ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

ENVIRONMENTAL STUDIES PROCEDURES MANUAL

SUBTASK 7.07
LAND USE ANALYSIS

Terrestrial
Environmental
Specialists, Inc.

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SUSITNA HYDROELECTRIC PROJECT

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PROCEDURES MANUAL

SUBTASK 7.07
LAND USE ANALYSIS

Submitted by

Terrestrial Environmental Specialists, Inc.

and

School of Agriculture and Land Resources Management
University of Alaska-Fairbanks

to

Acres American, Inc.

Environmental Study Manager (TES)

Environmental Study Director (TES)

Quality Assurance Coordinator (TES)

Group Leader (TES)

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I. INTRODUCTION

A. OVERVIEW

Portions of the Susitna River have been considered for hydropower development since the 1940's, and several preliminary plans for such development have been prepared. Proposals have included one to four reservoirs. Most of the proposals either have been overlooked, or simply have laid dormant. The present proposal preliminarily is focused on a two-dam development: one at Devils Canyon and one near Watana Creek. These two structures would create elongated reservoirs typically 1/2 to 3/4 miles in width, except the lower part of the Watana Reservoir.

The Alaska Power Authority sought detailed proposals in 1979. The overall planning and evaluation contract was awarded to Acres American, Inc. The environmental assessment portion was subcontracted to Terrestrial Environmental Specialists, Inc., who in turn contracted the University of Alaska to analyze land use changes that would result with the development of the project.

The land use analysis will describe and evaluate human use of the land. It will not generate data concerning the use of the land by various animal species or include other detailed descriptions of the physical environment. Information on these subjects will be provided to the land use specialists by other environmental studies specialists on the project team.

The land use analysis will assess, to the degree that data permit, the direct land use effects of the proposed Susitna Hydroelectric Project. The analysis will evaluate changes in land use that will occur with and without the proposed project, including the effects of the proposed dam(s) and reservoir(s) and access transportation system. To provide the total perspective to the analysis, past and present land uses will be described, and future land uses, as indicated by agencies and landowners, will be predicted.

An assessment of the effects of particular land uses on a specific environmental setting is not a simple, one-for-one relationship. When an essentially pristine environment is disrupted to develop a modern industrial project such as the one proposed for the Upper Susitna River Basin, many environmental disturbances occur. Some of these disruptions are predictable. However, others may occur which are not anticipated because there are few, if any, previous experiences on which to rely. One then begins to rely on theoretical models, integration techniques, and other technological thought to give a "best judgement" as to what might take place if certain proposed actions (dam building, transmission lines, roads, etc.) are implemented.

Land use analysis is one way of obtaining an overview of the systematic effects of proposed development. The specific details of the project are then filled in by the specialists on the team.

The proposed Susitna Hydroelectric Project presents many unique challenges to the land use analyst because of its magnitude, isolation, and location in a subarctic environment in the Upper Susitna

river drainage between Devils Canyon and the Tyone River. One of these challenges involves determination of past and present land uses involving extremely low densities. It is difficult to utilize the approach of mapping from current aerial photographs with a minimum of ground truthing to verify results. A more involved approach is necessary with greater emphasis on ground truthing. Oral history techniques plus agency interviews on current programs will be used to identify land uses and their locations. Artifacts, buildings, access routes, or other identifiable effects of man utilizing the resource will be verified on the ground after they have been identified through interviews and review of archival material. Uses such as trapping can only be identified and associated with a particular geographical area through interviewing and review of historical records.

B. OBJECTIVES

This land use analysis will evaluate the change in the present use of the land caused by the proposed project and will provide the basis for summarizing the overall impact of the project, including the dam, reservoir, transportation access, and transmission connection. This analysis is designed to provide information (baseline and impact assessment) that will satisfy FERC license application docketing requirements. The objectives of Subtask 7.07 Land Use Analysis are to:

1. evaluate past, present, and future land use trends;

2. facilitate the identification of the major changes in land use that would result with the development of the project; and

3. make preliminary identification of these changes and their impacts.

C. APPROACH

The land use analysis involves a comparison of land use trends to determine the major effects the project will have on the future land use of the area, and employs a modification of the McHarg Overlay Technique. This technique uses the superimposition of overlays showing specific resource values to determine where there is least conflict with existing values. The modification will entail the development of overlays which graphically depict land use changes. Through superimposing them, one can determine the actual change in land use caused by the project. Historical land use trends and the present land use of the project area will be examined, and an attempt will be made to isolate the factors and management decisions that have resulted in the land use that exists. The future land use of the area without the project will be predicted on the basis of interviews with Mat-Su Borough officials, landowners, land management and resource agencies, and a consideration of the resource potentials and limitations. Unique and significant scenic and natural features of the area will also be identified for consideration during the impact analysis. The changes that can be attributed to the project in the future and the significance of these changes cannot be evaluated without consideration of the changes that would occur without the project.

The land use analysis will be divided into two parts: (1) historic and existing land use and (2) future land use. Historic and existing land use will describe the use of the land and its resources from the beginning of historic documentation of the area to the present time. This period has been tentatively divided into two time periods: the first will extend from the beginnings of non-native exploration through the end of World War II and the second will span from the end of World War II to the present. Land use during these periods will be described by summarizing the acquisition and management of land, the use or alteration of specific resources, and the scientific or recreational use of the resources.

Future land use of the Upper Susitna Basin will be predicted for two different scenarios. The first scenario will assume that the project will not be built and that access will not be improved beyond present levels. The second scenario will assume that the Susitna Hydroelectric Project will be built. The analysis of the second scenario will be preliminary in that much of the detailed engineering and site planning data will probably not be available by the end of Phase I (first 2 years of total project). Both scenarios will be developed for approximately a 15-year time span beginning in 1980. Once future land uses with and without the project are estimated, it will be possible to suggest the change in future land use patterns likely to be caused by the project.

II. TECHNICAL PROCEDURES

Sections A through D below describe the major preliminary efforts and activities necessary to conduct the land use analysis. Section E indicates products from the Phase I effort. These are followed by a discussion of the process and procedures which will be conducted in performing the analysis. This latter discussion also provides a context for understanding the steps outlined in this section which, when completed, will yield the information necessary to meet the objectives of Subtask 7.07 and provide data required for submission as part of the FERC license application.

A. LITERATURE REVIEW

A general literature search will be conducted to determine what land use and management might be expected in the project area under certain conditions. The search will include review of available public and private agency planning documents to better understand past, present, and proposed future land uses. Expected sources of these documents and the type of data are shown in Table II-1.

B. AERIAL PHOTOGRAPH AND MAP RECONNAISSANCE

Available recent aerial photographs and maps will be obtained to locate cultural features such as trails, habitations, and other indications of past and present land use. Known sources include black and white NASA aerial photographs (dated 1976-77) available at the Susitna Office of the Soil Conservation Service. In addition, large scale photographs of the immediate dam sites are expected to be available by late summer 1980 (Subtask 2.08, Acres Plan of Study).

Old maps from historical texts, and early geological surveys will be reviewed for foot and sled trails and mining sites. These and other old maps available at the University of Alaska library and museum, and the U.S. Geological Survey will be reviewed. Recent maps and aerial photos will be examined to obtain information concerning ATV access, tractor trails, roads, landing strips, and guide camp locations.

C. INTERVIEWS

Two types of interviewing will take place in conjunction with the project. Oral history interviewing will be undertaken to construct a land and resource use history of the Upper Susitna Basin. This history will focus primarily on the Susitna River above Gold Creek and below the Denali Highway. However, consideration of adjacent areas will be necessary to put the history of the project area in perspective. The interviews will be non-directed, in that there are a specific format and data needs, but the interview is conducted so as to appear informal to the respondent. The interview process and a tentative list of interviewees are shown on Tables III-1 (in the next section of this manual) and II-2, respectively. The interviewer will have a map on which specific land uses can be indicated.

A second type of interviewing will be designed to seek information from land management agencies concerning present land use, current management direction, and alternative future management strategies

TABLE II-1

EXPECTED SOURCES OF LITERATURE AND TYPE OF INFORMATION SOUGHT
AND
LIST OF AGENCY CONTACTS FOR INTERVIEWS

SOURCE	INFORMATION
FEDERAL:	
US Department of Agriculture	
Soil Conservation Service— Susitna River Office	General land use patterns Susitna Basin Water Study
US Department of Interior	
Bureau of Mines	Mining activity reports, USGS survey info.
Heritage Conservation & Recreation Service	River use statistics and potential historical sites
Bureau of Land Management	
State Resources Library	Susitna studies, resource use info.
Southcentral District Office	Current and existing management plans
Glennallen District Office	Current and existing management plans
Chief of Planning Office	Past and present land acquisition
US Army Corps of Engineers	Regional water planning
STATE:	
University of Alaska	Historical documents
Library Mineral Industries	Documentation on mining claims
Research Laboratory Museum	Archeology and history
Department of Natural Resources	
Division of Lands	Current planning and land classification activities, and catalogued land use info.
Division of Geophysical & Geological Surveys	Geological surveys in project area
Division of Parks	Recreation use/potential of area
Department of Fish and Game	Current and future management policies
Department of Community and Regional Affairs	Regional planning; land use planning
Department of Transportation and Public Facilities	Transportation plans
MUNICIPAL:	
Talkeetna Public Library	Historical documents
Matanuska-Susitna Borough	Overall planning and development, relevant ordinances
Talkeetna Historical Society	Historical documents
PRIVATE:	
Fairbanks Environmental Center	Environmental concerns re. project impact
Cook Inlet Region Incorporated	Native land management planning
Talkeetna Air Taxi	Historic and present land use
Akland Helicopter	Historic and present land use
Era Helicopter	Historic and present land use
AHTNA, Inc.	Native land use and management

depending upon whether or not the Susitna Hydroelectric Project is built. Management agencies that will be contacted will be the Cook Inlet Region Inc., BLM, Alaska Department of Natural Resources (Division of Lands and Division of Parks), Alaska Department of Fish and Game, the Matanuska- Susitna Borough, and others as necessary, indicated on Table II-1. The types of questions that will be asked are shown in Table III-2.

D. FIELD RECONNAISSANCE

Field reconnaissance activities will take place throughout the project. Most likely three trips will be taken into the project area at different stages of data gathering. The first trip will substantiate information gathered during the literature review and interviewing. The second trip will investigate areas of potential human use with or without the project, paying particular attention to access and to unique scenic and natural features. The third trip will be for assessing probable conflict areas if the dams and transmission lines are constructed.

Field reconnaissance will be augmented by taking advantage of the field activites of other environmental scientists by requesting that they fill out field observation forms that can be returned to the land use analysis team. A sample of that form is shown in Figure III-1.

During field reconnaissance activities, unique scenic and natural features will be identified and recorded using the form shown in Figure III-2. A point-rating system will be developed to compare the relative significance of the features.

E. PRODUCTS

The following outputs are anticipated during Phase I:

1. Oral history report with accompanying maps showing land use by time period for the entire project area: the map will undergo ground truthing to verify accuracy. The final report will be submitted to TES by December 31, 1980.

2. Interview report on management agencies and landowners with maps showing present land use and discussions: present land use will be accomplished by December 1980; future land use without the project by July 1981.

3. Assessment of potential impacts: project lands will be reviewed by the entire team, and potential impacts will be evaluated both theoretically and in the field. A report of these will be submitted to TES by December 1981. The date will be as late as possible in order to incorporate the most up-to-date design of reservoir and access route. Where feasible, all maps showing land use patterns will be developed on a scale of 1:63,360.

TABLE II-2

LIST OF INTERVIEWEES-ORAL HISTORY

Guides, Hunters, Trappers:

Don Lee, guide, Talkeetna
Oscar Vogel, guide, Anchorage
Virgil Vial, trapper, Susitna Lake
Frenchy Lamoureaux, guide, Anchorage
Lester Tolefson, trapper, Talkeetna
Don Bennes, trapper and sledder, Talkeetna
John Schandelmier, trapper, Denali Lodge
Cleo McMahon, trapper, Glennallen

Charter Pilots, Air Services:

Cliff Hudson, Talkeetna
Mike Fisher, Talkeetna
Mrs. Roberta Sheldon, Talkeetna
Ken Binik, Glennallen
Kent Smith, Ermine Lake

Lodge Owners and Homesteaders:

Mr. and Mrs. Ken Oldham, Anchorage
John Ireland, Murder Lake
Jim Moran, lodge owner, Fairbanks
Rich Halford, lodge owner, Eagle River
Denny Thompson, Susitna Lodge

Miners and Alaska Railroad Workers:

Tim Nagy, miner
Ted Atwater, Alaska Railroad
John Carlson, Alaska Railroad

Recreation, Tourism:

Bill Glude, Takosha Ski Touring Association, Trapper Creek
Kathy Sullivan, Genet Expedition, Talkeetna
Mr. and Mrs. Jay Melville, Talkeetna Roadhouse
Verna and Carroll Close, Palmer
Tom Mercer, Denali Wilderness Treks, Talkeetna
Ed Wick, Mahoy's Riverboat Service, Talkeetna

Long-Time Residents:

Dorothy Jones, Talkeetna
Minnie Swanda, Talkeetna

F. DISCUSSION OF STEPS

Identification of Study Area

The first step in the land use analysis will be the identification of the project area boundaries. These boundaries will include adjacent lands that will be affected or influenced by the project, as well as the access transportation system and transmission corridors when the routes for these facilities have been identified. The downstream effects will also be considered in the overall land use analysis.

At the present time, the study area for land use extends as far downstream as Gold Creek. Task 3 Hydrology studies will determine if there is a need to extend the study area any further downstream. The study area boundaries will include the following zones:

1. Project Zone (actual occupied by project);

2. Management Zone (land acquired for management purposes such as watershed, recreation, etc.);

3. Influence Zone (that contiguous land whose use patterns would be influenced by development that takes place within Zones 1 and 2).

Prior Land Use

Past land use will be described through a review of historical documents using archives, development of oral history through interviews, and review of administrative files of managing agencies. The documentation of the historical overview of land use including the pre-white man, early white man, and modern eras is essential to understanding land use trends if they are to be accurately extrapolated into the future.

Present Land Use

The present land use of the project area will be determined by utilizing a number of sources of information. These sources will include aerial photos and maps, vegetation cover maps produced by the Plant Ecology team, discussions with landowners and government officials, and a field review of specific land uses identified through the reconnaissance and discussions. A preliminary list of potential agency contacts is presented in the next section. Existing resource management programs, either planned or de facto (they exist but were not planned by the agent) will be identified and described in detail. As a part of the total reconnaissance, unique scenic and natural features within the project boundaries will be identified and described. The preliminary location and design of the access transportation system and transmission corridor will be evaluated by the land use team in terms of long-term effects on land use. Furthermore, the land use team will identify concerns raised by the landowners and agencies and communicate these concerns to TES, who will make them known to the appropriate disciplines.

Future Land Use Without the Project

Regardless of the status of the project, certain future changes will take place within the project boundary. The land use team will describe these changes through documented landownership changes, and through landowner or agency interviews to ascertain long-range objectives, projects on the drawing board, and projects already underway. The results obtained from the various sources possibly will include some overlap and subsequently will be reconciled based on the existing landownership rights, supporting legislation, and a best estimate of the probability of the implementation program (if it is not already decided). It is essential to account for those changes that would have occurred without the project in order to determine the real effects of the hydroelectric project.

Preliminary Identification of Project Impacts

Realizing that certain conclusions will be based on preliminary location and design of the project structures and systems, the actual change in land use caused by the project will not be totally analyzed until Phase II (post-license application) when the final locations and designs are selected. The major impacts of changes that are expected to occur as result of the project will, however, be identified preliminarily at the end of Phase I (i.e., prior to license application). This preliminary identification of changes will be developed after evaluating the results of the office and field reconnaissance, the interviews with landowners and land managing and planning agencies, and available data generated by other disciplines including at least the wildlife ecology, plant ecology, and socioeconomic groups. The preliminary identification of project impacts will not represent a detailed description of the impacts that will be associated with the project; instead it will be utilized in the development of the Phase II Scope of Work to assure that adequate attention is given to those concerns and potential impacts that are expected to be most relevant and significant with respect to the construction and operation of the project.

Summary of Evaluation Process

The procedures described above can be expressed in the summary formula shown below:

Proposition A (Change in present land use)

	Present area land use with project
(minus)	Present area land use without project
(equals)	Overall change caused by project

Proposition B (Future Land use without project)

	Future land use (projections of long-term trends).
(minus)	Present land use
(equals)	Future change without project

Proposition C (The actual change caused by project)

	Overall change caused by project
(minus)	Future change without project
(equals)	Actual change caused by project

III. DATA PROCEDURES

This section provides outlines of the Oral History and Management Agencies interview process discussed in the previous section. Lists of contacts for both groups are indicated in Tables II-2 and II-1, respectively, and correspond to Tables III-1 and III-2 following.

Figure III-1 is a sample of the Field Data Collection Form, and Figure III-2 is a sample File Card for Unique Scenic and Natural Features.

TABLE III-1

THE INTERVIEW PROCESS - ORAL HISTORY

I. Introduction

- A. Who we are
- B. Explanation of the project
- C. What we want
- D. What we will do with the information
- E. Does the person think he can help
- F. Ask for permission to record conversation avoid use of the word "interview"

II. Background of the informant

- A. Relationship to and interests in project area
  1. Length of time involved with project area
  2. Seasons of year
  3. Means of access

III. Knowledge of land uses in the area (use map)

- A. How was project area used?
- B. What resources were utilized, where?
- C. Major changes that have taken place in the project area, when?, why?

IV. Who else might we contact?

- A. Name, address, and occupation
- B. Relationship to the area

TABLE III-2

THE INTERVIEW PROCESS - MANAGEMENT AGENCIES

I. Introduction (see Table III-1)

II. How agency relates to current land use in the area

A. Status of the resources for which the agency has responsibility

B. Current monitoring activities

C. Special use permits if any

D. Problem areas

III. Future plans for area

A. Planning documents

B. Other indications of present or future planning

IV. Agency long term goals for the area

V. Agency's perception of the impacts that the proposed Susitna Hydroelectric Project would have in its own future programs

VI. Background of informant

A. Position with agency

B. Time with agency

VII. Agency suggestions on ways in which the Susitna Hydroelectric Project could be most compatible with agency goals and interests

Figure III-1

Field Data Collection Form

Observations of Past Land Use:

Type	Description	Location
Sample: c. (1)	Track - vehicle trail, heads NE	S14, R1W, T32N
1.		
2.		
3.		
4.		

Unique Scenic/Natural Features:

Description	Location	Photo
Sample: Creek Canyon	S. 13, 24, 25 R10, W, T31N	Yes
1.		
2.		
3.		
4.		

Observed Groups:

Group No.	Activity	Date	No. People	Transportation	Location
Sample	Hunting	9/15/80	2	ATV	SE¼, SR5W, T31N
1.					
2.					
3.					
4.					

Observations of Land Uses

1. **Recreational or subsistence use**
   - a. Evidence of trapping
   - b. Campsites
   - c. Trails
     - (1) vehicle
     - (2) foot
   - d. Riverboat landing
   - e. Dwelling
     - (1) cabin
     - (2) lodge
     - (3) series of buildings (settlement)
   - f. Group actually observed
     - (1) Activity
     - (2) Date
     - (3) No. People
     - (4) Mode of Transportation
2. **Mining or related use**
   - a. Seismic lines
   - b. Prospects
   - c. Placer mines
   - d. Other
3. **Aircraft Landings (potential or related)**
   - a. Bush strip
   - b. Gravel bar
   - c. Lake
   - d. River section
4. **Unique scenic or natural feature**

FIGURE III-2

File Card for Unique Scenic and Natural Features

Observation No.

Feature Description Location Verification

Photo File No.

Figure III-1 (Cont.)

Sender's name: _____

address: _____

_____

POSTAGE PAID
U.S. DEPARTMENT OF
AGRICULTURE
AGR 101
THIRD CLASS
BULK RATE

Alan Jubenville
Agricultural Experiment Station
University of Alaska
Fairbanks, Ak 99701

Dear observer:

Please tear off attached postcard and record data according to instructions on reverse side of this card. Any photos taken of land use or natural resources will be appreciated. You will be reimbursed for them.

Please drop completed card in the mail at Base Camp or other convenient location. Thank you.

Alan Jubenville

FIGURE III-2

File Card for Unique Scenic and Natural Features

Observation No.

Feature Description Location Verification

Photo File No.

IV. QUALITY CONTROL

Quality control procedures will focus on the information gathered from interviews. Meetings will be held by team members as interviews are progressing to determine if the right type of information is being gathered and if it is reliable. Notes and tapes from interviews will be filed in the office of the Principal Investigator.

Procedures for ensuring accurate transfer of data involve routine review and double-checking of final data formats against original field notes, maps, and other sources of information. Especially important in the Land Use Analysis is accurate transfer of mapped information for use in the overlay process. All maps will be prepared by a qualified cartographer and be reviewed by members of the project team.

V. SCHEDULE

Schedules of activities and project completion dates are shown in Tables V-1 and V-2. It should be noted that the analysis of future land use both with and without the project will depend in part upon data received from other groups (i.e., environmental scientists, project engineers, etc.). The relationship of the land use analysis to the input from other sources will be shown in a PERT (project evaluation and review technique) chart which will be submitted as an amendment to the Procedures Manual at a later date.

TABLE V-1
SCHEDULE OF LAND USE ANALYSIS

ACTIVITY	1980 J F M A M J J A S O N D	1981 J F M A M J J A S O N D
Develop field procedures	X X X X	
Delineate boundaries	X X	
Oral history - early white man thru WW II	X X X X X X X X X	
Oral history - WW II to present	X X X X X X X X X	
Map & photo recon. of present land use	X X X	
Inventory of unique scenic/ natural features	X X X	
Discussions with landowners	X X X X X X X X X	
Existing programs	X X X X X X X X X	
De facto programs	X X X X X X X X X	
Communicate agency concerns to TES	X X X X X X X X X	
Discussions with landowners- validate future plans		X X X X X X
Review of design features- reservoir, access transportation, and transmission corridor		X X X X X X
Summarize the difference between present and future land use of project area		X X X
Overview of potential impacts with project - feedback from project specialists		X X X

TABLE V-2

DETAILED PRODUCT COMPLETION DATES AND RESPONSIBILITIES

Product	U of A Completion Date	Responsibility**	Remarks
Field procedures manual	4/30/80	PI & FC	
Map* of land use early white man to WWII	12/31/80	GS	Place on mylar overlay.
Map of land use WWII to present	12/31/80	GS	Place on mylar overlay.
Present land use map	12/31/80	FC	Place on mylar overlay.
Map of unique natural features	12/31/80	PI	Place on mylar (GS & FC from interviews).
Map of future land use	3/31/81	FC	Place on mylar (GS from interviews of users).
Preliminary map of likely points of impact	9/30/81	PI	(with FC review design specs on site.).
Change in land use map (future without project)	12/31/81	FC	Overlay process.
Map of land use with project	12/31/81	FC	Simple plotting of probable change.
Change from present to future with project (Preliminary assessment)	12/31/81	FC	Overlay process.
Net change in land use future w/project vs. future w/o project (preliminary assessment)	12/31/81	FC	Overlay process.
Report on recommended changes on access transportation, and transmission design	12/31/81	PI	
Map of possible impacts from project	12/31/81	PI & FC	Need feedback from project specialists.

* If appropriate, this may be divided into more than one time period.
** PI=Principal Investigator; FC=Field Coordinator; GS=Graduate Student.

VI. PERSONNEL

Descriptions of qualifications required to perform Phase I of the Land Use Analysis effort are provided here, along with the names of key personnel and their experience in land use analysis and related work. Table V-2 indicates personnel who will be working on the various portions of this subtask.

A. DESCRIPTIONS OF QUALIFICATIONS

This study requires that personnel be able to: (1) gather and analyze primary data; (2) gather and interpret secondary data from other project investigators and other sources; (3) effectively analyze existing land uses; and (4) develop and successfully implement a methodology for determining impacts, i.e. predicting future land uses, both with and without the Susitna project.

Additionally, the study requires that a project manager (i.e. principal investigator) be able to manage and coordinate personnel efforts in a manner consistent with budget and time constraints. This includes ensuring that: (1) the best data are available for use in the study; (2) these data are collected in a cost-effective manner (i.e. properly sequenced in time and place); and (3) the study products meet objectives and contractual requirements specified in the Scope of Work.

Development of Land Use Analysis Procedures and Methodology

This subtask requires personnel who are: (1) familiar with comprehensive land use analysis procedures and techniques; (2) familiar with methodologies for the gathering and interpretation of land use data; (3) knowledgeable with regard to wilderness areas; (4) able to assess a variety of land resource conditions in relation to potential large-scale development activities; and (5) able to develop a reliable methodology for predicting future land use and assessing its significance in relation to the present situation. This task also requires the ability to define and promulgate a methodology consistent with financial, personnel, and time constraints related to the overall plan of study.

Literature Review

The literature review requires personnel who are: (1) familiar with current development plans and programs of public and private agencies; (2) experienced in literature search techniques; and (3) able to synthesize information from many sources into a useful format.

Aerial Photography and Map Reconnaissance

This task requires personnel who are: (1) knowledgeable concerning sources of air photos and maps; (2) able to interpret air photos and derive information on cover types and locations of various land uses; and (3) able to synthesize such mapped information into the land use analysis process.

Interviews

The oral history interviews and interviews with personnel from land management agencies require personnel who are: (1) familiar with persons living in the Susitna area and other Alaska areas who have knowledge of historical and present land use trends and activities; (2) familiar with land management agencies; (3) familiar with non-directive questionnaire design and interviewing techniques; and (4) able to synthesize interview results and information into useful formats to be incorporated into the land use analysis process.

Field Reconnaissance

This task requires personnel to be knowledgeable of the land use analysis process and who are: (1) experienced in field techniques and surveys; (2) able to interpret primary data obtained in the field and convert it to usable study formats; and (3) able to assess a variety of resource data types and predict conflict areas and impacts to the land resource base.

B. KEY PERSONNEL

Robert L. Anderson, Group Leader (TES)

Mr. Anderson is responsible for coordination of the land use analysis effort with that of related disciplines, and for ensuring consistency of this effort with overall project objectives and procedures. Mr. Anderson's background includes formal training in land use, environmental, and social policies planning. He has extensive experience in directing project studies involving varied disciplines, and conducting land use and environmental planning activities. Examples of previous experience relevant to this project include:

- Principal Investigator on study to assess recreational potentials, access, design policies, and impacts in coastal communities as a result of land use development trends and population growth. For Coastal Consultants, Ltd., 1980.

- Project Manager of program to develop methodology for determining primary and consequent environmental impacts of land and water uses in coastal area. For St. Lawrence-Eastern Ontario Commission, 1977.

- Principal Investigator in development and implementation of methodology to determine areas of concern based on environmental, economic, and cultural concerns, considering land use and other factors. For St. Lawrence-Eastern Ontario Commission, 1976.

- Coordinated and directed environmental and comprehensive planning programs for five-county area. For a regional planning and economic development board, 1973-76.

- Principal reviewer of proposed development plans and programs of public and private sponsors; assessed compatibility and consistency with area development and environmental policies. For a regional planning and economic development board, 1973-76.

Alan Jubenville, Ph.D., Principal Investigator

Dr. Jubenville is responsible for management of the land use analysis effort being conducted by the University of Alaska. He is an Associate Professor of Management in the School of Agricultural and Land Resources Management. Examples of previous experience relevant to this project include:

- Project Investigator on study to assess river recreation research needs in interior Alaska. For the U.S. Forest Service, present.
- Project Investigator on study to develop a master plan for the Encampment Unit of the Continental Divide Trail in Wyoming, 1977.
- Developed composite plan for the Continental Divide Area of Medicine Bow National Forest in Wyoming, 1977.
- Project Investigator on Snake River Corridor Study. For National Park Service, 1974 and 1977.

Anthony F. Gasbarro, Field Coordinator

Mr. Gasbarro is responsible for coordination of site investigations in the field and portions of the land use analysis. He has a background in land resources emphasizing forestry, land use, and regional development. Examples of previous experience related to this project include:

- Project Coordinator on the Copper River-Wrangells Regional Study. For U.S. Forest Service.
- Project Coordinator on the Yukon-Porcupine Regional Study. For U.S. Forest Service.
- Co-investigator on study of a development rights purchase program for Alaska agricultural lands.

Susan Regan, Project Investigator

Ms. Regan is a graduate student at the School of Agriculture and Land Resources Management, University of Alaska. She is responsible for conducting the oral history interviews, and gathering and interpretation of project data. In addition, she will be responsible for various portions of the mapping effort.

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