TECHNICAL REPORT NO. 27 CONTRACT NO, AA550-CT6-61

ALASKA OCS SOCIOECONOMIC STUD [ES PROGRAM
OCS VISUAL RESOURCE MANAGEMENT
METHODOLOGY STUDY

FINAL REPORT

PREPARED FOR

BUREAU OF LAND MANAGEMENT

ALASKA OUTER CONTINENTAL SHELF OFFICE

March 2, 1979

DOCUMENT IS AVAILABLE TO THE PUBLIC THROUGH THE
NATIONAL TECHNICAL INFORMATION SERVICE
5285 PORT ROYAL ROAD
SPRINGFIELD, VIRGINIA 22161

NOTICE

This document is disseminated under the sponsorship of the U.S. Department of the Interior, Bureau of Land Management, in the interest of information exchange. The U.S. Government assumes no liability for its content or use thereof.

ALASKA OCS SOCIOECONOMIC STUDIES PROGRAM
OCS VISUAL RESOURCE MANAGEMENT METHODOLOGY STUDY

Prepared by
Harman, O'Donnell & Henninger Associates, Inc./Merlyn J. Paulson, Inc.

March 2, 1979

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

1. INTRODUCTION

The following study was prepared for the Alaska OCS Office of the Bureau of Land Management as part of its Socioeconomic Program, a five-year effort investigating the potential impacts of Outer Continental Shelf petroleum development in Alaska. The purpose of this report is two fold: to provide a critical review of the existing BLM Manual 8411 (Draft) of the Visual Resource Management System, as it relates to petroleum development activities on the Alaska Outer Continental Shelf, and adjacent on-shore areas: and to describe and illustrate a proposed VRM Methodology which will improve the ability of the Alaska OCS Office to inventory visual components of the landscape and evaluate potential visual impact of petroleum activities. The results of this study are based on the contractor's professional knowledge and recent experience in the application of Visual Resources Management techniques; from on-site investigations of petroleum related facilities, physical characteristics of the Alaskan coastal areas, and socioeconomic conditions which are directly affected by the proposed OCS development; a review of pertinent studies on visual resource inventories and analyses; and from a Case Study designed to determine the positive and negative elements of the proposed methodology.

The principal investigators of the study team participated in two field trips to the Study Area. The first reconnaissance occurred August 22 to 29, 1978 during which time oil and gas development and related activities on the North Slope of Alaska were investigated, including the area between Point Barrow and Prudhoe Bay; facilities toured included those of Atlantic Richfield, NPR-A, and support related companies.

General physical conditions of the area were determined during several helicopter flights and ground surveys. Socioeconomic conditions and influences were reviewed through discussions with BLM representatives and from various written reports provided by the Government. Typical oil and gas facilities off the southern coast of Alaska, specifically the Kenai Peninsula, were also reviewed at that time. Visits were made to off-shore drilling platforms, on-shore storage facilities, and other support elements of the oil and gas industry. From this general orientation, a review of pertinent visual resource literature and, consequently, the formulation of an applicable VRM methodology, was initiated. A second field trip was conducted September 26 to October 2, 1978. During this period, the contractor reviewed preliminary findings related to the existing BLM VRM System, and reviewed potential elements and simulation techniques being considered for the new methodology.

The literature search conducted as part of the study resulted in a reference library describing a wide variety of approaches to visual resource management and simulation techniques; information obtained from these sources have added greatly to the development of the proposed methodology. A bibliography is provided in Appendix 4 of this report. After a review of these sources, it is apparent that the methods used in the assessment of the visual landscape -- its inherent quality and potential for impact -- have been based predominantly on the aesthetic value judgements of the design professionals conducting the visual studies; there is much support, however, for an added emphasis on user preferences to aid in the determination of regional and national policy and management decisions related to landscape resources.

Costantini and Hanf, 1972, point out that "when the public's schedule of priorities is probed deeply, the concern for environmental problems often gives way to such other pressing problems of national security, law and order, and economic well-being:" that "environmental degradation, like beauty, appears to be in the eye of the beholder. Different people have different interests; they have different priorities, and therefore, they see the same slice of the environment from different perspectives." The authors go on to explain that "an individual's degree of concern may be closely associated with more fundamental social and political attitudes, as well as general social role and background." Given Alaska's physical, socioeconomic, and political environments, this approach, when applied to the determination of visual quality and potential impacts from oil and gas development, is considered to be a valid one. Although some VRM Systems have included user attitudes as part of visual analyses, few, if any, directly use that data to make policy and management decisions. Thomas A. Heberlein, 1973, states that "Effective implementation of these findings [user attitudes] depends on the manager's ability or willingness to take different actions depending on user preferences. Often a manager is merely curious about user attitudes but his behavior is not affected by knowledge of these attitudes." The VRM Methodology proposed in this report attempts to balance the inputs of the design professionals, acting as a "national conscience", with the attitudes and desires of the local users, to achieve a visual product more acceptable and more easily understood by those who experience it.

The Case Study, discussed in Part 4, was developed to aid in the determination of applicable and deficient elements of the proposed VRM Methodology. Students of the Landscape Architecture program at Colorado State University, were asked to evaluate the system over a three-week period; participants have previously tested and evaluated the existing BLM VRM System and that of the U.S. Forest Service, and are familiar with the specific needs of the Alaska OCS. Using a study area near Fort Collins, Colorado, the students implemented the steps outlined in Part 3, developed appropriate slide simulations, and conducted User Preference Testing to determine the visual impact of the development of three hypothetical power plants programmed for the area. Written reports and class presentations of the studies were made in December, 1978. Results of the Case Study, along with advantages and disadvantages of the proposed methodology, are discussed in Part 4. These comments have been utilized in the final revisions of the proposed VRM Methodology.

II. EVALUATION OF THE BUREAU OF LAND MANAGEMENT VISUAL RESOURCE MANAGEMENT SYSTEM

The Bureau of Land Management's Visual Resource Management System is divided into six major components:

- 8411 (Revised 8410 and 6310) - Upland Visual Resource Inventory and Evaluation
- 8420 - Visual Resource Planning (Reserved)
- 8430 - Application of Visual Resource Management Principles to Project Planning and Design
- 8440 - Environmental Assessment for Visual Resources
- 8450 - Rehabilitation and Enhancement of the Visual Resources (Reserved)
- 8460 - Visual Resource Management Analysis Techniques (Reserved)

The System, as such, provides for a "Bureauwide systematic approach for identifying scenic quality and setting minimum quality standards for management of the visual resource values 011 public lands through a process which classifies all lands into one of five VRM classes. Each of the classes contains a specific management objective for maintaining or enhancing the visual resource values. The Visual Management Class assigned to a given land area depends upon three factors:

- The inherent quality of the scenery being viewed;
- The visual sensitivity level of the type OF visual use it receives;
- The distance zone it is in."

The general philosophy of BLM related to Visual Resource Management, however, recognizes that "there is a variety of scenic values on natural resource lands, and there are numerous other resources with management objectives that may not coincide with the protection of the visual resource. These different values and objectives warrant different levels of protection for the visual resource."

This review, therefore, is based on the ability of the present BLM VRM System to specifically address this variety of scenic values and objectives. A visual resource management system which satisfies the specific needs of the Alaska OCS Office of BLM will consider the uniqueness of the Alaskan environments; the variety of socio-economic conditions, lifestyles, and needs of the Alaskan people; and the increasing worldwide demand for oil and gas production, and its potential economic impact on the entire state of Alaska. At the direction of the Alaska OCS Office, the evaluation which follows addresses components of the BLM Manual 8411 (Draft), with both applicable and deficient aspects discussed as they relate to the Alaska OCS proposed activities; a summary list of these applicable and deficient components is presented in Appendix 2. Other components of the BLM VRM System are not specifically addressed.

BLM Manual 8411 (Draft)
<u>Upland Visual Resource Inventory and Evaluation</u>

.1 <u>Interim Management for Visual Resources</u>

.2 <u>Scenic Quality Inventory for Unit Resource Analysis</u>

.21 Determine the Physiographic Province

A. State Supplement Map

B. Narrative

.22 Delineation of Scenic Quality Rating Units

.23 Describing Landscape Character

A. Inventory Form

B. Photo Record

C. Prepare General Narrative for Scenic Quality

.24 Identifying and Describing Cultural Modification

A. Visual Intrusions

B. Visual Improvements

C. Determining the Visual Significance of Cultural Modifications

.25 Scenic Quality Evaluation

.26 Use OF the Scenic Quality Rating

.27 Identification of Areas of Critical Environmental Concern for Scenic Values

A. Definition

B. Criteria for Identification

.3 Evaluation for the Planning Area Analysis

.31 Determination of Visual Sensitivity Levels

A. Visual Sensitivity Evaluation

1. Delineating Sensitivity Areas

2. Determining the Level of Survey

3. Analysis of User Attitude Toward Change

4. Prepare and Map User Reaction

5. Determining and Mapping Final Visual Sensitivity Levels

.32 Delineation of Distance Zones

A. Foreground-Middleground

B. Background

C. Seldom Seen

.4 Material Storage

The overall approach of the existing BLM Manual, as outlined above, is oriented toward a general "broad-brush" evaluation of visual components, based on initial value judgements on the part of the VRM Teams organized to conduct the visual study. Although this approach meets most of the needs of BLM Managers related to management objectives of BLM Manual 8400, the Alaska OCS Office of BLM has determined more specific requirements related to visual resource management of oil and gas development. The degree of detail at which data is collected and from which evaluations are made, becomes a significant concern; and because of the variety of socioeconomic aspects within the study area, an alternative method of evaluation of Scenery Quality and Sensitivity might be required. For Alaska OCS requirements, indications are that management activities should more directly reflect users attitudes toward change based not only on his particular sensitivity, but also his interpretation and definition of scenic quality. A VRM System which decreases the subjectivity of the professional evaluation team, and increases input from the specific users might best serve the needs of the client. The present BLM VRM System does allow, in some cases, for flexibility in implementation, especially during the Evaluation for the Planning Area Analysis, Visual Sensitivity Evaluation. Other components can also be utilized effectively. Generally, however, the large map scales utilized, the subjectivity of the scenic quality evaluations, and the composite evaluation methods require alternative approaches for OCS site specific decisions. The following discussion of components is directed toward these general deficiencies. Reference should be made to Appendix 1, BLM Manual 8411 (Draft) for specific review.

.1 Interim Management for Visual Resources

.2 Scenic Quality Inventory for Unit Resources Analysis

.22 Delineation of Scenic Quality Rating Units

Applicable Elements: "The important consideration is that all of the scenery within the unit be of the same nature."

Deficiency: "The size of the unit is of very little consequence."

Scale: Scale should be determined by the information to be mapped and facility to be located within the study area. 1:250,000 or 1 :62,500 does not necessarily allow for locating various elements within any one unit. Physical elements of the landscape should be mapped, by type and location, regardless of physiographic unit, landform, and designer's subjective evaluation of "same nature".

.23 Describing Landscape Character

Applicable Elements: Photo records should be maintained of scenery units for use during Preference Testing.

Deficiency: Inventory forms describing overall landscape composition of landscape units at a large scale will serve no purpose in locating or designing for a specific OCS use. Narratives can be developed, however, related to Visual Absorption Capability of each element or combination of elements for establishing mitigating measures and/or developed locational criteria.

.24 Identifying and Describing Cultural Modifications

Applicable Elements: "The location of all cultural modifications will be portrayed on the cultural modifications overlay."

Deficiency: Cultural modifications. . • re to be. . .evaluated for their visual significance on scenic quality. " Determination of "visual significance" and "scenic quality" should not be made by BLM. These aspects are subject to personal interpretation by user.

.24A Visual Intrusions

Applicable Elements: "A photo/slide record is to be kept..."

Deficiency: "Significant depreciative effect" on scenic quality should be based on user's personal interpretation.

.24B Visual Improvement

Applicable Elements: "Identify on the cultural modification overlay those cultural modifications, such as old mine shafts, abandoned communities, archaeological sites, and other such remains, as well as existing sites and communities."

Deficiency: Requirement to determine visual significance of cultural modifications on part of designer rather than user.

.24C Determining Visual Significance of Cultural Modifications

1. Procedures

Applicable Elements: None

Deficiency: No determination of "visual significance of cultural modifications" has been made by users within study area.

2. Rating

Applicable Elements: None

Deficiency: All ratings require value judgements by other than user.

.25 Scenic Quality Evaluations

.25A Applicable Elements: "Evaluate all areas which contain interspersed public lands within the District boundary and/or public lands that overlie Federal mineral estates, not just those managed by BLM."

Deficiency: Use of an interdisciplinary team, although providing potential for input from a variety of backgrounds, will noi provide local interpretation of visual quality based on ethnic background, economic impact, or political orientations.

.25B Applicable Elements: None

Deficiency: Ratings for Scenic Quality are based on p:e-determined value judgements; weights, i-f used, should be positive to negative.

.25C Applicable Elements: "The people doing the rating must be familiar with the scenery in the District."

Deficiency: "Size of an area to be evaluated is not critical."
Size of an area evaluated should relate to proposed activity. Evaluation of visual quality should be made by users.

.25D Applicable Elements: Key Factors of LandForm, Vegetation, Water, Color, Influence of Adjacent Scenery, Scarcity, and Cultural Modifications all relate to overall quality of a particular scene.

Deficiency: Application of Key Factors, with weighted categories, reflects subjectivity on part of designer, other than users, and is not considered appropriate for Alaska's OCS proposed activities; Application of Key Factors to overall area, as opposed to single visual feature, does not allow for site specific evaluation.

.25E Applicable Elements: None

Deficiency: Scenic Quality is determined by VRM Team, not user; value judgements required to determine "significant visual intrusion."

.26 Use of the Scenic Quality Rating

Applicable Elements: All

Deficiency: None

.27 Identification of Areas of Critical Environmental Concern for Scenic Values (ACEC)

.27A Applicable Elements: Use of ACEC's in overall evaluation of scenic quality provides more complete review and places special emphasis on areas which might otherwise not be considered.

Deficiency: Selection of ACEC requires value judgements of other than area users.

.27B Applicable Elements: None

Deficiency: Subjective ratings by VRM Teams for High Scenic Quality and Scarcity do not necessarily reflect actual user attitudes toward scenic quality.

.3 Evaluation for the Planning Area Analysis

.3 1 Determination of Visual Sensitivity Levels

.31 A Visual Sensitivity Evaluation

1. Delineating Sensitivity Areas

a. Use Volumes - Evaluation and Mapping of Criteria

Applicable Elements: All

Deficiency: Criteria for High, Moderate, and Low Sensitivity is based on figures which might not be appropriate for Alaskan demographics.

b. Identify and Map Key Observation Point(s) for Use Volumes

Applicable Elements: Preparation of Seen Areas and Seldom Seen Areas Maps will aid locational criteria of proposed OCS activities. Use of computer for delineation of Seen Areas is encouraged if data is available.

Deficiency: KOPS should be initially determined from all use areas, regardless of use volumes; general physical access to areas might not reflect user sensitively. Elimination of KOPS can be done at a later time if necessary. Consideration should also be given to indicate seen areas for each user type. Similar areas will indicate higher priority areas. Seen area determinations are difficult to do manually. Difficulty also exists with Viewit.

c. Identification of Sensitivity Level Rating Boundaries

Applicable Elements: Sensitivity boundaries and ratings will aid in setting priorities for development of proposed activities.

Deficiency: Additional data might be required to determine a more detailed indication of user sensitivity, depending on scenic quality areas determined previously.

Sensitivity Level Rating Boundaries should not coincide with scenic quality boundaries since one does not necessarily follow the other.

2. Determine the Level of Survey for User Attitudes Toward Change

Applicable Elements: BLM Manuals 1601 and 1607 provide an in-depth analysis of public needs and participation related to the high degree of public involvement which must occur for a completely successful planning framework. BLM recognizes this need for public involvement and that "the field manager must determine which method (of assessing attitudes and opinions) is best for a particular situation, rather than attempt to uniformly apply a few techniques on a Bureauwide basis."

Deficiency: Application of the above approach earlier in the VRM System, both from the standpoint of overall public participation, and to reduce subjectivity of VRM Team regarding quality of visual resources and potential contrast, should be considered. User attitudes have not been applied to scenic quality determination phases.

3. Analysis of User Attitudes Toward Change

a. Applicable Elements: Presentation of anticipated changes to user groups relates directly to Alaska OCS concerns. Types of activities should be related to oil and gas development, and may vary by location along Alaskan coasts.

Deficiency: Presentations should provide users with existing environment reference for comparison. Several methods of slide simulation can be investigated, with use depending on availability of technical expertise, equipment, and associated costs.

b. Applicable Elements: Rating of attitudes regarding change in environment will lead to final sensitivity ratings.

Deficiency: Rating criteria might be broadened from High, Medium, and Low to provide more flexibility for evaluation on both ends of the scale.

c. Applicable Elements: All

Deficiency: Summaries should reflect reasoning behind attitudes for developing mitigating measures.

4. Prepare and Map User Reaction

Applicable Elements: All

Deficiency: None

5. Determining and Mapping Final Visual Sensitivity Levels

Applicable Elements: All

Deficiency: Combination of use volumes and user attitudes might not be appropriate method for determining overall sensitivity levels. Additional consideration should be given to type of facility proposed for specific area.

.32 Delineation of Distance Zones

Applicable Elements: Preparation of Distance Zone Map

Deficiency: Distance Zones should be determined initially from KOPS in all sensitivity level areas; criteria for distance zones should be modified to show foreground as a separate consideration from middleground; distances attributed for each category might be re-evaluated based on user attitudes and related to specific area under study.

.4 Labeling Areas and Assigning VRM Classes

Applicable Elements: All

Deficiency: Class designations might generalize descriptions of permitted uses; site specific impacts will change within large units. Permitted uses in each area should relate more directly to user preferences and ability to mitigate adverse visual impacts.

.5 Outlying Visual Management Units

Applicable Elements: All

Deficiency: None

.6 Material Storage

Applicable Elements: All

Deficiency: None

.7 Visual Resource Management Classes

Applicable Elements: All

Deficiency: The existing BLM 8411 gives equal weights for Scenic Quality, Sensitivity Levels and Distance Zones. Consideration should be given to determining weights specifically addressing environmental, socio-economic and unique conditions within the study area,

The BLM Visual Resource Management System, of which Manual 8411 is a part, addresses evaluation of potential development in Manual 8420. The basis for evaluation is the concept that the degree of contrast of the proposed activity, as related to Form, Line, Color, and Texture, will indicate visual acceptability by the user. Although this concept might serve as an adequate guide for a "broad-brush" evaluation, Alaska OCS activities, along with the state's unique environmental and social conditions, require a more specific indication of acceptability. Proposed impacts should be an extension of user sensitivity, with Form, Line, Color, and Texture serving as excellent tools for mitigation of these impacts. Mitigating measures should be based directly on impacts, on a project by project basis.

III. PROPOSED VISUAL RESOURCE MANAGEMENT METHODOLOGY

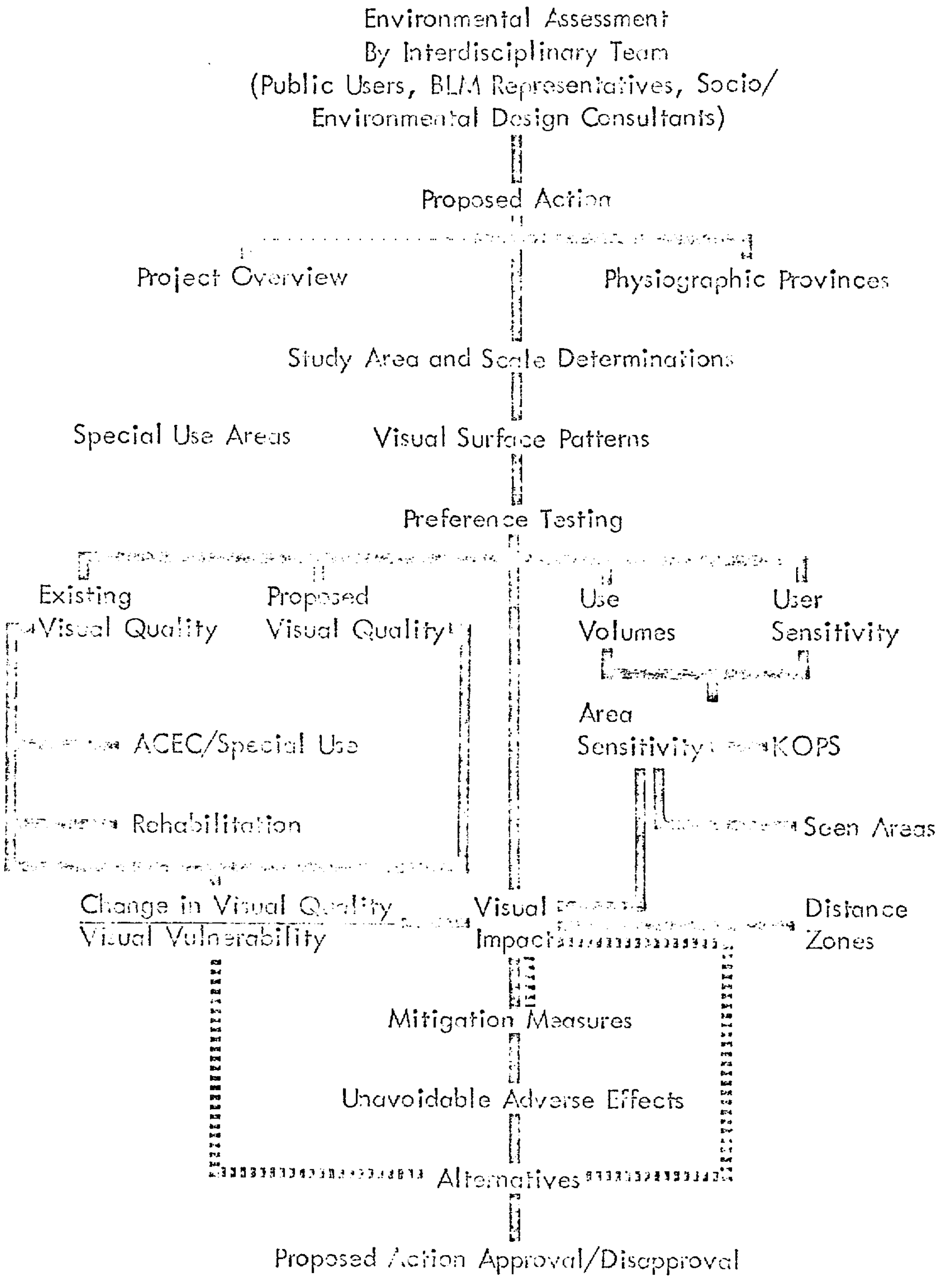
Methodology Organization

The methodology developed as part of this study is presented in the following section, and generally follows the steps and procedures outlined in BLM Manual 8410 -- Environmental Assessment for Visual Resources. Although the proposed system incorporates the basic principals and elements of the BLM Manual 8411, emphasis is placed on User Preferences as a means to determine visual quality, visual sensitivity, and overall visual impact of the proposed oil and gas facilities. However, because of BLM's responsibility, legally and ethically, to evaluate visual resources with respect to national interest, the system encourages the continued participation of BLM representatives, and its sociological and environmental design consultants. This "professional/user" interface will enable both "local" and "national" concerns to influence the definition of visual quality, and determine the potential visual impact as a result of future oil and gas development on the coastlines of Alaska. The needs of the Alaska OCS Office are such that the proposed Visual Resources Management System will not only provide for the inventory and analyses of visual resources, but also the necessary visual input for the selection of off-shore lease sales parcels, the determination of level of visual impact, and the acceptability of mitigation measures for minimizing potential visual impact of the proposed off-shore facilities and related on-shore activities. Illustration 1 diagrams the proposed VRM Methodology described in this report; illustrations describing the VRM procedures are included throughout Part III.

Project Overview

The first phase of the Visual Resource Management System proposed for use in the Alaska Outer Continental Shelf regions is an overview of the entire project under consideration. Meetings are held among the representatives of the BLM, its consultants, and representatives of the various jurisdictional agencies in order to establish the coordination of the project. The assumptions under which the project is undertaken are identified and the proposed actions, including alternatives, are provided by the BLM. The project is discussed in sufficient detail to allow the identification of issues required for the visual analysis of the proposed action. The following categories of information contribute to the description of the proposed action; its visual influence on the existing environment: the development of Form, Line, Color, and Texture related to mitigation measures; and the identification of alternatives. If sufficient detailed information cannot be obtained, assumptions must be made and clearly documented.

- General Descriptions
  - Type of project
  - Project location
  - Proposed methods of operation from preplanning and design through project completion
  - Project size and area
  - Time period of operation, including specific phasing of individual operations
  - Specific committed project operational procedures
  - Projected ultimate land use and adjacent land use



ALASKA OCS VRM
METHODOLOGY
1

- Specific Descriptions
  - Change in Water Area
    1. Exact location of change, activity or undertaking
    2. Anticipated change in water form from drill pad formation (vertical, horizontal and slope)
    3. Anticipated color of drill pad
    4. Anticipated change in inland water area and/or color
    5. Timing and duration of change in water area
    6. Methods of operation, length of each phase
    7. Anticipated ultimate use and final water form and area
  - Change in Landform
    1. Exact location of change, activity or undertaking
    2. Depth of excavation and/or fill (horizontal, vertical and slope)
    3. Quantity and location of earth to be moved (including sequence of operation)
    4. Color of changes to landform on coastline
    5. Color of various soil horizons associated with major excavations on fills
    6. Timing and duration of excavation or fill operations
    7. Methods of operation, length of each phase
    8. Method of reshaping after use, including final landform grades, slopes and drainage
    9. Anticipated ultimate use and final landform

- Change in Vegetation
    1. Exact locution and method of vegetation clearing and/or modification
    2. Size of area under change
    3. Type, location, method, quantity and timing of replanting and/or reseeding
- Change in Structures
    1. Exact locations of structures to be constructed and/or within the Project Study Area
    2. Design of structures
        u. size
        b. exterior Form, Line, Color, and Texture of proposed structures
    3. Expected life of structures
    4. Operations and maintenance schedules and methods

It is an important responsibility to research construction and maintenance requirements in the project region in order to establish reasonable and reliable visual mitigation measures and/or design alternatives.

As part of the project description phase, a determination and listing of critical environmental and social issues is made. This would include specific cultural, socioeconomic, political and other issues which might influence the ultimate outcome of the project. In addition, at least one orientation trip to the Project Study Area is required.

Project Study Area/Map Scale Determinations

The Project Study Area is the geographical area to be considered in the visual studies. It is defined as an area encompassing all of the proposed actions and all geographic zones which can, at this stage, be identified as exerting or receiving visual influence. In determining the Project Study Area, encompass all proposed actions, influenced areas and potential observation points. For purposes of illustration, a Project Study Area was selected in the Kenai Peninsula, south of Anchorage, Alaska; some modifications of landform and land use have been made for graphic display purposes.

In defining the map scale for the specific Project Study Area, use the rule of "the least common denominator"; that is, determine the map scale for which information is available and which will allow the delineation of the smallest geographic zone of importance to the project. Extremely diverse and finely dissected surface pattern areas will require smaller scales than areas containing a relatively homogenous surface pattern. It is important to evaluate the preliminary map scale for its practical efficiency in information handling for overlaying, map delineation, labeling, map size, etc. In general, it is less expensive and less reliable for decision-making to use a larger map scale (1 :250,000 or larger), and more expensive and more reliable to use a smaller map scale (1 :63,500 or smaller), thus the benefit of a thorough pre-analysis based upon practical efficiency and the "least common denominator" rule.

Base Map Preparation

Base maps are developed to serve as the common denominator of al I space-related project information. Two base maps are required for the analysis and display of visual information.

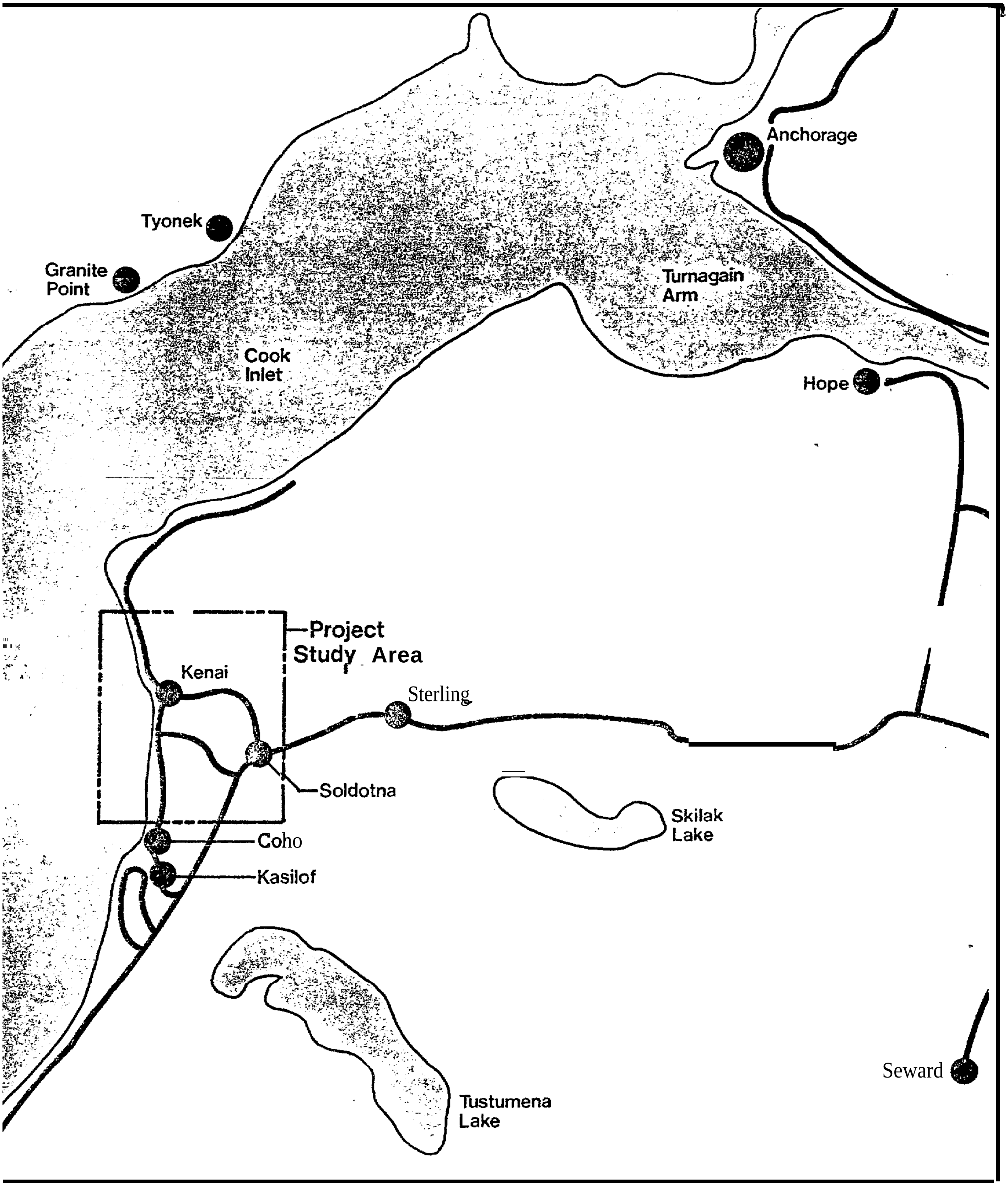
- Regions I Study Area Map - displays, at a very large scale, the Project Study Area in relation i-o po I itical boundaries, transportation routes, major cultural and/or physics! features, an d the physiographic province(s), (see Illustrations 2 and 10).
- Project Base Map - serves as the base for information, collection, analysis and display. It is desirable for the map to display highlighted transportation routes, population centers, unique physical features, and the Project Study Area - that area most directly impacted by the proposed actions (see II lustration 3).

A thorough review of the latest BLM requirements for map preparation, titles, legends, etc. is undertaken before map format designation. It is recommended that a pin-registered mylar overlay system be used for all project mapping. A system of opaque "separates" may be used for either gray tone or color reproduction,

Visual Surface Pattern Definition

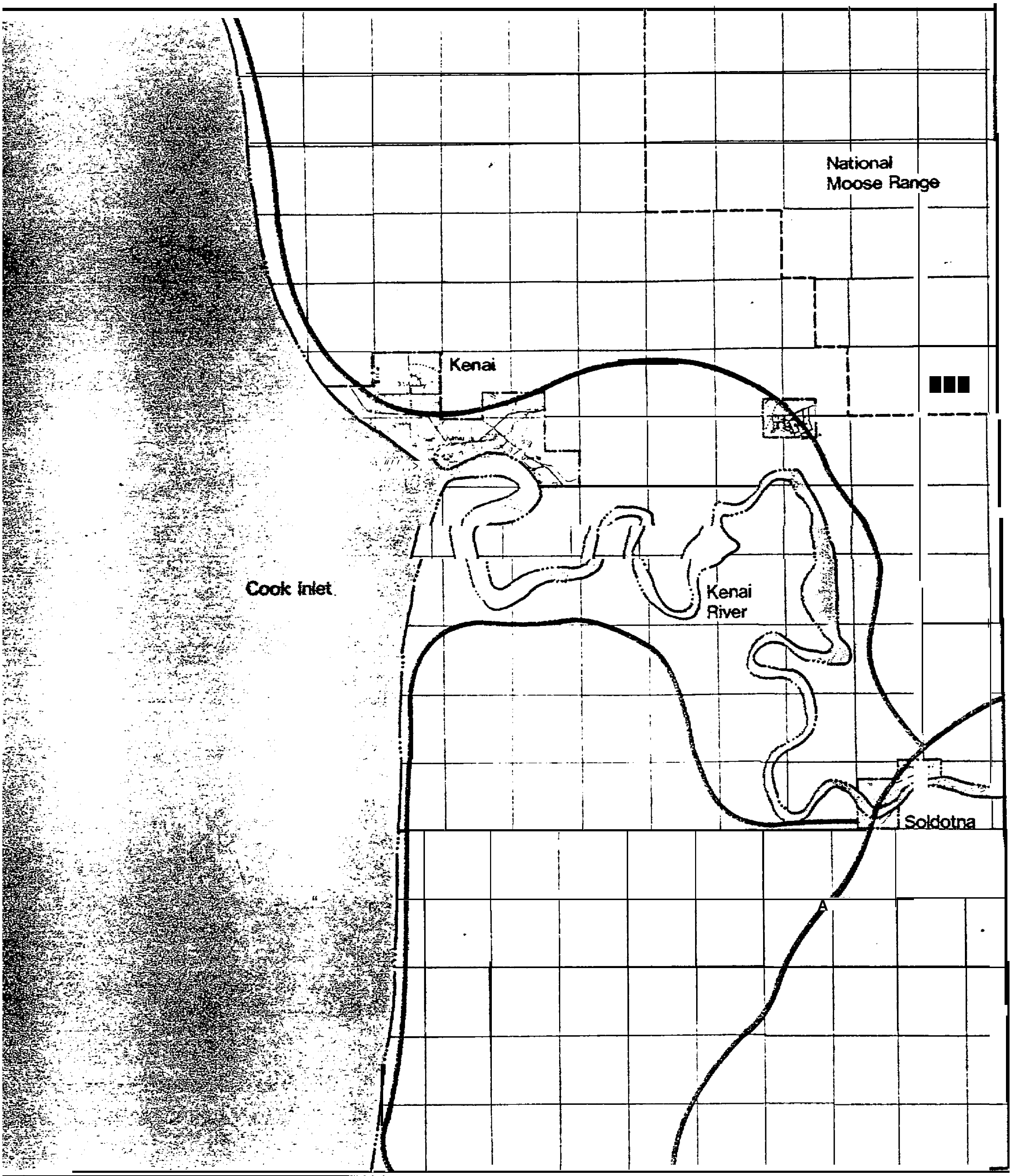
EXISTING VISUAL FEATURES

The identification and listing of each existing visual surface pattern feature normally seen from the ground or air is made. This identification and listing should include different locations of the same visual feature when visual quality, user sensitivity,

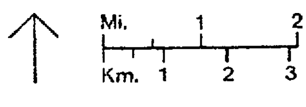


REGIONAL STUDY AREA

2



PROJECT BASE MAP 3



Harman, O'Donnell & Henninger Associates, Inc.
Planning Consultants · Denver, Colorado

visual impact, and visual acceptability of proposed actions might vary depending on the area's adjacent and/or background Form, Line, Color, or Textural characteristics. Typical examples of visual features include ocean, coast line, estuary, tidal flat, cliff, lake, pond, inlet, river, stream, trees (by type, if appropriate), meadow, tundra, industrial area, institutional area, commercial area, residential! area, historic structure, roads, topography, etc. Visual features, which will vary by geographical area, are identified during visits to the Project Study Area, from USGS maps, land use maps, aerial photographs, and other available information sources. The level of detail to which the surface pattern is defined depends upon the map scale, surface pattern diversity, relative scale of the proposed actions, etc. A written description of each visual surface pattern feature identified is made in terms of its relative dominance and uniqueness, as well as its general Form, Line, Color, and Textural characteristics (see Illustration 4).

Delineate and label on an overlay to the Project Base Map each of the identified existing visual features or combination of features (see Illustration 5). Visual features are displayed as points, lines and/or areas. Representative slide photographs, taken from a variety of appropriate ground and/or air locations, are produced for each different iype and location of visual feature identified, listed, and mapped. Slides will be used later for simulation of proposed actions, preference testing, development of mitigation measures, and design of alternative actions.

PROPOSED VISUAL FEATURES

The identification and I isting of all proposed actions (visual features) which would normally be seen from the ground or air is made (see Illustration 6). Typical examples of proposed visual features include dril I structures, storage flats, wel I head structures, " crew housing, service facilities, drill pads, pipelines, sand and gravel borrow areas, pipe coating yards, barge terminals, storage tanks, haul roads, and other facilities related to the oil and gas development operations. Delineate and label on an overlay to the Project Base Map each of the identified proposed actions (visual features) (see Illustration 7). Proposed visua I features are displayed as points, I ines and/or areas. Representative sl ide phonographs, taken from a variety of appropriate ground and/or air locations, are produced for each different type of proposed visual feature identified, listed, and mapped. Different viewpoints and view angles should be used, as necessary, to adequately describe the proposed activity. Preferably, slide photographs should be taken of simi lar proposed features already constructed elsewhere. If examples of similar proposed features are not available, a competent delineator should develop line drawings of the proposed features as if seen from a variety of ground and/or air locations.

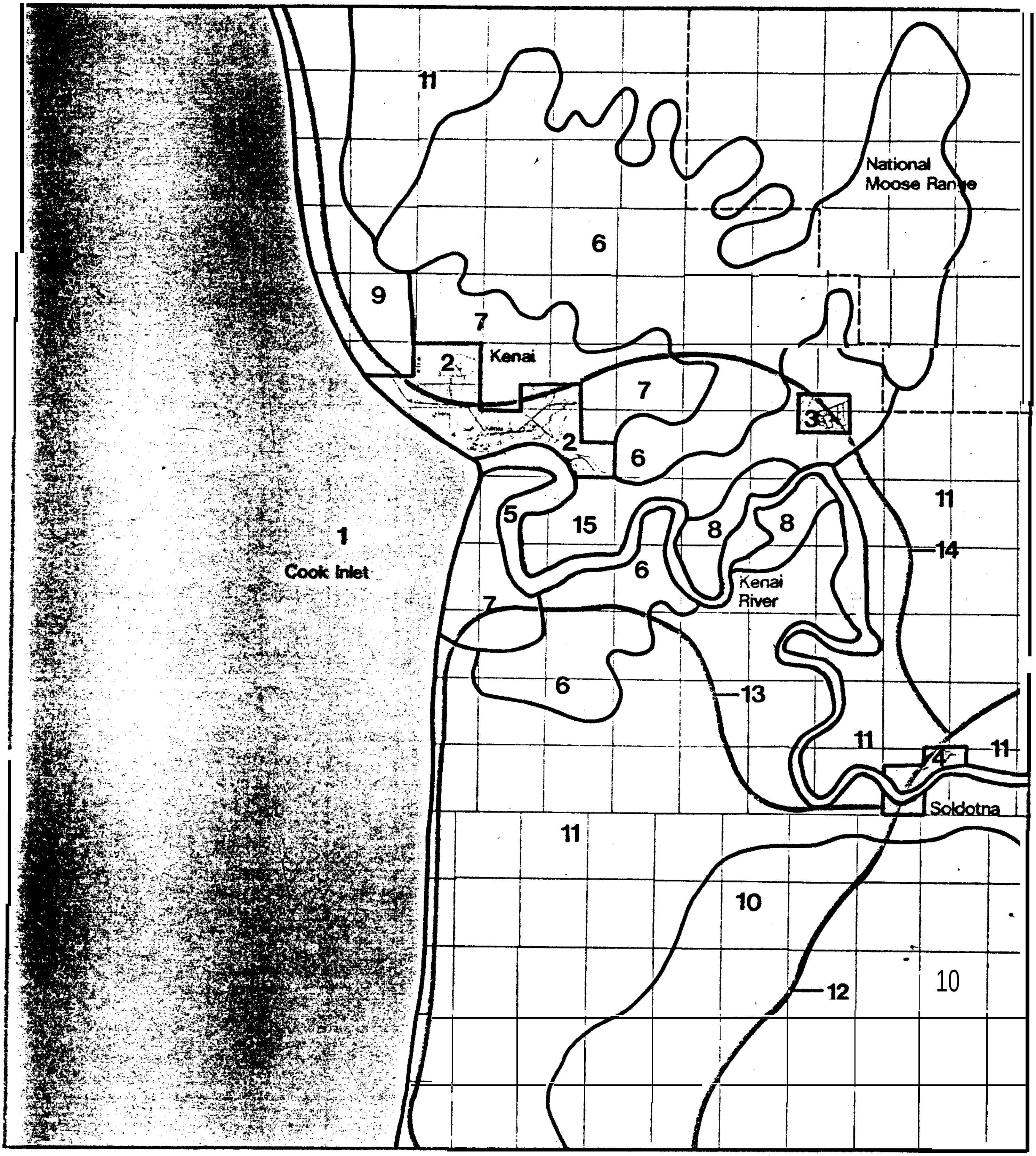
Identify and list all existing visual features where proposed visual features are programmed. For each such condition describe the Foreground, Adjacent Areas Right and Left, and Background characteristics in terms of Form, Line, Color, and Texture (see Illustration 8).

Written Description (General)

Existing Visual Features	Form	Line	Color	Texture	Preference Score
1 Cook Inlet					
2 Kenai					
3 Kenai Suburb					
4 Soldotna					
5 Kenai River					
6 Open Swamp					
7 Single Family Residential					
8 Isolated Swamp					
9 industrial ,					
10 Agriculture" (Dry)					
Etc.					

EXISTING VISUAL FEATURES/ DESCRIPTIONS

4



1. Cook Inlet
2. Kenai
3. Kenai Suburb
4. Soldotna
5. Kenai River
6. Open Swamp
7. Single Family Residential
8. Isolated Swamp
9. Industrial
10. Agriculture (Dry)
11. Undeveloped Land
12. Highway
13. Beach Road
14. Highway
15. Agriculture (Irrigated)

EXISTING VISUAL FEATURES

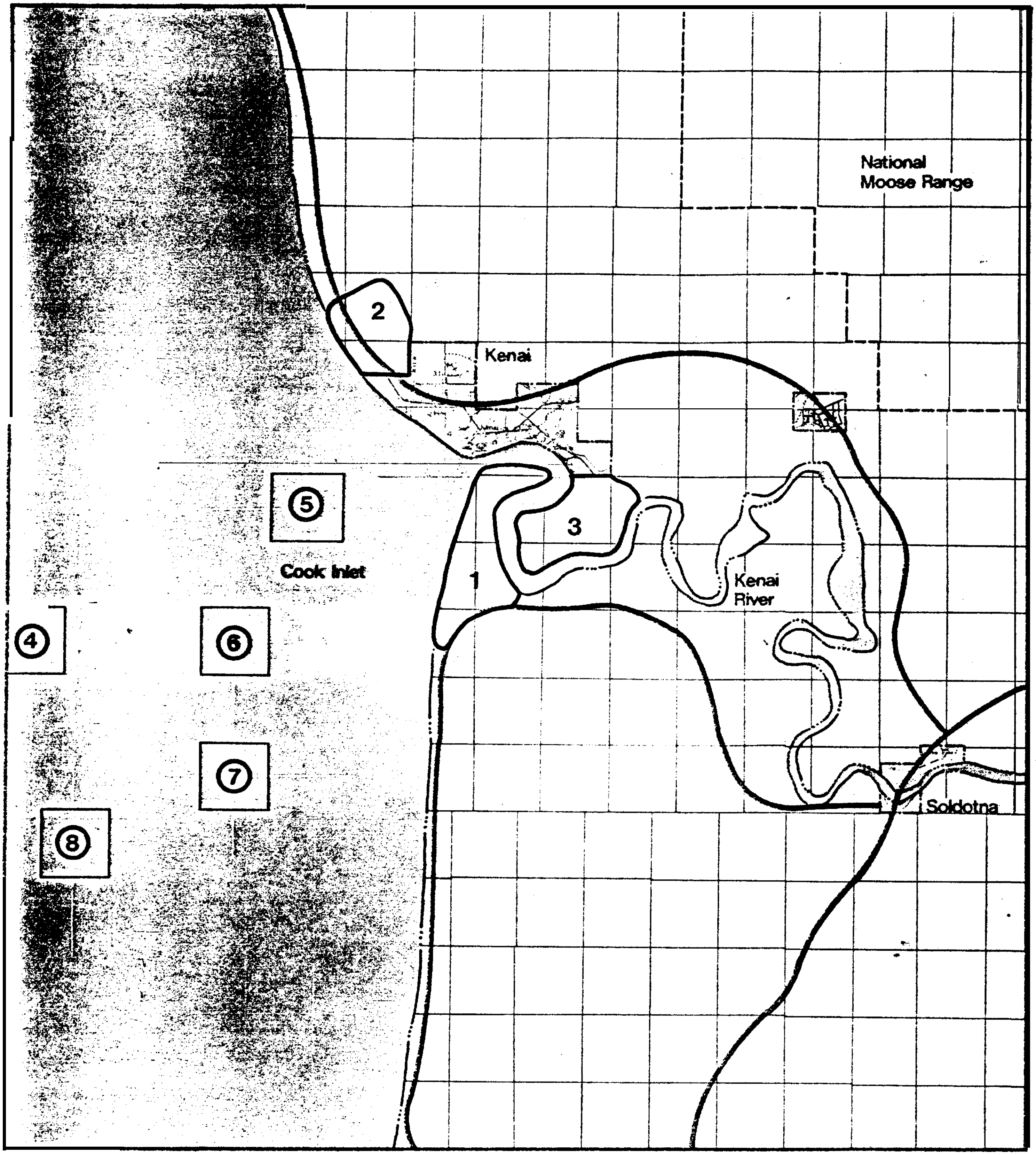
Mi. 1 2
Km. 1 2 3

5

Harman, O'Donnell & Henninger Associates, Inc.
Planning Consultants · Denver, Colorado

Proposed Visual Feature	Written Description (General)	Preference Score
1 Barge Terminal		
2 Employee Housing		
3 Pipe Storage		
4 Lease Areas/Drill Pad		
5 Lease Areas/Drill Pad		
6 Lease Areas/Drill Pad		
7 Lease Areas/Drill Pad		
8 Lease Areas/Drill pad		
9		
10		
Etc.		

PROPOSED VISUAL FEATURES/ DESCRIPTIONS



1. Barge Terminal
2. Employee Housing
3. Pipe Storage
4. Lease Areas/Drill Pad
5. Lease Areas/Drill Pad
6. Lease Areas/Drill Pad
7.9 Lease Areas/Dri I I Pad
8. Lease Areas/Dri 1 I Pad

PROPOSED VISUAL FEATURES

7

‘i’ Mi. 1 2 Km. 1 2 3

Harman, O'Donnell & Henninger Associates, Inc.
Planning Consultants · Denver, Colorado

	Preference Scores
Existing Visual Feature ______	
Proposed Visual Feature ______	

Foreground

Form

Line

color

Texture

Adjacent Area, Right

Form

Line

Color

Texture

Adjacent Area, Left

Form

Line

Color

Texture

Background

Form

Line

Color

Texture “

EXISTING/PROPOSED VISUAL FEATURE
ADJACENT AREA DESCRIPTION

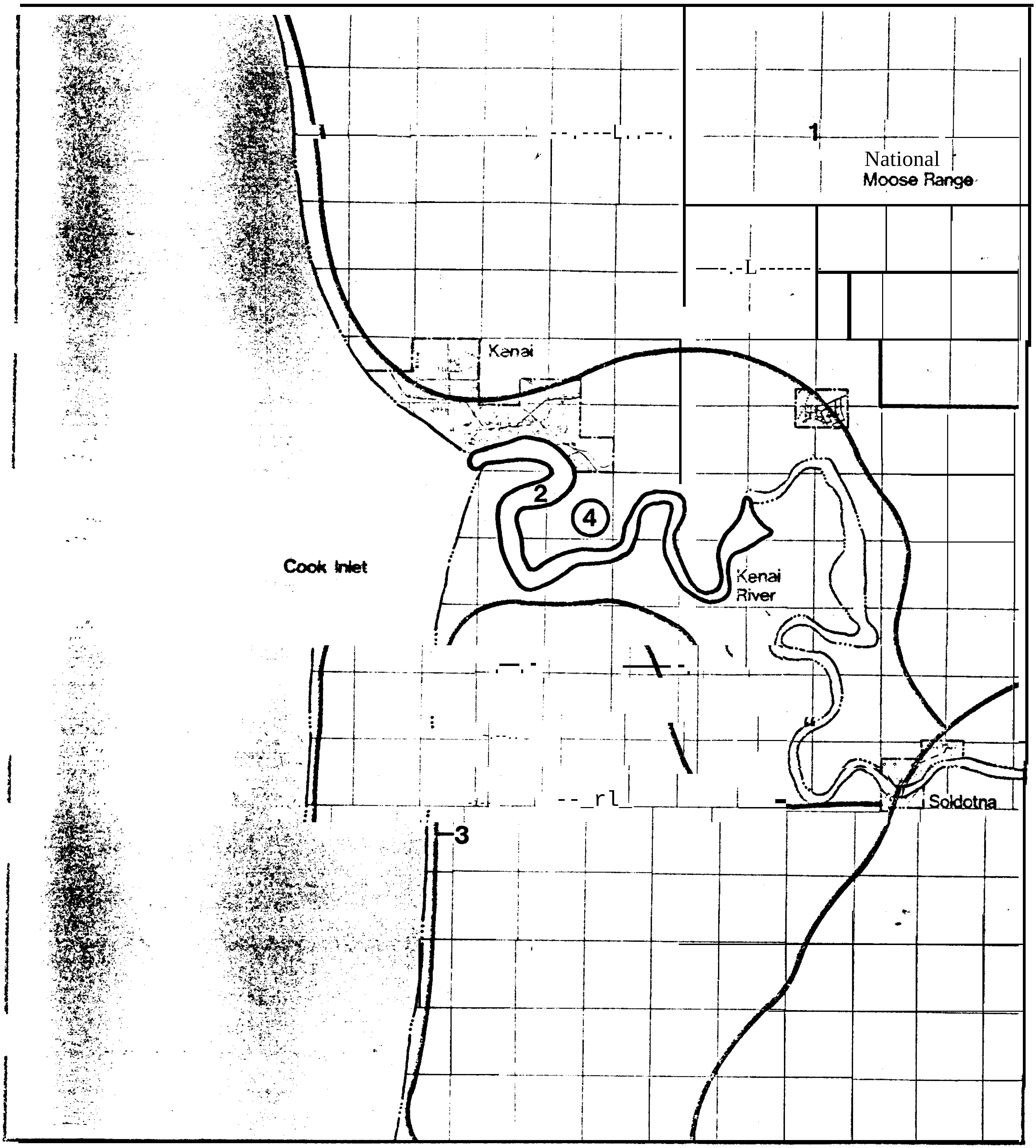
8

SPECIAL USE AREAS

The identification and I isting of each Special Use Area in the Project Study Area is made by members of the VRM Team assembled for the project. Typical examples include Parks, Wildlife Ranges, Wild and Scenic Rivers, Scenic Observation Points, Wilderness Areas, State or National Recreation Areas, Archaeological or Historical Sites and other areas considered significant. Delineate and label on an overlay to the Project Base Map each of the identified Special Use Areas (see Illustration 9). Special Use Areas are shown as points, lines, or areas. S[ide photographs, taken from a variety of appropriate ground and/or air locations, are produced for each area identified, I isted and mapped. Different viewpoints and view angles should be used as necessary to adequatel y describe the Special Use Area. Areas of Critical Environmental Concern (ACEC) are a result of overall Preference Testing.

PHYSIOGRAPHIC PROVINCES

The identification, 1 isting, and photographic documentation of representative visual surface pattern features (including unique features) and Special Use Areas within the Physiographic Province(s) encompassing the Proj ect Study Area is made. Representative photographs of the physiographic province(s) are used during Preference Testing for comparison of visual qua lity within the Project Study Area to that of the larger region (see Illustration 1 O).



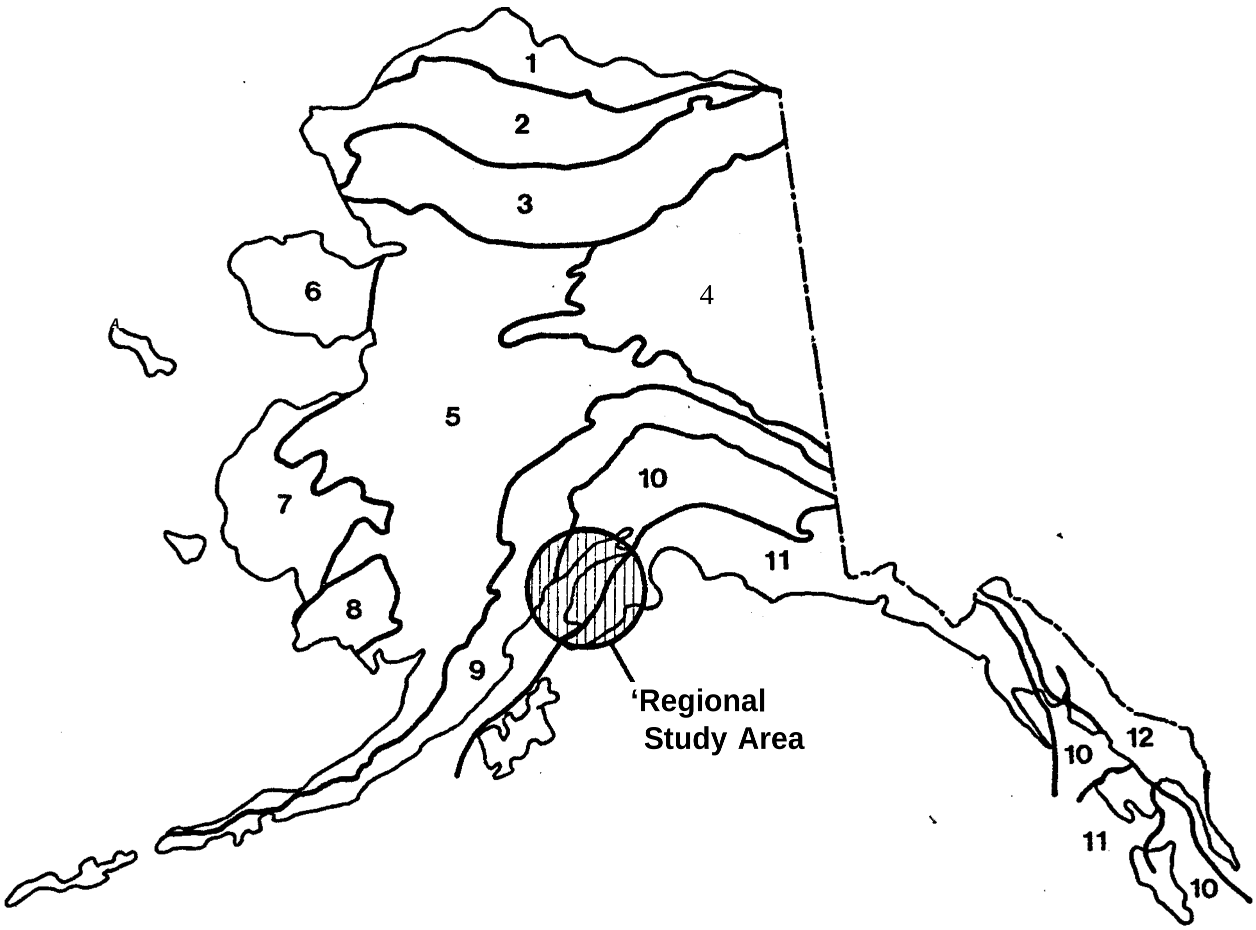
1. National Moose Range
2. Kenai River, Scenic Area
3. Beach Road
4. Archeological Site

SPECIAL USE AREAS

9

Mi. 1 2
Km. 1 2 3

Harman, O'Donnell & Henninger Associates, Inc.
Planning Consultants · Denver, Colorado



1. Arctic Coastal Plain
2. Arctic Foothills
3. Arctic Mountains
4. Northern Plateaus
5. Western Alaska
6. Seward Peninsula
7. Bering Shelf
8. Ahklun Mountains
9. Alaska-Alutian
10. Coastal Trough
11. Pacific Border Ranges
12. Coast Mountains

PHYSIOGRAPHIC PROVINCES

10

Use Volumes

The identification and listing of transportation and use areas, along with corresponding use volumes, is made. Use volume for transportation routes is measured in "Average Daily Traffic" (ADT); use volume for use areas is measured in "Visitor Days". Delineate and label on an overlay to the Project Base Map the actual 'numbers associated with human use for each appropriate transportation route and/or use area (see Illustration 11). Should overlaps occur, label the route or area which demonstrates the greatest use volume. Use volume information has a role in Area Sensitivity Analyses and the determination of Key Observation Points, discussed later in the report.

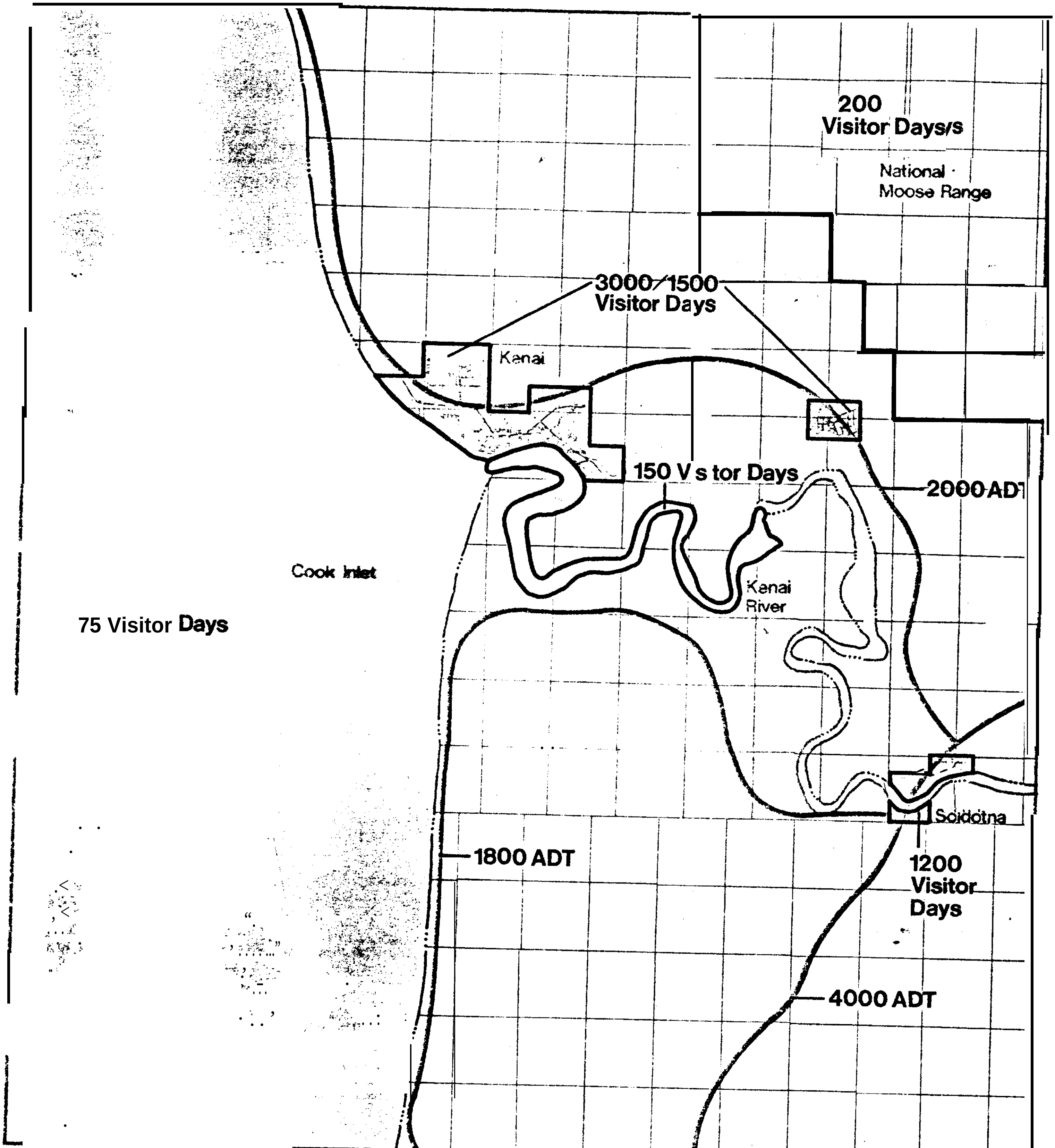
With consideration given to the resident and visitor population in the region, develop a Use Volume Matrix for the designated transportation routes and use areas applicable to the Project Study Area. Delineate and label on an overlay to the Project Base Map the appropriate levels of High, Moderate, and LOW use (see Illustration 12).

Visual Preference Evaluations

User and professional preference evaluations are a major factor in the determination of Existing Visual Qualify, User Sensitivity, Area Sensitivity, Proposed Visual Quality (from proposed actions), and the identification of Mitigation Measures and Alternatives to the Proposed Actions for the Project. Preference judgements are made by public participants, representatives of the BLM, and its design consultants. The selection of public participants is based upon a statistical I y valid representation of local residents, area users (including consumptive and non-consumptive users), and local agencies. Preference judgements made by representatives of the BLM and its consultants reflect, in visual terms, the relationship of the Project Study Area to the Physiographic Province in which it exists. The procedure used for Preference Testing is as follows:

- Arrange four slide projectors to project horizontally across a white wall or screen. The projector on the far left is used exclusively to display all the existing visual surface pattern features. The remaining projectors to the right are used to test proposed actions simulated within the existing scene, or different views of the existing visual feature if no changes are proposed within that particular feature. (The most obvious view angles should be tested.) Various mitigation measures and/or design alternatives are also simulated from the three right hand projectors. Mitigation Measure and design alternative tests should include a variety of distance, Form, Line, Color, and Texture related simulation.

- A series of introductory slides demonstrating representative visual features found within the Physiographic Province(s) and an appropriate sampling of proposed actions anticipated for the Project Study Area are shown to acclimate the viewers to the Preference Testing procedure. An explanation of the project objectives, procedures, instructions and uses of the results accompanies the orientation slides. The slides representing the Physiographic Province(s) allow judgements reflecting preference comparisons to the Project Study Area.



National Moose Range	200 Visitor Days
Kenai/Suburb	3,000/1,500 Visitor Days
Soldotna	1,200 Visitor Days
Highway	4,000 ADT
Beach Road	1,800 ADT
Highway	2,000 ADT
Kenai Scenic River	150 Visitor Days
Cook Inlet	75 Visitor Days

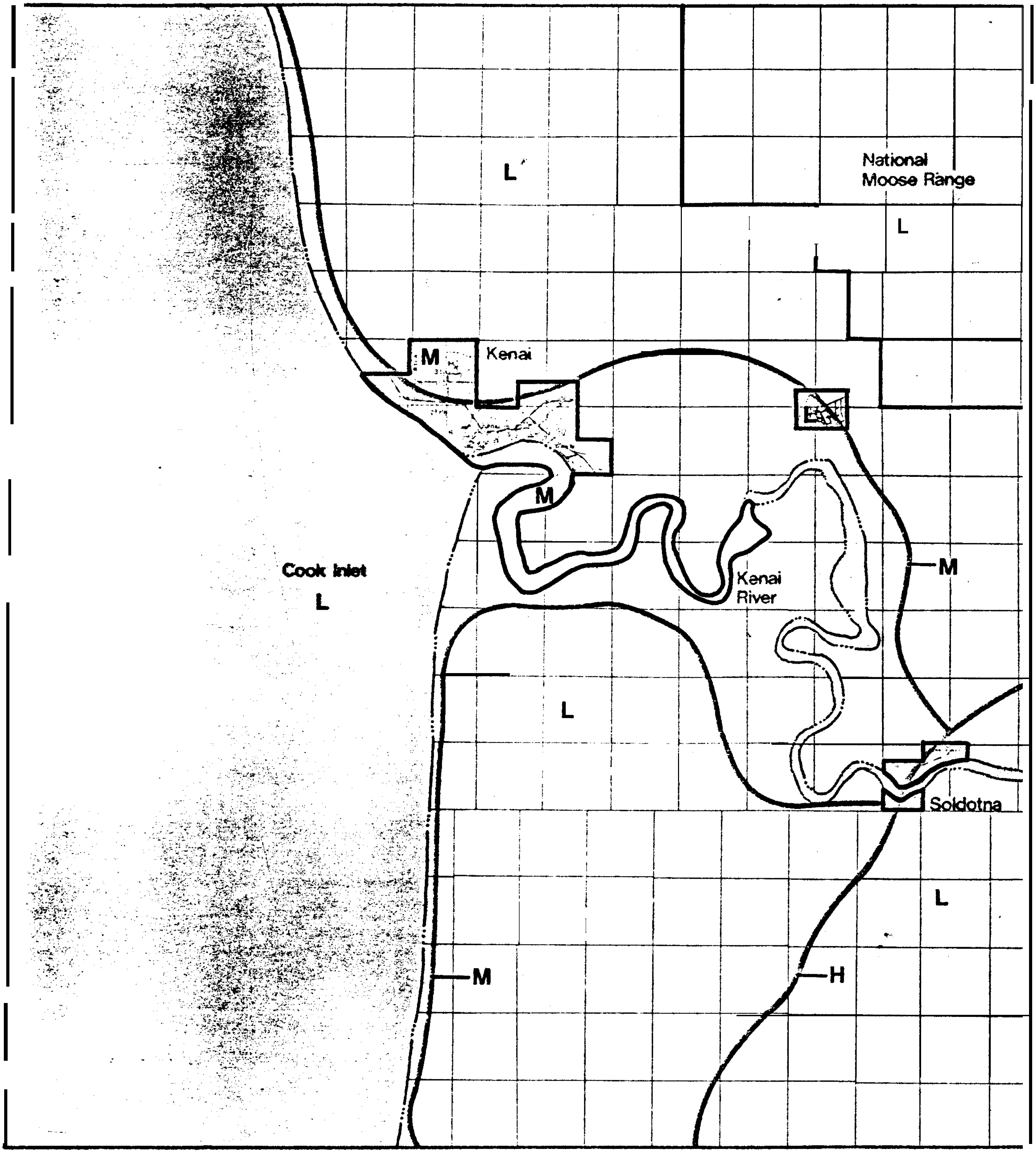
USE VOLUMES/TYPES

11

Mi. 1 2
Km. 1 2 3

Note:
Figures should represent actual use volumes for particular activity.

Harman, O'Donnell & Henninger Associates, Inc.
Warming Consultants. Denver, Colorado



	H	M	L
Urban	6,000	4,000	2,000
Recreation	500	300	100
Historic Use	150	100	50
Highways	5,000	3,000	1,000

Note:
Categories based on actual use volumes found in study area.

USE VOLUMES/RATINGS

12

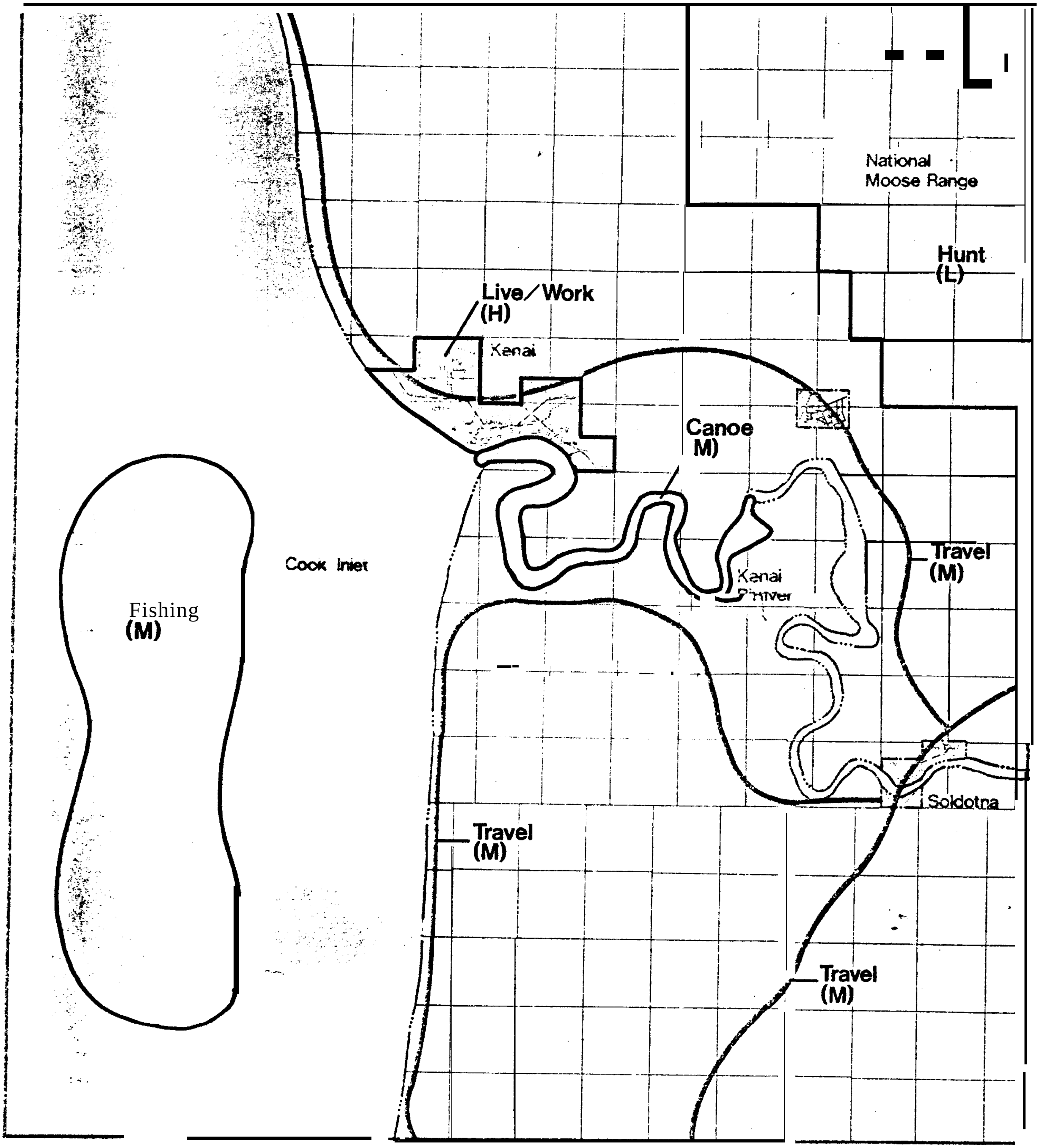
Mi. 1 2
Km. 1 2 3

Harman, O'Donnell & Henninger Associates, Inc.
Planning Consultants. Denver, Colorado

- Distribute the User Sensitivity Location Map (Project Base Map, reduced to 8-1/2 x 11") to participants with an explanation of the map's contents and use. Each participant is instructed to locate on the map the areas in which he or she lives, travels, works, and/or visits within the Project Study Area. The participants are then instructed to rank in terms 'of High, Moderate, or Low each area as to its importance as an observation point. This is used as a cross-check during Sensitivity Testing Analysis, and to determine potential Key Observation Points (KOPS). Representatives of the BLM and its design consultants are instructed to delineate visually important transportation routes and Special Use Areas on the User Sensitivity Location Map. This information is added to the areas of High sensitivity during the User Sensitivity Analysis. After completion of the maps, the group returns them to the instructor (see Illustration 13).
- Distribute and explain the Preference Testing Forms to the participants (see Illustration 14). Instruct the group to rate each scene (a judgement of the entire scene) by assigning a value to each box based upon the level in which the scene is "liked" or "disliked" as defined on the bottom of the Preference Testing Form. Values greater than +2 or less than -2 can be assigned if it is felt that circumstances warrant an extreme response.
- Using the far left projector, show the group a slide of each of the visual features indicated on the Existing Visual Surface Patterns Overlay (see Illustration 5). Specific features may be shown from different distances

and locations depending upon the more obvious locations of observers in the Project Study Area. Evaluate the entire existing environment before showing any proposed actions. (This is the final Preference Test for Visual Vulnerability/ Lease Permit Analyses if visual details regarding proposed actions are not available at this stage.)

- Using the remaining three slide projectors, show the group a slide of each of the proposed actions simulated within each of the appropriate existing surface pattern features. Several methods of slide simulations have been studied and utilized by the design professions. The method developed and recommended by this contractor which most realistically simulates the proposed actions is described in Appendix 2. Multiple slide sets should allow participants to compare and judge the influence of various distances, Form, Line, Color, Texture and appropriate design alternatives in connection with the proposed actions. It may be beneficial to show proposed actions at least twice, in varying sequences, in order to enhance the preference results.
- After a thorough display of the Existing Visual Surface Patterns, and simulations of Proposed Actions within those features, instruct the group to return the Preference Forms. Again, explain the project objectives, and uses (value) of the Preference Testing results.



Note:
Ratings used on l y for cross reference after preference test i ng.

USER SENSITIVITY LOCATIONS

13

Harman, O'Donnell & Henninger Associates, Inc.
Planning Consultants · Denver, Colorado

Slide Set No.	Projector A	B	C	D
1	+1	0	0	0
2	+3	-2	-2	-2
3	0	+1	+2	+1
4	0	0	0	0
5	0	+1	+1	+1
6	-2	+2	+3	+1
7	+1	-2	-2	-2
8	0	+1	0	+1

Rating Criteria

I Like It Very Much	++	+2
i Like It	+	+1
I Neither Like It Nor Dislike It	/	o
I Dislike It		-?
I Dislike It Very Much	--	-2

Note:
Add Slide Sets as required to illustrate all Existing Visual Features and/or different views of each feature.

PREFERENCE TESTING FORM 14

User Sensitivity

Having collected the Preference Testing Forms, evaluate the test scores and separate the responses of individual participants into categories of High, Moderate, and Low Sensitivity, based upon each persons demonstrated reation to visual change, e.g., reaction to proposed actions simulated in existing scenes versus existing scenes without proposed actions. Using information from the Sensitivity Location Overlay (see Illustratic 13), delineate and label on an overlay to the Project Base Map the areas in which the High Sensitivity users live, travel, work, and/or visit within the Project Study Area. Add to these areas, Special Use Areas which may have been omitted by the High Sensitivity users. Except in those areas already designated as a High Sensitivity Area, add the Moderate Sensitivity Areas, determined from the locational information provided by the Moderate Sensitivity participants; al I other areas within the Pro ject Study Area, except for Special Use Areas not already designated, are mapped as Low Sensitivity Areas. All Special Use Areas are designated as High Sensitivity Areas (see Ill ustration i5).

Key Observation Points

The determination of Key Observation Points (KOPS) is made from an evaluation of Use Volume and User Sensitivity. The following matrix defines Key Observation Points in a yes-no format:

KEY OBSERVATION POINT MATRIX

User Sensitivity	Use Volume		
	High	Moderate	Low
High	yes	yes	yes
Moderate	yes	yes	yes
Low	yes	no	no

Delineate and label on an overlay to the Project Base Map the KOPS identified by overlaying the Use Volume and User Sensitivity Overlays (see Illustration 16).

Seen Areas

Delineate and label on an overlay to the Project Base Map all "Seen Areas" from the Key Observation Points, considering proposed actions. Visibility (or invisibility) is dependent upon the terrain, atmospheric conditions, and in some cases, visual surface pattern. The maximum distance at which proposed actions are visible is based upon an evaluation of each of the proposed actions in relation to the specific Project Study Area. Separate overlays of "Seen Areas" from each KOPS should be saved for use in later Area Sensitivity Analysis (see Illustration 17).

Distance Zones

Visual distance is a critical factor in the evaluation of visual resources and development. In general, highly preferred visual features become somewhat less preferred (and less preferred somewhat more preferred) as distance increases. That is, all visual features tend toward neutrality with distance and its accompanying filtering characteristics.

Three visual distances are determined for the Project Study Area. These include (1) Foreground," or the area displaying the greatest resolution and visual detail as seen from an observation point; (2) Middleground, or the area in which visual features are clearly visible but lacking in fine-grained detail; and (3) Background, or areas in which visual features are discernible only as general visual forms.

As in the determination of "Seen Areas", the definition of Distance Zones is dependent upon the terrain, atmospheric conditions and, in some cases, the visual surface pattern in the Project Study Area. Distance Zone definitions are based upon an evaluation of each of the proposed actions in relation to the visibility conditions inherent in the Project Study Area. As a general guiding rule, Foreground visual distance is in the range of zero to one mile; Middleground visual distance is one to five miles; and Background visual distance is five to twenty miles or more. A fourth visua I category, Seldom Seen, is identified, regardless of distance, as invisible or partially invisible from Key Observation Points. Delineate and label on an overlay to the Project Base Map al I areas identified as Foreground, Middleground, Background and Seldom Seen, as determined from Key Observation Points. Should zones from more than one KOPS overlap, delineate the zone with the nearest and/or "Seen" classification (see Illustration 18).

Existing Visual Quality

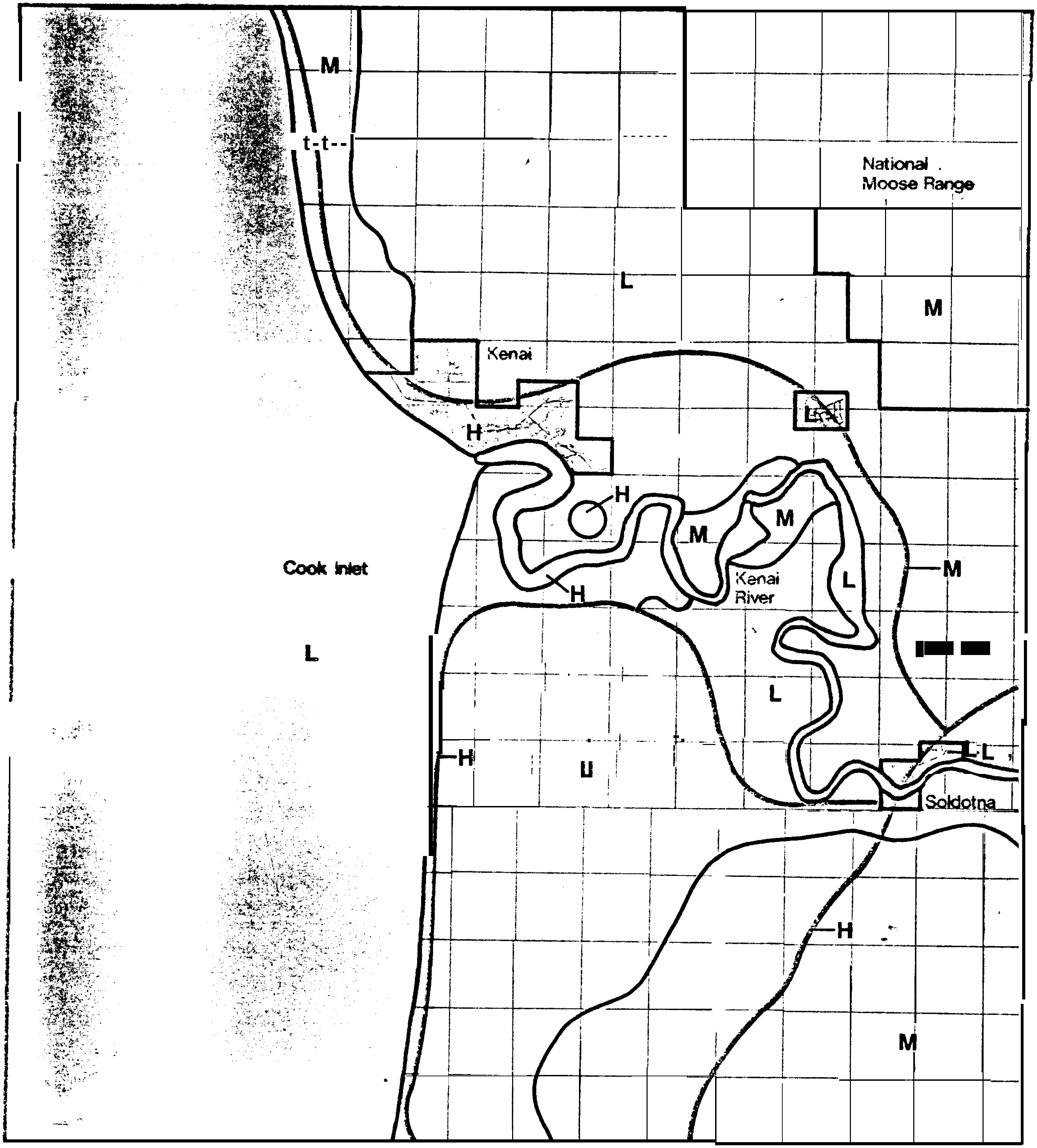
The determination of Existing Visual Quality is made from the application of Preference Testing results to the Visual Surface Pattern Features. Sum the scores for each of the different existing visual features, and divide the sum by the number of evaluators.

It is important to keep seaprate the public participants evaluations from those produced by representatives of the BLM and its design consultants. The written documentation of "local/regional" plus "nai-ions I" standards for visual quality is a requirement. Should results of the Preference Testing of both user and professional groups be similar, mesh the two together; should results be significant y different, use the group results which will ultimately more greatly protect or enhance the visual resources of the Project Study Area.

Develop a List of Preference Scores for each Existing Visual Surface Pattern Feature and record (see Illustration 4). Using the accompanying Visual Qua! ity Ranges, determine the Existing Visual Quality Category for each designated Visual Feature (see Illustration 1 9).

Preference Scores	Visual Quality Category
1.5 to 2.0	Category A Considered As Areas of Critical Environmental Con tern (ACEC)
.75 to 2.0	Category A
- .74 to .74	Category B
- .75 to -2.0	Category C
-1.5 to -2.0	Category C Considered As Areas Requiring Rehabilitation

Aggregating homogeneous areas, delineate and label on an overlay to the Project Base Map and the Existing Visual Surface Pattern Overlay, the relative level of Existing Visual Quality determined by the Preference Testing procedure (see Illustration 20).



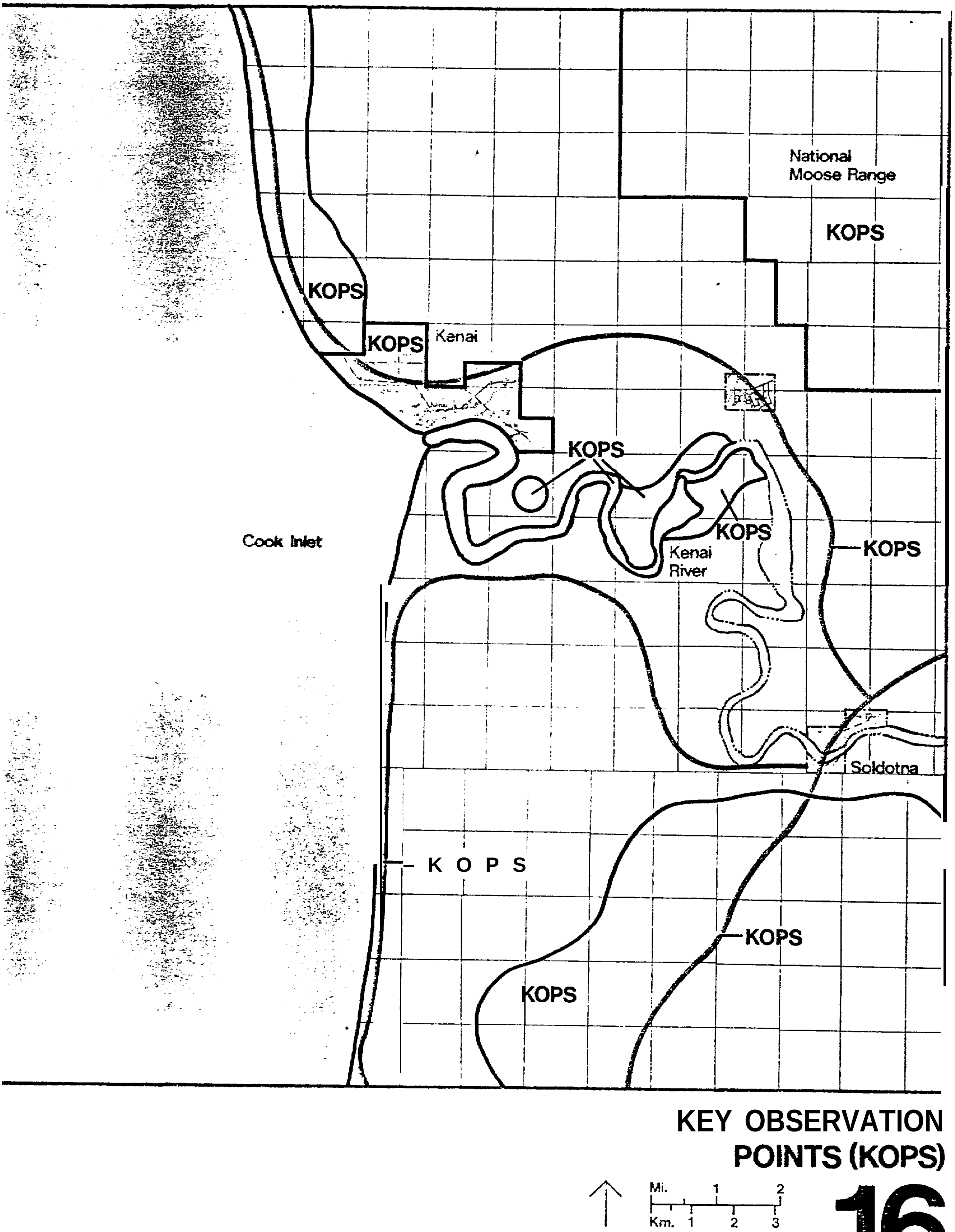
H-High
M-Moderate
L-Low

USER SENSITIVITY

15

Mi. 1 2
Km. 1 2 3

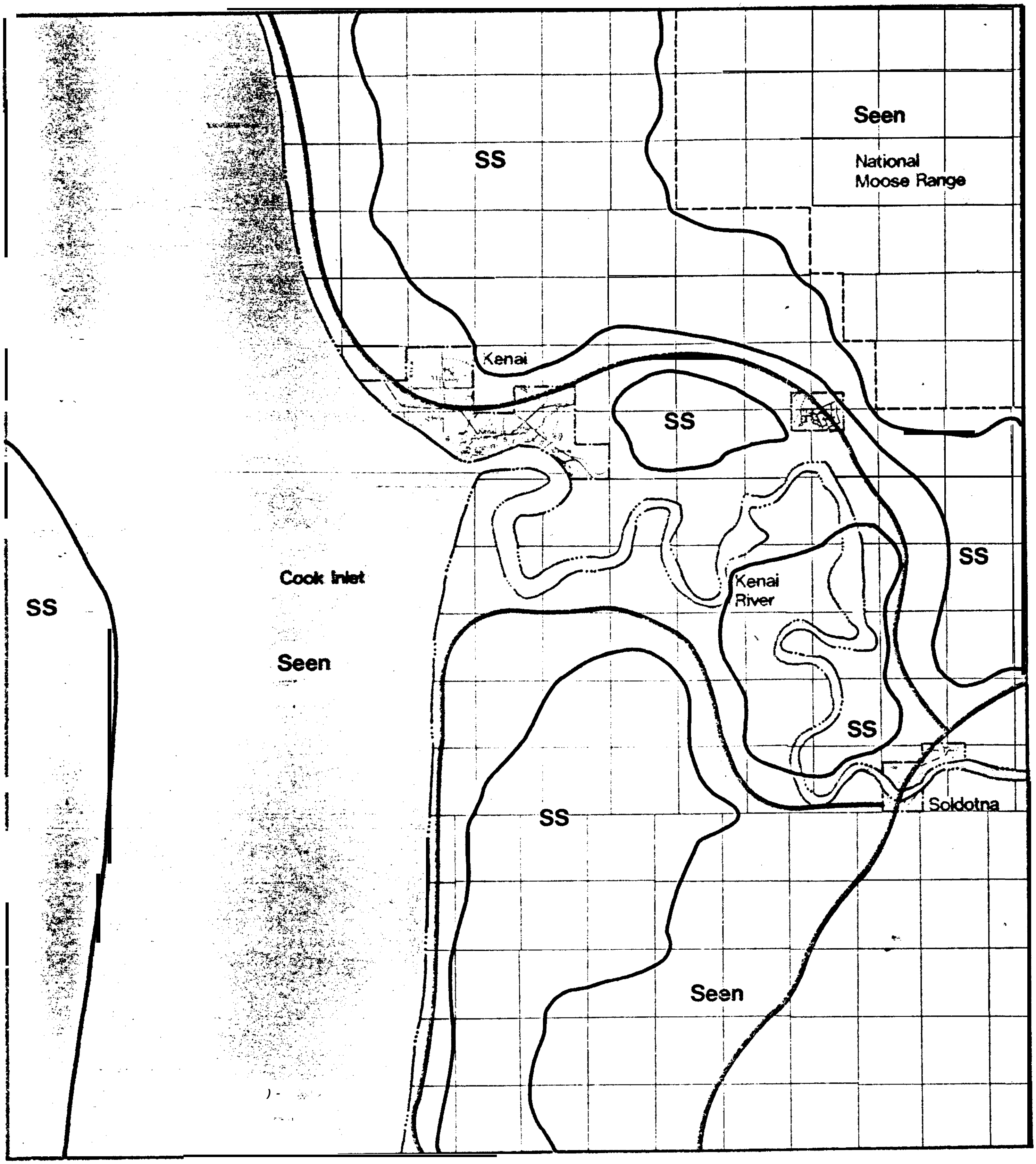
Harman, O'Donnell & Henninger Associates, Inc.
Planning Consultants · Denver, Colorado



KEY OBSERVATION POINTS (KOPS)

16

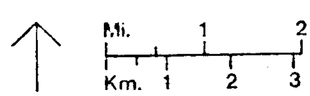
Harman, O'Donnell & Henninger Associates, h-m.
Planning Consultants. Denver, Colorado



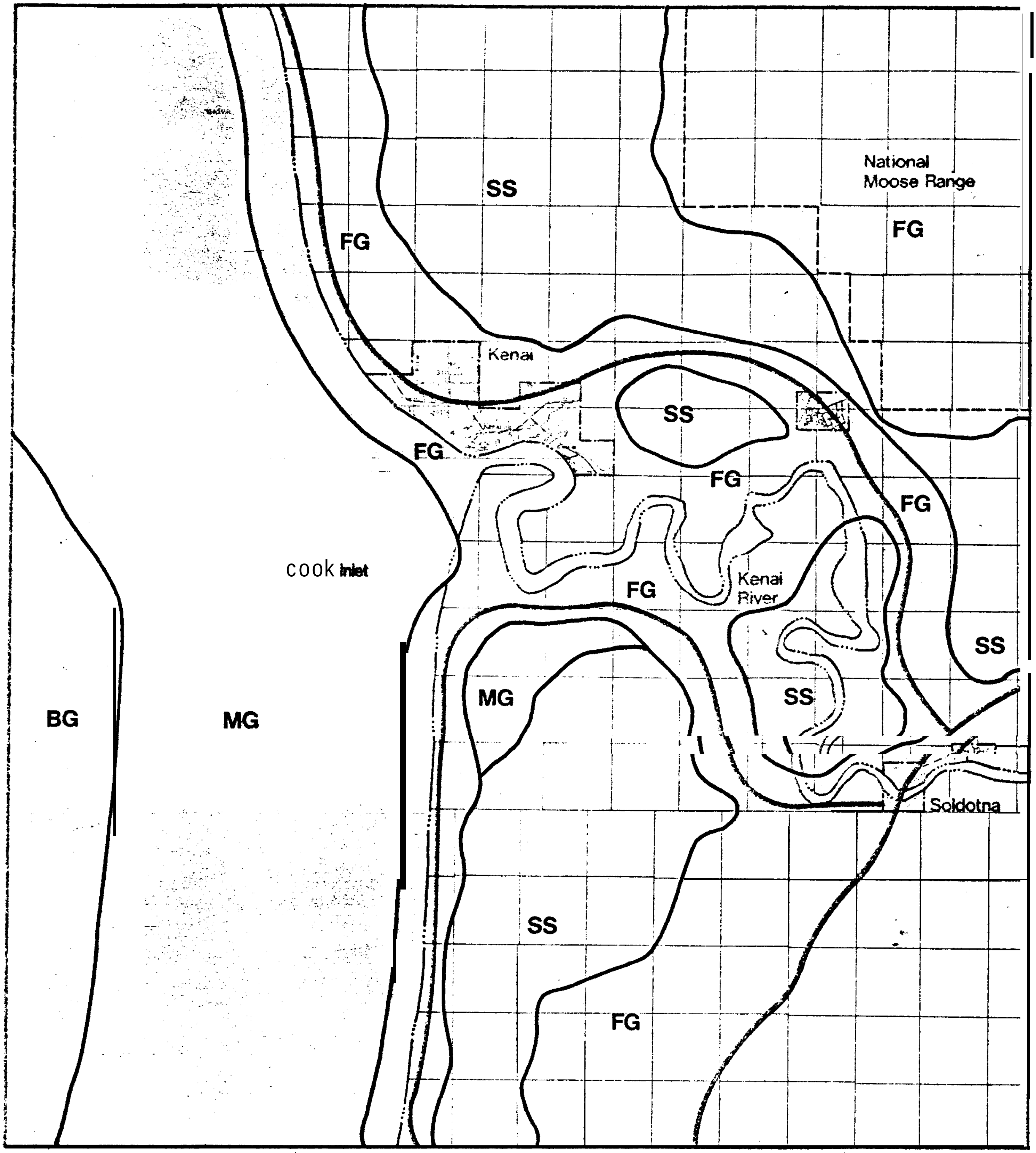
SS-Seldom Seen Areas

Note:
Maintain separate overlays
for seen area from each KOPS
for use in area sensitivity analysis.

SEEN AREAS 17



Harman, O'Donnell & Henninger Associates, Inc.
Planning Consultants. Denver, Colorado



Foreground (FG) O-1 Mile
Middleground (MG) 1-5 Miles
Background (BG) 5-20 Miles
Seldom Seen Areas (SS)

DISTANCE ZONES

18

Harman, O'Donnell & Henninger Associates, Inc.
Planning Consultants · Denver, Colorado

Number of Evaluators 35

Existing Visual Feature	Score +2	+1	o	-1	- 2	Average Score	Catego
1. Cook Inlet	4	16	15			.69	B
2. Kenai	9	22	0			1*14	A
3. Kenai Suburb		15	0	10		.14	B
4. Soldotna		5	20	10		.14	B
5. Kenai River	5	17	13			.77	A
6. Open Swamp		26		8	1	.46	B
7. Single Family Residential	25	4	6			1.54	A
8. belated Swamp		5	30			.14	B
9. Industrial		17			18	.54	B
10. Agriculture (Dry)	11	24				1.31	A
11. Undeveloped Land		5	30			.14	B
12. Highway		15	10	10		*43	B
13. Beach Road	25	10				1.7	ACEC
14. Highway		20	15			.57	B
15. Agricultural (Irrigated)	24	11				1.7	ACEC

PREFERENCE SCORE
EXISTING VISUAL FEATUR

1

EXISTING VISUAL QUALITY

20

Harman, O'Donnell & Henninger Associates, Inc.
Planning Consultants. Denver, Colorado

Area Sensitivity

The determination of Area Sensitivity is made from the evaluation and overlay of UserSensitivity, Use Volume and Seen Areas. The accompanying Area Sensitivity Matrix defines the relative level of Area Sensitivity. The Seen Areas Overlays determined previously from each Key Observation Point serve as the indicator of Area Sensitivity Map boundaries. Delineate and label on an overlay to the Project Base Map the results of the above composite evaluation. Should overlaps occur, use the area boundary demonstrating a higher level of Area Sensitivity. Areas invisible from Key Observation Points are included in the Low Area Sensitivity category (see illustration 21).

User Sensitivity	Use Volume		
	High	Moderate	Low
High	High	High	Mod
Moderate	Mod	Mod	Mod
Low	Mod	Low	Low

Visual Vulnerability/Lease Permit Analysis

The procedure used in the determination of the acceptability of the visual environment for energy related leasing involves the use of (?) Existing Visual Quality, (2) Seen Areas, (3) Distance Zones, (4) Area Sensitivity, and (5) Special Use Areas (including Areas of Critical Environments I Concern for visual values [ACEC]). For determination of environmental impact of existing facilities, evaluator should continue process described on Page 61, Visual Impact. Typical 1 y, only general information regarding the visual characteristics of the proposed action is available at this stage of the process.

Therefore, the analyses are based predominantly upon the ability of the visual environment to withstand that "type" of development, rather than being based upon detailed specifications and construction characteristics. "Typical" characteristics are used in the Project Overview and Preference Testing phases. The matrices shown below are used to define the level of acceptability of leasing in the Project Study Area. Maps are overlayed as required by the matrices. Del ineate and label on an overlay to the Project Buse Map the relative levels and corresponding zones as defined in the analyses (see Illustration 22).

Visual Vulnerability Matrices

Distance Zones

For Existing Visua I Quality Category "A" Areas:

		F G	MG	BG	SS
	H	I	I	I	I
Area Sensitivity		M	1	II II	II
	L	II	II	II	II

For Existing Visual Quality Category "B" Areas:

		F G	M G	BG	SS
	H	II	II	II	III
Area Sensitivity	M	II	III	III	III
	L	Ill	III	III	III

For Existing Visual Qual ii-y Category "C" *Areas:*

		F G	MG	BG	SS
	H	II	III	Ill	III
Area Sensitivity	M	III	III	Ill	Iv
	L	III	III	Iv	IV

		Special Use Area	
		Yes	No
Visual Vulnerability Category (Determined from above analysis)	I	I	I
	II	I	II
	III	II	III
	Iv	. II	IV

Visual Vulnerability Category Definitions

Category 1 - Unsuitable for the proposed actions; very high visual quality, in combination with high visibility by sensitive users of the visual resources, make lands within this zone extremely vulnerable to visual degradation.

Category II - Suitable for the proposed actions only if substantial Form, Line, Co lor, and Textural mitigating measures are implemented. Proof of adequate mitigating measures, prepared by professionals trained in the environmental design arts, must be demonstrated and committed before leasing is authorized.

Category III - Suitable for the proposed actions if Form, Line, Color, and Texture related mitigation measures are implemented. Mitigating measures, prepared by professionals trained in the environmental design arts, are required to reduce Form, Line, Color, and Texture related anomalies.

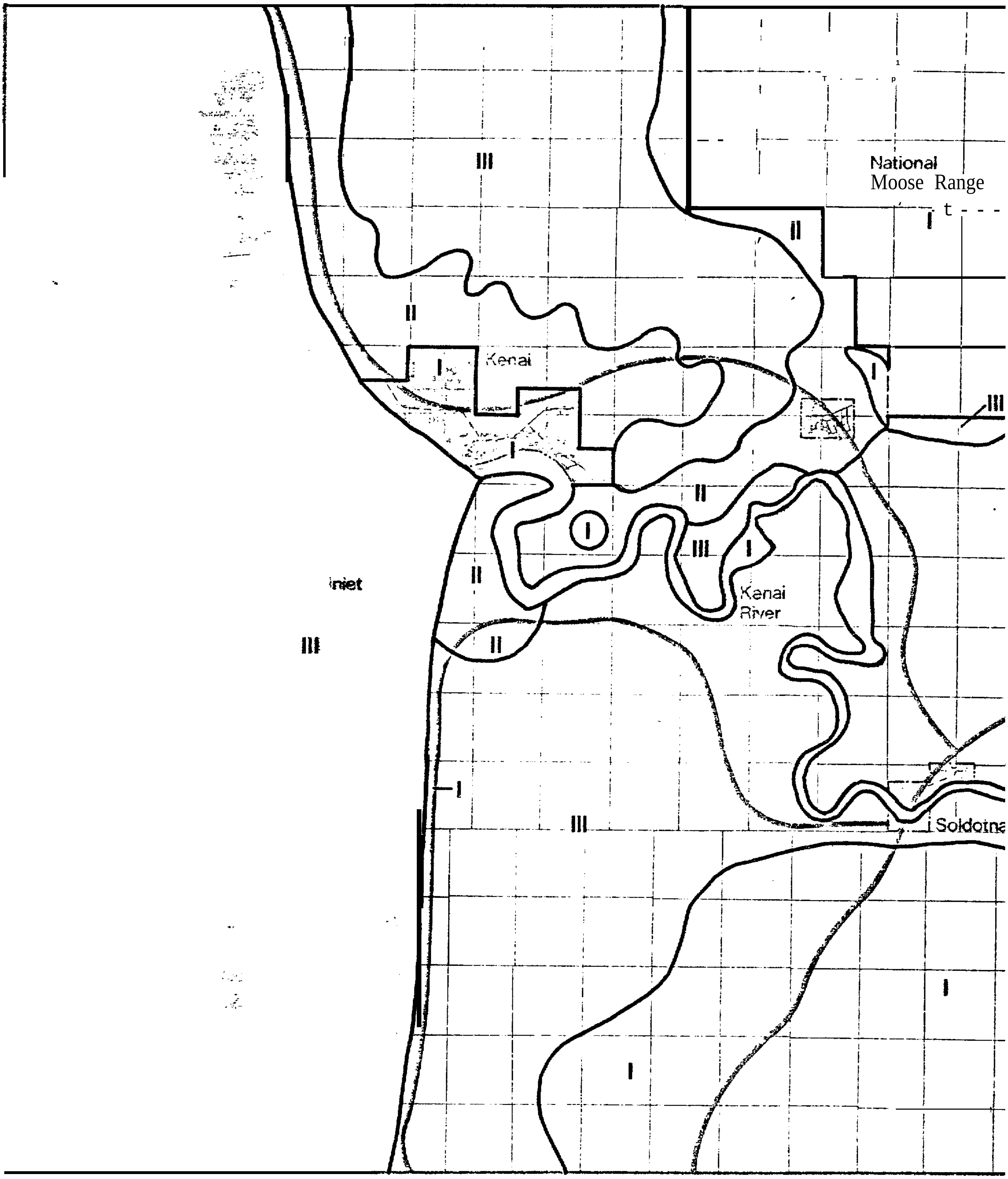
Category IV - Areas most suitable for the proposed actions. Facilities developed in these areas wi I I cause the I east degradation of the visua I resource; designation of color related mitigating measures, however, is required.

H-High
M-Moderate
L-Low

AREA SENSITIVITY

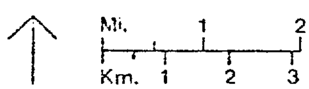
21

Harman, O'Donnell & Henninger Associates, Inc.
Planning Consultants · Denver, Colorado



VISUAL VULNERABILIT

22



Harman, O'Donnell & Henninger Associates,
Planning Consultants · Denver, Colorado

Visual Impact

For Environmental Impact Statements, the procedure used in the determination of Visual Impact involves the analysis and overlay of (1) Existing Visual Quality, (2) Seen Areas, (3) Distance Zones, (4) Area Sensitivity, (5) Special Use Areas (including Areas of Critical Environmental Concern for visual values), and (6) Change in Visual Quality, developed as a result of the following steps:

Sum the Preference Scores for each proposed action (as proposed, without new mitigation measures), and divide the sum by the number of evaluators. It is important to keep separate the public participant's scores from those produced by representatives of the BLM and its design consultants. The written documentation of "local/regional" plus "national" standards for visual impact is a requirement. Should the results of the Preference Tests of both user and professional groups be similar, mesh the two together; should results be significantly different, use for the impact analyses the group's scores which will ultimately more greatly protect or enhance the visual resources of the Project Study Area. Using the Proposed Visual Features Overlay (see Illustration 7), develop a List of Preference Scores for each Proposed Action and record (see Illustration 6). Using the Visual Quality Ranges established on Page 49, determine the Proposed Visual Quality Category for each of the proposed actions (see Illustration 23). Aggregating homogeneous areas, delineate and label on an overlay to the Project Base Map and Existing Visual Quality Overlay, the relative level of Proposed Visual Quality determined by the Preference Testing procedure (see Illustration 24), Using the Change in Visual Quality Matrix, shown on the next page, delineate and label on an overlay to the Project Base Map, the Change in Visual Quality (see Illustration 25).

		Proposed Visual Quality		
		A	B	C
	ACEC	III	IV	Iv
	A	II	III	Iv
Existing Visual Qualify	B	I	II	II
	C	I	I	II
	Rehab	1	I	II

Proposed Preference scores must be within .25 points of existing visual feature scores for unqualified approval.

The accompanying matrices are used to define the level of visual impact of the proposed actions in Project Study Area. Maps are overlayed as required by the matrices. De-1 ineate and label on an overlay to the Project Base Map the relative levels and corresponding zones as defined by the analyses (see II lustration 26).

Visual Impact Matrices

For Change in Visual Quality Category I

		Distance Zones			
		FG	MG	BG	SS
	H	I	I	I	I
Area Sensitivity	M	I	I	I	I
	L	I	I	I	I

For Change in Visual Quality Category II

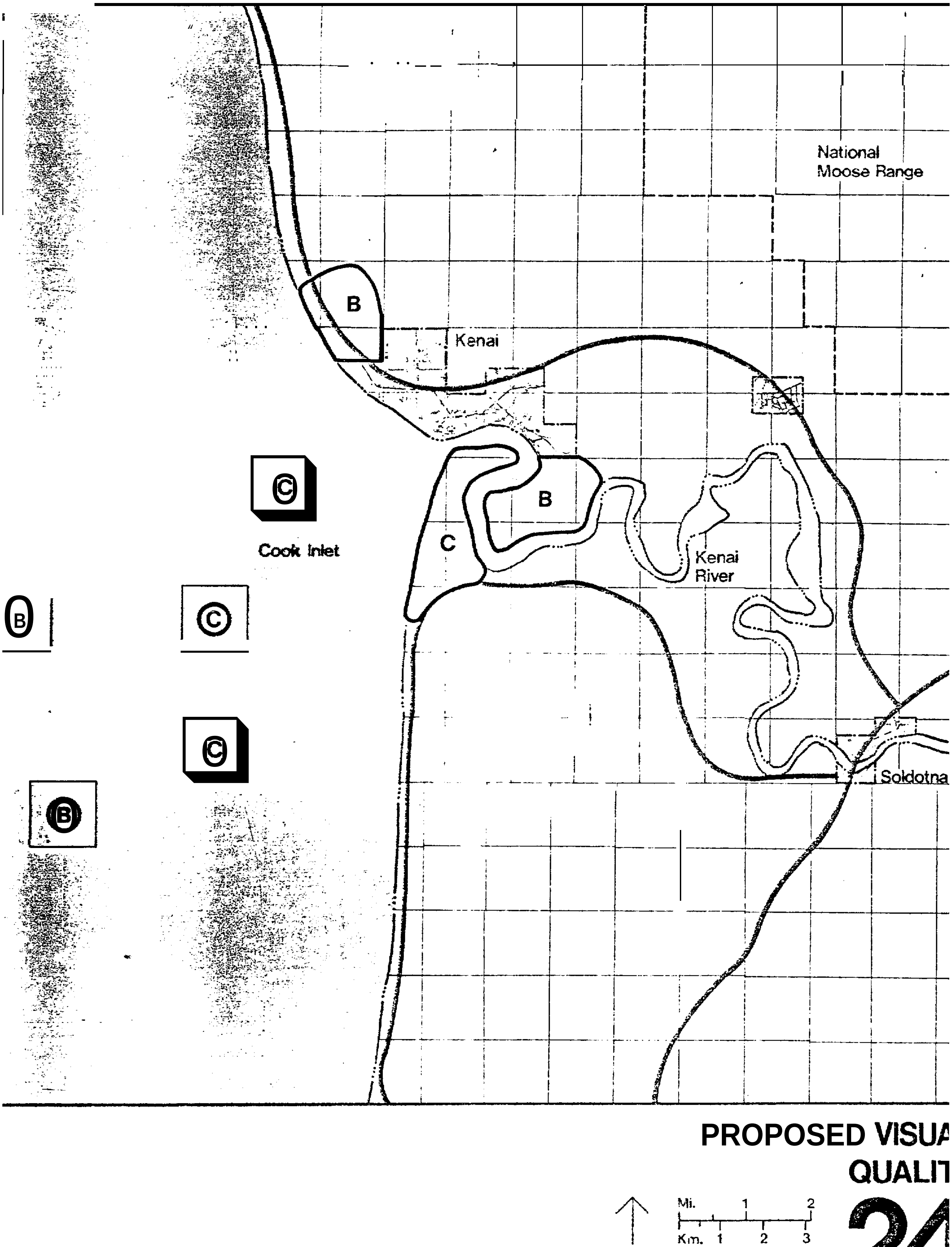
		FG	MG	BG	SS
	H	II	II	II	II
Area Sensitivity	M	II	II	II	II
	L	II	II	II	II

umber of Evaluators 35

Proposed Visual Feature	+2	+1	0	−1	- 2	Average Score	Category
1. Barge Terminal			3		32	-1.74	C
2. Employee Housing		5	22	2	6	- .26	B
3. Pipe Storage		26	0			.74	B
4. Lease Areas/Drill Pad			0			0	B
5. Lease Areas/Drill Pad				29	6	1.17	C
6. Lease Areas/Drill Pad			8		27	-1.54	c
7. Lease Areas/Drill Pad			3	9	23	-1.57	C
8. Lease Areas/Drill Pad		19	10	6		.37	B

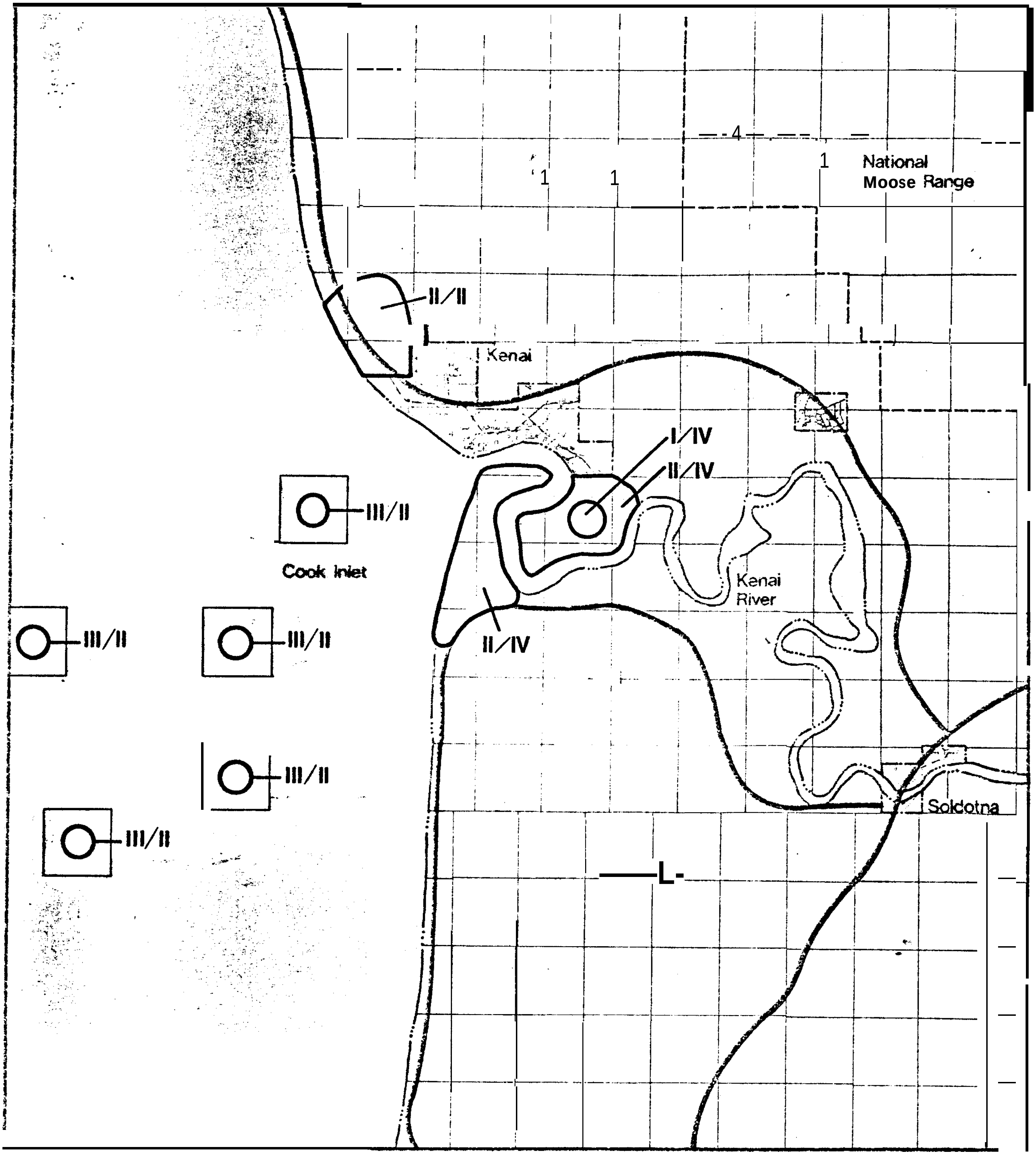
PREFERENCE SCORES/ PROPOSED VISUAL FEATURES

23



PROPOSED VISUA
QUALIT
24

Harman, O'Donnell & Henninger Associates,
Planning Consultants. Denver, Colorado



Visual Vulnerability Category / Change in Visual Quality Category

CHANGE IN VISUAL QUALITY

Mi. 1 2
Km. 1 2 3

25

Harman, O'Donnell & Henninger Associates, Inc.
Planning Consultants, Denver, Colorado

For Change in Visual Quality
Category III

Area Sensitivity		FG	MG	BG	SS
	H	iv	III	III	III
	M	III	III	III	III
	L	III	III	III	III

For Change in Visual Quality
Category IV

Area Sensitivity		FG	MG	BG	SS
	H	Iv	Iv	IV	Iv
	M	IV	IV	Iv	IV
	L	w	Iv	Iv	III

To determine Final Visual Impact of the Proposed Actions, use the fol lowing matrix.

Visual Impact Category (Determined from above analysis)		Special Use Area	
		Yes	No
	I	I	I
	II	III	II
	III	IV	III
	IV	Iv	IV

Visual Impact Category Definitions

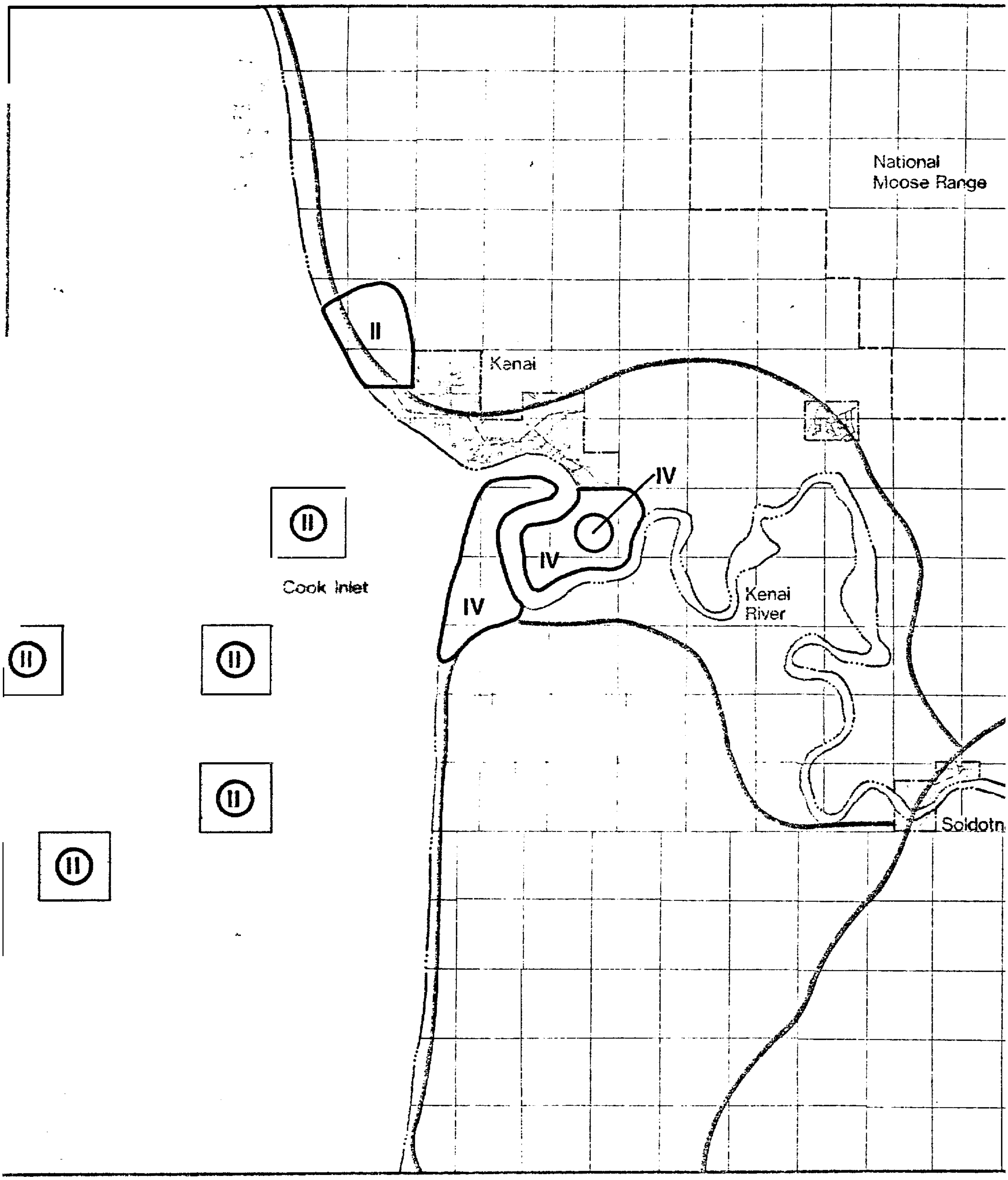
Category J - The visual impact of the proposed activity is positive in nature. The visual resource would be enhanced by the addition of the proposed action.

Category II - The visual impact of the proposed actions is neither positive or negative. The proposed actions are compatible with the visual resource, Category III - The visual impact of the proposed action is moderately negative in nature. The proposed actions would cause a noticeable and negative change in the visual resource.

Category IV - The visual impact of the proposed action is severely negative in nature. The proposed actions would cause a very influential and severely negative change in the visual resource,

Visual Mitigation Measures

The determination of mitigating measures is made from the Preference Testing procedure and from design decisions made by representatives of the BLM and its design consultants. Sum the Preference Scores for each mitigation measure and divide the sum by the number of evaluators. Determine scores of each visual feature within which proposed actions are located to identify target scores for mitigation measures. Proposed mitigation related Preference Scores must be within .25 points of that allowable for the appropriate impact category for successful mitigation. If not, redesign. Use of Illustration 8 is made to assist in the determination of Form, Line, Color, and Texture mitigation measures. This illustration permits the identification of adjacent design criteria.



VISUAL IMPA

26

Harman, O'Donnell & Henninger Associate
Planning Consultants. Denver, Colorado

IV. REVIEW & TESTING OF THE PROPOSED V R M METHODOLOGY

As part of the OCS Visual Resource Management Methodology Study, it was considered necessary to initially test the proposed system through in-the-field implementation. Although it is recognized that results of such testing are not conclusive, advantages and disadvantages can be evaluated and recommendations for improvement incorporated early in the development stages. To conduct the Case Study, HOH asked 58 students of Colorado State University's Landscape Architecture Program to review the methodology and conduct the necessary steps to determine the visual impact of three hypothetical power plants; selection of the plant with the least visual impact was also a requirement. Students, whose backgrounds included landscape architecture, forestry, range sciences, outdoor recreation, and natural resource management, were under the guidance of Merlyn J. Paulson, co-author of this report, and instructor of the Visual Landscape Management course at CSU. The study site, located south of Fort Collins, Colorado, was selected based on the immediate availability of data, accessibility, and similarity in visual characteristics (edge of foothills) to the Alaskan OCS environment. Student participants were instructed in the purpose of the study, the procedures to be used, methods for slide simulations, and other factors necessary to adequately evaluate the proposed system! The students were familiar with the U.S. Forest Service and Bureau of Land Management's visual resource evaluation methods through previous course work undertaken during the preceding eight week period; the OCS Case Study was conducted over a four week period, with final products and reports prepared by each of ten study teams. Each team followed the recommended procedures', including slide simulations, mapping, user preference testing[2], and other requirements necessary to complete the methodology.

The initial results of the testing indicated that the OCS Methodology presented an improved system for evaluating visua I impact. One major indication is the fact that al l teams selected the same power plant location as contributing the least visual impact. With other systems “implemented previously by the same group, no unanimous selection for least impacted area had been made, emphasizing the more subjective approach of other systems. Other indications are summarized in the following list of advantages presented by the group members; disadvantages are also summarized, The Final Report has addressed some of these shortcomings, as appropriate; other comments are explained accordingly.

1 - At the time of initiation, the proposed methodology had not been completely developed. Handwritten copy, therefore was provided, and without the benefit of graphic i I lustrations.

2 - To conduct user preference tests, students asked the League of Women Voters, church groups, hospital patients, the Chamber of Commerce, and other local citizens to participate in this part of the methodology.

<u>Advantages</u>

- Less time required to conduct” the study
- Increased public participation
- More valid determinants for use volumes, KOPS selection, distance zones, and area sensitivity
- Easi I y understood, straightforward approach (once immersed in it)

- Directly applicable to site specific studies
- increased accuracy/more detailed
- More realistic system
- Easily implemented
- Allows for flexibility to conduct large or small scaled projects in any environment
- Less bias in decision making

Disadvantages

- Costs involved for slide simulation were higher
- Large number of maps required (though not more mapping time)
- Difficulty in slide simulations
- Potential for misrepresentation of Existing Visual Features/Proposed Visual Features

The advantages and disadvantages stated above were in no way unanimous, but were the views of the majority of participants. The significance of the advantages, and the potential for mitigation or explanation of the disadvantages indicates what the authors consider an initial success of the proposed OCS Methodology. For example, students considered costs based on their personal expenditures necessary for photography and slide simulations. The majority of the teams, however, felt that the system could be implemented over a shorter period of time than other systems, resulting in fewer man-hours to complete the study. The reference to the large number of map products is somewhat balanced by other comments indicating the ease in implementation and straightforward approach due to the logical mapping information and sequences. Slide simulation comments might have been avoided if graphic illustrations were available to the students prior to initiation of the study. The potential for misrepresenting existing and proposed visual features can be mitigated by increasing the number of photographs of each visual feature to insure that al I obvious angles of view are shown, and al I aspects of the proposed features are indicated.

Recommendations as a result of the Case Study included the inclusion of a glossary of terms, a list of goals and objectives, clarification of use volume matrices, and a requirement to increase the number of slides to insure valid representation of visual features. The contractor feels that these are all valid comments and has incorporated them into the fina l product (the glossary of terms has not been specifical l y provided, since most terms are consistent with the existing BLM VRM system; new terms are explained as necessary in the text of the report).

APPENDIX A. BUREAU OF LAND MANAGEMENT MANUAL 8411 (DRAFT) UPLAND VISUAL RESOURCE INVENTORY AND EVALUATION

(camera-ready copy to be provided by BLM)

APPENDIX B. SUMMARY OF APPLICABLE AND DEFICIENT COMPONENTS OF BLM MANUAL 8411 (DRAFT) UPLAND VISUAL RESOURCE INVENTORY AND EVALUATION

Applicable Elements:

- Evaluation of Scenic Quality
- Documentation of Scenic Quality and Cultural Modifications through photography and mapping
- Identification of Cultural Modifications and "Visual Significance" of each
- Consideration of key factors in evaluation of Scenic Quality
- Use of Scenic Qua I ity ratings to influence future master planning
- Identification of Areas of Critical Environmental Concern for Scenic Value (ACEC)
- Delineation of Visual Sensitivity Areas
- Identification of Key Observation Points
- Preparation of Seen Areas
- High level of public involvement to determine Sensitivity Levels
- Analysis of user's attitude toward change through use of ratings
- Mapping user reaction to change
- Preparation of Distance Zones Map
- Label ing areas and assigning VRM classes
- Outlining Visual Management Units
- Material storage
- Delineation of VRM classes

Deficiencies:

- Potential size of Scenery Quality Rating Units
- Scale requirements
- Use of narratives to describe general landscape characteristics
- General use of design professionals to evaluate:

    Scenic Quality

    Cultural Modifications

    Visual significance of Cultural Modifications

- Criteria for Use Volumes and Overall Sensitivity
- Seen Area Determination;
- Lack of user attitudes/evaluations for Scenic Quality ratings
- Generalization of VRM classes and associated uses permitted
- Equal weighting of Scenic Quality, Sensitivity Level, and Distance Zones to determine VRM class
- No tie between Sensitivity and Mitigation Measures

APPENDIX C. SLIDE SIMULATION PROCEDURES

Several methods for simulating proposed activities within the existing environment have been explored and tested by both governmental and private planning sectors. These methods vary in applicability, preparation costs, equipment, and required expertise. The U.S. Forest Service utilizes a rear projection simulator for many of its recreational planning needs. Techniques and appli cations of this method are discussed in "FSH 2309.17 Landscape Management Visual Display Techniques Handbook; the Bureau of Land Management is currently testing a similar technique with some success. Jones and Jones et al. describe a method of slide simulation in their presentation of "A Method for the Quantification of Aesthetic Val ues for Environmental Decision Making", in the April, 1975 Issue of Nuclear Technology. One alternative color photographic technique considered by Jones is described as fol lows:

- "Two color sl ides of each viewscape -- a before and an after sl ide -- mounted together with an additional transparent image of the facility combined into one slide. The additional transparency of the facility would be one of a series made available to the visual quality evaluator, These standard transparent facility images would illustrate the facility and plume from one-half-mile-distant intervals at various vertical observer positions. They would illustrate different directions relative to the direction of sunlight and represent hourly intervals from 9:00 to 11:00 a.m. and 1:00 to 4:00 p.m. The appropriate facility image would be mounted within the frame of a second before sl ide to depict the after visual image of a facility in that location. The slide alternative has the advantage of being quickly and directly prepared and is capable of being projected as a large image that more closely resembles actual viewing conditions. "

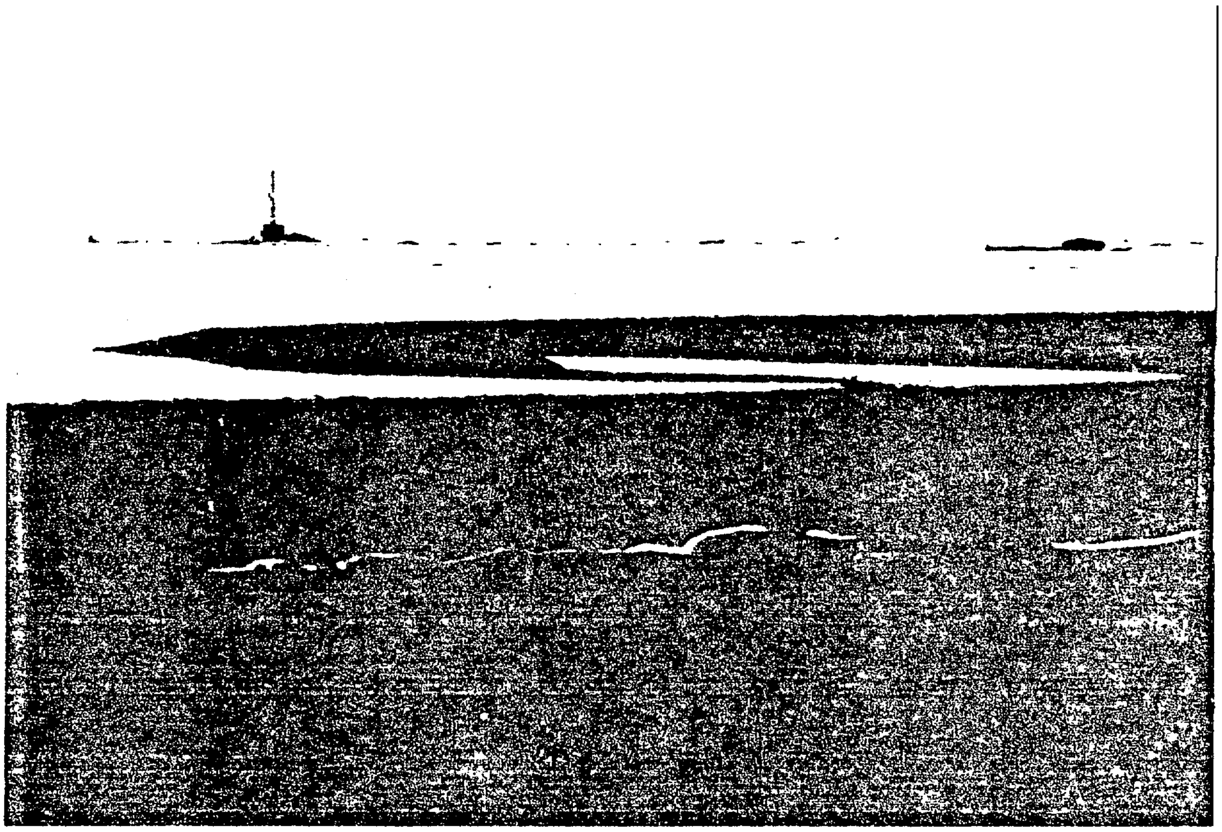
Jones goes on to discuss the need to accurately locate the proposed visua l features with the existing viewscape, a task most easily accomplished by locating the horizon in the viewscape and determining the elevation of the viewpoint in relation to the elevation of the facility.

The sl ide simulation method developed as part of the VRM Methodology proposed specifically for the Alaska OCS Office, and its field representatives, incorporates the principals of each of these techniques. The following section gives a step-by-step description, with illustrative examples of final products.

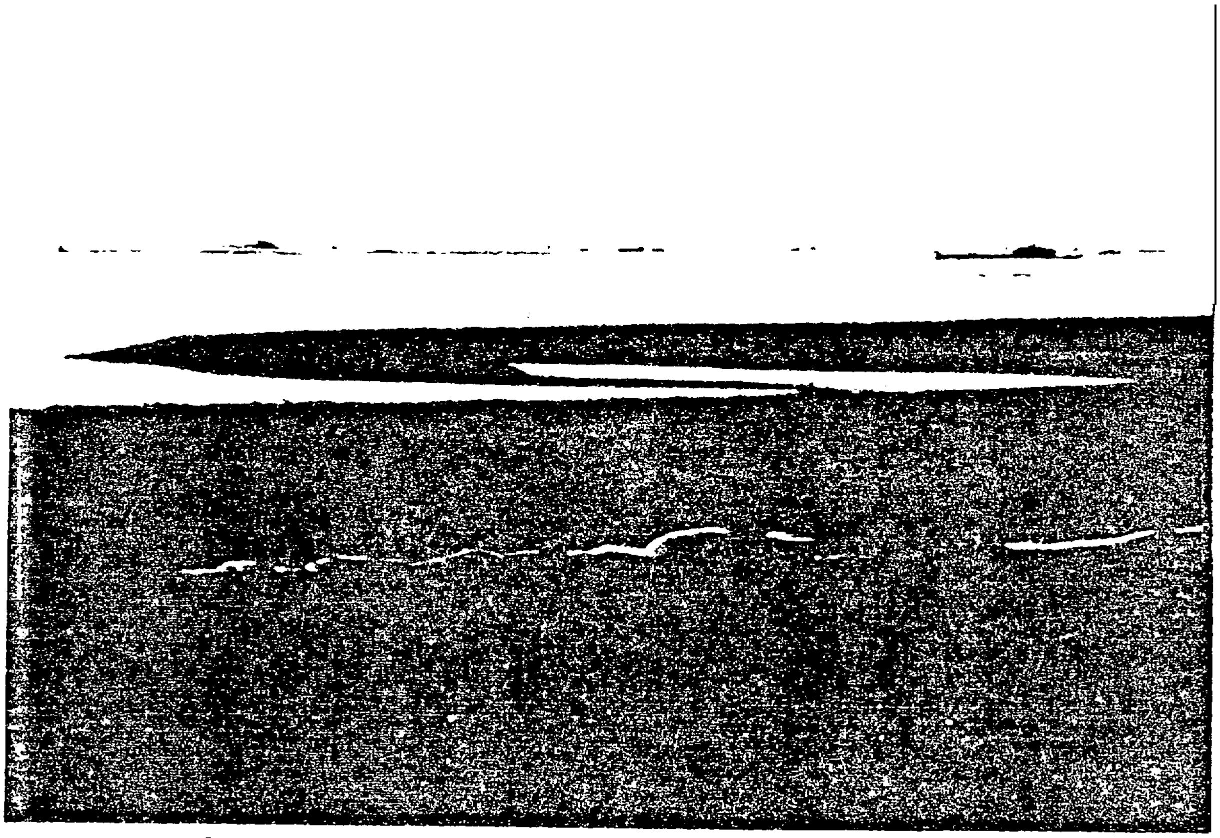
- Step 1 - Determine Existing Visual Features within the Project Study Area.
- Step 2 - Determine Proposed Visual Features anticipated for the Project Study Area.
- Step 3 - Photograph representative examples of each existing and proposed use type, using Kodak Vericolor II, Type S film. if examples of proposed actions do not exist in the Project Area, photograph simi lar features elsewhere or use line drawings to portray them. Produce a variety of proposed designs for three distance zones and/or design modifications, as appropriate.
- Step 4 - Process film (include contact sheet).
- Step 5 - Select photographs from contact sheet to be made into 8“ x 10“ color prints. (Use magnifying glass to select photographs. Only clear and sharp negatives make good quality en largements.) If examples are photographed on slide film, make Type C prints (of enlargements). Ektacolor Type C prints are recommended, since an internegative is required, giving correct color balance and good control over sizing images to be superimposed.

- Step 6 - On the 8" x 10" C print draw with a grease pencil on a tracing paper overlay the outline of the size and the placement of the image you want superimposed.
- Step 7 - Using an enlarger make color prints of the images to be superimposed to the sizes drawn.
- Step 8 - Using a util ii-y knife cut out images to be superimposed; in order to obtain as much realism as possible, images should be cut very careful ly.
- Step 9 - Using a copystand with a 35 mm camera and color slide film, photograph backgrounds to be used.
- Step 10 - Position image to be superimposed with spray adhesive to cover C print of background and photograph. To make color changes of the image to be superimposed, black and white prints to size should be made from the color internegatives. Color can then be added to the black and white print by using watercolor-color dyes, color film, or zip-a-tones.

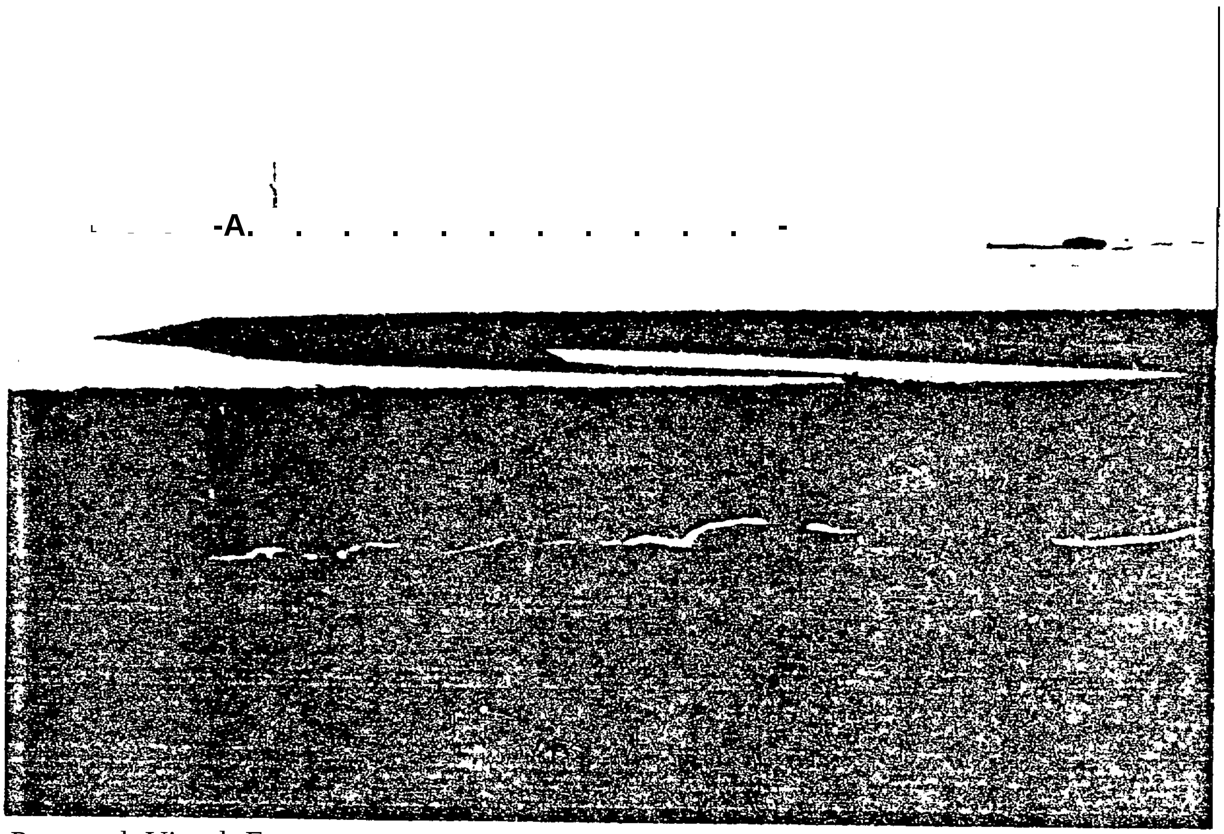
Existing Visual Feature



Proposed Visual Feature

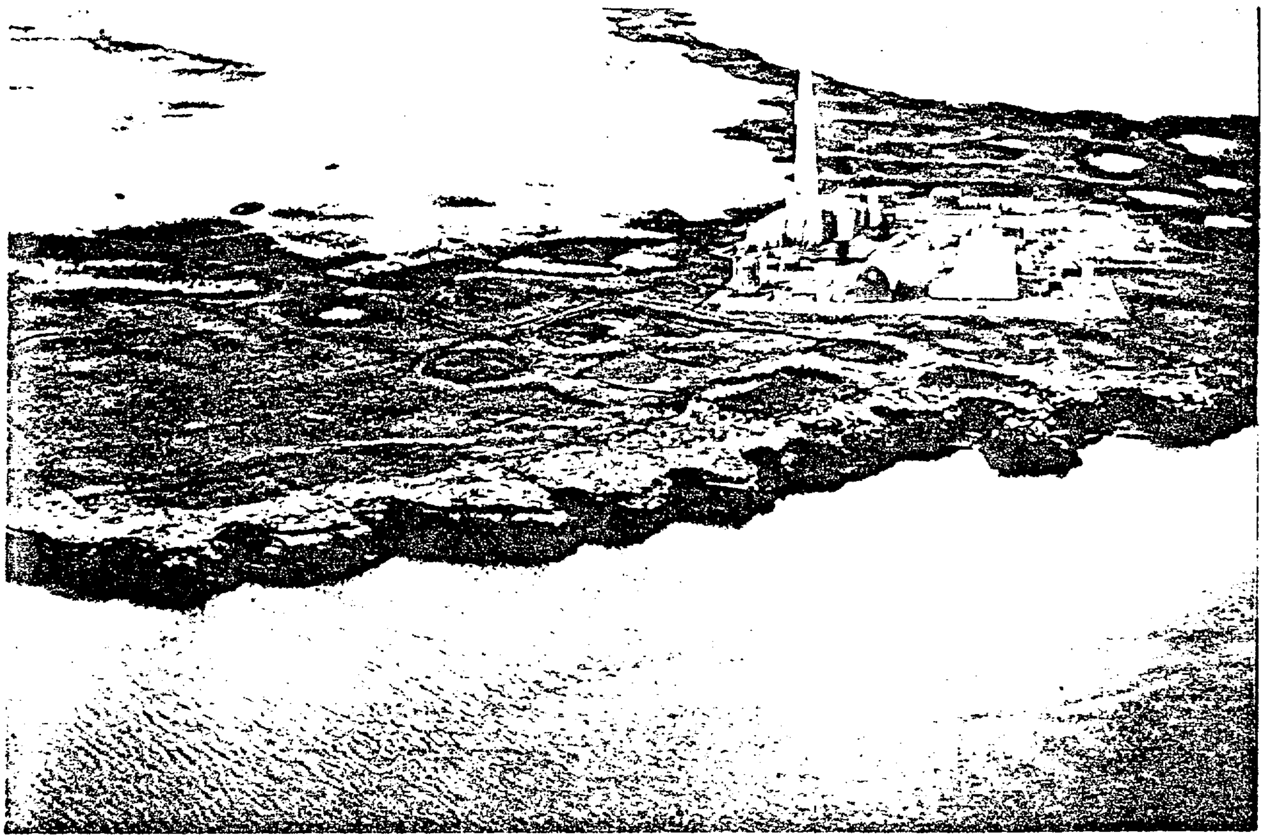


Existing Visual Feature



Proposed Visual Feature

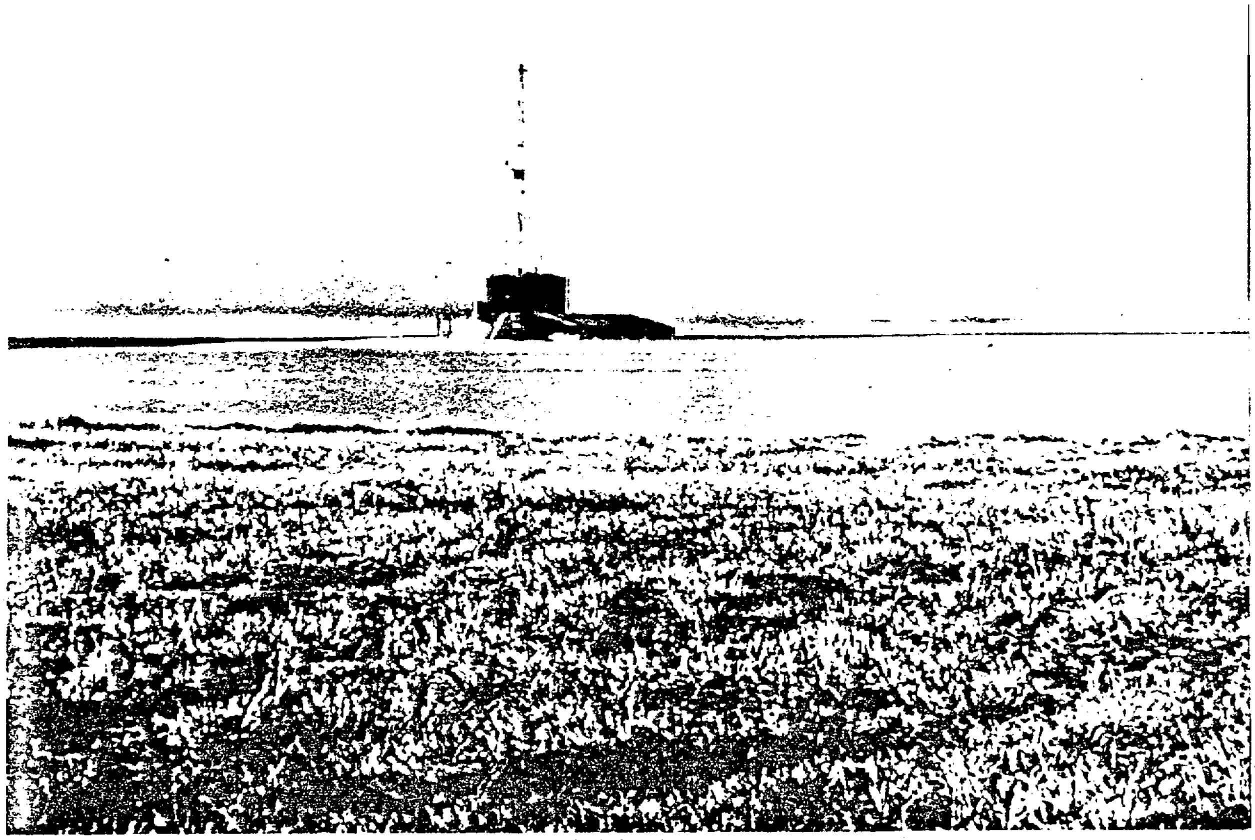
Existing Visual Feature



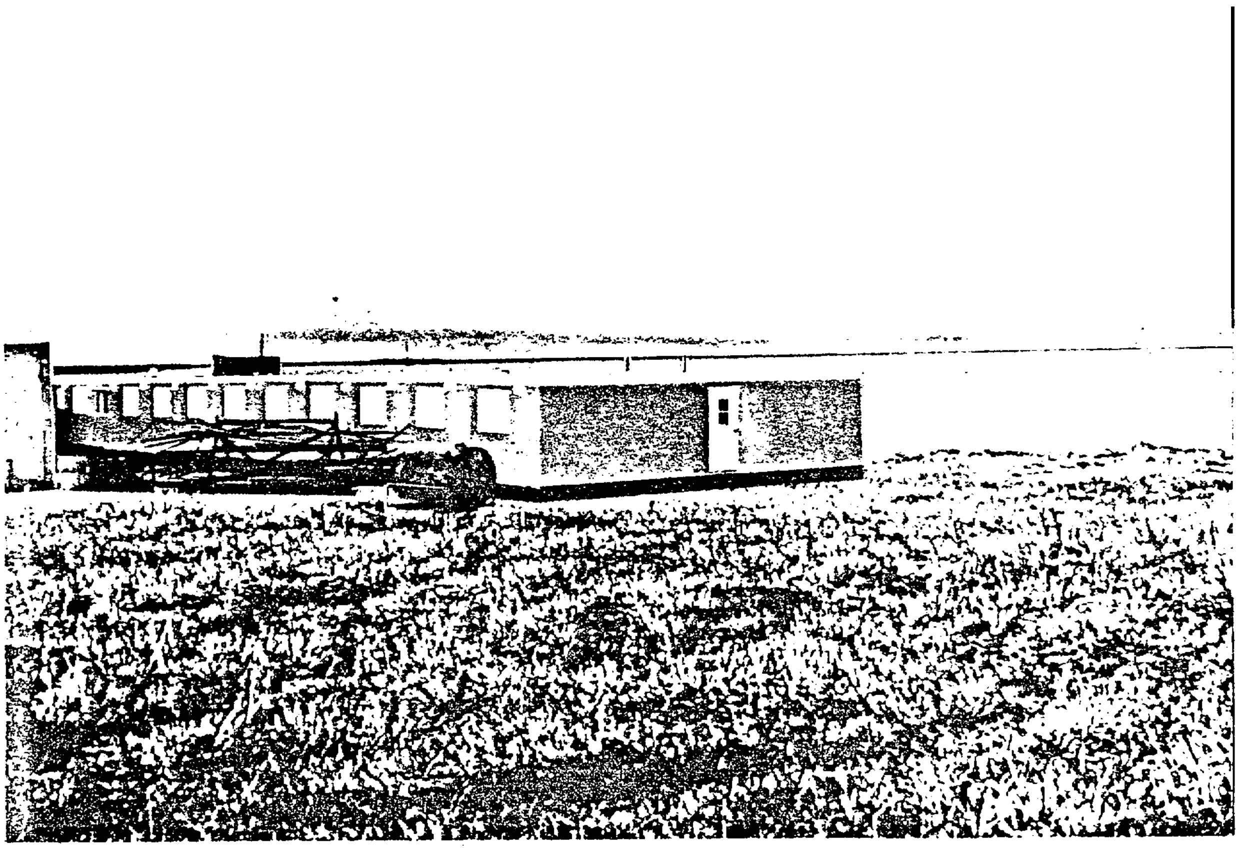
Proposed Visual Feature

Existing Visual Feature

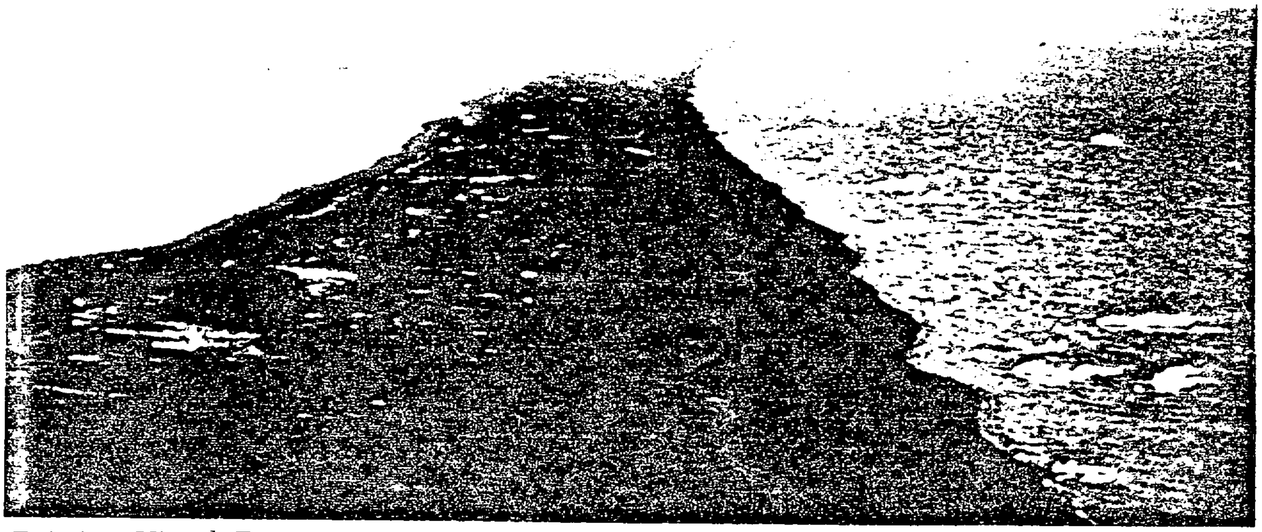
Proposed Visual Feature



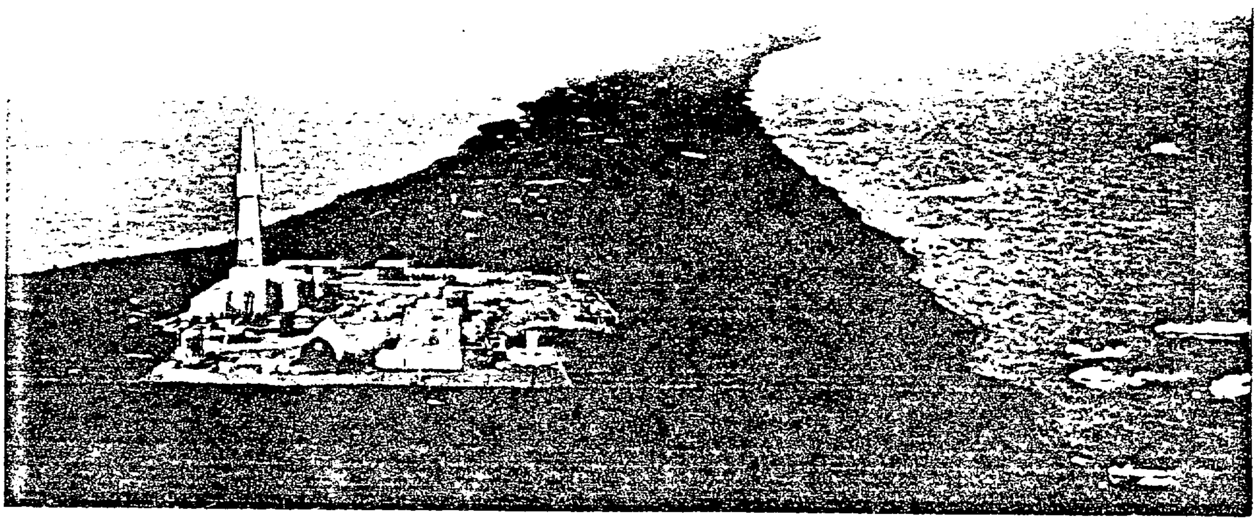
Proposed Visual Feature (Distance Modification)



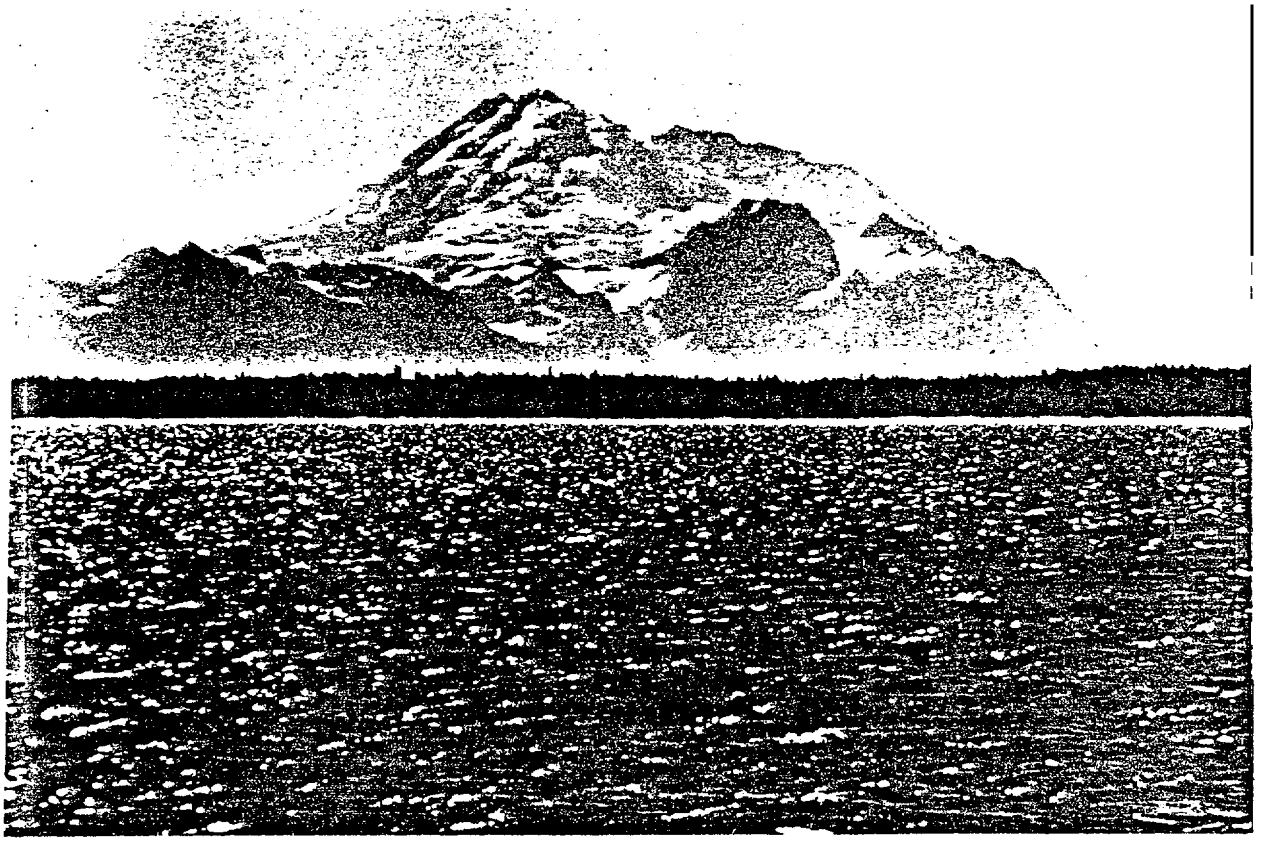
Proposed Visual Feature (Adjacent Facility Modification)



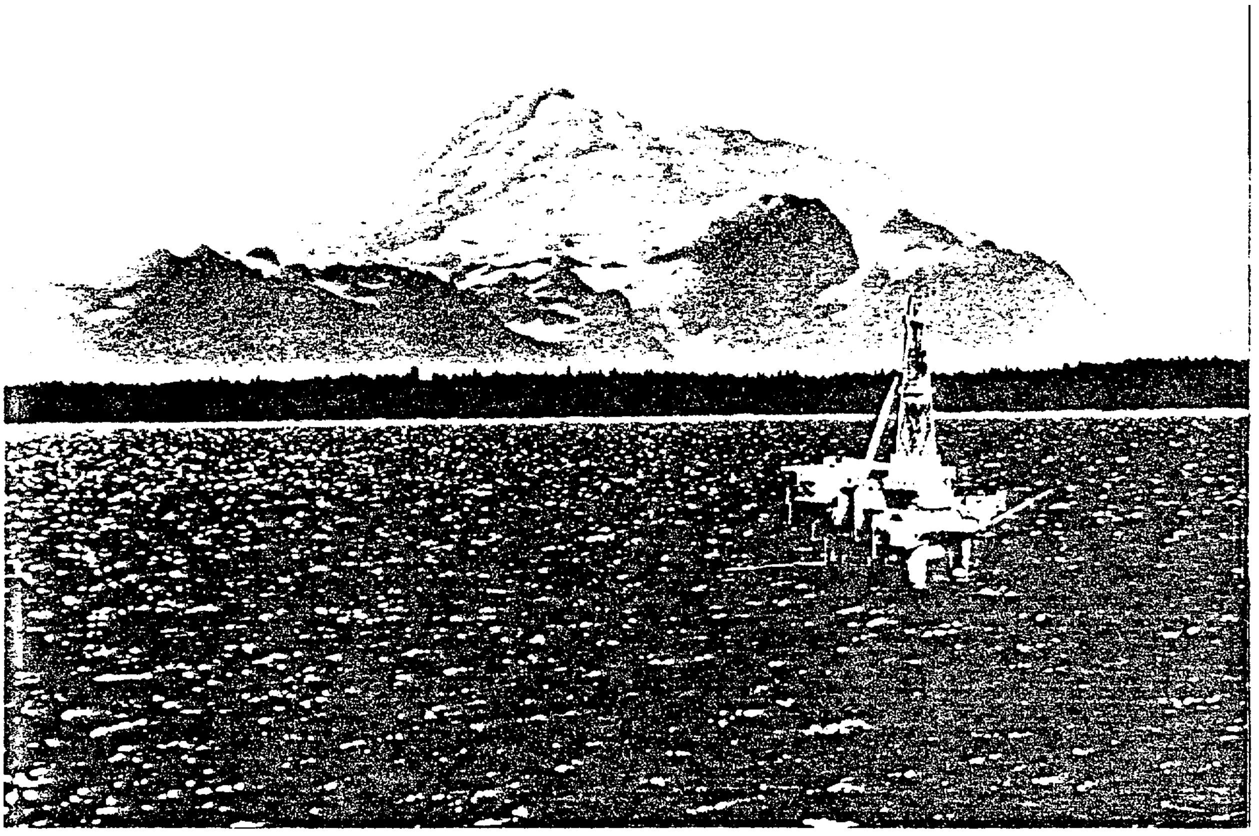
Existing Visual Feature



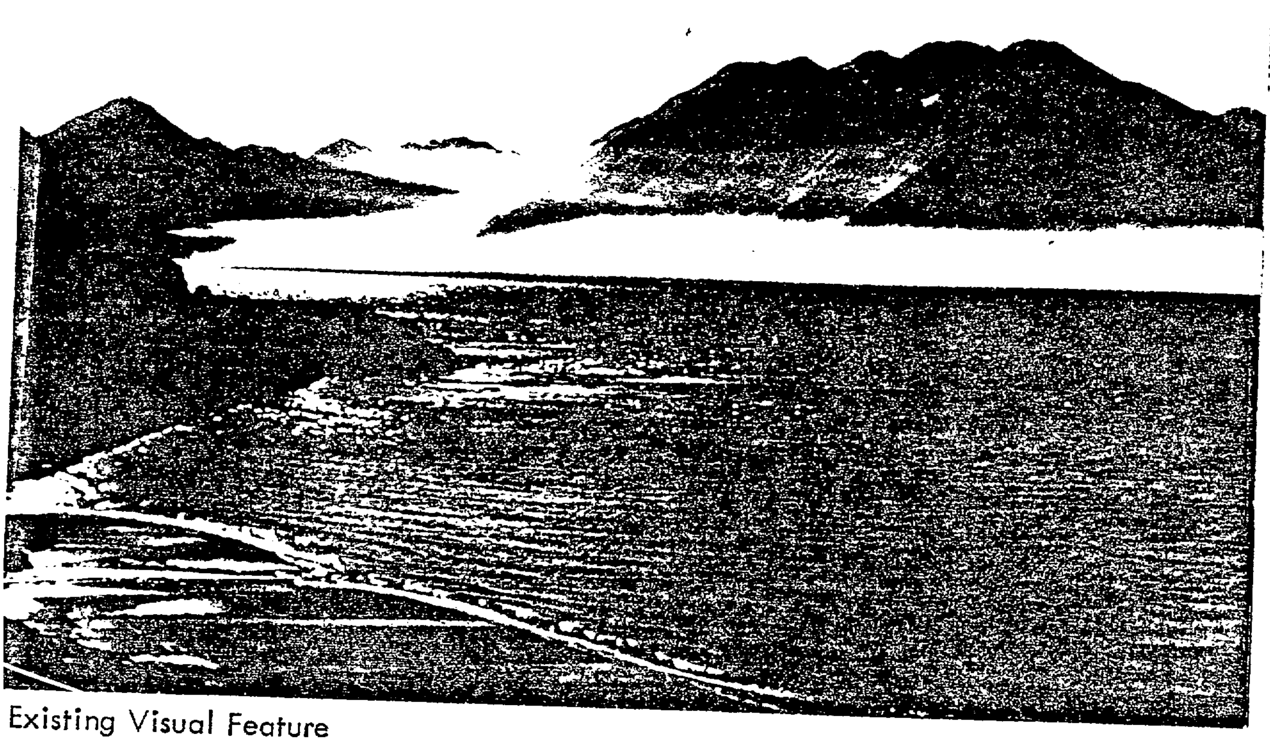
Proposed Visual Feature



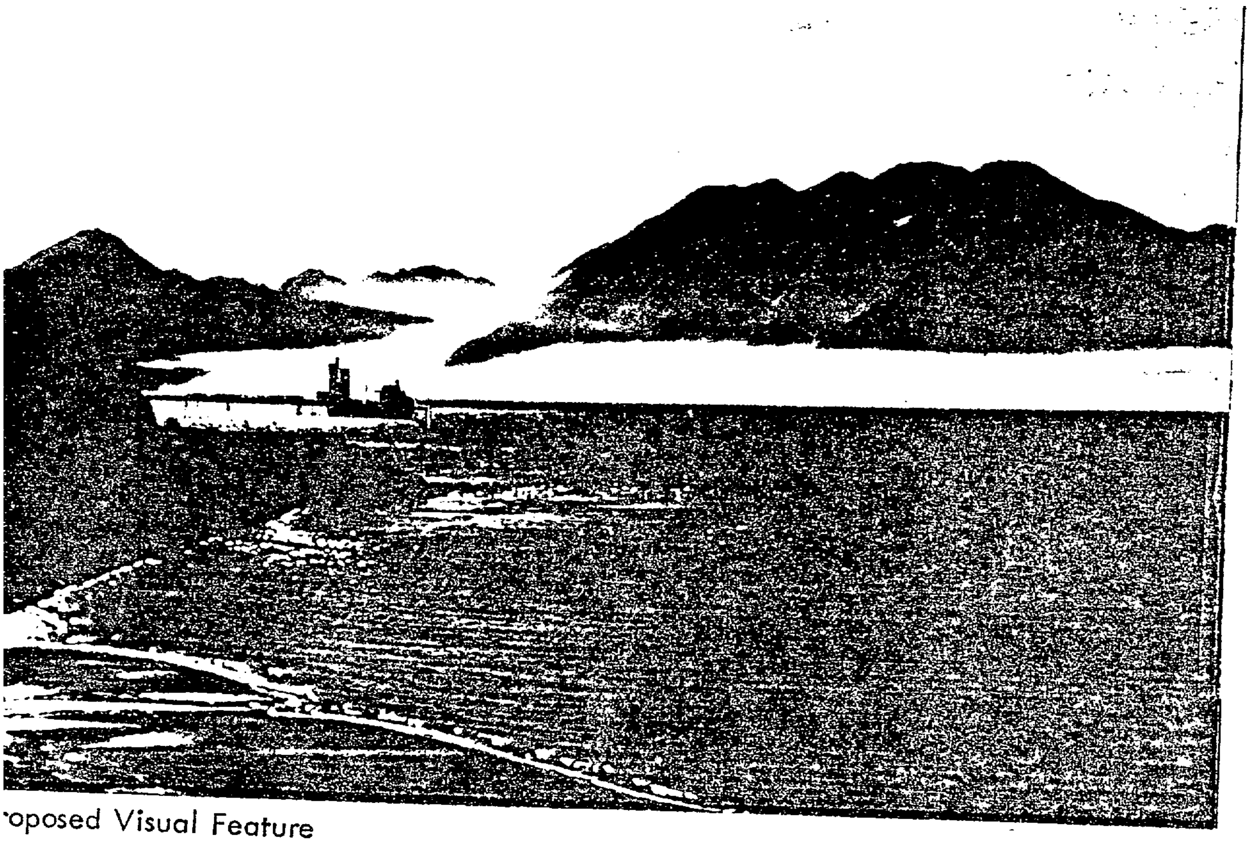
Existing Visual Feature



Proposed Visual Feature



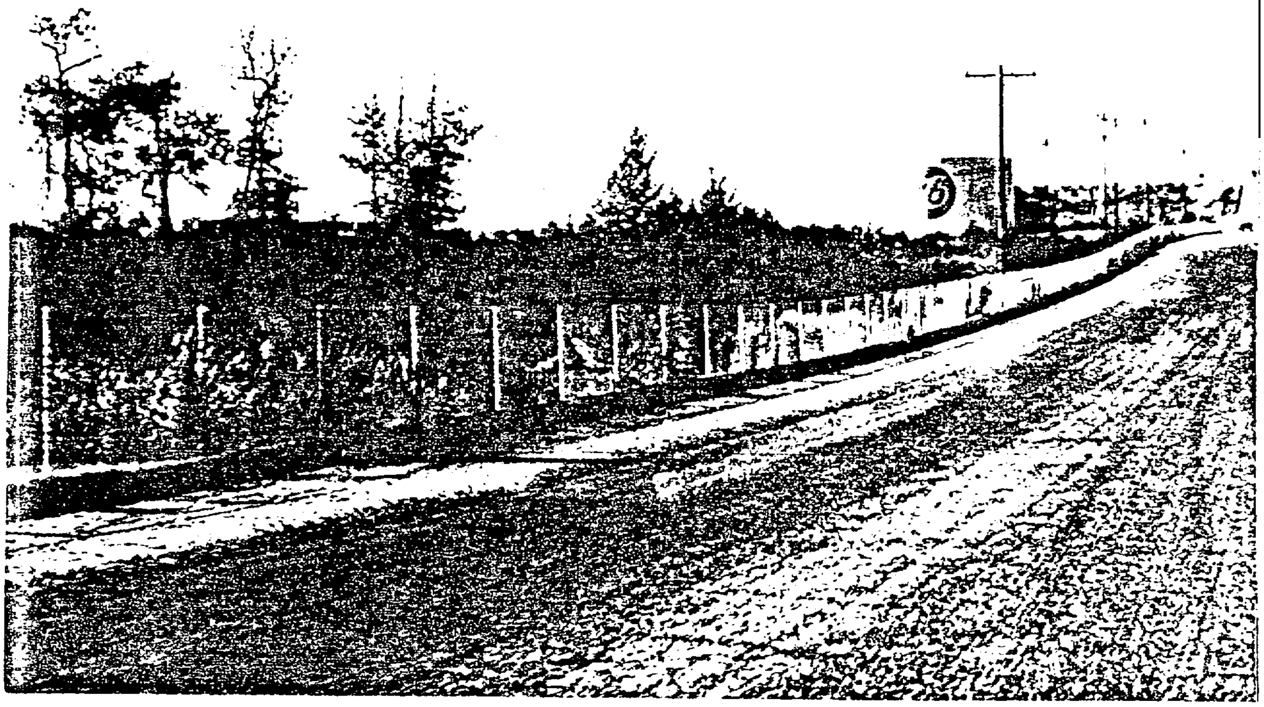
Existing Visual Feature



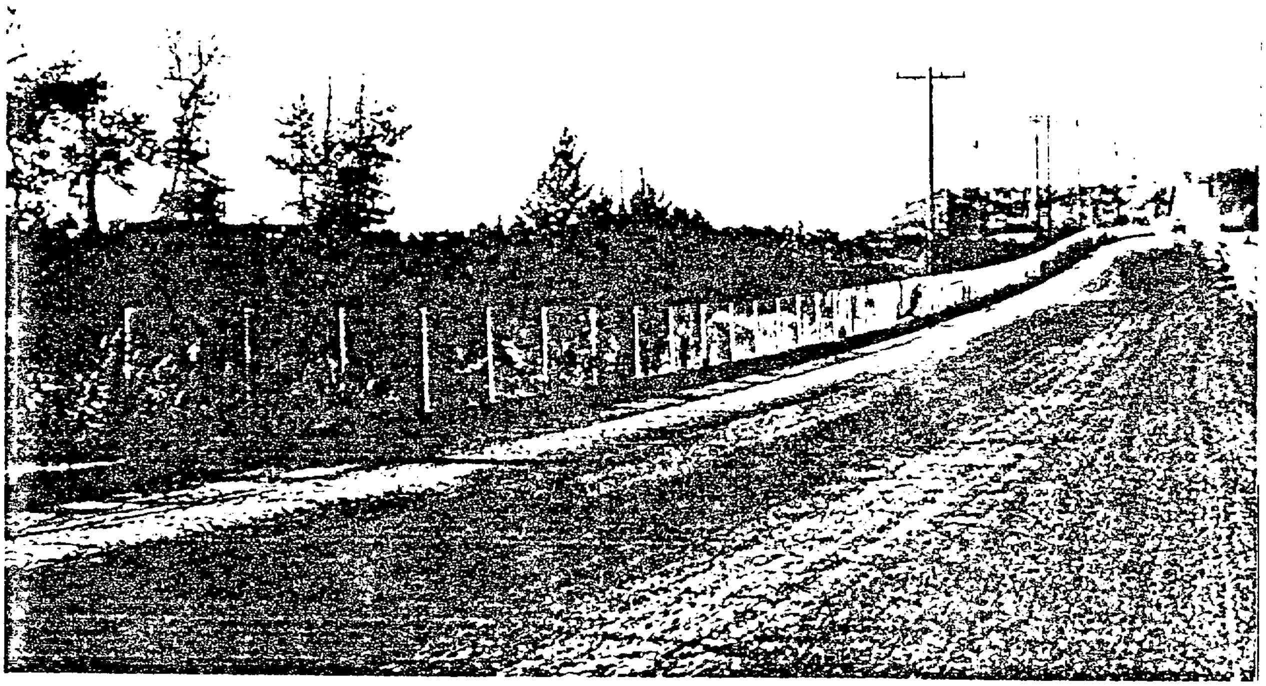
·oposed Visual Feature


Existing Visual Feature


Proposed Visual Feature



Existing Visual Feature



Proposed Visual Feature (Adjacent Facility Removal)

APPENDIX D. BIBLIOGRAPHY

Acking, C., and G.J. Sorte. 1973. How do we verbalize what we see: Landscape Architecture. 64(1): 470-475.

Anderson, L., et al. 1977. Visual absorption capability. U.S. Forest Service, California region, Ureka, CA. 30 pp.

Bacon, W. R. Resource management guides, Region Six. 1971. U.S. Forest Service, Washington, D.C. 81 pp.

Bagley, M. D., Kroll, C.A. and K. Clark. 1973. Aesthetics in environmental planning. Environmental Protection Agency report number EPA -. 600/5-73-009. Stanford Research Institute, Stanford, CA. 185 pp.

Blair, W. G. E., et al. 1976. Visual impact of high-voltage transmission facilities in northern Idaho and northwestern Montana, final report for Bonneville Power Administration, United States Department of Interior. Jones and Jones, Seattle, WA. 157 pp.

Bureau of Land Management. 1978. VRM System. U.S. Govt. Printing Office, Washington, D .C.

Cemy, J .W. 1974. Scenic analysis and assessment. University of New Hampshire, Plymouth, N .H.

Costantini, E., and K. Hanf. 1972. Environmental concern and Lake Tahoe. Environment and Behavior. 4: 209-242.

Coughlin, R.E., and K.A. Goldstein. 1970. The extent of agreement among observers on environmental attractiveness. Regional Science Institute, Philadelphia, PA. RSRI Discussion Paper Series, no. 37.

Craik, K .H. 1972. Psychological factors in landscape appraisal. Environment and Behavior. 4: 255-266.

Craik, K .H., and E. Zube. 1975. Issues in perceived environments l qua l ity research. Nationa l Science Foundation, University of Massachusetts, Amherst, MA.

Daniel, T. C., and R.S. Boster. 1976. Measuring landscape esthetics: the scenic beauty estimation method. U.S.D. A. Forest Service Research Paper RM-167. Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO. 66 pp.

Driscoll, E. C., et al. 1976. Measuring the visibility of high voltage transmission facilities in the Pacific northwest. Jones and Jones, Seattl e, Washington. 55 pp.

Fabos, J .G. 1974. Putting numbers on qualities: the rising landscape assessors. Landscape Architecture. 64(3): 164-165.

Fines, K. D. 1968. Landscape eva luation: a research project in East Sussex. Regional Studies. 2(I): 41-55.

Heberlein, T. A. 1973. Social psychological I assumptions of user attitude surveys: the case of the wildemism scale. Journal of Leisure Research. 5(3) 18-33.

Hendee, J. C., et al. 1971. A typology of outdoor recreation activity preferences. The Journal of Environmental Education. 3(1):

Jacobs, P., and D. Way. 1969. How much development can landscape absorb; a system for measuring impact and consequences of projected changes. Landscape Architecture. 59 (4): 296-298.

Jacobs, P., and D. Way. 1969. Visual ana lysis of landscape development. Harvard University, Graduate School of Design, Cambridge, MA. 53 pp.

Jones, G. R., et al. 1975. A method for the quantification of aesthetic values for environmental decision making. Nuclear Technology. 25: 682-713.

Kaplan, Rachel. 1973. Predictors of environmental preference: Designers and "clients:. [n Environmental design research. W .F. E. Preiser, ed. Dowden Hutch inson, and Ross, Strousburg, Pa. p. 254-264.

Kaplan, Stephen. 1975. An informal model for the prediction of preference. In Landscape assessment: Values, perceptions, and resources. E. H. Zube, J. G. Fabos, and R. O. Brush, eds. Dowden, Hutch inson, and Ross, Stroudsburg, Pa. p. 92-101.

Kaplan, Stephen, Rachel Kaplan, and John S. Wendt. 1972. Rated preference and complexity for natural and urban visual material. Percept. and Psychophys. 12(4):354-356.

Kramer, L. S., V.C. Clark, and G.J. Cannelos. 1978. Planning for offshore oil development, Gulf of Alaska OCS handbook. Alaska Department of Community and Regions I Affairs, Juneau, AK. 257 pp.

Leopold, L.B. 1970. Quantitative comparison of some aesthetic factors among rivers. U.S. Geological Survey, Washington, D .C. Geological Survey Circular 620.

Litton, R.B. 1974. Visual vulnerability: forest landscapes. Journal of Forestry. July: 392-397.

Lynch, K. 1977. Managing the sense of a region. M.I.T. Press, Cambridge, MA.

Lynch, K. 1966. View from the road. M.I.T. Press, Cambridge, MA.

McGuire, J. R. 1977. Landscape management visual display techniques handbook. U.S. Forest Service, Washington, D.C. 26 pp.

Maloney, M. P., and M.P. Ward. 1973. Ecology: let's hear from the people; an objective scale for the measurement of ecological attitudes and know! edge. American Psychologist. 28: 583-586.

Mann, R. L. 1973. A visual approach to regional planning. Center for Urban Development Research, Cornel I University, Ithaca, NY. .81 pp.

Menig, D.W. 1976. The beholding eye, ten versions of the same scene. Landscape Architecture. 68(1): 47-54.

Myklestad, E. and J.A. Wager. 1976. PREVIEW: computer assistance for visual management of forested landscapes. U.S. D.A. Forest Service Research Paper N E-355. Northeastern Forest Experiment Station, Upper Darby, PA. 12 pp.

New England River Basins Commission. 1973. A methodology for OCS-related onshore facility site identification and impact analysis, draft. NERBC/RALI Project Methodology #3. Boston, MA. 58 pp.

New England River Basins Commission. 1975. People and the sound, shoreline appearance and design, a planning handbook. Roy Mann Associates, Cambridge, MA. 293 pp.

Nieman, T. J., and R.C. Niohl. 1976. The description, classification, and assessment of visual landscape quality. Council of Planning Librarians Exchange Bibliography #1064. S.U.N.Y. College of Environmental Science and Forestry, Syracuse, NY. 27 pp.

Paulson, M.J.. 1978. The visual information system. Landscape Architecture. 68(3): 233-235.

Paulson, M.J. 1975. Western coal stripmines, related energy conversion structures and transmission lines: a study of visual quality, visual change, and alleviating visual siting criteria. Harvard University-Ford Foundation, Cambridge, MA.

Steinitz, C., and M.J. Paulson. 1974. visual model NSF/RANN program sponsored, third annual report: the interaction between urban ization and land: quality and quantity in environmental planning and design. Landscape Architecture Research Office, Harvard University, Cambridge, MA.

Steinitz, C., and M.J. Paulson. 1975. A visual quality model applied to the coastal zone. NSF/RANN, Harvard University, Cambridge, MA.

Steinitz, C., Frederick, C. J., and W. Blair. 1973. Visual model, National Science Foundation/RAN N program sponsored, second annual report: the interaction between urbanization and land: quality and quantity in environmental planning and design. Landscape Architecture Research Office, Harvard University, Cambridge, MA.

Steinitz Rogers Associates. 1972. Interstate highway 84 in Rhode island. Vol. 3, Draft environmental impact statement. State of Rhode Island and Providence Plantations, Department Of Transportation, Providence, R.I.

Stone, E. H., II. 1978. Visual resource management. Landscape architecture technical information series, VOI. 1, no. 2. American Society of Landscape Architects, Washington, D .C. 32 pp.

Tognacci, L. N., *et al. 1972.* Environmental quality: how universal is public concern ? Environment and Behavior. 4: 73-86.

Travis, M., et al. 1975. VI EWIT: computation of seen areas, slope, and aspect for land-use planning. USDA Forest Service General Technical Report PSW-11. Pacific Southwest Forest and Range Experiment Station, Berkeley, CA. 70 pp.

Twito, R .H. 1978. Perspectives, plotting landscape of clear-cut units. USDA Forest Service General Technical Report PNW-71 . Pacific Northwest Forest and Range Experiment Station, Portland, OR. 26 pp.

Twito, R. H., and J. Warner. No date. Perspective plot program for evaluating visual impact of proposed timber harvest units with desk top calculator, plotter and digitizer. U.S. Forest Service, Portland, OR. 19 pp.

U*S. Department of Agriculture. 1974. Mineral king visual anal ysis. U.S. Forest Service, California region, San Francisco, CA.

U s . Forest Service. 1973. National forest landscape management, vo 1. 1. Agriculture Handbook Number 434. U.S. Department of Agriculture, Washington, D.C. 76 pp.

U*S. Forest Service. 1974. National forest landscape management, vol. 2, chapter 1. The visual management system. Agriculture Handbook Number 462. U.S. Department of Agriculture, Washington, D.C. 47 pp.

U .S .Forest Service. 1975. National forest landscape management, vol. 2, chapter 2. Utilities. Agriculture Handbook Number 478. U.S. Department of Agriculture, Washington, D.C. 147 pp.

U*S. Forest Service. 1977. National forest landscape management, vol. 2, chapter 3. Range. Agriculture Handbook Number 484. U.S. Department of Agriculture, Washington, D .C. 43 pp.

U s . Forest Service. 1977. National forest landscape management, VOI. 2, chapter 4. Roads. Agriculture Handbook Number 483. U.S. Department of Agriculture, Washington, D.C. 62 pp.

Woodward-Cl yde Consultants. 1977. Oil terminal and marine service base sites in the Kodiak Island Borough, summary report. Anchorage, Alaska. 163 pp.

Wuenscher, J .E., and J .M. Starrett. 1973. Landscape compartmental ization: an ecological approach to land use planning. Duke University, Durham, N.C. 107 pp.

Zube, E .H. 1973. Rating the everyday rural landscape of the northeastern U ,S. Landscape Architecture. 63(4): 370-375.

Zube, E .H. 1973. Scenery as a natural resource: implications of public policy and problems of definition, description, and evaluation. Landscape Architecture. 63(2): 126-132.