constraints, to perceive or comprehend the unifying role of the tides. Recognizing this weakness, then, we must be prepared to fall back on the static features of the estuarine landscape in order to make a case for the unity of parts. This is where the idea of pattern, or patterned complexity, becomes useful. The critical pattern imprinted on the static estuarine landscape is the incised network of tidal channels that, from the air, resembles a deciduous oak in winter. Whenever water flows over the surface of the earth, this branched network is permanently etched on the landscape. And so it is in the estuary. But here we find it at a much smaller scale than that of the river or watershed. This imbedded pattern visually connects the component parts in a way that allows easy comprehension and does not require the viewer to observe the action of the tides over a period of time.

Returning to the definition of "pattern," the branched structure is one of the most common displays in nature. Therefore, due simply to its redundancy it qualifies as a pattern. To comprehend the unity of parts in an estuary, one needs only to have previously comprehended the branching structure of a tree, of root fibers, of a human circulatory system. Or, because the branched structure has been replicated and idealized by artists, one need not have had to see a tree. Merely to have observed the folk or commercial art of Homo sapiens, for over the centuries the branching pattern has become somewhat of an idealized form. Thus "patterned complexity" in this sense is the ordering or arrangement of landscape information into a structure that is easily comprehended because that structure is not new to ones experience.

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Table 1. Evolutionary Stage of California Estuaries

Location	Water Acres	Water %	Mudflat Acres	Mudflat %	Marsh Acres	Marsh %
YOUTH (>66% water)						
Bodega Bay	840	90	45	5	50	5
Klamath River	4,250	80	165	3	870	17
San Francisco Bay	258,000	78	41,600	13	32,000	9
Smith River	3,825	76	230	5	920	19
MATURITY (33-66% water)						
Tomales Bay	5,950	64	2,900	31	440	4
Drakes Estero	1,290	62	580	28	200	10
Eel River	2,300	59	500	13	1,050	27
Big River	120	47	90	35	45	18
Humboldt Bay	4,500	45	5,000	50	500	5
SENESCENCE (<33% water)						
Bolinas Lagoon	370	30	720	58	150	12
10-Mile River	40	24	100	58	30	18
Morro Bay	600	23	1,400	55	575	22
Elkhorn Slough	97	3	0	0	2,840	97

Base data from Calif. Dept. Fish and Game, Coastal Wetland Inventory, 1968-69, (unpublished)

Table 2. Morphological Elements of Bolinas Lagoon Expressed as Acres and as Percent of Total Estuary Area, 1854-1969

Year	Area of Lagoon	Marsh Acres	Marsh %	Mudflats Acres	Mudflats %	Channel Acres	Channel %
1854	1216	157	13	909	75	150	12
1929	1130	72	6	653	58	402	36
1939	1096	88	8	742	68	266	24
1969	938	118	13	654	70	166	17

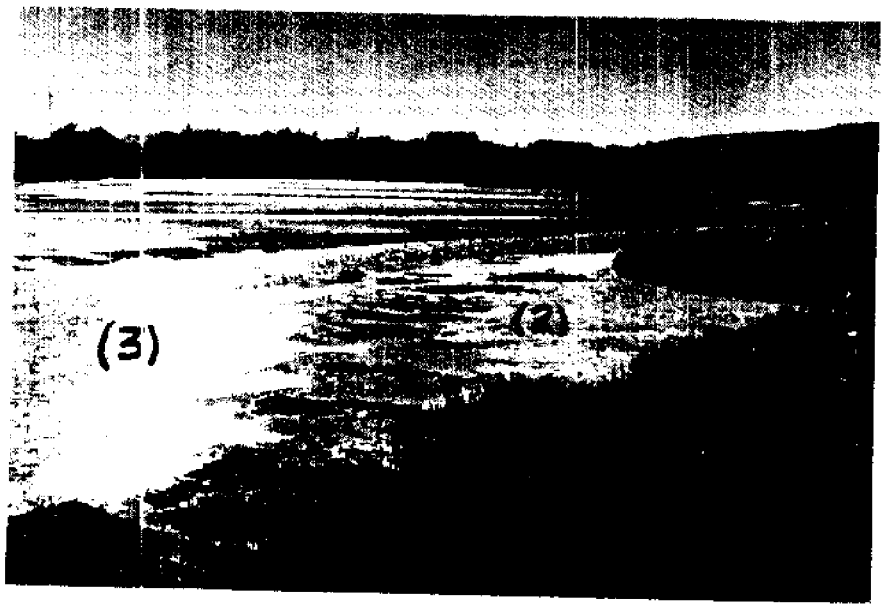

Figure 1. Morphologic units of an estuary as principal visual components. (1) Intertidal marsh, extending from right margin of photograph, (2) Mudflats, a rich substrate for feeding shore birds, (3) Channels, remain full of water even at low tide.

Figure 2. Field of wheat-like Spartina (S. foliosa, Bolinas Lagoon, Marin County, California) colonizing mudflat and abutting channel is one of the principal visual features of many estuaries.

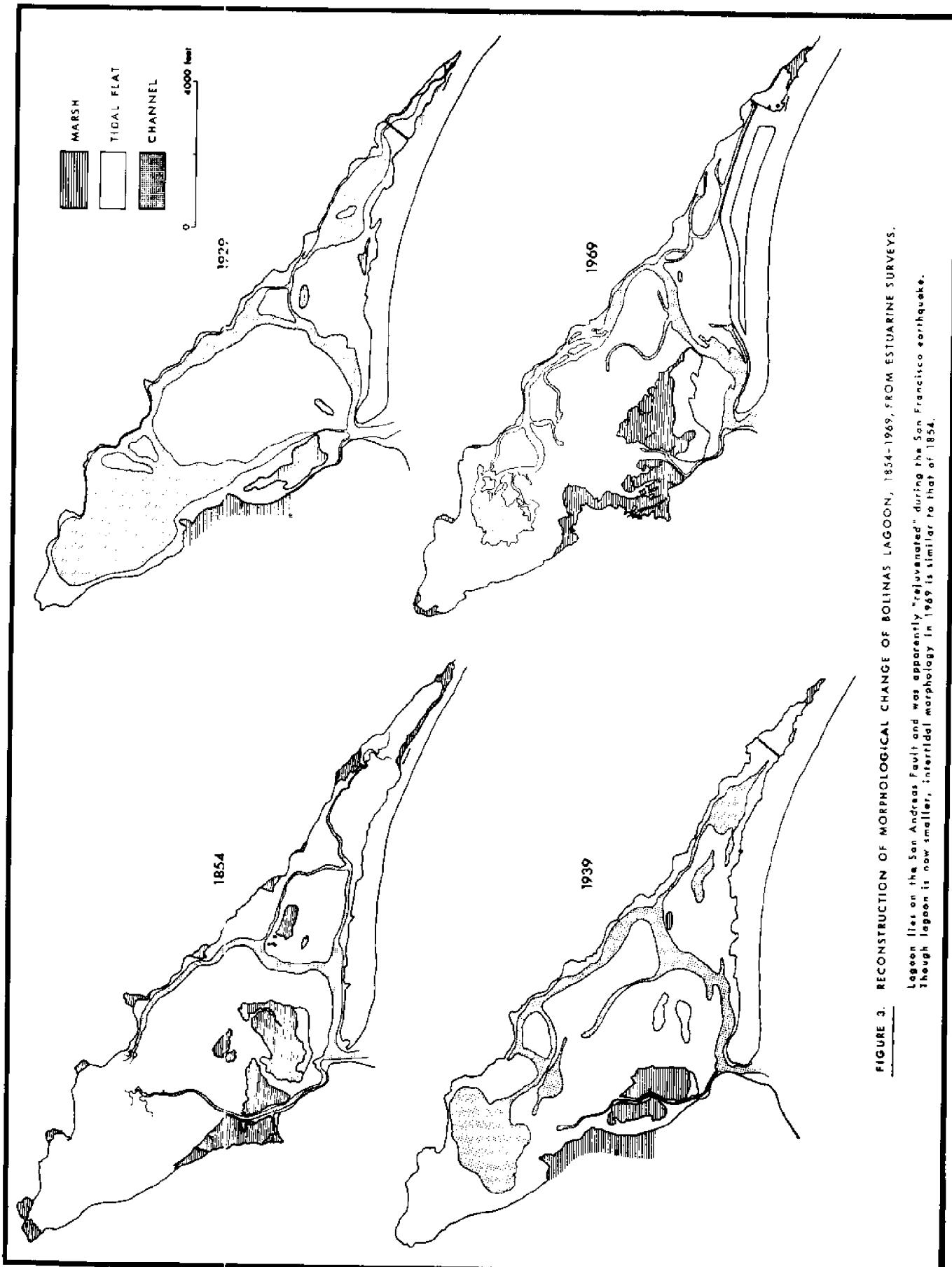

FIGURE 3. RECONSTRUCTION OF MORPHOLOGICAL CHANGE OF BOLINAS LAGOON, 1854-1969, FROM ESTUARINE SURVEYS.

Lagoon lies on the San Andreas Fault and was apparently "rejuvenated" during the San Francisco earthquake. Though lagoon is now smaller, intertidal morphology in 1969 is similar to that of 1854.

Figure 4. Short-legged diggers rely primarily on the Mudflats for food. These birds leave the estuary in its senescent state when extensive mudflats no longer exist.

Figure 5. Long-legged Egrets, Herons, and Cranes can remain at an estuary in its senescent state because they fish in the Channels and rest in the marsh, employing the Mudflat only minimally.

Figure 6. Comparison of Salicornia (left) and Spartina (right). Spartina foliosa shoots from San Francisco Bay, California, (right) vary in height depending on their location. Generally, Spartina alterniflora on the Atlantic and Gulf coasts is taller than S. foliosa shoots shown here.

Figure 7. The aggressive Spartina invades channels of the estuary, choking off the circulation of tidal water. Often, these plants are torn from the channel bottoms during storms and the broken rhizomes are deposited on bare mudflats elsewhere to spring up again in profuse colonies. This appears to be an important means of expansion for cordgrass.

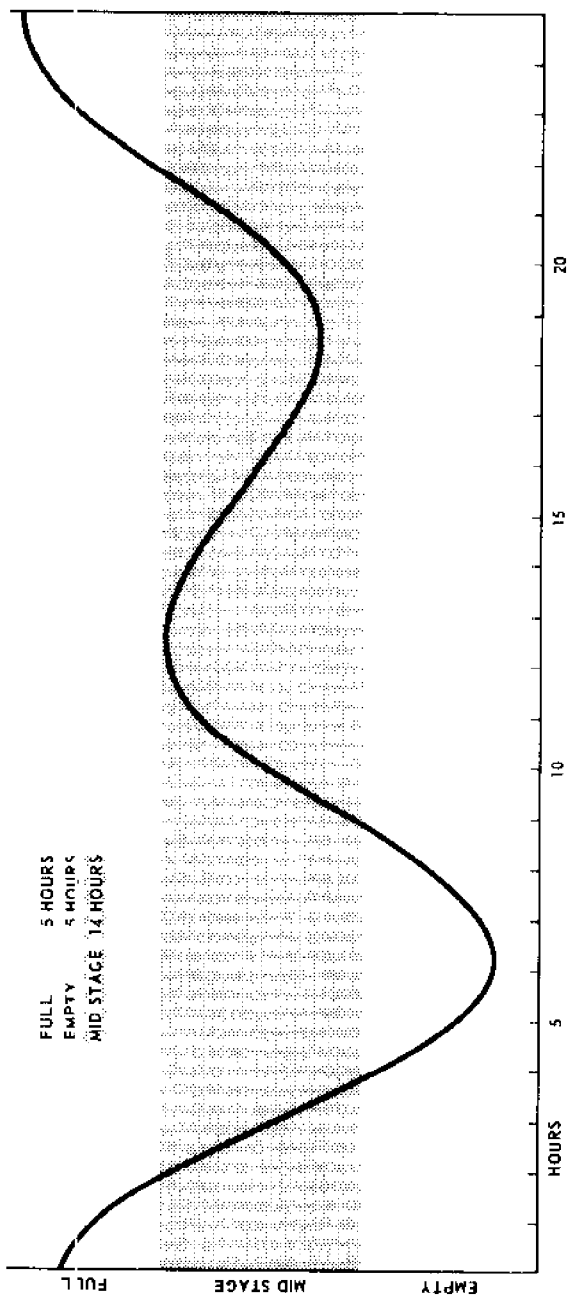

Figure 8. Mean tidal curve for a typical Pacific coast estuary (Bolinas Lagoon, Marin County, California). The estuary is "full" only 20% of the time, "empty" only 20% of the time. The most common visual state is at "mid-stage" when the tides are ebbing or flooding. During this time, the mudflats are covered with shorebirds, adding a rich dimension to the visual character of the estuary.

CONFERENCE
SESSION TWO

29 MAY 1975
8:00-10:00 P.M.
30 MAY 1975
9:00-10:00 A.M.

VISUAL QUALITY ASSESSMENT METHODS

Dr. Thomas J. Nieman
Chairman

VISUAL QUALITY ASSESSMENT METHODS

INTRODUCTION

Dr. Thomas J. Nieman
School of Landscape Architecture
S.U.N.Y. College of Environmental Science and Forestry

The consideration of visual quality as an important element in the planning process is rapidly gaining support among planning agencies, consulting firms and research institutions. While there has been considerable documentation of efforts to appreciate in a literary sense the visual aspects of the environment, visual quality has not been a major consideration in policy planning. Nonetheless, under the term "aesthetics", federal and local guidelines refer to visual quality as a required consideration on an equal basis with economic, social and environmental issues. The problem lies in that understanding visual quality, much less objectively quantifying it, is at a much lower level of sophistication than the other issues. As a result, policy planning is at best inconsistant and leads to conflicts that further frustrate attempts to deal with visual quality as a tangible element in the planning process.

One of the upshots of the confusion is the adoption, through misunderstanding, of cosmetic policies and implementation procedures, eg., putting fences around junk yards and cleaning trash out of streams, etc., that while better than nothing are expensive and relatively short-termed. Concomitantly public opinion has demanded more and Congress has responded with the National Environmental Policy Act (Public Law 91-190, NEPA 1969) which requires the Environmental Protection Agency to define a workable procedure for assessing visual quality impact. Because of the paucity of available information and research no way presently exists for establishing objective guidelines for application on a uniform basis to visual quality planning.

In recent years, basically since NEPA, serious attempts have been made to quantify and qualify various aspects of visual quality so that they could be utilized feasibly with economic, social, and environmental planning proposals. While these have primarily been directed toward forestry, water resources, highway programs, conservation and preservation areas, and land use planning, some studies dealing with coastal environments have been developed for the California coastline. Unfortunately the very dramatic natural landscapes and visual quality variables which bless the California coast and the west coast in general are not found on most of the other coasts of the country. Thus, in New York State we are faced with the problem of developing workable objective analytical methodologies that can relate to a far less exciting coastal landscape.

Our interests presently center on the development of methodologies that relate to application, rather than basic research. They may be thought of as tools to aid planners and decision makers in their attempts to identify and maintain the visual quality of the coastal area of their immediate concern. These would hopefully allow their use on a level comparable with the better known and more frequently utilized variables common to planning decisions. In this vein methodologies for quantifying visual quality may be considered from two perspectives: visual assessment and user preferences. Visual assessment is the approach that planners or decision makers would utilize to evaluate visual

quality so that the implications of environmental impacts or changes may be better understood. User preference methodologies involve the evaluation of user responses to certain landscapes and landscape settings. The goal of both approaches however is to allow a more objective evaluation of visual quality so that planners and decision makers will be in a better position to respond positively to alternative planning proposals that deal with the visual quality of an area.

Some of the problems inherent in visual assessment and user preferences involve the bias of the administrator or designer of the methods by which the experience of the public is somewhat guided by the perception and attitudes of the individual test and the individuals administering the test. Questions also arise as to the selection of samples of potential visual resource users being evaluated. Varying the socio-economic status may lead to different conclusions as to the quality of the visual resource in question. Bias also comes into play in defining the physical attributes of visual quality. What one designer may consider important another may disregard. The range of criteria offered to the evaluator for preference ranking may not be indicative of his actual preference. His sophistication in this situation may be overestimated or underestimated, thus forcing a middle-of-the-road response. As a result the evaluation becomes indicative of an average landscape with average likes and dislikes being identified as areas of high or low visual preference. The implication of these and other similar problems is that more objective and rigorous techniques should be developed so that effective evaluations become the rule rather than the exception.

One observation in relation to these approaches is that, for all practical purposes, they are still theory. While many have been tested and have been replicated, the results have not been applied to real life planning situations. They have been suggested as approaches to take and results to consider but they have not been processed into the comprehensive planning procedure. In cases where this attempt has been made the results have not been processed through the implementation procedure nor have they stood the scrutiny of numerous review procedures. While almost everyone agrees that visual quality is an important aspect of the planning process, few have been successful in gaining its acceptance on a par with economic, social and environmental concerns.

In the papers that follow, problems of the nature presented above are addressed, although the authors readily admit their dissatisfaction with the results. It is encouraging to note however that attempts to quantify variables previously considered unquantifiable are being made. The subjective approach is grudgingly giving way to the objective approach and bias is being reduced. The attitude is positive and the indication is that in the near future we will be able to evaluate in a reasonably objective manner the visual quality of any particular piece of identifiable physical environment.

KEYNOTE ADDRESS:
THE WATER'S EDGE –
VISUAL TENSION ZONE

Professor R. Burton Litton, Jr.

THE WATER'S EDGE - VISUAL TENSION ZONE

Prof. R. Burton Litton, Jr.
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Abstract

Certain dilemmas and communications hurdles confronting research in landscape aesthetics are posed in a prologue.

High potentials for both visual quality and impacts represent tension in the coastal zone. A physical inventory concept is suggested using three visual elements: (1) Shore edge types, (2) Inshore landscapes, (3) Connective corridors.

Prologue: Dilemmas and Communications

Before turning to the direct subject of this paper, I should like to comment on some of the dilemmas, both philosophic and semantic, affecting all of us in the nebulous world of research in "landscape aesthetics."

Whether dealing with the visual quality of the seashore as a relatively specific kind of landscape or with the broad and unlimited landscape, the beginning point is essentially that of aesthetics. "Aesthetics" is defined as a branch of philosophy concerned with that which is beautiful in art and nature. Physical things perceived through the senses, awareness, reaction, and appraisal are the raw stuff of it. Discernment of quality is searched for through tests; judgment is involved. Theoretical linkage is sought between human response and things which are held to be beautiful. Santayana said -- "Beauty is pleasure regarded as the quality of a thing." (Santayana, 1955). The definition is thus circular as aesthetic judgment is tied to the beautiful; it is obtuse and abstract. "Natural Beauty" as expressed during the 1960's was never defined. Perhaps we understood it well enough. Now, however, with a surprisingly diverse group of researchers, administrators, planners, and citizens interested in the landscape as an aesthetic resource, there are all kinds of chances that our communications - hence our objectives - may not be clear. In research, it is my opinion that aesthetics constitute a blunt introduction for landscape analysis and evaluation unless we take the utmost care to explain both our limitations and our goals. Geographers, geologists, sociologists, psychologists, economists, planners, designers, architects and landscape architects are engaged in landscape and open space research. This 1975 Conference on Visual Quality and the Coastal Zone brings just such different disciplines together. We represent the dichotomy of arts and sciences. To characterize our cooperation in aesthetic terms, we are collectively diverse; but we must also be collectively unified. Because the landscape is so varied and so large with our research effort so modest in terms of money and people, I hope we can maintain the tolerance that now seems to exist among ourselves.

One communications gap may emerge as we consider "subjective" versus "objective" criteria for application to landscape evaluation. As a landscape architect, my work has been based upon the physical landscape which can be seen. It seems that the landscape is "objective" in itself although my landscape inventory methods are usually characterized as "subjective" - presumably because of judgments made as an individual professional. Can objectivity surface from subjective description and analysis if the procedure is clear and accurate enough? Does it matter? I also find it interesting that designer's reactions are often labeled "intuitive"; it would be more accurate to say that a designer's reactions are conditioned by his field of knowledge - a field constituted partially of design principles, perception and aesthetics. Does a scientist's reaction avoid intuition because of his field of knowledge? Intuition is a part of each one of us. I presume all reactions may be colored by intuition and in that sense cannot wholly avoid subjectivity.

One of the presently significant areas of landscape research deals with user preferences - an examination of subjective opinions. Scientists, such as geographers and psychologists, are studying these subjective reactions through application of objective analytical methods. Will the final results of such studies produce objective or subjective criteria? Does it matter much as long as the criteria are clear, logically constructed, and subject to scrutiny? I suggest we not waste much energy on the objective-subjective dilemma; we could counter it through research teams which span the diversities of our disciplines.

Philosophically, there are some traps built into the premise that someday we may have a nice, neat system of quantified values for the landscape. Throughout the culture of man there has been the development of aesthetics but without any urgency for the accompaniment of a quantification system. Some do give very high priority to a quality measurement system for the landscape, but, it would ruin the character of our environment if from adopting a quantified evaluation we protected only those scenic areas which had the distinction of high values. Or what if quantified landscape values merely represented median values? In accordance with the aesthetic criterion of unity, as much of the landscape's beauty is vested in its overall integrity - its connective fabric - as in its nodes of distinction. Neither can we take a static view that whatever we designate now as highly valuable may necessarily serve the values of a future time. I am convinced that an acceptable quantified system of scenic evaluations will be a very long time coming, if ever, and that then we should expect it to apply only to most restricted segments of our total landscape. Maintenance of the landscape's overall integrity is to me the fundamental goal that all of us could adopt in whatever means we use for research. There is room for all of us in that endeavor.

Visual Tension Zone

Visual tension of the sea water's edge comes from the meeting of water, land, and sky. It is difficult to consider water and its line against the earth in purely visual and perceptual ways, but that restriction will be attempted here. Acknowledgement of unfathomable human responses to water is suggested in Loren Eisley's well chosen words: "If there is magic on this planet - it is contained in water (Eisley, 1959).

Distinction lies in the difference between fluid water and solid land - though land is anything but solid in coastal places. Visually the relationship is vivid. It is much like a skyline, characterized by the changing contrasts of light sky above and darker terrain below. Water, like the sky, has its own life of infinately changing colors and movement. But water is perhaps more tangible than the air above, its ceaseless motion ever changing at the shore, always gnawing at the land junction. Sometimes land and water join together and are seen as one in color and plane.

Looking seaward, the lands' edge and any man-made structures there can be expected to show in sharp display; the simplicity of the water-sky background becomes an ideal foil. This is a most conspicuous expression of the figure-ground relationship. (Koffka, 1935).

Thus the coast's visual tension zone is two fold: its landscape has highly visible contrasts; visual impact potentials for man-made changes are similarly high. With the objective of holding all possible qualities of the varied coastal landscape, one of the necessary steps will be to make an inventory of existing conditions using visual elements.

Physical Inventory: Visual Elements

Three visual elements may be considered for coastal landscape inventory use. They are (1) Shore Edge Types, (2) Inshore Landscapes, and (3) Connective Corridors.

With the junction of land and moving sea water having the distinction of visual contrasts that capture our attention, then that edge must be the primary inventory element. The water edge is the most limited part of the whole shore landscape - off shore water surface and land surface inshore represent the far greatest quantitative part of the total. What kinds of visual edges does a coast have? How much of each? What do they look like - from placid to vivid - and why? Where are they? How do they hook up with the inshore landscape? For an excellent introduction to certain of these questions, see "Wisconsin's Lake Superior Shoreline" (Zube and Dega, 1964); it inventories 155 miles of continuous lake shore and identifies 13 shore types. The 1959 "Pacific Coast Recreation Area Survey" (1700 miles of coastline) is also of interest for illustration of various edge types although only discontinuous segments are identified because of limiting recreational criteria used. (USDI, 1959).

Shore Edge Types:

At least five water-shore cross-section edge categories should provide the beginning of a visual inventory. The horizontal arrows suggest the visual cross-shore connection; vertical arrows suggest the various edges generally parallel with the water margin.

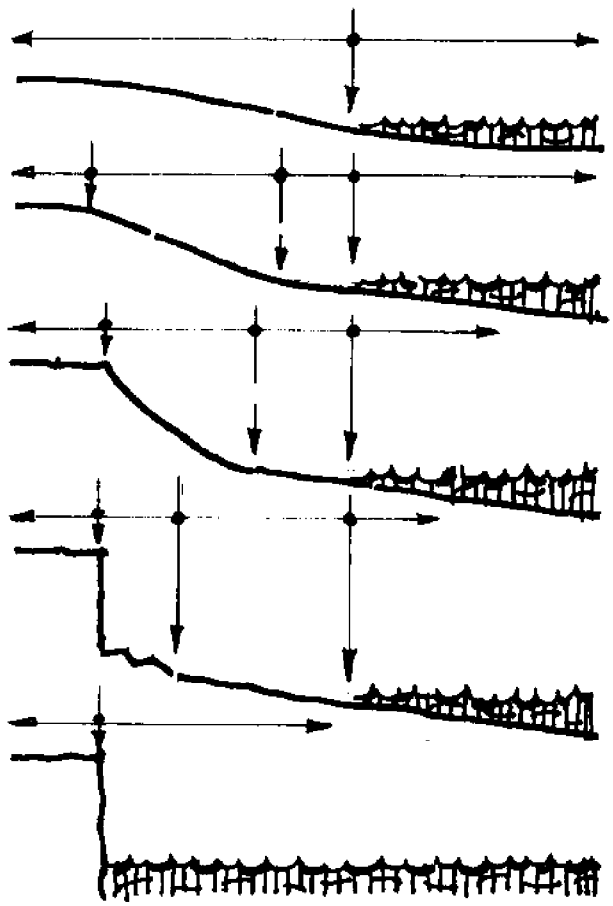
1. Flat with beach

2. Low Angle Slope with beach

3. Steep Angle Slope with beach

4. Vertical Bluff with beach

5. Vertical Bluff no beach



From these five, a complex set of variations can then be accounted for, depending upon whether the documentation is to be broad and generalized or more limited and detailed. Variations are built upon modifiers such as (1) Off shore slope and water depth, (2) beach width (if any), (3) Slope - bluff gradient, height, and proportion to beach width, (4) slope/bluff material: homogenous/heterogenous, and (5) vegetation: types and relationships to the cross section.

Although not suggested in the five edge sections above, another basic type might be characterized as vegetation - dominated: as diverse as estaurine marsh grasses set behind dunes or beach pine crowding a low bluff. Whatever the nature of the edge type, the visual inventory for landscape quality has the purpose of indicating design attributes: contrasts (or lack thereof) of colors, lines, surfaces, proportions, and scale; relationships of types to one another - linkages into planimetric configurations, orientations to light, relative visual display as seen from both off-shore and onshore viewing positions. While a landscape inventory has significant connections with both geological and vegetation surveys, aesthetic qualities are not revealed directly through scientific information but rather emerge from analysis of design relationships.

Adjacent to the shore edge will be the Inshore Landscape. Its characteristics need particular scrutiny and design analysis. This area exerts a crucial influence over the visual quality of the whole coastal zone, either reinforcing or degrading the quality of the main edge.

Inshore Landscapes:

With the shore edge types accounted for, then the connected inshore landscapes need to be recorded. No limiting definition for the bounds of the inshore landscape seems possible other than to suggest it be set by the zone with visible interchange back and forth from edge to the inshore area. Visual signs such as vegetation responses related directly to the coastal climate influence should also enter into delineation of this special zone.

Three basic configurations of inshore landscapes may be identified. They are (1) headland areas, (2) benches and slopes generally parallel with the shore edge, and (3) spatial recesses with a concavity facing seaward. Headlands have a dominant thrust outward against the general shore direction; they would be especially conspicuous seen from either land or water. Benches and slopes comprise a greatly varied set of land areas: flat to precipitous, simple to dissected in form, low or high relative to the ocean surface, diversified in relative size, the connection with waters' edge differing from abrupt and hard to gradual and soft. Spatial recesses are special "land coves" facing the water. They may especially be benches, characterized by steeper backland encirclement or perhaps near forest edge definition.

Again modifications affecting the visual variations of the inshore landscapes will come into play. These relate to terrain and vegetation patterns, scale differences, color and surface characteristics, all to be analysed for the various displays provided. Land use patterns and impacts of agriculture, urbanization, commercial endeavors, roads and utility functions need to be accounted for according to the ways they are matched, fitted, or misfitted to the inshore landscapes.

Next will be the Connective Corridors coming from inland, cutting across the inshore landscapes and connecting to the shore edge.

Connective Corridors:

These are the linkages or routes from hinterland to the coastal zone, normally being transverse to the directional trend of the sea edge. Connective corridors are of two types: those comprising rivers or major streams and those which are related to highway or road routes. Frequently the two are combined, they fit between the road and stream corridor having much to do with perceptions of visual quality. Also, for most of us, the travel corridor represents the introductory sequence of visual impressions which indicate coastal influence, finally revealing the inshore landscape and the water edge itself. As for bounds or edge definition, the corridor may be considered the envelope of space that can be seen from road and stream - but not slavishly restricted to a visual plot. Lewis' study of corridor concepts for Wisconsin should be reviewed for application here. (Lewis, 1964)

The river's sequential changes from hinterland to coast, riparian vegetation, and the transitional influence of estaurine waters are the basic sources of visual variety within the corridor (Litton et al, 1974). These sources are all set low in the landscape but will carry apparent contrasts with the adjacent landscape of upper slopes. By comparison, some travel corridors will be divorced from streams with ridge or high elevation routing resulting in quite different visual opportunities.

Corridors will not only be connective from inland but stream corridors will simultaneously divide inshore landscapes into segments. Such crossings should reveal a notable concentration of visual relationships while also providing tangible subdivisions.

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The concepts of a visual inventory for the coastal landscape based upon shore edge types, inshore landscapes, and connective corridors are scarcily original. I should like to think that fundamentals are represented, fundamentals from which characteristics of visual quality may be teased.

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METHODOLOGIES FOR SCENIC ASSESSMENT

Dr. Ron S. Boster

METHODOLOGIES FOR SCENIC ASSESSMENT [1/]

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Abstract

The paper is divided into two parts. The first part is a discussion of the various methodologies available for scenic assessment. The second part is a description of the esthetics research program being conducted by the author and colleagues in the Southwest. Concommittent with the first part, a major purpose of the paper is to cite references of the various methodologies for describing and predicting scenic beauty.

Introduction

This session of the conference concentrates on visual quality assessment methods and I have been asked to discuss this topic in an overview manner. Scenic assessment is both an art and a science, and rarely is any one method entirely one or the other. From the speakers before me you have heard of several different approaches to the problem of assessing scenic beauty. There are many more. The fact that there are so many possible approaches is both a blessing and an evil; while number and variety of choice are tenets of human welfare, decision among many alternatives is more difficult than for only a few.

My objectives are twofold. First, I will briefly overview the various approaches to scenic beauty assessment, evaluation, and prediction. Secondly, I will review the Tucson-based esthetics research program with which I have been associated for the Rocky Mountain Forest and Range Experiment Station of the Forest Service. It was through this research that we noticed the work of others and began to categorize the various approaches.

Two Questions (a digression)

I'd like to digress and answer two questions:

First Question. Why is an Arizonan into coastal esthestics? Methodologies of social research -- and scenic assessment is a subset of social research -- are transferrable. Procedures we have used to quantify public perception of and preference for the National Forests of the Southwest are rooted in a general methodology which may also be applied to assessing the visual quality of a coastal zone. The Scientific Method is the grandfather of "methods", and specific methods, procedures, and techniques (as for measuring scenic beauty) are subsets of the Scientific Method.

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1. Participants of the Conference/Workshop will note a change of title from my talk: "the state of the art and science of scenic assessment." I have made this change because the above title better describes this paper and because the paper by Drs. Arthur, Daniel, and myself (in press) is very close in content to the old title.

Second Question. What is an Economist doing measuring scenic beauty? I have long argued (mostly unsuccessfully, I might add) that economics has about as much to do with dollars as mathematics does with numbers, a very nice analogy if made to mathematicians (who are generally outraged at the sight or mention of numbers). So, my analogy--though proper--flops because of the dismal failure of mathematicians to explain to other mortals what mathematicians do. Economics (dubbed the dismal science by Thomas Carlyle) is a social and a behavior science. As such, Economics is concerned with the study of humans and how they express their wants in response to internal and external stimuli, not merely in dollar terms. Nobel Laureate Paul Samuelson's definition of Economics (1973) is long, but easily understood:

> Economics is the study of how men and society end up "choosing". with or without the use of money, to employ "scarce" productive resources that could have alternative uses, to produce various commodities and distribute them for consumption, now or in the future, among various people and groups in society. It analyzes the costs and benefits of improving patterns of resource allocation. (p. 3, emphasis added).

Just as many people associate mathematics with number crunching (instead of logic), many associate economics with money. But, as explicitly stated in the above definition, economics transcends pecuniary considerations. We often hear of "economic" as distinguished from "noneconomic" outputs, an improper classification if we buy Samuelson's definition. Thus, the terms "commodity" and noncommodity" are rearing their ugly heads more and more. While clearly an improvement over "economic" and "noneconomic", we can do better. The terms "market" and "nonmarket" are much better. Ruff (1970) has argued for "pecuniary" and "nonpecuniary" (literally translated meaning "money" and "nonmoney") which has a certain (snobbish) appeal to me. However, I can also live with "market" and "nonmarket".

As with any science, economics is concerned with both description and prediction. It is the study of how people choose (and express their wants) among competing wants. Therefore, if "beauty is in the eye of the beholder", economics may have something to offer because people make choices and harbor opinions (sometimes quite strong ones) about the esthetics of their environment. Other social sciences -- psychology, political science, geography, and sociology -- likewise have much to offer.

Enough of my rationalizations! Studying esthetics has some real advantages for an economist. It gets me out of the office, away from the computer, and into the woods, and, I sometimes get to go to conferences such as this one and meet non-economists.

There are many procedures available to assess, measure, and predict scenic beauty. By way of introduction to these procedures, I'd like to place scenic assessment in perspective. First of all, scenic assessment is a part of land use planning, sometimes a major part, sometimes minor. Secondly, the choice of a technique depends on many factors, one of which is financial or economic (or should I say 'pecuniary"?). Thirdly, available expertise is another important factor. Knowledge of the options defines the range of choice in

selecting a technique. This is important because there are many different approaches and my reading of the literature suggests to me that my many colleagues have not often made much of an effort to search out the various options applicable so that a conscious, deliberate, rational (as distinguished from rationalized) selection can be made.

A fourth point is that both land planning and Science are concerned with prediction as well as description. Unfortunately, land use planning of late has concentrated on the latter, often ignoring the former.[2] One might infer from this that techniques for description are different from techniques for prediction. While some techniques are solely descriptive, all predictive techniques are in part descriptive. The line is not fine, however, and it is best to say that some techniques predict better than they describe and visa versa.

Classification

Classification is the critical element in description. While not completely arbitrary -- classification is usually dictated by the scientific axiom that the simplest explanation is the best explanation -- classifications such as the one I am about to present are essentially arbitrary.

For no particular reason, let's start with Public Involvement, which should not imply the absense of professional input. I have divided public involvement into two broad categories: quantitative and verbal. By the former I mean procedures that generally deal with responses that are numerically codified, and by the latter, I mean responses that are generally characterized by words. The two obviously are not mutually exclusive (verbal responses may quite legitimately be translated into numerical representations). Unfortunately, procedures are sometimes prostituted in order to gain a semblance of quantitativeness for materials best left qualitative.

Counting the Ways

Figure 1 is my own arbitrary classification scheme.[3] In this section, I will discuss (briefly) each "box", and offer some bibliographical references associated with the Methodologies rather than the methods. Unfortunatley, a comprehensive text on methods or methodologies does not exist. The books by Emmert & Brooks (1970), Festinger & Latz (1966), and by Simon (1969) taken together, are nearly comprehensive. For articles illustrating the practical application of these methodologies, I refer the reader to the general literature; Arthur, Daniel, and Boster (in press) offer an "overview" of scenic

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2. For an interesting perspective on a possible reason for the emphasis on description, see the Science Editorial by Amitai Etzioni, "Fact-Crazy, Theory-Shy?" (1970).

3. The basic requirement for drawing up this chart was (1) a familiarity with the literature, and (2) familiarity and experience with flow charts. Of the million plus possible ways to represent the boxes in the figure. I settled on this configuation based on the criteria that "it looked good to me." In this regard, I was surprised that Prof. Nieman (a bona fide Landscape Architect) simply listed his methods.

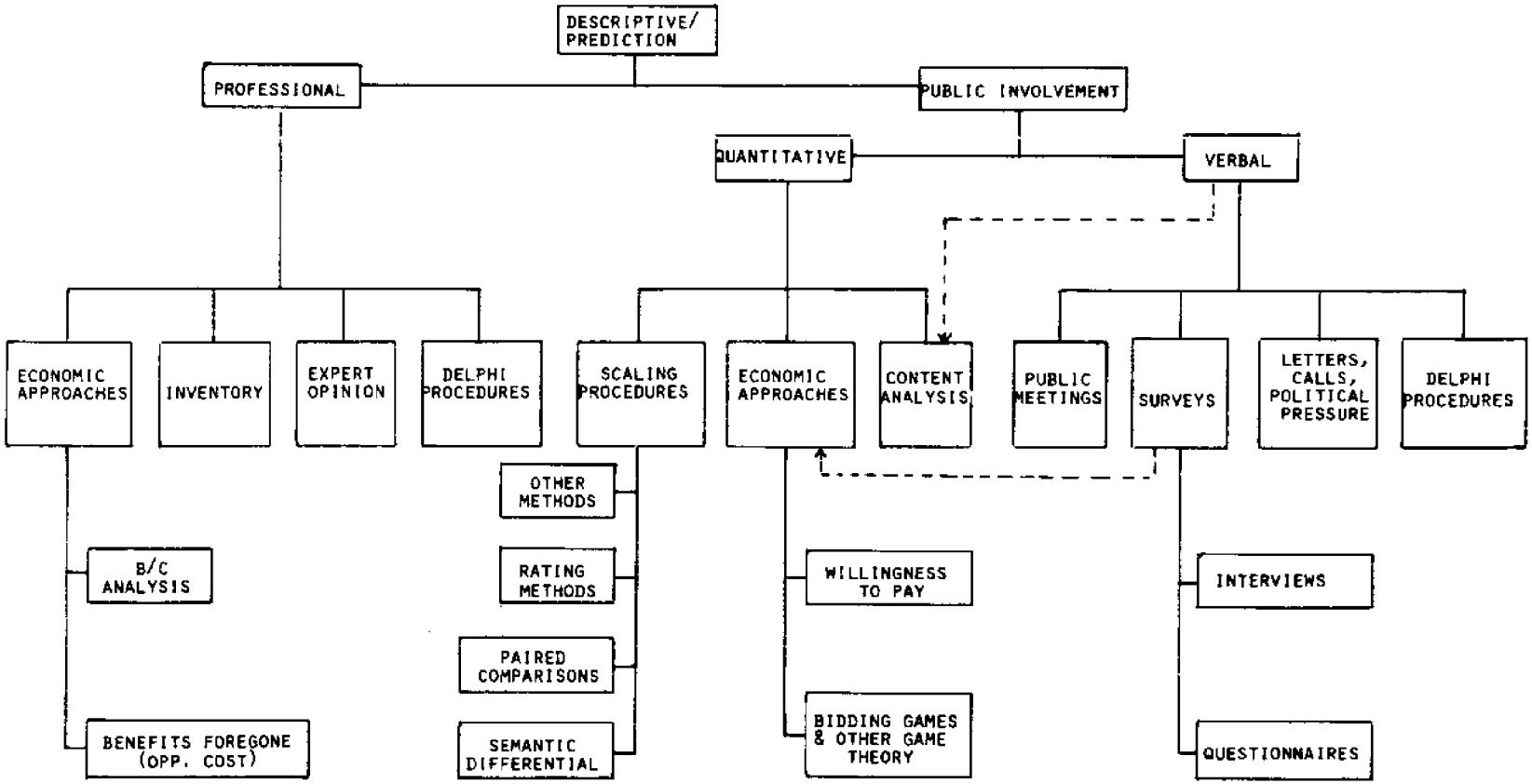

FIGURE 1. METHODOLOGIES FOR SCENIC ASSESSMENT

assessment techniques, and Arthur & Boster (in press) offer an annotated, critical bibliography of the scenic assessment literature.

Verbal Public Involvement

Delphi Procedures. The astue among you will note that Delphi Procedures appear under both Public Involvement and Professional headings. The reason is that Delphi procedures can be conducted with any group -- it is a group encounter process -- whether experts or laymen, or combinations of both. All that is required is that participants be considered "experts" for the job at hand. Delphi is a game, in the context of formal game theory (Buchler & Nutini 1969), and was developed by Helmer & Gordan at the RAND Corporation. Everyone has probably been in a Delphi situation at one time or another, even if the fancy name was missing. In the real world of decision-making, many decisions arising from "staff meetings" are arrived at through a Delphi process.

So, what is it? The procedures vary greatly, from highly structured to very loose group discussions. The aim is to arrive at a concensus within a group, a group "guesstimate":

> In Delphi types of games, opinions, information, judgements and evaluations of relatively poorly defined concepts and intangible properties of a social problem are brought together from the personal background of the players themselves. These judgements and opinions are then brought into potential conflict with each other by the framework of the game and a resolution of conflict is forced by making players agree upon certain key positions and decisions. In the course of play, a consensus on a number of difficult issues may emerge from the participants which may represent some closer approximation to the best combined wisdom and insight of the persons involved in the exercise. While difficult to describe adequately or justly, the process appears to have some substantial merit, qualified primarily by the ability and background of the participants in the exercise. (Becker & Goodappel 1972, p. 117)

Of course, Delphi procedures do not always work; sometimes hardheads (so-called "dominant individuals") control the situation and meek participants don't participate. The idea is that within the group of "experts" no one has all the necessary information to answer the question before the group. Through an iterative communicative process, however, a concensus very close to the "right" answer will occur.

Dalkey and his associates (1972), discuss the Delphi procedure and cite numerous experiments aimed at determining if "2-heads are really better than 1". Results of experiments using Delphi for factual questions have often been amazingly accurate.

The value of the technique lies, in my opinion, in answering subjective questions. Scenic assessment is an excellent example. I once participated in a Delphi procedure to determine relative esthetic indices for several ponderosa pine treatment alternatives being considered as part of an Environmental Impact Statement (Boster 1975) Since "beauty is in the eye

of the beholder", we were all bona fide experts, and since the true parameters (relative scenic values) are unknowable (they can only be estimated), the stage was set for a Delphi session. I think it worked. We all had a piece of the puzzle. In attendance were a landscape architect, the District Ranger, the Recreation and Land Staff Officer for the Forest, and me (the scientist). Through a gentlemanly session we arrived at a set of numbers that seemed to me to closely approximate the relative scenic beauty of the alternatives in question (but, may be unrelated to others's perception of scenic beauty).

Delphi can play an important role in esthetic problem-solving. Delphi is especially useful in the early stages of an investigation when it is desirable to clearly state the problem at hand, and for exploring alternative solutions. It can be loose or structured, but two heads are generally better than one in subjective areas. One caution: there is always the inclination to pass off Delphi-generated results as gospel; whether the results are fact or not is often unknowable and I would admonish all who use the technique to keep this in mind.

Letters, Calls, Political Pressure, and Public Meetings. These two boxes were combined because of their similarity. They represent verbal public involvement procedures. Letters and calls often provide valuable public input, whether solicited or not. In terms of representative samples, this means of public input is at least as valid as open meetings. There are systematic procedures for handling such responses, such as CODINVOLVE (Clark, Stankey, & Hendee, 1974); however, as noted by Arthur et al (1975) there are caveats to keep in mind: 1) the reliability of the input, 2) subjective interpretations of the coders, 3) randomness of the sample, and 4) whether subjective information is best left subjective.

This last point is important not only for letters and calls, but whenever subjective information enters the decision-making process. Quantification of inherently subjective information imposes an implied "dignity" that is often misleading. A number implies exactness, precision, accuracy, and this implication is strong where subjective concerns (e.g., esthetic value) are presented with objective ones (e.g., timber yield, water runoff, forage production).

Public meetings are useful and serve important functions: 1) they provide a forum for an agency to present a problem (and sometimes its already determined solution) to an interested public (which is usually much more palatible than for the public to read through thick reports), 2) they fulfill procedural rules and requirements (e.g., as a requirement for preparing an Environmental Impact Statement), 3) they provide a vehicle for the public to ask questions, 4) they permit persons and interest groups to let off steam, and 5) they provide a measure of public input and involvement.

This last point is the one of interest here. Public meetings may serve some very useful and important functions (points 1 through 4 above), but not as a vehicle for gathering representative public information. Generally, only the most interested and vocal participate, and their views may be quite different from those of the general public or other interest groups who, for whatever reason, choose not to participate. Small group public meetings

are being tried in Tucson by the Coronado National Forest with generally positive results to date. Public meetings are time consuming for the agency presenting them, and they are inefficient as far as gathering objective, representative public information and involvement is concerned. However, their total utility must be judged in the context of the other functions served.

What can I say about political pressure? It is naive to believe that public agencies are insulated from such pressure. Federal Agencies react with speed, if not vigor, to Congressional inquires, and often the surest way to get a response from a non-responsive agency is to write your elected representative. Opinions expressed by elected officials may represent a large segment of the agency's clients.

Surveys. The final box under Verbal Public Involvement is Surveys. Surveys may take many forms, from oral or verbal interviews (structured or unstructured) to mailed questionnaires (themselves a myriad of possibilities) to combinations thereof. Any manner of collecting public information is a survey method, but I draw a somewhat finer distinction and consider surveys in the vernacular: interviews and questionnaires. Surveys have not been used much to evaluate scenic beauty, though they have been used extensivley to assess opinions on environmental quality considerations. Many of the assessment methods of figure 1 are usable as surveys.

We've all been on at least one of the two ends of questionnaire (sending or receiving). Questionnaires take many forms (e.g., the semantic differential, discussed below, is a questionnaire survey instrument). Questions may be "closed" (e.g. true/false, multiple choice, ranking) or "open" (permitting varying degrees of latitude in response). Survey design is both a science and an art and is fraught with considerable danger (White, in press). For details on surveys see Chapter 11 of Goode & Hatt (1952), and the texts by Raj (1972) and Tull and Albaum (1973).

Quantitative Public Involvement

Quantification is not necessarily better than the more subjective, verbal techniques discussed above. The value of quantification is directly related to the methodological rational, underlying assumptions, sampling procedures, and responses, among other factors. These, unfortunately, are not always specifically stated. Our analytically oriented society dignifies and adjulates quantification as "good"; quantification is often cited as its own reward, which it is not. Scientifically valid quantification does make things easier to understand and deal with, but if we strive for quantification, it should be for the soundly-based variety.

Content Analysis. Content analysis is similar to coding and involves categorizing qualitative materials. Content analysis is the (one-way) bridge between qualitative and quantitative information. Though not technically identical with coding, content analysis has been defined by Berelson (1952) as "a research technique for the objective systematic, and quantitative description of the manifest content of communication" (1952, p. 18). Stankey (1972) who has discussed content analysis in the context of resource decision-making, lists

four steps: 1) selecting the response categories, 2) sampling, 3) measurement, and 4) analysis. As with Delphi procedures, content analysis is not easily explained in a short space. In addition to Berelson's book, and Stankey's article, see Festinger and Katz (1966) and Simon (1969).

Economic Approaches. This topic is under Public involvement because of its close relationship to Surveys (note the dotted line, Fig. 1). However, the same topic also occupies a box on the other side of the Figure, under Professional Techniques, and I will discuss it there also. From the introduction, you already know what Economics is and should not shudder at the thought of applying economics to esthetic problems. For the general topic of Economic Survey Methods, see the text by the same title by Lansing and Morgan (1971).

(1) Willingness to pay. This approach has been widely used to estimate values for recreational experiences. The economic logic behind the approach is well stated by Sublett & Martin (1975):

> Economic values are measured by what people are willing to sacrifice in order to obtain a good or a service. Therefore, a relevant measure of an outdoor recreation value is simply the willingness on the part of a consumer to give up all or part of his income and/or time, that is to incur a cost, in order to enjoy an outdoor recreation experience. This measure of value is conceptually the same as that for other economic goods. The method of valueingan outdoor recreation experience based on the notion that the value of the experience is reflected in the cost of consuming that experience is consistent with the methods used for valuing resources associated with market-priced goods, except that outdoor recreation goods lack a formal market determined price. Consumers of any economic good or service must receive satisfaction (utility) that is at least equal to the cost that they are willing to incur, otherwise they would not be acting rationally in incurring this cost. With a market-priced commodity, the price that is paid in the market, along with the time involved in purchasing that product (other factors such as income being constant), regulates the amount that is consumed of that product. Likewise, the money and distance (time) costs of a recreational activity will determine the amount of participation of individual recreators, and the satisfaction (utility) received must be at least equal to the cost the people are willing to incur. (p.3)

Thus, willingness to pay is essentially the classic demand curve analysis in introductory micro-economic texts. The well-known Clawson-Hotelling approach (Clawson & Knetch, 1966) is widely used in recreation studies.

I know of no study that attempted to derive willingness-to-pay values specifically for scenic quality. The problem is that esthetics is too

confounded with recreation to be separable. However, the extent recreation proxies esthetic concerns in a given situation, willingness to pay may be a good way to gain a quantitative handle on esthetics.

(2) Game Theory and Bidding Games. Game theory is relatively new, but has enjoyed increasing popularity and interest Buchler & Nutini 1969. Coombs, Dawes, Iversky 1970) since first articulated by Newman & Morgenstern (1953) in their Theory of Games and Economic Behavior in 1947. Many people have been introduced to game theory through popular books such as Games People Play (Berne 1964). However, game theory has remained largely rigorous and mathematical and often incomprehensible to most mortals. Game theory has yet to make any significant inroads into natural resource decision-making. Riggs (1968) describes game theory in its general terms:

> In competitive decision-making two or more decision-makers are pitted against each other. Both are to be equally informed and intelligent. They are referred to as "players" and their conflicts are called "games". The rationale of their competition is the basis of "game theory". (p. 351)

As with willingness-to-pay, game theory per se has not been used for scenic assessment. However, a sub-set of game theory -- bidding games -- shows considerable promise if not extensive use. Bidding theory involves "forcing" the participants to allocate resources within a budget constraint. Thus, players face a real-world situation (man's insatiable demand) of wanting to do more than resources permit.

Responding to a questionnaire, a person may ascribe infinite value to a given proposal if that person knows he will not have to pay for it (the "free rider" concept, see Dolan 1971). But, bidding is more realistic because of the presence of the budget contraint. Of course, hypothetical bids may or may not simulate actions in the real world. Stark (1971) has compiled an impressive bibliography on competitive bidding.

Scaling Procedures. Trying to quantify scenic beauty is really an attempt at measuring human perceptions to that dimension. Scaling -- the assignment of numbers to properties (such as scenic beauty) or objects (Coombs, Dawes, and Tversky 1970, p.31) -- has become a rigorous, mathematical science. The lion's share of the development has occured in the field of psychology. The short text by Hays (1967) -- Quantification in Psychology -- is excellent and readable.

If scaling is desired, the type of output must be selected: ordinal or interval. Ordinal means rank. For example, six landscapes may be ranked 1-6 in order of natural beauty. This is often adequate and may be all that is required. However, many times knowlege of the magnitude of the differences between stimuli (e.g., landscapes) is desirable and so an interval output is sought. In other words, knowlege that landscape x is prettier than landscape y (an ordinal bit of information) is one thing, knowing how much prettier is another. Scaling procedures provide the methodological wherewithall to achieve these types of quantitative indices.

Scaling procedures are attractive and powerful tools for determining public perceptions and preferences. However, a warning is in order. Like many of the other procedures in Figure 1, they should not be applied willy-nilly. Reading the books and the literature will not make one an expert. These (and the other) procedures are fraught with methodological nuances (see Guilford 1954, Ch. 11). One of the most common errors is non-recognition of the assumptions underlying the procedures. The literature is repleat with misapplication of techniques.

Some of the important questions that should be addressed (if not answered explicitly) are: 1) If, as is usually the case, "representations" of the real world must be used, how good are the representations? Some representations (e.g., black and white photos) are not as good as others (e.g., color slikes) which, in turn, are not as good as the real thing (on-site ratings). 2) Are the representations unbiased, e.g., are they drawn randomly, or are they one person's notion of what is "representative"? 3) Is the order in which the slides (representations) are presented random (it should be) and do the subjects know the number of areas and other aspects of the sampling procedure (they should not)? 4) Are the subjects themselves representative of some identifiable population? The validity and reliability of the exercise will depend on the answers to these and other questions.

(1) Paired Comparisons. This is useful for rank ordering small sets of stimuli (e.g., six scenes, each on a photo). Generally, (though not always) the procedure requires all possible combinations of pairs within the set to be considered. It is then straightforward to rank order the elements of the set. The problem with the procedure is that so many (often all) pairs must be considered; for 6 scenes, 15 comparisons (the total number of combinations of 6 items taken two at a time) must be made.[5]

(2) Rating Methods. Paired comparison is, technically, a rating method because the product (the rank order) is derived from binary (paired) rating judgements. However, in this sub-section, I am speaking of rating procedures that result in interval indices, for example, numerical scores of relative scenic quality, as: Landscape A = 5.3, Landscape B = 6.1, Landscape C = 2.2. Of course, ordinal information is contained in interval outputs; rank ordering the three landscapes, Landscape B is the prettiest, followed by Landscapes A & C, in that order. Note, however, that the interval indices (and not the ordinal ranks) provide a further measure of the relative beauty of the three hypothetical areas, namely, the intensities of beauty preference. The output obtainable with these procedures provide valuable information in their own right, but are also easily compared with values of other resources in a multiple-use planning/decision-making framework.

The most common means of obtaining interval scores is to have participants (subjects) assign numerical scores to Likert-type scales (e.g., -10 to +10, 1 to 10), where the lower the number the least beautiful and the higher the number, the more beautiful. From the data means, standard deviations and other statistics are calculable. One can also perform statistical

5. The formula for this progression is $N!/(2(N-2)!)$, which reduces to $N(N-1)/2$.

analyses to determine if there are meaningful differences (e.g., does the mean rating of Landscape A (5.3) differ significantly, other than by chance from the mean rating of Landscape B (6.1)?). Often, scores from raw ratings are transformed mathematically to account for differences in how people use the rating scale and for other methodological reasons.

There are numerous texts in the area of rating methods. In addition to the one by Hays cited above, the one by Nunnally (1967) is outstanding (for other psychophysical procedures as well), and the well-known book by Torgerson (1958) is also recommended.

(3) Semantic Differential. The semantic differential is a technique that has been used widely to evaluate visual quality. Unfortunately, the procedure is not easily explained in a single paragraph, though it is not complicated (in fact, it is extremely simple). Briefly, lists of adjective opposites are scaled for various stimuli. Examples of adjective opposites would be harmony-disharmony, smooth-rough, monotonous-varied. Examples of stimuli are the words landscape, trees, ground cover, but may also be pictures, drawing, slides, or other representations. Factor analysis is used in an attempt to group the scales and try to make sense out of the data as they relate to, say, scenic beauty. Semantic differential is a controversial technique in that many persons dismiss the voluminous justifications for the approach as rationalizations and the procedures as being non-rigorous. The most comprehensive treatment on semantic differential is the sourcebook edited by Snider and Osgood (1969).

(4) Other Methods. I have noted in very general terms the more common scaling procedures. However, this is a large field. There are several other techniques (e.g., Q-sort, see Brooks 1970; adjective check lists, see Craik 1971), but this paper is already too long.

Professional

Just as there is no fine line between primarily predictive and primarily descriptive methods, there is no clear distinction between methods oriented toward public involvement and those oriented toward professional expertise. Public involvement methods, of course, involve substantial amounts of expertise, and the distinction between the two, I think, is best taken to be the lesser reliance on input from the public in the case of those techniques I have labeled "Professional."

Expert Opinion. Expert opinion is a Delphi procedure with one participant (an encounter group of one), and is by far the most common form of scenic assessment. If inventory procedures appear to be a close second, it is only because experts commonly invent their own inventory scheme to legitimize their product, so that their report does not appear to come straight from the blue, which it often does.

If you think I'm down on expert opinion, you're wrong. What I am opposed to is elitism, a failure to recognize that in the area of esthetic assessment, there are no experts or everyone is an expert; there is no middle ground. There are professional and non-professional estheticists and they often must work

together as a team. This is not a one-way street. Non-professional estheticists often fail to recognize what professional estheticists have to offer, which is a lot.

Inventory. Descriptive inventory techniques are the second most common form of scenic assessment. In our effort to work up a bibliography of assessment procedures, inventories comprised by far the largest category (Arthur & Boster in press). They are almost entirely professionally oriented and may be qualitative (purely descriptive) or quantitative (assigning numbers or weightings to various components of landscapes). Inventories are as varied as the people who use them; there is no set of landscape components common to all inventory schemes; there is no accepted set of component weights. For a fairly detailed overview of the approach see Arthur, Daniel, and Boster, in press).

Economic Approaches (again). I haven't necessarily saved the best for last, but I did want to split Economic Approaches into the two main groups of Figure 1 -- Professional and Public Involvement.

(1) Benefit/Cost Analysis. B/C analysis though often maligned and misused is a fact of life. Properly (or improperly) used B/C analysis is a very useful and powerful tool. B/C analysis is a "with and without" procedure; for example, a multifunction reservoir/dam project is analyzed on the basis of the consequences (economic, environmental, esthetic, etc) with the project vis a vis without the project. B/C analysis is thus a marginal analysis (see Berkely & Seckler 1972); it is the incremental analysis of one alternative (e.g., build the dam) against another (e.g., don't build the dam).

Like some of the other scenic assessment approaches. B/C analysis is not applicable to scenic assessment per se. Rather, its utility lies in permitting the comparison of alternatives that differ in several respects, not only in scenic quality. Knowing what went into a particular B/C analysis and identifying the scenic consequences as best as possible often permits valuable comparisons between the relative esthetic-economic tradeoffs between projects.

(2) Benefits Foregone. The value of a resource is measured by sacrifice. For example, an officially designated wilderness has a value based on what must be (sacrificed) foregone (e.g., timber production, mineral extraction, many forms of recreation, etc) to enjoy such a luxury. Thus, resources are valued on the basis of benefits foregone, otherwise known as opportunity costs (i.e., one gives up the opportunity to cut timber, extract ores, or ride a motorized vehicle in a wilderness).

Amenity values (if not scenic quality per se) can also be measured using opportunity costs. The procedure is to account for all resources except amenities, which are called the "residual claimant". The approach is similar to benefit-cost analysis; alternatives are first analyzed on the basis of the non-amenity (dollar quantifiable) resources. For example, assume Alternative A has net non-amenity benefits equal to those of Alternative B, but A costs "x" dollars more than B, yet B is greater in amenities. The decision is made on the judgement of whether the greater amenities of B are worth B's greater cost, not a particularly easy decision, but one that is made a log easier because economic analysis has trimmed the fat and reduced the problem to its bare essentials.

Forest Service

Southwest Esthetics Research

The second portion of my discussion deals with the esthetics research I have been involved in over the past several years. This research has been sponsored by the Rocky Mountain Forest and Range Experiment Station, USDA Forest Service (my employer) in cooperation with the University of Arizona.

This research began in 1971, I think in response to a growing public awareness of scenic beauty as a resource in its own right (a logical outgrowth of the Environmental Movement which had reached a peak in April the year before) and in the face of a substantial void as to how to adequately consider scenic beauty in a multiple-use planning context.

The research has been related primarily to concerns of forest lands, but applications to other environments are certainly possible.

Needs. We first identified four "needs" which we have been trying to meet.

1. The need for better integration of scenic beauty with other resources.

2. The need for better justification for land use decisions.

3. The need for increased and more meaningful public involvement.

4. The need to restore the client-designer relationship.

I think the first three needs are self-evident to anyone who has dabbled with scenic beauty evaluation problems in the real world. I'll not go into detail here as I have done so elsewhere (Daniel & Boster 1975). However, I might expand a little on number 4. The Forest Service, I understand, is the largest employer of landscape architects. This is commendable, at least for the Forest Service, however, there is a world of difference between a landscape architect practicing in the private sector and one working for a public land planning and managing agency such as the Forest Service. That difference, I believe, has to do with the intensity of the client relationship -- intense in the private sector and weak and poorly defined in the agency case where the Public is the client. There is little opportunity or means for an agency-employed LA to interact with his clients (the Public) in order to determine client preferences, wishes, and wants. Our research is directed, in large part, at providing LAs (and others) with objective, defensible information about the public's esthetic preferences. I would argue that an LA who is aware of client perceptions is in a position to do a better job for the client.

Goals & Criteria. With these needs articulated, we established four general goals (or objectives, depending on definition):

1. Develop easily used, relatively inexpensive tools and procedures for assessing scenic beauty that are scientifically defensible and adequately tested.

2. Develop a predictive capability to permit relatively simple determination of scenic beauty indices for management alternatives.

3. Develop tools, procedures, and models that augment the Visual Management System (VMS) and VMS-type procedures.

4. Conduct related studies.

Some of the criteria we adopted to guide the development, testing, and application of our procedures have already been noted (e.g., easy to use, inexpensive, methodologically sound). I have also discussed the question of criteria elsewhere (Boster 1973), as have others (Brown 1973). Basically, we chose a rigorous experimental approach (Figure 2).

Development of the SBE Method. We have focused on the field of experimental psychology because psychologists have been studying perception rigorously for several decades. We found that with appropriate modifications of their models and methods, scenic beauty considerations (as a type of human perception) could be handled quite well. The figure helps explain the approach. This first box is discussed in detail elsewhere (Daniel and Boster 1975); suffice it to say that the Scenic Beauty Estimation (SBE) methodology evolved from classic pychophysical scaling theory (Thurstone 1948, Torgerson 1958) as well as from the more recent Theory of Signal Detection (Green & Swetts, 1966, Swetts 1973).

The SBE procedure utilizes randomly sampled color slides, shown to subjects (observers -- such as special interest groups, professional persons, and users) in a randomized order. Observers judge each slide stimulus on a numerical rating scale (e.g., 1 to 10). SBEs are standarized scores derived from the assigned ratings. The SBE Program is a computer program which computes SBEs for the represented landscapes or areas. Pretesting involved -- you guessed it -- university students, who gave their valuable time for science and brown points. Pre-testing taught us a great deal about how people reacted to this particular kind of task and we came to appreciate the upper limits as to the number of slides to show and the lower limit as to the exposure time per slide, among other concerns.

Testing. Pretesting involved several forested areas that were quite different from each other. For the final testing, less divergent areas, more feasible treatments, and non-students were used. We sought out 30 environmental interest and user groups instead of students. Following this extensive testing (pretesting and final testing) program, we concluded that the SBE method is an effective way to assess scenic perceptual preferences; people can and do make distinctions between different forest management schemes.

Having established that SBE is reliable and valid (we have bused several groups to the areas and compared their on-site judgements with their by-slide judgments) we moved into the next major phase of the research, developing a predictive capability.

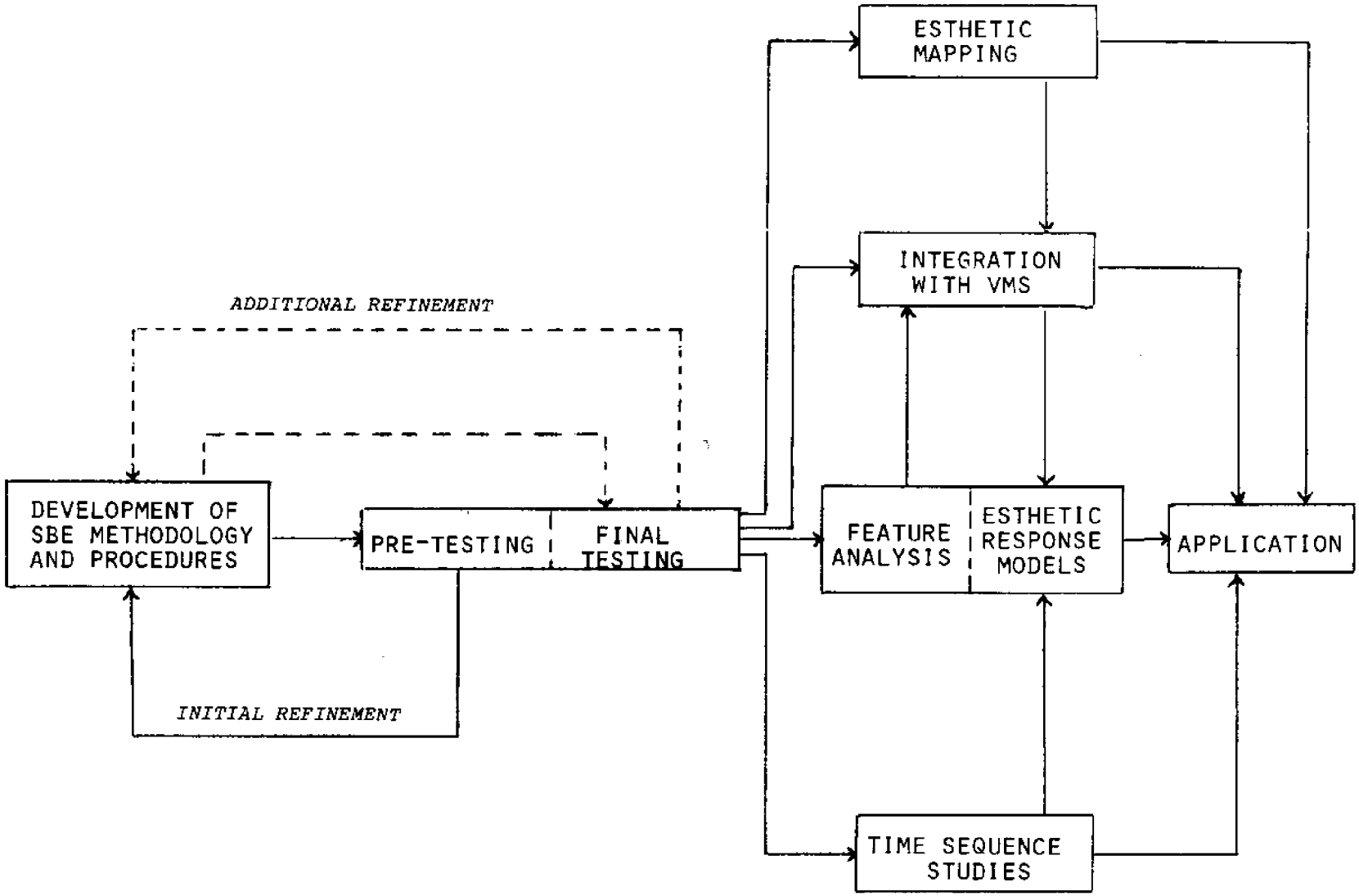

Figure 2. Esthetics Research, Rocky Mountain Forest and Range Experiment Station, USDA Forest Service

Developing a Predictive Capability

As you might imagine, its rather hard (in fact, impossible) to take slides of treatments that do not yet exist, which is the normal case if one is analyzing a set of treatment alternatives for a given piece of real estate. A method based on slides is hardly useful here. Determining the scenic value for actual landscape is one thing; predicting what the scenic value would be given a treatment prescription is another. So just as managers use and need water, forage, timber, recreation prediction (response) models, so too does the decision-maker desire a predictive tool for esthetic consequences. A model that predicts esthetic consequences would therefore be termed an Esthetic Response Model.

Our efforts at developing esthetic response models fall under the heading Feature Analysis (see Figure 2). By Feature Analysis we attempt to determine the relative predictive importance of several manageable landscape features ("manageable" meaning those over which the decision-maker has some control, e.g., amount of downed wood, average tree diameter, tree density). We have employed various empirical procedures (e.g. factor, cluster, and regression analysis) for up to 50 such features. Results have suggested that only a handful of features are necessary to adequately predict scenic beauty.[6/]

While we have concentrated most of our efforts on the ponderosa pine forests of the Southwest, the methods and procedures employed will enable similar esthetic response models to be developed for other areas (the relative importance of certain variables may change drastically).

Esthetic Mapping

Figure 3 is an esthetic contour map. The area is the Thomas Creek Experimental Watershed, located on the Apache-Sitgraves National Forest, in northeastern Arizona. The watershed is approximately 1100 acres, and the vegetation is mixed conifer.

Two randomly-directed color slides were taken from each of 250 survey stakes on the ground. Slides were rated by subjects in the normal manner. The SBE Method was modified to yield relative Scenic Beauty Estimates (SBEs) for each point with zero the average value for the entire watershed. Scores above zero represent scenic beauty in excess of the average scenic beauty and scores below zero represent views with less than average beauty. Note the analogy with topographic maps -- on a topo map, values are the elevations on the contour; on an esthetic map, values on a contour are what can be seen from that line. Once each point had a value, contouring was straightforward.

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6. These features become scaleable independent variables in a multiple regression equation (model). SBEs are the dependent variable. Preliminary findings are reported in Daniel and Boster (1975), but the state of the art is documented by Arthur (1975).

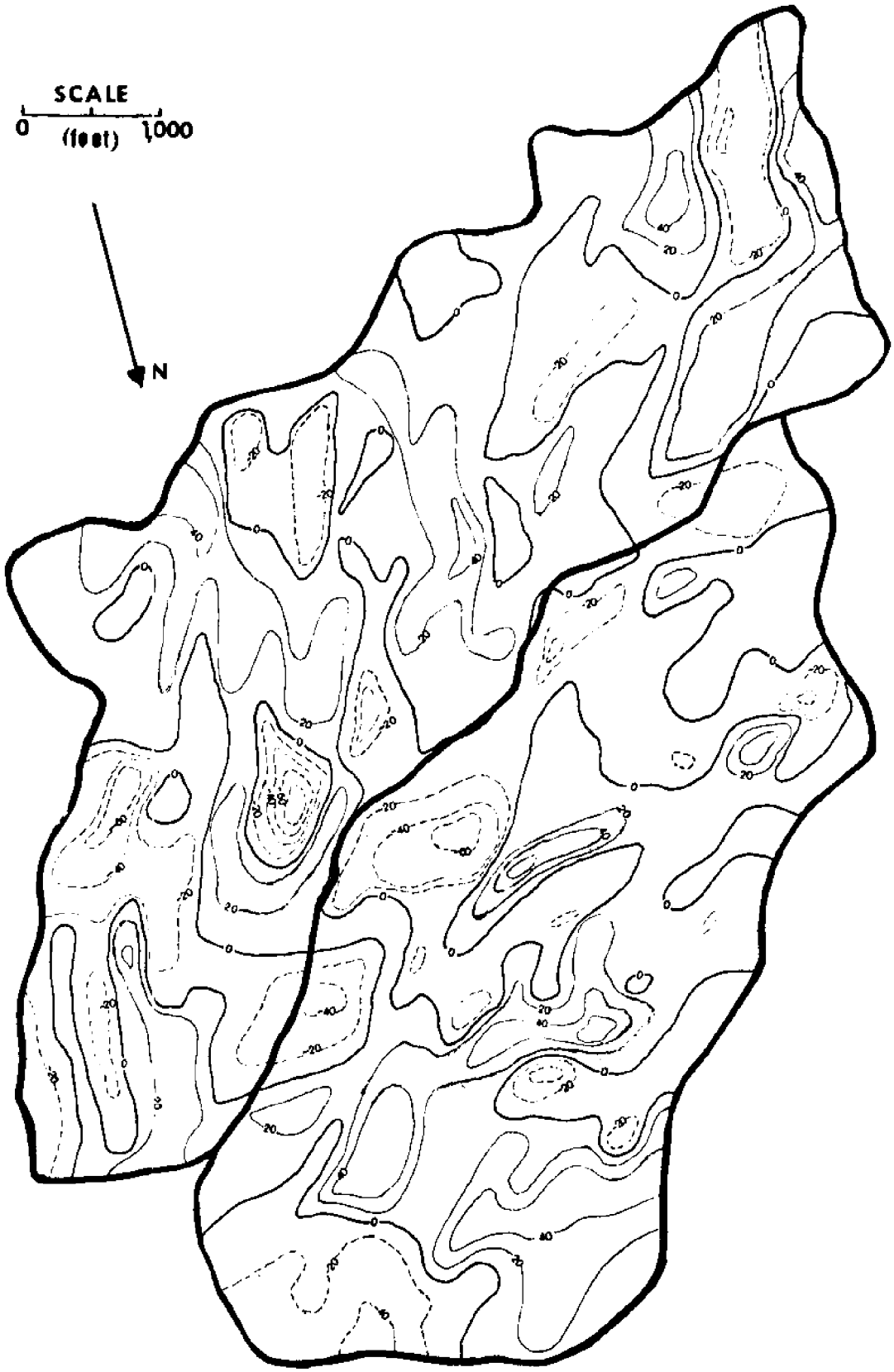


Figure 3. Esthetic Contour Map (SBE units). Thomas Creek Experimental Watersheds, Apache-Sitgreaves National Forest.

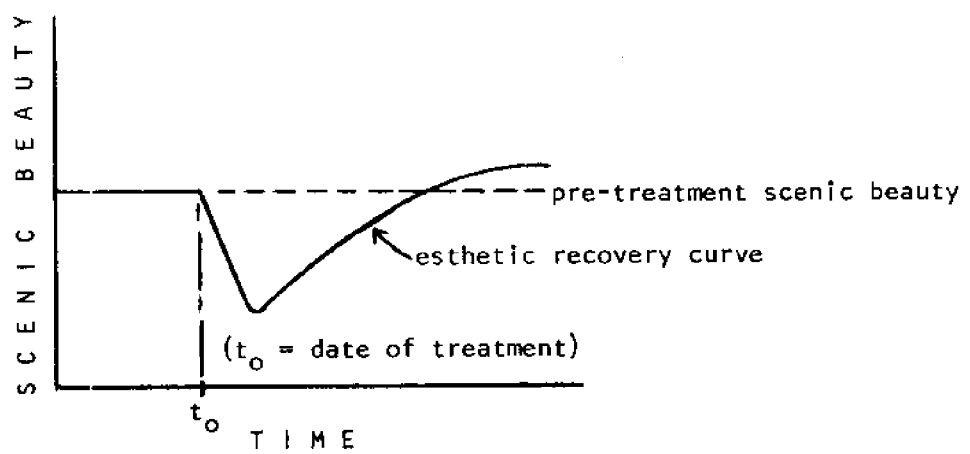
The idea of an esthetic contour map is exciting to me and also to many landscape architects and others. The reason are obvious. Such a map has the potential for becoming a valuable planning/decision-making tool. One obvious application is as an overlay with, for example, soils, vegetation, and engineering maps. The scenic beauty of alternative roading systems would be readily apparent. With the use of esthetic response models (prediction models), alternative management plans could be systematically analyzed from an esthetic viewpoint. And, there are other possibilities.

Because of the significant interest and possibilities associated with esthetic contour mapping, we have expanded our research efforts. We have resampled Thomas Creek, this time with four shots per stake. Our aim is to determine the number of shots necessary to adequately represent the view from a point and also to determine optimal sampling point densities. We have also expanded our studies to include Woods Canyon, a large (approximately 15,000 acre) operational-size watershed. There, we have also sampled from points located at random throughout the watershed. Woods Canyon is predominately ponderosa pine which means we can apply our prediction models and derive a set of esthetic contour maps for various management alternatives, including present management. At this writing, we are still running subjects.

Time Sequence Studies

The immediate esthetic impact from land management activities is often significant and negative. A perfect example is when timber is harvested; the site looks quite bad just following the harvest because the evidence of the activity (felling, skidding, bucking, and loading) is dramatic. With time, however, there is an esthetic recovery as the evidence becomes less apparent and as the new landscape takes on a more natural look. It is known that deliberate disturbances such as timber harvesting can lead to a more pleasing landscape (Boster & Daniel 1972).

The main consideration concerns the rate of the esthetic recovery, as illustrated by the figure:



We have studies currently underway aimed at quantifying the above conceptualization. One study is concerned with the esthetic effects of prescribed burning. Control and treatment areas have been established and have been photo sampled. At this writing, we are waiting for the right weather conditions to burn the treatment areas.

Our thinking is that decision-makers would benefit from denfensible information such as how long will be required for the scenic quality to return to, exceed, or otherwise level off following a specific treatment. Methods (such as SBE) are available to obtain such information.

Integration with VMS

The Forest Service has long been concerned about scenic beauty:

> The time has arrived when there is a definite need for the adoption of a national policy for the landscape development of the National Forest areas. A long-range program of planning, relating to the scenic and recreational features is most essential (Taylor 1935).

Most recently, considerable effort has gone into what is termed the Visual Management System or VMS (see for example, USDA Agricultural Handbook Numbers 434 & 462). VMS is intended to provide the framework for considering the visual resource as an important resource in its own right and for integrating visual concerns with other management considerations.

Development of VMS is an ongoing process and all Forest Service Regions as well as in the Washington Office are participating. Part of our research is directed at integrating SBE-type approaches with the more descriptive VMS-type approach. We see the two as compliments rather than opposites.

Many persons are working with VMS to iron out some bugs and shore-up soft spots, and otherwise see how VMS works in their particular area and for their particular concerns. For our part, we are working closely with National Forest LAs to identify those places within VMS that SBE-type procedures can be integrated with advantage.

Application

Research is often an end in itself. A close look at the literature and at management/planning practices reveals that only a small percentage of research gets translated into application. Over the past 5 years, scenic assessment has been a very "hot" topic, both in research and management. Much of this research has been ignored and could find gainful employment in many practical areas.

My own feeling is that both researchers and practicioners need to make a more concerted effort to understand each other and to work together on problems of mutual concern and consternation. Involving the expected user in the research is important if the researcher is really interested in future application of his findings. The old traditions of publishing

in journals or outlets primarily for other researchers and giving papers at meetings attended mostly by other scientists does little to foster application. Conferences and workshops such as this one are a move in the right direction.

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AESTHETIC PREFERENCES AND RIVERSCAPES

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AESTHETIC PREFERENCES AND RIVERSCAPES

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Abstract

Viewers from areas across the United States evaluated slides depicting riverscapes. Frequency distributions of ratings of each slide indicates (with three exceptions) that there is a distinct esthetic value for each. Thus esthetic preferences can be determined. There seems to be no difference in esthetic ratings between men and women.

Introduction

All of us at this conference are deeply concerned with the esthetic appreciation of nature - with the recognition and evaluation of our natural surroundings in order to conserve and preserve a quality environment.

We who are present here come from a variety of disciplines so it may be no great surprise to you that a geologist is taking part - but it does seem strange to geologists. Traditionally, a geologist would not be professionally interested in the esthetics of the environment in which he works. However, as a geomorphologist, concerned with landscape formation and analysis, I feel we should be professionally involved in determining the esthetic and environmental values of landforms and, particularly, in preserving unique or beautiful landscapes. Some geologists are presently offering their expertise to aid in choosing wild and scenic rivers and natural landmarks, to be preserved by the National Park Service. So I come here as a student of natural landscapes and, especially riverscapes.

It has been stated (Sonnenfeld, 1966) that man's attitude towards nature varies with the society to which he belongs and to his individual outlook. Primitive man regarded nature with superstition and awe. Its forces were powers that he could not understand, so the extraordinary, dramatic and mysterious in nature inspired fear and reverence. Particularly

awesome spots were preserved through taboo.

In other societies (as in Japan) nature is an esthetic potential - a source of renewal of spirit, a force with which man can harmonize or which he can imitate - where natural beauty pleases by mere contemplation.

In modern western society we have usually regarded nature as an opponent, to be conquered, dominated or tamed. However, even in our mechanized, engineering society we realize that our health and well-being is related to nature and to natural beauty. Most individuals try to surround themselves with physical environments which are beautiful. We buy paintings and sculptures, raise flowers or plant greenery. In our spare time or on vacations we rush off to scenic areas to "return to nature". In a previous study at Green River Lakes campground, we found that people visited the area to get away from the pressures of society and to enjoy the peaceful natural surroundings (Morisawa and Murie, 1970). The campers said that modernization or "improvement" of campgrounds or road access would be detrimental.

Although basically societal, our attitudes and appreciation of natural beauty are also partly a result of individual set or outlook. Reaction to a natural scene, as with any art object, is both emotional and intellectual and depends upon the point of view of the observer. We see a river with churning white-water. To one it might convey a feeling of exhilaration, adventure and excitement. To another it might bring a sense of danger or fear. To still others, observing such turbulent, foaming water might instill a sense of freedom and escape from the boredom of everyday life.

Appreciation of a scene means losing oneself in it. Thus the view might be pleasurable (or beautiful) if it brings back pleasant memories. The relationship of the scene to the observer is, thus, very important. Hence it has been maintained that judgement of natural beauty is so personal and subjective that it is difficult, if not impossible to predict, Sonnenfeld (1966).

However, it is believed (and we have heard this several times today) that there seems to be an esthetic stream of consciousness as a result of biological evolution. There are some basic universal qualities which man values and which appeal to his esthetic sense. These basic qualities are the object of our search.

An Inquiry into Esthetic Preference

Even though the esthetic qualities of an object or landscape may be indeterminate and its appreciation vary from person to person or society to society, it may be possible to measure and compare preferences. This will provide a guide in choosing areas with the desired qualities for preservation.

Accordingly, a project was devised to determine:

1) If it is possible to predict landscape (riverscape) preferences.

2) Qualities or factors of riverscapes which are of universal appeal.

3) Qualities in the landscape which are universally disliked.

4) Differences in preference among groups of different sexes, ages, education and region of the United States.

To do this, 45 riverscape slides were chosen and shown to a wide variety of people in widely dispersed regions of the United States. In addition to evaluating the scenery depicted in the slides, viewers were asked to give their sex, age, education, region of the United States where they spent most of their lives, and population of the area in which they considered their nome, Table 1.

Of course a slide does not represent the actual scene as we all know. Seddon (1970) claims that the living scene is not recorded in a photograph which is simply an abstraction from reality and thus the visual experience of the eye is not truly represented. Much of the beauty of the scene may have to do with the time of day, time of year and ability of the photographer. However, all slides would suffer under the same drawbacks and all represent a natural scene under specific conditions with certain qualities that can be determined. A photograph or slide is the best that can be done short of the impractical procedure of going to each place and asking viewers in person how they evaluated the scene. Shafer and Richards (1974) concluded that viewer response to slides or photographs agree favorably with on-site evaluations.

Slides were put into the carousal randomly to eliminate the effect of order. Viewers were asked to rate the slides from 1-5 as follows:

1 - uniquely beautiful, breathtaking

2 - very beautiful, out-of-the-ordinary, more than average

3 - pretty and pleasant to look at, but not especially so

4 - unpleasant to look at, not pretty

5 - an eyesore, ugly

Statistical analyses are being carried out to determine preferences of groups and qualities of scenes preferred.

Esthetic Factors

One can approach the problem of landscape characteristics which determine the esthetic quality of a scene from several points of view. We can characterize the landscape in terms of characteristics of the sky, land, vegetation and water elements and try to understand how each contributes to the value. Or we can disregard these specific elements and speak in general overall terms such as variety, unity, diversity, texture, spatial relationships in the scene.

We chose a mixture of these two approaches in characterizing the riverscapes. One set of factors have to do with the vegetation, landforms, and water. These are categorized according to variety,arrangement and abundance (Table 2). The other set of characteristics are somewhat more intangible. These are relief, vista, vividness, and form. Relief and vista are spatial concepts which can be quantified and measured. Vividness refers to the dramatic effect of the scenery, perhaps mostly in terms of contrast. Form applies to pattern, relationship of pieces within the scene to each other and the overall unity. These were categorized according to Table 2. Emotional appeal refers to the quality of excitement or adventure versus mundane or serene. Each slide was tabulated according to the ranking in Table 2. The numbers have no value, they are simply categories.

Discussion

Statistical analysis of the data is not yet complete but I would like to share with you some results and comments. First, from analysis of the data, I believe that it is possible to determine scenic preferences of people. Tabulation of the ratings showed a clear cut evaluation of all except three slides.

I would like to show you some of the slides and talk about their ratings and characteristics. (The black and white photographs do not do justice to the scenes since the color is not visible.) The slides chosen as uniquely beautiful most often by

the 510 evaluators were slides 32, 11, 37, 39 and 35. The four rated most often as unappealing or ugly, an eyesore, were 4, 3, 27 and 26 (Table 3).

Slide 32, Plate 1A was taken along the headwaters of the Big Sandy River in Wyoming. It was rated as uniquely beautiful by 75% of the evaluators. (The black and white photograph does not emphasize the partly snow-covered mountain in the background and contrasting green and white river water.) It gives a sense of spaciousness with a long vista and high relief. The mountain in the distance and the turbulently flowing water give a feeling of drama, adventure and freedom. The man with a pack promotes the effect of isolation and remoteness.

Scene 11, Plate 1B lies along a small, steep-gradient tributary to the Colorado River in the mountains of Colorado. The lush, green vegetation is in striking contrast to the bare rock and white, frothy water. There is a strong contrast, vividness and sense of drama to the scene, even without much relief or vista. Plate 2A, shows slide 37, again, a highly rated view of rushing, white-water with densely vegetated stream banks. Whether the man is recognized as a fisherman is debateable. I tend to think so as more men rated this view highly than did women, Table 3.

Plate 2B, at the headwaters of the Green River, Wyoming stood fourth in number of highest 1 ratings. Could it be the lack of white-water here which lowered it in the viewers estimation? Otherwise, it has many of the characteristics of slide 32, mountains, vegetation, variety. It simply lacks the excitement and contrast of rushing water.

The next two slides were highly ranked esthetically despite the fact that there was no vegetation and not very inspiring streams. In both cases, however, the relief, drama, vividness and color of the scenery were enough to satisfy over 50% of the evaluators. (Plates 3A and 3B)

Readers may note that all of these uniquely beautiful rivers are in the western United States. Eastern river scenes which were evaluated as uniquely beautiful, but not by such a high percentage of viewers as these discussed in this paper, are Kaaterskill Falls and the Letchworth Gorge of the Genessee River (both in New York) and the Wisconsin River as it flows though the Dells in Wisconsin.

Now let us look at some of those scenes ranked as ugly or an eyesore (Table 4). These were not as unanimous as evaluations of beauty, perhaps because there is some beauty in all nature. The one slide ranked as an ugly eyesore most often (by 60% of the viewers) was one which showed river pollution, Plate 4A. It may be that this was a result of "education" -

those who knew or realized that they were looking at pollution evaluated the scene accordingly. Those who did not realize this saw the beauty of the patterns in the suds and the contrasting colors of the brown and white froth on the blue water. Perhaps ignorance is bliss even in esthetics.

Plate 4B is an old gully in Iowa, and Plate 5A is an eroding stream in Ohio. These, although rated ugly by about half the viewers seem to be considered almost normal by large numbers of people. It is the kind of "river" view to which they are accustomed and, hence, do not find it unpleasant. That familiarity does influence evaluation seems to be pointed out by results of viewers of Plate 5B. This scene in Wyoming is typical of many western streams - drab, little vegetation, muddy water. It was acceptable to western viewers, easterners were the ones who found it ugly.

Finally, it may be interesting to look at two riverscapes which had a broad and indeterminate spread of values. Plate 6A shows rubber-rafters on the Salmon River, Idaho. The raft and white-water gives a feeling of excitement and adventure to some. But the same scene strikes others with its lack of vegetation, drabness of the land and even fear of the water. The result was that evaluations spread fairly evenly from ratings of 1 to 2 to 3, Table 5. Plate 6B is of a stretch of Cabin Creek in Montana. Evaluations were evenly spread with a slight weight towards the pretty. There was one other landscape which had a close rating over three values with an 8% spread. Other than these, ratings were definitive. Hence we conclude that preferences are discernable, and predictable.

Although the complete analysis has not yet been done, it seems that in the cases presented in Table 3 there is no great difference in the preferences of males or females. Certainly, the slides most frequently rated uniquely beautiful are rated so almost equally by male and female viewers. The same is true of those scenes rated most ugly. However, a definitive answer to the question of sexual preferences in esthetics cannot be given at this time. This and other analyses are being processed and a report will be made as soon as they are completed. The important point at this time is that preferences can be established and should be used to guide our choice in preservation of natural landscapes.

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TABLE 1

Questions Accompanying Slide Evaluations

This test will be used in an attempt to determine preferences in natural riverscapes. Please rate each slide on beauty according to the scale given. Try not to rate on photography.

Since an important part of the analysis will be preference by background of person evaluating, please answer the following:

Age _____ Education: less than high school _____
Sex _____ High School _____ College _____
Graduate school _____

I am from a town less than 1000 population _____
1000-5000 in population _____
5000-10,000 in population _____
10,000-100,000 in population _____
greater than 100,000 population _____

State in which I have lived most of my life _____

TABLE 2

Qualities of Scene Considered in Evaluation Analysis

Characteristic	Ranking		
Vegetation - diversity, abundance	High	Medium	Low
Landforms - diversity, abundance	High	Medium	Low
Water - form, roughness movement	High	Medium	Low
Relief	High	Medium	Low
Vista - spaciousness	High	Medium	Low
Vividness, drama, contrast	High	Medium	Low
Form, pattern	Simple	Intermed.	Complex
Excitement, adventure	High	Medium	Low

TABLE 3

Slides Most Often Rated Uniquely Beautiful

Slide Number	Percent rating slide in category 1		
	*Total Viewers	**Men	***Women
32	75	75	75
11	64	63	66
37	64	66	63
39	56	60	51
35	55	58	51
38	51	46	56

*Total number of viewers 510
**Total number of men viewers 323
***Total number of women 187

TABLE 4

Slides Most Often Rated as ugly, an Eyesore

Slide Number	Percent rating slide in category		
	Total Viewers	Men	Women
4	60	61	59
3	58	52	64
27	48	48	48
26	45	43	47

TABLE 5

Slides with an Indeterminate Evaluation

Slide Number	Percent of viewers rating in category		
	1	2	3
13	27	33	33
31	32	34	29
43	28	35	32

Plate 1A. Scene most frequently rated uniquely beautiful.

Plate 1B. Scene with second highest uniquely beautiful ratings.

Plate 2A. Scene with third highest "1" ratings.

Plate 2B. Scene with fourth highest "1" ratings.

Plate 3A. Riverscape with fifth highest "1" ratings.

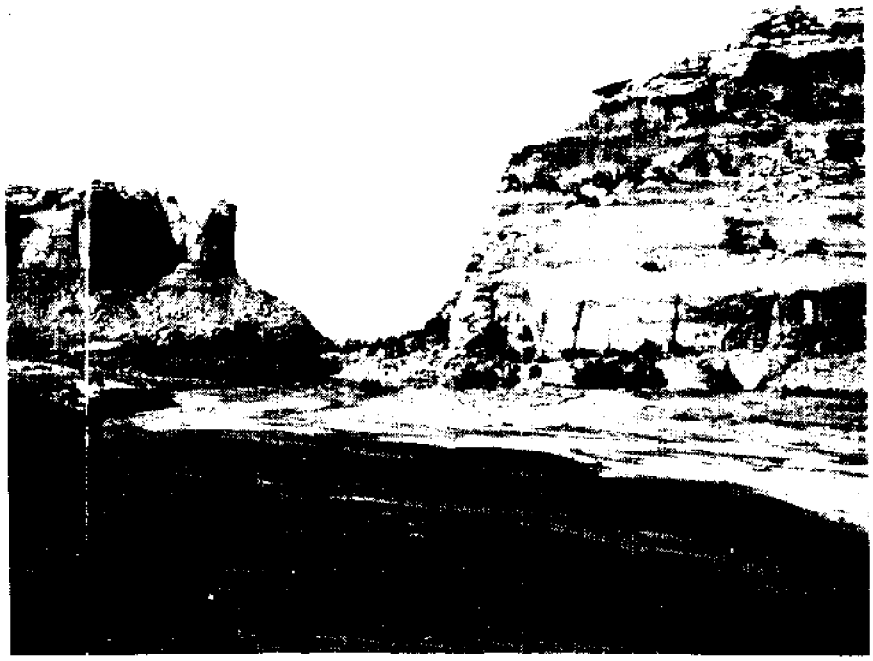

Plate 3B. Riverscape with sixth highest "1" ratings.

Plate 4A. Scene most frequently rated ugly, an eyesore.

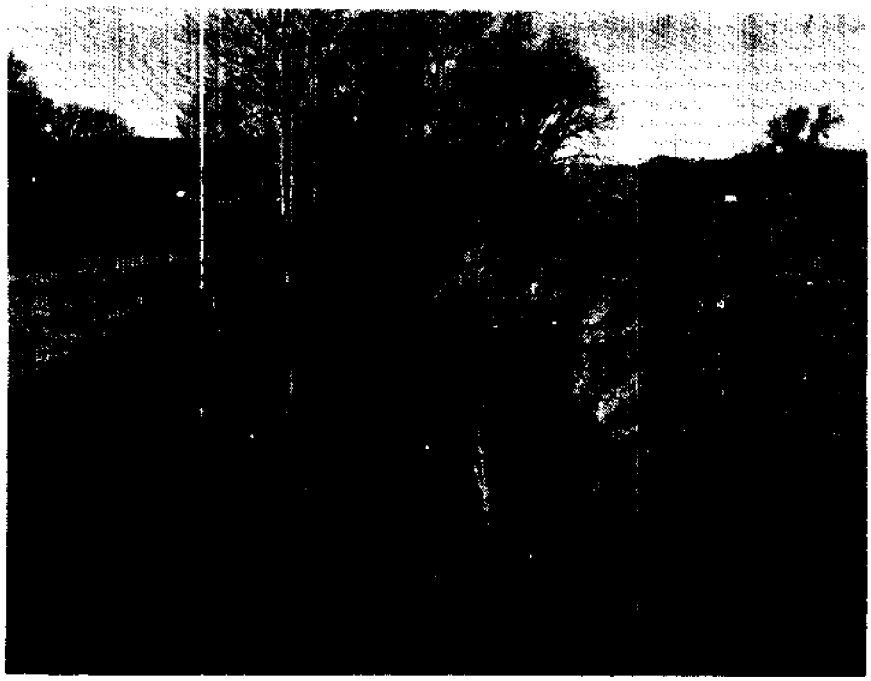

Plate 4B. Scene with second highest number of "ugly" ratings.

Plate 5A. River view with third highest number of "ugly" ratings.

Plate 5B. River view with fourth highest number of "ugly" ratings.

Plate 6A. Salmon River, slide with indeterminate ratings.

Plate 6B. Cabin Creek, slide with indeterminate ratings.

A PLAN TO SAVE THE SCENIC VALUE OF THE BLUE RIDGE PARKWAY

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Abstract

Increasing pressures for land development along the Blue Ridge Parkway have led to conflicts over land use between the local people and the Federal government. This study was conducted for a county agency in Virginia to use in controlling development in sensitive areas along the Parkway. Visual, environmental, and developability analyses were conducted and synthesized to show which areas had the highest priorities for development control, and which could most easily accomodate growth without great impact on the visual and natural environment.

A PLAN TO SAVE THE SCENIC VALUE OF THE BLUE RIDGE PARKWAY

The Blue Ridge Parkway is a 469 mile two-lane scenic highway through the mountains of Virginia and North Carolina, connecting the Skyline Drive with Asheville and the Great Smoky Mountains. Millions of visitors travel the road each year, experiencing the many moods and panoramic views of the Blue Ridge Mountains. The road winds its way through the crests of the mountains, passing old churches, barns, and nineteenth century farmhouses. Its split-rail fences and hillside agricultural patterns create an image of rural America that is unique only to this part of the country. The Parkway's overlooks and panoramas are some of the best in the eastern United States.

Creating the Parkway has not been easy. Construction began in 1935, when recreational travel by automobile began to increase tremendously. Before the first shovelful of earth was turned, however, many bitter arguments over the location and purpose of the road had ensued between states and localities. Much skepticism prevailed during the early thirties--in Washington, the states, and backwoods localities--that a road would or even could be built through the terrain (Jolley, 1969).

Through the perseverance and devoted efforts of political forces, engineers, National Park Service landscape architects, and thousands of local laborers, the Blue Ridge Parkway is essentially complete today. The gentle curving ribbon of asphalt is a monument to modern technology and an inspirational experience to many travelers.

The future of this experience, however, lies with the localities through which the road passes. The Blue Ridge Parkway owns only a narrow strip of land on each side of the road; only the adjacent landowners can determine what happens to the land beyond this strip. Since the 1930's, the land has remained primarily in the family ownership, and has continued to be used agriculturally. In recent years, however, increased pressures have mounted for these family farmers to sell the land which they have used for subsistence for decades, to developers of second home and recreational communities, as well as to others interested in commercial ventures along the Parkway. An ensuing change in land use, therefore, is threatening the very quality that makes the Parkway unique--its rural, pastoral scenery.

It was with this problem that the Floyd-Floyd County Planning Commission approached the landscape architecture program at Virginia Polytechnic Institute and State University, in nearby Blacksburg, for assistance. Like most rural counties in the region, no form of land use controls had been implemented; until recently, there had been no need for land use guidance. The rural agricultural county had not experienced much growth because of its remoteness and unsuitable topography. Lately, however, an increasing demand for second homes, weekend mountain retreats, and permanent homes has driven the value of land in the county, particularly along the Parkway, to unheard-of heights. The Planning Commission and the county citizens echoed similar concerns: how could the county improve its economic situation by accepting growth, but still maintain its rural character, particularly in the immediate area of the Blue Ridge Parkway.

A group of landscape architecture faculty and students at Virginia Polytechnic Institute and State University took on the task of attempting an answer to the question, with the encouragement of the Virginia Fourth Planning District Commission, the regional planning agency which provides assistance in Floyd County.* Work on the project began in May, 1974, and an initial presentation was made in October to the Floyd-Floyd County Planning Board. The methodology employed, a unique combination of field surveys and computer analysis, was well received by the citizen group. It is hoped that similar projects might be undertaken by other jurisdictions contending with similar problems and by the Blue Ridge Parkway Office in Asheville.

The project team began with a period of research and data gathering. The 40-plus miles of the Parkway were driven several times to establish the character of the Parkway in Floyd County. It was observed that this segment had no features that were outstanding compared to other portions of the total Parkway, but it did have a relatively unspoiled pastoral landscape. Several overlooks, with distant views to the eastern plateaus of central Virginia, and a restored grist mill were the highlights of the drive. Some evidence of second home development and many mobile homes were observed. Strip commercial along adjacent and intersecting highways was also prevalent. The group was pleased, however, to find that the majority of this segment was relatively free from any unattractive, incompatible uses.

The pastoral landscape and the architectural heritage--rough hewn barns, zig-zag split-rail fences, old frame houses, rural cemeteries, and similar features--were documented with over 500 slides. These were used in later analyses, and about 150 of the slides were used as an introductory show, displayed with soft bluegrass music in the background, for presentations of the project to the public.

Base maps were drawn for the study area, which encompassed the area to both sides of the Parkway which could be seen from the road. Distant views over the escarpment of the mountains were occasionally experienced along the roadway, but since the scope of the project did not allow for control of the land within these views, the nearest ridge outside of Floyd County was used as the boundary of the study area. A grid of squares representing approximately ten acres was imposed on the base maps, which was later used for coding information into a computer-usable format.

From this point three simple analyses were undertaken, which were later used to formulate a composite "priority areas" map. These three analyses were: a visual analysis, an environmental analysis, and the delineation of developable land within the study area. This information was drawn onto plastic overlays, to facilitate the creation of the priority areas map by an overlay method.

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*The project team included Professor Alan G. Winslow; Assistant Professor Benjamin C. Johnson; the author; Gary E. Day, Instructor; H. Cales Givens, Charles Craig, landscape architecture students; and Robert Gariepy and Robert Hogan, architecture students.

The visual analysis was handled by combining a field reconnaisance method and a computer-aided method called the "VIEWS" program. After reviewing existing methods of visual landscape analysis (some ten studies were examined in detail), the project team developed a classification methodology that was suited to the Blue Ridge landscape. A simple system was devised, so that it could be readily understood by the citizens of the county. Six basic view types were catalogued for the visual experience of the Parkway. These included:

1. Corridors or enclosed landscape. This type of landscape encompasses the majority of the study area along the Parkway. In this landscape the roadway is completely enclosed with vegetation or landform, or both. It allows no visual penetration from the Parkway.

2. Corridor with openings or semi-enclosed landscape. This landscape is similar to the preceding one, only it presents the viewer with an occasional opening in the barrier, such as a dip in constraining topography or break in tree lines.

3. Intermediate view landscape. This landscape is one where the middleground predominates, providing the focus of the viewer's attention on a subject away from the road. An element of enclosure or foreground may be present in this classification as well.

4. Intermediate view landscape with limited distant view. This landscape consists of an intermediate length view, with an occasional or brief distant view past the middleground.

5. Distant view landscape. This landscape is comparable to R. Burton Litton, Jr.'s panoramic landscape, where the observer is in a superior position with a distant view of several miles. (Litton, 1968.)

6. Distant view landscape with distinct foreground and middleground. This landscape type is a combination of all of the above landscape types, with distinct visual elements in the foreground and middleground.

These view types were mapped through the use of a graphic symbol indicating where a particular type of view could be experienced. Figure 1 is an example of the visual analysis maps prepared for this report. The first two types offer little visual penetration, and are therefore not readily subject to visual impact. Intermediate views which represent primarily a view of a "meadow landscape" are more subject to sight than enclosed views. The development of these lands could detract from the scenic character of the Parkway, if the design and siting of structures were not carefully studied to ensure a blending of building character, materials, and other factors. The final view categories, the distant views, are the most dramatic and scenic views along the Parkway. It is important that the land areas within the distant view

Figure 1

VISUAL ANALYSIS

LEGEND

TIGHTLY ENCLOSED — V.S.R.

SEMI ENCLOSED — VISUALLY SIGNIFICANT

1 INTERMEDIATE (MEADOWS, ETC.)

2 INTERMEDIATE WITH BRIEF DISTANT VIEW

3 DISTANT VIEW & FOREGROUND - NO MIDDLEGROUND

4 FOREGROUND MIDDLEGROUND VISTA/BACKGROUND W/ DISTANT VIEW

BLUE RIDGE PARKWAY STUDY
FLOYD COUNTY, VIRGINIA
4th PLANNING DISTRICT COMMISSION
VIRGINIA POLYTECHNIC INSTITUTE & STATE UNIVERSITY
COLLEGE OF ARCHITECTURE
LANDSCAPE ARCHITECTURE PROGRAM
BLACKSBURG, VIRGINIA

NORTH

SCALE: 1" = 2000'

categories be controlled in some manner to avoid development which is detractive from the scenic quality of the Parkway.

Another factor in determining visual significance is the frequency of which something is viewed. To study this aspect, the project team employed the "VIEWS" program, a computer system designed to assist in visual analysis. VIEWS is a search program, which simulates the view that a person would have from a particular point, by scanning all of the grid cells in the study area. Topographic elevation, and vegetation height and density were the variables used to determine what was visible. In this project, the computer simulated a drive down the Parkway and recorded the number of times a particular cell could be "seen", up to a maximum of seven times. For this exercise, it was decided to record the number of times an area could be viewed if vegetation was removed, thereby giving an impression of the potential visual character if development were to occur. The project team made an arbitrary judgment that if a particular cell was visible between four and seven times, it should be considered visually significant. If a cell was seen once, or up to four times, it was classified visible, but not as significant. Figure 2 shows this final VIEWS map. This information was transferred from the computer output to a plastic overlay to permit its use in determining priority areas.

A second analysis was made to determine critical environmental areas within the study area. This information was available in computer format from a previous study conducted at Virginia Polytechnic Institute and State University, (Simutis and Johnson, 1974) and was employed on the Parkway study. These critical environmental areas were defined as those areas with maximum potential for productive forest cover and diverse wildlife habitats. Generally, these areas are characterized by steep, north and east facing slopes at high to moderate elevations. Because of the relatively rare and unique conditions which prevail in these locations, they are regarded as areas which might be highly sensitive to landscape modification, thus disrupting delicate plant and animal ecologies. The greatest concentration of potential productive habitats is along the escarpment of the Blue Ridge mountains, generally to the east of the Parkway in Floyd County.

The information generated on the computer maps was transposed onto a mylar overlay. This is shown in Figure 3. Only one category was delineated--critical environmental areas--as precise locations of individual ecological communities of various types were not possible with time and data limitations. These critical environmental areas served as a second input into the Priority Areas map.

A third analysis was undertaken to determine which areas within the study area could realistically be considered developable. It was assumed that if a parcel was essentially undevelopable, it would not be necessary to impose controls on these parcels. Figure 4 shows this analysis map.

The developability analysis was generalized, because of time and data available, to include three factors: topography, accessibility to improved roads, and soils suitable for septic systems. Only slopes of 12 percent or lower were considered developable, because of serious cost and feasibility problems encountered at gradients above this percentage. If access to improved county or state roads was not within a reasonable distance of a parcel, it was not considered developable for the purposes of the project. Likewise, if soils

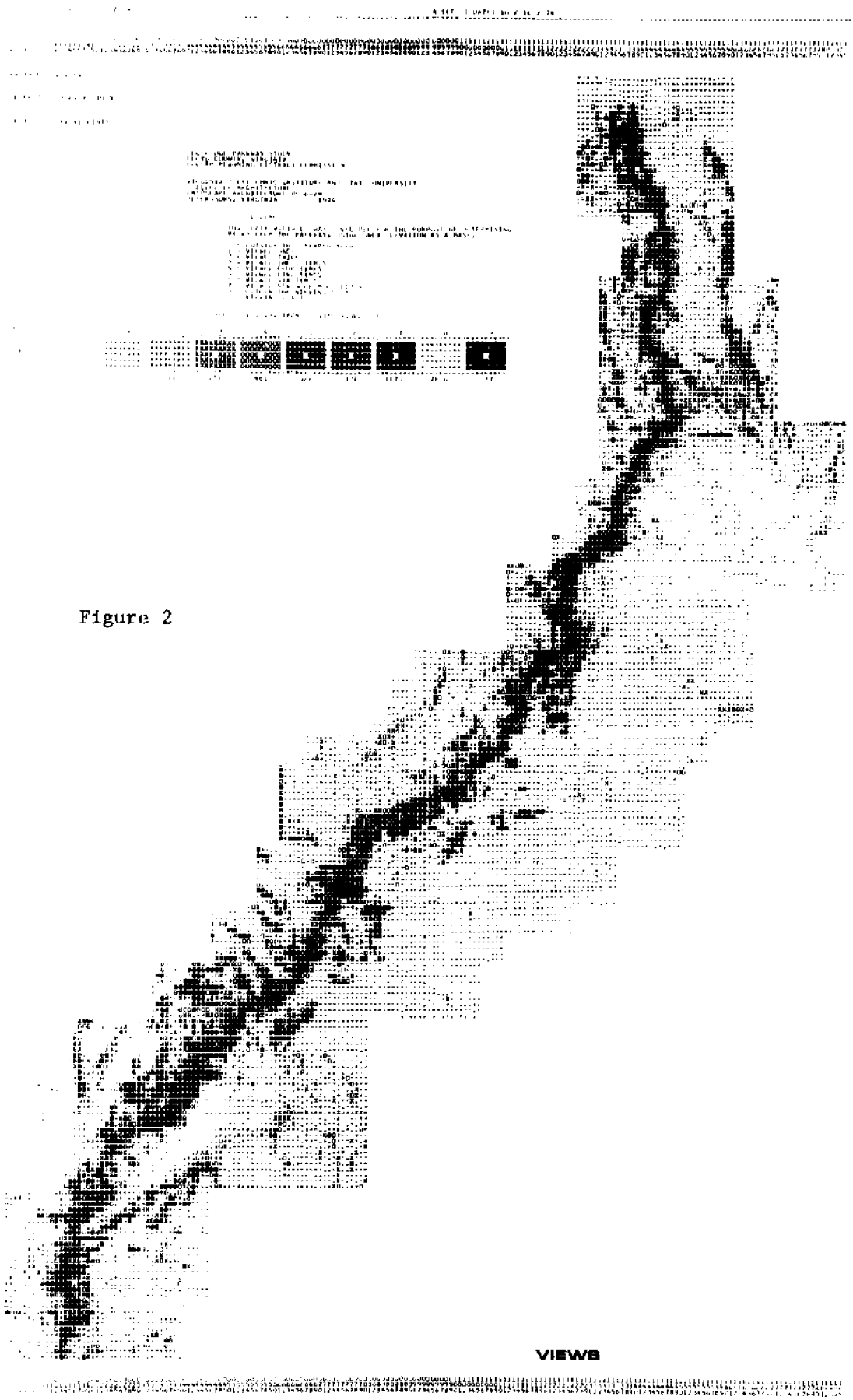

Figure 2

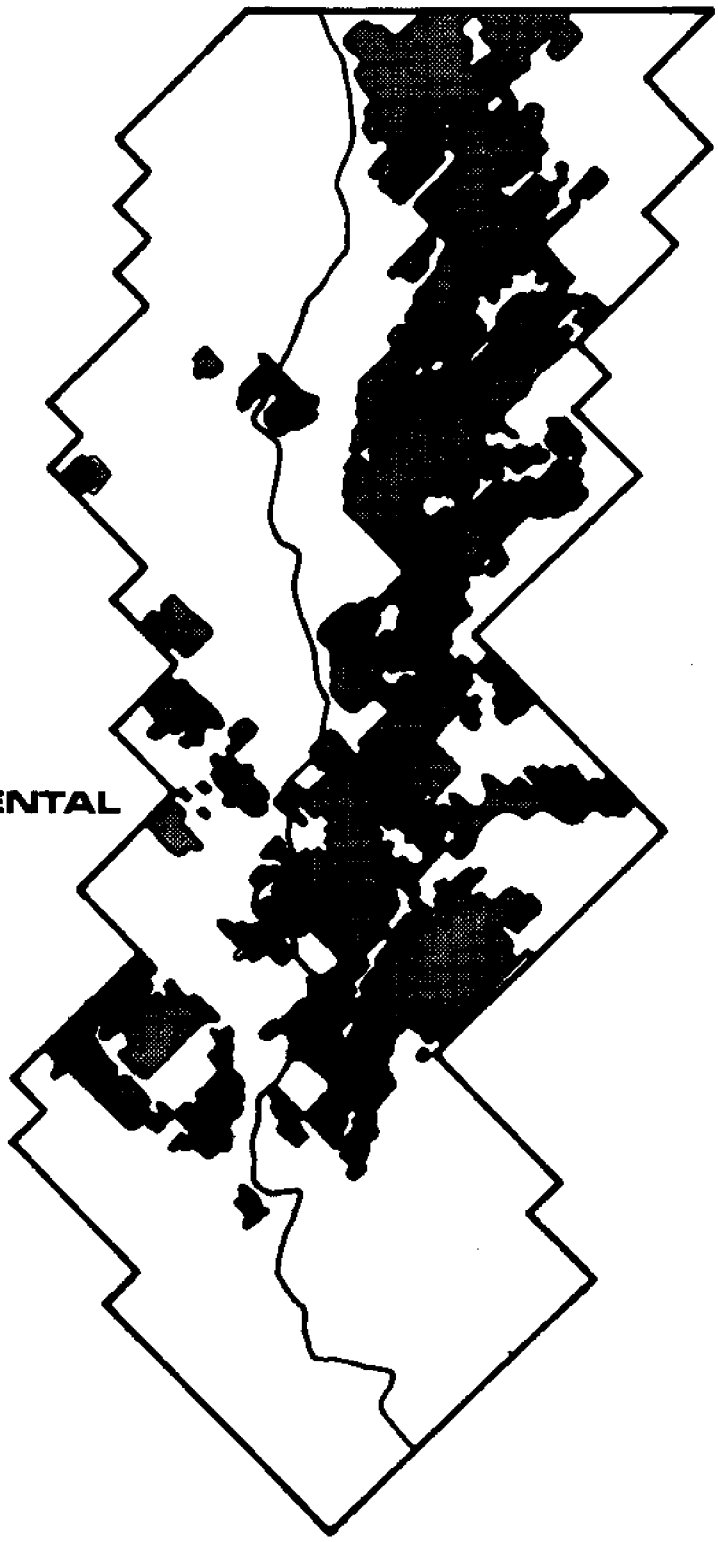

Figure 3

ENVIRONMENTAL ANALYSIS

BLUE RIDGE PARKWAY STUDY
FLOYD COUNTY, VIRGINIA
4th PLANNING DISTRICT COMMISSION
VIRGINIA POLYTECHNIC INSTITUTE & STATE UNIVERSITY
COLLEGE OF ARCHITECTURE
LANDSCAPE ARCHITECTURE PROGRAM
BLACKSBURG, VIRGINIA

NORTH

SCALE: 1" = 2000'

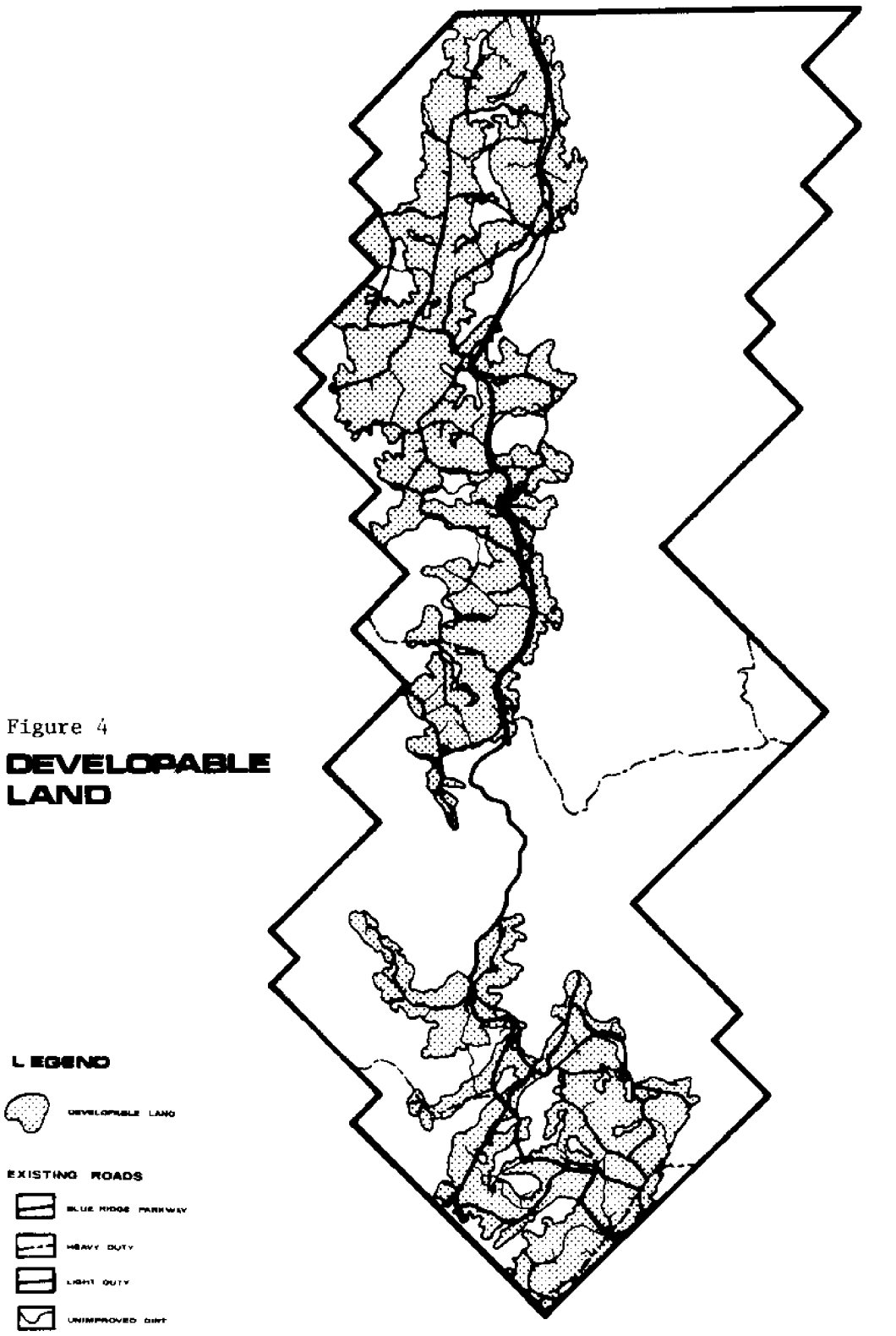

Figure 4

DEVELOPABLE LAND

were not suitable for septic systems, which is the primary means of sewage disposal in rural areas, the land could not be considered developable. Developable areas were delineated in a generalized manner on another overlay.

The three component maps described above were overlayed and given equal importance to develop a synthesis map of priority areas. Figures 5 and 6 show the priority map and the criteria used for determining the categories. A graphic system analogous to a stoplight was used for easy understanding by the public. This involved using a red, yellow, and green color scheme on the map to indicate the highest to lowest priority areas for development controls. Also for this last phase of the work, an investigation was made into what kinds of land use guidance mechanisms were most appropriate for use in a rural environment such as Floyd County. These mechanisms were summarized, and the most appropriate ones for a particular priority area were enumerated.

High priority (red) areas were those which showed an overlap of developable land and visually significant areas, or visible and critical environmental area in combination. These areas, because they are likely to be critical to the preservation of the scenic and environmental quality of the Parkway, should receive the strongest and most immediate attention to prevent irreversible and incompatible development. The consideration of means for controlling development in these high priority areas should include land acquisition by the Parkway, easements, or tax incentives to land owners if they agree to preserve their land. If these means are unrealistic, strict site and building design performance standards should be imposed on any proposed construction in these areas.

Moderate priority (yellow) areas on the map were the overlay of developable land with areas falling under either the visible or critical environmental delineations. These are developable portions of the study area which deserve serious consideration for protection from development because they are strongly visible from the Parkway, or they are sensitive environmentally. The most probable method of land use control in these areas would be site and building performance criteria to ensure minimal visual or environmental impact, yet not discourage compatible development.

Low priority (green) areas are those with developable land, but are not subject to view from the Parkway or critically important environmental areas. Development can be allowed in these areas which would improve the overall county economic development. This development might include second homes, cabins, motels, or highway commercial. Even development of this land should be subject to some regulation, to ensure a minimal environmental and esthetic impact in the county.

The final portion of the study involved determining responsibilities for land use controls, based on the findings of the research team. Since two very different governing bodies--the local county and the federal Parkway agency--have interest in what happens to the land along the roadway, it was felt that some initial guidelines could be established using visual, environmental, and developability criteria.

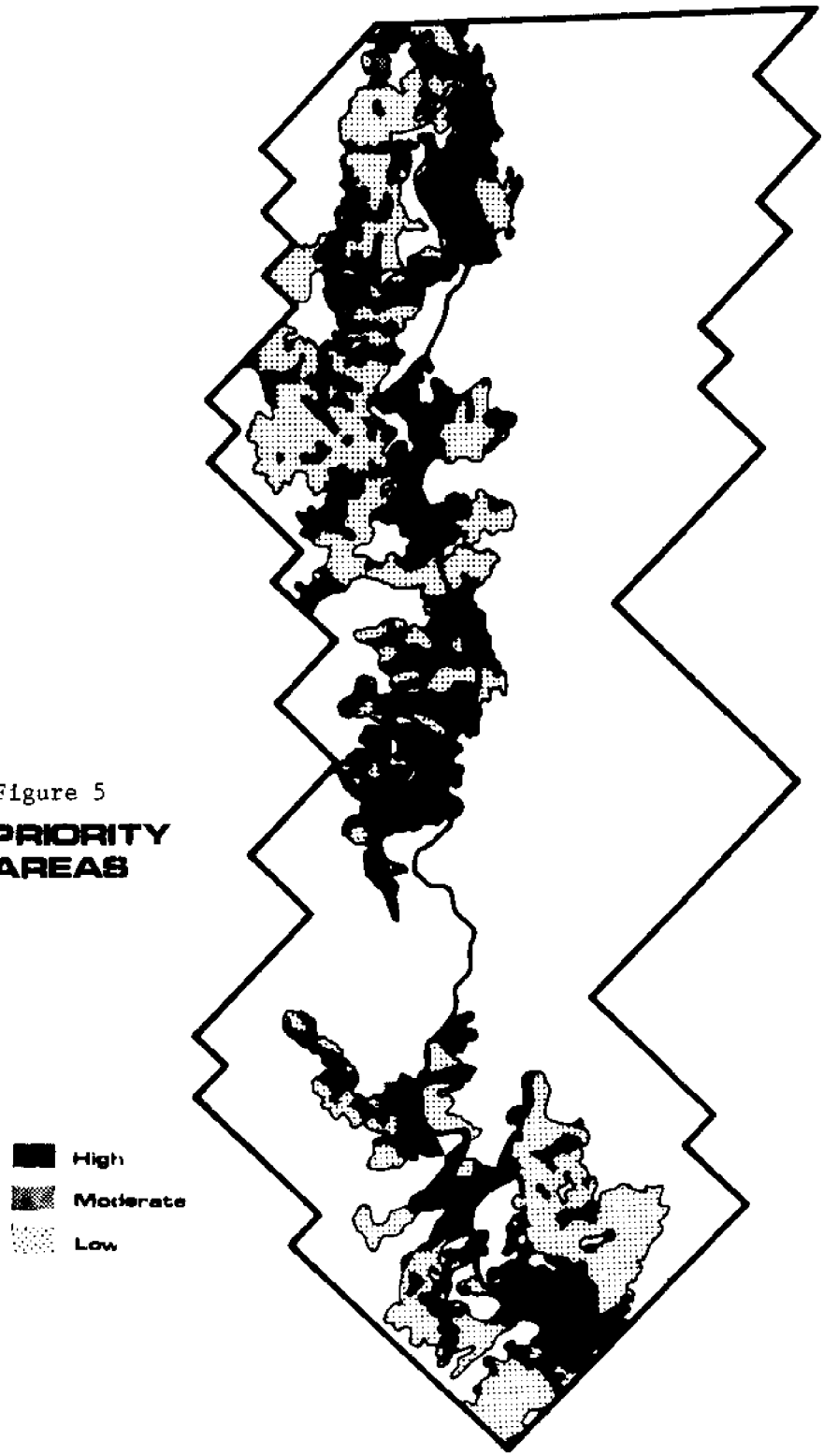

Figure 5

PRIORITY AREAS

BLUE RIDGE PARKWAY STUDY
FLOYD COUNTY, VIRGINIA
4th PLANNING DISTRICT COMMISSION
VIRGINIA POLYTECHNIC INSTITUTE & STATE UNIVERSITY
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LANDSCAPE ARCHITECTURE PROGRAM
BLACKSBURG, VIRGINIA

NORTH

SCALE: 1" = 2000'

	Component Map		
Priority Level	Development Potential	Visual	Environmental
High (red)	Developable	Visually Significant	None
High (red)	Developable	Visible	Prime
Moderate (yellow)	Developable	None	Prime
Moderate (yellow)	Developable	Visible	None
Low (green)	Developable	None	None
No Priority (white)	None	None	None

Figure 6. Priority Areas Criteria

In general, it was felt that the higher the priority and the closer to the Parkway a parcel is, the greater is the federal government's concern and responsibility. The lower the priority, and the farther from the Parkway, the greater would be the County's responsibility. Mechanisms for land use control would vary, based upon responsibility, from outright purchase or scenic easements on the part of the federal government, to site an architectural performance standards for low priority areas in the County's realm of responsibility. Thus the priority areas system, based on visual, environmental, and developability, plays a strong role in controlling future land use in this very scenic area. These responsibilities are summarized in Figure 7.

Priority Area	VIEW TYPE CATEGORIES		
	Foreground	Middleground	Background
High (red)	High Federal Responsibility	High Federal Responsibility	Mixed Federal and Local Responsibility
Moderate (yellow)	High Federal Responsibility	Mixed Federal and Local Responsibility	Local Responsibility
Low (green)	Mixed Federal and Local Responsibility	Local Responsibility	Local Responsibility

Figure 7. Land Use Control Responsibilities

The results of the study have offered rural Floyd County a new way of controlling development along the Parkway. Previous attempts by the Parkway Office to impose an arbitrary setback distance for development limiations had been met with strong disfavor by county residents. The system described above would allow any development in non-visible and non-unique environmental areas, and would only control development in visible and critically important environmental areas. This would allow landowners the right to develop in areas that do not affect the Parkway, and impose controls only on land that does influence the scenic and environmental quality of the roadway and the county.

The method employed here, or similar ones, can be used on other portions of the Parkway, as well as for other scenic districts. The procedure is simple, and it provides a readily understood product which can be applied by the locality to assist in solving its land use control problems, and at the same time, allow the visual quality of its scenic resource to be maintained at a high level.

References Cited

1. Harley E. Jolley, The Blue Ridge Parkway, Knoxville: University of Tennessee Press, 1969.

2. R. Burton Litton, Jr., "Forest Landscape Description and Inventories," USDA Forest Service Paper, PSW-49, 1968.

3. Leonard J. Simutis and Benjamin C. Johnson, Computer-Aided Location Studies, Blacksburg, Va.: Virginia Polytechnic Institute and State University, College of Architecture, 1974.

ENVIRONMENTAL ANALYSIS OF CENTRAL OHIO

Prof. Koichi Kobayashi
Department of Landscape Architecture
School of Architecture
The Ohio State University

[I] Environmental Analysis of Central Ohio

1. Environmental Analysis of Central Ohio

a) Objectives

Environmental Analysis of Central Ohio consisting of 29 counties (Fig. 1) is conducted under the contract with the Army Corps of Engineers by the Ohio Biological Survey to which reporter is a subcontractor.

The overall objective of the analysis is to provide base information to guide future study and to reveal tradeoffs and optimum choices for the environmental quality objectives in water and land resource planning.

b) Areas of Analysis

The Environmental analysis is conducted in the following areas:

Climate
Groundwater
Surface Water Quantity
Surface Water Quality
Geology and Physiography
Mineral Resources
Soils
Vegetation
Forestry
Terrestrial Vertebrates
Aquatic Biology
Archaeology and Historical Features
Cultural Features
Social and Population Geography
Land Use
Landscape Analysis
(Visual Component)

c) Scope of Analysis

It should be emphasized that the study is limited in scope to a compilation of existing data. As such it will not represent a complete analysis of the study region but it will serve as a data base upon which more complete analyses can be built.

Duration of the visual component study lasted for six months. During this time a reporter and an assistant spent two weeks on the ground and air; the rest of the time was spent collecting available published data, executing analysis and producing maps and reports.

2. Visual Component Study

A. Objectives

The specific objectives of the (Visual Component Study) of the Environmental Analysis of Central Ohio were established as follows:

1. To identify the visually homogeneous landscape depending on landscape pattern and land form areas.
2. To evaluate visual quality of the identified homogeneous landscape areas on a basis of the diversity of the total landscape.
3. To integrate rare, unique, natural and wild landscape visual features, which are mainly point datas, with a broad regional visual analysis established through 1) and 2) to establish a total visual quality for a given unit study area.

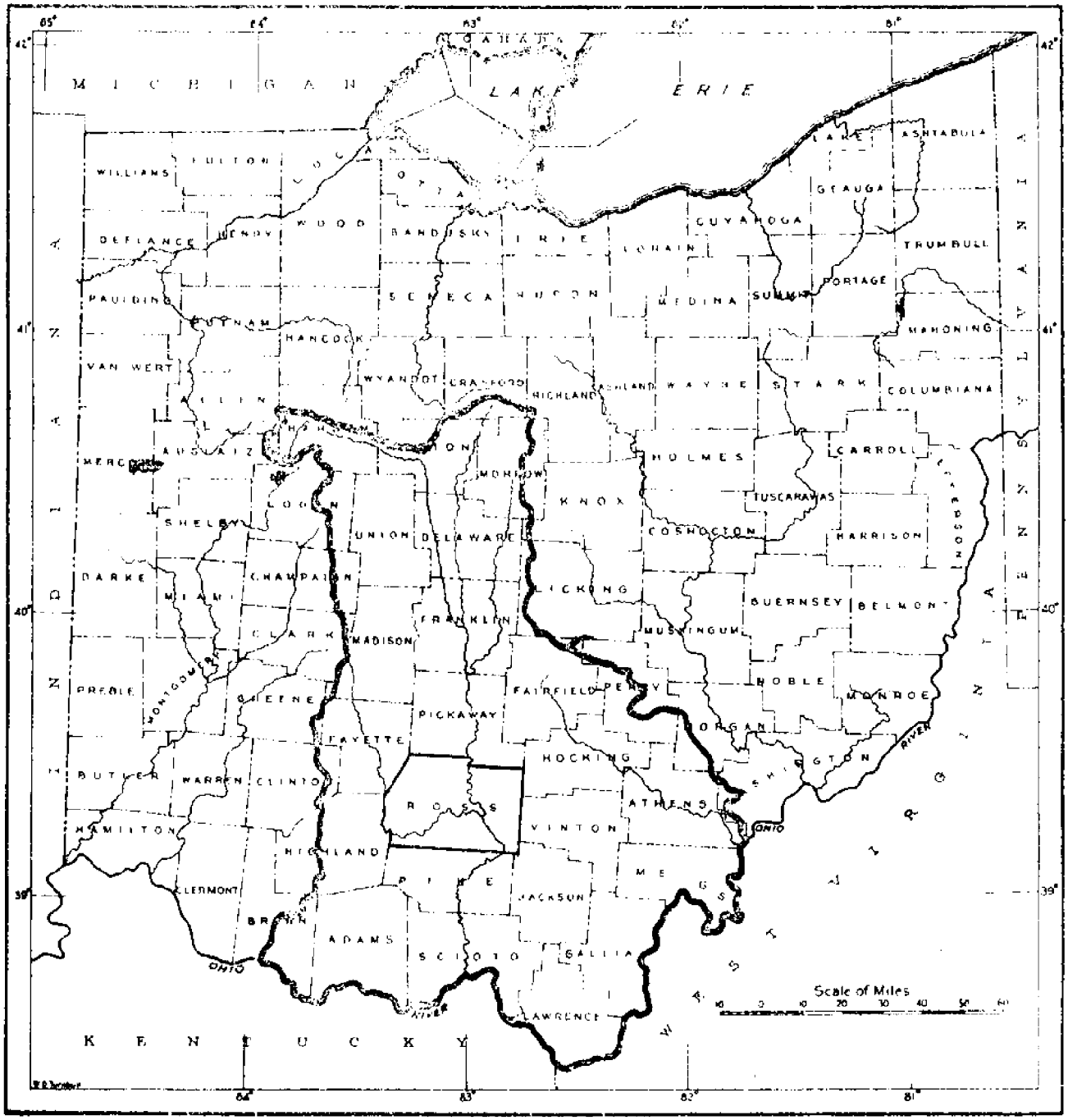

MICHIGAN
LAKE ERIE
CANADA
INDIANA
OHIO
KENTUCKY
WILLIAMS
FULTON
LUCAS
DEFIANCE
HENRY
WOOD
OTTAWA
SANDUSKY
ERIE
LORAIN
CUYAHOGA
LAKE
ASHTABULA
GEAUGA
TRUMBULL
PORTAGE
SUMMIT
MEDINA
PAULDING
PUTNAM
HANCOCK
SENECA
HURON
MAHONING
VAN WERT
WYANDOT
CRAWFORD
RICHLAND
WAYNE
STARK
COLUMBIANA
ALLEN
AUGLAIZE
MERCER
HARDIN
MORROW
KNOX
HOLMES
CARROLL
TUSCARAWAS
SHELBY
LOGAN
UNION
DELAWARE
COSHOCTON
HARRISON
DARKE
MIAMI
CHAMPAIGN
LICKING
GUERNSEY
BELMONT
CLARK
MADISON
FRANKLIN
MUSKINGUM
PREBLE
MONTGOMERY
GREENE
PICKAWAY
FAIRFIELD
PERRY
NOBLE
MONROE
FAYETTE
MORGAN
BUTLER
WARREN
CLINTON
ROSS
HOCKING
ATHENS
MEIGS
HAMILTON
HIGHLAND
VINTON
CLERMONT
PIKE
JACKSON
BROWN
ADAMS
SCIOTO
GALLIA
LAWRENCE
Scale of Miles
84°
83°
82°
81°
42°
41°
40°
39°

Fig. 1

4. To investigate the possibility of utilizing the study for the formulation of policy and for planning and management decisions.

B. Method (See Flow Diagram Fig. 2.)

Identification

a) First, attempt was made to identify the homogeneous landscape pattern on a basis of the percentage coverage of a unit study area by such land uses as residential, farm and forest.

The entire study area is gridded into 10 x 10 km squares on 1:250,000 scale USGS map. The size was chosen as suitable to a visual analysis study after a preliminary site observation, taking also into consideration of our study methodology and time constraint.

Then, the cells are sorted into nine categories depending upon their pattern of land use.

Landscape patterns categorized are: urban, suburban, town/farm, town/forest, village/farm, farm, farm/forest, forest and strip mining areas (see Fig.3). Final Landscape Pattern of the study area is shown in Fig. 4. Urban and strip mining areas are not shown on the map.

Fig. 3

Landscape Pattern		% of coverage in a cell	
	Population[2]	Farm	Forest
Urban[1]	(delineated areas)		
Suburban	5	25-75	60
Town/Farm	5	25-75	20
Town/Forest	5	25	60
Village/Farm	5	25-75	20
Farm	5	75	--
Farm/Forest	5	25-75	20-60
Forest	5	--	60
Strip Mining[3]	(delineated areas)		

Note: 1. Urban areas are those delineated in the Land Use Map.
2. Population based on the coverage of residential development.
3. Mining areas are those delineated in the Land Use Map.
4. Farm and Forest coverages are interpreted from a combination of USGS topo maps and the Land Use Map.

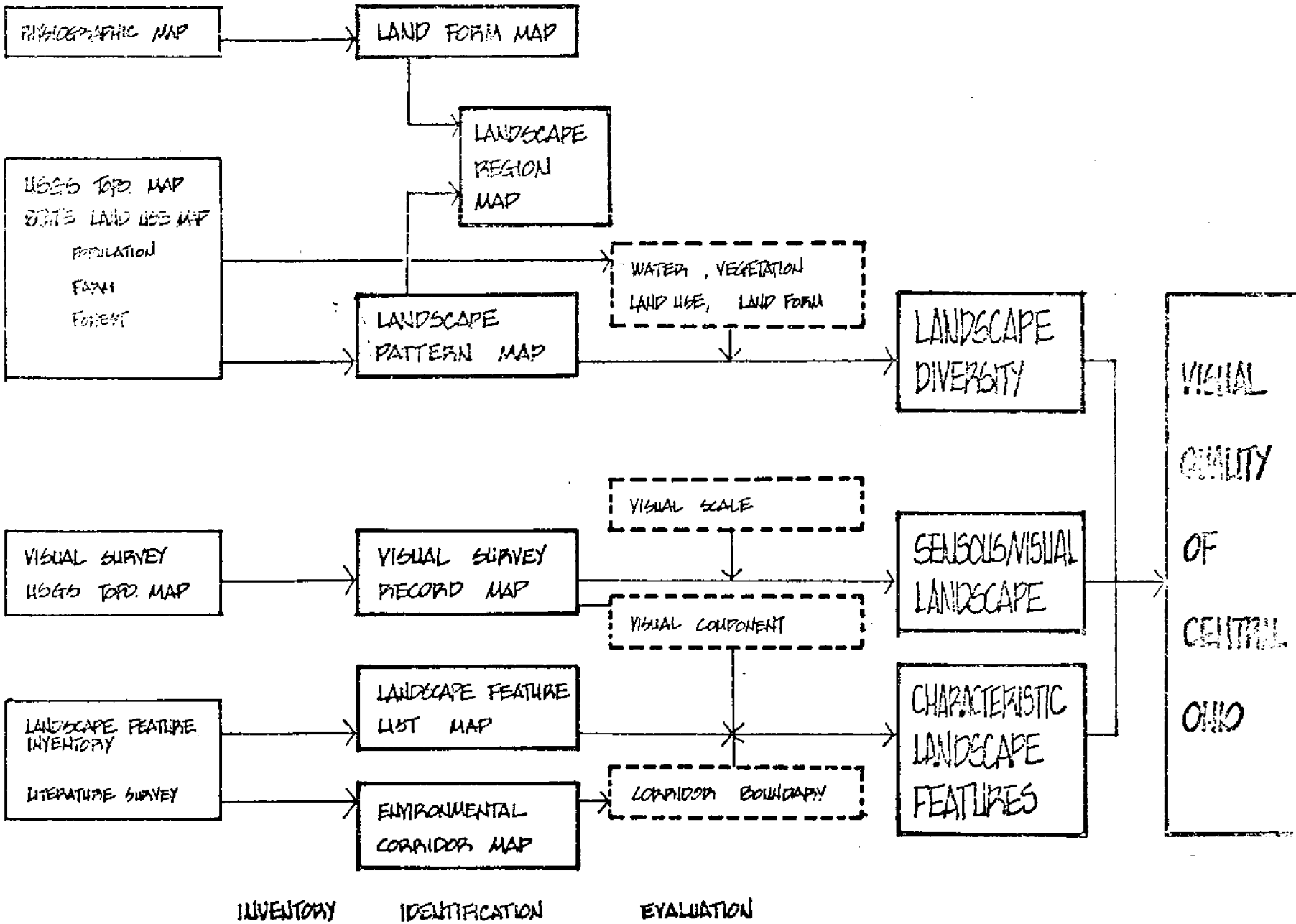
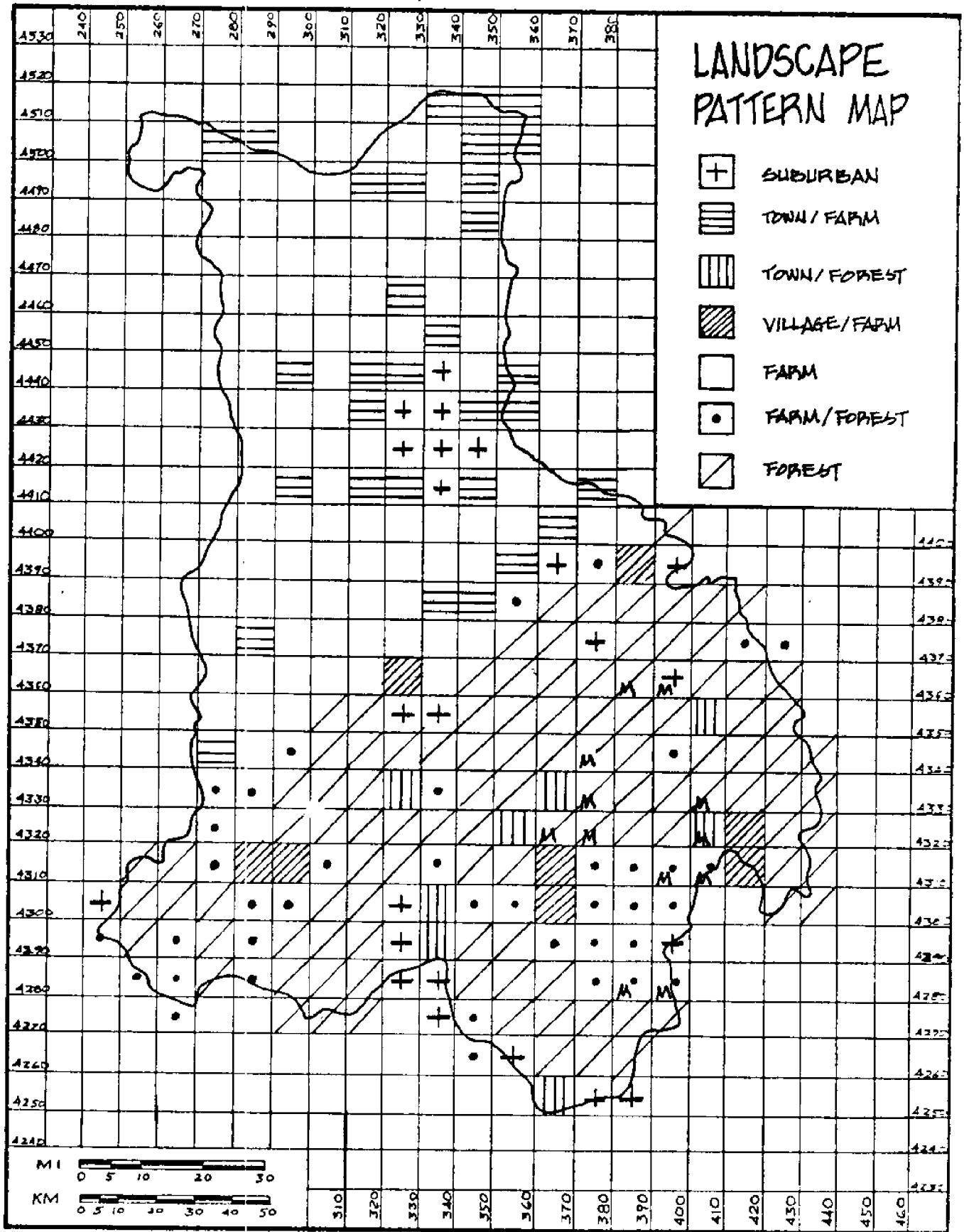

PHYSIOGRAPHIC MAP
LAND FORM MAP
LANDSCAPE REGION MAP
USGS TOPO. MAP
SOILS LAND USE MAP
POPULATION
FARM
FOREST
WATER, VEGETATION
LAND USE, LAND FORM
LANDSCAPE PATTERN MAP
LANDSCAPE DIVERSITY
VISUAL SCALE
VISUAL SURVEY
USGS TOPO. MAP
VISUAL SURVEY RECORD MAP
SENSOUS/VISUAL LANDSCAPE
VISUAL COMPONENT
LANDSCAPE FEATURE INVENTORY
LITERATURE SURVEY
LANDSCAPE FEATURE LIST MAP
CHARACTERISTIC LANDSCAPE FEATURES
ENVIRONMENTAL CORRIDOR MAP
CORRIDOR BOUNDARY
VISUAL QUALITY OF CENTRAL OHIO
INVENTORY
IDENTIFICATION
EVALUATION

Fig. 2



M: A CELL WITH STRIP MIXED AREAS

Fig. 4

b) Secondly, the Land Form Map is prepared on the Physiographic Region Map supplied by the participating geologist with a minor modification; the inclusior of valley bottom areas since they have a distinct visual form. (Land Form Map, Fig. 5)

The Land Form categories mapped are:

Plains	Upland Till Plain
	Valley Bottom Till Plain
	Lexington Plain
Plateau	Unglaciated Upland
	Unglaciated Valley Bottom
	Glaciated Upland
	Glaciated Valley Bottom

c) Identification of Landscape Region

A composite of the two maps, Landscape Pattern and Land Form, is produced using an overlay technique. A pattern presenting homogeneous areas appears on the map, identifying the Landscape Regions of Central Ohio. (Fig. 6)

Identified Landscape Regions shown in Fig. 6 are:

I) Ohic Till Plain
II) Columbus Metropolitan
III) Ohic Escarpment (Glaciation line)
IV) Lexington Plain
V) Ohic Plateau

i) Forest Area
ii) Strip Mined Area
iii) Dairy Farming

VI) Lower Scioto Valley
VII) Hocking Valley
VIII) Ohio River

d) Thirdly, the sensuous/visual elements and the characteristic elements of the landscape based on the field survey and literature survey were inventoried and recorded on a map.

[II] Evaluation

The visual components of the environment of Central Ohio as described above are evaluated on the basis of the following three factors:

I. Landscape Diversity
II. Scale of Sensuous/Visual Landscape
III. Scale of Characteristic Landscape Features

These three factors are numerically expressed after a series of manipulations and interpretations performed on the several base maps.

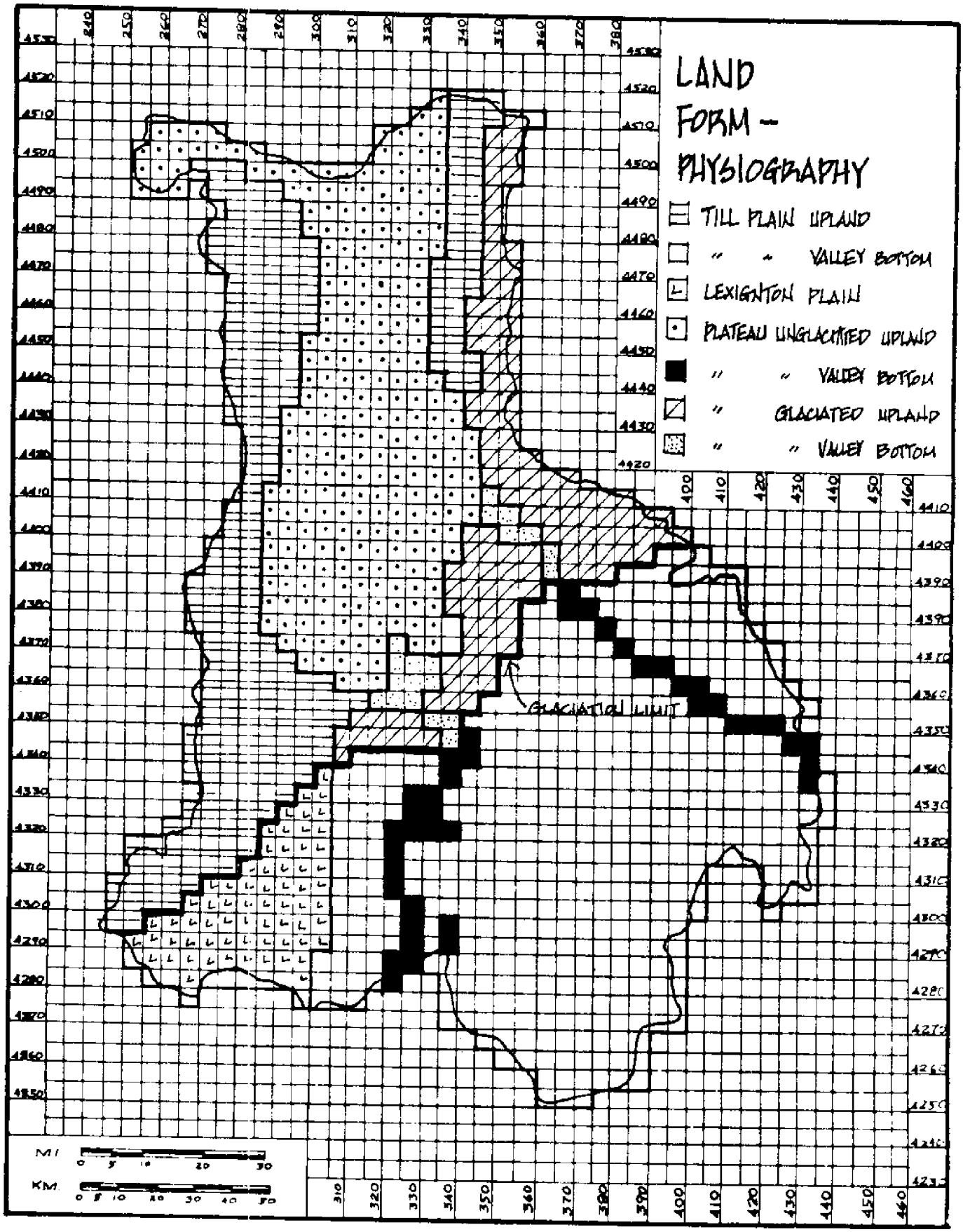

LAND
FORM –
PHYSIOGRAPHY
TILL PLAIN UPLAND
" " VALLEY BOTTOM
LEXINGTON PLAIN
PLATEAU UNGLACIATED UPLAND
" " VALLEY BOTTOM
" GLACIATED UPLAND
" " VALLEY BOTTOM
GLACIATION LIMIT
MI
KM

Fig. 5

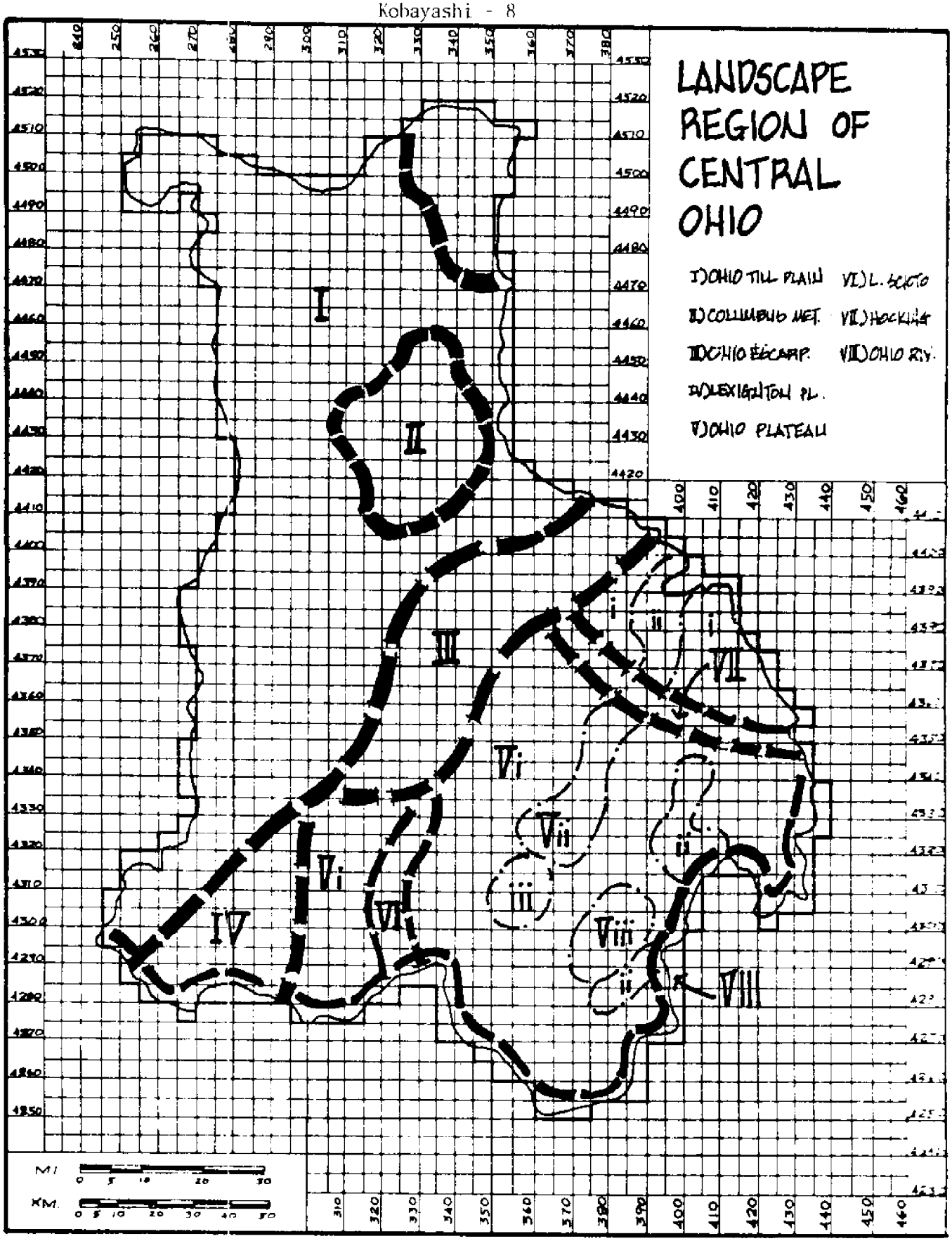

LANDSCAPE REGION OF CENTRAL OHIO
I) OHIO TILL PLAIN
II) COLUMBUS MET.
III) OHIO ESCARP.
IV) LEXINGTON PL.
V) OHIO PLATEAU
VI) L. SCIOTO
VII) HOCKING
VIII) OHIO R.V.
I
II
III
IV
V
VI
VII
VIII
MI
KM

Fig. 6

a) The first of the three factors, Landscape Diversity deals with the diversity of components, namely landscape pattern and land form. Maps of vegetation, topography and land use provide the base information which is manipulated and interpreted. Our hypothesis in Landscape Diversity is that in each unit area, a 10 x 10 km sqaure in this study, the visual quality of the area is a function of the diversity rating of the area.

The existing landscape elements identified in the LANDSCAPE PATTERN and the LAND FORM are employed to evaluate the degree of Landscape Diversity of the study area by a unit cell (10 x 10 km) basis.

Those landscape elements identified are(1) Water, (2) Vegetation and (3) Land Use Types in the LANDSCAPE PATTERN category and Topographical Variations in the LAND FORM category.

The numerical points ranking system was employed for a total evaluation. The maximum rating points for LANDSCAPE PATTERN AND LAND FORM was set equally at six points. The highest diversity points a cell may get is 12. (e.g. LANDSCAPE PATTERN 6 + LAND FORM 6 = 12.)

a-1) Diversity in Landscape Pattern

Evaluation of the Landscape Diversity in LANDSCAPE PATTERN was executed in the following manner:

(1) First, the water element was evaluated in the following categories:

a) Rivers and Creeks in terms of river order
b) Intensity of year round streams by graphic scale
c) Large water body by 40 acres as lower limit

(2) The Diversity of Forest Coverage (Vegetation) is evaluated employing the established graphic scale for each cell.

(3) The land use pattern of the study area is evaluated according to the following categories employing established graphic scale:

a) Existence of Urban Area
b) Intensity of Residential Development
c) Intensity of Road Development
d) Intensity of Manufacturing and Commercial Development
e) Intensity of Mining and Extraction Industry

a-2) As to Diversity in Land Form

At the same time, land form element was evaluated on the basis of variations of topographical contour lines in each cell.

All cells are evaluated on the scale of High (6 points), Medium (4 points) and Low (2 points).

a-3) Total Evaluation

In order to get the total evaluation of Landscape Diversity for each cell, two steps are involved:

First, points assigned for LANDSCAPE PATTERN are totaled.

Example: Cell Number 330 E. 4350 N.

River and Creek	2
Year round creek	1
Water body	1
Vegetation	6
Urban Area	1.5
Residential	3
Road	0
Commercial	-1.5
Mining	0
TOTAL	13

The points acquired are divided by three and added to the point established for LAND FORM to establish the total points for Landscape Diversity. (See Fig. 7 for result.)

Landscape Pattern (13/3 = 4.3)	
Land Form	4
	8.3

b) The second factor, Sensuous/Visual Landscape, focuses on edges, linear elements, landmarks, nodal points and views. The primary method of collecting data on these components was field observation of the study area, supplemented by interpretation of the topography map.

As the major objective of the study is to collect and analyze information which exists prior to the study and from other constraints--time and fund, a gross visual survey of the study area was conducted.

Topographical edges, enclosures and view-vista points are inventoried using field observation, average 2 stations in a cell (10km x 10km) on major routes and interpretation of topography map.

Due to the grossness of the unit cell scale of the study and of the source of information (USGS topography map 1:250,000), vegetative and man-made visual screens are not considered.

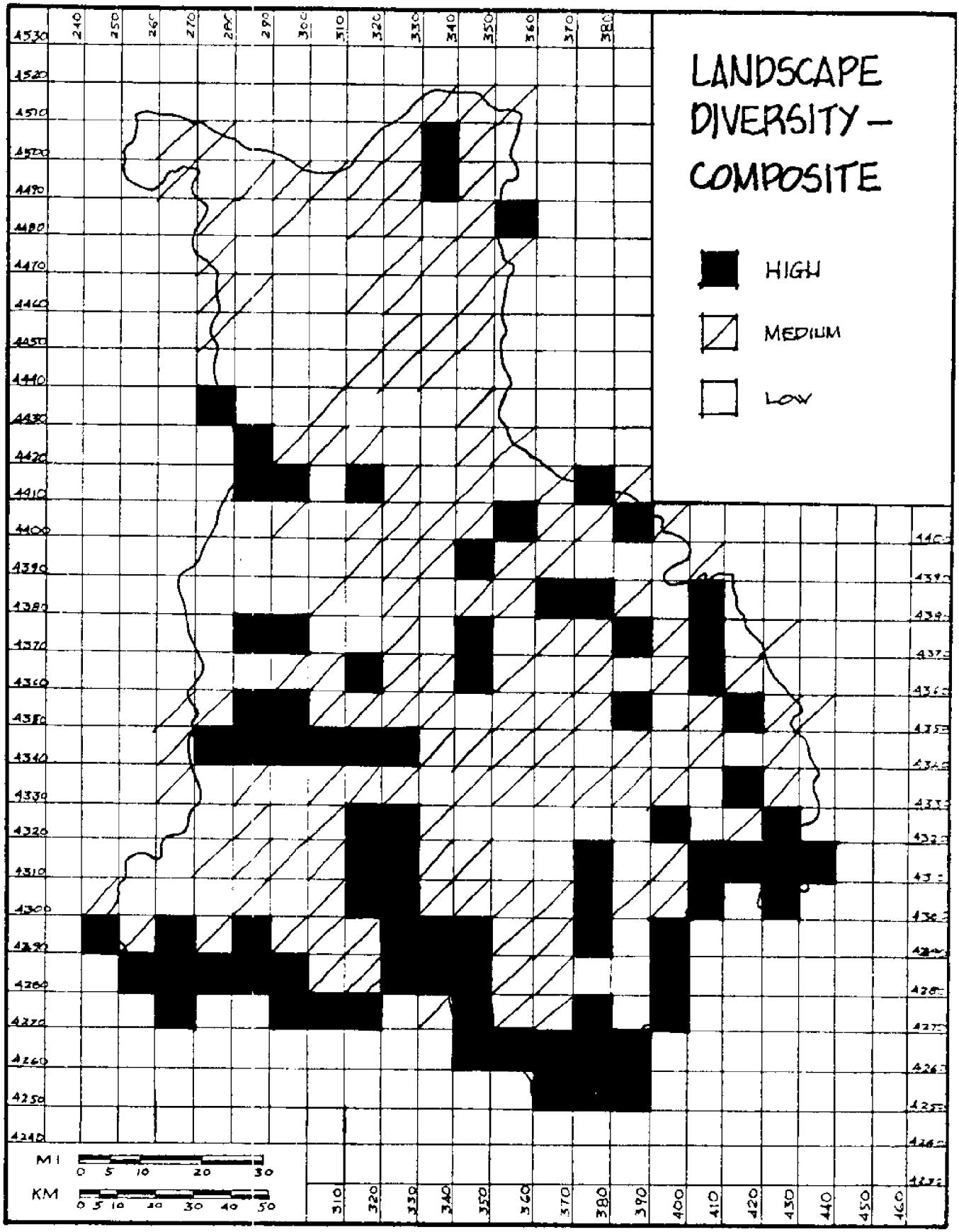

LANDSCAPE DIVERSITY – COMPOSITE
HIGH
MEDIUM
LOW
MI
0 5 10 20 30
KM
0 5 10 20 30 40 50

Fig 7

Inventoried Datas (Edge/Enclosure and View/Vista) are evaluated subjectively as major or minor visual elements depending on the scale.

The following score points are given to each evaluated datas. (See Figs. 8 & 9)

Edge/Enclosure (Topographic)	Major	3
	Minor	1
View/Vista	Major	3
	Minor	1

c) The third factor, Characteristic Landscape Features, designates natural and human/cultural points of significance located in the study area. The data on these features was gathered mainly from existent literatures.

First, those identified landscape features, most of which are point data, i.e. earth mound, Museum, Mt. Logan, Old Man's Cave, etc. are plotted on a map.

*Any characteristic landscape features which are identified also as visual components in Sensuous/Visual Landscape are determined higher of value.

*Any features existing within the environmental corridor boundaries establishec by overlaying recreational resource maps by DNR get higher evaluation. (Fig. 10)

*Popularity of these landscape features both natural and human/cultural is evaluated on the number of occurrences of the name in the existing literatures.

*Any features which are listed in more than two publications get higher evaluation.

Relative importance among these features is given below:

A. Any features which is a part of visual components	1
Any features which is not part of visual components	0
B. Any features which is inside corridor boundary	2
Any features which is not inside corridor boundary	1
C. Any features which is listed more than twice	1
Any features which is listed once	0

d) Visual Qua'ity of Central Ohio

In order to get a total view on the visual quality of Central Ohio, a composite map is made from the preceding three maps. First, relative importance of 6, 3 and 4 to Landscape Diversity, Visual

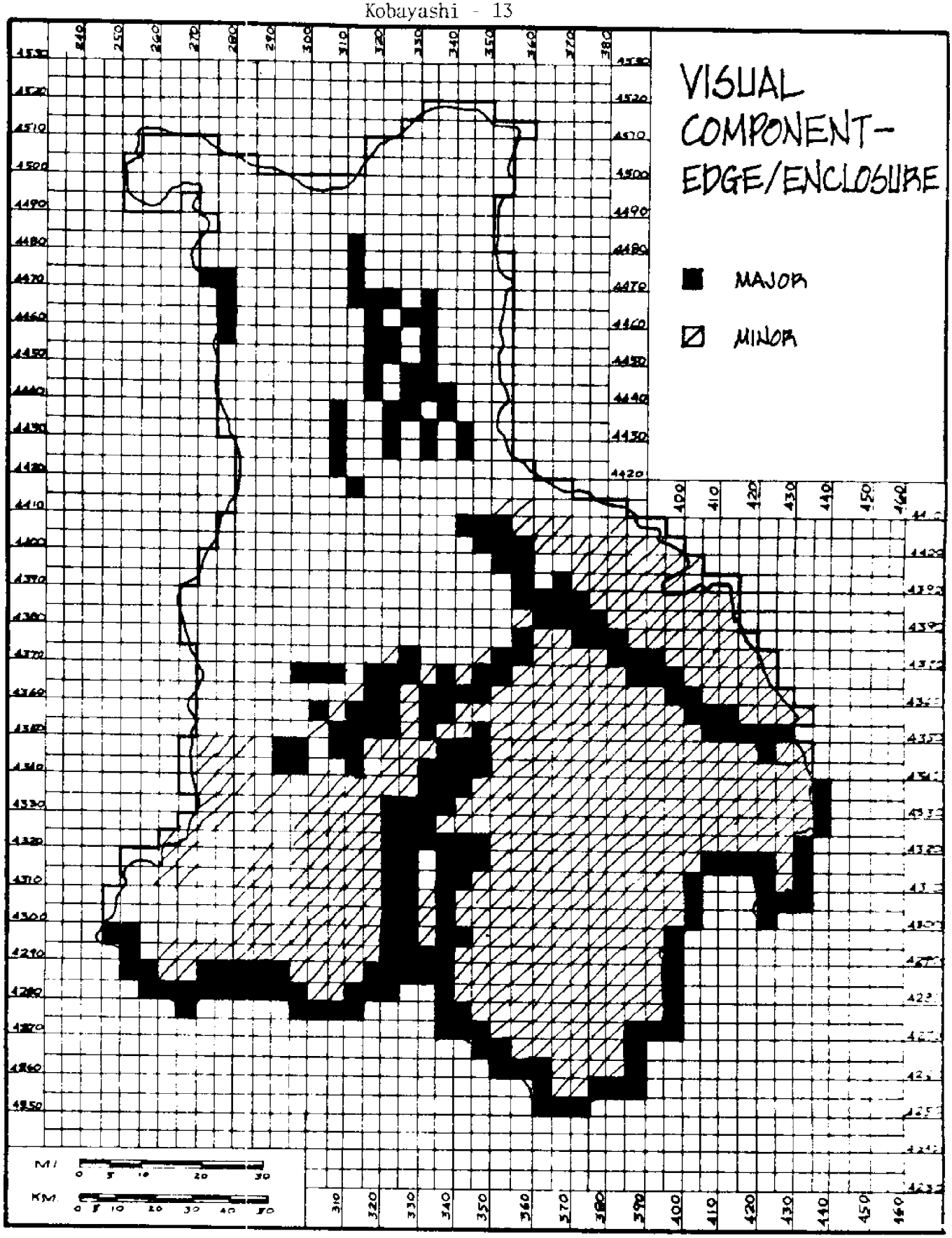

VISUAL
COMPONENT-
EDGE/ENCLOSURE
MAJOR
MINOR
MI
0 5 10 20 30
KM
0 5 10 20 30 40 50

Fig. 8

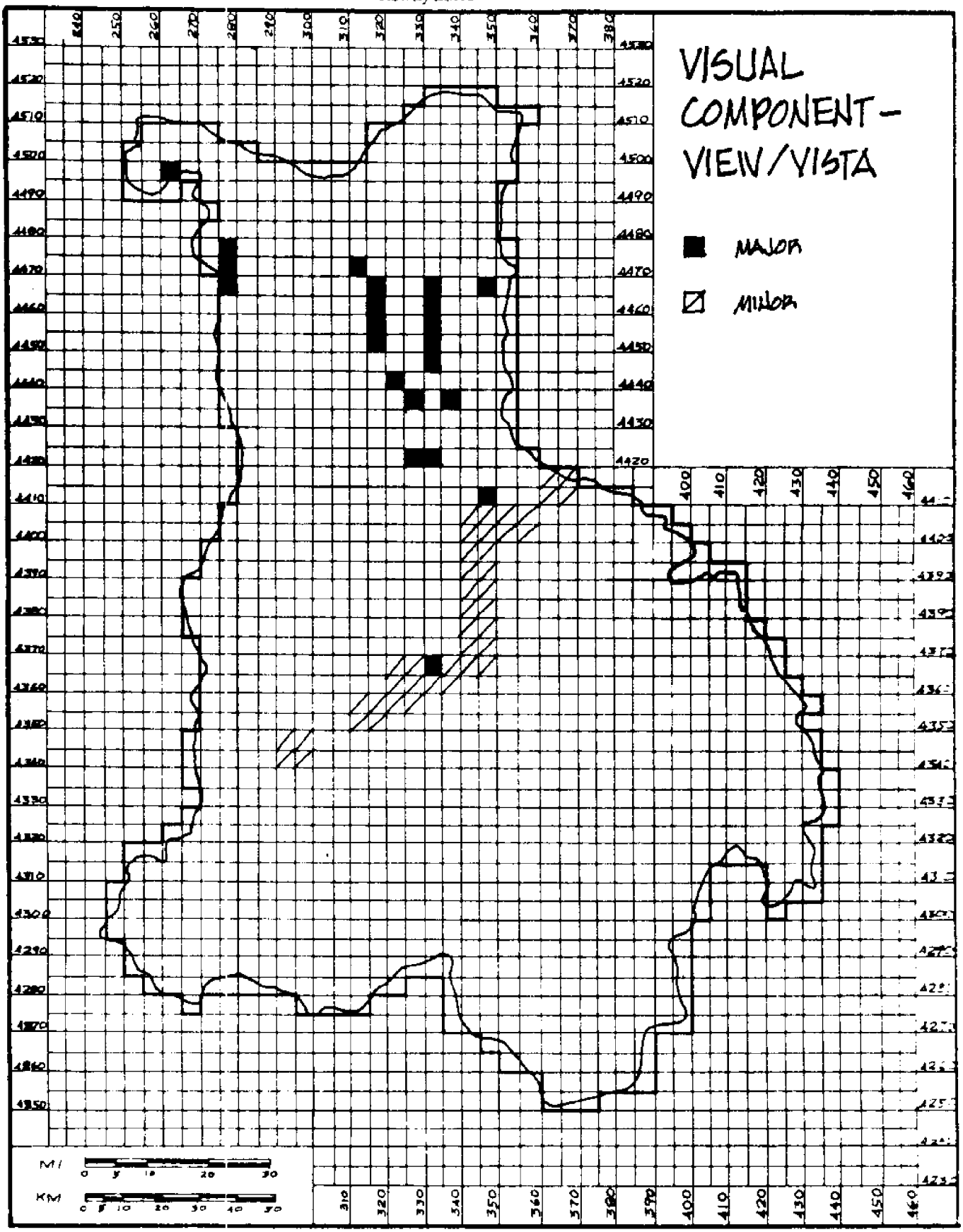


Fig. 9

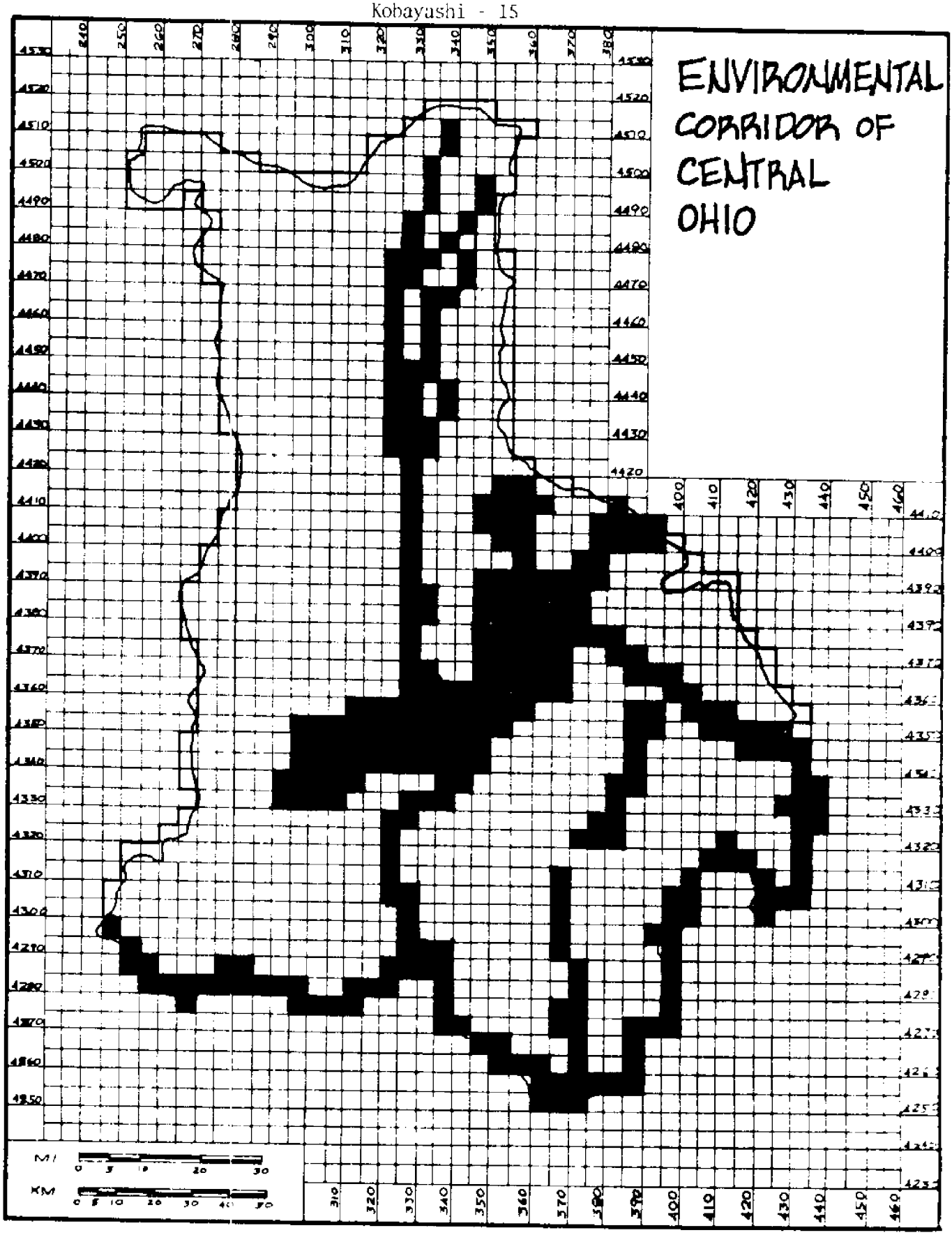

ENVIRONMENTAL
CORRIDOR OF
CENTRAL
OHIO
MI
0 5 10 20 30
KM
0 5 10 20 30 40 50

Fig. 10

Landscape and Landscape Features respectively are given to each of the three components. Later computer mapping is employed to reveal the effect of various relative weighting systems.

The following ranking system is employed to grade all cells into five classes according to the number of points each cell has received on the composite map.

		SCORE
Highly Rated Class	I	13-11
	II	10- 8
	III	7- 6
	IV	5
Lowly Rated Class	V	4- 2

Thus a total view on the visual quality of Central Ohio is rated and shown in Fig. 11.

e) Landscape Perception Survey

e-1) Survey

A primitive survey was conducted to see if there is any correlation among the image (perception) of the evaluation of the landscape, and the Landscape Regions identified through the process described above.

Specifically, the survey was designed to test three hypotheses of this study. They are:

Hypothesis 1 Areas of rolling hill (abundance of topographical change) get higher evaluation than flat areas.

Hypothesis 2 There are some homogeneous landscape areas which can be visually identified in the state.

Hypothesis 3 Those homogeneous landscape areas can be pre-identified by the mapped information.

Surveyees were asked to 1) "divide the state into maximum of 20 areas such of which you think has been homogeneous characteristics in both natural and man-made", 2) "describe those areas identified by brief statement", and 3) "rank those areas in terms of visual quality in the range of 0 (lowest) - 5 (highest)".

Approximately 70 students of various majoring fields responded and 54 of them were analyzed. The rest were not analyzed because they showed few identification of any region because of short stay in Ohio.

e-2) Discussions and Conclusions

The result of the survey from the students on map form is generalized to show 10 areas in the state. (Fig. 12)

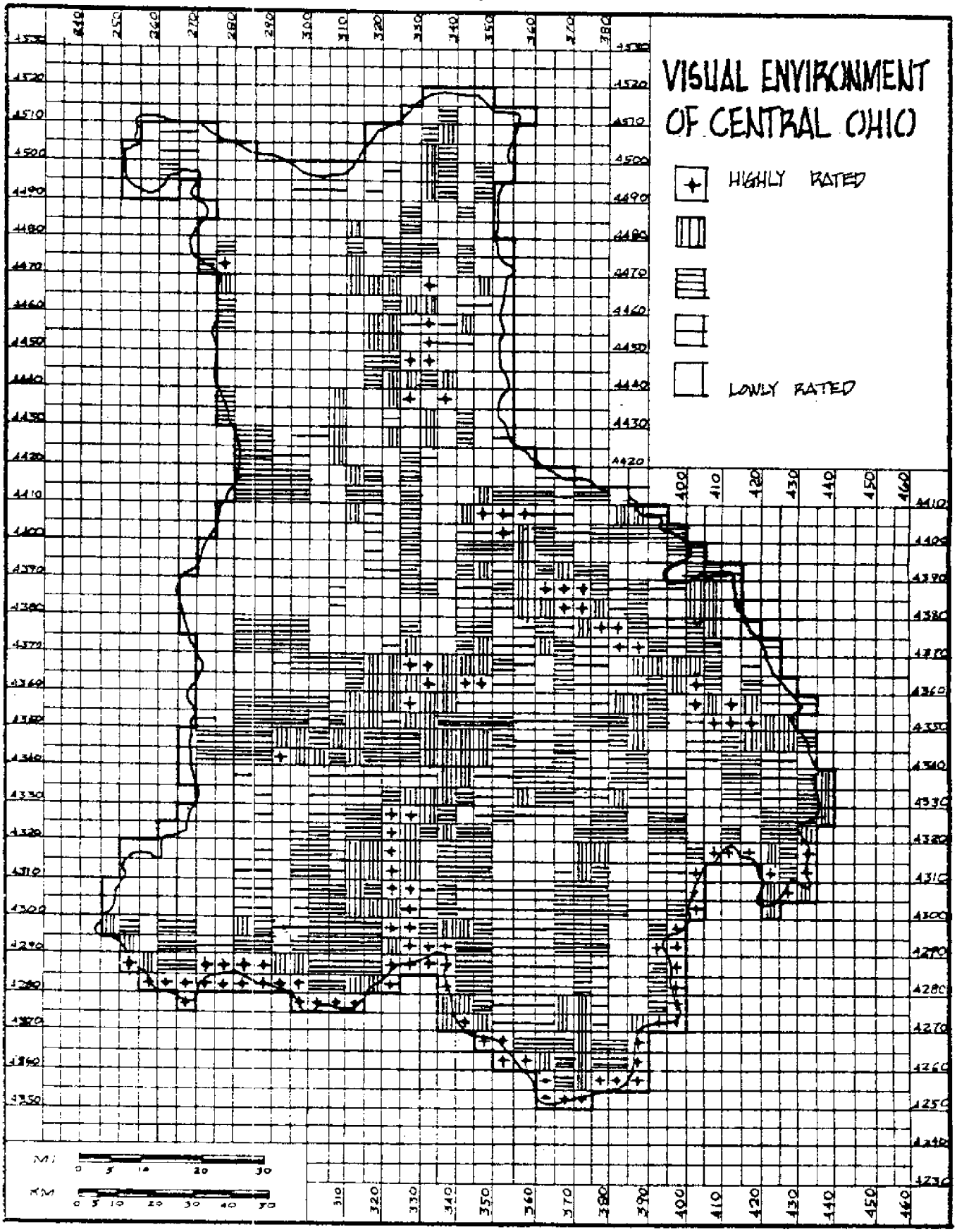

VISUAL ENVIRONMENT
OF CENTRAL OHIO
HIGHLY RATED
LOWLY RATED
MI
0 5 10 20 30
KM
0 5 10 20 30 40 50

Fig. 11


2.66
FLAT
ROLLING
GLACIATED
FARM LAND
TOLEDO
3.50
URBAN
FLAT
CLEVELAND
3.60
ROCKY
HILLY
FLAT
WOODED
AKRON
CANTON
3.33
FLAT
LIMA
2.83
FLAT
ROLLING
FARM
MARION
3.80
FLAT
FARM
MANSFIELD
2.42
4.00
3.83
FLAT
VALLEY
LAKE
DAYTON
CINCINATI
FLAT
FARM
POPULATED
RIVER
COLUMBUS
WOOD
HILLS ROLLING
POOR
PICTURESQUE
ATHENS
3.66
HOCKING HILLS
EDGE OF HILLS
LESS WOODED
0
25
50
100
LANDSCAPE ARCHITECTURE 5B.

Fig. 12

There are four types of information shown on the maps.

They are as follows:

i) most distinctive and commonly agreed division lines
ii) ten areas (identifiable)
iii) brief description of the areas
iv) their evaluation scores as to visual quality

Generally speaking, from the survey results, the following is concluded:

1. most distinctive and commonly agreed division line coincides with Glacial Boundary.

2. ten areas identified are identical except in a few situations.

3. descriptions of the areas are commonly done by land form, land use and name of the major cities.

4. areas south of Glacial Boundary tend to get higher evaluation score.

Based on these conclusions, we can roughly prove the Hypothesis 1 since the areas which received higher evaluation score are the areas south of Glacial Boundary coincides with rolling hill areas.

Visually, there are two homogeneous landscape areas--hill and flat. In addition to those areas, other areas are also identified as homogeneous landscape in terms of flatness of the land, forest coverage, existence of water and population, thus proving Hypothesis 2.

In this study area, four commonly sited areas can be identified.

Flat, Rural, Farm Land Area
Populated, Suburban Columbus Area
Scioto Hill, Pasture, Forest Area
Hocking Hill, Forest Area

Perceived landscape regions (Fig. 13) and landscape regions (Fig. 6) identified through mapping process are roughly overlapping, thus proving the Hypothesis 3.

It turned out to be useful and practical to employ USGS topography map and land use map (each at 1:250,000 scale) for identifying homogeneous landscape areas.

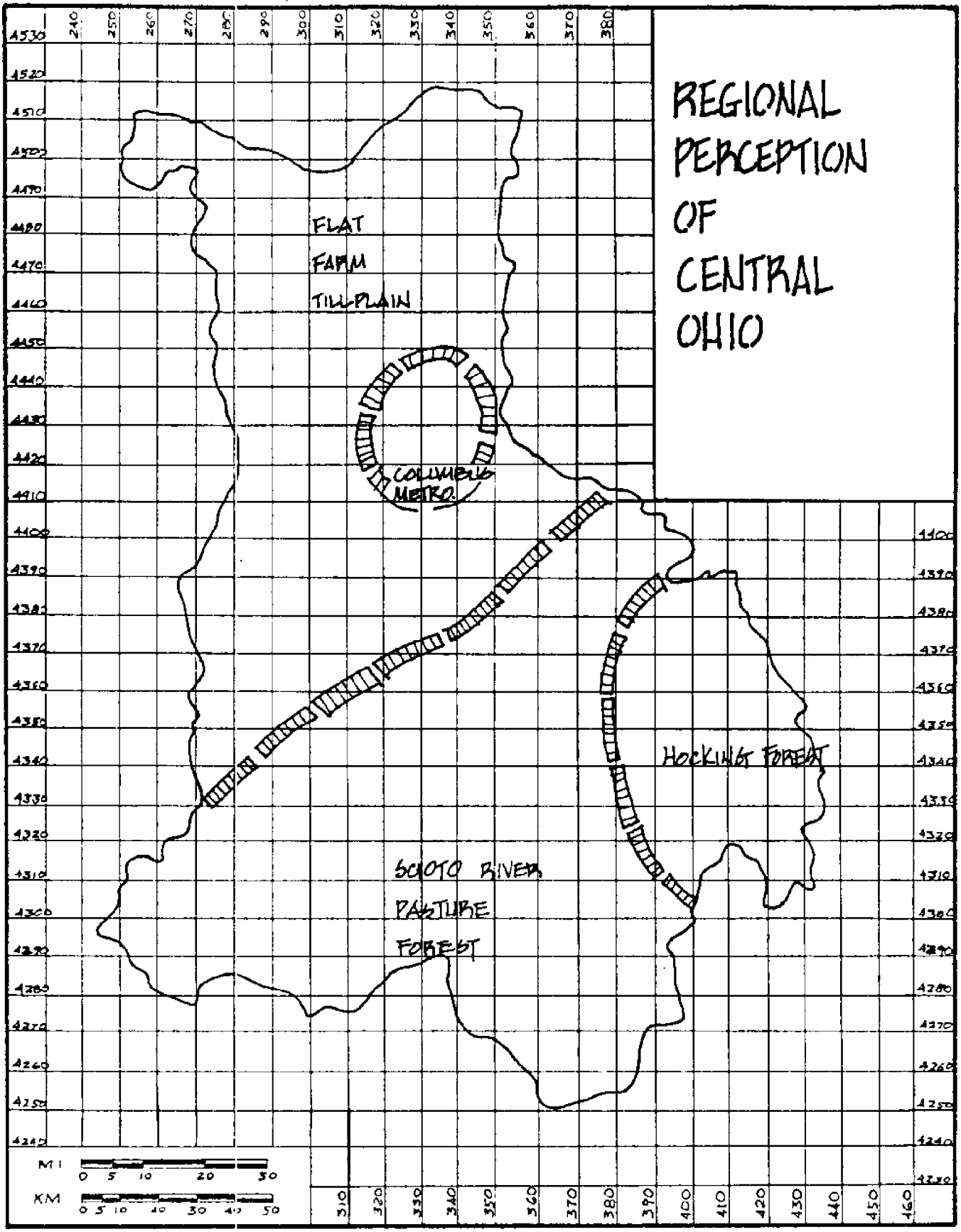

REGIONAL
PERCEPTION
OF
CENTRAL
OHIO
FLAT
FARM
TILL-PLAIN
COLUMBUS
METRO.
HOCKING FOREST
SCIOTO RIVER
PASTURE
FOREST
MI
0 5 10 20 30
KM
0 5 10 20 30 40 50

Fig. 13

f) Conclusions

f-1) Identification

The size of the study unit may need careful examination. In this study, 10km x 10km cells were used for identification of Landscape Patterns and 5km x 5km cells for the final quality evaluation.

Identification of visually homogeneous landscape on the basis of landscape pattern and land form through manipulation of available mapped information is executed and validated by perception survey.

As one can predict without the aid of any study, the glaciation limit clearly distinguishes two major visual landscape areas: Ohio Till Plain and Ohio Plateau.

Although identification and evaluation of the visual components of landscape (views/vistas, edge & landmarks) could be better executed on 1:24,000 scale, the study was done at 1:250,000 scale in order to cover the entire study area.

f-2) Evaluation

The visual quality evaluation of these areas on the basis of diversity of landscape closely relates to the perception survey, validating the method used.

The method of integration of visual landscape and characteristics landscape with landscape diversity for total visual landscape quality evaluation is still primitive; more comprehensive methods should be developed in future study.

The ranking of the total visual quality of an area is only relative to any other area in the study area, thus prohibiting the study from indicating any international, national, state, and local significance of a given cell or area.

The ranking is useful in placing priority for such projects as restoration, beautification, reforestration and introduction of water body in the study area.

f-3) Planning Implementation

Some of the utility of this study can be summarized as follows:

1. Visual quality ranking can indicate areas needing upgrading.

2. Means of visual upgrading can be suggested from evaluation criteria.

3. Visual impact of the area from development and its related action can be predicted when the rating is used in combination with the identification of the ecological stability of the area, when available.

Visual integration of the area thus can be indicated.

4. Since visual experience is largely sequential, the visual quality map is best utilized in identifying a visual corridor which can be designated as a scenic route.

When available, the results of the study on the natural and human/cultural components done by the other consultants participating in the Environmental Analysis of Central Ohio should be compared with the findings of this part of the study to see if any correlation exists between the two sets of results.

[III] Ross County Visual Analysis

The previous Central Ohio study leaves two questions: 1) appropriate unit size for identification/evaluation at 1:250,000 scale and 2) level of detail in the field survey. These are dealt with in The Study for Ross County (one of 29 counties) conducted at a smaller scale and more detailed level. Visual survey at 1:24,000 scale is executed employing the following method and identifies sixteen Landscape Sub-Regions, which are evaluated based on diversity of land form, vegetation and other visual features.

1. Identification of the Landscape Dimension
Following landscape elements were employed in this study:

Slope Gradient
Physiology Unit
Vegetation Types
Land Use Pattern & Coverage

Corresponding to these elements the following maps were produced:

Topography (USGS)
Land Use (1960 State of Ohio)
Elevation Relief
Slope
Physiography
Existing Foliage (ERTS)
Original Vegetation (Gorden)

2. Landscape Unit Identification

a) Composite of landscape elements -
Those maps of landscape elements described in the preceding section are overlaid to produce a composite map. (Fig. 14)

From this process, a pattern of areas with homogeneous characters is revealed.

A field survey was conducted. This preliminary visual field survey determined the size of the homogeneous character areas identified previously. Then, each area was labelled. (Fig. 15)

Also an Image Map of Ross County was produced through the field survey. (Fig.16)

b) Identification of Landscape Unit -
Secondly, these areas are grouped into the following Landscape Unit Categories:

City
Town Farm
Forest Farm
Town Forest
Forest

3. Visual Quality Evaluation
Landscape Diversity in each Landscape Unit Category and for Ross County as a whole were determined and the average of the two was determined as the Landscape Diversity Rating.

Existing Visual Features and View Types were inventoried through field and map survey.

4. Comparison
Comparison of these two studies reveals that there is a general agreement between the results of the evaluation. However, the Ross County Study results reflect more accurately the land form variations identified by human perception.

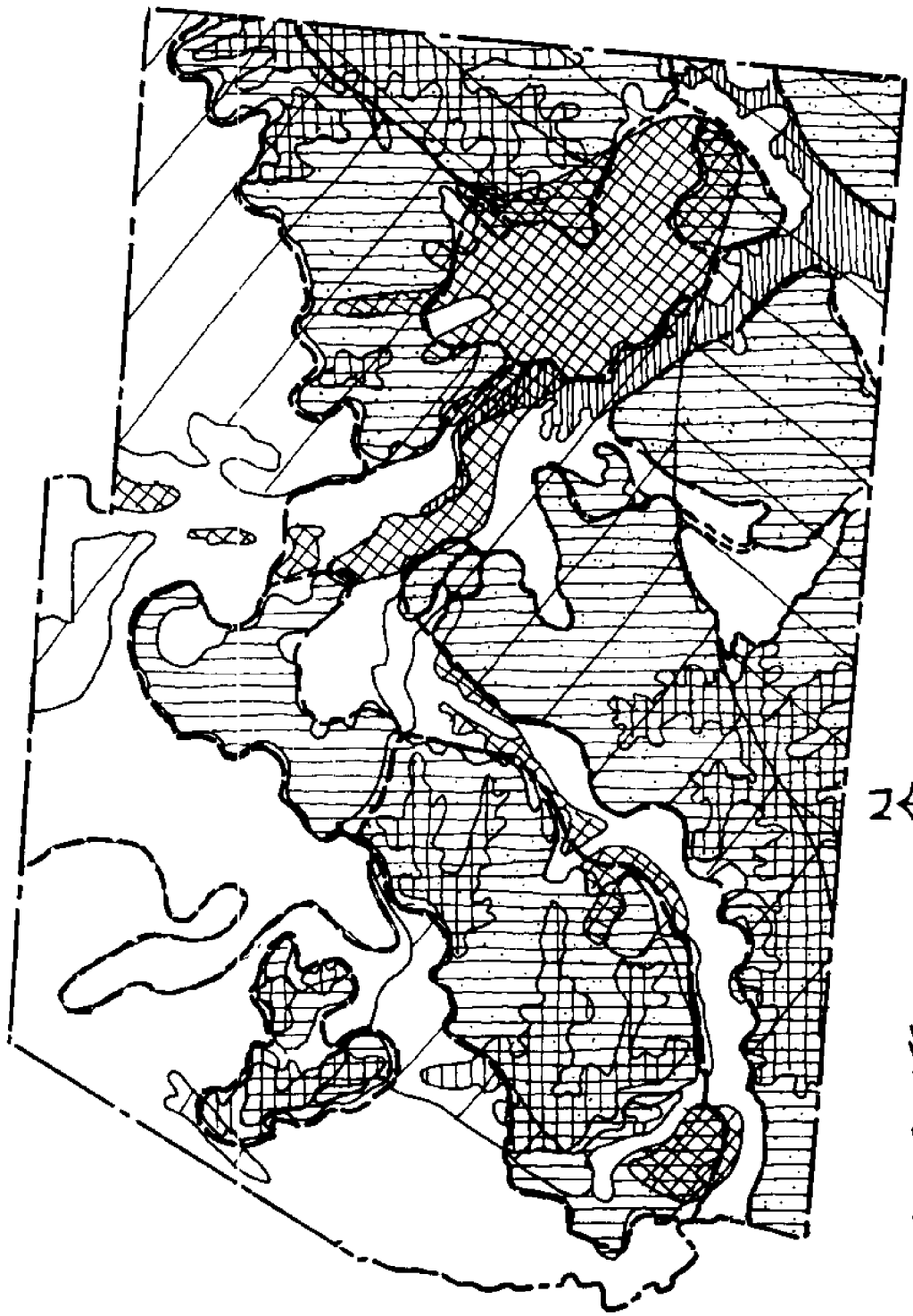

COMPOSITE
1:250000
STEEP SLOPE
EXISTING FOLIAGE
PHYSIOGRAPHY

Fig. 14

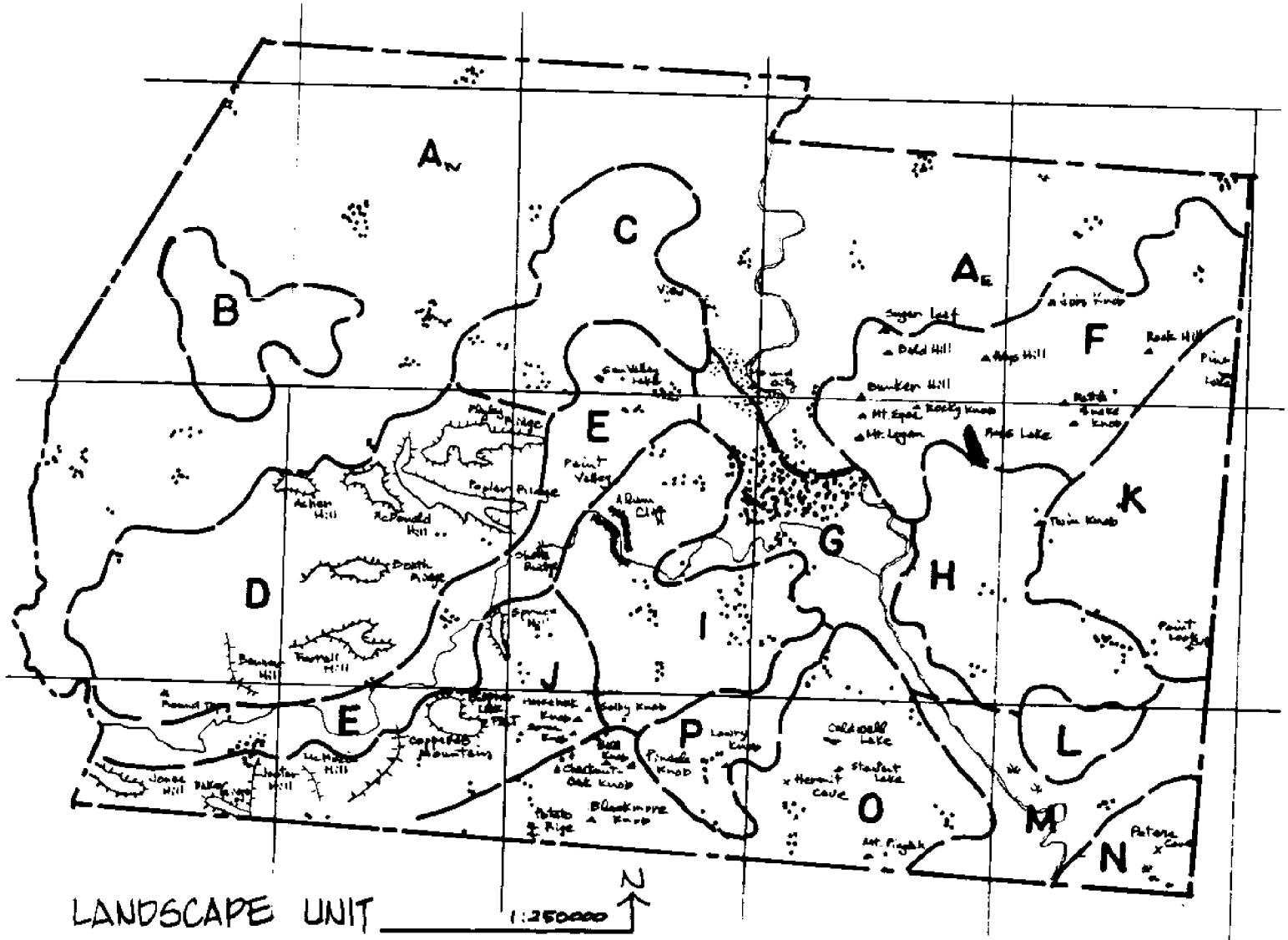

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
LANDSCAPE UNIT
1:250000
A UNIT IDENTIFYER
SETTLEMENT
VISUAL FEATURES

Fig. 15

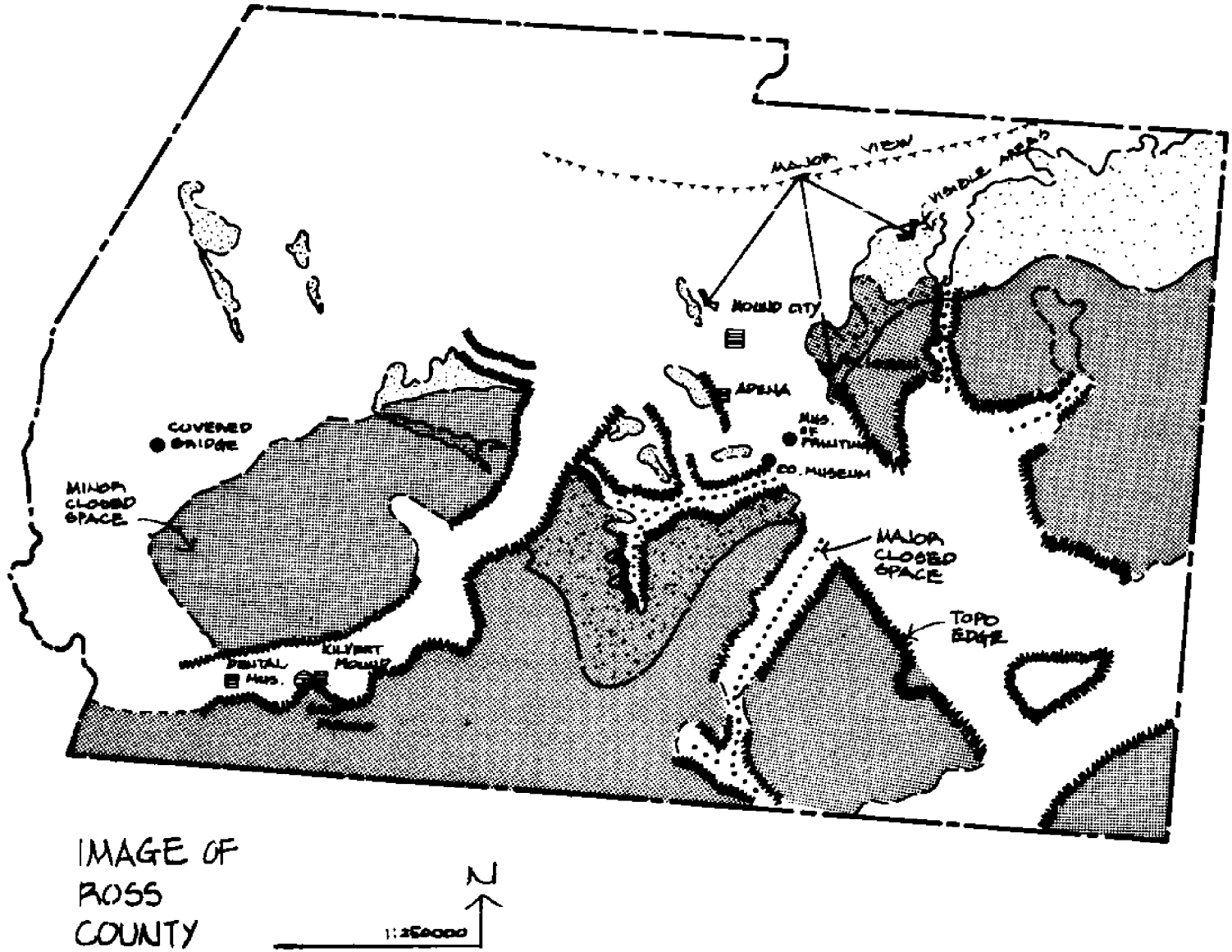
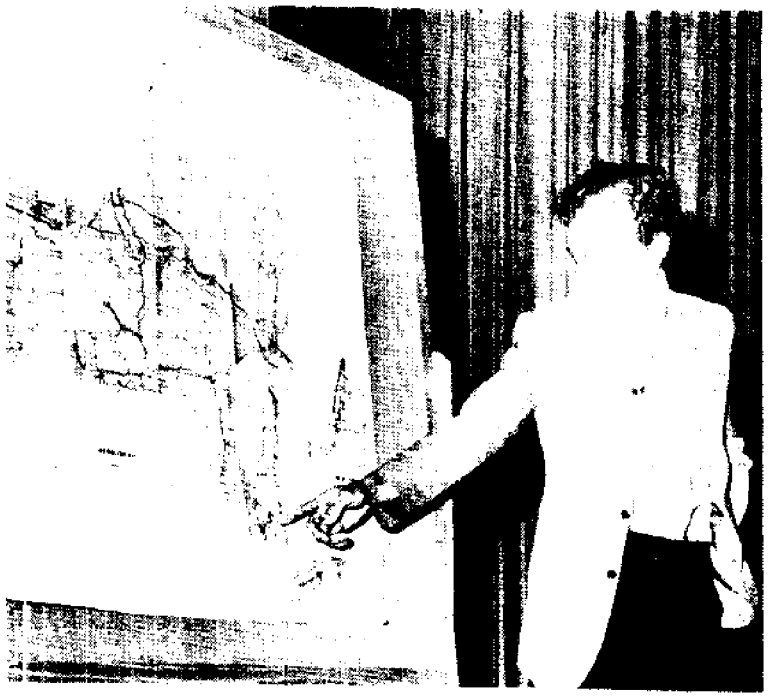


IMAGE OF ROSS COUNTY

Fig. 16

VISUAL QUALITY AND CULTURAL WEALTH:

THE CASE OF POWERLINES



Michael E. Rapp

VISUAL QUALITY AND CULTURAL WEALTH: THE CASE OF POWERLINES

Michael E Rapp
Department of Geography
Vassar College

Abstract

According to David Lowenthal (1973, p. 32), one of our greatest problems in formulating policies to protect visual amenity is that "we tend to interpret our manmade landscapes as inherited failures rather than tomorrow's promises." In our visual blight study at Vassar College, we attempted to correct this flaw, looking with promise rather than condemnation at massive new visual intrusions including high voltage energy transmission systems.

Cultural Processes and the Landscape

Numerous processes occur on our landscape that interact to form an environment for man; some of the processes are natural and some of them are cultural. It is generally assumed that most natural processes and most cultural activities, at least until the industrial revolution, helped contribute to an aesthetic environment. Suddenly in our century various cultural processes have exploded, altering our landscape with a myriad of systems and developments of many types. The question is essentially: Is worldwide industrialization compatible with the maintenance of a beautiful environment?

The issue is much larger, of course, than just visual environment. What is at issue is the quality of life in general in a technological world. This is not a question that can be answered in one study, or really in any number of studies; but in our visual blight report (Flad, 1974), we at least determined that one fruitful way to inititate debate on this vital issue was to study a number of particular cultural-visual problems.

High voltage transmission is a large scale process that is both altering our civilization and altering our landscape. What process so concisely epitomizes the harsh impact of a massive industrialization on natural wilderness areas and the further adding of complexity to developed areas? The sheer conception of a super high energy web spun over our landscape is a symbol of just how large a problem we face in improving visual America, giving insight into our massive capability to harness natural energy sources to alter our environment.

Overall, a year's worth of study of powerlines did not lead us to depair over the prospects of visual quality in a technological society. On the contrary, the efforts and new ideas that have been applied to the powerline visual issue lead one to cautious optimism, not only about powerlines, but more importantly for our landscape in general.

The Powerline Issue

From a design standpoint, powerlines exhibit both positive and negative qualities. On the positive side they exhibit a regularity and coherence of form and function resulting from modern engineering and economics that often can be compared to the work of Mother Nature in economy of materials used and grace of form. On the negative side, not only are many powerlines and their related substations ugly, but even good ones are often not in the best place; they have a failing in the art of "relationship," (Flad, 1974, p. 10), and their positive qualities are obscured either by other powerlines, other manmade development or beautiful vistas they might chance to disrupt.

However, powerlines of all shapes, sizes, and vintage present a hidden potential for those citizens willing to take a brave cultural approach to their appearance. Powerline rights-of-way, and other technological linear spaces including abandoned railroad lines, aqueduct paths, and gas lines, offer us a potential for recreation. According to Robert Royston:

> People will soon demand connected park systems, systems which make sense, linkages by rights of way for the continuation of natural processes and people's movements free from automobiles. .....There is a strengthening public demand for....access systems of greenways that will express permanent faith in the landscape as a matrix for community life and growth. (Royston, 1974, p. 238)

America's road system, while being very useful for the economy, has led to a serious shortage of small-scale and green paths. Powerline linear space is of particular value in supplying maximum edge per acre and maximum accessibility. Powerline paths are an ecological resource as well, (Carey Arboretum, 1973), a vibrant transition zone supporting many species of animals and plants.

Mythology and Landscape

A central question still remains: Are we coming out ahead learning to use powerlines, or are we accepting enviromental degradation with a grain of salt? We must move to a more theoretical approach to evaluate this question.

A. David Hill looks at the cultural context of landscape change (Hill, 1964, p. 44):

> A people's estimation of their own needs and their capabilities to use natural features determines the ultimate manner in which those features are exploited.

Hill studied a rural Mexican landscape, a landscape almost totally devoted to the growing of corn. Corn is the central food; even more importantly, it is the central energy source for a whole society, with man and animal being the primary work force. The Mexican landscape molded itself to this energy system of sun to corn to man; the cornfield itself and

where conditions are right to put a cornfield not only alters the placing of every other activity, but becomes the central environmental image, assuming mythological qualities.

Our society marches to a different beat, powered by the forces of rivers, resources from the crust of the earth, and hidden relationships of the atom. Just how vital energy availability has been to the development of modern civilization has only recently become obvious, with a new "energy consciousness" enveloping the land. But as the availability of cheap fossil fuel led to our "automobile landscape," it is likely that future energy relationships have and will become central determinants of landscape change.

It is not certain just what powerlines represent in terms of energy utilization in America. To some they are only one more artifact of a wasteful system that will recede as America learns to use alternate energy sources as well as use energy more carefully. But most experts envisage powerlines as a potential system that will maximize energy efficiency by pooling energy from region to region.

If powerlines become an enduring artifact of our modern era, than the use of powerline rights-of-way assumes much greater implications than learning to live with more blight. Hopefully the early efforts and the work to come concerning their visual appearance will serve as a model for the vigilance we can direct towards our entire landscape.

The Real Issue: The American Landscape

Powerlines are not really the central issue, however, they are only an isolated artifact, thankfully perhaps. The real issue concerns the places we spend the most time at, the visual quality of our "beats" (Clay, 1973, p. 110), our highways, our streets, and our shorelines. We face complex issues in safeguarding the amenity of these areas because of the multiplicity of processes occurring.

We face hard issues in balancing economic factors and visual coherence, but these two issues are not as separated as we often make them out to be. Yi Fu Tuan (Tuan, 1974, p. 64), says that we tend to judge harshly,

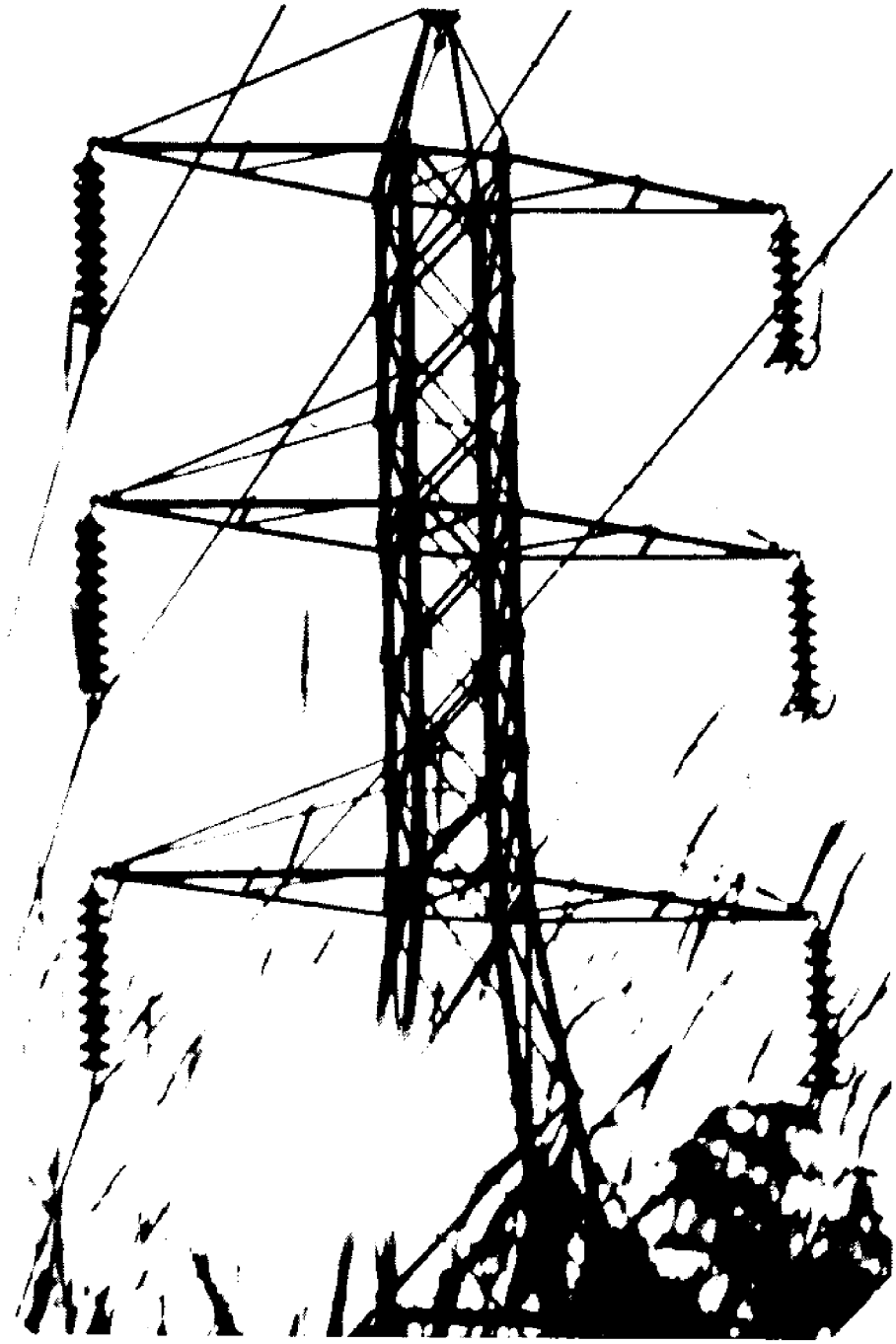
> the raw disorderly cityscapes of the American West----the endless rows of gas stations, motels, "dairy queens," and hamburger stands. The operator of an eat stand, however, can be proud of his business and his modest role in the community just as the backwoods farmer saw in his untidy patch of corn reassuring evidence of his success in the struggle for independent livelihood.

Tuan would certainly be the last one to call for more hamburger stands on our landscape, however. His point is that not only must we recognize the relativism of judgement as mediated by economic factors, but that overzealousness in squashing our landscape's ability to communicate the feelings of people can lead to a sterile landscape.

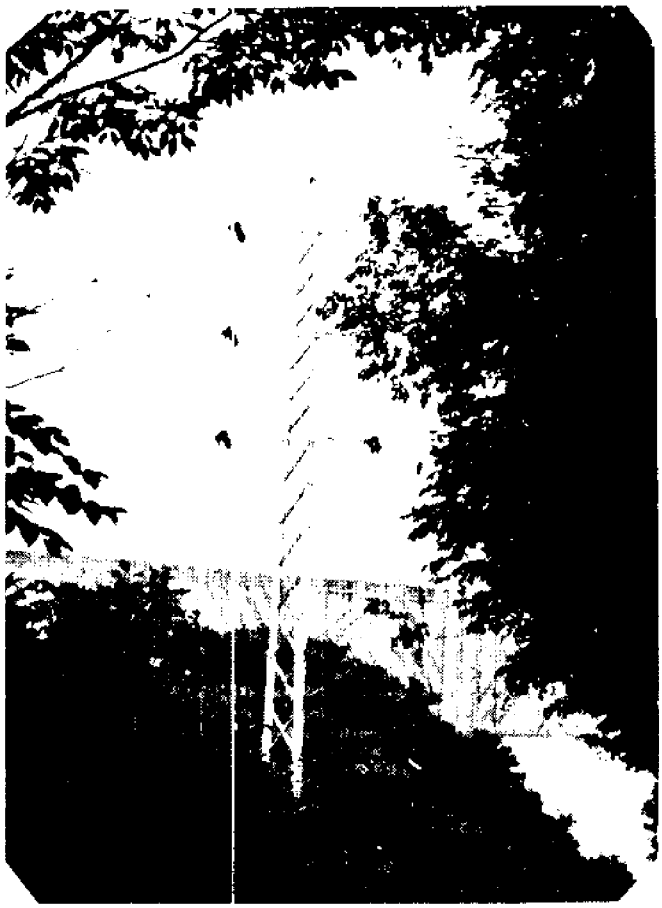
Ultimately the determination of what is beautiful is undoubtedly historical. Our conference on coastal management certainly might indicate a new era when hamburger stands owners will begin to find out that they must sell visual quality as well as hamburgers to a more discriminating public. The point is, as expressed by A.E. Parr (Parr, 1972, p. 27), that the task,

> of environmental quality is not to provide a terminal retirement home for civilization, but to guide the evolution of our surroundings in such a manner that we may find delight and assurance both in the process and in the stages it takes us through.

A cultural committment to improve the looks of the landscape can only come through a greater appreciation, understanding, and respect for the many processes that occur on it. Our landscape can not be beautified across the board at once. We are likely to make the best progess by concentrating efforts in areas where results are likely to be reaped. One fruitful areas is powerline impact; results are possible in this area because of the singular nature of the process occurring. Another area is the case of shorelines; we can achieve in this area because of the strong likelihood of popular support to improve this vital recreational space. In these two areas in particular, an example can be set for the development of the American landscape in general.



Artifacts stand as presences in their own right, like persons themselves, in their own immutable idiosyncracy and entirety. They differ of course from man himself in their usual immobility and unmoved permanence, thus forming a sensibly different realm -- allied and related to man, derived from and representative of man and deeply involved in his life. (Philip Wagner, 1972, p. 67).



Isolated islands of green are no longer enough for the enlightened urban community. People will soon demand connected park systems, systems which make sense, linkages by rights of way for the continuation of natural processes and people's movements free from automobiles. There is a strengthening public demand for corridors to protect wild open areas and conservation zones, and access systems of greenways which will express permanent faith in the landscape as a matrix for community life and growth. (Royston, 1974, p. 238).

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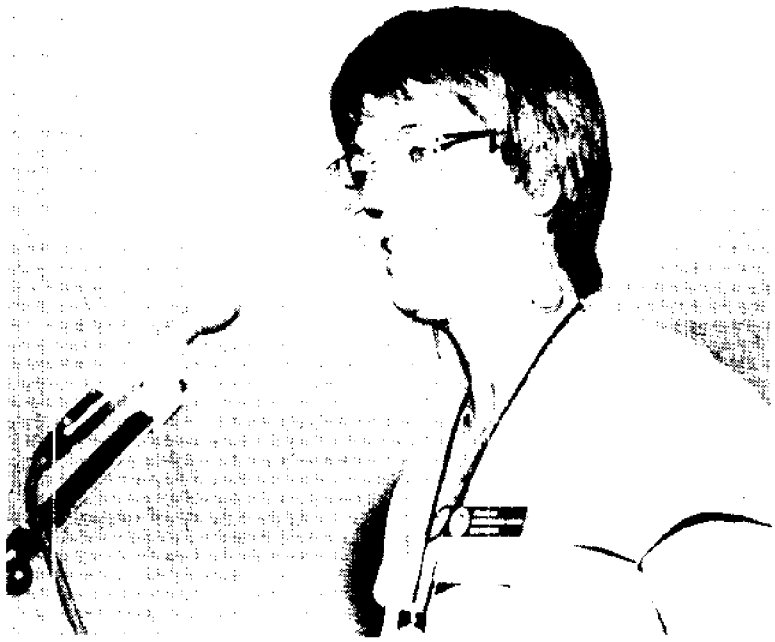
A SCENIC HIGHWAY ASSESSMENT PROCESS:
ITS APPLICATION TO THE MASSACHUSETTS COAST



Nancy Watkins Denig

A SCENIC HIGHWAY ASSESSMENT PROCESS: ITS APPLICATION TO THE MASSACHUSETTS COAST

Nancy Watkins Denig
Department of Landscape Architecture and Regional Planning
The University of Massachusetts at Amherst

The work described in this abstract is part of a larger transportation study undertaken during the 1974-75 academic year by various departments of the University of Massachusetts, and sponsored, with funds from the Federal Highway Administration, by the Massachusetts Department of Public Work's Bureau of Transportation Planning and Development. Nancy W. Denig and David C. Holden were student researchers developing and co-authoring the assessment process, supervised throughout the year by Professors Julius Gy. Fabos and Barrie Greenbie, Principle Investigators.

This assessment process was designed as a simple way to evaluate the scenic quality of existing Massachusetts state-numbered highways. Its ultimate purpose is the creation of a statewide network of legally designated and protected scenic routes.

The process includes six levels of scenic evaluation - landscape context, viewshed, corridor, special resource linkage, field check, and scenic potential. The first three levels were developed fully and applied during the first year of the study, and are described below. All of these first three levels are based on data derived from USGS $7\frac{1}{4}$' topographical maps. Their basic unit of analysis is the highway segment, ranging from 20-35 miles wherever natural breakpoints in the highway network occur. Each segment is ranked in relation to the others and placed in one of three groupings denoting high, medium or low quality. Rather than evaluating with externally fixed standards, relative ranking was thought to recognize the given-ness of the existing highway network from among which the best must be chosen.

Level 1 outlines a procedure for assessing the landscape context. The study area is classified into distinct terrain and land use landscape types. The highway segments are then ranked vis a vis the diversity and contrast levels of their surrounding landscape. Diversity refers to the number of landscape types per mile; contrast refers to the average degree of change thought present in each juxtaposition of landscape types along the route.

Level 2 - the viewshed area assessment - is applied to areas having special open and discrete characteristics, qualities which have long been appreciated. As such, this level does not obtain for the majority of highway segments within the state. Highway segments which are within viewsheds are evaluated according to their percentage of mileage within such an area, the degree of visual access (openness) it affords, and the number of visible special landscape features (landmarks within the viewshed).

Level 3 is the corridor assessment whereby each segment is ranked according to its sequence of roadside elements (ie. types of vegetation, development, topography), and its degree of alignment variability. This third level is of the kind most usually associated with scenic highway studies.

Each of the three assessment levels borrows heavily from previous studies. It is the combination of overlapping foci, however, from the general to the more specific which makes this process unique. The final score for each segment represents the sum of the scores earned at each level. With a range of 2 - 9 (2 rather than 3 since not all segments go through viewshed areas), a segment must receive a minimum score of 6 to qualify as highly scenic.

This process has general relevance for the coastal zone since highways - the major mode of public access - deeply affect both the intrinsic quality of the coast and our perception of it. Also, each of the three assessment levels relates to the coast in a specific way. The coastal zone, for example, is one of the terrain landscape types (level 1), large water bodies such as ocean fronts and bays are prime determinants of viewshed areas (level 2), and water bodies such as rivers and lakes are one of the special roadside elements counted in the sequence evaluation (level 3).

The assessment process was applied to most of the highways throughout Massachusetts. Results brought no surprises, confirming intuitively held notions about areas of scenic beauty in the state. Coastal segments ranked high in relation to the others - of the 11 coastal segments (representing 15% of the total number), none received a combined low score, 2 received a medium score, and the rest ranked high. The only segment receiving the highest possible score was a coastal one. The coastal segments even ranked higher in relation to other segments with the added benefit of a viewshed (scoring an average of 2.27 as opposed to 2.08 out of a possible 3).

One curious phenomenon noted in the results is that more than half (64%) of the coastal segments received low scores for the other two aspects of scenic quality - context and corridor. This suggests that the coastal zone routes are highly scenic due to the compelling nature of the water and its edge, rather than to more ubiquitous factors shared by non-coastal routes.

All of the above results should be seen as preliminary, since they need to be modified by the next and last three levels of assessment procedure - special resource linkage, field check, and scenic potential.

Editors' note: Unfortunately, a full text was unavailable when these proceedings went to press.

A VISUAL QUALITY ANALYSIS MODEL APPLIED TO THE COASTAL ZONE

Merlyn Paulson

A VISUAL QUALITY ANALYSIS MODEL APPLIED TO THE COASTAL ZONE

Carl Steinitz and Merlyn Paulson
Landscape Architecture Research Office
Graduate School of Design
Harvard University

Abstract

This paper describes a computer-based model for evaluating visual aspects of urbanization in a rapidly suburbanizing area. It is applied to part of the coastal zone in Massachusetts.

Introduction

This paper outlines the Visual Quality Analysis Model that has been developed as part of a research program entitled "The Interaction Between Urbanization and Land: Quality and Quantity in Environmental Planning and Design."[1] The major premise underlying the research program is that it is feasible to develop a series of major models that analyze the processes of urban development in a region; the social, fiscal, and environmental evaluations of these changes, and the legal constraints upon them. One of these component models is the Visual Quality Evaluation Model. It was presumed that these allocation and evaluation models could be organized to share a technical infrastructure consisting of a computer data base, a variety of spatial and other analysis programs, and a series of computer graphic and other output devices. It was further assumed that these analysis models could be combined in a variety of ways to respond to questions posed by users beyond the scope of any single component model. The intent of the research, therefore, was not to develop a single model, but a series of discrete, yet inter-related, models that could be combined in a number of ways depending on the kinds of information desired, or the type of policy question being addressed. In the proper combinations, the models may be used for such tasks as planning-simulation, projection, plan evaluation, gaming, "optimizing," and the exploration of new legal and implementation tools. These goals have generally been met, and the resulting models have been used to address growth-related issues in the study area.

The area included in the study is located in the southeast sector of the Boston Metropolitan Area (Figure 1). Considerations for the determination of the boundary of the study area were both physiographic and political. A foremost consideration was the delineation of the drainage basin for the North and South Rivers and the presence of a coastal zone. In addition, the study area was expanded to include all of the eight towns which were either contained in these two watersheds, or have major land areas within either watershed. The eight towns contained are: Duxbury, Hanover, Hanson, Marshfield, Norwell, Pembroke, Rockland, and Scituate. The total data area measures 756 square kilometers (or, at the scale of the data, 75,600 hectare cells), of which approximately one-fifth is water.

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[1]Sponsored by the National Science Foundation/RANN under Grant #AEN-72-03372-A05. The studies described herein are a part of the visual quality analysis studies conducted by Carl Steinitz with the assistance of Merlyn Paulson, Peter Klinefelter, William Blair, Charles J. Frederick, Peter Lavender and Katherine Kiernan.

The Visual Quality Evaluation Model

The model postulates that the visual quality of an area (or the visual impact of change) is to be evaluated in terms of how people perceive or "like" what they see as they look from the places in which they are located (or as they move about). In order to provide this evaluation, it also identifies visibility patterns and spatially organizes information about land types and land uses that are relevant to preference evaluations.

The output of the model provides criteria for evaluating any "future state-of-the-region." The model is also used to provide preanalyses that are required for the various land use allocation models. For example, it is used to analyze the visual quality components of land price and housing price. The model makes the assumptions that the existing conditions in the area will be stable over time in terms of appearance, except that they will change as development occurs (as per new allocations of houses, industry, roads, etc.) and as vegetation changes (as per growth and change as described by a Vegetation Growth Model). It assumes that viewing populations are stable except as they change with development and through changes in transportation patterns (according to the various Allocation and Transportation Models). It also assumes that viewer preferences will remain stable, though hypotheses relating to this can be tested by the model.

The Visual Quality Evaluation Model has two basic stages. The first is the identification of the intervisibility of places (the pattern of what can be seen from any cell or group of cells), and is accomplished with a flexible searching process. The model can be run to establish the views from points (single cells), lines, or areas. Questions of intervisibility can be satisfied with a yes-no statement, or with a more complex response indicating frequency of view, by number and type of viewers, and the spatial composition and content of the observed environments. The search process takes into account the elevation of view, the various blocking and screening factors that are associated with buildings and vegetation, as well as salient visual characteristics of the viewed places such as height. The model recognizes that places are perceived and evaluated differently as a function of distance from the observer. Therefore, the model describes and evaluates the land use and landscape types in more aggregated groups as distance increases from the cell from which the view originates. Generally, physical features become less distinctly recognizable, and extremely positive and negative evaluations tend toward a more neutral evaluation, as distance increases.

Input

The model requires the user to provide information which establishes the locations of views to be analyzed, and data files which describe the visual topography (including various height and blocking factors associated with vegetation and development), the dominant visual characteristics of cells and their several distance-preference evaluations.

View Origins

The model assumes that the viewer is located at the centroid of a cell defined as the view origin. The origin elevation can be set by the user to reflect pedestrian or vehicular height, or any other elevation.

The view origins can be described--and the program run--on the basis of points, lines and areas. An example of a point origin is shown in Figure 2, in which a panoramic 360 search has been performed from the tip of Fourth Cliff in the town of Scituate. In Figure 2, the photographs are part of the process used to verify the accuracy of the search procedure. A linear example would be a search from those cells which constitute highway Route 3. The Coastal Zone examples cited in this paper are an example of the view to or from an area, in this case from the land (area) to the ocean (area) and vice-versa.

Visual Topography

The model, through its search process, operates in a "visual topography" consisting of the base topographic elevation plus the visual blocking heights of the various types of development and/or vegetation. These descriptions are developed from files maintained in the data base, and thus can reflect changes in land use and vegetation over time which in turn change the patterns of visibility. The user can also directly change the visual topography. For example, one can test the visual impact of a proposed project, or test the changed visual quality from a new origin such as a proposed high bridge.

Visual Dominators

Three Visual Dominator files define and describe the 267 land use and landscape types of the NSF research project in visual terms and characterize the content of what is visible for each type on the basis of its distance from the observer. In near distance views, those cells seen within or immediately adjacent to a view origin cell, visual dominance "recognizes" all 267 separate types which individually describe the study area. In medium distance views the 267 types are aggregated into thirty types recognizable at a distance of 3 cells (300 meters) from the origin. Far distance views recognize 13 aggregated groups. These files describe the study area physically as it could be seen at different distances. They are also able to be changed and updated, allowing the testing of changed landscapes.

Visual Preferences

Each land use and landscape type (dominator) has been assigned preference ratings as a function of its distance to the view origin. A five-level rating system is used: most positive, positive, neutral, negative and most negative. Since the model is organized around three distance zones--near, middle and far--each dominator can have up to three preference ratings. In general, as distance increases, the ratings tend away from the extremely positive or negative groups and toward the neutral. The ratings are based upon the literature[2] with photographic-interview field studies as a verification of the ratings and the output visual quality evaluations. Figure 3 shows the near view preferences, indicating in effect the visual preference of a cell for a viewer located in it.

Search

The pattern and content of the area seen from a view origin cell is established through a process of searching out along rays extending from the origin cell. As shown in Figure 4, the area surrounding the origin cell is separated into

[2]As part of the research program, a summary of visual preference research was prepared. It will be part of the full technical documentation of the study.

eight, forty-five degree octants which are delinated by principal rays of which there are also eight. Each of the octants and principal rays are assigned numbers corresponding to cardinal directions. The central ray and the number of octants to be searched can be specified by the user so that only desired areas are studied. Thus, the user can specify the range of angle, distance, and density of coverage which are desired for any search. As shown in Figure 4, the interleaving of eight rays per octant will result in 100% coverage out to nine cells from the origin, 90% coverage out to thirteen cells, and 65% coverage out to twenty-six cells from the origin.

The program records the user-specified analyses as it processes the searches from each origin cell in turn.

Output

In its descriptive output, the visual quality analysis model describes the area seen from the origins in terms of what types were seen (visual dominators) and how much these were visible (frequency). In its evaluative output, the model identifies the visual preferences of the visible cells. It also summarizes the visual quality of the views from any origin.

What Is Seen?

The model produces in a mapped format the pattern of development and landscape types (dominators) recognizable from any set of view origins. It also produces (optional) tabular output for each view origin in which each octant and distance zone is described in terms of the distribution of dominator types within view.

This output is useful in describing the changing visual character of an area over time, or via a specific proposed change. It is also useful in establishing the qualitative, descriptive character of views from a place, route, or area.

How Frequently Is A Place Seen?

The model records the number of times a cell is within view of a set of origins. A higher frequency rating means that a cell has been seen from more origins, and is more highly exposed to view. If the number of viewers can be established for an origin, as for example via the traffic loads on a road network, the frequency measure can be converted to person-views (or even person-time-views).

This output is useful in establishing whether visually desired places are in fact exposed to view. Conversely, it is useful in locating visually undesirable but otherwise necessary facilities by putting them in low view-frequency areas. Visual frequency is an important criterion in determining which areas are visually sensitive to new development. An area which is highly visible from many significant viewing areas is more sensitive to impact than one which is not.

Are Visually Preferred Cells Seen?

The model records and maps the appropriate preference-distance ratings for those cells within the pattern of visibility from an origin set.

This output describes the extent to which people prefer to see the visually exposed area. It is useful in establishing whether the visually exposed area is "improving" or "declining" as a result of development over time or through

any other proposed changes. Figure 5 shows the visual quality evaluation as seen from all land cells in the study area. In this figure, all 100% water areas are mapped with blank symbols (white) in order to graphically highlight the land areas. For example, one can tell how and where views improve as they approach water.

An Example: Coastal Zone Identification and Visual Analysis

As part of the Coastal Zone Management Process, the states are establishing definitions of the Coastal Zone as an area in which special planning programs will be applicable. There are many possible ways to define this zone, among them by visual criteria. In this example, therefore, the focal question is the following: Where is the coastal zone as defined by visual criteria?

Analysis Process

The Visual Quality Analysis Model can be used to define the coastal zone by determining the intervisibility of the ocean and coastal wetlands with inland areas. The first step is to provide the geographic boundaries, in visual/perceptual terms, of coastal wetlands and the ocean, and the adjacent inland area. These are derived from the visual dominator files. The second task is to identify all inland areas which can be seen from any part of the ocean or coastal wetlands areas. This is done by searching from the ocean and coastal wetland cells (as view origins) and by checking the output for the presence of inland cells. The third step determines the land area from which the ocean or coastal wetlands can be seen. This task is accomplished by searching inland from the ocean and coastal wetlands to pedestrian eye level (five feet) above each inland cell. In effect the analysis assumes that if a person standing in an inland cell is seen from the ocean or coastal wetland, he can similarly see outward to ocean or coastal wetland cells.

Output

Three maps have been produced in this example.

Figure 6 displays the results of the frequency analysis. It displays both the number of times an inland cell is seen from ocean and coastal wetland cells, and the number of times an ocean or coastal wetland cell is seen from the inland cells. The dark colored cells are seen more often than the light colored cells. The cells displayed in white (as a mask) are those land areas from which no ocean or coastal wetland cells are visible, and thus which fall outside this visual definition of the Coastal Zone.

Figure 7 shows the land use and landscape dominators visible in the Coastal Zone. The 267 dominators are displayed in their 13 level aggregate groupings.

The preference ratings of the area within the Coastal Zone is shown in Figure 8.

Application Issues

The output displayed on these three maps and their accompanying tables demonstrate analyses which can be useful in addressing a variety of issues relating visual analyses to Coastal Zone management. Among these are:

Projection:

1. How will the visual character of the Coastal Zone change in the next 30 years?

Plan Evaluation:

1. What are the potential visual consequences within the coastal zone of the town of Marshfield Master Plan?

Project Evaluation:

1. Where is the "most scenic" route for a highway or bicyle path within the coastal zone?
2. What would be the visual impact of an oil drilling structure if built in a location close to the coast of Scituate?
3. Where might residences be located inland to afford an open view to the ocean?. . .and thus a higher sales price?
4. Which visually sensitive areas and/or areas of high visual quality should receive priority in a conservation policy?

Several of these issues have been investigated as part of the research program and in workshops which have applied the visual model along with the rest of the research models. These efforts have demonstrated the feasibility of developing a set of interactive allocation and evaluation models, in which visual quality plays its appropriate role.

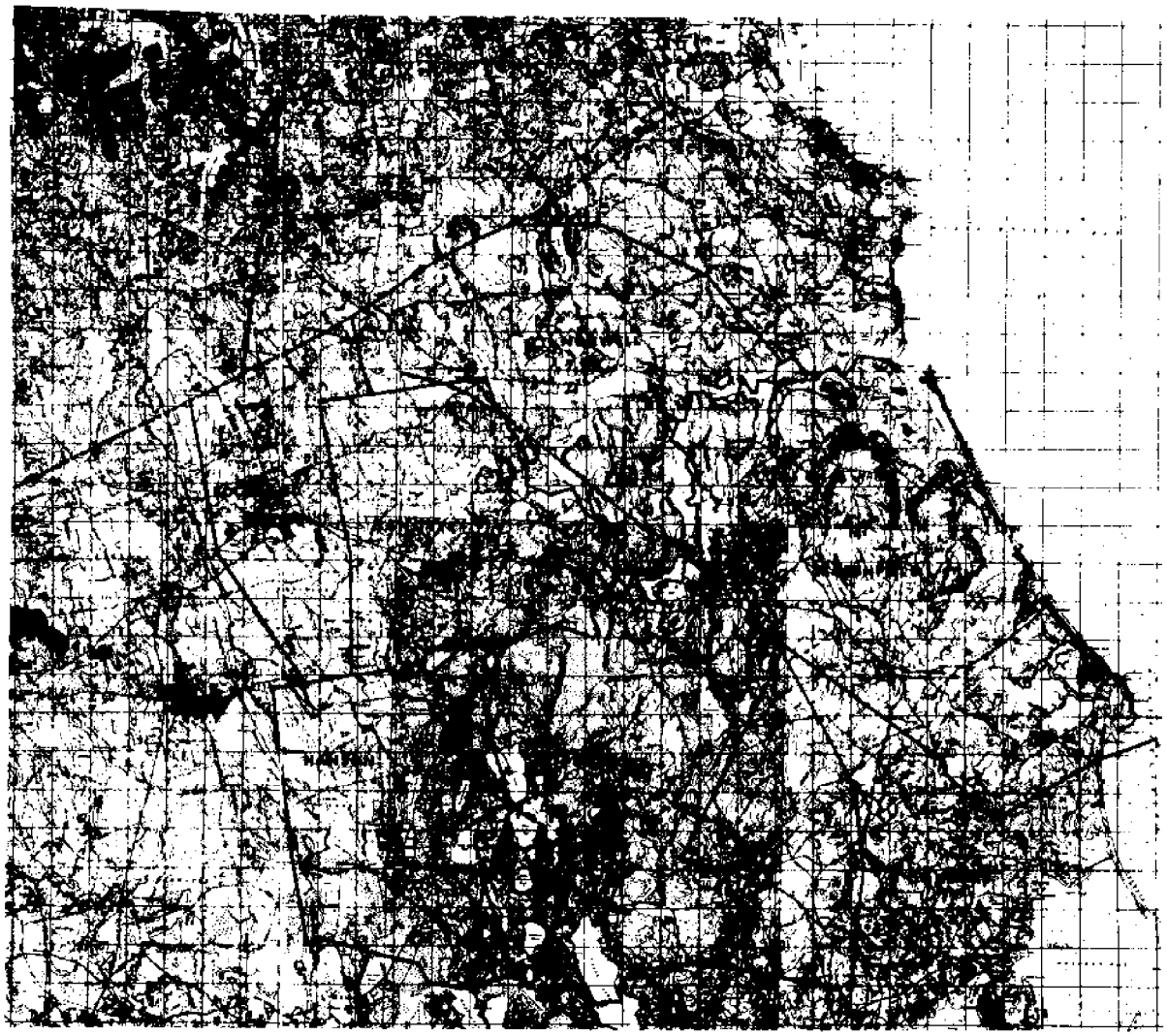

Figure 1

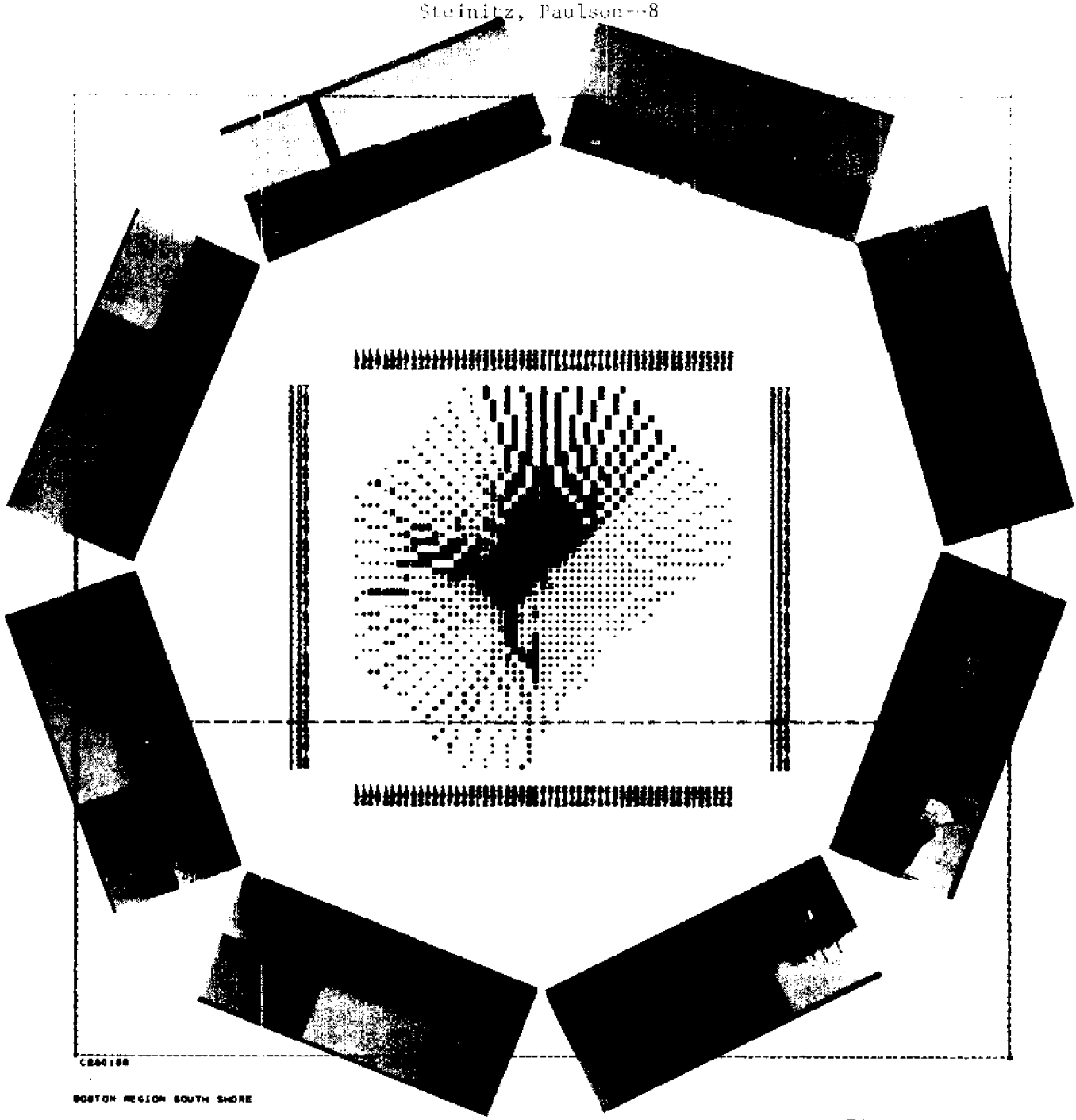

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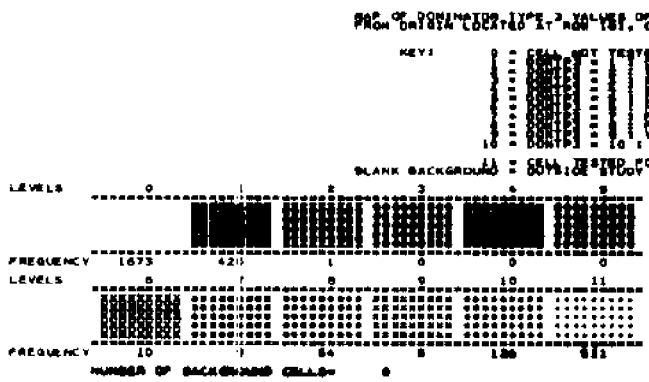
Figure 2



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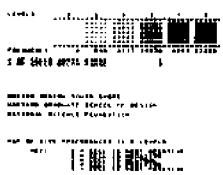
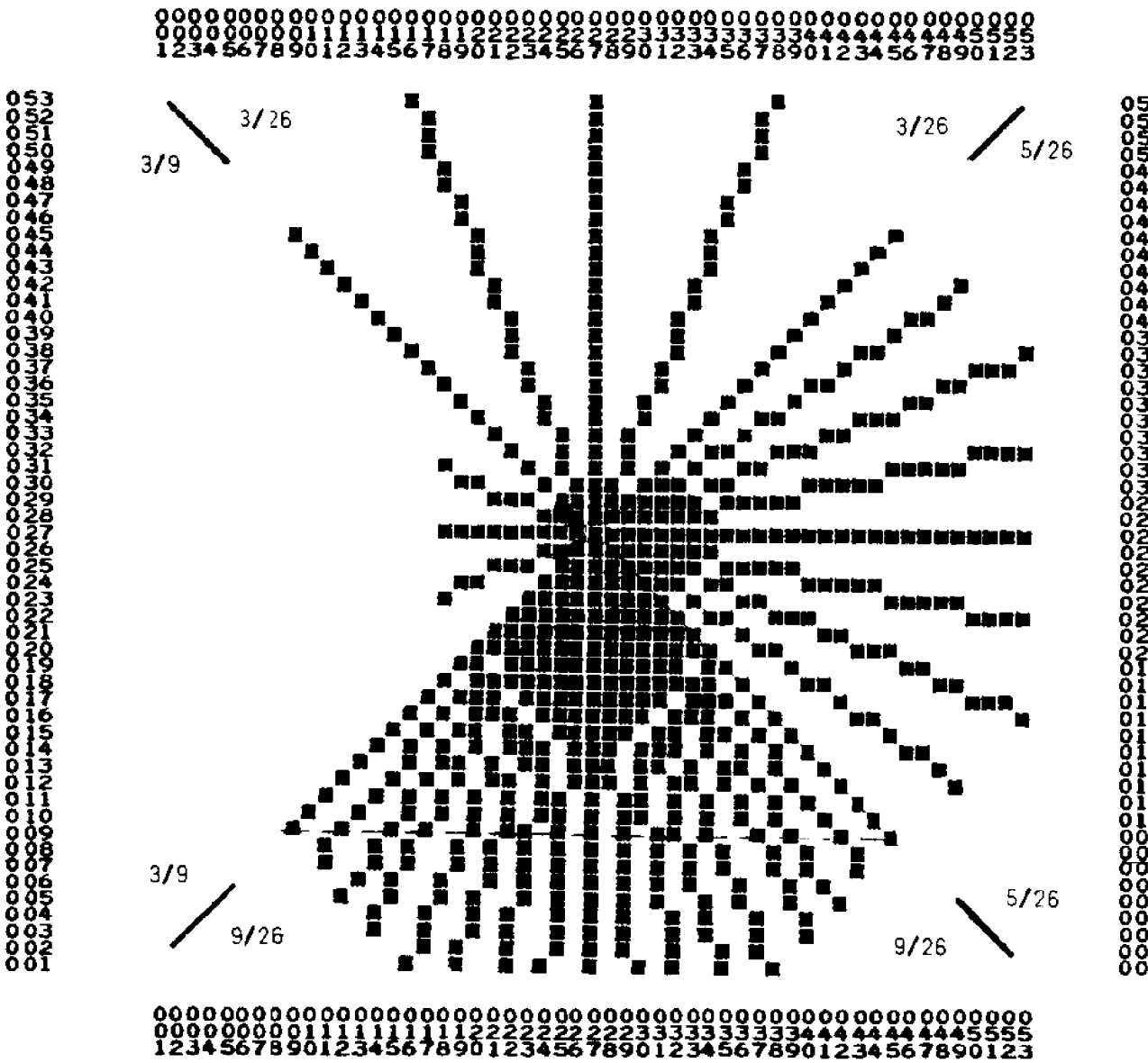




LEGEND: X/Y

X = Rays per Octant

Y = Length of Ray

Figure 4

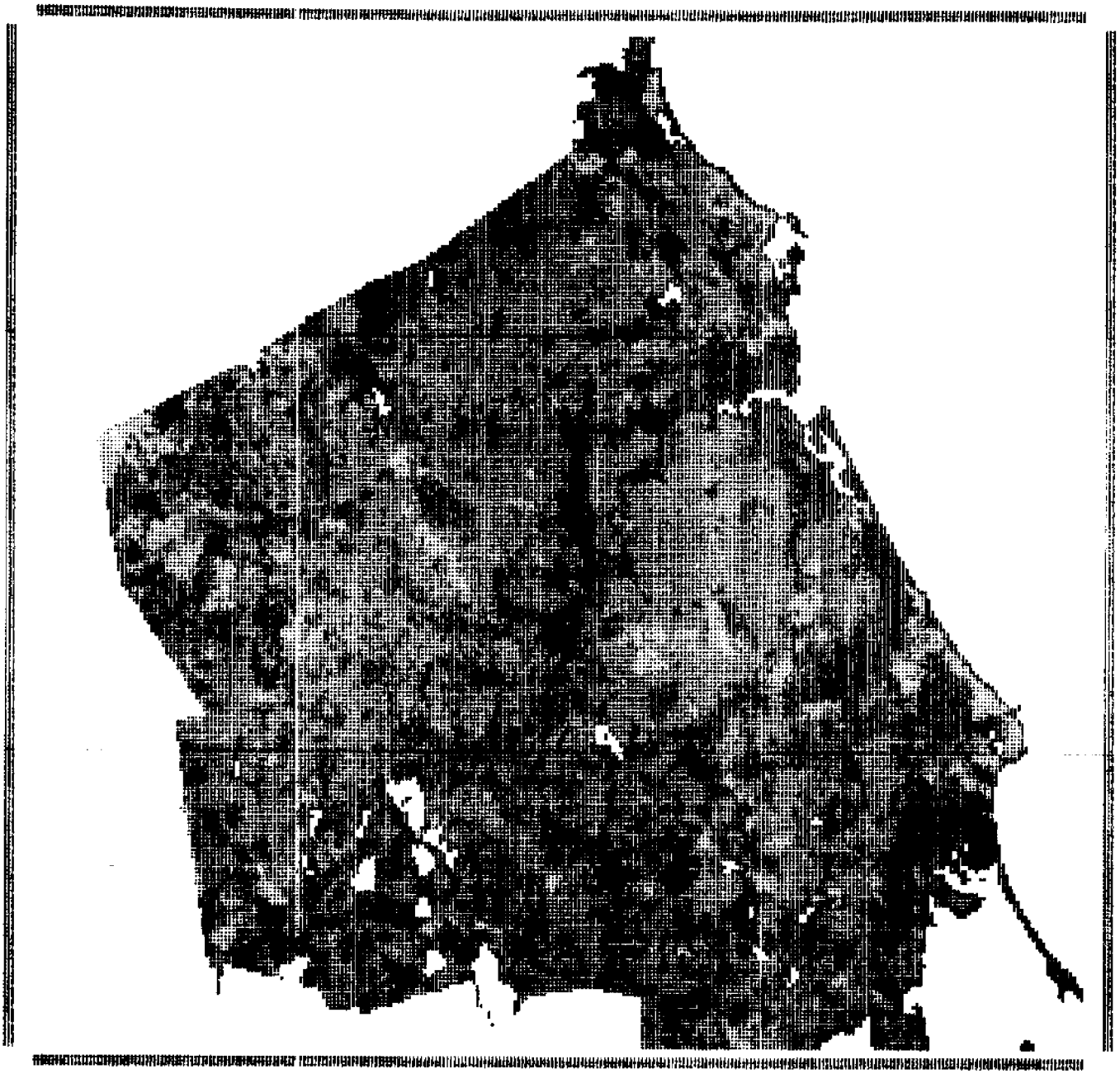


Figure 5

Figure 6

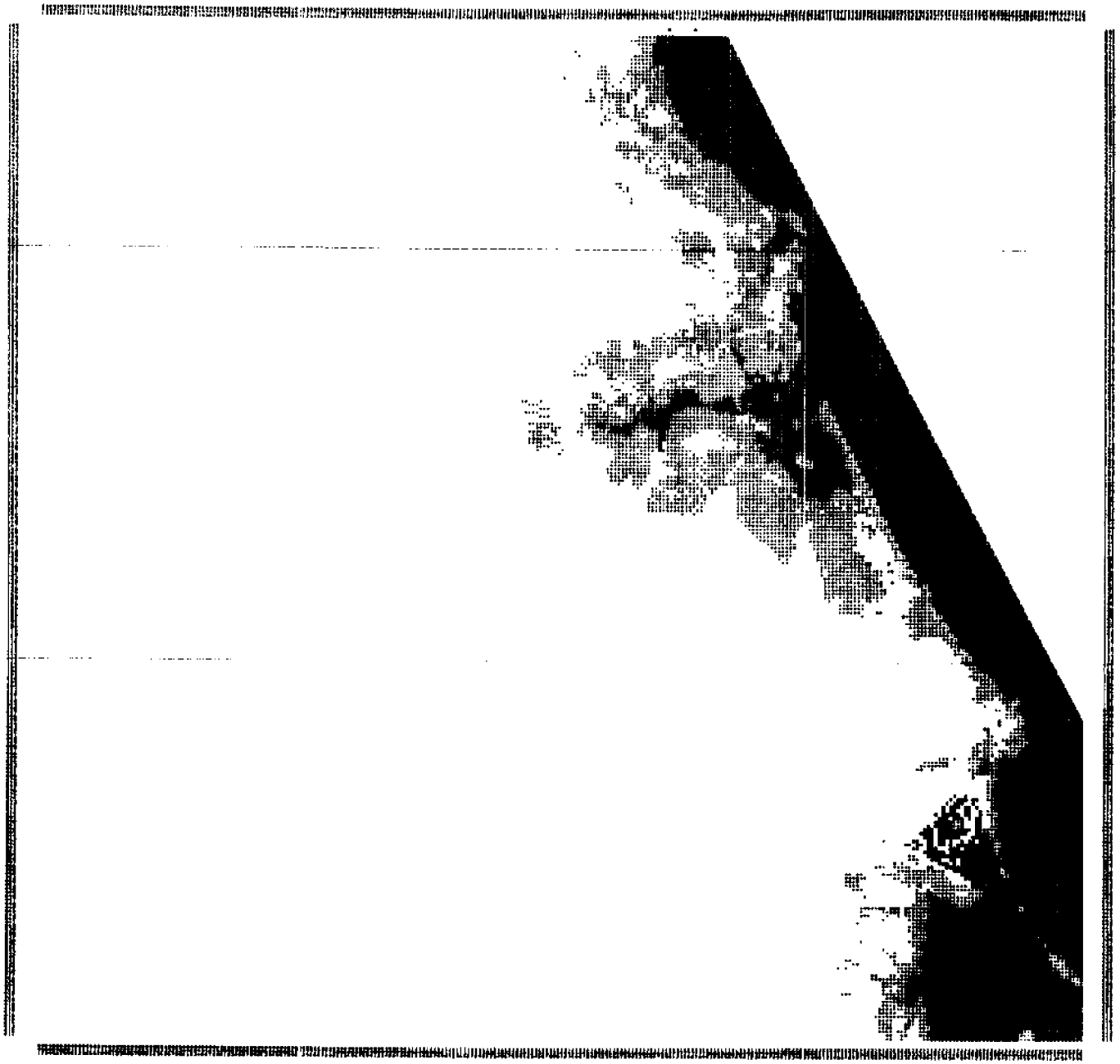
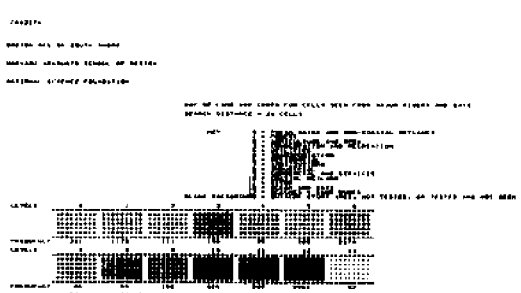


Figure 7



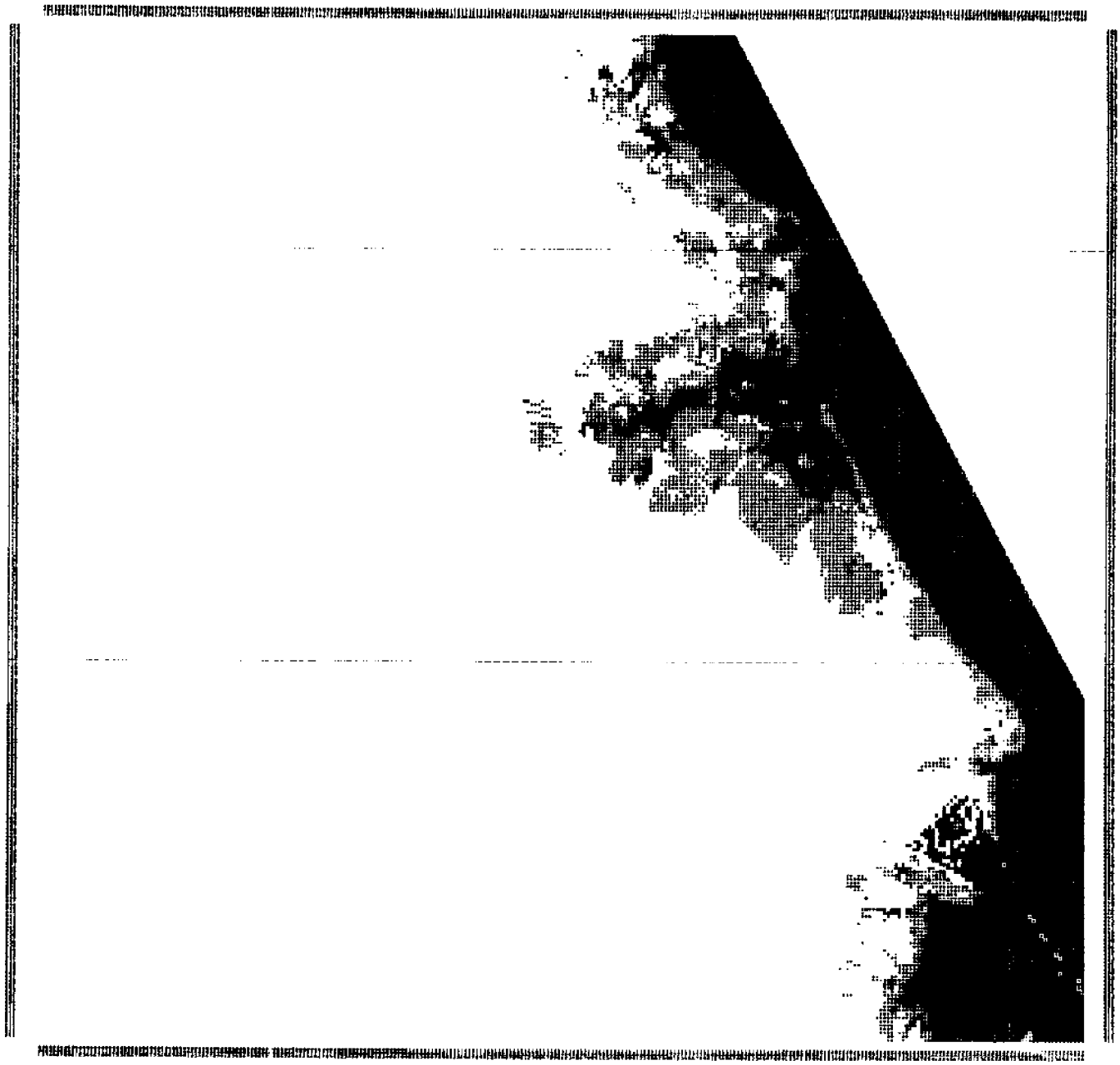
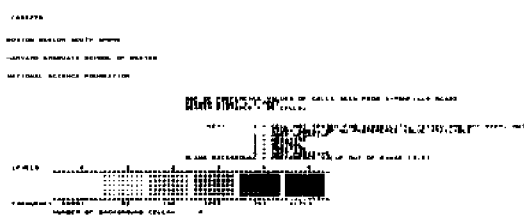


Figure 8



CONFERENCE
SESSION THREE

29 MAY 1975
2:00-5:00 P.M.

VISUAL QUALITY PLANNING ON THE COAST

Dr. John P. Felleman

Chairman

VISUAL QUALITY PLANNING ON THE COAST

INTRODUCTION

Dr. John P. Felleman
School of Landscape Architecture
S.U.N.Y. College of Environmental Science and Forestry

Land Use Planning has been defined as

> "...consist(ing) of methods and techniques to coordinate and bring into harmony the uses of land, and the numerous and varied public and private structures placed upon it...unless design coordination and adjustment are applied in determining their location and relation to one another, serious deficiencies are likely to ensue." (International City Managers Association, Local Planning Administration. P. 10.)

The essence of this definition is its combination of functional and aesthetic considerations in enhancing the quality of man's environment.

Visual quality is not a new concern in American planning. L'Enfant's original design for Washington, D.C. made strong use of existing natural features while incorporating a circulation and monumental open space system that focused attention on the major governmental structures. As America grew, construction of new communities provided opportunities for innovative designs.

By the beginning of the twentieth century, the growing reaction to the ills of industrialization and rapid urban growth generated renewed interest in visual quality in planning. The "city beautiful" movement which emerged from the World's Colombian Exposition in Chicago stimulated the growth of metropolitan park systems and municipal architecture. The English "Garden Cities" concept was translated into the development of new towns which combined urban uses and natural open space. Parkway systems, pioneered in Westchester County, provided scenic views to auto travellers.

Zoning and subdivision regulations were first allowed by state enabling legislation in the 1920's. These gave planners the tools to regulate the visual character of discrete districts by specifying permitted uses, building shape and location, and site improvements.

If one examines these rich historical roots some general conclusions can be drawn about the character and content of visual quality in the planning process. First, decisions tended to be made by rather few participants. (The Power Broker about Robert Moses is an excellent example.) Second, the aesthetic considerations in plans were generally the result of graphic designs individually developed by trained professionals such as architects and landscape architects. Finally, capital projects which resulted from the plans were typically local in scale or single purpose in function.

The rapid social changes of the past decade have profoundly affected the role of visual quality in the planning process. Planning today is by mandate comprehensive. For example if the state highway agency wishes to construct a new road, it must consider alternative transport technologies and alternative locations. For each alternative, benefits and costs must be evaluated for twenty-three factors ranging from national defense to historic and natural areas.

Another broadening of the planning process has taken place regarding the geographic and institutional scale of planning. Site plan and architectural approval by municipalities may go so far as to dictate the color of buildings and tree planting locations. The Federal Office of Management and Budget requires regional planning agencies to review aid requests in the context of statewide, areawide and local plans.

Planners and design professionals can no longer be the sole developers of a plan. The move to "open planning" has led to widespread citizen participation, and review by other levels of government. Section 305 of the Federal Coastal Zone Management Act

> "...encourages the states to move beyond formal public hearings to actively engage the public in the development of management plans and policies." (Introduction to Marine Coastal Planning, p.42)

The speakers in this afternoon's session represent a diverse cross section of the planning profession. Each of them is playing an active role in translating these complex and challenging trends into plans and projects which will protect and enhance the visual quality of our coastal resources.

KEYNOTE ADDRESS:
NEW YORK STATE'S COASTAL ZONE MANAGEMENT DEVELOPMENT PROGRAM

Henry G. Williams, Jr.

NEW YORK STATE'S COASTAL ZONE MANAGEMENT DEVELOPMENT PROGRAM

Henry G. Williams, Jr.
Director of Planning, Division of State Planning
New York State Department of State
Albany, New York

My assignment today is to describe New York State's activities concerning coastal zone management, particularly with respect to the Federal Coastal Zone Management Act of 1972 and its relationship to the current planning and regulatory activites of the State and local governments. I would betray my own experience and default on the opportunities this Conference provides, however, if I failed to comment on the relationships between the idea of coastal zone management and that of visual quality.

Certainly, there is a fundamental similarity in Coastal Zone Management and Visual Quality because both must be regarded in terms of their totality and continuity. Our conception of the Coastal Zone is not limited to the finite band which marks the meeting of land and water; rather, it is comprised of the overall environment which it influences, and by the functions, benefits and problems we identify with it. Similarly, the meaning of visual quality is found not only in the individual objects we may see, but in the endless stream of impressions which reaches our brains and interacts with our experiences.

Perhaps, "comprehensiveness" is as good a word as any to characterize the approaches we must take to derive maximum benefits from our Coastal Zone and Visual Quality planning efforts, especially to assure their proper integration.

The Coastal Zone Management Act provides for assistance to coastal states to enable them to develop "management programs" for the wise use of coastal resources.

The Federal Coastal Zone Management Act has two phases: planning and implementation. During the planning phase, participating Coastal States undertake the development of a "management program" which is to consist of a plan, a procedure for bringing together diverse interests, both government and private, and the means to carry out the plan. The States may receive up to three consecutive one year grants for this purpose. Approval of the Management Program by the U. S. Secretary of Commerce could be followed by a series of administrative grants to assist in carrying out the program. So we have a two phased operation, a planning phase and an implementing phase.

Another key point of the Federal legislation is that it requires the participation of all the parties having interests in the States' coastal territories -- public, private and governmental. It provides 2/3 federal aid to be matched by a balance of state resources -- either cash or in-kind services.

While the Federal coastal zone legislation will be useful in assisting New York State to further advance the interests of the State and local governments in the coastal zone, considerable attention has already been paid to the State's coastal areas. County, regional, town and village plans have been formulated and in many cases have been reflected in statutes that are being seriously implemented -- and in which local residents have been

heavily involved. In many instances these local efforts have been assisted through the State and Federally-aided comprehensive planning assistance program. At the State level, planning activities of the Department of Environmental Conservation and the St. Lawrence-Eastern Ontario Commission, for example, illustrate the interest of the State government in taking action where matters of statewide concern are clearly indicated. Tidal Wetlands legislation, for example, was enacted at the 1973 legislative session and is now being carried out. The Pure Waters Program is another indication of the State Government's interest in matters where statewide concern is clearly demonstrated.

Nevertheless, the basic authority for the use and control of land in this State rests with local governments. It is in that context that we must continue to plan and carry out a program for coastal resources.

In 1973, when a Federal agency was created and charged with the responsibility of carrying out the requirements set forth in the Federal Coastal Zone legislation, and it appeared that Federal funding would be available, we determined that it would be appropriate to undertake action that was designed to keep the State's options open, to insure that regardless of how the State wanted to proceed ultimately in addressing the questions and challenges associated with its coastal resources, Federal support would be available. Accordingly, in January 1974, a draft document was prepared, and distributed to over 400 local officials, planning agencies and other interested parties. Scores of replies and many useful comments were received -- reflecting the wide interest in the subject.

Subsequently, we submitted an application for an initial coastal zone development grant, and a State agency was designated to receive a Federal planning grant and to be responsible for the preparation of the State's coastal zone planning effort under the Federal program. A Federal grant of $550,000 was awarded to the State in November 1974.

The major objective of the State's initial coastal zone planning program, is to enable State and local governments and the public at large to determine the need, desirability and feasibility of Coastal Zone approaches and techniques. It is also expected that basic information and procedures will be produced which will be useful in themselves, and in the existing planning, development and regulatory activities of State, regional, county and local agencies.

New York State's coastal zone planning task is especially difficult because it has both a Marine Coastal Zone and a Great Lakes Coastal Zone. The existence of two coastal zones in New York State presents a special problem because many elements of the Management Program must be handled separately in consideration of the different characteristics and needs of coastal zones, while remaining in the overall context of a single Statewide Management Program as required by the Federal law.

In order to develop an orderly and effective Management Program, a Coastal Zone Planning Area has been delineated. This includes all coastal counties, but it is anticipated that attention will be concentrated in the areas in proximity to the coastline. This procedure will enable the State, working closely with local governments, to undertake plans and studies for a broad area and

also enable specific delineation of a smaller coastal zone for purposes of a management program. The number of governmental, planning, citizen, and private bodies and parties in the planning area and the diversity of their interests and activities affecting the coastal zone accounts for another challenge. Any management program, to be effective, must have full participation by all levels of government, as well as private agencies and interested parties.

There are 116 towns, 94 villages, 27 cities, 8 regional planning bodies, and 4 Indian Reservations bounding on New York State's coastal waters; and planning activities have been underway in most of them. Approximately 80 percent of the State's 1970 population resided in the 28 counties (including New York City), comprising the Coastal Zone Planning Area and every county except one has been engaged in comprehensive planning.

Our coastal zone planning program calls for the investigation of a number of statewide coastal zone issues, including:

1. Visual quality -- how may visual quality be handled in relation to coastal zone goals and objectives?
2. Competition among land uses -- how may competing land and water uses be reconciled with the need for economic and social development and preservation of natural and scenic features?
3. Preservation of Wetlands -- how may further loss or degradation of the State's wetlands be prevented without causing undue economic hardship?
4. Public access -- how may opportunities for public recreation and enjoyment of coastal resources be achieved without undue adverse impact upon private property?

5. Protection of fish and wildlife resources -- how may fish spawning areas and other wildlife habitats be protected and restored?
6. Siting electric generating and transmission facilities -- how may sites that satisfy generating and transmission facilities requirements be developed for such purposes without undue impact upon other Coastal Zone resources?
7. Planned development of fossil fuel resources -- should coastal fossil fuel resources be exploited? How may fossil fuels be produced, transported, refined, stored, distributed and consumed with minimum advance impact on the coastal zone?
8. Erosion -- how may shoreline areas be managed to minimize the impact of storms, winds and flooding?
9. Intergovernmental cooperation -- how may maximum voluntary cooperation among State and other levels of government be achieved?
10. Port and waterfront development -- how may the economic advantages of existing and potential major ports and harbors be maximized? How may dredging problems be minimized? How may blighted waterfront areas be restored?

In addition to these Statewide issues, we are also giving particular attention to the formulation of standards that reconcile local interests and impacts with State and national priorities. It is in this context that the opportunity to identify and work out acceptable guidelines to help restore and maintain the visual quality of our coastal territory should be pursued.

In setting boundaries of the coastal zone such factors as statutory requirements, character of natural systems, recognition of jurisdictional units, permanence of boundary indicators, and cost of surveying boundaries must be considered. Other standards must be developed with respect to the nature of uses that may be permitted in the coastal zone, identification and proper management of areas of particular concern (such as unique wetlands or areas having substantial value for industrial development). Standards must also be devised to assure that the people who will be directly affected by any regulatory action will have full opportunity to help shape any program. Finally, standards must be worked out to assure that a coastal zone program, once identified, will be implemented. One of the more perplexing aspects in standard-setting is the determination of the Federal interest -- which must be accommodated under the Coastal Zone Management Act -- and many other Federal programs. An example of the difficulties in nailing down Federal interests in relation to State concerns is illustrated by the current Federal proposals regarding the award of leases in the Outer Continental Shelf.

We have taken specific actions to encourage participation by local governments in the coastal zone planning program because the effectiveness of any management program would depend upon local governments' direct involvement in implementing regulatory measures, such as land-use controls. We have designed our work program in such a manner that the federal grant is

being shared equally with participating local governments. Numerous meetings have been held with State and local officials and other interested parties, and work schedules have been developed and are now being undertaken under contract with the State. Regional planning boards (such as Genesee/Finger Lakes Regional Planning Board), two counties, and three cities have contracts with the State.

While this substantial local participation will contribute significantly to the strength of the program, we have recognized that the number of participants makes it imperative that careful attention be given to prevent duplication and to assure that all important issues are addressed, and that they are addressed by the appropriate parties. Accordingly, we have been working closely with interested State agencies, regional planning bodies, and local governments to make sure that planning activities are properly coordinated.

The St. Lawrence-Eastern Ontario Commission, for example, has the statutory responsibility to prepare a comprehensive plan for a portion of the Great Lakes coastline; so we are undertaking the coastal-area planning for that area in close cooperation with the Commission. Similarly, we have been working with other State agencies, such as the Department of Transportation which has a port development study; with the New York Sea Grant Program in order to integrate its research and advisory services capabilities; and with the Public Service Commission which has major responsibilities in the planning and review of electric generating and

transmission facilities. Arrangements have also been made to work through the locally-established Nassau-Suffolk Regional Planning Board which has a coastal zone planning operation. We are also working to assure that Federally-sponsored programs, such as the Long Island Sound Study, are effectively integrated with our planning efforts.

Obviously, the implications of the Coastal Zone Management Program, as set forth in the Federal act, raise not only issues such as I have previously described, but many key questions for the people of this State. How do we set up a structure that builds effectively and thoroughly upon the activities that State and local governments have been pursuing over many years? Another question is: how may an organizational structure be developed to insure that the authority vested in local governments -- and the interest that local governments have in carrying out and continuing their statutory authority -- be maintained. How do we develop a coastal zone management program that insures the protection of natural resources of the State's coastal territory, but at the same time recognizes the need for economic vitality? We need to insure that jobs are maintained in many areas of the State where the quality of the economy is a pressing concern -- we can't do it all one way and ignore other considerations.

As I have indicated, there are numerous ongoing activities, involving many governmental and private agencies, directed at particular aspects of coastal zone management. Through our

collective participation in the development of planning programs, we can build upon these efforts, bringing the interested parties together to find workable solutions to the important problems which I have outlined. In my view, this process is essential to the successful development of any sound overall program for managing our coastal and land resources.

SHORELINE APPEARANCE AND DESIGN MANAGEMENT PROCEDURES: THE LONG ISLAND SOUND EXAMPLE

Roy Mann

SHORELINE APPEARANCE AND DESIGN MANAGEMENT PROCEDURES: THE LONG ISLAND SOUND EXAMPLE

Roy Mann
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Abstract

The Long Island Sound Study, Shoreline Appearance and Design Handbook is an illustrated guide to a shorescape planning process for the Connecticut and New York shore areas of the Sound. Both local and regional landscape management questions are dealt with and specific recommendations for large-scale facilities are provided.

The key questions posed by the Shoreline Appearance and Design Planning Element are much the same as those that emerge from any landscape planning effort, whether of a regional or individual site scale: where do you avoid putting things and how do you design them, where you do put them?

Translated into planning terms, this meant, at the regional and subregional scale, first the identification of the general scenic resource base, second the identification within this base of outstanding scenic assets as well as eyesores and other value-eroding factors, which could be interpreted as areas of particular scenic concern in the coastal zone, and third, the development of management measures which would aid in the protection of scenic resources and in the enhancement of damaged areas. At the site scale, the need was for, first, the identification of constraints and variables in the physical layout and structural or architectural design of major facilities -- and urban development, and second, the development of site planning and design recommendations which would optimize the compatibility of facilities or development harmonious with the environment in other respects, and with scenic values in their surroundings. The study product dealing with the regional-subregional scale we have termed a Scenic Resources Planning Atlas; the study product dealing with the site scale is referred to as a Shoreline Appearance and Design Handbook. (Figure 1)

Our first planning assumption was that rural or unaltered natural areas possessed greater natural scenic potential, generally, than urban-modified areas. This assumption was consistent with the stated LISS objective of preserving as much of the existing Sound shoreline as possible.

In the case of the Long Island Sound region, the question of avoiding the siting of large-scale facilities and urban development in areas of natural scenic significance was an urgent one, for relatively little unurbanized or unsuburbanized scenic shoreline or upper shoreland is now left. Long reaches of partly rural, partly small-town shoreline and agricultural upper shoreland are still found on the Sound east of Port Jefferson on the North Fork of Long Island and low density settlement with pockets of rurality still exist along much of the Connecticut shore east of New Haven to the

Rhode Island border, with the exception of the New London and Old Saybrook areas. But the conversion of this relatively rural shoreline and countryside to more densely settled patterns is proceeding rapidly, while the smaller semi-natural areas left in the denser western end of the region are being subjected to even greater pressures. The first challenge at the regional and sub-regional level, therefore, was to devise a methodology for the identification of areas of natural scenic value, that is, of the general scenic resource base, which would include as many of the remaining unspoiled areas of the Sound shoreline as possible. The methodology has to be both authoritative, for obvious reasons, and simple, by reason of the fact that between 1,000 and 2,000 square miles of land area would have to be examined. The scenic resource base also had to be easily interpreted for identification of areas of special scenic concern in the following step. The methodology selected, therefore, relied on three criteria easily examined and checked through use of U.S.G.S. quadrants, aerial photography, and field observation: 1) absence of urban modifications, 2) topographic rhythm -- i.e. combinations of high and low relief which present a molding of landscape views, and 3) vegetative texture -- i.e. natural or cultivated vegetation which appears to have significant coverage in any area meeting the first two criteria.

The second planning assumption formulated was that scenic value can be ascribed to the man-made landscape as well, although on the basis of criteria somewhat different from those employable for natural scenic areas. The need was apparent, therefore, that townscapes and groups of structures that met these criteria should likewise be identified in the context of the scenic resource base. (Figures 2 and 3)

The third planning assumption was that the limit of visual significance for scenic resources on the shore of the Sound generally lies along the horizon line inland of all points of importance to the coastal zone community, including access routes, which are relevant to the enjoyment of coastal aesthetics or amenity. This horizon line, or regional viewshed, may lie at a considerable distance inland (averaging five to seven miles on the Connecticut shore) since it must encompass the towns, villages, interstate highways, feeder roads, and other points which house or serve people in one or another coastal zone interest, and around which the question of scenic resource management may play important environmental, social, and economic roles. Riverine and estuarine systems such as the Connecticut and Thames Rivers, of course, extended the regional viewshed along their corridors even further back from the Sound, but on the whole the regional viewshed followed topographical and access, rather than drainage patterns. Delineation of the regional viewshed permitted an identification of scenic resources within it as being of greater importance to the coastal zone than resources beyond it. Delineation of local viewsheds was not made, but is a step which is urged upon shorelines and lower major river mouths particularly, for the purpose of identifying locally important scenic factors for determinations of probable compatibilities or the lack thereof.

The Shoreline Appearance and Design Planning Element developed a large number of managerial recommendations which constitute conclusions of the study.

Relative to study methodology, alone, the following can be stated: 1) that simple techniques can be used to reliably evaluate and map coastal scenic resources, 2) that the classification of coastal shoreline in terms of a descending hierarchy from region to landscape unit is valuable both in the resource identification and evaluation pages, and in the development of management recommendations, 3) that the delineation of a regional viewshed is a valuable technique for isolating a tier of first priority scenic resources within the coastal zone, 4) that the delineation of areas of particular scenic concern can best be drafted in a generalized graphic style prior to public review and in a more specific depictive form following review and response, and 5) that site planning and design of large-scale facilities and development be carried out in reference to the local viewshed as well as to location within the regional viewshed, and in conformance with viewshed/landscape guideline criteria for the given facility or land use class. (Fig. 4)

We are still at the beginning, however, of the search for effective management planning for aesthetics in the coastal zone, and we will require further substantial refinement of aesthetic identification and evaluation tools if areas and resources of particular concern are to be given suitable protection and enhancement at both the regional-subregional and individual site scales.

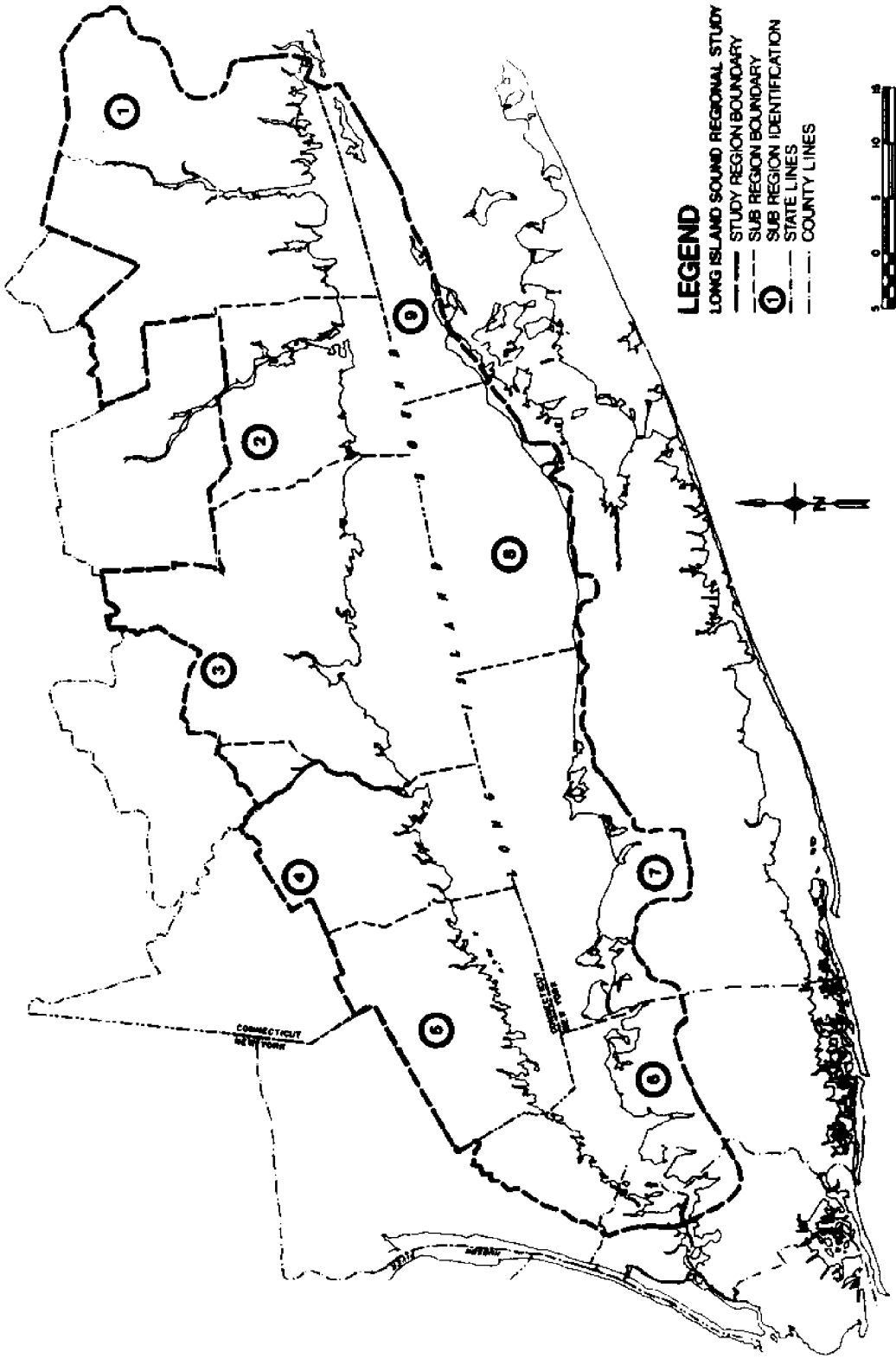
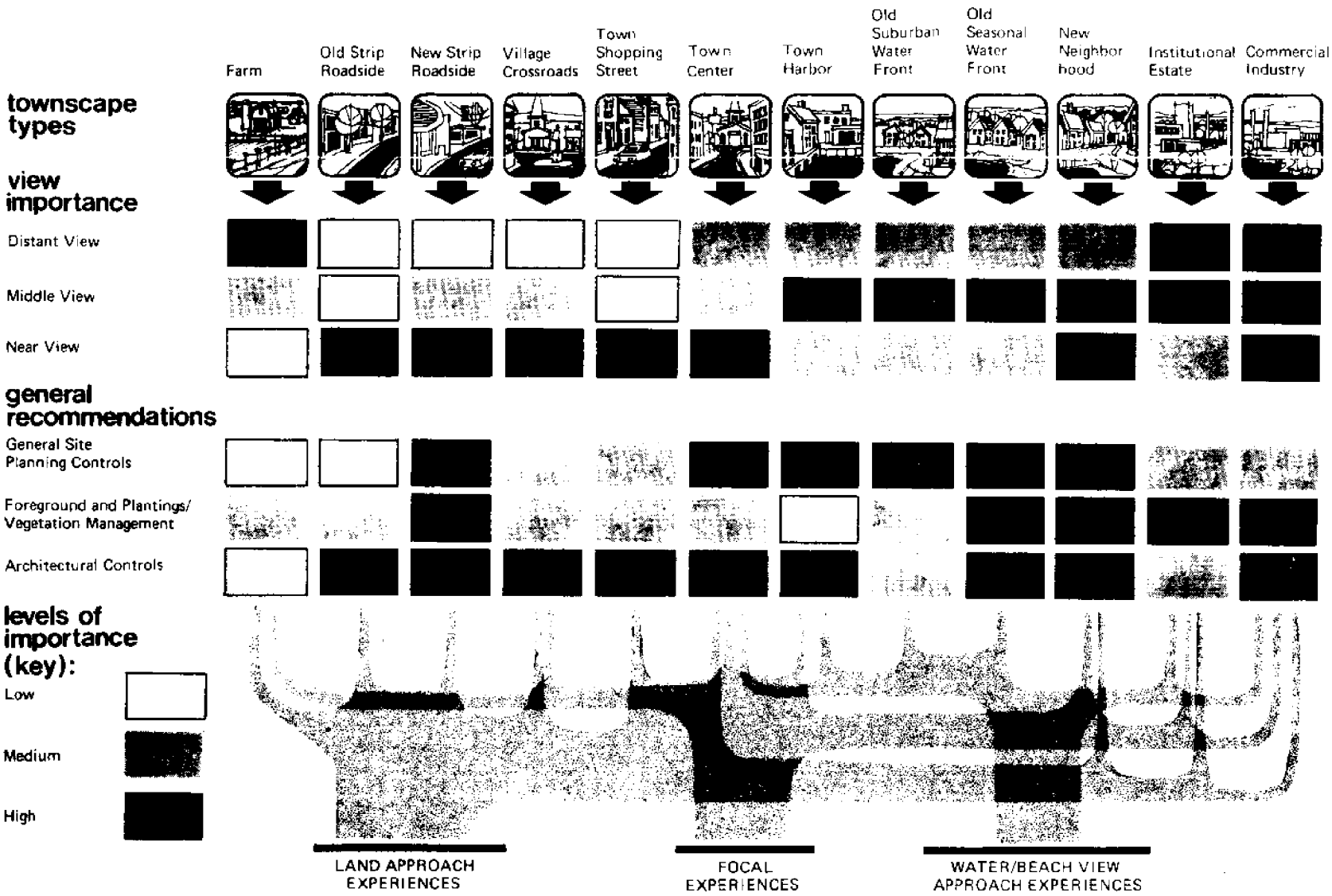


Figure 1: Long Island Sound Regional Study area and jurisdictional boundaries.

Townscape Types and Site Controls



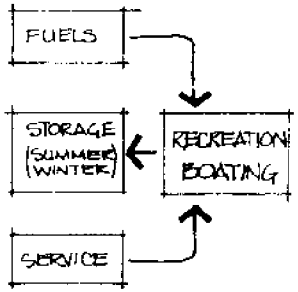
96 Figure 2: Man-made landscape types and control criteria in shoreland access corridors

facility class: **marinas**

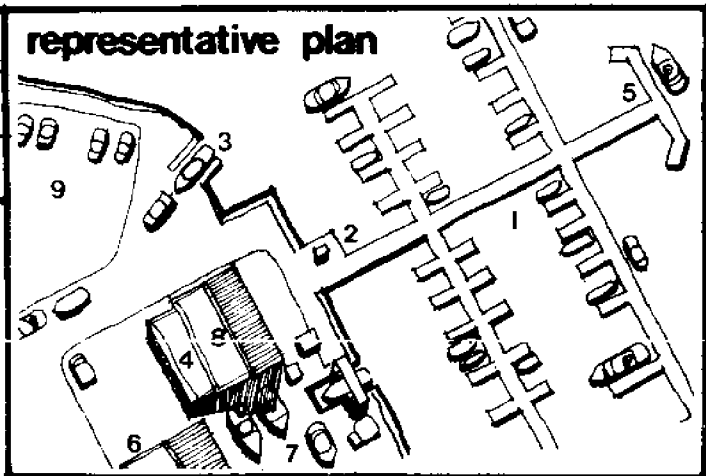
type:

example capacity : 200 SLIPS

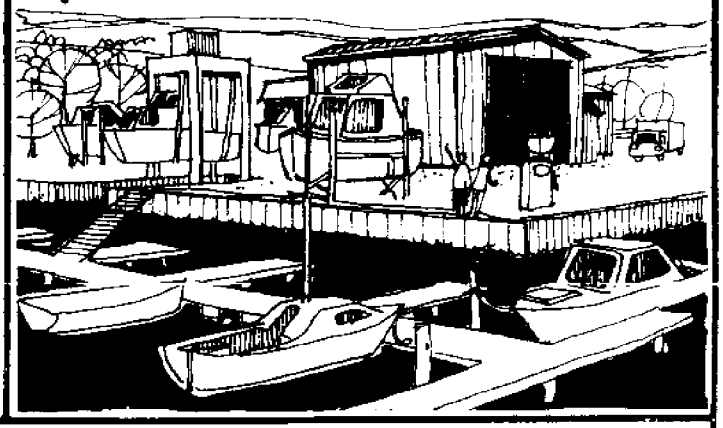
process



representative plan



representative silhouette



central components		critical dimensions: horizon.	critical dimensions: vertical	prominent structures	typical material	remarks
1	PIERS	20-60'	2-4' abv. water	mooring piles	concrete wood	← Modular prefabricated units can be joined to form piers in various efficient stone and near-shore patterns.[1]
2	FUEL DOCK	40-70'	2-4' abv water	fuel pumps	concrete wood	← Should be located nearest to open water for safety and accessibility. Dock length depends on size of boats.
3	LAUNCHING RAMPS	20-40'		ramp slope	concrete	← Generally perpendicular to water but can be parallel.
4	REST ROOMS	20-50'	10-15'		conc.wd brick	← Typically integrated with other service buildings.
5	PUMP-OUT STATION	10-20'	8-10'		conc.wd brick	← Station may be on shore; hook-up remote.
ancillary components						
6	SALES AND REPAIRS SHOP	75-150'	15-30'		conc.wd brick	← Dimensions and numbers of shops depend on services offered. Can be shed structure.
7	REPAIR YARD	1-2 acres		boat hoists		← Can be set back somewhat from water. Screening by buildings or other attractive elements possible.
8	BOAT STORAGE AREA	2-3 acres		struct. or boats	conc.	← Open area or enclosed single or multi-stack structure. Serious visual impacts possible. Orientation, architecture critical.
9	PARKING AREA[2]				asphalt	← Area larger if extensive facilities, many trailers. Multi-story parking possible if visually integrated.

notes

1 A 200 slip marina with finger piers will require from 5 to 7 acres of water surface

2 On-land facilities and parking can require from 10 to 20 acres, depending on the services offered and the extent of trailer use. Parking for non-trailer use requires 1 acre per 400 boats stored at the marina.

MARINAS

Constraints and Variables

All marinas require relatively flat shoreland with direct access to sheltered navigable water. In some areas, it may be most feasible to construct a regional marina to make use of the limited shorefront which meets marina criteria. In other areas, the regional concept may lead to overcrowded conditions which are unacceptable from both safety and aesthetic standpoints.

Wet marinas: Water surface requirements for a 200 slip marina range from 5-7 acres, depending on the size of boats and the arrangement of the slips. Modular prefabricated piers can be joined in various efficient shore and near-shore patterns to reduce area needs and add interesting visual patterns on the marina areas. **Dry marinas:** For marinas which serve small craft (under 22 feet), it is possible to adopt a dry land marina system, in which boats are stored on land in a multi-level storage rack and moved to and from the water via stacker cranes. Water area requirements for 400 boats are reduced to one-half acre of water surface but land requirements are not significantly changed. The system may result in serious visual impacts if storage racks are not screened.

Parking requirements for a 200 slip marina will be at least 5 acres. One acre can provide parking for a maximum of 40 cars with trailers, or about 90 cars without.

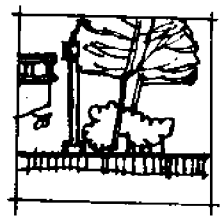
Marina architectural form and colors may be selected with relative freedom. Structures can thus be designed in the traditional shed style of the Sound's harbors and villages. Specially treated wood is a preferable material; corrugated synthetic panels can be replaced by improved synthetics more closely resembling traditional wood.

Recommended Guidelines

1. Utilize architectural forms which reflect the traditional coastal architecture of the Sound region. Use materials, colors, and graphics which are harmonious with the surroundings.
2. Consolidate on-land facilities. Control placement to maintain views to water. Use vertical space through construction of below-ground parking on flood-safe upland or parking structures enclosed or integrated into compatible building structures.
3. Control the location and design of fuel, restaurant, and other service barges. Explore the use of modular slip units (more space-efficent than finger piers). Adopt dry-land storage, with careful landscape integration to eliminate extensive docks and slips.
4. Use tree and shrub plantings, fencing, and where feasible, earth mounding, to integrate into their surroundings structures that cannot otherwise easily be integrated. Screen repair and storage areas from recreational and scenically important areas and from general view.
5. Employ measures to prevent fuel and oil spillage and resulting visual and environment damage.
6. Eliminate floating eyesores and damage to marine and estuarine life by careful enforcement of EPA and state pump-out requirements and more effective policing and prevention of jettisoning debris and wastes from recreational and commercial boats.
7. Prevent overcrowding of recreation harbors and waters by judicious planning and control of marina locations and size as well as by improved regulations governing boating activity. Consider water surface zoning to discourage conflicts and interference between sail and motor boats.
8. Locate marinas where little or no dredging of fill will be required, and where minimum damage to wetlands will be incurred. Extend open dockage to deeper water to avoid dredging.
9. Encourage the development of marinas with launch service in large open harbors such as Bridgeport and New Haven to provide more diverse and interesting public views to and from the shore.

An essential part of the shorescape planning process is to understand and properly manage the siting and design of very tall structures:

local architecture and materials help avoid visual conflicts



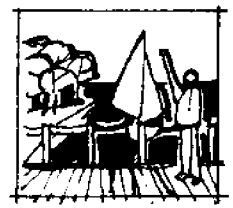


Figure 3: Characteristics and siting and design guidelines, large-scale facilities

shorescape analysis

shorescape				evaluation																				
reach	unit No	unit name	patterns	topographic complexity	shoreline complexity	vegetative integrity	vegetative diversity	color/tonal contrast	pictorial components	composition	evidness	shore dynamics	ecosystem continuity	near/far contrast	uniqueness	enhancement	scale to form	rarity	true to form/ townscapes	human dynamics	absence of distractions	active use qualities	soil/island horizons	sensitivity to change
COLD SPRING	5	Centre Island	Convex beach forming eastern side of Centre Island, connected to shore by narrow neck of Centre Island Beach; tidal flats along shore; swampland along small river inlet.	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶
	4C	Mill Neck Creek	Tidal inlet with several small streams draining uplands; complex shore with swamp, tidal flats, and some rocks and sand toward outer sections of Mill Neck Creek.	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶
	4B	Brackard Point	Interior of Oyster Bay Harbor, enclosed by Centre Island and Mill Neck with Mill Neck Creek extending to west; some swampland and associated tidal flats.	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶
	4A	Oyster Bay Cove	Continuation of Oyster Bay, enclosed by sandy beaches; some heavily developed, with shore structures and sewage plant.	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶
	4	Cove Beach	Two somewhat parallel shores of Oyster Bay Harbor, both sandy beaches with tidal flats; scattered development and piers on each side.	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶
	3	Cold Spring Harbor	Western side of Cold Spring Harbor; straight beaches along perimeter of Cove Neck, rising bluffs at end of neck; on west, tidal flats and sandy beaches rise steeply to flat plain.	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶	▶

shorescape management

areas of special scenic concern

units included	atlas No	name	assets	deficits	management recommendations
Ferry Beach Centre Island Mill Neck Creek Brackard Point Oyster Bay Cove Cove Beach Cold Spring Harbor	30	Oyster Bay/ Cold Spring Harbor	Outer Oyster Bay Inner Oyster Bay Cold Spring Bay	Ferry Beach, dense development	Preserve open spaces at Centre Island, Mill Neck, and Cove Neck Increase access points to views along Ferry Beach and within Oyster Bay Harbor Constrain building along Mill Neck Creek and Beaver Lake and on Oyster Bay Harbor shores Open up developed shores at Ferry Beach and in Oyster Bay Manage townscapes: town of Oyster Bay Enhance harborsides within Bay Relocate industrial uses from shore in town of Oyster Bay; limit future industrial development on shore.

237

Figure 4: Atlas charts, indicating shorescape analysis and management recommendations

COMPUTER - ASSISTED RESOURCE ANALYSIS

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Editors' note: unfortunately a text of this paper was unavailable when these proceedings went to press.

COASTAL ZONE MANAGEMENT STRATEGY:

TOWARDS MORE PRACTICAL IMPLEMENTATION

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One of the more important characteristics of a successful coastal zone management strategy is its capability to monitor and shape the seemingly insignificant building decisions made by ordinary people every day of the week. These everyday decisions, though small when isolated, combine to represent the bulk of force which can reduce the quality of the coastal zone environment.

Coastal zone management strategies must deal with the local decision-making process. It must be a way of thinking that lay people can assimilate in the most common settings of local decision-making on development practices. In this sense, therefore, it seems particularly important that coastal zone management strategy be translated into language and procedures that are direct, practical and sensible to the man on the street. If the layman can understand the common sense which is the basis of sound coastal zone management, the chances are good that the strategy will be built into the daily practices of how a community deals with its building needs.

If this premise that greater citizen understanding is critical to successful coastal zone management is sound, it follows then that there must be a fundamental motivating interest in it. Without such motivating force no amount of tugging, pulling, pushing will persuade people to use this strategy.

Fundamental Benefits of Sound Management

Citizen interests in a program increase when the benefits are direct. Interest in coastal zone management procedures should be exceedingly high if the pocketbook is important to people, if health is important to people and if pleasures are important to people. As an example, consider the following expected results from a sound coastal zone management program:

1. Increased economy of construction and maintenance involving the various land which can appropriately occur in a coastal zone .... saving of dollars.
2. Protecting and enhancing the quality of water supplied for domestic and recreational uses .... clean water.
3. Protecting and increasing the stability of the recreation tourism industry which depends so much upon the attractiveness of the visual environment .... protect jobs.
4. Protecting and increasing the pleasures of environmental beauty .... adding significantly to the joy of being alive.

Key Ingredients in the Strategy

For practical implementation it is important for people to understand the key ingredients in effective coastal zone planning. Although technical understanding is not critical, local citizens involved in development should be aware of what this kind of planning includes, who can do it, and to be able to sense their own unique role in it. These ingredients include:

1. Certain critical circumstantial insights such as: a comprehensive overview of coastal characteristics identifying what the critical problems are and an analysis of where these problems are most likely to occur in the future.

2. Coastal zone management strategy involves: a local understanding of coastal zone development issues seen in the context of regional and local sets of land use goals as expressed in a sequential series of development and protection objectives.

3. The approach includes: the careful negotiation between local citizens and those who propose to develop (both private and public investments). This negotiation can modify and alter development plans in order to avoid excessive environmental damage or even to enhance environmental quality over existing standards.

4. To implement decisions the process includes: the use of enforcement power related to creative environmental legislation and sensitive, on-the-spot guidance by informed public officials.

5. The entire approach to effective coastal zone management embodies: a necessary partnership between federal, state and local interests. Each partner needs to be strong and aggressive, each partnership needs to know its unique role in the whole set of efforts, none of the parties can operate alone.

The strategy is logical and orderly. It is possible to understand if it is worked at carefully and deliberately. But by its very nature, environmental management is very complex. For all those involved it is a big order to accomplish it with sensitivity. It is an even bigger order for the citizen to be effectively involved. Yet, in view of the increased dependence upon citizens at the local level to chart the course of decision-making events, lay people have to gear up to operate this type of process. The approach involves greater expectations than laymen are able and even willing to deliver. Accordingly, citizens are in great need of practical help in increasing their ability, insight, trust and motivation in the management process.

Local Negotiations may be the Weakest Link

The capability to negotiate effective plan resolutions between development interests and environmental interests at the local level may be the weakest link in the planning system at this time. This type of development control is fundamentally a communication and education problem. It must be kept in mind by those who are implementing coastal zone management strategies that the local laymen involved in the process are often truck drivers, welders, gas station attendants, hotel operators, farmers, hospital attendants, realtors, housewives and merchants.

The reform in development practices sought by a sound management program is marked with common sense. It is common sense which appeals to local people. Few of them, however, ever experience the simplicity with which negotiations can be made if the problems are raised early enough and if the "better" practices were more clearly understood.

A Communication/Education Program is Needed

Hundreds of decisions are being made as each day passes. They often affect the environment in a degrading way. Lay groups at local levels are making these decisions with relatively little of the kind of planning being discussed here. It is urgent that ways be found to bring to the table of the working local planning groups the best of the logic that sound management represents. They need the most literal of criteria with which development proposals can be reviewed and evaluated. They need the most creative ideas with which the reviewing citizen can counter developer's proposals and thereby improve development practices.

It is during the early moments of plan development that creative and informed negotiations can do much to adjust development location, development form and development practices which honor the environment, improve the community and allow the developer to maintain a sound investment. It is at this point that the greatest worth can be drawn from planning and management strategies.

Accordingly, one of the priority elements in coastal zone management strategies should be a communication and education program designed to help local citizens become more effective at their own unique role in creatively working with development interests. The results can do much to allow local governments to protect environmental quality while still accommodating the human needs of shelter, transportation, recreation and jobs.

There are an increasing number of examples of development programs which are being effectively implemented using the planning strategy procedures and the negotiative processes cited above. Central to their success has been the way in which laymen have played responsible roles in the decision-making.

AN ACTIVIST'S GUIDE TO THE VISUAL ENVIRONMENT

Ronald Lee Fleming

VISION, INC. is a non-profit, tax exempt (501(c) (3)) public foundation concerned with corporate and governmental policy changes to conserve and enhance the visual environment. It is located at 2 Hubbard Park, Cambridge, Mass.

An Activist's Guide to the Visual Environment

by Ronald Lee Fleming
Executive Director
VISION, INC.
Cambridge, Mass.

Abstract

This paper is both in recognition of and in response to the Conference on Visual Quality and the Coastal Zone. It is divided into three parts. First, some general comments on the conference and what I believe our objectives should be in having it; secondly, a discussion of the methodology of townscape conservation which we developed in the two-projector slide presentation at Syracuse, and finally, a proposed "visual manifesto" for state policy change which can be one outgrowth of the conference. Hopefully, it can be further refined by other participants and by the conference sponsors so that it can become a document endorsed by the participants. It can help generate a certain public advocacy benefit of public awareness and concern, which should be a major objective of the conference.

General Comments

During the course of the two-day conference, I was first bemused and then gradually mystified by the enormous attention given to the analysis of the mechanics of visual surveys and to the struggle over definitions of scenic quality, of beauty. Though I can understand how this activity might be the preoccupation of an academic conference on visual environment, the very fact of it is illustrative of the fragmentation in our society of which the visual environment is one indicator. The majority of speakers evidenced little or no concern for issues of implementation, of strategy for achieving some change in the status quo, which they commonly perceived as appalling.

This complacency about action apparently represents a fragmentation of roles--a loss of responsibility about outcomes not unlike the dilemma of the visual environment we have been talking about. Indeed, it is this very loss of connection between what we said at the conference and what the world does about what we say which I feel we need to address in the papers which accompany the conference. Certainly it has been a failure of responsibility in the environment as well as a fragmentation of roles which has led to the present visual chaos. The confusion along the roadside has much to tell us about limited senses of responsibility. The same limitation of responsibility amongst those of us interested in the problem can only reduce our ability to affect change that will conserve and enhance the visual environment. We need to cultivate the necessary discipline

of implementation. Otherwise we will talk only to ourselves and the visual environment will continue to serve not only as a metaphor of a larger cultural confusion about roles and responsibilities in the society beyond these academic groves, but also as a mirror of our inner confusion about the allocation of energies to address these visual problems.

One aspect of implementation is to make both the corporate world and government more aware of our concern.* In order to do this, we cannot spend all of our time on definitions of beauty and classification systems; we must define specific alternatives--ranging from the distribution of electrical power to the design of Kentucky Fried Chicken, from highway siting to the character of public telephone booths, from information systems along the highway to visual conservation districts with the commercial heart of our cities and towns. As another speaker, Mr. William Johnson, noted, we must cultivate the ability to speak plainly and to illustrate clearly our alternatives, both to policy makers and to the common men who are usually their constituencies. People are interested; they are concerned, but it is our responsibility to develop the process for popular communication which can insure the implementation which, I submit, should be a conference objective.

Townscape Conservation

What To Do

I should like to share with you one illustration of this process of making alternatives clear to people. It is the work of townscape conservation which our foundation has embarked upon in New England and New York State. It is a process of working with community groups, local government, property owners and merchants, absentee landlords and national corporations to define the visual and amenity assets of towns develop visual guidelines which conserve and enhance them, devise specific and discrete projects into a plan encouraging pedestrian activity and human scale, and then advocating the plan to merchants in "design clinics" and to outside corporations with personal visits. The community participation process is used as a basis for building a constituency for long-term changes--new and revised legal codes, allocations of capital improvements money, active solicitation of governmental grants for these objectives.

We would hope that it might serve, as it was intended, as a demonstration of both the procedures and the results which can be achieved elsewhere. We also believe that we shall need detailed processess like the townscape work which build in implementation strategies if we are to grapple meaningfully with the other issues identified at the conference on visual quality.

*Fleming, Ronald L., "A Call for Visual Relevance," In Historic Preservation, Washington, D.C.: National Trust for Historic Preservation. July-September 1973, pp. 24-25.

Why Do It?

But first, why townscape conservation? America is becoming more plasticized, and standardized, and hence, more anonymous. Those towns which do retain some continuity with their past are in a position to reap rewards of their differentiation from the rest. Indeed, Vermont as an entire state is experiencing both the pain and the pleasure of such a differentiation, such a recognition of value.

Ironically, any of the cities and towns that have "townscape" qualities--a harmonious integration of building materials, style, architectural elements, landscaping and open spaces, are not specifically aware of these values. Often, too, they have been consciously or unconsciously devalued in the eyes of local residents so that neglect, urban renewal or the intrusion of new development, be it a fast food franchise or the outscale insert of old age housing can take their toll with only a feeble local protest overruled in the face of "inordinant" progress. Historically, that particularly American concern with saving the most famous house, where someone important slept or slept with someone else, has conspired with local apathy to lose the block while saving the house. Townscape reverses the process. It starts with an acceptance of the entire block, the tout ensemble, and states that it is this context which adds value to the individual properties and ironically too, often makes them easier to conserve as vital tissue in the townscape.

Where to Look

It is into such places which had townscape quality, often neglected, often threatened, that our design team has been, by local invitation, advocating alternatives--illustrating with our process why that built enviornment is of value. We sometimes discover that it is the greatest resource the towns have! Our team of young designers has discovered that everywhere Americans are hungering and thirsting for a "sense of place," a phrase quickly becoming a cliche amongst academics and designers but having great meaning when put in the context of a townscape process. It becomes an exciting phrase when the process of rediscovering stimulates a community to find the old bandstand, lying forgotten in a back yard and reinstall it in the town common or conversely explore the possibilities of recasting the ornate Victorian fountain that used to stand at the apex of the green until it was removed and sold for scrap. During the 1940's, people complained that it was splashing the cars. What a metaphor!

This search for continuity with the past is one result of townscape process. These acts of rediscovery actually took places in Middlebury, Vermont this year. Where

there is no townscape process to challenge energy into the conservation of meaningful places, the people will continue to seek it elsewhere, often at the expense of our balance of payments, with European excursions, after which people return to visual squalor, or the privatist retreat of restored farmhouses and collections of antiques, or even, when other means do not avail, day trips to Disneyland, to mingle on a main street of exaggerated Victorian detail with the instant nostalgia of some imagined yesteryear. The townscape conservation process has as its principle objective the recognition of value where it is now, in the materials, craftsmanship and harmony of scale and detail, which characterized so many of our older townscapes. It is conservation rather than preservation because it means maintaining a living tissue rather than preserving dead artifacts.

So far, VISION's work has focused on smaller cities and towns in the northeast. Often the process is initiated by word of mouth contacts and newspaper articles. Projects have been completed in Portsmouth, N.H., Exeter, N.H., Windsor,Vt., Middlebury, Vt., Bellows Falls, Vt., and York, Me. Projects are ongoing in Warren, R.I., Plymouth, Mass., Oyster Bay, N.Y., and Great Neck Plaza, N.Y.

Often the towns have come to us because townscape conservation means to them an increase in tourist revenue, higher property values or improved downtown shopping before the threatened, banal efficiency of roadside shopping centers. But, the VISION design team views the work from a broader perspective: that of making the built environment a source of meaning in people's lives that can answer their needs for visual order, for continuity, for complexity and,certainly,for delight. Our work often has been a demonstration that it costs no more and sometimes much less to achieve these objectives by conserving the character of "place."

Our process of interacting with local groups has taught us that Americans are looking not only for "righteousness," a Watergate fall-out, but also for the related integrity of place. Often they know not what they want, but they do know that they are dissatisfied, and that the increasingly pathetic weekend pilgrimages to someplace else are not securing it. This does not mean that downtown merchants will automatically vote for street trees and coordinated awnings. They will talk mainly about traffic and parking, but they are increasingly aware that there are two generations--the old and the young--who want to linger in real places and that this need has something to do with the visual quality of the downtown environment.

Objectives

Our townscape process involves the following set of objectives:

(1) to build an awareness of the meaning of townscape--its fragility, the danger of its incremental destruction, and the potential for reinforcing the fabric and character of areas with a special "sense of place"

(2) to develop practical techniques for translating this new visual awareness into visual guidelines which can be implemented by local communities--guidelines respecting the intrinsic character of materials, and the rhythm of spaces and textures that are the legacy of so many New England towns

(3) to use visual techniques and economic rationale to explain these guidelines to individual merchants and property owners with free "design clinics"

(4) to provide local governments with options--alternative designs, suggested changes in zoning and sign ordinances, information on amenities which can encourage policy change including application for appropriate federal and state funds, changes in the capital improvements budgeting and stimulation for leadership roles in conserving and enhancing special man-made environments

(5) to represent local communities as advocates to major corporations and absentee property owners to secure changes in their installations which abuse the special character of these townscapes

Process

We usually start by encouraging an appreciation for the scale elements of nineteenth century towns. We can contrast the scale, which often is for elements twice the height of a man, and materials such as brick, cast iron and wood, with the materials and scale that we have today. We cast no moral judgement on those newer materials--plastic, aluminum, neon--which are designed to attract motorists going 55 miles an hour, are mass-produced and often do not show the passage of time; we say merely that they are inappropriate in nineteenth century towns and when they are imposed on the existing scale of nineteenth century architecture, the results often are disastrous. This is because the proliferation of out-of-scale information, e.g., signs and facades that are meant to be signs, becomes ultimately confusing and that the escalation of information is self-defeating.

The "creation" of townscape today faces some difficult hurdles. Today there is a proliferation of building styles and materials with no particular respect for the dictates of geography or climate. In the nineteenth century, there were really only a handful of different style books, which were locally adapted by master carpenters who, for the most part, served as the architects. Using local materials and respecting the character of the land, on the scale of pedestrians, not automobiles, they produced a building environment which had a certain rhythm and compatibility.

Great Neck Plaza, N.Y., is challenging us to relate to this larger problem--the "creation" of townscape. What do we do in an auto-oriented, nondescript twentieth century village which, incidentally, has no plaza, but much black top? When there is no "visual vocabulary," the problem is more difficult, but also more relevant to the "gray areas" of twentieth century development. Our work in Great Neck Plaza involves collaboration with a lawyer, Lisle Baker, associate professor environmental law at Suffolk University in Boston,and a firm of landscape architects, Hornbeck Okerlund in Cambridge. The objective is to define a comprehensive visual plan and then legally to enforce it. The designers developed a colored awning system which "ties" nondescript commercial buildings together, organizes a graphic system beneath the awnings, and cleans off the facades above. It involves both private and public investment and defines some "frontier" legal actions--facade amortization (within a two-year period), affirmative actions for facade enhancement by the merchants, and a series of Design Development Districts which impose the design controls with the incentive of village subsidy for street and sidewalk improvements. Each Design Development District is also treated as a special assessment district with the city making the initial investment and the merchants paying a portion of the funds back over a five-year period.

The plan is daring because it combines facade renovation with the amortization clause that requires action within a prescribed period. If the merchants within a given Design Development District do not like the design produced by the VISION- Hornbeck Okerlund design team, they must come up with an alternative approved both by a majority of the property owners and the Village Design Review Board.

What We Are Doing

We send a team of three or more designers to work in a town on and off for a year's time in a process of analysis, design consultation, and advocacy. Planning with a local advisory committee, at least partially supported by local funds, and involved in a series of public presentations and meetings with government officials, merchants and property owners and representatives of outside corporations, the team develops a process involving the following major components:

(1) review opportunities and options with the community. The design team presents a series of visual opportunities for conservation with community groups, usually including an advisory board, and asks for their advice and comment. By giving people tangible before and after drawings and visual analogy slides, the team elicits community interest and hopefully a dialogue ensues which is continued throughout the project.

(2) analysis. The designers develop an analysis of the townscape, which includes the quality and condition of buildings, use patterns, opportunities for increasing amenity and open space, growth options, historic continuity, treatment of traffic and parking problems, and alternatives for standardized corporate installations such as fast food and gas stations.

(3) overall visual plan and supportive performance standards. Based on the previous analysis, the design team prepared an overall visual plan--a building by building critique of downtown storefronts. Utilizing this plan, the team develops a set of visual guidelines which the town can utilize as the visual performance standards for a design review ordinance, changes in the sign code, applications for grants, or justification for new priorities in capital improvements budgets.

(4) implementation: advocacy for constructive change. Finally, the team engages the merchants and townspeople in a continuing dialogue, called "design clinics," in which the rationale for townscape change is discussed. Renovations of their individual building facades, painting, lighting and graphics are then defined in terms of these townscape guidelines. A slide show is prepared for this "friendly persuasion" process, and is also utilized in an advocacy effort with national corporations which often have standardized installations which do not respect the "sense of place" or character of a particular townscape. The advisory board usually becomes an implementation organization. This is part of the strategy.

(5) evaluation. A series of public presentations, newspaper inserts of planning ideas, conversations with an advisory committee, town government, and interested groups, usually encourage a higher percentage of implementation projects which in turn are evaluated to encourage further change.

Our work sometimes has been in areas where there had been a great crisis--in Windsor and Exeter, banks planned to tear down significant buildings for drive-in parking, elevating consciousness to the point where broader guidelines for conserving many buildings could be proposed (the threatened buildings were saved; thanks partially due to the national coverage by Ada Louise Huxtable). In Bellows Falls, Vt., and Warren, R.I., we initiated action in ethnic, blue collar communities with little organized support. In some communities we found particularly enlightened professional staff who wanted our support. Some towns had no staff; in others, staff were somewhat threatened by our presence. In almost all of the communities an advisory committee became the broker for change, often becoming an implementation committee when our contract was over. The best results have been achieved where existing professional staff have worked closely with an ongoing implementation committee.

The best way to achieve results is to build awareness--VISION designers have done this with slide shows running automatically in storefront windows, moveable displays in post offices and banks, newspaper foldouts of townscape plans, 7 a.m. breakfast meetings with the chambers of commerce, banquets with Rotarians, and bull sessions with bankers.

Perhaps the most radical position we have taken is that in the work of townscape conservation in a free society there is not one client but many clients, most of whom do not pay directly for townscape services. A classic approach of architects and planners has been to narrow the client down, to satisfy the client, and then to get out of town. This can work in urban renewal areas or for large developers who control large tracts of property. But in the creation of townscape where there are multiple private and public interests and hence a variety of actors, whose action or lack of action affects the others, the only way that some plan for visual quality is going to have a lasting effect is if its benefits are spread throughout the society so that merchants, bankers, chambers of commerce, public officials, even, yes, corporations and other absentee owners feel that they have a stake in the outcome, feel that they have a responsibility toward the community in visual terms.

What Are the Results?

What do we prcduce as a result of this townscape process? We develop an array of sketches and finished drawings which illustrate alternative treatments for key spaces, amenity planning, facade renovation, graphic design, streetscape solutions including traffic, parking, street furniture, landscaping, written guidelines for individual shop owners or

tenants, critiques of existing zoning and signing codes and copies of some of the best design and amenity legislation in the country, a project brochure, a series of design clinics and public meetings and exhibitions of the above materials.

What is the impact in the communities? The townscape process takes a long time. It is dependent upon community good will, the state of the economy, and local leadership, which often needs to be developed (this can be one project result). Most of the projects are less than a year old. However, these results are apparent so far:

- Portsmouth, for the first time in this century, has a substantial capital improvements program for street trees and amenities in the downtown ($10,000 a year for five years). A number of merchants and the ARCO station have made visual improvements in their properties. The city is building the minipark we suggested adjacent to the Loeb Theater parking lot on Market Square. We have leveraged probably more than $100,000 worth of municipal and private visual improvements from the original $10,000, year-long, visual advocacy effort. The city is considering an historic distric ordinance for the entire downtown and revisions of the sign code.*

- Exeter has adopted the visual guidelines as part of their master plan. Banks and businesses have made changes. The town is planning to use Federal Department of Transportation funds to build a Town Hall Common, connecting the bandstand (now engulfed in a sea of traffic) to the city hall with a greensward. Estimated costs are $200,000.**

- Bellows Falls is spending $75,000 in revenue sharing funds to implement the pedestrianization scheme for the main square-street trees, paving and curb changes to accommodate people, not cars. This will extend for about three blocks. Gulf is changing their service station at the town entrance and planting trees.

- In Windsor, the first capital of Vermont, Chamber of Commerce President Harry Gale said recently, in a feature article about Windsor in Vermont Life, "VISION has become a focus around which the entire business community can rally." Stores have been repainted, the American Legion changed its plastic, internally-lit sign with Coca-Cola trademark to a carved, indirectly-lit wood sign without logo. We are convinced that when the American Legion changes, VISION has reached the "hearts and minds."

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*Yee, Roger, "Pilgrims with Painted Faces." In Progressive Architecture. December 1974, pp. 73-76.

**"Fixing Up Four New England Towns: The consistent imposition of "Good Taste." In Architectural Record. December 1974, pp. 96-97.

Middlebury. The Garden Club is sponsoring a tree-planting scheme down the main street, capturing, as we suggested in our plan, fire hydrant, no-parking zones for street trees. The Frog Hollow Federation now has a plan for a major cultural attraction which will encourage pedestrian use of the downtown. The old Victorian bandstand has been reclaimed from a back yard and now graces the green again. Mobil has agreed to visually enhance the service station on the main street (across from the house of our first ambassador to England).

Benefits

With townscape plans averaging $10,000 per project, we have "leveraged" several hundred thousand dollars worth of improvements.

Perhaps one of the principle benefits, albeit a spin-off, has been the increased interest by both professionals--architects, landscape architects, town planners, and designers--in the work of townscape conservation, and by government agencies. The American Institute of Architects* has presented us at regional meetings around the nation to discuss the townscape work with local chapters. Architects now are identifying potential projects in their own areas and calling us for assistance. We now feel that some of the front-end costs of doing this work can be born by local chapters of the AIA and that they can begin to lobby for funding from local philanthropic institutions to cover some of the project costs.

As a result of our projects and our advocacy work, the state arts councils in both Massachusetts and New York are allocating money for townscape conservation work. In Vermont, where we completed three successful townscape projects which attracted wide attention, the Division of Historic Sites determined that it could use some of the Department of Interior money for townscape as well as for the rehabilitation of individual buildings. They funded a study for Montpelier and a leading Vermont architect is doing the project. Sometimes innovation stings a bit, as VISION was the other finalist. The architect determined that it would be in his long-term interest to take this work, because the community effort would encourage many individuals to undertake other renovations in their buildings as well as help him develop city contracts for enhancement programs. This relates to a long-term VISION theme as a motive for private action--self interest in the public interest.

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*Kashden, Sandra, "Profile: Vision, Inc. And The Practice of Townscape Conservation." In the AIA Journal. June 1975, pp. 46-49.

Funding

Funds for the projects usually came from a variety of sources, often painfully dollar by dollar (some are still coming). We required that even the poorer towns raise at least a third of the budget to insure interest and participation, but often the "official" budget was underwritten by additional funds which subsidized some overhead costs. Regional planning agencies, planning commission, Rotary clubs, chambers of commerce, downtown merchants associations, selectmen, individual contributions, and foundations grants have underwritten the projects.

Summary

In conclusion we hope that this in-depth treatment of one process can serve as the inspiration for many others. The visual environment can be one indicator of the ability of our society to cooperate. Instead of serving as the metaphor for fragmentation, loss of identity, and failure of civic responsibility, it can serve as tangible evidence of concern. Seen in this light, planting daffodials on main street is not a cosmetic cop-out but a potential catalyst for securing more comprehensive institutional change; it can help provide the psychological reinforcement many of us need to press on to insure that amenity is not window dressing but evidence of a sense of mutual responsibility between institutions, individuals and government, which is both a definition of what a culture should be and some insurance that it will survive.

A Visual Manifesto: Opportunities for State Action to Conserve and Enhance the Visual Environment

Today, the expansion of public powers is generally regarded to include aesthetic regulations as long as they are neither arbitrary nor capricious, but in spite of the constitutionality of regulations, we have yet to develop a comprehensive body of law which can stimulate visual reform and conserve existing quality areas. Zoning and sign ordinances at the local level have been an obvious failure, with a laxness of minimal standards, or easily obtainable variances eroding existing visual values. It is our assumption that it is increasingly incumbent upon the state to protect the public interest in visual quality, particularly in states where tourism has such an enormous economic impact. We are urging that the state establish some minimal visual standards and guidelines where local government has failed to establish them. The following paragraphs identify some areas of statewide concern and suggest policy options. If adopted, this visual manifesto can help roll back the tide of visual pollution which threatens to rob us all of our "sense of place," and with it the sense of shared identification and participation which is essential to the healthy functioning of our government. Seen in this light, the quality of the visual environment is not an expendable frill, but an indicator of the health of our society. It needs immediate attention.

1. Land Use Planning

We need a concept of land use planning and management which places increasing responsibility on state and regional planners for decision-making that has more than local impact. We specifically endorse a survey of "critical environmental areas" in the states. These areas as defined under this protective legislation have a particular manmade or natural quality that would be protected by statewide visual performance standards to ensure that any construction or development does not erode their character.

2. Utilities.

We urge the increased use of underground public utility distribution wires and contend that the utility companies, not individual citizens or municipalities, should bear the major costs of burying existing overhead wires with a certain percentage of annual revenues. California's public utility commission recently ruled that 2% of gross revenues should be earmarked for burying underground wires. We support a 1% of budget requirement for landscaping transmission line rights-of-way--similar to the landscaping requirement for highway construction projects. We

urge recreational development of some transmission rights-of-way as well as increased consolidation of transmission lines. We further support strong environmental representation for state public utilities siting commissions, which will make binding decisions on the location of future power plants. We support state requirements that all utility substations be landscaped in a manner appropriate to the character of existing manmade or natural environments.

3. Design Review.

a) Cities and towns. We support an amendment to state zoning enabling legislation which clearly will authorize cities and towns to establish design review boards. This legislation should include a specific mandate of a public purpose for preserving natural, scenic, historic, and aesthetic qualities of the environment as a purpose for such boards. The design review boards would have the explicit authority to consider the siting, scale, use of materials, and general appropriateness of all structures and signs to be constructed or renovated in areas designated by local governments.

b) Along turnpikes, intersection of interstates. Here in Massachusetts, the Turnpike Authority should define design review criteria for facilities located at rest areas along the turnpike, and require that these standards be met within a designated number of years as a condition of franchise leases. At the intersections of interstates, the Department of Public Works should define visual performance standards, including siting, signing, landscaping, and lighting of facilities. The Executive Office of Environmental Affairs or the State Planning Office should be assigned the role of "visual ombudsman" to inventory the capabilities of State agencies to attend to the visual environment without additional legislative enactments and then to insure guideline compliance.

4. Sign Regulation.

a) Billboards (off-site sign controls). We favor state action to remove billboards without compensation, in line with decisions in other state courts (e.g., in Vermont). Amendments which would allow billboards along interstate highways with directional signing should be resisted, but directional signing on corporate logos of services available at interchanges should be permitted. These facilities should in turn be subjected to design review which would limit the use of towering, expensive signs. At a minimum, definition of commercial and industrial areas along interstates where billboarding is allowed should be clear so that this designation is not abused. (At one point, South Dakota designated the entire length of its interstate system as "commercial and industrial" to help the billboard industry.) In the interests of energy conservation, all billboard operators should be required to turn off the lighting of their signs.

b) On-site signs. We urge that state zoning enabling legislation be amended to define minimal standards for on-site signing including maximum height limitations. We support an amortization clause to ensure the removal of non-conforming signs within a reasonable period (three years). These minimal standards for on-site control can immediately ban all twirling, blinking, fluctuating, animated or portable signs. Flashing graphics (lights which are intermittently on and off) should be permitted only for motion picture theatres, amusement and recreation services, or special districts; they are a highway hazard.

5. Corporate Policy.

A comprehensive effort by major corporations with multiple installations is needed to redesign existing automobile-oriented prototypes so that they relate to the environment in terms of the use of materials, siting, signing, lighting, landscaping, and scale. We support legislative and advocative action to encourage these actions, which can include "environmental audits" by state departments of environmental affairs of corporate facilities to insure that they meet a given visual performance standard by a certain date, and the convening of conferences with key corporate executives to insure visual accountability. We suggest state action asking corporations to a) immediately stop the use of temporary paper placards, flapping pennants, and flashing lights in areas which have scenic or historic quality, b) to landscape corporate facilities with plants and greenery indigenous to the area, and to provide more than minimal landscaping, which often results in the undesirable use of astroturf or plastic flowers, and c) to use materials which harmonize with the fabric of an existing place. (This does not necessarily mean gasoline stations which parody colonial architecture.) State-wide awards for constructive action would be one incentive to encourage compliance. State boycotts of corporate facilities that have not made measurable progress could be another incentive to encourage compliance with state-wide visual performance standards.

6. Landscaping of Parking Lots.

We support state-wide legislation requiring the landscaping of all parking lots of more than two acres. Such legislation should include specifications as to square feet of landscaping per acre of parking, to insure that the landscaping is more than a symbolic shrub. Already, after observing the impact of asphalt wastelands in the region, Maine has enacted landscape requirements for parking lots.

7. Information Facilities.

a) State off-site signing systems. We encourage the development of information facilities for commercial and non-commercial use along major state highways as an alternative to billborads and on-site signing. Vermont's use of a Travel Information Council which oversees installation of a state-wide logo system identifying facilities and erection of standardized off-site signs (with the proviso that existing off-site signs are then removed) is a useful example.

b) Sign plazas. A state tourism division, or equivalent organization, should institute sign plazas, located and designed so that drivers of motor vehicles may leave the main traffic lanes and inspect them. Sign plazas could contain maps and other information, depending upon space availability, and may have telephone and other information facilities attached to them.

8. Scenic Easements.

We recommend that states embark on an aggressive program in the acquisition of scenic easements, and that the state zoning enabling legislation be amended to give cities and towns, through conservation, design review, and historic district commissions, as well as designated state authorities the power to use eminent domain to acquire extensive facade easements in designated areas of manmade or natural quality.

9. Public Art.

To increase amenity in new construction, we urge that it be mandatory that all units of government apply 1% of construction costs to the purchase or creation of public art. Rest areas along highways should include public art. We support the creation of local arts councils which can broker the interests of arts groups to municipal government.

10. Townscape Conservation.

We support the development of state matching funds for local appropriations aiding merchants and property owners in designated townscape improvement districts to enhance their facades, graphics, lighting, and landscaping according to visual guidelines which maximize harmonious design relationships to streets and adjacent buildings.

11. Litter.

We support a ticket system for litter violations and endorse mandatory installation of litter containers. We urge legislation banning the future manufacture of nonreturnable bottles for beer and soft drinks and encourage a mandatory deposit system for these bottles to provide an added incentive for their collection.

12. Environmental Impact.

Administrative oversign of adverse visual impact under state environmental policy acts, should be improved; guidelines defining visual impact should be graphically illustrated, both for benefit of administrators and developers.

LOCATING POWER GENERATION AND TRANSMISSION FACILITIES IN THE COASTAL ZONE - THE REGULATORY AGENCY VIEWPOINT

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Abstract

Many power generation plants and miles of associated transmission lines are planned for the coastal zones. This paper explores how government regulation embodying public participation functions in balancing societal needs, environmental impacts and the nature and economics of various alternatives. Environmental considerations, legal support and situation ethics for aesthetic judgements are outlined.

Locating Power Generation and Transmission Facilities In the Coastal Zone - The Regulatory Agency Viewpoint

Energy Facilities: Environmental Pariahs?

Power generating plants and high voltage transmission lines have been among those necessary manifestations of a modern society held in special disfavor by the contemporary environmental conscience. Indeed, siting a transmission line has been called "akin to locating the skunk works".

Until fairly recently utility companies were largely dependent upon local government for approval of construction. They found themselves negotiating longer and building less, as groups organized to oppose new plants and lines on environmental grounds. In some instances this unpleasantness became grevious when legal sanctions were employed to halt projects.

Legal Constraints

A series of precedent-setting court cases and several new federal laws (NEPA, Air Quality Control, etc.) changed the picture considerably, making it increasingly difficult to program and construct new facilities. Even when a company sought to be responsive to environmental considerations there was no single authority speaking for the environment. Opposition was often divided between those seriously concerned with environmental quality and those simply wishing the burden somewhere else. The problem was, "Every somewhere else is somebody's here."

Transmission Siting Law

The utilities in New York early experienced difficulties in siting power plants and transmission lines and sought a one-stop siting law. Environmental groups supported state review but preferred such review to be in the hands of an environmental authority. Article VII of the Public Service Law was enacted as a compromise providing for a one-stop procedure for the siting of major transmission lines under the Public Service Commission.

The law went into effect July 1, 1970. The New York State Public Service Commission (NYS PSC) is probably unique in the country as a regulatory agency with the clear statutory responsibility for environmental certification of utility facilities and the in-house environmental capability to freely discharge that responsibility.

The intent of the law is clear, however, in terms of application the law is unspecific. The Public Service Commission is given considerable latitude in its implementation. This is in general contrast to other environmental laws but appears consistent with previous Public Service Law in New York.

Public Participation

The law requires extensive public notice and provides for the participation of certain other state agencies. Commission rules expand the requirement for certification and embrace other agencies as well ensuring a complete participation of all parties with an interest in a project.

Permits and Condemnation

In addition to providing a one-stop certification, obviating the need for any other permits, the law gives the Commission the authority to override any local ordinance or zoning restriction which in its judgement would be unduly restrictive in its application. The law further provides that certification automatically is a finding of need for purposes of condemnation, the condemnation laws have been revised accordingly.

Generation Plant Siting Law

Subsequently Article VIII of the Public Service Law was enacted providing for power plant siting. A five-member New York State Board on Electric Generation Siting and the Environment is empowered to resolve all questions associated with the siting of new generation plants in a manner similar to that established in siting transmission facilities. Environmental staff assigned to the NYS PSC perform a similar role in the analysis of power plant proposals as they do in transmission line projects. Professionals from the Department of Environmental Conservation also participate.

Legal Insufficiencies

There are shortcomings in attempting to employ legal mechanisms in the environment's behalf. Courts cannot rule on anything except the instant case coming before them, which may or may not be a precedent for future action. Judges are increasingly called upon to distinguish between the fine technical distinctions of scientists in disagreement, rather than constructing decisions on the finer points of law which represents their own competence. Worst of all, the process of judicial review often appears interminable.

Environmentally based appeals have often been based on the inadequacy of environmental review. Under NEPA it is enough that an intervenor establish a reasonable doubt as to the sufficiency of some aspect of the impact analysis for the court to find against an applicant. The first priority for any environmental impact analysis therefore is comprehensiveness.

Balancing

The regulatory mechanism permits considerable flexibility within the legal framework. The regulatory agency has the expertise at its disposal and a continuing leverage on the applicant utility to tailor construction activities to the individual circumstances of each case. The law establishes that the PSC may not grant a certificate for a transmission facility unless it shall find and determine:

(a) the basis of the need for the facility;

(b) the nature of the probable environmental impact;

(c) that the facility represents the minimum adverse environmental impact, considering the state of available technology and the nature and economics of the various alternatives and other pertinent considerations.

The Plant Siting Law makes similar provisions incumbent upon the Siting Board. It is this mandate which provides for the balancing of all the factors. The costs and the benefits of any accommodation for environmental purposes or need are taken into account. The adversary proceeding permits any party an opportunity to present his case and to temper and perfect it in the heat of the contest and cross-examination of his or her protagonists.

Public Interest Case

In the process the staff functions most often as the applicant's adversary, arguing for what it regards as the "public interest". This public interest is the greater community need for the facilities, and minimizing the environmental impacts and the costs. In a judicial context it is not always the vocal minority which is supported by staff position. Considerable dialogue within the staff predates the assumption of a staff posture on any issue. As important as the immediate effect with respect to a specific case, is the precedent in the establishment of a Commission policy. There are considerable interrelationships to be considered. Permitting the employment of a herbicide to

control the brush under a power line has important engineering reliability considerations. Cost is also a factor as alternative methods of brush control may be more expensive. The environmental impacts implicit in employing such materials are obviously important. The visual impact is also a factor. If applied in certain seasons the "brown-down effects" may create a very adverse appearance.

Staff cannot afford to take a rigid position in favor of or in opposition to such a policy without considering the alternatives. The public interest does not permit a disregard for the reliability of the electrical facility nor for the integrity and quality of the environment.

A Democratic Process?

Decisions must be based on the best evidence it is possible to assemble. A consensus among the interdisciplinary staff is sought which balances the various factors. A strict majority viewpoint cannot be indulged. The opinion of the professional must necessarily be valued as greater than that of a citizen or sometimes many citizens and yet not be unresponsive to the concerns of such citizenry. Aesthetic decisions are particularly difficult to arrive at by a purely "democratic" process. There is also always an attendant cost to any improvement.

Long Range Planning

Article VIII of the Public Service Law contains an important provision, a mandate for long-range electric system planning. Accordingly, rules of procedure adopted by the PSC provide for each electric corporation to submit on an annual basis a long-range plan for future operations and the facilities which will be required to meet the needs.

The long-range forecasts and the lead time necessary to plan construction of generation facilities begin the process of site selection and development. The analysis of fuels mix and technological forecasting characterizes the nature of the facilities to be constructed, and the specific site requirements.

For example present technology and constraints on air quality will not permit fossil-fired generation in some air sheds.

Planning Parameters

Environmental analysis may be divided into four classes of considerations, land use, cultural, aesthetic and biological. They are in many respects interrelated. Unfortunately they are sometimes in conflict. It is difficult to divorce considerations

of one kind from another because the decisions which are unilateral regards one factor ultimately have impacts in others. When a facility is clearly required an effort is made to optimize each class of consideration at the least cost possible. Often the most difficult decisions are whether a particular accommodation is worth the additional cost, particularly when the object is improvement of visual appearance.

Visual Impact

Visual impact is the influence that the placing of a facility within a particular landscape as perceived by an average viewer. Considering the average viewer is important as the professional designer will normally be more attuned to an intrusion while some persons, particularly if they have a commercial interest in the intrusion, will tend to minimize it.

The nature of the impact is a function of the context within which the facility is located, the degree to which it is visible and the extent or nature of the intrusion.

Context

A transmission tower would ordinarily be more acceptable in the context of an industrial landscape than in a low density residential subdivision for reasons of appearance, scale and a sense of appropriateness. The average person is more tolerant of seeing a tower in the context of an industrial land use than in a residential land use.

Visual Improvement

To make a facility acceptable, particularly one which is generally regarded as unattractive like a transmission tower two strategies obtain. First, one can improve the appearance of the object itself by changes in design, color, material, etc. Secondly one can diminish the effect of hide it completely from sight, by screening or removal to "somewhere else". The somewhere else is rarely a satisfactory solution. In responding to a request to relocate elsewhere one most often burdens another, often equally deserving landscape.

Exposure

Visual impact as it derives from the degree of exposure may be said to vary from observable to apparent to marked to severe. Observable would mean that it is possible for an average observer to detect the presence of the facility. Apparent would be more obvious to the viewer, while marked

would be difficult to ignore and severe would clearly be intrusive. Anything more visible than "apparent" represents a significant impact.

Incremental Impact

If no compromise of an otherwise attractive area exists before the placing of a facility, the impact will be incrementally greater than if the facility is an addition to an area already burdened. This, of course, argues for the use of existing transmission corridors because of the small incremental impact. The ethic argues for making a spoiled area worse rather than inflicting new damage on an unspoiled area.

The case is not always so simple. Often existing corridors reflect the lack of concern for visual impact of the era in which the original construction took place. Sometimes the land use changes in the intervening years make the choice less promising.

Even when the circumstances favor the incremental impact, there comes a point at which the addition of further facilities within the context of many previous facilities overburdens the visual environment. This is visual saturation, or the point at which the average viewer is intolerably afflicted by the cummulative impact. Thus although the incremental impact is small (like the proverbial last straw) the result is unacceptable. These considerations should be addressed in an analysis of alternatives.

Land Use Implications

Power lines are almost universally regarded as ugly and unacceptable visual intrusions. To the average person, particularly those in prospect of having the facility imposed on their vicinity, the solution is clearly elsewhere or underground.

The undergrounding alternative with respect to high voltage lines is clearly an expensive option. Studies of the impact on rates of universally undergrounding overhead service clearly make such a policy impractical. Therefore, selective undergrounding of utilities becomes a logical policy alternative.

However, selective undergrounding presumes being able to evaluate which landscapes are most deserving. For this reason the staff of the NYS PSC has devised a series of priorities essentially based on land use. High priority is given to those scenic areas enjoying protection by ownership committed to preserving such qualities. Similarly important cultural resources are deserving such as historic sites.

Control or Regulation

Basic to the concept of assigning priorities is that the value ascribed to a landscape, justifies expending the extra funds for undergrounding to prevent a visual intrusion, because it is otherwise protected. Protection is afforded through governmental ownership or regulation. A scenic area subject to strip development and suburban sprawl does not justify the inordinate expense of undergrounding transmission lines. This places a high premium on land use controls. It is not sufficient to identify scenic quality, it must be possible to protect it. What is the sense in undergrounding utilities if billboards are going to be permitted to destroy the very landscape which the undergrounding sought to protect?

Recognizing the importance of undergrounding utilities, the NYS PSC initiated public hearings on the subject. The hearings were conducted in separate phases.

Phase I considered the advisability of ordering the underground installation of distribution facilities in new residential subdivisions of four or more dwelling units.

Phase IA dealt with the installation of underground distribution lines to new commercial and industrial customers or to public construction and other (less than four units) residential construction.

Phase II covered the conversion of existing overhead distribution facilities to underground.

Phase III considered the underground installation of transmission facilities.

Phase I resulted in the adoption of mandatory undergrounding rules by the Commission which went into effect in June 1971. The rules spell out the various responsibilities of parties, allocate the cost burden and provide for exemptions. The Commission concluded their original opinion with:

> The rules promulgated today, though limited in scope, provide a beginning in the orderly and systematic development of undergrounding utility facilities in this State. Through these rules the trend toward underground distribution facilities will become more widespread.
>
> At the same time, the present potential for abuses by tying underground to unwarranted promotional practices will be greatly reduced.

The utilities are also obliged to report their experience with the rules on an annual basis including their average cost per foot of providing service. The unit cost becomes the basis for computing the charges for the following year.

Appeals

A number of appeals and requests for exemption from the rules have been made to the Commission.

During 1972, the Commission consequently issued three separate opinions of general applicability interpreting the rules. Among the applications for exemption was one from a developer, Sleepy Hollow Lake, Inc. After their application for exemption was denied they appealed to the Appellate Division of the Supreme Court of the State arguing that the Public Service Commission did not have the authority to prescribe such rules, that the statute conferring such authority was unconstitutional, that the Commission's decision was not supported by substantial evidence, and that the determination as applied to land developers was void as being arbitrary, unreasonable, discriminatory and unlawful.

The Commission defended its decision as based upon its general authority--

> The Commission shall encourage all persons and corporations subject to its jurisdiction to formulate and carry out long-range programs, individually or cooperatively, for the performance of their public service responsibilities with economy, efficiency, and care for the public safety, the preservation of environmental values and the conservation of natural resources.*

In response to petitioners contention that the Public Service Law contains no standards to guide and limit the Commission in determining whether undergrounding should be required for aesthetic reasons the brief stated:

> The standard is one of reasonableness and public interest and the declared legislative objectives are that facilities and service be adequate and in all respects just and reasonable and that the utilities be encouraged to perform their functions with care for the preservation of environmental values."

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*From the Public Service Law § 5 - "Jurisdiction, Powers and Duties of Public Service Commission" -- emphasis added.

Court Decision

While the Commission argued that aesthetic effect is one kind of quality of service and therefore deserving of attention the court, in ruling in the Commission's favor stated:

> Although the Commission denies that the aesthetic advantage of underground as opposed to overhead wiring was the sole basis for the challenged determination, it, nevertheless, appears that the Commission did have the authority to order mandatory undergrounding on that basis alone....
>
> On the issue of preservation of environmental values, there was substantial evidence on which the Commission could base the conclusion that the undergrounding of distribution lines was aesthetically preferable to their being strung through the air, the record containing various expressions of opinion on the subject, in addition to the fact that undergrounding is mandated by the FHA and VA wherever economically feasible and is encouraged by the Public Service Commission of the states of California, Maryland, Arkansas and Michigan. Aesthetic considerations have already been judicially recognized as sufficient to support zoning regulations. (Matter of Cromwell vs. Ferrier 19 NY 2d 263; People vs. Stover, 12 NY 2d 462 app. dsmd. 375 US 42.) It further appears that there was substantial evidence before the Commission on which it could base a decision that the costs of undergrounding, as apportioned by it, were not unduly burdensome and met the test of reasonableness."
>
> (Opinion for confirmance, Hon. Ellis J. Staley, Jr.) Sleepy Hollow Lake, Inc. vs. Public Service Commission of the State of New York #22004, Supreme Court, Appellate Division, Third Judicial Department.

Thus we have a landmark ruling establishing the legitimacy of aesthetics as a purpose for the regulating of utilities.

Other Rules

In an order dated March 26, 1975, the PSC established rules pertaining to transmission lines (Phase III) not subject to the siting law (Article VII). Establishing a program of selective undergrounding, the rules provide for review of all proposed transmission facilities which might impact areas of significant cultural or aesthetic quality.

Rules implementing other phases of the undergrounding proceeding are still under review by the PSC. The obstacle to extensive undergrounding remains the high costs and the problem for the PSC is to fairly distribute the costs among the beneficiaries of the improvement. Should the general public which travels by it or the abutting property owners support all or the most of the cost associated with an improvement in the visual landscape engendered by undergrounding?

Plant Siting Problems

The problems associated with generation plant siting loom even larger as the sums to be invested are truly gargantuan* and the costs of operation equally frightening. There is much current debate about the extent of energy requirements for the future and the possible impact of conservation efforts, fossil-fuel shortage, and the technology of nuclear power generation. While these topics cannot be debated herein, they will directly affect the visual quality of the coastal zones.

Reliable estimates of the requirement for thermal plants on the Great Lakes indicate that by 2020 69,000 additional acres will be necessary for the construction of between 150-200 plant sites. If constructed on the lake shore this will mean occupation of 200 miles of shore out of 4,000. In addition transmission lines will necessarily occupy in excess of 100,000 acres.

Water Needs

Large amounts of water are required for cooling a generating plant, and for making up water lost in the process. Nuclear plants use 50% more condenser water than thermal fossil plants. The prodigious amounts of cooling water which are required makes location on large bodies of water necessary. Each foot that a plant is located back from the waters edge adds considerably to the cost for pumping and piping and adds to the energy requirement for plant operation. Thus trying to make a plant "less visible" by siting well back from the shore becomes prohibitive in most instances.

As more stringent water quality regulations preclude flow-through cooling, cooling towers become necessary. These are themselves very large structures which add to the visual burden and which consume 1/2 of one percent of the energy produced just to pump water to the tower.

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*$400 to $500/KW capital costs, $3 to $6/KWHR fuel cost

The Aesthetic Problem

It is almost a foregone conclusion that new plants will be visible, at least from the water. Fortunately the contemporary plant is generally well ordered. In some landscapes the stacks are a welcome relief from a drab landscape and an important navigation aid to sailors. More than the geometry of the plants are involved, however. Coal plants require extensive fuel storage areas and handling equipment and ash disposal areas as well. Where stack scrubbers are used an enormous volume of sludge may be manufactured which must be disposed of. Similarly equipment to filter stack gases produces large volumes of fly ash. Economical disposal of these waste materials does not always lend itself to aesthetic solution.

Planning a power plant involves a variety of considerations.* Aesthetic concerns cannot be subtracted from these or dealt with as a separate and distinct matter. The basic site analysis and the arrangement of the facilities upon the site have a tremendous impact on the final appearance of the complex.

Collaboration

The design problem is foremost one of collaboration between professionals, indeed teams of professionals integrating the diverse technologies, regulations, site conditions, and societal objectives into a comprehensive, functional plan, The scope of this effort is reflected in the exhibits required of an applicant utility under the NYS PSC rules. See Appendix A showing the documentation required for transmission facilities and Appendix B for the documentation required for a generation facility. It should be apparent that many of the subject areas will have a profound effect upon the visual aspect of the project. The utility is compelled to consider all of the factors.

The licensing procedure permits a full review of the proposals and facilities ultimately approved for construction will exhibit the least environmental and aesthetic impact possible.

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*See "What this Country Needs is a Good, Cheap Nuclear KWH Factory", Electric Light & Power, March 24, 1975

Appendix A

Exhibits Required for an Article VII Certificate of Environmental Compatibility and Public Need*

1. Exhibits Required for Both Gas and Electric Transmission Lines.

   Exhibit 1: General Information Regarding the Application
   Exhibit 2: Location of Facilities
   Exhibit 3: Alternatives
   Exhibit 4: Environmental Impact
   Exhibit 5: Design Drawings
   Exhibit 6: Economic Effects of the Proposed Facility
   Exhibit 7: Local Ordinances
   Exhibit 8: Other Pending Filings
   Exhibit 9: Cost of Proposed Facility

2. Additional Exhibits Required for Gas Transmission Lines.

   Exhibit G-1: Total Gas Supply
   Exhibit G-2: Market Data
   Exhibit G-3: Revenues, Expenses, Income
   Exhibit G-4: Construction of the Facility

3. Additional Exhibits Required for Electric Transmission Lines.

   Exhibit E-1: Description of Proposed Transmission Line
   Exhibit E-2: Other Facilities
   Exhibit E-3: Underground Construction
   Exhibit E-4: Engineering Justification
   Exhibit E-5: Effect on Communications
   Exhibit E-6: Effect on Transportation

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* 16 NY Codes, Rules and Regulations, Part 85 et seq. (1973)

Appendix B

Exhibits Required for an Article VIII Certificate of Environmental Compatibility and Public Need for Steam Electric Generating Facilities*

Exhibit A: Need for a Facility
Exhibit B: Engineering Designs
Exhibit C: Associated Transmission Facilities
Exhibit D: Cost Analysis
Exhibit E: Present Air Quality and Meteorology
Exhibit F: Facility Features and Operating Characteristics Affecting Air Quality and Meteorology
Exhibit G: Impact of Facility Features and Operation on Air Quality and Meteorology
Exhibit H: Present Aquatic Ecology
Exhibit I: Facility, Conceptual Design, Operation, and Maintenance Characteristics Affecting Aquatic Ecology
Exhibit J: Impact of Facility Construction, Operation Maintenance on Aquatic Ecology
Exhibit K: Present Environmental Sound Levels
Exhibit L: Facility Conceptual Design, Construction, Operation and Maintenance Characteristics Affecting Environmental Sound Levels
Exhibit M: Impact of Facility Construction, Operation and Maintenance on Environmental Sound Levels
Exhibit N: Regional and Site Geology
Exhibit O: Assessment of Potential Geologic and Seismic Hazard of the Site
Exhibit P: Facility Conceptual Design Criteria
Exhibit Q: Present Land Use and Aesthetics Characteristics
Exhibit R: Facility Conceptual Design, Construction, Operation, and Maintenance Characteristics Affecting Land Use and Aesthetics
Exhibit S: Impact of Facility Design, Construction, Operation, and Maintenance of Land Use and Aesthetics
Exhibit T: Waste Characteristics
Exhibit U: Waste Facility Features
Exhibit V: Impact of Waste Facilities and Discharges
Exhibit W: Present Terrestrial Ecology
Exhibit X: Facility Conceptual Design, Construction, Operation and Maintenance Characteristics Affecting Terrestrial Ecology
Exhibit Y: Impact of Facility Construction, Operation and Maintenance on Terrestrial Ecology
Exhibit Z: Present Water Quality and Quantity

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* 16 NY Codes, Rules and Regulations, Part 70, et seq. (1973)

Exhibit AA: Facility Features and Operating Characteristics Affecting Water Quantity and Quality

Exhibit BB: Impact of Facility, Construction and Operation on Water Quality and Quantity

Exhibit CC: Other Permits, Consents, Approvals, or Licenses, other than a Certificate from the United States Atomic Energy Commission, which will be required for the construction or operation of the facility

Exhibit DD: A copy of each Federal and State law, rule, regulation, or standard, interstate compact and international requirement applicable to the location, design, construction, operation, or maintenance of a proposed facility

VISUAL RESOURCES OF THE ST. LAWRENCE - EASTERN ONTARIO REGION

William E. Tyson

VISUAL RESOURCES OF THE ST. LAWRENCE-EASTERN ONTARIO REGION

William E. Tyson
St. Lawrence-Eastern Ontario Commission
Watertown, New York

Abstract

The St. Lawrence-Eastern Ontario Commission's service area is noted for its scenic and recreational resources. In our planning process, the Commission has indicated the importance of open space and visual resources in the region's economy. Our agency will be establishing standards and criteria to bring about development compatible with the area's natural environment.

VISUAL RESOURCES OF THE ST. LAWRENCE-EASTERN ONTARIO REGION

During the late 1960's, riparian land owners along the St. Lawrence River and the eastern Lake Ontario region--concerned over the rapidly changing nature of the lands along the waterway--contacted their elected New York State representatives with a request for assistance to ensure that land use changes along the waterway were compatible with the region's natural resource base.

Accordingly, in 1969 the legislature created the St. Lawrence-Eastern Ontario Commission. The major purpose of the Commission is to preserve, enhance and develop the scenic, historic, recreational and natural resources of the land along the waterway from the Canadian border at Massena to the Town of Sterling west of Oswego.

The region, for which our agency is developing a coastal planning and management effort, includes the very scenic Thousand Islands, barrier beach and dunal areas, and attractive limestone ledges. It has long been noted for its unique water-oriented recreational resources and has for decades served as one of the main resort areas serving the northeastern United States and southeastern Canada.

With the opening of the St. Lawrence Seaway and attendant changes in the movement of waterborne commerce through the Seaway into the upper Great Lakes, interests other than those associated with recreation and tourism began to view the area as a possible location for economic activities which without proper design and siting would not lend themselves to the natural environment and the nature of the region. As an example, among these interests were companies interested in locating additional petroleum tank farms and another company seeking to develop a very large cement, mining and manufacturing operation along a stretch of shoreline which contains some of the highest assessed evaluation along the waterway.

These, then, were the type of visual changes which were in the offing and which were being perceived by the residents of the region.

Over the past four years the Commission and its staff have also developed an awareness of the visual trespasses on the lands along the waterway. However, we feel a much more serious problem than the massive developments such as tank farms or cement operations is the piecemeal deterioration of the visual quality of our region. We also find that, of the four major areas of pollution (that is water, air, noise and visual pollution) that one of the hardest concepts to sell is the possible negative impact of visual pollution.

For the next few minutes I'd like to share with you our perception of the environment along the waterway in the service area of the St. Lawrence-Eastern Ontario Commission. I believe that the brief slide show which we have prepared and which we use in the day-to-day activities of the Commission, will transfer a fairly comprehensive view of the conflicts for land along the waterway and the resulting degradation of the visual resources of our region.

The St. Lawrence-Eastern Ontario region of New York State is endowed with unique scenic beauty, is rich in the history of our land, and possesses one of the great commercial waterways of North America. It provides a livelihood for its residents and a playground for hundreds of thousands of visitors seeking relief from the day-to-day pressures of our urban society. In addition, the St. Lawrence Seaway provides a link to the nations and markets of the world and power for the northeastern United States and southeastern Canada. The continued development of the region will provide substantial local, state, and national benefits. However, it is essential that growth be compatable with the region's environment.

During the early days of colonization, the area was sparsely settled. Owing to the great wealth of natural resources, there was a minimum impact upon the ecological systems of the region. Economic activities throughout the area relied upon the natural resource base for a number of commercial operations, utilizing the area's forests, fields, and waterways. During the past decade, however, many changes have occurred in the use of the lands and the waters of the St. Lawrence River Valley and eastern Lake Ontario. These changes, occasioned by a series of national trends, have placed increased pressure on the resources of the lake/river region. A growing population, increased leisure time, and the mobility of the public in general are but some of the factors influencing land use changes throughout the region. Add to this such economic factors as a decrease in rural employment opportunities and a decline in farm population, and you begin to realize the many components involved in keeping an area economically viable while at the same time sustaining its environmental quality.

As an example, the completion of the interstate highway system to our area has placed millions of people of the New York/New Jersey metropolitan area only a little over six hours from our doorstep.

The result of these demands has been a deterioration of the water, land, and scenic resources of our area and has provided little lasting economic benefit to the vast majority of our residents.

In addition to the impact on the area's resources by man, nature also continues to cause problems. Beginning in the early 1970's, excessive precipitation in the Great Lakes Basin, and specifically in the Lake Ontario Basin, has created a high water problem. In this decade Lake Ontario has reached peak levels rarely equaled during the period of record. Since it has been twenty years since such excessive lake levels were recorded, we find hundreds of new developments in areas which under normal water level conditions are protected. However, with high lake levels and storm surges, we find that many of the new developments have been placed upon very fragile and vulnerable coastal sites. During the spring of 1973 the St. Lawrence-Eastern Ontario Commission held two conferences to inform the public of the extent of impending problems and provide property owners the technical advice and assistance needed to minimize damage to lands along the waterway.

Some results of the high water have been erosion and deterioration of public beaches, erosion of some major natural resource areas, and the eroding away of private property developed over the past two decades. Currently, the only solution appears to be the lowering of lake levels.

The St. Lawrence Seaway may be a great boon to inland cities on the Great Lakes, but it has had little positive impact on the economic base and the natural resource base of the St. Lawrence-Eastern Ontario region. One constant threat to the natural resource base is the possibility of a major oil spill, which indeed would have a serious long-term impact on many of the area's water-related resources. In the spring of 1974 such a mishap did occur with a spill of approximately 175,000 gallons of oil into the St. Lawrence River. Fortunately, the area where the spill occurred was an open stretch of waterway; much of the oil was trapped, and the oil that did proceed downstream did not enter areas where it would have a serious long-term impact.

One of the most valuable resources associated with the coastline is its wetlands. Statistically it can be noted that well over half the wetland acreage immediately adjacent to the St. Lawrence River and Lake Ontario has lost its natural resource productivity.

With increased pressures for boating facilities and other services to a growing transient population, we find that those sites which most readily lend themselves to development are in many cases the wetland units along the waterway. The importance of these wetland units cannot be overemphasized. They provide areas for the production of waterfowl and spawning areas for our fisheries. They also provide open space and areas for the propagation of the non-consumptive resources of interest to many of the tourists who frequent

the area. In addition, the marshes provide a filtering system so that upland silt and sediment do not reach out and cover the gravel spawning beds of those game fish which prefer the lake and river for their propagation.

Another important and endangered physiographic province within the service area of the Commission is the very beautiful, yet fragile, sand dunes of southern Jefferson County and northern Oswego County. An extremely limited, yet valuable resource, the dunes are being degraded by the trespass of man. Of all the areas along the waterway which present developmental problems, it is the fragile, shifting dunes that pose the biggest problem to those who seek to develop. In many cases, the vast wetlands of the St. Lawrence-Eastern Ontario region--even those which have come under public ownership--are being threatened as high water level and development erode away the barrier beach and associated dunal areas.

Yet another limitation to development of the region is the fact that, occasioned by the relatively recent glaciation of the area, much of the soil normally available to accept sewage, provide good drainage, and permit construction has been scoured away and we are left with vast areas of bedrock where the only cover available is a very thin layer of lake clay. Since the capacity to absorb and to treat the runoff from development is limited throughout much of the region, we must provide a planning process which will identify good land-use practices and appropriate environmental protection systems. Without the adoption of good development practices, a rapid aging of some of our shallow waterways will occur. During the past decade, a period of accelerated land-use change, we find excessive expansion of weed beds which, as the water goes down in the fall, prevent utilization of the area for boating, swimming, fishing, and other forms of recreation.

While there is a great need to protect the environmental resources of the lake/river region, it should be remembered that those same resources also must be utilized to provide employment and additional job opportunity for the residents of the region if the economy of the area is to grow. With the adoption of good land-use practices and the application of a series of good design and engineering criteria, as well as an appreciation for the siting of development, there is room along the waterway for all types of economic opportunity. While much of the area is blessed with the Thousand Islands and the beaches of eastern Lake Ontario, other areas of the region have long lent themselves to industrial and port development. As the region develops, there will be an opportunity for increased employment in the areas of manufacturing and commerce. The relationship of the coastal region to our Canadian neighbors is very important in terms of economic opportunity. Port areas such as Oswego, Ogdensburg, and Waddington all have additional lands available for economic development--a potential which surely will be recognized.

In other areas, economic opportunity could evolve around the development of the historic sites associated with northern New York. For instance, battles were fought at Sackets Harbor during the War of 1812--a war sometimes referred to as "The Second War of Independence." The Canadians have capitalized upon their regional heritage with developments such as Upper Canada Village and the program at Old Fort Henry. We should utilize the resources provided by areas such as Madison Barracks at Sackets Harbor, the French influence at Cape Vincent and Ogdensburg, and the many other historic sites along our waterway. Fort Ontario has provided some stimulus to the economic base of the Oswego area. Throughout our area we find many additional opportunities for this type of increased economic activity.

Yet another area of opportunity which needs to be explored further is the possibility of increasing the agricultural base of our region. Recently, some of the dairy operators have begun the transition to a beef industry.

Yet another economic resource which as yet has not been tapped, to its full potential, is the opportunity to extend the tourist season and to provide some additional outdoor recreation activities during the winter months. In some cases, communities have taken advantage of this, such as Sackets Harbor, with its annual North Country Fishing Derby.

These are but a few of the factors which must be considered if the St. Lawrence-Eastern Ontario region is to support an increased population. While many of the people who frequent our region are concerned about recreation of a consumptive nature--such as fishing and hunting--a vast majority of the people are interested in the open space and the opportunity to swim, relax, sightsee, and to simply enjoy the beauties of the waterway. Only by proper utilization of all of these resources will the lands and waters of our region continue to provide a life-support system for the area's population and for those future generations that will inherit the area and call upon it for their livelihood. Unless steps are taken to provide an orderly growth process, the major resource possessed by the fragile coastline--its scenic and open space characteristics--may be lost to future generations of New Yorkers.

This is how the St. Lawrence-Eastern Ontario Commission views the environment in which we must conduct our planning process. Our feeling is that, in order to produce a credible plan for the orderly growth of the region, that we must not only honor the open space and the natural resource characteristics of the area, but we must indeed continue to provide additional employment opportunity as appropriate. Our feeling is, that, while opportunity is limited, there are some opportunities to expand upon existing economic activities, such as recreation and agriculture.

As one element of the planning process we have therefore indicated the role open space and scenic resources play in the recreation economy of our area and will seek to establish standards and criteria aimed at bringing about development compatible with the area's resource base. But only if indeed we pay respect to the visual nature of our area. For it is this visual characteristic which if indeed is kept intact will contribute greatly to the future productivity of our region.

Editors' note: although not presented at the conference, this paper was received subsequently and deemed an appropriate addition to the proceedings.

VISUAL ANALYSIS OF CAPE MAY COUNTY BARRIER ISLANDS, AND APPLICATION TO WASTEWATER FACILITY DESIGN PROBLEMS

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Abstract

Visual Analysis procedures were key components in the site selection and design specifications of wastewater treatment plants on the barrier islands of Cape May County, New Jersey. Consideration of the varied experiences and viewpoints within the islands, and analysis of the topography, vegetation, building textures, street scenes and water areas revealed solutions to the problems of location and design of facilities in densely populated areas. Utilization of a "natural" design theme with careful siting of buildings and structures led to community praise of the prototype facility model.

Purpose of Study

The Cape May County Municipal Utilities Authority (CMC MUA) selected a county-wide system for wastewater treatment and disposal in 1973. The consulting firm of Pandullo, Quirk Associates was retained to develop the selected plan, consisting of the following major elements:

- barrier island treatment and ocean disposal facilities to be located in three coastal regions
- mainland treatment and land disposal facilities to be located in two inland regions

In 1974 the CMC MUA authorized initiation of engineering and environmental work specifically directed to the selection of sites for barrier island treatment facilities and the determination of service routes within the coastal zone.

Cape May County, located in Southeastern New Jersey, has a total area of 267 square miles, with a permanent population of 60,000 and a summer population of 550,000. The dominant tourist economy is concentrated in the coastal area, and is defined by a series of

barrier islands bounded on the east by the Atlantic Ocean, and on the west by an extensive back bay area of waterway, marsh and wetland.

Ocean City is typical of the barrier islands under study: approximately 7 miles in length, with average width of ½ mile; flat topography, and dense urban development occupying almost the entire buildable area. (Fig. 1)

The object of the study was to locate sites and routes on three barrier islands which conformed to engineering, environmental, planning and aesthetic criteria, and to inform residents that a sewage treatment facility located in their community could be compatible with their economic and social sensitivites. It was apparent that there existed a general acceptance of the necessity of eliminating widespread water pollution, but that the location of facilities in the designated region was not a welcome addition to the community.

Methodology

Professionals with various technical backgrounds within Pandullo, Quirk Associates were assigned the task of selecting, analyzing and recommending sites and routes to the CMC MUA and to the public at large. Those disciplines were as follows:

Engineering
Community Planning
Terrestrial and Aquatic Biology
Architecture
Systems Analysis
Geohydrology
Landscape Architecture
Environmental Science

The natural, social and economic characteristics applicable to the siting of a wastewater treatment facility were investigated in order to form the basis for selection of the sites and routes.

Investigation of these characteristics was carried out in the office by review of existing reports, studies, and planning documents, and by close scrutiny of aerial photographs; and in the field by the entire team of specialists performing repeated automobile and pedestrian surveys of the region, as well as detailed study of sites under consideration.

This paper is concerned with the visual aspects of the environment, and it must be emphasized that while the scope of the study dictated a comprehensive analysis of the communities, visual elements could not be separated and analyzed outside of the context of the

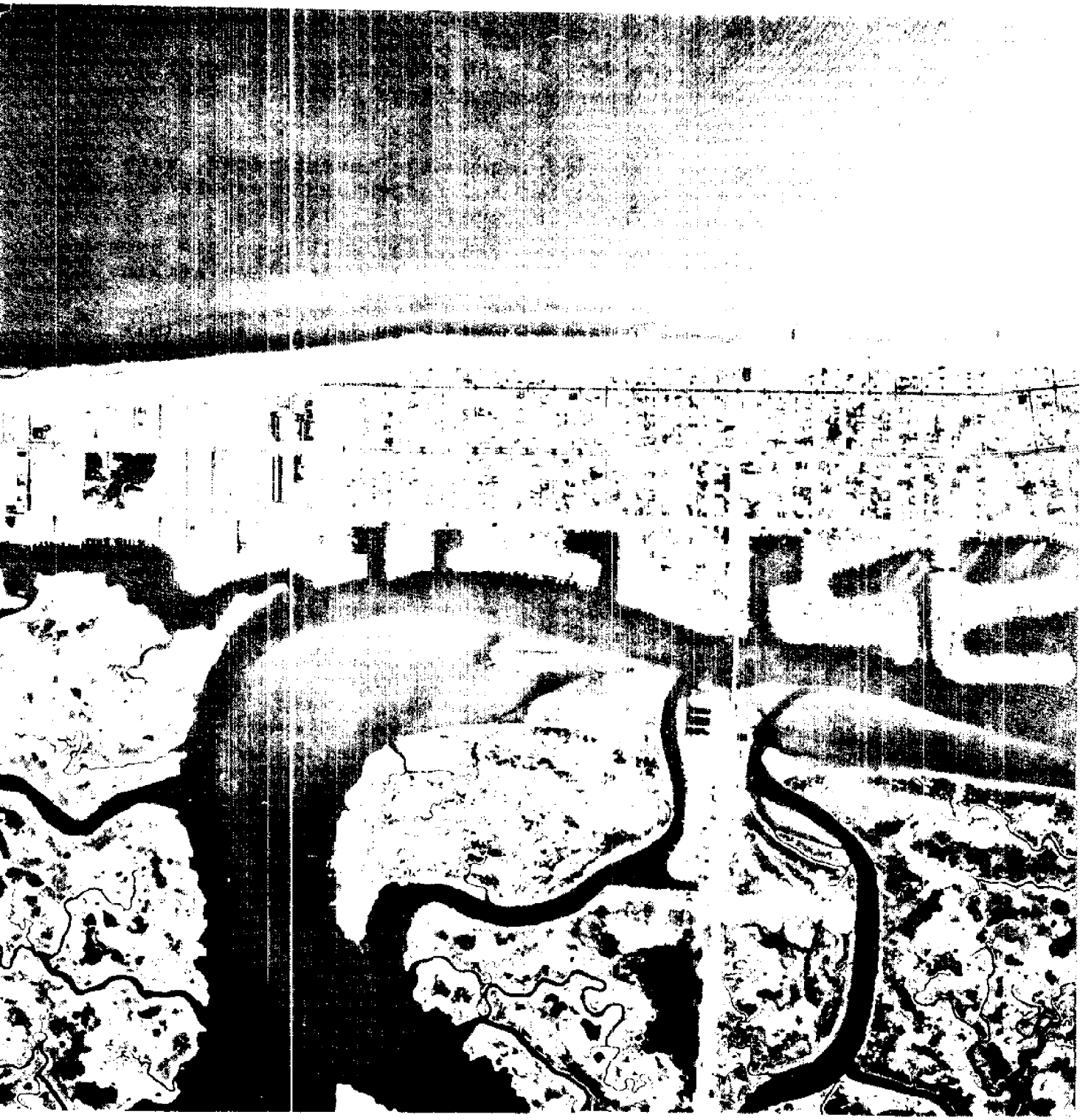


FIG. 1 Aerial View of Ocean City, New Jersey

study objective. In fact, all of the professional disciplines involved recognized the importance and sensitivity of the visual environment.

The entire range of visual experiences was investigated, with consideration given to the varied references and viewpoints existing within the region. These included:

- observation from moving vehicles, with emphasis upon the approaches to the region and orientation within the natural and man-made landscape
- pedestrian movement; the time and intensity of leisurely perceptions
- fixed viewpoints; existing and potential framed vistas and panoramas
- boat traffic; duration and variability of views from slow moving water traffic

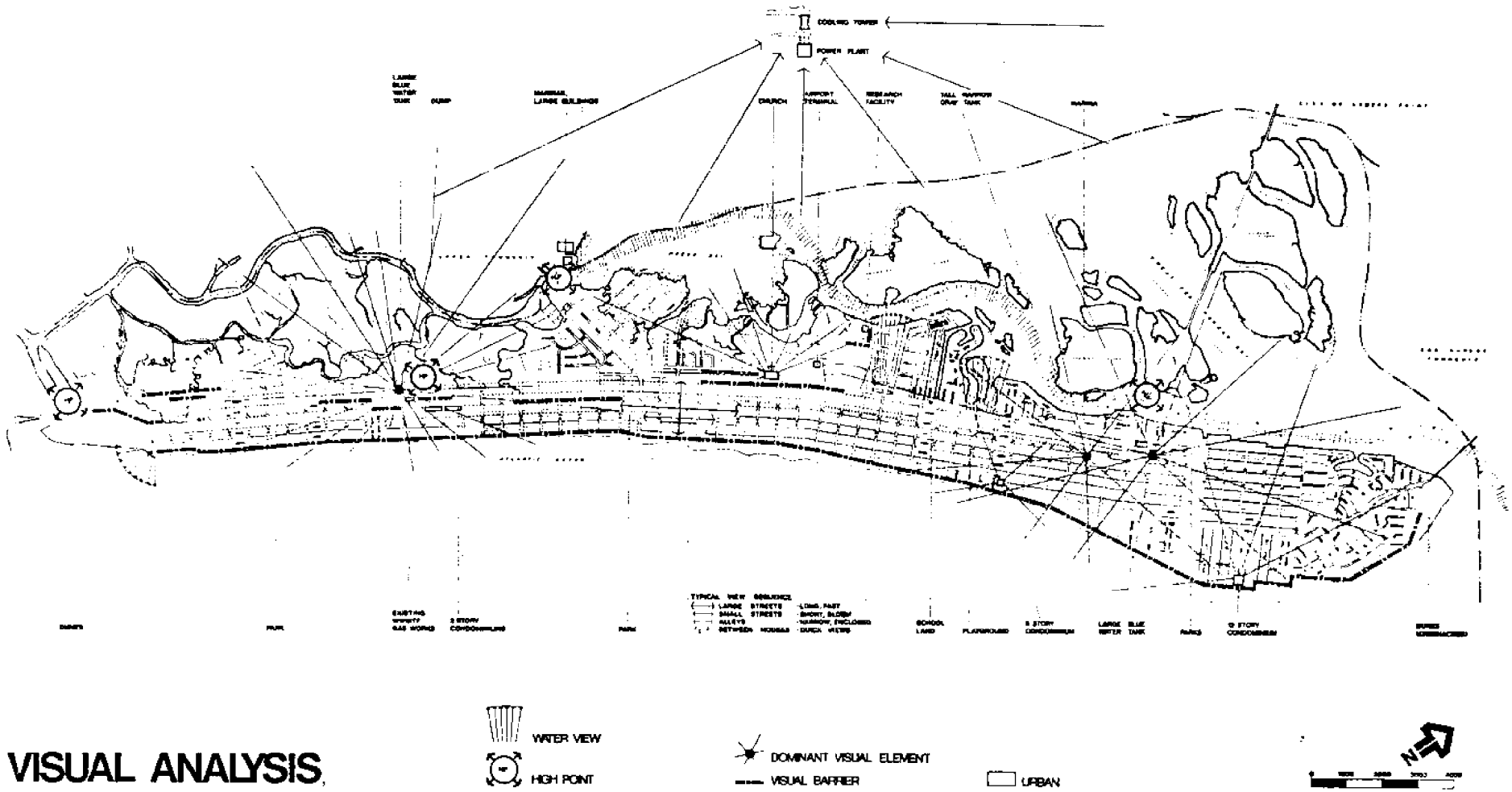
Visual Description of Region

The dominant distant visual experience upon entry into the barrier island regions of Cape May is one of broad bands of water and sky, separated by the narrow line of the islands. The elevation ranges from an average of +6' to +10' throughout the islands, to high points of +15' to +30' in limited dune areas. Thus, the horizon line defines "place," and the vertical elements such as water towers and high rise buildings occurring at one-half to one mile intervals become significant nodal points which punctuate the horizon. These vertical elements also define the commercial centers, and serve to orient the approaching traveler. (Fig. 2)

Once in the urbanized areas of the barrier islands, a rectilinear street plan imposes a rigid set of constraints upon the range of visual experiences and textures. North-South axes are wide, and this width is emphasized by the low scale of the fronting buildings. These streets yeild distant perspectives to the vanishing point, emphasized by the repeated rhythm of utility poles, with no finite termination or focal point.

The gaps caused by the breaks of the cross streets are lost in the continuous rhythm of the buildings, and become apparent only fleetingly at the point of intersection. These smaller perspectives become reduced in scale as the street pattern gives way to the narrow corridors of alleys, and the even narrower spaces between buildings.

The only high points which can provide an elevated viewpoint and thus display the ground/water plane are from bridges, (where views are extended by a pause for tolls or traffic delays), occasional tall buildings, and tops of sand dunes. These elements,



VISUAL ANALYSIS

SITE SELECTION REPORT Ocean City Region

Cape May County Municipal Utilities Authority

Pandullo, Chrisbacher and Associates 545 Tilton Road, Northfield, New Jersey

(FIG. 2)

however, are limited and relatively isolated.

It is noteworthy that there is little visual awareness of the back bay and ocean within the urbanized corridors of the barrier islands due to intensive building at the water's edge, and the richly textured centers of boating activity are only rarely seen from cross streets.

Generally, structures are undistinguished, but of a relatively fine scale which is unified by the grid pattern of the streets. This pattern is strongly contrasted by the high-rise residential structures which stand out against the more restrained fabric of the urban area.

There are exceptions to the limited visual experiences. Occasional curvilinear street systems are relaxing, and public "malls" and playgrounds provide large, well defined open spaces. Some open vistas across the back bay occur where major avenues parallel undeveloped land. In isolated areas, dunes and thickets have been preserved as parks or sanctuaries and these natural "intrusions" come as surprises in an urban environment.

An important visual corridor arises from travel along the Inland Waterway. Here, travel is relaxed, with few of the distractions that characterize land travel, and thus visual experiences are intensified. From the water, buildings are always evident and are part of the total experience (from the land, disruptive). Obviously, the ocean is the magnet which is the ultimate attraction of the region. It is almost never seen until the barrier of buildings, boardwalk, or dunes is crossed. Once on the beach, however, the eastward view of ocean is enforced by the wall of buildings to the west. The limited dune areas can soften this effect, but the essential visual experience is not one of pure natural "coastline"; it is too dominated by human activity.

Prototype Site

Site selection and design parameters were based upon technical engineering requirements, availability of buildable sites and the observed visual characteristics. It was assumed that:

1. Altered wetlands in the back bay area, approximately 20 acres in extent, would have to be utilized.
2. These sites could not be completely isolated from residential areas.
3. The facility would include diverse structures and elements arranged for mechanical efficiency and elevated for flood protection.

4. Removal of sludge and delivery of materials would create service and access functions.
5. Certain objectionable elements would need visual concealment and/or wind protection.
6. The facility had to serve a public function, with environmental displays, meeting rooms, and possible accessory marine or park use.

A prototype design was developed for a theoretical site incorporating the above elements and representing a typical cross section of the islands.

Each of the sites under consideration had these elements in varying degrees of intensity and proximity, and it was felt that the design reponse would be applicable, with modifications, to the selected sites.

Visual Design Considerations

As we have seen, on the Cape May barrier islands natural elements are the exception rather than the rule. A primary objective of facility design must be to preserve, enhance, or create natural environments. A natural design approach will enrich the visual environment and provide valuable wildlife habitats much better than a formal "landscape" or park design, although the latter treatment must be retained occasionally to provide balance and order. Elements of the prototype site design which were developed in response to the visual characterisitics of the region are:

1. Use of earth features for land form diversity and gradual transition to structures. These forms will soften the horizon intrusion, screen facility features, and provde elevated situations for plant material. They also create and frame views.
2. An "informal" building and tank layout and a curvilinear approach road. Relief from the strict geometry of typical treatment plan layout provides diverse forms and spatial treatment, and can relive the impact of rectilinear street patterns.
3. Use of wetlands. Depending upon individual site characteristics, wetlands can be preserved, restored, or created, thus bringing more back bay views to the public.
4. Use of natural vegetation. The variety of indigenous material (marsh grass, reeds, wildflowers, thicket shrubs and evergreen trees) provides a rich landscape palette and valuable wildlife habitats. The majority of the site would be planned as rough nature: thickets, dunes, grasslands and

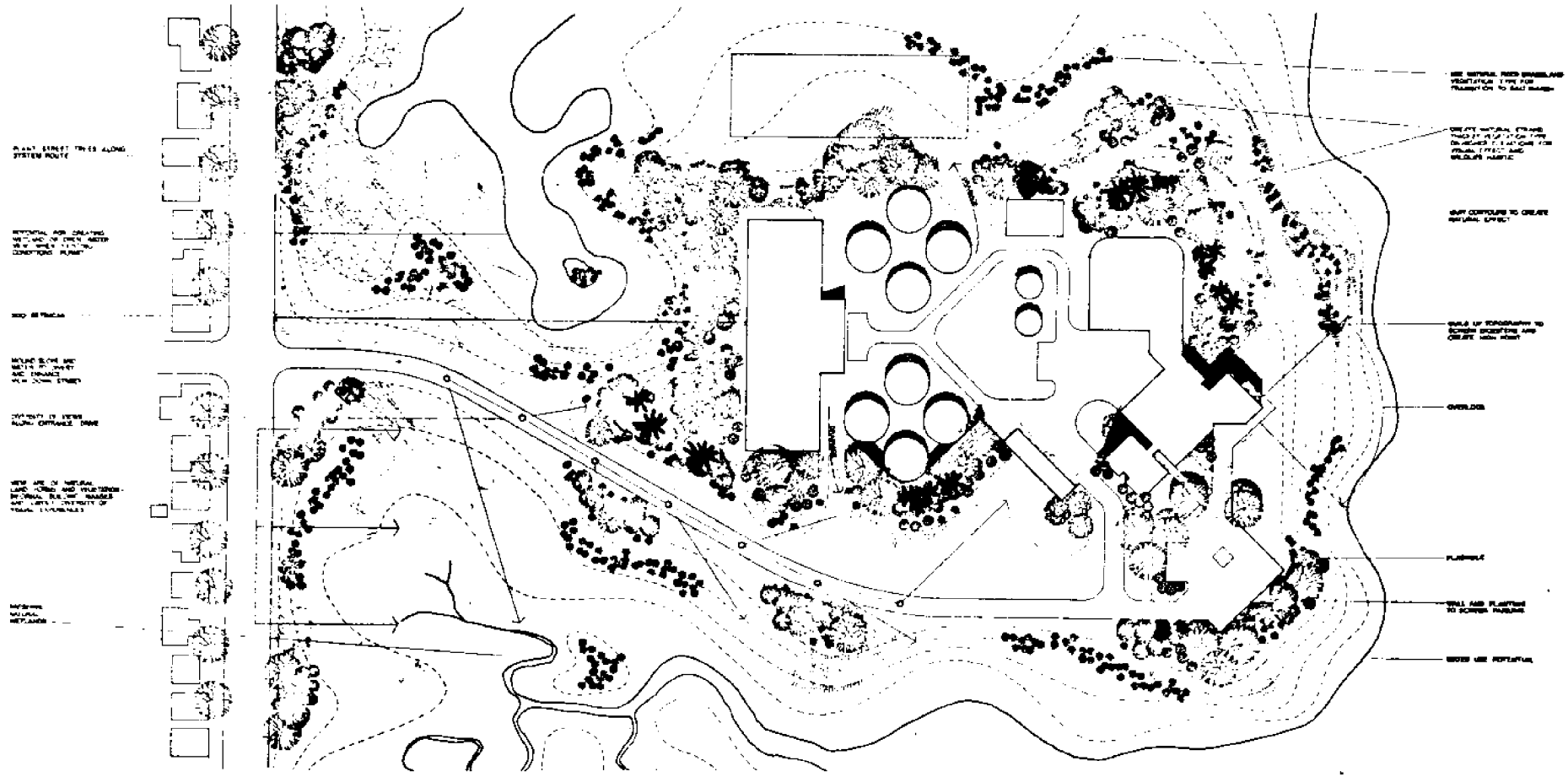
salt marshes. Along roads and near entry points, however, a more refined approach is needed to provide more uniform textures and less visual complexity.

5. Orientation of the public and administrative functions toward the back bay rather than the street. This enhances the waterway views and provides potential for environmental demonstration areas and public marine use.
6. Use of varied building forms and textures to sympathize with the local architecture and to avoid the "industrial municipal" look.
7. Planting of street trees along service routes. Few now exist, due to social rather than natural reasons, and trees provide welcome relief in the urban summer environment. (See Fig 3)

Conclusions

It was apparent that the visual aspect became the controlling factor in site selection, both to the technical team involved in the study as well as to the community. Intimate knowledge of the region, recognition of critical visual elements, and the utilization of these elements in the design, have led to community praise of the project. This is especially significant, as the public attitude was entirely negative to the concept of of sewage treatment plant. This negative attitude, to be sure, was based upon their perceptions of treatment plants. It can be concluded that acceptance of the facility as a positive visual contribution was based upon analysis of a total visual experience, and the overall visual quality of the area.

The qualitative visual analysis provided a satisfactory and valid design basis, and served as a valuable catalyst for the development of the design concepts and the expression of these concepts to the public. The brief time available for the study, however, and the absence of seasonal observation, was felt to be a limiting factor. A greater sense of the community's visual perceptions would be valuable, and could be gained through surveys and interviews. We intend to quantify the visual experiences in future studies, with appropriate determination of viewing distances, screening density, perception zones, sequential analyses, etc. We regard these as a means to refine the initial visual observations and to confirm community perceptual attitudes.



PROTOTYPE SITE

SITE SELECTION REPORT Ocean City Region

Cape May County Municipal Utilities Authority

(FIG. 3)

Pandullo, Chrisbacher and Associates 545 Tilton Road, Northfield, New Jersey

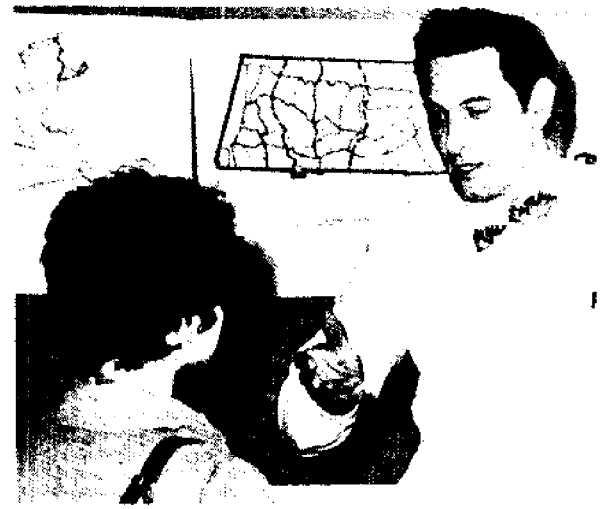
WORKSHOPS

30 MAY 1975

10:30A.M. - 12:30 P.M.

The workshop sessions raised issues more than producing solutions. The sessions encouraged people from various disciplines and viewpoints to find a meeting ground in their common concern for visual quality. Academicians, planners and citizens-at-large searched for a common language for addressing their mutual concern. Workshops also stimulated participants to begin considering how visual quality-related research can be applied in real situations in the public arena.

VISUAL QUALITY WORKSHOPS



Conference participants were able to share ideas informally in a workshop setting.

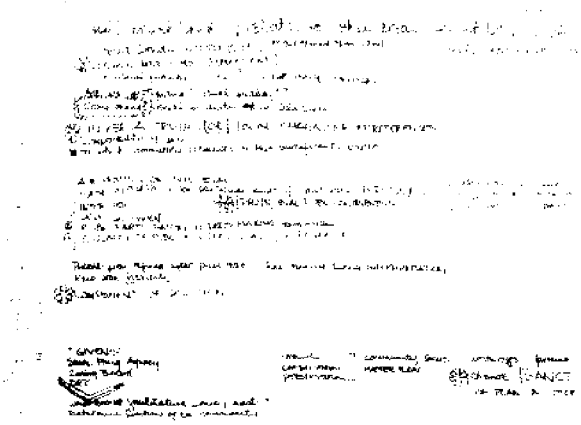
They were asked to discuss the incorporation of visual quality criteria in the planning process. Specific hypothetical situations were provided to focus the discussion.

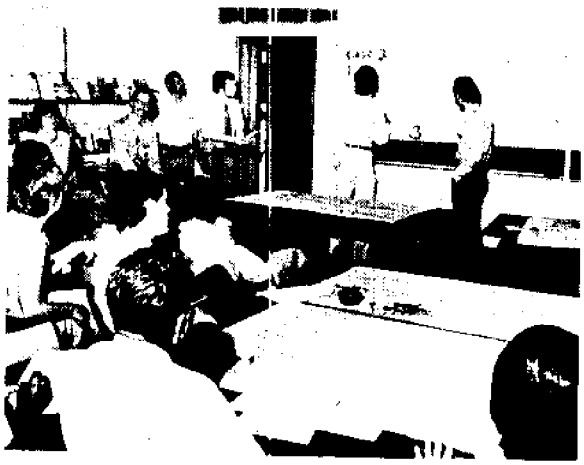
A choice of 3 case studies was offered:

* industrial shoreline development
* residential shoreline development
* multi-use development of natural areas

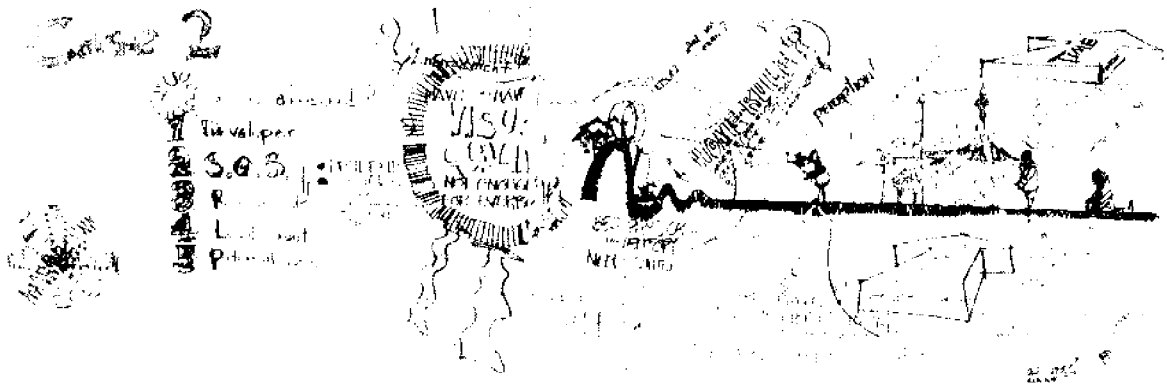
For each case study, a proposed plan for development and background information were provided.

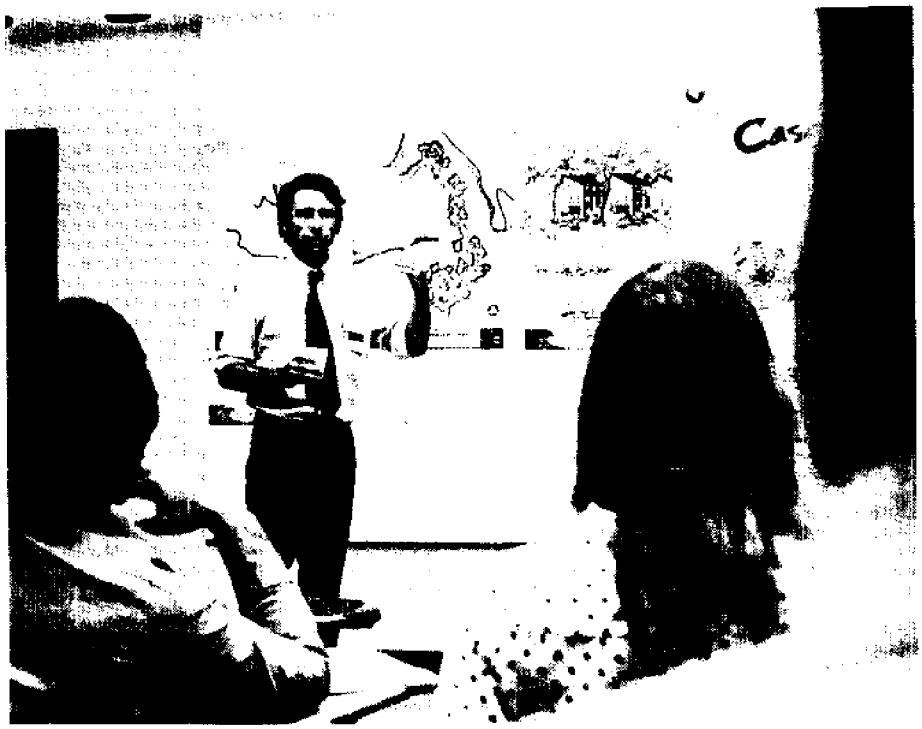
After workshop leaders had described the case study, participants worked in small groups at drafting tables. They recorded their views of relevant issues on large sheets of paper.

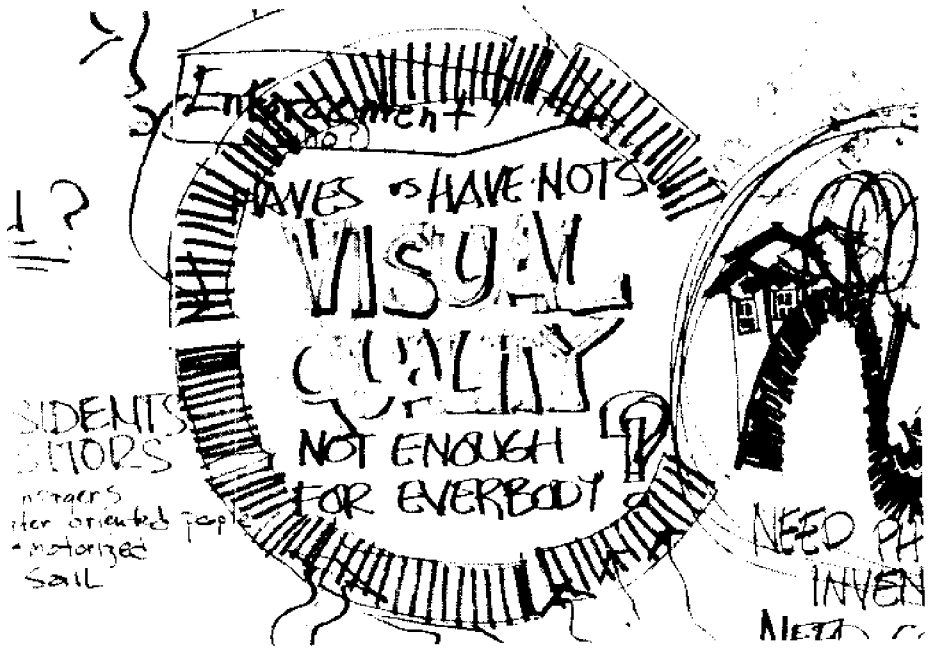




Each large case study group then re-assembled to synthesize its ideas. Suggestions were recorded graphically and then reported to the whole group.





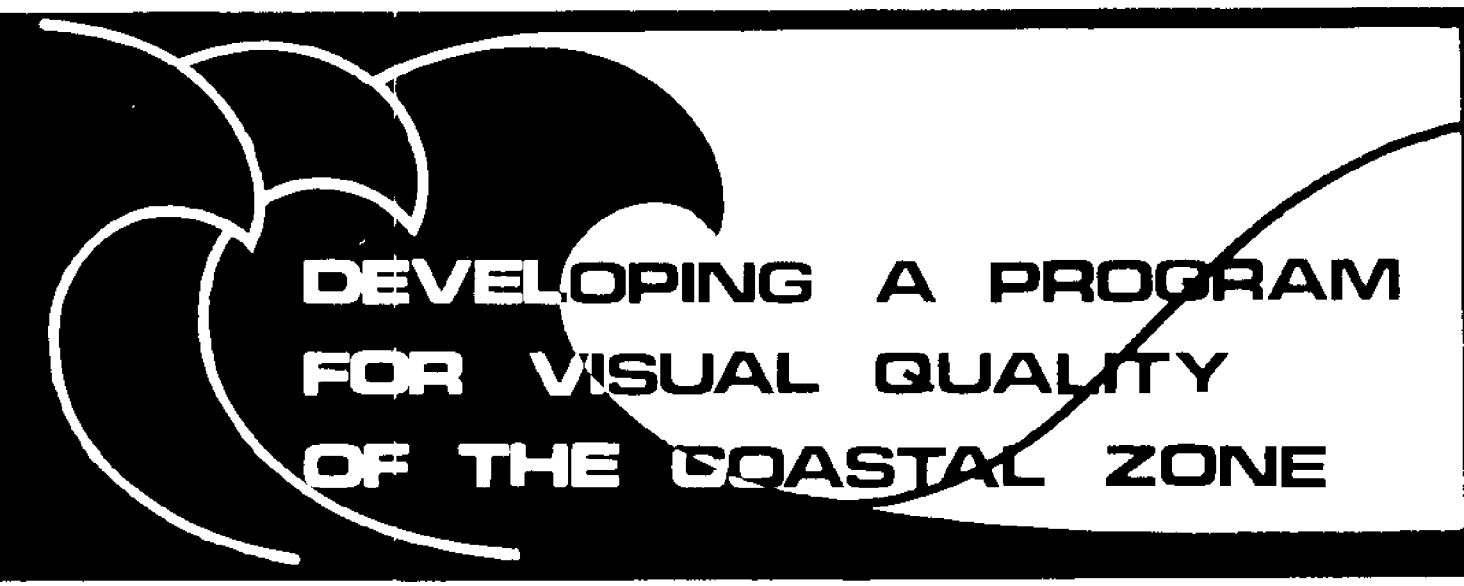

HAVES vs HAVE NOTS
VISUAL
QUALITY
NOT ENOUGH
FOR EVERBODY
INVEN

CASE STUDIES

WORKSHOP ON VISUAL QUALITY AND THE COASTAL ZONE

Sea Grant Project, School of Landscape Architecture

SUNY College of Environmental Science and Forestry, Syracuse, N.Y.



CASE STUDY INTRODUCTION

Industrial, commercial, housing and recreational demands have placed heavy developmental pressures on the coastal zone. In planning for orderly development, decision makers have referred to economic criteria as well as land suitability, land-use patterns, and protection of resources. The visual resources of the coastal zone have yet to be integrated on an equitable basis in the planning process.

This workshop will focus on potential conflicts between development demands and maintenance of visual quality. The primary objective will be the simulated development of a program for the analysis of visual quality that would be useful for dealing with such conflicts in coastal zone management, planning, and design.

The workshop will be based on a particular type of potential development within a specific context. In relation to a particular case study, the following general questions will be addressed:

1. What planning issues are encountered in this situation and what is the relationship of visual quality to these issues, if any?

2. What significance is visual quality likely to have for the groups of users involved in this situation?

3. How can visual quality be evaluated comprehensively in this context? What methods should be used to gain more information for this evaluation?

4. How can visual quality evaluation data be incorporated in the planning process?

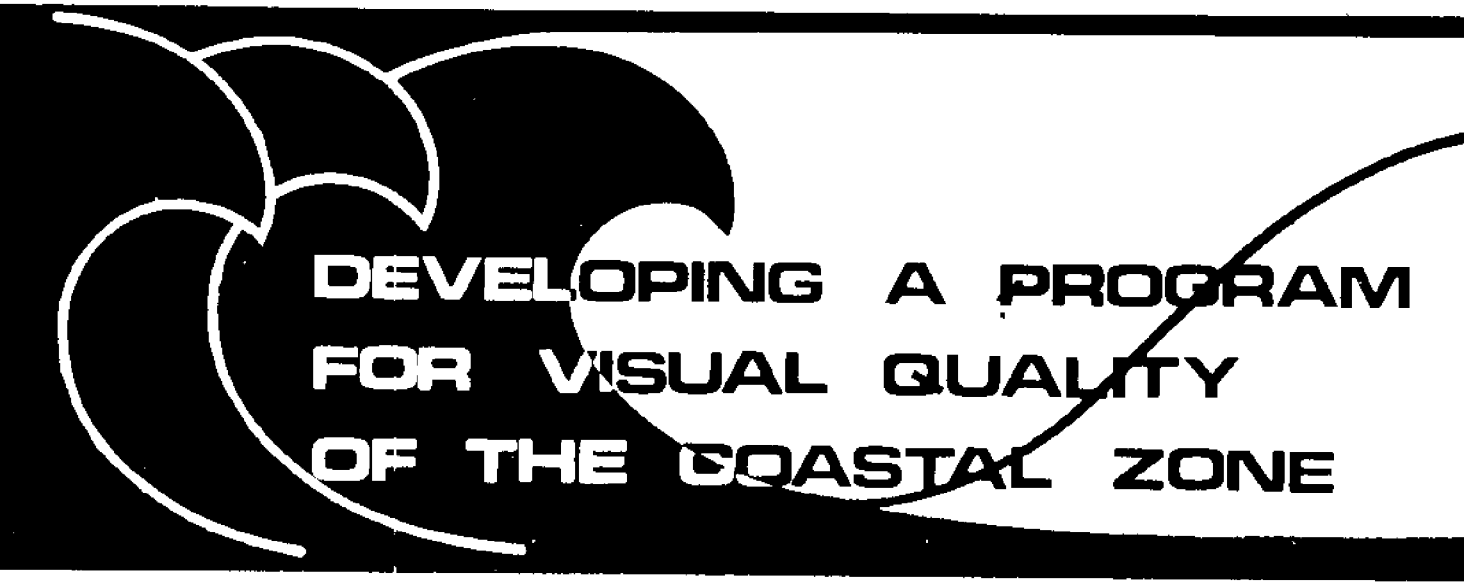
5. Who makes, or should make decisions on the approach to be used to maintain coastal zone quality? What group or groups should be involved--management, public administration, interest groups, the general public?

CREDIT: The following offices supplied graphics for use in the base studies:

Reimann Buechner Partnership
Everett H. Jenner - AIA Architect

CASE STUDY 1

INDUSTRIAL SHORELINE DEVELOPMENT
FOSSIL FUEL POWER PLANT



WORKSHOP ON VISUAL QUALITY AND THE COASTAL ZONE

Sea Grant Project, School of Landscape Architecture

SUNY College of Environmental Science and Forestry, Syracuse, N.Y.

Case Study #1
Industrial Shoreline Development--Fossil Fuel Power Plant

DEVELOPMENT RATIONALE

The increased demand for power in New York and the Northeast has been accelerating over the past two decades. This demand has placed an undue burden on older existing plants. The proposed lakeside fossil fuel facility will satisfy the region's projected additional power needs for the next fifteen years.

LOCATION

The riverside site has been selected on the basis of the following criteria: cooling water availability, air pollution criteria, property aquisition, and rail access.

The site is located on a slight rise above the lake front in an agricultural setting.

PHYSICAL DESCRIPTION

As depicted ir the illustrations, the main facility includes:

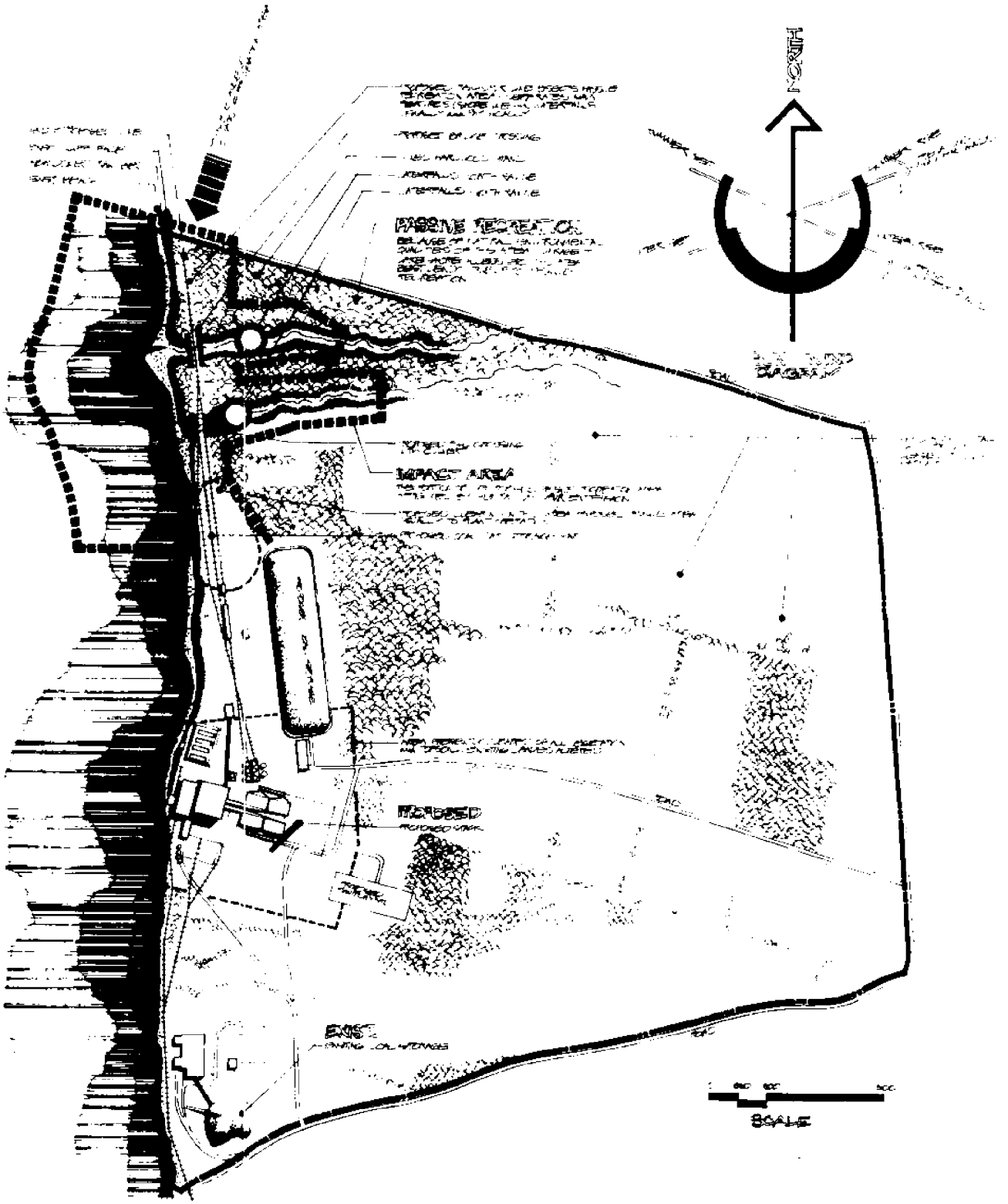
Turbine building,
Stack (variable configuration),
Transmission switchyard,
3-345 KV Transmission lines (variable tower shapes)

PRINCIPAL VIEWERS

Adjacent farmers - 200 pop.
Recreational sailors - 12,000 user days/yr.
Recreational fisherpeople - 3,000 user days/yr.
Village (5 miles) - 4500 pop.
State Park (1 1/2 miles across lake) - 31,000 user days/yr.
Cottage owners (3 mile radius) - 175 units

DECISION MAKERS

S.O.S. - Save Our Shores - Citizen Conservation Group
Municipal Zoning Board - Rezone from rural residential to heavy industry.
County Commissioners - Construct new access road to site.
State Environmental Conservation - Water and air quality permits.
State Public Service Commission - Certificate of environmental compatability and public need.



DEVELOPING A PROGRAM FOR VISUAL QUALITY OF THE COASTAL ZONE

CASE STUDY 1 PLAN

INDUSTRIAL SHORELINE DEVELOPMENT – FOSSIL FUEL POWER PLANT

S U N Y COLLEGE OF ENVIRONMENTAL SCIENCE AND FORESTRY SCHOOL OF LANDSCAPE ARCHITECTURE

NEW YORK STATE SEA GRANT PROJECT MAY 1975

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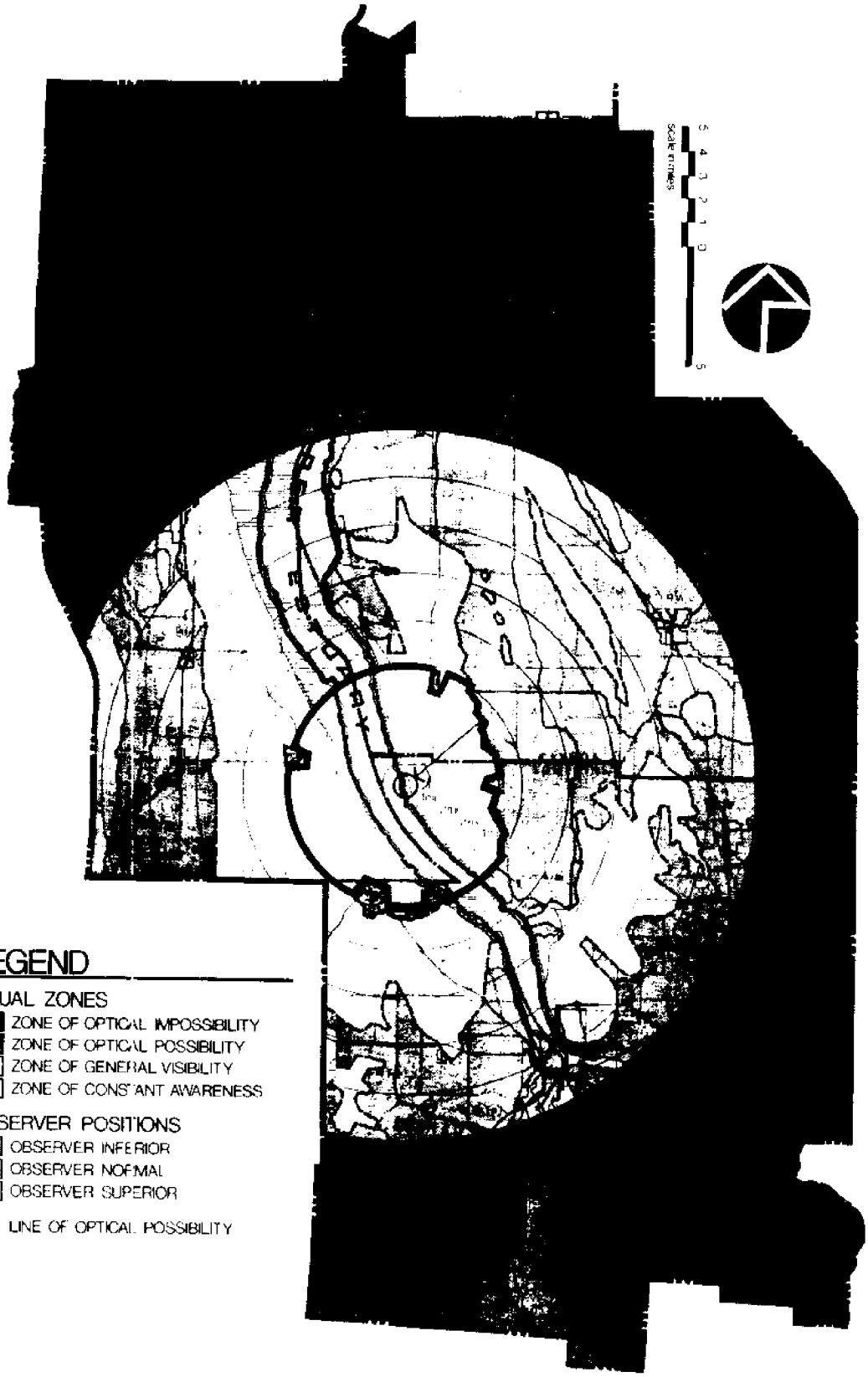

LEGEND

VISUAL ZONES

- ZONE OF OPTICAL IMPOSSIBILITY
- ZONE OF OPTICAL POSSIBILITY
- ZONE OF GENERAL VISIBILITY
- ZONE OF CONSTANT AWARENESS

OBSERVER POSITIONS

- OBSERVER INFERIOR
- OBSERVER NORMAL
- OBSERVER SUPERIOR

LINE OF OPTICAL POSSIBILITY

DEVELOPING A PROGRAM FOR VISUAL QUALITY OF THE COASTAL ZONE

CASE STUDY 1 AUXILIARY INFO.

INDUSTRIAL SHORELINE DEVELOPMENT – FOSSIL FUEL POWER PLANT

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NEW YORK STATE SEA GRANT PROJECT MAY 1975

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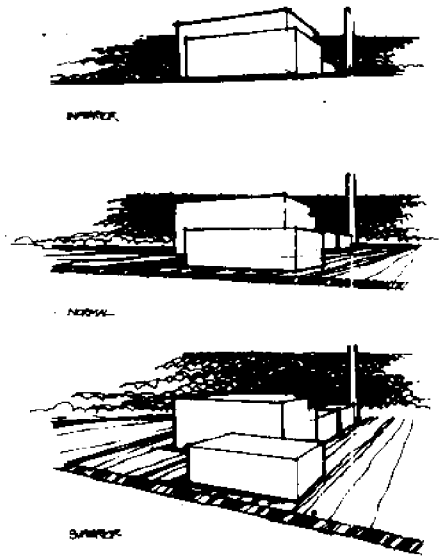
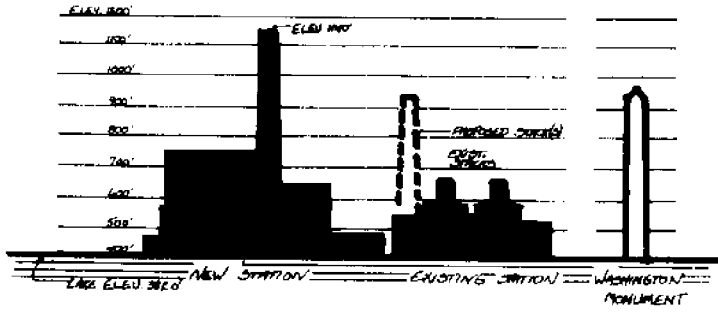
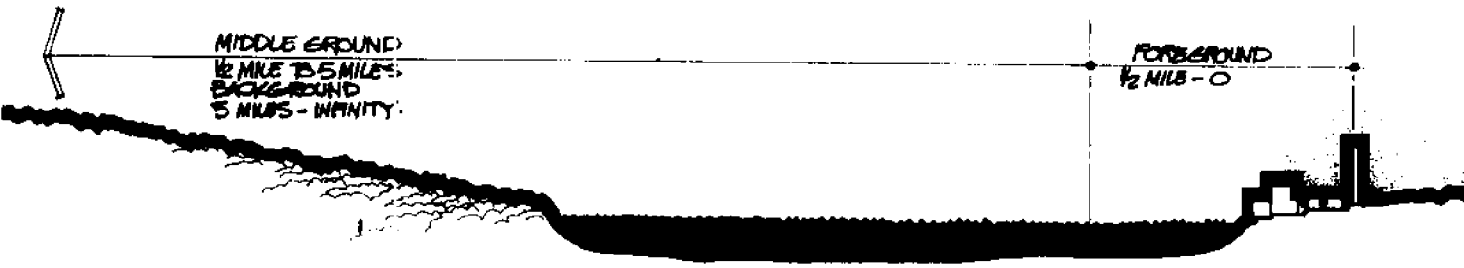


VIEWER POSITION



PROFILE



CROSS SECTION

DEVELOPING A PROGRAM FOR VISUAL QUALITY OF THE COASTAL ZONE

CASE STUDY 1
AUXILIARY INFO.

INDUSTRIAL SHORELINE DEVELOPMENT — FOSSIL FUEL POWER PLANT

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Case Study 1

Participants concentrated on selection of sites for power plants since their form and location on large water bodies were felt to be largely dictated by technology. The group felt that visual impact needs to be assessed in choosing between alternative sites. Visual analyses should be compiled for alternative sites, which would coordinate surrounding land use, vegetation, topography, etc. with various viewer positions from the land and water.

It was felt that visual impact could not be determined without understanding viewers' attitudes toward a power plant within different contexts. The intrusion of the power plant might vary according to activities engaged in by the viewer. The function of the power plant might affect his attitude towards it, as opposed to, say, an eight-story library. If a power plant were located in an industrial area, some people felt it might be viewed in a positive way. Problems with attitude surveys were discussed, such as changes in response over time and potential conflicts between general attitudes and reactions to a concrete proposal in one's own backyard.

If the visual effect of alternative power plant locations could be thoroughly determined, then it would be necessary to weigh visual effects against economic costs to determine the optimal site. It was suggested that multi-use development, combining recreational and industrial use, would maximize benefits of the coastal resources, although some people considered power plants detrimental to recreational use.

Some Issues Raised:

* How can power plant siting be incorporated in overall master planning for an area?

* How can all viewers, including transient users of the shoreline, have an input into power plant siting decisions?

* Are present power plants being used as efficiently as possible? Is further construction really necessary?

* What do industrial landscapes symbolize to people? Are they sometimes a positive representation of the "vitality of our economic system"?

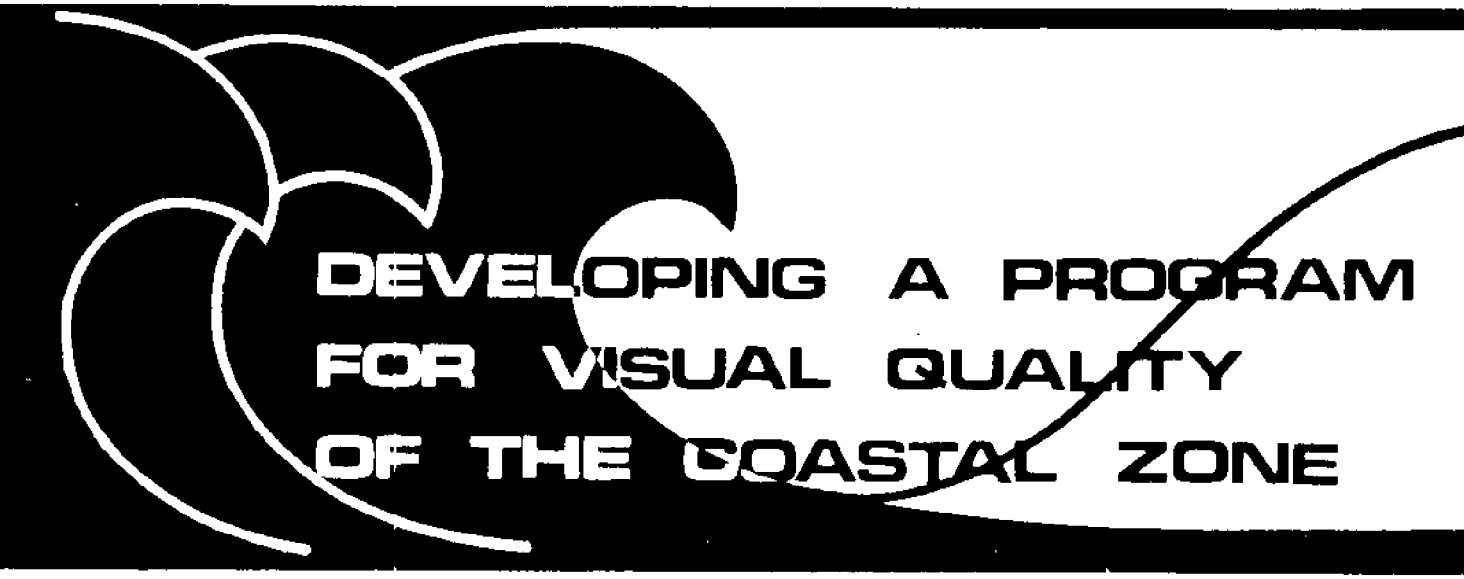
* Are park values threatened by power plants?

* Could a good architect design an acceptable-looking power plant? How should the utilitatian function of power plants be expressed formally?

* Is it axiomatic that the coastal interface is a visual resource worth preserving? At what cost and for whom?

CASE STUDY 2

RESIDENTIAL SHORELINE DEVELOPMENT
RECREATION COMMUNITY



WORKSHOP ON VISUAL QUALITY AND THE COASTAL ZONE

Sea Grant Project, School of Landscape Architecture

SUNY College of Environmental Science and Forestry, Syracuse, N.Y.

Case Study #2
Residential Shoreline Development--Recreation Community

DEVELOPMENT RATIONALE

More and more people in search of a leisure time "change of scene" are demanding high quality residential development along the coast. They want access to the water: boat launching sites, marinas, boat storage and supply facilities, beaches, and fishing piers. People want summer and year-round housing within sight of the water. People need to eat--restaurants, drive-in snack shops, and supermarkets. And people want a variety of entertainment, cultural and leisure facilities--sporting goods stores, bait shops, gift shops, boat tours, museums, golf courses, and the like. The multiplier effect followed by the development of high quality residential accommodations for people with leisure time and money would provide an economic boom to the region, providing a major portion of the regional income.

LOCATION

The lakeside site has been selected on the basis of the following criteria:

- Access to Interstate Highway
- 45 minutes from major population center
- High visual quality of site
  - Interesting landform
  - View of lake
  - Existing vegetation and wildlife
- Good soil conditions

PHYSICAL DESCRIPTION

As depicted in the illustrations, the development includes:

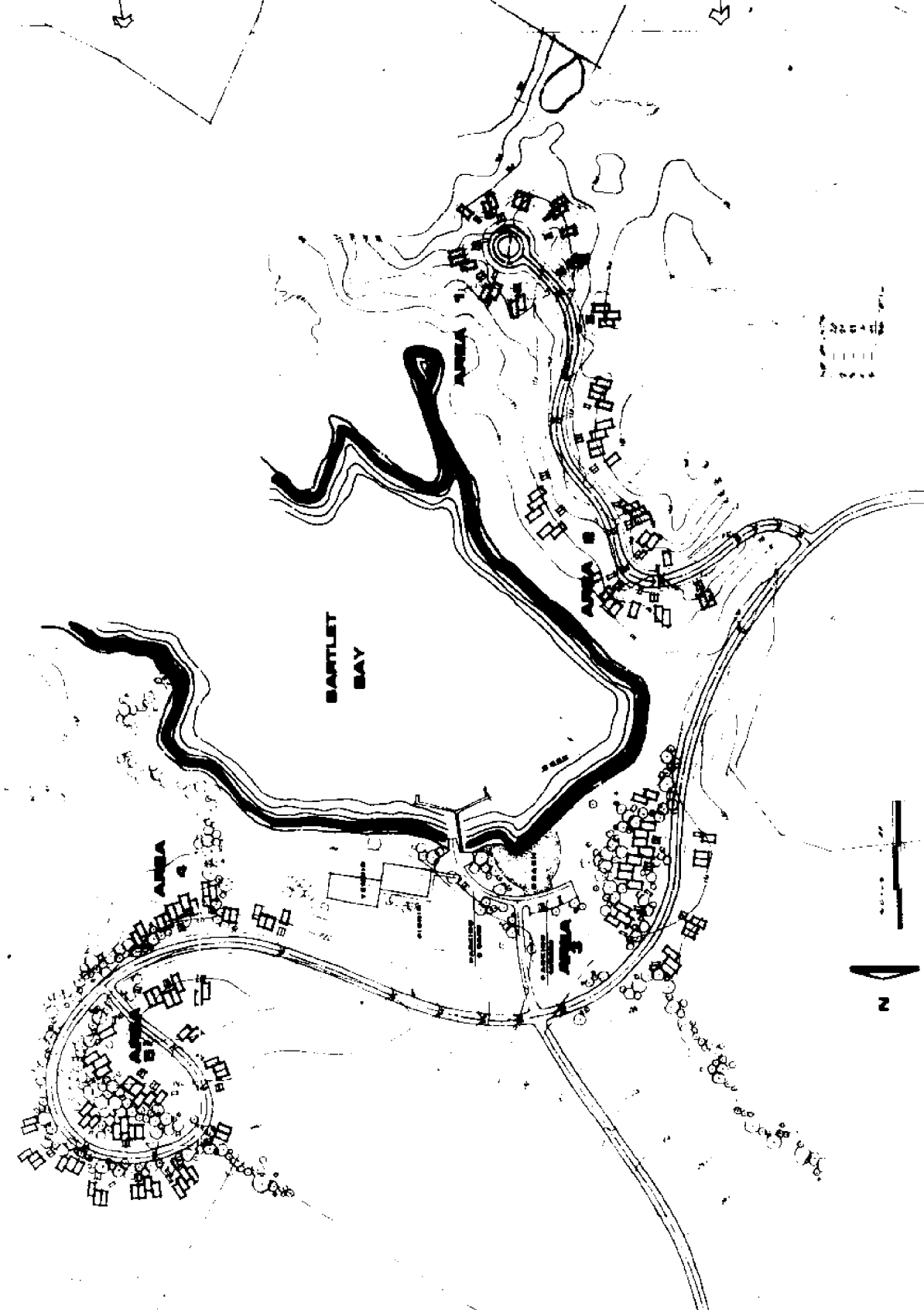
- 136 number of dwelling units (7/ac.)
- Beach development
- Boat launch facilities
- Tennis courts
- Picnic area
- Beach/picnic parking (22 cars)
- "Forever Wild" areas (areas not developed on plan)

PRINCIPAL VIEWERS

- Adjacent farmers - 200 pop.
- Recreational sailors - 12,000 user days/yr.
- Recreational fisherpeople - 3,000 user days/yr.
- Village residents (5 miles distant) - 4500 pop.
- State Park (1 1/2 miles across lake) - 31,000 users/day/yr.
- Cottage occupiers (3 mile radius) - 175 units

DECISION MAKERS

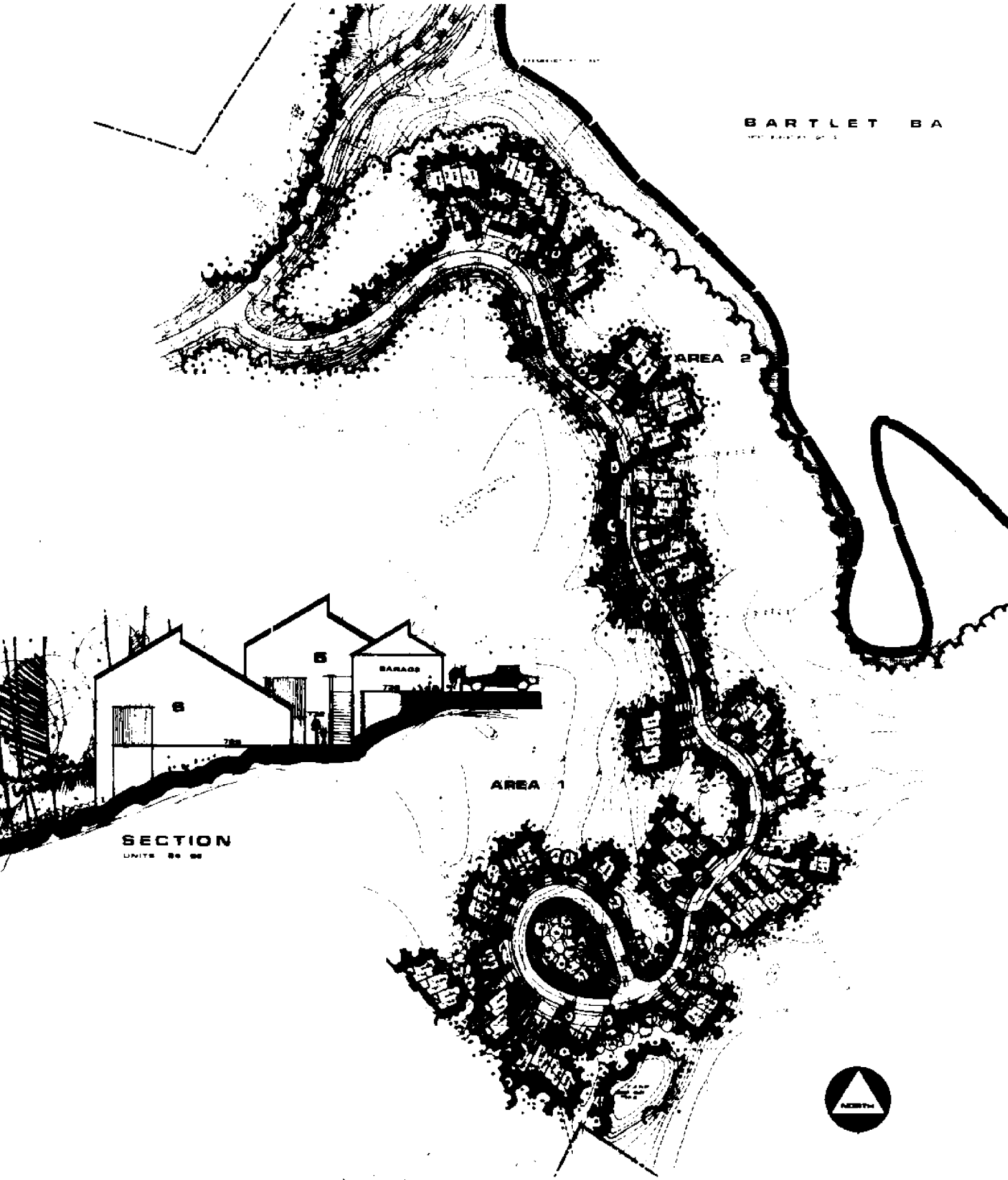
S.O.S. - Save Our Shores - Citizen Conservation Group
Municipal Zoning Board - Rezone from agricultural to residential.
County Commissioners - Construct new access road to site.
State Environmental Conservation - Approve dredging permit.
Federal, State, County Agencies - Require and enforce sewage treatment to meet water quality standards.



CASE STUDY 2
PLAN

RESIDENTIAL SHORELINE DEVELOPMENT –
RECREATION COMMUNITY

DEVELOPING A PROGRAM
FOR VISUAL QUALITY
OF THE COASTAL ZONE



DEVELOPING A PROGRAM FOR VISUAL QUALITY OF THE COASTAL ZONE

CASE STUDY 2 AUXILIARY INFO.

RESIDENTIAL SHORELINE DEVELOPMENT - RECREATION COMMUNITY

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NEW YORK STATE SEA GRANT PROJECT
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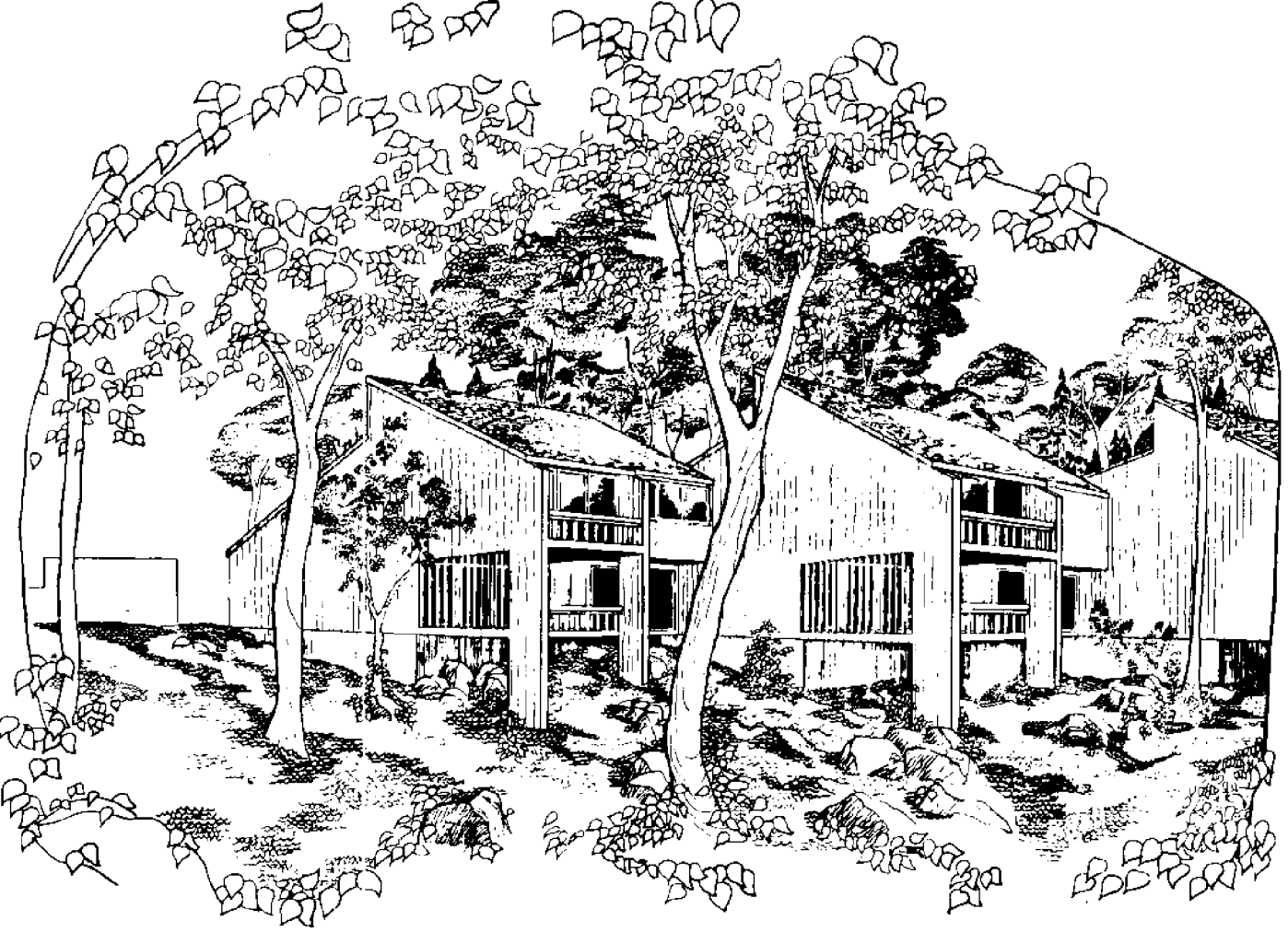

DEVELOPING A PROGRAM FOR VISUAL QUALITY OF THE COASTAL ZONE

CASE STUDY 2
AUXILIARY INFO.

RESIDENTIAL SHORELINE DEVELOPMENT – RECREATION COMMUNITY

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Case Study 2

The group agreed that various users' expectations would have to be determined in order to judge a proposed residential/recreational development. Besides the categories established in the case study, the group identified other user groups based on age, ethnic background, and type of recreational use. It was questioned whether these aggregates could indicate common expectations. Potential users from nearby urban centers should be considered along with defined groups. Mental maps of people's expectations and perception of the area could be compared with a physical assessment of it in order to develop schemes for consideration. Physical assessment should include data on vegetation, shoreline character, etc.

Other factors which planners should consider were mentioned, such as attitudinal and physical changes over time, including diurnal and seasonal changes in the landscape. The visual quality of the route to the shoreline was seen to be as significant as that of the shoreline area itself.

The group also discussed whether the shoreline with its scenic value should be a private or public resource. Some believed that land on the shore should be in the hands of those who valued it enough to make a private investment, while others believed that scarcity and cost make private ownership impractical. In any event, it was pointed out that providing greater access and thus an increasing number of people using facilities may have a strong effect on visual quality.

Some Issues Raised:

* Can you discover people's needs by asking them? What about the Edsel, designed according to market research?

* How can visual quality standards best be enforced? Safeguards are needed to insure maintenance of standards.

* How does the specific area under consideration fit into the regional landscape?

* Do "glossy" renderings of prospective developments really show the visual impact which the development would have?

* To what extent is lakeview in the public domain and visual quality a public concern?

* Do citizens have the right to lock up resources for their own use?

* Is visual quality to be judged by the people who will live there or by professional designers, planners, etc.?

* What is the psychological cost of adapting to environments with poor visual quality or lack of psoitive visual stimulation?

CASE STUDY 3

NATURAL AREAS

MULTI-USE DEVELOPMENT

DEVELOPING A PROGRAM
FOR VISUAL QUALITY
OF THE COASTAL ZONE

WORKSHOP ON VISUAL QUALITY AND THE COASTAL ZONE

Sea Grant Project, School of Landscape Architecture

SUNY College of Environmental Science and Forestry, Syracuse, N.Y.

Case Study #3
Natural Areas--Multi-use Development

DEVELOPMENT RATIONALE

The site is one of the few remaining open areas adjacent to a rapidly expanding coastal urban area.

It is a major flood detention area whose development would necessitate extensive flood control facilities (cost/benefit ratio exceeds 1). The waters of this site provide for significant fish breeding and migratory waterfowl stopover.

In addition, the site is surrounded by historic communities and artifacts whose origin and heritage are directly related to the unique characteristics of the site.

It is therefore proposed that the site be preserved as a wetlands ecological education area with light recreational development where possible.

LOCATION

Riverside wetlands adjacent to rapidly expanding urban area--under strong pressures for industrial development.

DESCRIPTION

As depicted in the illustrations, the potential development includes:

- Natural Area Preserve
- Marinas
- Picnic areas
- Bike Trails
- Hiking Trails
- Environmental Education Center

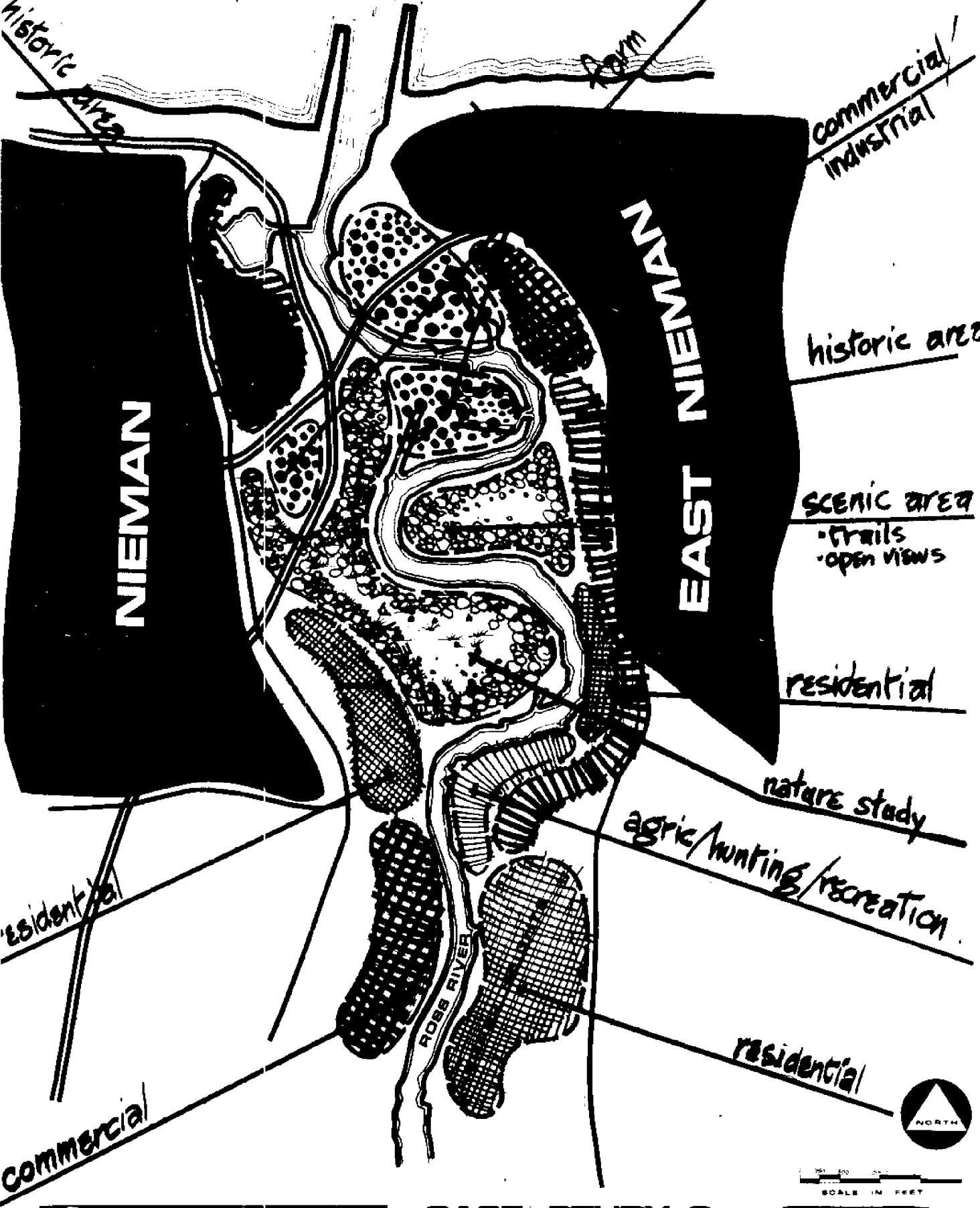
PRINCIPAL VIEWERS

- Adjacent farmers - 200 pop.
- Recreational sailors - 12,000 user days/yr.
- Recreational fisherpeople - 3,000 user days/yr.
- Town residents - 4500 pop.
- Urban commuters and pleasure driving - 20,000/day (both ways)
- Town parks - 31,000 user days/yr.
- Bird watchers - 1000 active members in organization

DECISION MAKERS

Environmental Commissions of the Towns - Protect local ecology of the area.
State Planning Agency - Plans in keeping with State plan.
Federal Flood Insurance Act - HUD, SCS
Municipal Zoning Board - Rezone from agricultural to floor plain recreation.
County Commissioners - Approve construction.

State Environmental Conservation - Approve disturbing the meadows.
Industrial Development Consortium - To continue to develop industry close to existing industry.
S.O.S. - Save Our Shores - Citizen Conservation Group
Conservation Trust - Citizen group



DEVELOPING A PROGRAM FOR VISUAL QUALITY OF THE COASTAL ZONE

CASE STUDY 3
PLAN

NATURAL AREAS – MULTI-USE DEVELOPMENT

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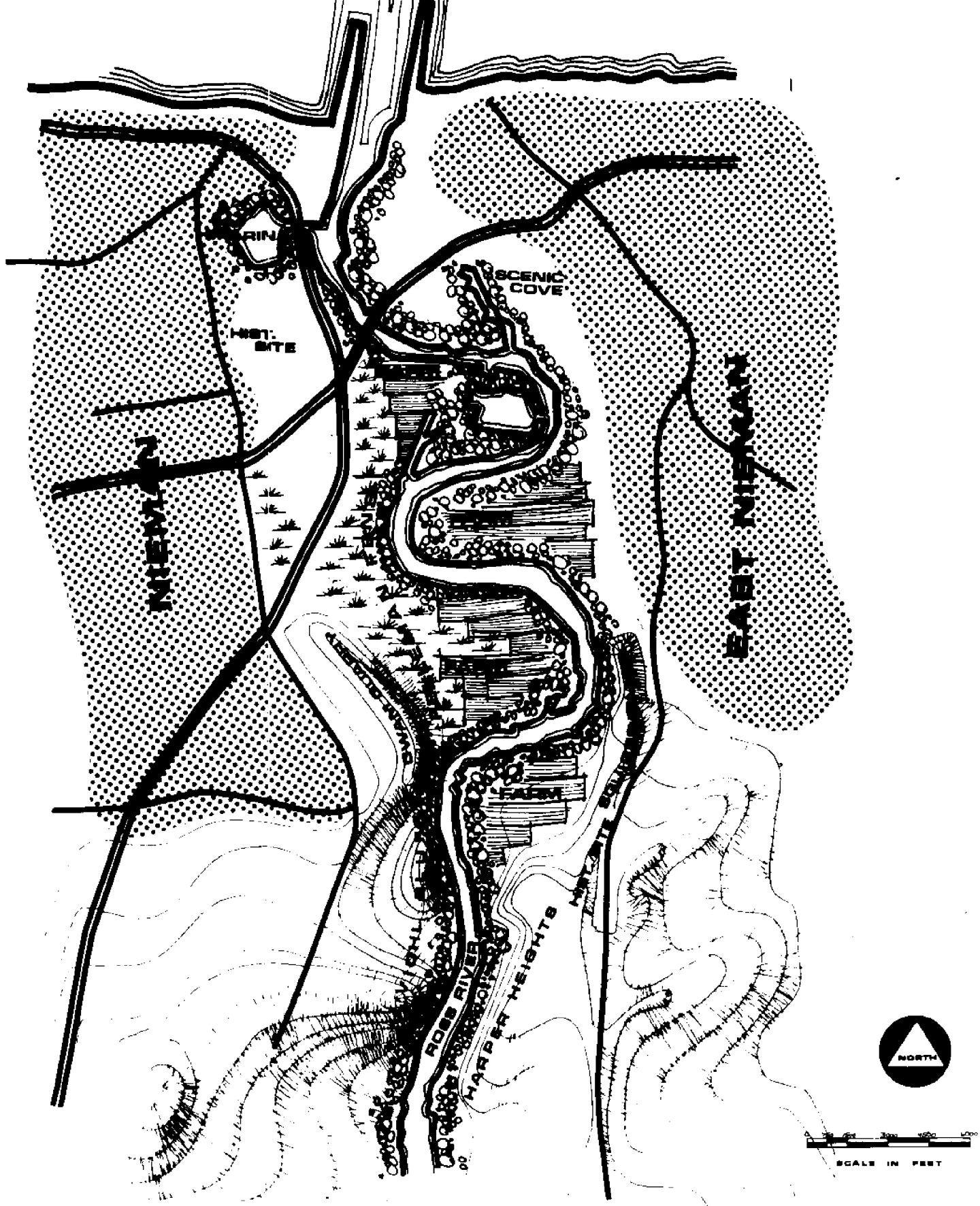

DEVELOPING A PROGRAM FOR VISUAL QUALITY OF THE COASTAL ZONE

CASE STUDY 3 AUXILIARY INFO.

NATURAL AREAS –
MULTI-USE DEVELOPMENT

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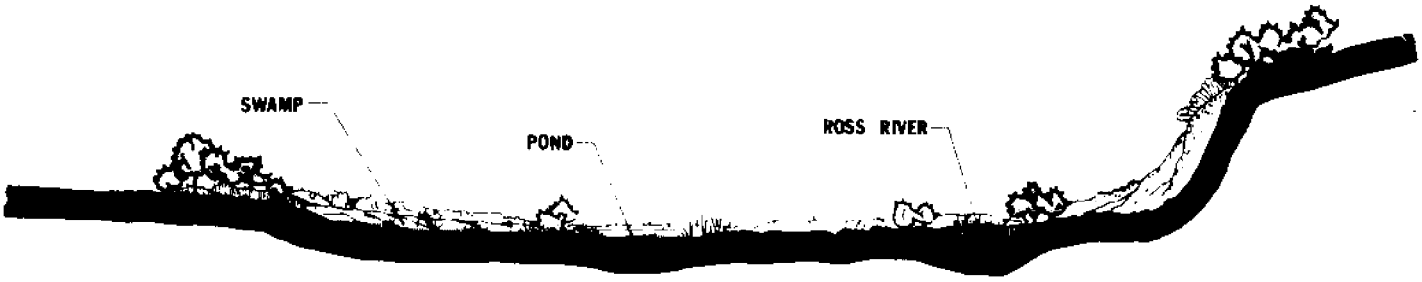
SCHOOL OF LANDSCAPE ARCHITECTURE

NEW YORK STATE SEA GRANT PROJECT
MAY 1975

SHEET NO. 3E

PERSPECTIVE



CROSS SECTION

DEVELOPING A PROGRAM FOR VISUAL QUALITY OF THE COASTAL ZONE

CASE STUDY 3 AUXILIARY INFO.

NATURAL AREAS –
MULTI-USE DEVELOPMENT

S.U.N.Y. COLLEGE OF ENVIRONMENTAL SCIENCE AND FORESTRY
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Case Study 3

The primary concentration of the case study group centered on the role of the public's involvement in regional planning decisions. It was agreed that visual quality should become a more important planning consideration; however, its value to people must be proven and the public must be encouraged to express its concern for maintaining visual quality. On this basis the public should be able to participate in choosing among development alternatives. Designers and planners could help to develop alternatives and inform the public of visual implications of these alternatives, thus expanding the range of choices and avoiding monotony. While different segments of the population should have a voice in decision making, there needs to be a means for reconciling conflicts in interests.

In assessing the multi-use development proposal of the case study, the group felt that more information was needed on the relationship of the area to a wider region and on the socio-political situation. As a result, a two-level system of planning was suggested: the choice between broad regional alternatives and the subsequent review of site-scale development by a design review board. If functioning properly, a design review board could then represent the developers' interests as well as the public's.

Some Issues Raised:

* How can sectors of the public who are less articulate be better represented in environmental decision making?
* What means can be used to increase public awareness of visual quality?
* How can conflicts among interest groups be resolved?

* Should viewer preferences be considered as specific for each situation, varying with localities, or as universal standards?

* How can planning be made more flexible and plans appear less sacrosanct?

STATE UNIVERSITY OF NEW YORK
COLLEGE OF ENVIRONMENTAL SCIENCE AND FORESTRY
SYRACUSE, NEW YORK

CONFERENCE/WORKSHOP
on
VISUAL QUALITY AND THE COASTAL ZONE
May 29-30, 1975

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