SUSITNA HYDROELECTRIC PROJECT

ENVIRONMENTAL STUDIES

SUBTASK 7.08: RECREATION PLANNING
PHASE 1 REPORT
MAY, 1982

ACRES

Terrestrial
Environmental
Specialists, Inc.

ALASKA POWER AUTHORITY

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PHASE I ENVIRONMENTAL STUDIES FINAL REPORT

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RECREATION PLANNING

May 1982

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Introduction

The Report on Recreation Resources for the proposed Susitna hydroelectric project concentrated on the upper Susitna River basin in the southcentral region of Alaska. The Susitna River, the sixth largest river in Alaska, drains an area of more than 49,000 square kilometers (19,000 square miles). Centrally located between the two largest population centers in Alaska, Anchorage and Fairbanks, the upper Susitna River basin has been studied for many years as a potential source of hydroelectric power, initially, by the Bureau of Reclamation in the 1940's, later, by the Corps of Engineers and, recently, by the state of Alaska.

The current Susitna hydroelectric study has proposed the construction of two large dams at the Watana and Devil Canyon sites. If built, these dams would create major reservoirs in the project area. Watana, the larger reservoir, would extend 77 kilometers (48 miles) upstream of the dam site, with an average width of 1 to 2 kilometers (1 mile), a maximum width of 8 kilometers (5 miles), a surface area of about 15,400 hectares (38,000 acres), and a maximum depth of about 207 meters (680 feet) at normal operating level. Devil Canyon reservoir would be about 42 kilometers (26 miles) long and less than 1 kilometer (0.5 mile) wide, with a surface area of about 3,200 hectares (7,800 acres) and a maximum depth of about 168 meters (550 feet) at normal operating level.

Planning for the Report on Recreation Resources for the project area began in the late spring of 1980 and encompassed the immediate reservoir areas, the proposed access corridors to the dams, and additional lands recommended for acquisition for recreational purposes. The basis for the planning effort was the concept that recreational planning, while controlling the general nature of development and minimizing undesirable impacts, has an equally important function in controlling the type and quality of recreational opportunities to be offered to the public. The initial steps in the planning process involved, first, resource suitability studies to inventory the

potential recreation sites and opportunity settings in the project area and, next, the use of a concept plan survey to assess public opinion regarding the level and types of recreational facilities the public would prefer developed for the project area. Throughout this planning process, it was assumed that the Alaska Division of Parks of the Department of Natural Resources would be the eventual managing agency.

The Upper Susitna River Basin Description

The upper Susitna River basin is characterized by a diverse landscape composed of deeply incised canyons, turbulent whitewater, and thick stands of spruce-hardwood forest that graduate into gently rolling, upland terrain of tundra vegetation with numerous clear lakes and streams. Significant natural features of the project area include Devil Canyon; Vee Canyon; the Tyone River Bluffs; and numerous scenic waterfalls on Deadman, Tsusena, Devil and Cheechako creeks. Wildlife is abundant in the basin and includes moose, caribou, Dall sheep, grizzly and black bear, wolf, and many other smaller animals.

Existing Recreational Activities and Facilities

The upper basin currently offers a variety of roadless recreational opportunities for hunting, fishing, boating, trapping, and hiking. Recreational opportunities and facilities adjacent to the project area boundaries include: Denali National Park and Preserve, Denali State Park, Nancy Lake State Recreation Area, Independence Mine State Historical Park, and Lake Louise.

Suitability Studies

Resource suitability studies involved developing an inventory of possible recreation sites, which were reviewed and evaluated during the summer field seasons. Based on the results of these studies, a series of five concept plans were formulated, representing different scenarios of recreation opportunities. These plans ranged, on the one hand, from purposefully avoiding providing facilities and maintaining restricted access to, on the other hand, developing the majority of the potential recreation sites.

Concept Plan Survey

Results from the resource suitability studies were then used to devise a survey, which was a primary means of obtaining public participation in the planning process. This questionnaire was designed to identify that portion of the recreation opportunity spectrum that the majority of the potential users would prefer the recreation plan to focus upon. The plan finally selected was, thus, a reflection of the results of this questionnaire and served as the framework for the management plan.

The Management Plan

Pending design and construction activities associated with the hydroelectric project have serious ramifications for both the recreational opportunities of the area and the scope and focus of the proposed recreation plan. Some features of the project determine the location and development of the resource for recreation purposes. In those areas in which recreational development will be possible, the management plan integrates the planning process with certain management procedures for the purpose of providing specific types of recreation opportunities that can then be stabilized for an extended period of time. Since much of the cost of development is road-related, some preparation could take place at the time of road construction for little additional cost. Moreover, once the type and location of opportunities to be offered to the public have been established, it is important to stabilize these opportunities at that level; failing to do so early will risk that the original opportunities be changed or lost.

The majority of proposed site developments are scheduled for completion during the first three years of project operation. These developments reflect the chosen recreational concept, the design and location of the access road, the probable attractions that determine the types of activities people seek in each opportunity setting, and the level of development necessary to provide for each opportunity. Emphasis during this first phase is on day-use along the road system, with overnight camping facilities located near the dam sites.

Proposed long-term site developments scheduled for completion after the first three years include boat-in facilities at both reservoirs and the expansion of the two campgrounds. Development of these facilities must necessarily be delayed, however, until the shoreline effects of the reservoirs can be evaluated.

1 - INTRODUCTION

1.1 - Overview

The upper Susitna River basin is a 15,000 square kilometer (39,000 square mile) area bordered by the Alaska Range to the north, the Chulitna and Talkeetna Mountains to the west and south, and relatively flat lowlands to the east. As a result of the feasibility study for the Susitna hydroelectric project, two dams are proposed for this stretch of the river, one at Devil Canyon and the other upstream of the confluence of Tsusena Creek. If built, these dams and associated developments will alter much of the present wilderness character of the Susitna River basin and create two elongated reservoirs. Devil Canyon Reservoir would be approximately 42 kilometers (26 miles) long and Watana Reservoir, 77 kilometers (48 miles) long. Devil Canyon reservoir would average less than 1 kilometer (0.5 mile) in width. Watana reservoir would average 1 to 2 kilometers (1 mile) in width, except near the confluence of Watana Creek, where the reservoir would be about 8 kilometers (five miles) wide. Watana would have a surface area of about 15,400 hectares (38,000 acres) and Devil Canyon would cover an area of about 3,200 hectares (7,800 acres). The maximum depth of the reservoirs at normal operating level would be 207 meters (680 feet) for Watana and 168 meters (550 feet) for Devil Canyon. Figure 1 shows the regional setting for the project area.

As part of the environmental study for a license application, the Federal Energy Regulatory Commission (FERC) requires that a report on recreational resources be prepared. The report is to include a proposed recreation plan which describes the proposed utilization, design, and development of project recreational facilities and public access to the project's recreational lands and waters. The Susitna recreation planning subtask involved inventorying the environmental setting associated with the hydroelectric project, assessing public opinion, and developing a recreation plan that considers both the setting and opinions as well as applicable federal and state regulations and project facilities and components.

1.2 - Objectives

The objectives of the recreation planning subtask were to develop:

(1) a master plan that outlines the proposed recreation opportunities, the associated opportunity settings, and the proposed recreation developments for the project area;
(2) a schedule and cost estimates in 1981 dollars for implementing the plan;
(3) operational needs and cost estimates in 1981 dollars;
(4) suggestions for boundaries, land acquisition programs, and cooperative management agreements;
(5) coordination with agencies and landowners;
(6) estimates of recreational use, including methods for updating estimates; and
(7) an assessment of management concerns relative to the type of opportunities being offered and the opportunity settings that are available.

1.3 - Pertinent Definitions

Various terms are used throughout the recreation report that relate to different components of the planning process. Definitions for terminology with which the reader may not be familiar are provided below.

(a) Recreation opportunity - involves the availability of conditions appealing to a recreator and conducive to participation in one or more recreational activities desired by the participant.
(b) Recreation development - involves the man-made facilities and landscape alterations provided in the natural situation to facilitate participation in recreational activities.
(c) Recreation opportunity setting - involves the combination of the physical, biological, social, and managerial conditions in an area in which various recreational activities can take place; varying combinations of conditions will result in different experiences for the recreator:

- Primitive: Natural environment is dominant, and site modifications are minimal. Rustic improvements are designed for protection of the site rather than for user comfort; the recreational experience of the user is centered around a sense of adventure and the challenge of the wilderness, with "foreign" elements viewed as distracting or intrusive. Designated trails (cleared and gravel) and portages to accessible areas are provided; motorized access is neither provided nor permitted.

- Semi-primitive: The natural environment is dominant, with little site modification; rustic improvements are designed for protection of the site rather than for user comfort. User experience centers around a feeling of accomplishment in the face of the elements, but physical stamina is not essential. Outside influences are tolerated. Facility development may accommodate day and overnight use, with picnic areas, campgrounds, boat launches and trails; motorized access may or may not be provided for or permitted.

- Semi-modern: The environment is pleasing and still natural, despite substantial modification. Some facilities are designed strictly for the comfort and convenience of users and incorporate synthetic materials, for example, the artificial surfaces of roads and trails. User experience is centered around a change of routine and surroundings and an opportunity for socializing with others; development focuses on road-oriented, day-use activities, providing areas for scenic pull-outs, parking areas, and trails. Vehicular traffic control may be present, with primary access usually over paved roads.

2 - OVERVIEW OF THE PLANNING PROCESS

The recreation planning effort has focused on the immediate reservoir areas, the potential access road corridors, and those additional lands recommended for acquisition for recreational purposes (Figure 1). The planning process consists of three principal components: (1) an inventory of the recreation opportunity settings in the project area, including an assessment of resource suitability, and the potential recreation opportunities associated with the project setting; (2) an assessment of public opinion regarding the types and levels of recreational development the public would prefer relative to the potential recreation opportunities that could be offered; and (3) the development of a master plan that incorporates the findings of the first two components with management procedures for providing and maintaining the specific recreation opportunities chosen.

The major steps of the planning process are shown in Figure 2. Components of the process are described below.

2.1 - Resource Suitability Studies

Resource suitability studies involved developing a list of potential recreation sites, using aerial photographs, topographic maps, and field reconnaissance. Topography and proximity to the reservoirs were the initial criteria for preliminary selection of sites. A list of possible factors influencing site choice was developed. A more detailed field evaluation of site suitability for recreation development was then performed. Additional details on the methods employed in the suitability studies are presented in Section 5.

2.2 - Development of Concept Plans

Based on the results of the resource suitability studies, five concept plans were developed representing different scenarios of

recreational opportunities, from the purposeful avoidance of recreational facilities (in combination with restricted access) to the development of the majority of the identified potential sites. The purpose of the plans was to offer a wide range of recreational opportunities based on access and increasing levels of development.

2.3 - Public Input

To obtain public input, the various plans were incorporated into a public survey questionnaire that was mailed to randomly selected residents in Fairbanks, Anchorage, and other parts of the Railbelt (the area from Seward to Fairbanks, adjacent to the Alaska Railroad and the George Parks Highway). Questionnaires were also used in a series of public workshops sponsored by the Alaska Power Authority. Responses from both sources were used to determine the public's preferred level of recreational development if a decision is made to proceed with the Susitna hydroelectric project. Additional details on the questionnaire survey are presented in Section 6.

Throughout the planning process, information has been exchanged with relevant federal, state, and local agencies concerned with recreational development.

2.4 - Selection of Preferred Concept Plan

Based upon the suitability studies and public preference, a draft recreation plan was selected. The draft plan incorporates the access route as presently recommended by Acres.

2.5 - Participation Survey

To allow for further refinement of the plan and for adjustments to accommodate anticipated levels and types of use, a participation survey was mailed to another random sample of Anchorage, Fairbanks,

and other Railbelt residents. The survey was designed to provide information concerning the numbers of possible visitors and the frequency of use likely to occur if the proposed recreational facilities are developed.

2.6 - Final Recreation Plan

The final recreation plan will need to be refined on the basis of the results of the participation survey. Additional input from public and state agency review of the Feasibility Report and this report should also be considered in developing the final plan.

3 - UPPER SUSITNA RIVER PROJECT AREA

The upper Susitna River basin is characterized by a diverse landscape comprised of deep canyons with steep rock walls, colorful rock outcroppings, and dense stands of spruce-hardwood forest that give way to rolling upland tundra with numerous clear lakes and streams. The opportunities for hunting, fishing, trapping, boating, hiking, and backpacking that the basin presently offers as well as its strategic location between Anchorage and Fairbanks were important considerations in planning recreational use and development for the project area's lands and waters.

3.1 - Susitna River

The Susitna River is cold, swift, and silty and flows from glacial headwaters in the Alaska Range. Below the glaciers, the river's braided channel traverses south through nearly flat lowlands that were once covered by an immense proglacial lake. Where the Susitna takes a sharp turn to the west, it becomes progressively entrenched between broad, rounded uplands until exiting below Devil Canyon.

Although the Susitna itself is silt-laden, its tributaries except the turbid Maclaren and Oshetna rivers, are clear. Many of the tributary streams that drain the uplands below Vee Canyon fall from steep embankments, creating impressive waterfalls. Above the gorges and canyons, where the uplands have been smoothed and shaped by glaciers of the Pleistocene era, the streams are quite flat and even meandering.

The Susitna River surges through the narrow, rocky gorge at Devil Canyon, creating a major Alaskan whitewater area in an 18-kilometer (11 mile) stretch of river. Once past the canyon, the river gradually turns south, becomes braided and eventually empties into Cook Inlet.

3.2 - Climate

During summer months, mild weather predominates. This weather results from warm, moist air that travels north from the Gulf of Alaska and encounters the southern foothills of the Alaska Range, where it is then lifted and cooled. This process can produce significant amounts of precipitation in the area.

3.3 - Vegetation

The diversity of landforms, elevation, and climatic conditions in the project area are reflected by the varied vegetation. The areas of the proposed impoundment that are dominated by steep slopes support stands of spruce (Picea glauca, P. mariana), birch (Betula papyrifera),and alder (Alnus sinuata),with a well-developed ground layer consisting primarily of herbaceous species and some shrubby plants. The terraces above the river are covered with low shrub and shrub-bog communities, dominated by shrub species such as dwarf birch (Betula glandulosa) and blueberry (Vaccinium uliginosum). The transition from shrublands to higher elevations is characterized by sedge-grass tundra and mat and cushion tundra vegetation. Here, well-drained areas usually contain low-growing herbaceous plants or matted shrubs.

3.4 - Soils

Rough, mountainous land generally predominates above 1,200 meters (4,000 feet) elevation in the project area. Soils here are stony and shallow over bedrock or boulder deposits and are restricted to sparsely vegetated locations on lower slopes and in valleys. Aside from extensive areas of rough, mountainous terrain, the soils of the upper Susitna basin are dominated by two principal soil orders, Inceptisols and Spodosols. The majority of the soils are Inceptisols, poorly developed soils most common on extreme landscape

positions, such as depressions and steep upland locations of young geomorphic age. Many Inceptisols here are Histic Pergelic Cyraquepts, wet soils with a thick accumulation of organic matter. These generally occur in lowland depressions but may also develop in basins at higher elevations where permafrost is usually present. Another subgroup, Pergelic Cryumbrepts, are well-drained soils of higher elevations that typically occur above treeline on low ridges and steep slopes. Spodosols, the second principal soil order, are well-drained soils dominant on uplands in areas of high precipitation. The most common Spodosols found in this area are Humic and Pergelic Cryorthods (USDA 1979).

Most of the soils of this area present severe limitations for all kinds of land use, including roads and recreation facility construction, because of excessive soil moisture, the presence of permafrost, the occurrence of slumping along slopes, and other terrain features (USDA 1979). Land use limitations established by the Soil Conservation Service for various soil subgroups found in the project area are given in Appendix A.

3.5 - Wildlife and Fisheries

Wildlife within the basin includes moose; caribou; Dall sheep; grizzly and black bear; wolf; wolverine; lynx; red fox; migratory and nonmigratory bird species, including raptors such as golden and bald eagles; and many other smaller animals. The basin provides important moose and caribou range; in fact, the Nelchina caribou herd extends its range over much of the upper basin, particularly the central and eastern portions. On the other hand, Dall sheep occur only at higher elevations. The basin also supports a relatively high black bear population, primarily in the forested regions along the Susitna River. Grizzlies, on the other hand, are more prevalent above treeline during the summer months, but are known to migrate to rivers and lakes that have salmon runs.

A variety of resident fish are present in the tributary streams and lakes of the basin; grayling, rainbow trout, burbot, Dolly Varden, lake trout, and whitefish. Migrating salmon spawn in sloughs, Indian River, and Portage Creek but are not found above Devil Canyon, where the rapids prevent them from going farther upstream.

3.6 - Significant Landform Features

The upper Susitna River occupies a deep, entirely stream-cut valley, an unusual geological feature in an area that is dominated by glacially carved, broad, U-shaped valleys. Some of the significant landform features include Devil Canyon, Vee Canyon, the Tyone River bluffs, Clear Valley, and Mt. Watana (Figure 3). [A detailed description of significant natural features of the project area is included in the TES Subtask Report on Land Use (APA 1982)].

(a) Devil Canyon

Devil Canyon is significant for both its narrow, rocky gorge, with 180-meter-high (600 foot-) walls that have been entirely stream carved and its whitewater, the result of the river's great volume, the constriction of its channel, and the rocky obstructions in its bed.

(b) Vee Canyon

Vee Canyon, with its prominent, multi-colored, sheer rock walls and double hairpin bends, also has turbulent whitewater. In addition, the canyon is the western terminus of the Copper River lowland landscape.

(c) Tyone River Bluffs

The Tyone River bluffs are composed of chalky, lacustrine deposits that contrast sharply with the dark water of the Tyone River. The

Tyone drains Susitna Lake and Lake Louise and is distinguishable from other Susitna tributaries because of its slow, meandering character and dark color.

(d) Clear Valley and Mt. Watana

Clear Valley is an interesting geological feature for its prominent lateral moraines and terraces. Mt. Watana is highly visible in much of the central and eastern portions of the basin. Along its eastern flank is Watana Lake and above this lake is a glacially carved, hanging valley with a small cirque lake surrounded by steep scree slopes.

3.7 - Significant Water Forms

The majority of the significant water forms in the basin include waterfalls and lakes. [A description of individual features is provided in the Subtask Report on Land Use (APA 1982)].

(a) Waterfalls

Many of the tributary streams of the Susitna that flow down from the uplands pass through narrow, rocky gorges and drop over steep embankments, creating a variety of waterfalls. The most significant of these waterfalls, because of their size and beauty, are located in Deadman, Tsusena, Devil, Cheechako, and other, unnamed creeks. These constitute some of the most scenic features in the upper Susitna basin.

(b) Lakes

Most of the lakes in the project area are concentrated in the uplands above the river valley. Big Lake is the largest with a surface of 437 hectares (1080 acres). Stephan Lake is the second largest, covering over 340 hectares (840 acres). Stephan

is also one of the few lakes in the area with a run of salmon and with relatively high recreational use. Many of the larger lakes, such as Big, Stephan, Deadman, Watana, and Clarence, provide good fishing opportunities in addition to their scenic qualities. They are most striking during the brief autumn when the colors of the tundra vegetation contrast sharply with both the blue water and the rugged, snow-covered mountains in the distance.

4 - EXISTING RECREATIONAL ACTIVITIES AND FACILITIES

4.1 - Project Area

Currently, there are no areas within the project boundaries that are included or designated for inclusion in the National Wild and Scenic Rivers System, the National Trails System, or as a wilderness area under the Wilderness Act. The present level of recreational use in the project area is limited by the difficulty of access into the area, with most use concentrated at larger lakes that are accessible by float plane. A number of manmade trails (ORV, dogsled) do traverse the basin, their primary use devoted to subsistence, recreation, or mining exploration activities.

No publicly developed recreation facilities exist within the project area. Although there are no public facilities or means of road access, various recreational activities do take place in the upper basin. These are normally characterized by low-volume use associated with hunting, fishing, camping, hiking, and boating. Some rafting and kayaking also occurs on the Susitna, Maclaren, Talkeetna, and Tyone rivers and on Prairie Creek.

There are also three privately owned lodges -- on Stephan, High, and Tsusena lakes -- and other structures that are used mostly on a seasonal basis for hunting, fishing, and trapping. Some of the other recreational activities mentioned also occur in connection with these private facilities. The principal mode of travel to the lodges, in particular, is by plane (Figure 4).

(a) Stephan Lake Lodge

The lodge, located south of the Susitna River at Stephan Lake, is the largest of the three lodges (ten main structures with seven additional outlying cabins) and receives the greatest number of visitors annually. Serving a predominantly European clientele, it offers a variety of

outdoor recreation activities in a wilderness setting. These focus chiefly on hunting and fishing and on occasional float trips down the Talkeetna and upper Susitna rivers and Prairie Creek.

(b) High Lake Lodge

High Lake Lodge, with 11 structures, is the second largest lodge and is located northeast of the proposed Devil Canyon dam site at High Lake. Historically, this lodge has provided guests with services similar to those offered at Stephan Lake Lodge in connection with hunting and fishing activities in a wilderness area. The lodge is currently being leased to Susitna project personnel during the summer field seasons.

(c) Tsusena Lake Lodge

Tsusena Lake Lodge is north of the proposed Watana dam site and Tsusena Butte, adjacent to Tsusena Lake. This lodge, with three structures, is used primarily by the lodge owners and members of their families and friends. Most use occurs in summer and fall, with little or no use during the winter.

4.2 - Adjacent Areas

(a) Denali National Park and Preserve

As shown in Figure 4 and Table 1, the lands adjacent to the project area offer numerous recreational opportunities and facilities. The major attraction is Denali National Park and Preserve, with a total area of about 2 million hectares (5.7 million acres). The single most outstanding feature of the park is Mount McKinley (or Denali) which soars to an altitude of 6,194 meters (20,320 feet). Administered by the National Park Service, the park facilities include a hotel complex, depot, hostel, shuttle bus service, visitors' centers, six

campgrounds, and various trailheads. Although the park is open year round to visitors, many of the facilities are only available from late May or early June until September.

(b) Denali Planning Block

To the north of the project area, the U.S. Bureau of Land Management maintains the 1 million hectare (4.5 million acre) Denali Planning Block, which incorporates most of the land adjacent to the Denali Highway, including the Tangle Lakes Archeological District. This 186,000 hectare (460,000 acre) district, with more archeological sites than any other known area of comparable size in the American Subarctic, has major archeological significance, with prehistoric sites dating back 12,000 to 15,000 years. The Bureau also maintains several small campgrounds and picnic areas along the Denali Highway, including boat launches, canoe trails, two campgrounds at Tangle Lakes, and one campground each at Brushkana River and Clearwater.

(c) Denali State Park

Denali State Park is located south of Denali National Park and Preserve and west of the project area. The park contains about 170,425 hectares (421,120 acres) and a central recreational development at Byers Lake. Winter use of Denali State Park is limited by the lack of year-round facilities and its distance from major population centers. Various studies have been done to evaluate the feasibility of developing a recreational facility on the southside of Mount McKinley in the Tokositna area, but no decisions have been made to build such a facility.

(d) Nancy Lake State Recreation Area

Nancy Lake State Recreation Area is about 110 kilometers (70 miles) north of Anchorage and, with 9,181 hectares (22,685 acres), it provides many opportunities for camping, picnicking, and hiking. Other activities are fishing, boating, and canoeing on more than 130 lakes and ponds in the recreation area and ice fishing, cross-country skiing, snowshoeing, and snowmachining in the winter.

(e) Independence Mine State Historical Park

Independence Mine State Historical Park is Alaska's newest state park with 110 hectares (271 acres) that is located at Hatcher Pass in the Talkeetna Mountains. Once an old mining area, it includes weathered buildings and remnants of former mining days. Visitors are attracted to the park in the summer months to view the mining relics and the mountain scenery and to hike and camp.

(f) Lake Louise

Lake Louise, with adjoining Susitna Lake, is a popular fishing, boating, and hunting area, primarily in private ownership. There are limited camping and picnicking facilities available at the Lake Louise State Recreation Area. Lake Louise is the main source of the Tyone River, a tributary of the Susitna River. The Tyone is occasionally used by boaters, who float from Lake Louise to the confluence with the Susitna River.

(g) Chugach State Park

Chugach State Park is located in the mountains east of the city of Anchorage. There are about 200,406 hectares (495,204 acres) that offer a year-round variety of outdoor opportunities for hiking, picnicking, camping, wildlife

viewing, fishing, canoeing, berry picking, skiing, and snowmachining.

(h) Privately Owned Facilities

Privately owned and operated facilities in adjacent areas provide additional services to the public. Lodges, cabins, restaurants, airstrips and flying services, guiding services, whitewater rafting trips, and campgrounds are the types of services and facilities provided by private enterprise.

5 - SUITABILITY STUDIES

Suitability studies involved assessing the recreation resource potential of the project area. These studies were pursued in two phases: a general resource suitability study, which involved determining the types of recreational opportunities available, compiling a list of potential sites, and conducting preliminary field investigation of these locations; and a more detailed study of the suitability of the potential sites to accommodate recreational development and use. Similar criteria were used in both studies, including site stability, recreation desirability, and scenic quality.

The first step in this assessment was to determine what types of recreational opportunities are possible in the project area (see Section 1.3). To accomplish this task, an inventory of potential recreation sites was developed with the use of topographic maps, available aerial photographs, and a literature review of material relating to the project area. Topography and proximity to preliminary reservoir location options were the primary criteria for selection. Subsequently, other project investigators identified possible access corridors, and these were also used in identifying potential recreation sites. A total of 90 sites were identified (Figure 5), and each site was evaluated in the field. The final selection of sites judged suitable on the basis of the field evaluation is shown in Figure 6; the field data form used to compile information about the sites and make the selection of sites is shown in Appendix B.

Selection criteria that were used in the field to evaluate each site included scenic quality; site stability factors, including an analysis of vegetation, soils, and topography; and recreation desirability, a combination of factors including size of area, lay of land, relative accessibility, and visitor safety.

Although the project area offers a variety of recreation opportunities, it also presents some unusual and difficult conditions that must be considered when planning and developing recreation facilities. The

sides of the proposed reservoirs will be very steep and highly erodible, limiting access points to both reservoirs. Severe reservoir conditions, including drawdowns of as much as 43 meters (140 feet), for Watana and 17 meters (55 feet) for Devil Canyon, and hazardous ice conditions will limit access in terms of time, to only a few months each year. Boat launching, docking, and mooring facilities in both reservoirs will need to be designed to accommodate the changes in water level. On a daily basis, these changes will be insignificant. From June to September, however, the average water level of Devil Canyon reservoir will rise 15 meters (50 feet) and that of Watana will rise 9 meters (30 feet). When the reservoirs are not full, the aesthetics of the exposed drawdown zone could reduce the attractiveness of water-based recreation. The reservoirs will be cold and silty, with slumping shorelines and possible mud flats occurring in various areas. Reservoir conditions may restrict the sizes of fish populations, so fishing may generally be concentrated at the mouths of clearwater streams where they enter the reservoirs.

Another problem to be addressed by planners is that the upland tundra vegetation, while presenting an attractive environmental setting for many viewers, will also be quite sensitive to man-made disturbances and overuse. In addition, streams and natural lakes accessible by the road and trails may be even greater attractions as recreation sites than the reservoirs themselves. Finally, there are no other similar projects in the area that can be used for comparison in order to anticipate specific planning considerations.

Based on the results of the suitability studies, a series of five concept plans was developed, representing different scenarios of recreation opportunities. These ranged from purposely refraining from creating public recreation facilities, combined with restricting access, to developing most of the potential recreation sites that passed the suitability evaluation.

6 - CONCEPT PLAN SURVEY

6.1 - Purpose

A concept plan survey was the chief means of soliciting public participation in the recreation planning process. This procedure was consistent with the objective of determining the interests and desires of the public regarding recreational development. The actual survey method was a questionnaire pertaining to the recreational potential of the project area and the preferences of the public. Concept plans that were developed as a result of suitability studies were incorporated into the questionnaire that was mailed to a random sample of Alaska residents in Anchorage, Fairbanks, and other areas of the Railbelt, the locations of the majority of potential users. An abbreviated questionnaire was also used at a series of public workshops on the proposed Susitna hydroelectric project sponsored by the Alaska Power Authority.

6.2 - Survey Questionnaire

A copy of the recreation survey questionnaire is shown in Appendix C. The objectives of this questionnaire were to identify the portion of the recreation opportunity spectrum on which the majority of potential users would prefer that recreation planning be focused. This segment of the spectrum would then serve as the framework for the recreation plan. The questionnaire was also a means of maximizing the public contribution in selecting recreation sites and opportunities.

A total of 2,145 questionnaires were mailed to a random sample of Alaska residents in Anchorage, Fairbanks, and other parts of the Railbelt region. The number of questionnaires completed and returned totaled 549, or 26% of the total mailed. This percentage and the rate of response to certain key questions (see Section 6.3) were considered adequate for analysis (Table 2).

6.3 - Selection of the Recommended Concept Plan

The questionnaire recipients' responses to Question 1 of Part III were used as the principal selection criteria for choosing the recommended concept plan. In Question 1, respondents were asked to rank the five approaches in order of each one's value to the individual, with number 1 being of greatest value and number 5 of least value. A total of 473 respondents of the 549 total answered Question 1 by ranking both a first and a fifth choice. The number of responses for each approach was totaled, with the selection of the recommended concept plan based on that approach receiving the greatest number of most desirable responses.

Results of responses were analyzed considering the region in which the respondent lived (Anchorage, Fairbanks, and other Railbelt) and their perceived residency classifications (urban, rural, remote rural, and other). No significant statistical differences in concept plan choice were found based on either region ($P<0.5$) or residency ($P<0.1$) classification; therefore, the data were aggregated for analysis of the concept plan choice indicated as most desirable by the majority of questionnaire respondents. Results of the questionnaire analysis are shown in Table 3.

Approach A was ranked as the first choice by 18% of all respondents. This approach purposely curtailed public access and planned no development associated with the two reservoirs; it was also ranked by 44% of the respondents as being of least value to them and, therefore, was eliminated from further consideration.

Approaches C and D represented a combination of various levels of development for each reservoir, with one reservoir having greater development than the other. Respondents that ranked these two approaches as their first choice gave Approach C a 13% response rate and Approach D, 15%. Although there was no strong preference shown for either approach, there was also a very small percentage of respondents

that ranked these approaches as least valuable to them -- Approach C with 1% and Approach D with 2%. These percentages seemed to indicate that while both approaches did not have the most value to respondents, they were more acceptable to a greater proportion of respondents than all other approaches.

Approaches that received the highest ranking as being of most value to respondents were B and E. While neither approach was indicated by large proportions of the questionnaire respondents, Approach E received the highest percentage of responses, 30%, and represented the development end of the spectrum. Approach B, providing reasonable access but limited facility development associated with the reservoirs, was indicated as being of most value by 25% of the respondents. Reviewing the percentages of respondents that ranked both approaches B and E as their last choice, with the least value, Approach B received 4% and Approach E, 49%. Approach E, therefore, received the highest percentage of responses for all five approaches as having both the least value and most value to respondents. When comparing the total number of responses that ranked Approach E as being of most value, 142 (30%), with the total that ranked it fifth or of least value, 231 (49%), it became apparent that a greater proportion of questionnaire respondents ranked Approach E of least value to them than respondents that ranked it of most value.

These results left Approach B as the primary choice to serve as the framework for the recreation plan. Approach B received the second highest ranking for being of most value to respondents with 116 responses (25%) from the total of 473 responses and 18 responses (4%) for the least preferred choice. It was clearly indicated by a greater proportion of respondents as their first choice than it was by ones that ranked it as their last choice, that is, of least value. Further analysis of the unsolicited comments from the questionnaires indicated that facilities should be developed and managed on an as-needed basis, starting with minimal facility services and expanding only when demand warrants it. Concept Plan Approach B

will provide for facilities at a minimal level now and allow for expansion if and when there is demand for such addition.

6.4 - Public Workshop Questionnaire

While the concept plan survey questionnaire was the principal method used for choosing the recommended concept plan, some suggestions were included from the results of a questionnaire distributed to participants at a series of public workshops sponsored by the Alaska Power Authority on the Susitna hydroelectric project, held March 16,17 and 19, 1981, in Fairbanks, Talkeetna, and Anchorage, respectively. At each workshop a questionnaire was distributed to participants to be completed and either handed in at the end of the workshop or mailed back to the Alaska Power Authority. A copy of the questionnaire is shown in Appendix D. A total of 90 questionnaires was completed and returned by individual workshop participants.

Based on the results from the mail survey questionnaire and the site suitability studies, and some suggestions from the public workshop questionnaire, a variation of Approach B was selected as the recommended concept plan. This concept plan (Figure 7) meets the following criteria:

- Recreation developments proposed for the first three years would be essentially those shown in Approach B. Emphasis would be on rustic facilities and limited services. Primitive picnic areas and campgrounds would be located near the dam sites and designed to accommodate various types of users and to permit future expansion. Developed trails and portages would lead to alpine lakes and waterfalls in the project area, and boat launches would provide access to the reservoirs.

- After the first three years, long-term development would focus on the potential expansion of the campgrounds at the dam site areas as well as on the development of boat-in facilities at other locations on the reservoirs. A delay in the development of the boat-in facilities would be necessary until the reservoirs are filled and the effects of shoreline stability and erosion evaluated.

- The semi-primitive opportunity setting would be maintained with an emphasis on rustic development and limited services. Initially the plan would be similar to Approach B but could be expanded later through the development of additional facilities. This arrangement would also preserve the option of providing additional commercial services, such as a service station, campstore, or lodging, if such development could be shown to be both economically feasible and suitable for the opportunity setting.

7 - RECREATION MANAGEMENT PLAN

The integration of the planning process with management procedures is important for providing specific recreation opportunities that can be stabilized for an extended period of time. Recreation opportunities are a function of user preference and a product of management actions. During the development of this plan, a broad range of recreation opportunities were considered as well as the natural resource capability of the project area to accommodate recreational uses. Also examined were the costs and benefits of the proposed facilities.

7.1 - Proposed Recreation Opportunity Settings and Activity Emphasis

The proposed opportunity settings are shown in Figure 8, with a description of the management program and activities to be emphasized appearing in Table 4. The recreation opportunity settings offered are semi-modern, semi-primitive, and primitive. These settings meet the planning criteria for the recommended concept plan (Figure 7) and are consistent with the types of facilities and access necessary for maintaining and operating the dams. The existence of the dams and reservoirs, their associated facilities, and the gravel access road that connects them with the Parks Highway would render adjacent recreation sites as semi-modern on the recreation opportunity spectrum. The two reservoirs will offer a semi-primitive opportunity setting, with motorized boating activities available but with other recreational facilities limited. Areas that are accessible from the road and reservoirs but where ORV use is restricted are classified as primitive and will receive low-volume, dispersed types of recreational activities.

The emphasis of recreation in the region will be on day-use, with camping facilities located near the Devil Canyon and Watana dam sites. Scenic alpine lakes within the project area will be major attractions and, together with the scenic drive itself will be the focus of the majority of the road-oriented recreation. Developed

portages and trails to these lakes and various waterfalls in the project area will offer additional opportunities that will not be available at the two reservoirs.

7.2 - Initial Recreation Site and Facility Development

The proposed recreation sites and developments are a reflection of the recommended concept plan, the design and location of the proposed road system, the dams and reservoirs, and the attractions likely to determine the types of activities people will seek within the various opportunity settings. The proposal also denotes the amount of development necessary to offer and maintain these opportunities. Figure 9 shows the locations and types of site and facility developments, and Table 5 describes them in greater detail.

(a) Access Road

Access from the Parks Highway to the reservoirs and recreation facilities will be provided by a gravel road, which falls within the semi-modern portion of the recreation opportunity spectrum. Most recreation along the access road will be day-use. An orientation and information sign, placed at the entrance of the project road from the Parks Highway, will inform visitors of the opportunities and restrictions of the project area. All information signs will be of simple and rustic design, in keeping with the opportunity settings in which they are placed. Scenic viewpoints; pull-outs and parking areas at trailheads and portages; and access at Indian River, where spawning salmon can be viewed during the summer months, are the only additional facilities planned along the road system. Waste containers will be placed at the Indian River access point and at trailhead pull-outs, with scheduled disposal and maintenance for these containers. All other scenic viewpoints, for short-term viewing and photography, will not have waste containers.

ORV use will not be allowed from the access road, and this policy will be strictly enforced. Particularly in the alpine zone, use of ORV's would destroy the very opportunities the recreation plan is designed to enhance and protect.

(b) Devil Canyon and Watana Reservoirs

The greatest concentration of recreational use will be focused near the Devil Canyon and Watana dam sites, where reservoirs and existing facilities will be accessible. Recreation development for the first three years includes: developed campgrounds, designed to accommodate all types of vehicle users and to allow for future expansion; picnic/rest areas; boat launches; and parking areas. Emphasis will be placed on rustic facilities that are both aesthetically pleasing and functional but with minimal services.

Recreational development at both reservoirs will be severely limited by the cold, silt-laden water; steep, highly erosive canyon walls; slumping shorelines; hazardous ice conditions throughout much of the year; and large seasonal water level fluctuations (see Section 5). When the reservoirs are not full, the aesthetics of the exposed drawdown zone may limit recreational use. Fish populations in both reservoirs will probably be low and fishing restricted primarily to the mouths of clearwater streams where they enter the reservoirs.

At Devil Canyon reservoir, development will be limited by the reservoir's narrow, gorge-like character. Several side canyons may offer some protection from the wind and, therefore, could serve as sheltered moorages, but their steep banks may make them ill-suited for any type of development. Upstream, however, where the canyon broadens, there may be suitable reservoir banks for some types of future recreational facilities.

The Devil Canyon dam site area would serve as the focal point for recreational activities in the lower portion of that reservoir area. A combination of day-use and overnight facilities would be available to visitors interested in both water- and land-oriented activities, such as boating, picnicking, hiking, and camping. Day-use facilities proposed for the dam site area include picnic and rest areas with orientation and interpretive information, a boat launch and parking area for the reservoir, and several scenic overlooks with short trails.

Boat launches and parking areas are proposed at Cheechako Canyon, located east of the Devil Canyon dam, and at Tsusena Creek, just west of Watana dam. Upper Cheechako Canyon, south of the boat launch, would be designated a no-wake boating zone to encourage non-motorized, day-use of the canyon. Boating access at Tsusena Creek would disperse some of the recreational use throughout the reservoir, while giving greater access to the upper regions of the reservoir.

Overnight camping would be available near Cheechako Canyon with a developed, 60-unit campground designed for eventual expansion in the future. Locating the campground at Cheechako Canyon would make it both accessible to and convenient for all types of users, while removing visitors from the operation and maintenance activities associated with the dam. The terrain and forest vegetation along the canyon should create a pleasant and secluded atmosphere, simultaneously buffering noise. A proposed trail would follow the canyon from the campground area to a series of waterfalls along Cheechako Creek, with a short loop of the trail designed specifically for the handicapped. A picnic and rest area would be located near the boat launch and parking area at Tsusena Creek, with a developed trail to Tsusena Falls.

It is expected that Watana reservoir will receive low-volume, dispersed use, mostly for boating, hunting, and sightseeing activities. Reservoir access will be via a boat launch and parking area near Deadman Creek. Proposed camping facilities, which would be located near Deadman Creek, would be similar to those offered at the Cheechako Canyon campground but with fewer units for the first three years (Phase 1). All developed campgrounds and picnic areas would have conveniently located toilets and trash containers, with scheduled maintenance at both.

(c) Other Areas

Proposed recreation developments in the semi-primitive opportunity setting adjacent to the access road offer visitors scenic views of the Susitna River valley; the reservoirs; the alpine tundra landscape, dotted with clearwater lakes and streams; and the Talkeetna Mountains and the Alaska Range, including Mt. McKinley. Developed portages and trails would lead to larger lakes and waterfalls within the area. Primitive trails to additional lakes in the area would be cleared of brush and the wet areas stabilized. To protect this sensitive environment and the recreational opportunity it affords, no facilities are to be provided except for the overlooks, portages, and trails. Dispersed tent camping would be allowed and a "pack-in, pack-out" policy used. All ORV use would be prohibited and the regulation strictly enforced for both visitors and the maintenance and operations personnel at the two dam sites. A public information campaign would be initiated to acquaint people with the regulations and to explain their necessity.

7.3 - Long Range Recreation Development

The semi-primitive opportunity setting would be maintained for both reservoirs and for the land adjacent to the access road. Areas classified in the primitive setting would remain so. In terms of

actual development for recreation, Figure 10 shows the location, type, and number of various recreational facilities planned for the future. Table 5 describes them in greater detail.

These developments would focus on the expansion of the campgrounds near Watana reservoir and a boat-in picnic area at Devil Canyon reservoir. Delay in the development of these facilities is necessary until the anticipated demand is known and until the reservoirs are entirely filled and the shoreline effects of erosion and slumping can be evaluated. These developments would include the addition of 40 camping units at the Cheechako Creek campground and 30 units at the Deadman Creek campground. Boat-in campgrounds would have ten primitive campsites each, and both boat-in campgounds and the picnic area located at Devil Canyon reservoir would have toilets, water, and picnic facilities serviced on a regular basis, and food caches provided to minimize bear/man encounters. The "pack-in, pack-out" policy would be enforced for waste disposal, and a monitoring system would be used to measure environmental and site deterioration created by overuse or vandalism.

Boaters coming down the Susitna River from the Denali Highway area and from the Tyone River by way of Lake Louise would be accommodated by a camping area near the confluence of the two rivers. A cooperative agreement could be made with the future landowner [either CIRI (Cook Inlet Region, Inc.) or the Bureau of Land Management] that would stipulate the type and location of recreational facilities that would be provided and maintained when such development is needed.

Any plans for additional facilities would have to incorporate anticipated and actual public demand and still be compatible with the resource capability. The option of providing commercial services, such as a service station, lodging, boat rental, or campstore, would be considered if such developments were shown to be economically feasible and suitable to the opportunity setting. If this option were desirable, it could be pursued under a tightly controlled concession contract.

7.4 - Shoreline Buffer Zone, Boundary, and Land Acquisition Program

A shoreline buffer zone will allow for public access at both reservoirs, while protecting the scenic, cultural, and environmental values associated with the reservoir shorelines. For the protection and enhancement of these values and the visual quality of the buffer zone, proposed recreational facilities have been designed and located so as to cause the least impact on the landscape. Developments at the dam sites are situated away from the reservoirs, and with their rustic design and their location within vegetation types with higher absorption factors, are intended to blend into the landscape. By locating recreation facilities near areas of existing or prior development, the number of additional unnecessary disturbances to natural areas is reduced. Low-density, dispersed use in the semi-primitive and primitive opportunity settings will minimize potential damage to reservoir shorelines and other environmentally sensitive areas that could result from overuse or inappropriate types of use. See Section 7.7 (f) for a discussion of potential disturbance of cliff-nesting raptors.

The lands recommended for acquisition (or other means of protection from incorporated development) include: the rights-of-way of the access roads; the visual corridor, or "seen" area, for both Devil Canyon and Watana reservoirs; and the land circumscribed by the access road joining both dams on the north boundary, the dam sites to the west and east, and Devil Canyon reservoir to the south. In addition, some type of cooperative agreements should be made with the Alaska Department of Natural Resources for the protection of public fishing access adjacent to Indian River and with CIRI or the Bureau of Land Management for a designated camping area near the confluence of the Tyone and Susitna rivers.

7.5 - Estimate of Existing and Future Recreation Use

(a) Existing Data

There are no statistical records on the amount of recreational use the interior Susitna River basin receives on an annual basis.

The type of use the area receives (primarily dispersed, low-volume activities such as hunting, fishing, boating) and the principal mode of travel to the area (predominantly private aircraft) combine to make accurate data collecting difficult and expensive. Two of the private lodges in the project area (Stephan Lake and Tsusena Lake lodges) currently receive between 1,458 and 4,864 combined visitor-days of use. The third lodge, at High Lake, currently serves only project personnel during summer field seasons.

Traffic counts taken for the Denali and Parks highways provide some indication of the amount of use these highways receive during the summer months, the time of the year when most recreational use occurs within the region. The results of traffic counts conducted from 1973 to 1978 are shown in Table 6, with the average daily traffic count for the full length of the Denali Highway and for the East Fork Maintenance Station, which is approximately 32 kilometers (20 miles) north of the intersection of the proposed access road to the project area and the Parks Highway. Table 6 also shows the average daily traffic count for both highways for the period from the middle of May to October (when the Denali Highway is open to the public) and the annual average daily traffic count for the Parks Highway.

Results from the 1975 outdoor recreation study for the Denali Highway area indicated that for a 75-day season from July 1 to September 13, 1975, approximately 6,400 recreation groups (average size of 3.2 persons) used the Denali Highway area, for a total of 20,500 recreation visits. The study (Johnson 1976) found that 90% of highway travelers interviewed (1,088 respondents) cited recreation as the primary purpose of their trip. The majority of the respondents (82%) were Alaska residents, with 35% from Anchorage and 27% from Fairbanks.

Visitor counts taken by the Alaska Division of Parks for state recreation areas adjacent to the Parks Highway are shown in

Table 7 and were compiled from all available data collected for the summers of 1979 and 1980.

Most methods of estimating future recreational use of the proposed reservoirs are based on existing, analogous reservoirs or other regions with similar conditions. The value of such analogies is doubtful, however, when used for comparison with the unique environmental, economic, and social conditions existing in Alaska. General factors to be considered when estimating the projected recreational use of the project area are:

- The majority of the user population is located 240 to 320 kilometers (150 to 200 miles) north and south of the project area in the primary population centers of Anchorage and Fairbanks. This siting places the project area at the extreme of the travel radius acceptable for day-use but well within the radius considered feasible for weekend or overnight use.

- The potential user population for the project area, including both reservoirs, could be 484,000 people by the year 2000 (Anchorage, Fairbanks and the Railbelt populations) (Frank Orth & Associates 1982). On the other hand, the competition from Denali National Park, Denali State Park, Nancy Lake State Recreation Area and Big Lake (East and South) Recreation Sites, the Denali Planning Block, and other regional attractions is difficult to determine.

- Additional considerations when estimating project use include the possible conditions of the reservoirs (including the cold, silty water; steep slopes; erosion and slope stability problems; large fluctuations in pool levels and aesthetics of the drawdown zone; and low fish populations); the degree of access; seasonal availability; and the location and design of hydroelectric facilities, including transmission lines, substations, permanent housing and other associated facilities.

(b) Recreation Participation Survey

To obtain additional information concerning potential future use of the proposed recreational facilities, a participation survey (Appendix E) was mailed to 3200 randomly selected Anchorage, Fairbanks, and other Railbelt residents. Survey results have not been analyzed, but they will be used to estimate the future use likely for project facilities.

7.6 - Schedule and Cost of Recreation Facility Development

Most of the site developments proposed are scheduled for completion during the first three years of project operation. Much of the development cost is road-related and could be accomplished during the initial phase of road construction with minimal extra cost. In addition, once the type and location of opportunities to be offered to the public have been established, the essential developments for each opportunity setting should be completed in the first three years to develop and protect these opportunity settings properly. Failing to protect the settings early would permit the original opportunities to be changed or lost as additional developments are introduced.

Short-term costs for recreational facility developments, exclusive of road construction costs, are estimated to be $2,062,235 in 1981 dollars. With the addition of road construction costs, the total is $4,383,876 in 1981 dollars. A summary of these costs, with subtotals for each opportunity setting and proposed site, is given in Table 8.

The estimated cost of parking areas varies with the type of area designed. Parking areas located at boat launchings have 3.1 meters x 12.2 meters (10 feet x 40 feet) spaces; in all other locations, parking areas will be 3.1 m x 9.1 m (10 feet x 30 feet). The estimated cost of scenic overlooks and pull-outs is based on an average size of 1,300 square meters (14,000 square feet). Actual

Actual costs are expected to vary with actual site conditions, distance to nearest material site, and other factors. Cost estimates are subject to modification when detailed site planning and construction drawings are completed.

Proposed facility developments scheduled for completion after the first three years (that is, the long-term development) include a boat-in picnic ground at Devil Canyon Reservoir, two boat-in campgrounds at Watana Reservoir, and the expansion of the campgrounds at Cheechako Canyon and Deadman Cove. The long-term cost of these proposed facilities, exclusive of road construction costs, is estimated to be $1,050,585 in 1981 dollars. Adding road construction costs, the total in 1981 dollars is estimated to be $1,664,877. A summary of these costs, subtotaled for each opportunity setting and recreation site, is shown in Table 9. The total projected cost of capital improvements, exclusive of road construction costs, is $3,112,820 in 1981 dollars. With the addition of road construction costs, the total projected cost in 1981 dollars is $6,048,753.

Estimated operating costs are shown in Table 10 and were developed by determining normal agency operations, developing a list of possible cost categories, and soliciting 1981 costs for these items. The projected total operating cost in 1981 dollars is $405,939 for the first year and $290,280 per year after that.

7.7 - Management Issues

Management issues refer to possible actions that would be required to protect and enhance an area's recreational opportunities and resources for a period of time. This interrelationship of the types of opportunities, the specific opportunity settings, and the management issues that must be addressed to maintain them both are addressed below according to the opportunity settings in Table 7.

(a) Semi-modern Opportunity Setting (A)

Primary use will focus on road-oriented, day-use activities, chiefly sightseeing and photography. Area information signs will

be necessary for visitor orientation and information pertaining to recreational opportunities and regulations in the project area. Scenic viewpoints and pull-outs are intended primarily for short-term observation, with a short trail to a scenic waterfall near the road. A waste container will be placed at the Indian River pull-out with scheduled waste disposal; no other pull-outs will have waste containers. Off-road vehicle (ORV) use should be prohibited, but minimal enforcement should be necessary, since the natural terrain will greatly limit such use in this zone.

(b) Semi-modern Opportunity Setting (B)

Along the access road between Devil Canyon and Watana dam sites, day-use activities will focus on low-speed, auto-oriented sightseeing, with scenic overlooks and trails to accessible lakes and waterfalls within the area. Pull-outs will provide panoramic views of alpine tundra with clearwater lakes, the Susitna River valley, the Talkeetna Mountains, and the Alaska Range, including Mt. McKinley. To protect this sensitive resource base and to maintain maximum aesthetics, no facilities (except overlooks and trails) are to be placed in this setting. To avoid further conflict and interference with existing private lodge operations at High Lake, this area will not be developed for recreation.

The issue of ORV use must be addressed during both the initial construction phases of the project and after construction. Design considerations and construction activities, as well as leisure activities by construction workers could have significant impacts on the resource base by permitting irreparable damage while creating unplanned patterns of recreational use that, once developed, would be difficult to reverse. The result would be the destruction of the opportunities that the recreation plan and other mitigation plans are designed to protect. Road patrols would monitor the area and a visitor check point, perhaps at Devil Canyon dam, could be established. No overnight use would be permitted along the road.

(c) Semi-primitive Opportunity Setting (C,D)

Day and overnight use would be accommodated by picnic areas, campgrounds, boat launches, and trails. Providing two access points to Devil Canyon reservoir would disperse some of the recreational use of the reservoir. To minimize conflict with non-motorized, day-use of the canyon, upper Cheechako Canyon, above the boat launch area, would be designated as a no-wake zone.

Boat launching, docking, and mooring facilities will need to be designed to accommodate changes in pool level of as much as 15 meters (50 feet) in the Devil Canyon reservoir and 9 meters (30 feet) in the Watana reservoir during the June-September recreation season. At Watana, the maximum drawdown range of 43 meters (140 feet) will also need to be taken into consideration. Daily fluctuations are not expected to be significant. Both Watana and Devil Canyon reservoirs may have hazards caused by wind, wakes from passing boats, the depth and temperature of the water, the steep and unstable reservoir banks, and the fluctuating water levels. For public safety and to encourage boating courtesy, boat patrols will be necessary.

(d) Semi-primitive and Primitive Opportunity Settings (E,F)

Trails and portages from the access road would lead to the more accessible lakes and waterfalls on Devil, Cheechako, and Tsusena creeks. Overnight camping would be permitted and the "pack-in, pack-out" policy enforced. Enforcement will require periodic inspection of the popular camping areas to assess impact, to communicate with visitors, and to insist on compliance.

(e) Opportunity Settings (A-F)

- Interference with the normal operations of the hydroelectric dams and facilities will be alleviated by the design of the

facilities' access and appropriate fencing and signing. Scheduled tours of the dams could be arranged if public interest were sufficient.

- Patrolling of the project area, including the reservoirs, will be necessary for visitor safety and to reduce vandalism of public and private property. Off-road vehicle use will be prohibited and enforcement will be a normal part of the patrolling effort.

- To minimize encounters with bears, visitors will be informed of the rules on the proper handling of food and waste disposal in the project area. Boat-in facilities will offer food caches to store food items, and the "pack-in, pack-out" policy will be enforced. A solid waste management program will also be mandatory.

- Measures to protect cultural resources in the project area will consist of a combination of avoidance and preservation measures implemented throughout the entire planning, development, and operation and maintenance phases. Important cultural features and artifacts should be protected and preserved, since they are an integral segment of the resource base. Mitigation of impacts to cultural resources resulting from recreational activity in the area is discussed in the report on Subtask 7.06, Cultural Resources Investigation (APA 1982).

- Coordination with Bureau of Land Management and private landowners will be necessary. An interagency council should perhaps be established for communicating and coordinating activities, and project area boundaries should be clearly designated to discourage casual trespass onto private lands.

- As recreational use of the area increases, the feasibility of establishing additional services, such as food, lodging, and

minor repair should be investigated to determine if they are warranted by public preference. If warranted and if concession operations are the best approach, such services should be obtained under a tightly controlled concession contract.

- It is important for management purposes that a system for unobtrusively monitoring use patterns be established. One such system could include electronic vehicle counters installed at the entrance to each major site. Such counters would need to be calibrated periodically to ensure accurate interpretation of the data they produce. In addition, periodic assessments for signs of overuse of areas and facilities must be a routine part of the recreation management program.

(f) Conflicts with Cliff-nesting Birds

A potential conflict exists between the protection of cliff-nesting raptors and recreational development at Cheechako Canyon and Deadman Creek. Because of potential disturbance by nearby construction activities, it may be moot to attempt to avoid disturbance by limiting recreational development at these locations. At the least, however, some restrictions on visitor activities close to active nests may be warranted.

TABLE 1: REGIONAL RECREATIONAL FACILITIES

Site Development	Location (a)	Managing Agency	Capacity/ Units	Total Area
WITHIN THE PROJECT AREA				
1 Stephan Lake Lodge	23 km (14 mi) SW of Watana damsite at Stephan Lake	Private	45 people maximum	17 hectares (42 acres)
2 Tsusena Lake Lodge	13 km (8 mi) NW of Watana damsite at Stephan Lake	Private	15 people maximum	20 hectares (49 acres)
3 High Lake Lodge	10 km (6 mi) NE of Devil Canyon damsite at High Lake	Private	15 people maximum	45 hectares (111 acres)
OUTSIDE THE PROJECT AREA				
4 Denali National Park and Preserve	Entrance: Parks Highway, Mile 237.3	National Park Service	228 campsites	2,305,000 hectares (5,696,000 acres)
A Riley Creek Campground				
B Morino Campground				
C Savage River Campground				
D Sanctuary River Campground				
E Teklanika River Campground				
F Igloo Creek Campground				
G Wonder Lake Campground				
5 Denali Planning Block		Bureau of Land Management	33 campsites	1,800,000 hectares (4,500,000 acres)
A Brushkana River Campground	Denali Highway, Mile 105			

a. Locations of facilities outside the project area taken from the 1980 Milepost.

	Site Development	(a) Location	Managing Agency	Capacity/ Units	Total Area
	B Clearwater Creek Campground	Denali Highway, Mile 55.9			
	C Upper Tangle Lakes Campground	Denali Highway, Mile 21.7			
	D Tangle Lakes Campground	Denali Highway, Mile 21.5			
6	Tangle Lakes Archeological District		Bureau of Land Management		186,000 hectares (460,000 acres)
7	Paxson Lake Wayside	Richardson Highway, Mile 179.4	Bureau of Land Management	4 campsites	1.6 hectares (4 acres)
8	Paxson Lake Campground and Boat Launch	Richardson Highway, Mile 175	Bureau of Land Management	20 campsites	16 hectares (40 acres)
9	Sourdough Creek Campground	Richardson Highway, Mile 147.4	Alaska Division of Parks	20 campsites	65 hectares (160 acres)
10	Dry Creek State Recreation Site	Richardson Highway, Mile 117.5	Alaska Division of Parks	58 campsites 4 picnic sites	151 hectares (372 acres)
11	Denali State Park		Alaska Division of Parks	61 campsites 15 picnic sites	170,427 hectares (421,120 acres)
	A Byers Lake	Parks Highway, Mile 147			
12	Willow Creek State Recreation Site	Parks Highway, Mile 71.2	Alaska Division of Parks	17 campsites	97 hectares (240 acres)
13	Nancy Lake State Recreation Site	Parks Highway, Mile 66.5	Alaska Division of Parks	30 campsites 30 picnic sites	14 hectares (36 acres)
14	Nancy Lake State Recreation Area	Parks Highway, Mile 67.2	Alaska Division of Parks	106 campsites	9,181 hectares (22,685 acres)

	Site Development	(a) Location	Managing Agency	Capacity/ Units	Total Area
A	South Rolly Lake Campground	Parks Highway, Mile 67			
15	Rocky Lake State Recreation Site	Parks Highway, Mile 52.3	Alaska Division of Parks	10 campsites	19 hectares (48 acres)
16	Big Lake, East and South, State Recreation Sites	Parks Highway, Mile 52	Alaska Division of Parks	28 campsites 8 picnic sites	14 hectares (35 acres)
17	Houston Campground	Parks Highway, Mile 57.3	Community of Houston	42 campsites	32 hectares (80 acres)
18	Finger Lake State Recreation Site	Bogard Road, Mile 6	Alaska Division of Parks	41 campsites	19 hectares (47 acres)
19	Independence Mine, State Historical Park	Hatcher Pass Road	Alaska Division of Parks	no developed facilities	110 hectares (271 acres)
20	Moose Creek State Recreation Site	Glenn Highway, Mile 54.7	Alaska Division of Parks	8 campsites	16 hectares (40 acres)
21	King Mountain State Recreation Site	Glenn Highway, Mile 76.1	Alaska Division of Parks	22 campsites 2 picnic sites	8 hectares (20 acres)
22	Bonnie Lake State Recreation Site	Glenn Highway, Mile 82.5	Alaska Division of Parks	8 campsites	52 hectares (129 acres)
23	Long Lake State Recreation Site	Glenn Highway, Mile 85	Alaska Division of Parks	8 campsites	194 hectares (480 acres)
24	Matanuska Glacier State Recreation Site	Glenn Highway, Mile 101	Alaska Division of Parks	6 campsites	94 hectares (229 acres)
25	Little Nelchina State Recreation Site	Glenn Highway, Mile 137.4	Alaska Division of Parks	6 campsites	9 hectares (22 acres)
26	Lake Louise State Recreation Area	Glenn Highway, Mile 157	Alaska Division of Parks	6 campsites	35 hectares (90 acres)

	Site Development	(a) Location	Managing Agency	Capacity/ Units	Total Area
27	Tolsona Creek State Recreation Site	Glenn Highway, Mile 172.5	Alaska Division of Parks	5 campsites	243 hectares (600 acres)
28	Mirror Lake State Recreation Site	Glenn Highway, Mile 23.5	Alaska Division of Parks	30 picnic sites	36 hectares (90 acres)
29	Peters Creek State Recreation Site	Glenn Highway, Mile 21	Alaska Division of Parks	32 campsites	21 hectares (52 acres)
30	Chugach State Park		Alaska Division of Parks	100 campsites 74 picnic sites	200,406 hectares (495,204 acres)
	A Eklutna Campground	Glenn Highway, Mile 26.2			
	B Thunderbird Falls Picnic Area	Glenn Highway, Mile 25.5			
	C Eagle River Campground	Glenn Highway, Mile 11.9			
	D Upper Huffman Picnic Area	Upper Huffman Road, Mile 104			
	E McHugh Creek Picnic Area	Seward-Anchorage Highway, Mile 15			
	F Bird Creek Campground	Seward-Anchorage Highway, Mile 25.8			

TABLE 2: RESPONSE TO THE CONCEPT PLAN SURVEY QUESTIONNAIRE

REGION	NO. MAILED	NO. RETURNED UNDELIVERED	NO. OF NO RESPONSES	NO. COMPLETED & RETURNED	
				Number	(%) of Returns
Anchorage	715	191	347	177	32
Fairbanks	715	188	372	155	28
Railbelt	715	101	397	217	40
Total	2145	480	1116	549	100
% of Total	100	22	52	26	

TABLE 3: COMPARISON OF CONCEPT PLAN CHOICE BY REGION AND PREFERENCE

	REGION							
	Anchorage		Fairbanks		Railbelt		Total	%
	Number	%	Number	%	Number	%	Responses	Total
1. Approach indicated as having most value to respondent								
Approach A	34	21	20	15	29	16	83	18
Approach B	34	21	34	25	48	27	116	24
Approach C	24	15	14	11	24	14	62	13
Approach D	22	14	18	13	30	17	70	15
Approach E	47	29	48	36	47	26	142	30
Total	161	100	134	100	178	100	473	100
% of Total Responses		34		28		38		100
2. Approach indicated as having least value to respondent								
Approach A	66	41	70	52	70	39	206	44
Approach B	11	7	2	2	5	3	18	4
Approach C	3	2	0	0	4	2	7	1
Approach D	3	2	4	3	4	2	11	2
Approach E	78	48	58	43	95	54	231	49
Total	161	100	134	100	178	100	473	100
% of Total Responses		34		28		38		100
3. Residency Classification								
Urban	142	86	120	85	12	6	274	55
Rural	19	12	13	9	142	74	174	35
Remote Rural	3	2	3	2	28	15	34	7
Other	2	1	5	4	10	5	17	3
Total	166	100	141	100	192	100	499(a)	100
% of Total Responses		33		28		39		100

a. Does not equal 473 because not all respondents ranked concept plans in order of value to the respondent.

TABLE 4: DESCRIPTION OF OPPORTUNITY SETTINGS

(Keyed to Figure 8)

Recreation Opportunity Setting	Site Numbers	Activity Emphasis	Management Program
Semi-modern	A 1-6	Day-use; auto sightseeing; photography	Pull out and area information sign at Parks Highway intersection. Also a series of scenic pull-outs at Indian River, Susitna River, waterfalls and over look at Susitna canyon. The road will be gravel.
Semi-modern	B 1-8	Day-use; auto sightseeing; photography	A series of scenic overlooks and pull-outs in the alpine zone along the road connecting the two dams. Portages and trailheads to alpine lakes and waterfalls in the area with limited parking areas. No overnight use will be permitted along the road.
Semi-primitive	C 1-4	Day-and overnight use; boating; sightseeing; hiking; at Devil Canyon reservoir	Boat launch, picnic grounds and parking area near Cheechako Creek. Primitive, auto-oriented campground and trail at Cheekchako Creek with no-wake zone management of the canyon to separate motorized and non-motorized boating. At Tsusena Creek there will be a boat launch with parking area and gravel road access. A primitive, auto-oriented picnic ground will be located nearby. Long-term development will provide for a boat-in picnic ground.
Semi-primitive	D 1-4	Day- and overnight-use; boating; sightseeing; hunting; and fishing at Watana reservoir	Gravel road access from Watana dam area to Deadman Cove. A boat launch, campground and parking area are scheduled for Watana reservoir. Long- term development will provide two small, boat-in campgrounds near the shoreline of Watana reservoir.
Semi-primitive	E 1-6	Day- and overnight-use; hiking; canoeing; fishing; photography; hunting	Trails and portages from the road will lead to the more accessible lakes and waterfalls on Devil, Cheechako, and Tsusena creeks. Emphasis will be on dispersed, low-density use with camping permitted and the 'pack-in, pack-out' policy enforced. Primitive portages will not have developed trails. All ORV use will be prohibited.
Primitive	F	Day- and overnight-use; hiking; backpacking; sightseeing; and hunting	Low-density use with camping permitted, no developed trails, no ORV use; 'pack-in, pack-out' policy will be enforced.

TABLE 5: DESCRIPTION OF PROPOSED RECREATION SITES AND FACILITIES

(Keyed to Figures 9 and 10)

Opportunity Setting	Site Number	Site Description
A Semi-modern	1(a)	Pull-out with area information sign
	2(a)	Pull-out and parking area limited to five vehicles, with access to Indian River
	3(a)	Scenic pull-out near the Susitna River
	4(a)	Scenic pull-out, with small parking area limited to five vehicles, and a trail to waterfalls near the road
	5(a)	Scenic pull-out with a project entrance size
	6(a)	Scenic pull-out and parking area with view of Devil Canyon dam and Devil Canyon
B Semi-modern	1(a)	Scenic pull-out and parking area with panoramic view of reservoir and trailhead to observation point
	2(a)	Scenic pull-out and portage trailhead to several alpine lakes; parking area limited to seven vehicles
	3(a)	Scenic pull-out and portage trailhead to Mermaid Lake; parking area limited to five vehicles
	4(a)	Scenic pull-out with parking area and trailhead to Devil Creek Falls; parking area limited to five vehicles
	5(a)	Scenic pull-out overlooking Swimming Bear Lake; parking area limited to two vehicles
	6(a)	Scenic pull-out with panoramic view of the upper Susitna River basin
	7(a)	Scenic pull-out and access to Tsusena Creek; parking area limited to two vehicles
	8(a)	Pull-out and trailhead for short trail to overlook of Tsusena Creek Canyon and Tsusena Falls; parking area limited to seven vehicles
C Semi-primitive	1(a)	Boat launch and picnic grounds with parking area near Cheechako Canyon with trailhead to Cheechako Creek waterfalls
	2(a)	Primitive, auto-oriented campground (100 units, 60 units to be developed for first 3 years) and a secondary trailhead to Cheechako Creek waterfalls

a. Handicapped accessible.

TABLE 6: DAILY TRAFFIC COUNT FOR THE DENALI AND PARKS HIGHWAY

	1973	1974	1975	1976	1977	1978
Denali Highway[a]	36	53	103	66	72	58
Parks Highway [a]	551	588	721	619	739	735
Parks Highway [b]	334	387	516	452	481	468

a. Average daily traffic count, from mid-May to October
b. Annual average daily traffic count

TABLE 5 (Continued)

Opportunity Setting	Site Number	Site Description
	3	Primitive, boat-in picnic ground (10 units, long-term development)
	4(a)	Boat launch, and picnic grounds with parking area at Tsusena Creek and gravel access road
D Semi-primitive	1(a)	Boat launch, and parking area, with primitive auto campground (60 units, 30 units to be developed the first three years) with a gravel road; primary access point for Watana reservoir
	2	Primitive boat-in campground at Watana reservoir (10 units long-term development)
	3	Primitive boat-in campground near Jay Creek (10 units long-term development)
	4	Camping area for Susitna and Tyone River floaters (to be developed in agreement with BLM or the native landowners)
E Semi-primitive	1	Trail to observation point north of Devil Canyon (see B-1)
	2	Developed portage to alpine lakes and primitive portages to more distant lakes (see B-2)
	3	Developed portage to alpine lakes (see B-3)
	4	Developed trail to Devil Creek Falls (see B-4)
	5	Developed trail to Tsusena Creek Falls (see B-7)
	6(a)	Developed trail to Cheechako Creek Falls (see C-1, C-2)
F Primitive		No developed facilities

TABLE 7: VISITOR COUNTS FOR STATE RECREATION AREAS

ADJACENT TO PARKS HIGHWAY

Location	Summer - 1979 (a)	Summer - 1980 (b)
1. Byers Lake Campground	10,238	13,327
2. Denali State Park (excluding Byers Lake Campground)	N.A.(c)	1,337
3. Nancy Lake Recreation Site	10,487	10,035
4. Nancy Lake Recreation Area (excluding Nancy Lake Recreation Site)	8,976	8,179
5. Big Lake - East Recreation Site	15,075	14,776
6. Big Lake - South Recreation Site	17,883	11,887

a. Total for the months of July, August, and September 1979.
b. Total for the months of May, June, July, and September 1980.
c. Not Available.

TABLE 8: CAPITAL IMPROVEMENT COSTS FOR PROPOSED FACILITIES, SHORT-TERM[a]

Opportunity Setting	Site Number	Total Cost[b] Excluding Roadwork	Total Cost[b] Including Roadwork
A	1	$ 1,216	$ 37,291
	2	2,329	48,534
	3	336	36,103
	4	1,779	47,791
	5	1,264	37,356
	6	480	46,038
		$ 7,404	$ 253,113
B	1	$ 564	$ 46,151
	2	886	50,558
	3	886	46,585
	4	336	45,843
	5	336	39,999
	6	336	36,103
	7	336	39,999
	8	886	50,482
		$ 4,566	$ 355,720
C	1	$ 128,705	$ 328,425
	2	1,083,282	1,866,004
	3	-0-	-0-
	4	128,705	328,425
		$1,340,692	$2,522,854
D	1	$ 574,999	$1,117,615
	2-4	-0-	-0-
		$ 574,999	$1,117,615
E	1	$ 23,482	$ 23,482
	2	4,548	4,548
	3	4,548	4,548
	4	31,811	31,811
	5	8,443	8,443
	6	61,742	61,742
		$ 134,574	$ 134,574
Total		$2,062,235	$4,383,876

a. In 1981 dollars.
b. Roadwork includes the cost of roads, pull-outs and all parking areas.

TABLE 9: CAPITAL IMPROVEMENT COSTS[a]
FOR PROPOSED FACILITIES, LONG-TERM

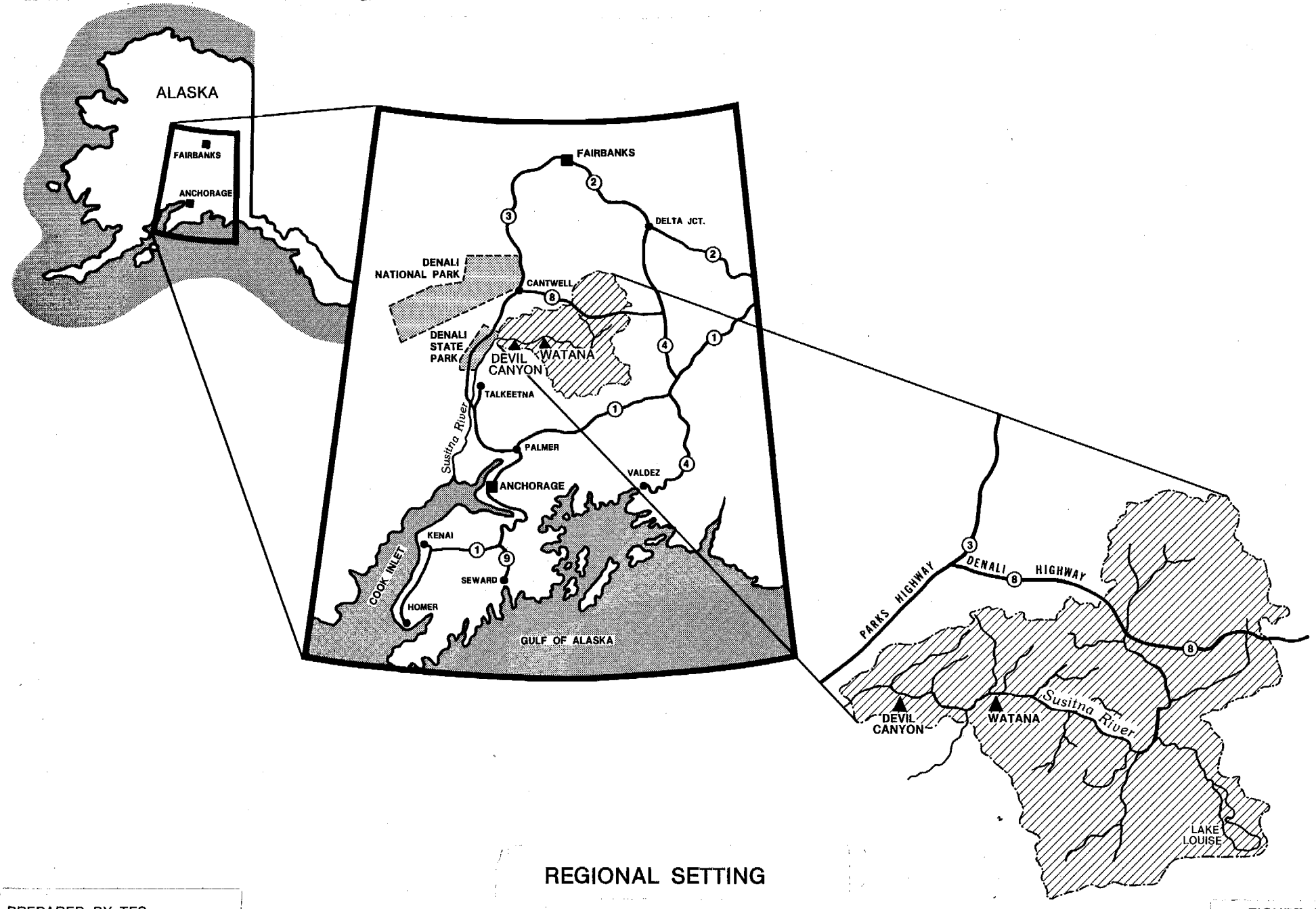
Opportunity Setting	Site Number	Total Cost[b] Excluding Roadwork	Total Cost[b] Including Roadwork
A	1-6	$ -0-	$ -0-
	Subtotal	$ -0-	$ -0-
B	1-8	$ -0-	$ -0-
	Subtotal	$ -0-	$ -0-
C	1	$ -0-	$ -0-
	2	583,748	909,640
	3	50,365	50,365
	4	-0-	-0-
	Subtotal	$ 634,113	$ 960,005
D	1	$ 350,232	$ 638,632
	2	33,120	33,120
	3	33,120	33,120
	4	-0-	-0-
	Subtotal	$ 416,472	$ 704,872
E	1-6	$ -0-	$ -0-
	Subtotal	$ -0-	$ -0-
	Grand Total	$1,050,585	$1,664,877

a. In 1981 dollars.
b. Roadwork includes the cost of roads, pull-outs and all parking areas.

TABLE 10: ESTIMATED ANNUAL OPERATING COST[a]

Items		Projected First Year Operational Cost
1. Personnel		$ 145,140
1 Park Ranger III - permanent, 3 months		
1 Park Ranger II - permanent, 12 months		
1 Park Ranger I - part-time, 6 months		
1 Park Tech. II - permanent, 12 months		
2 Park Tech. I - part-time, 6 months		
1 Main. Worker - part-time, 6 months		
1 Clerk/Typist - part-time, 6 months		
2. Travel Expenditures		7,257
3. Contractual Services		72,570
4. Commodities		12,095
5. Equipment		101,220[b]
Shop Maint. Equip., Tools & Supplies	$19,579	
2 Boats with Equip., Tools & Supplies	38,134	
4 Pick-up Trucks with Equip., Tools & Supplies	34,936	
Office Equip., Tools & Supplies	8,571	
Subtotal		$ 338,282
20% Contingency Factor		67,657
Total		$ 405,939

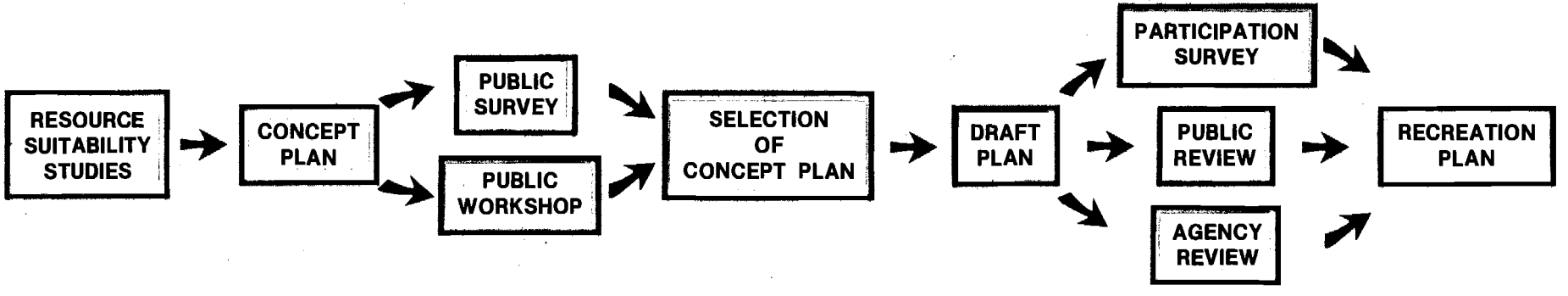
a. In 1981 dollars.
b. Projected equipment costs would be less for successive years and estimated to be $4,838. Total operating cost would be estimated at $241,900 with a 20% contingency factor for a total of $290,280.



REGIONAL SETTING

PREPARED BY TES

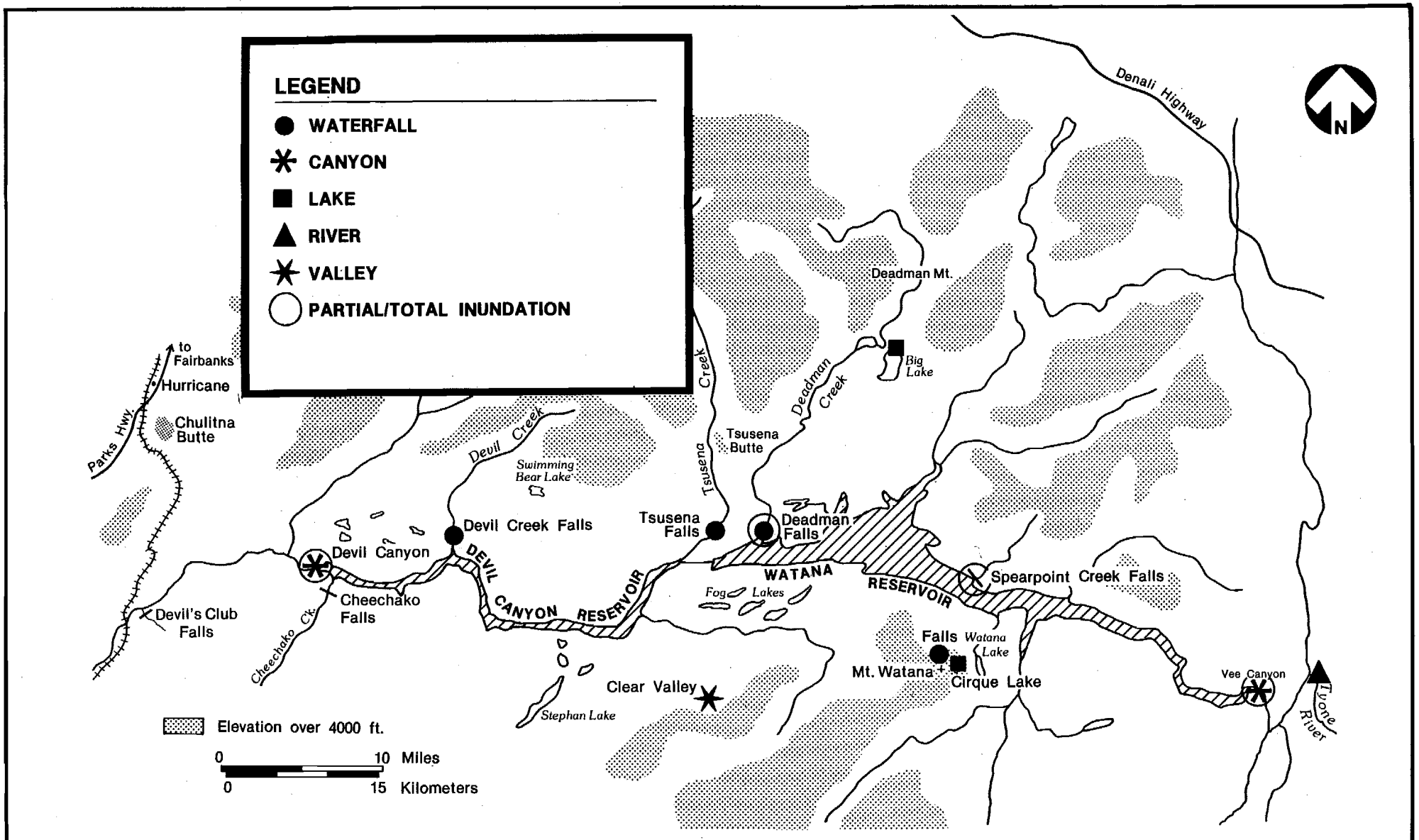
FIGURE 1



THE RECREATION PLANNING PROCESS

PREPARED BY TES

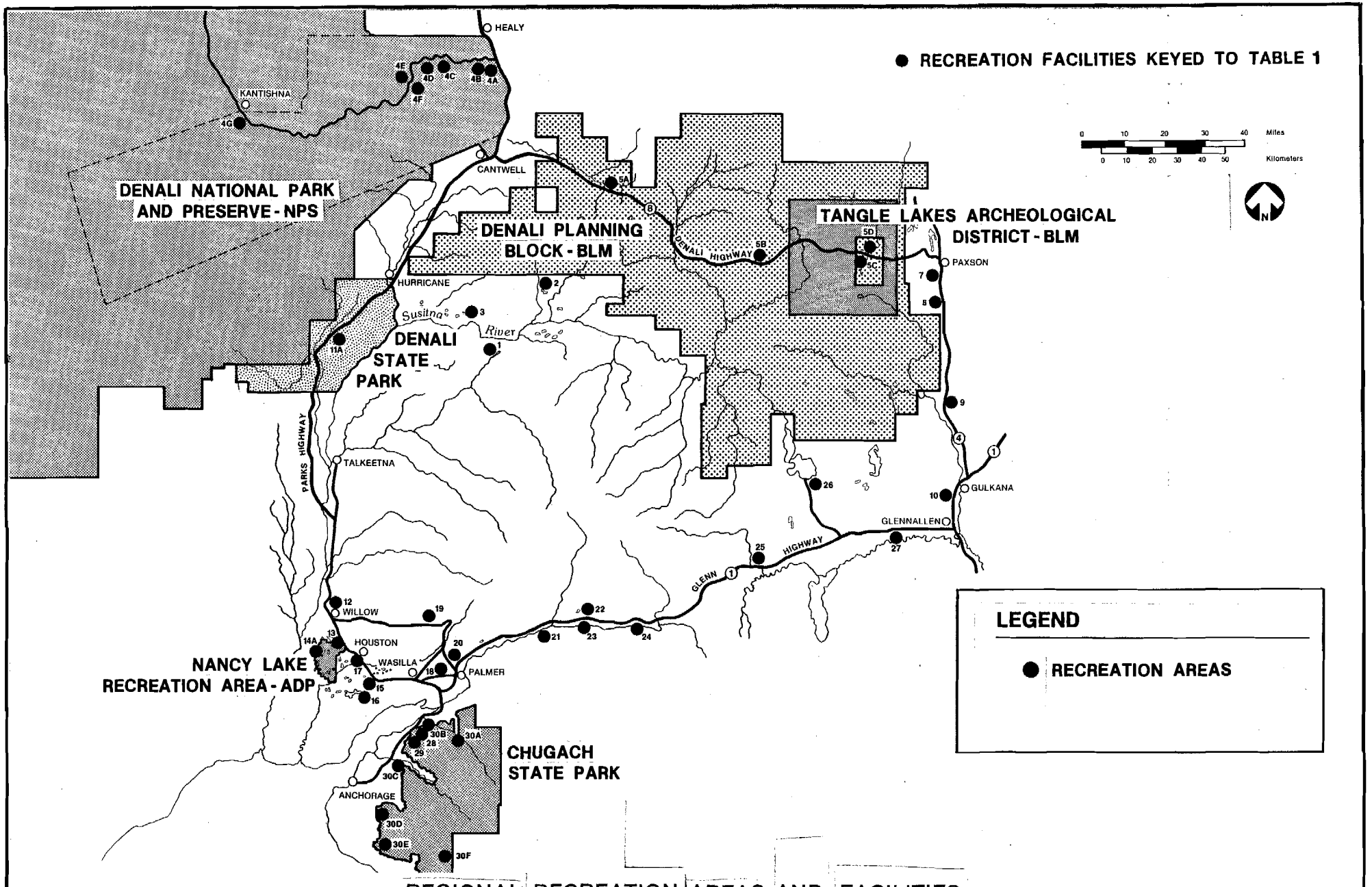
FIGURE 2



EXCEPTIONAL NATURAL FEATURES (SYMBOLS)
AND OTHER IMPORTANT NATURAL FEATURES

PREPARED BY TES / UNIVERSITY OF ALASKA

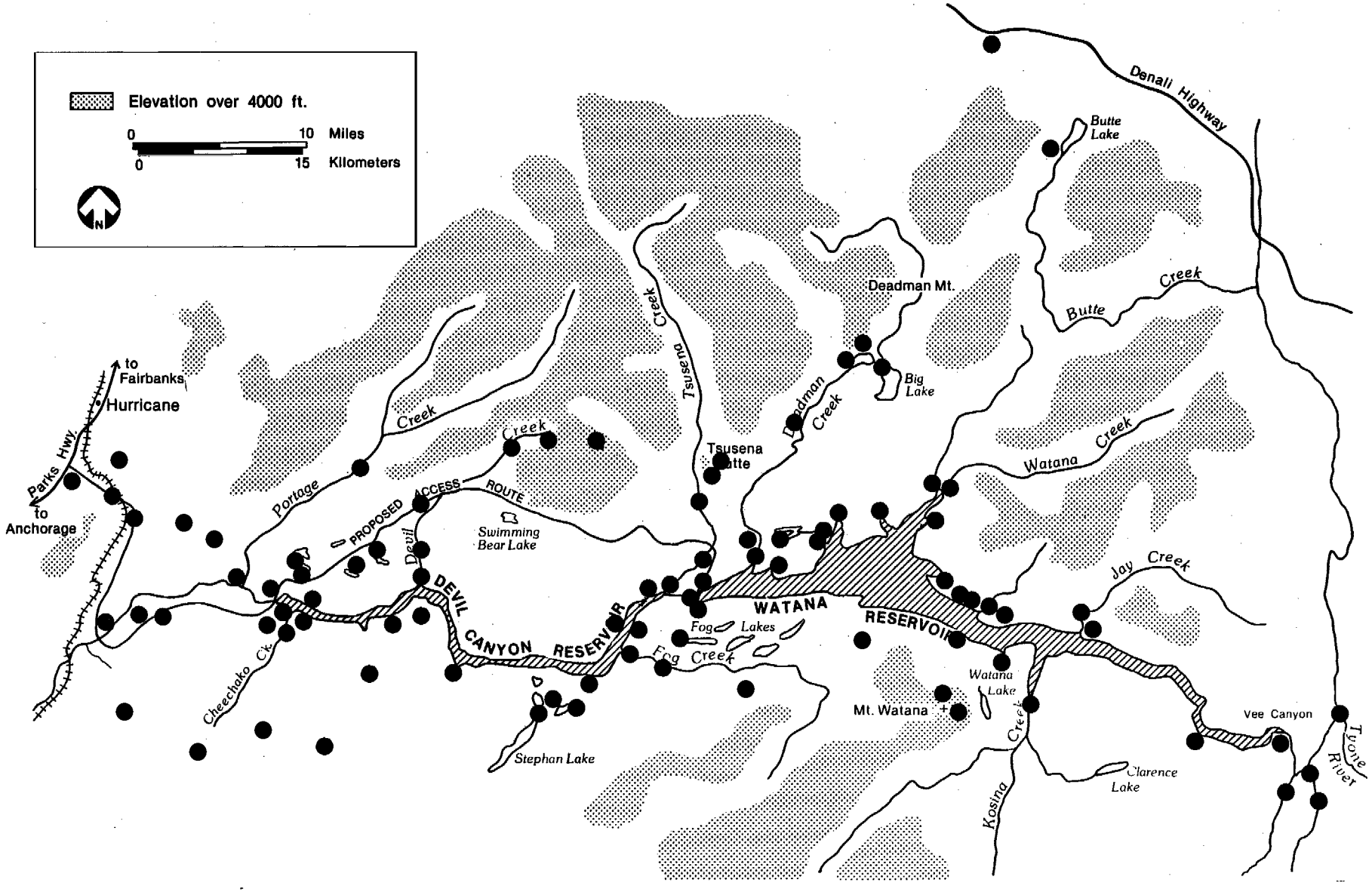
FIGURE 3



REGIONAL RECREATION AREAS AND FACILITIES

PREPARED BY TES

FIGURE 4



RECREATION SITES CONSIDERED

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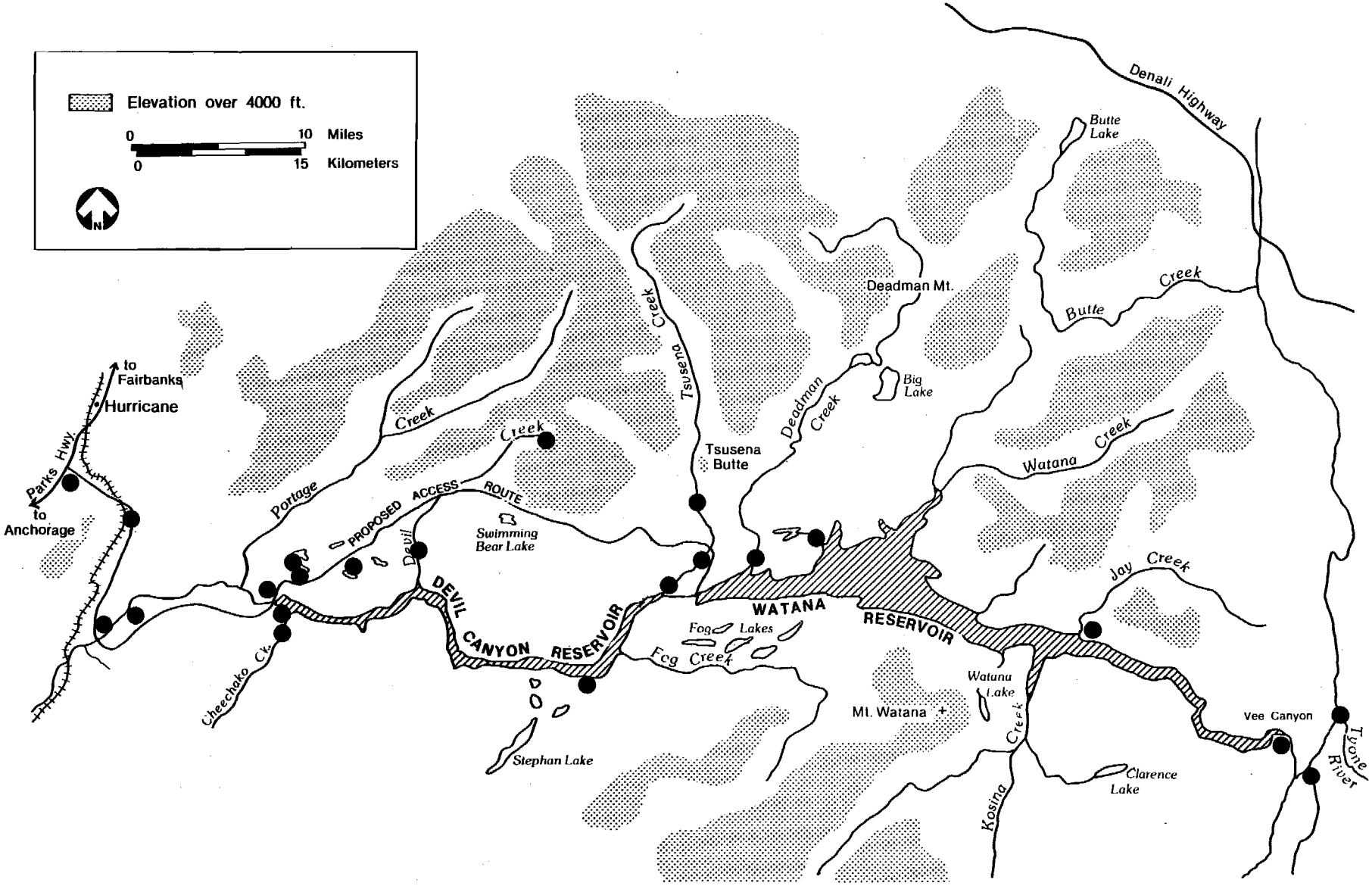
FIGURE 5



SITES SELECTED FOR RECREATION DEVELOPMENTS

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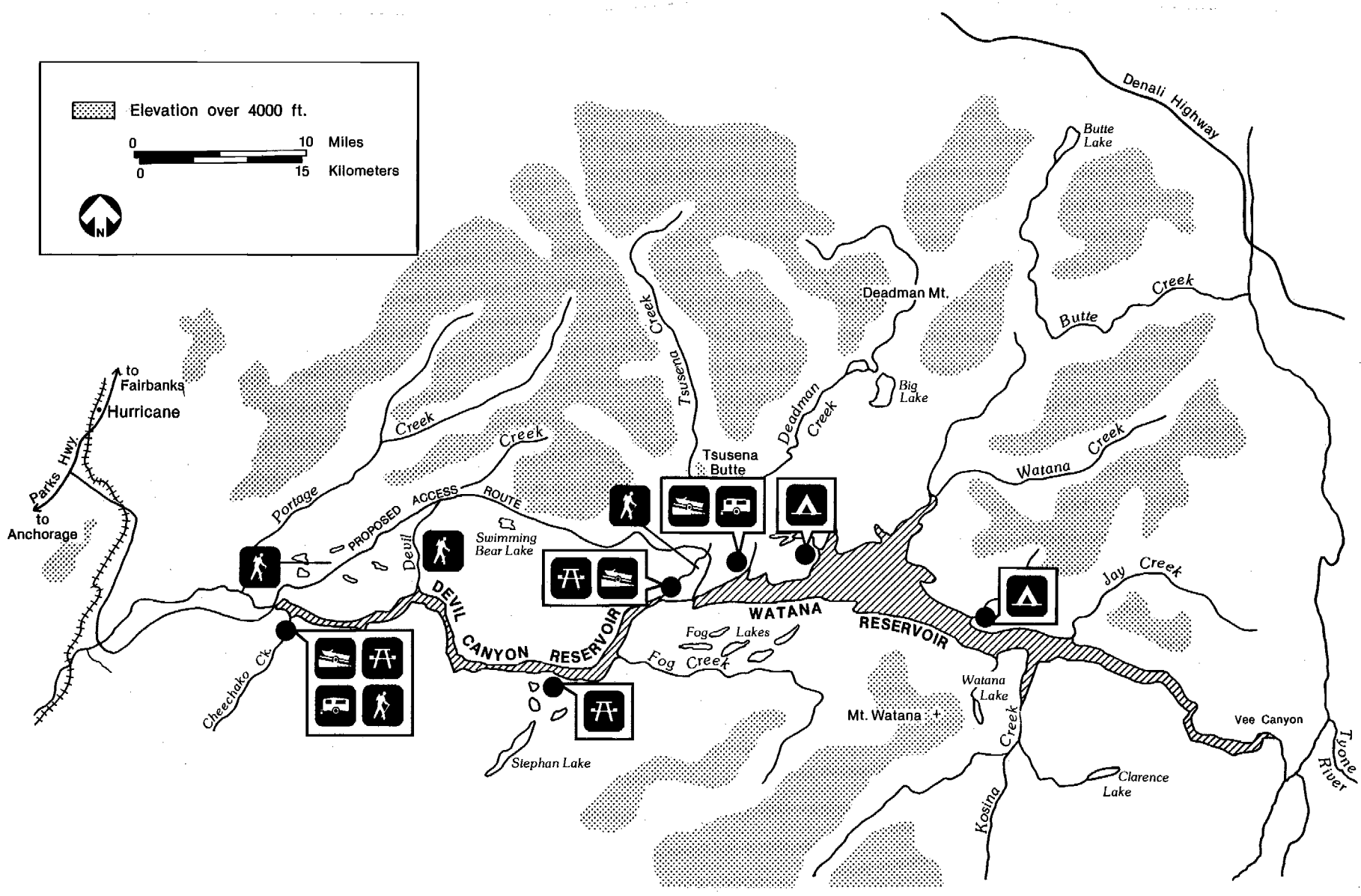
FIGURE 6



PREFERRED CONCEPT PLAN

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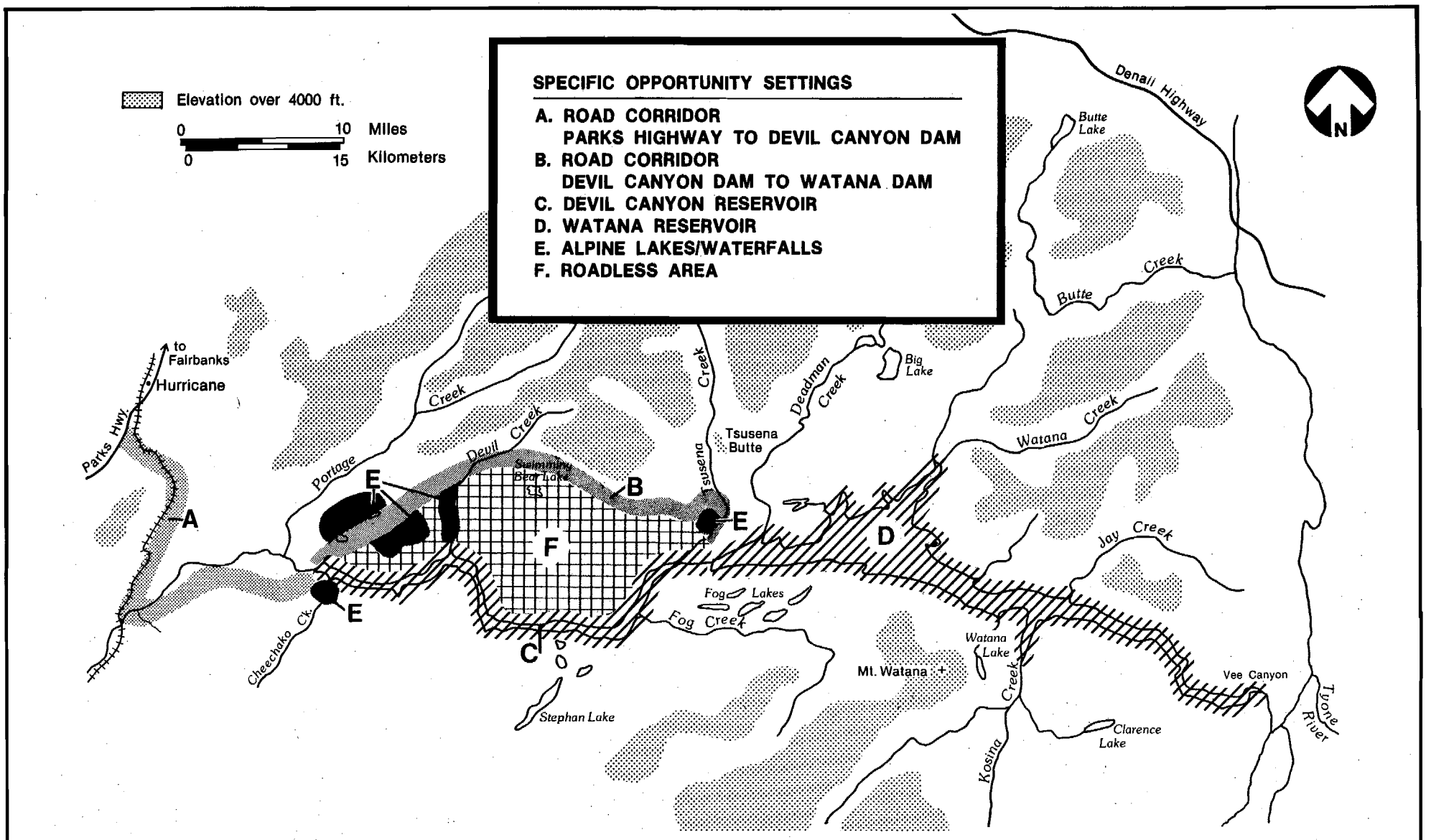
FIGURE 7



RECREATIONAL OPPORTUNITY SETTING FOR THE SUSITNA AREA

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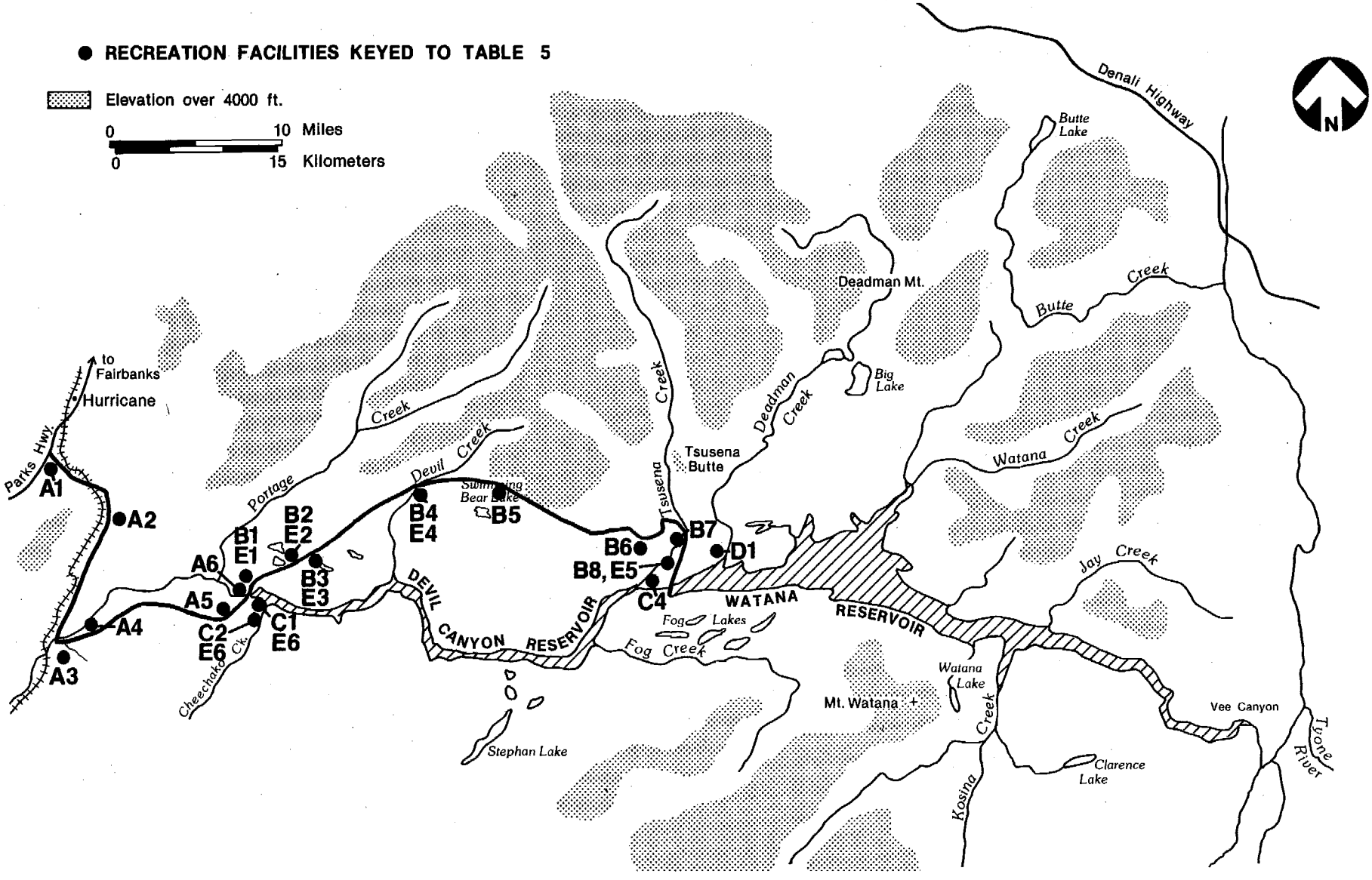
FIGURE 8



RECREATION FACILITIES -- IMMEDIATE DEVELOPMENT

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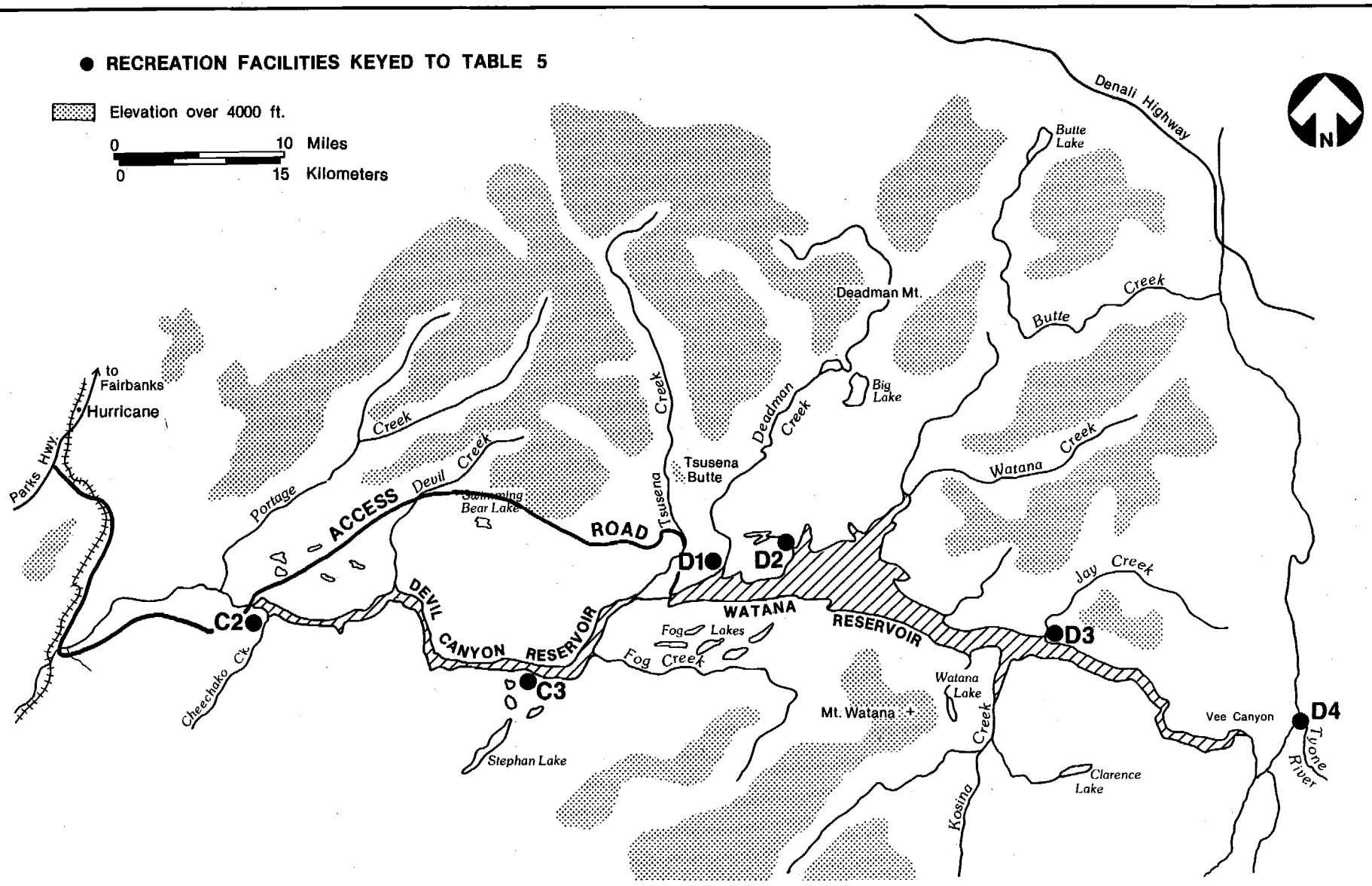
FIGURE 9



RECREATION FACILITIES -- LONG-TERM DEVELOPMENT

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FIGURE 10

REFERENCES

Acres American, Inc. 1980. Susitna Hydroelectric Project Plan of Study. Alaska Power Authority, Anchorage, Alaska.

ADNR. 1980. Alaska State Park Master Plan. Alaska Department of Natural Resources, Division of Parks, Anchorage, Alaska.

ADNR. 1980. Chugach State Park Master Plan. Alaska Department of Natural Resources, Division of Parks, Anchorage, Alaska.

ADNR. 1980. Susitna Basin Land Use/Recreation Atlas. Alaska Department of Natural Resources, Anchorage, Alaska.

ADNR. 1981. Catalog of the Alaska State Park System. Alaska Department of Natural Resources, Division of Parks, Anchorage, Alaska.

ADNR. 1981. Estimated Facility Costs. Alaska Department of Natural Resources, Division of Parks, Anchorage, Alaska.

ADNR. 1981. Tokositna Development Study. Prepared by HKS Associates in Association with D. D. W. L. Engineers for the Alaska Department of Natural Resources, Anchorage, Alaska.

Alaska Department of Transportation and Public Facilities. 1973-1978. Annual Average Daily Traffic--State Route 140000 Denali Highway. Alaska Department of Transportation and Public Facilities, Fairbanks, Alaska.

Alaska Department of Transportation and Public Facilities. 1973-1978. Fixed Recorder Summary, Recorder Number F-03-35. Alaska Department of Transportation and Public Facilities, Fairbanks, Alaska.

APA. 1980. Susitna Hydroelectric Project Environmental Studies Procedures Manual Subtask 7.08: Recreation Planning. Submitted by Terrestrial Environmental Specialists, Inc. and the University of Alaska to Acres American, Inc. for the Alaska Power Authority, Anchorage, Alaska.

APA. 1982. Susitna Hydroelectric Project Environmental Studies Subtask 7.06: Cultural Resources Investigation Phase I Report. Submitted ; by University of Alaska Museum and Terrestrial Environmental Specialists, Inc. to Acres American, Inc. for the Alaska Power Authority, Anchorage, Alaska.

Behan, R.W., and J.J. Gratzer. 1966. Recreation at Libby Reservoir - An International Opportunity for Regional Development. Montana Forest and Conservation Experiment Station.

Brown, P.J., B.L. Driver, and C. McConnell. 1978. Integrated Inventories of Renewable Natural Resources: Proceedings of the Workshop. General Technical Report RM-55. United States Department of Agriculture, Forest Service, Fort Collins, Colorado.

Cantril, H. 1944. Gaging Public Opinion. Princeton University Press, Princeton, New Jersey.

Christiansen, J.L. 1977. Park Planning Handbook. John Wiley and Sons, New York.

Chubb, M., and E.H. Bauman. 1977. Assessing the Recreation Potential of Rivers. Journal of Soil and Water Conservation.

Clark, R. and G.H. Stankey. 1979. Proceedings of the Wildland Recreation Impacts Conference. Seattle, Washington.

Clark, R. and G.H. Stankey. 1979. The Recreation Opportunity Spectrum: A Framework for Planning, Management and Research. General Technical Report PNW-98. United States Department of Agriculture, Forest Service, Washington, D.C.

Daniel, T.C., E.H. Zube and B.L. Driver. 1979. Assessing Amenity Resources Values. General Technical Report RM-68. United States Department of Agriculture, Forest Service, Fort Collins, Colorado.

Federal-State Land Use Planning Commission for Alaska. 1979. Outdoor Recreation in Alaska. Federal-State Land Use Planning Commission, Anchorage, Alaska.

Federal-State Land Use Planning Commission for Alaska. 1979. Outdoor Recreation in Alaska: An Examination of Governmental Roles - Commission Study No. 36. Federal-State Land Use Planning Commission, Anchorage, Alaska.

Fogg, C.E. 1975. Park Planning Guidelines. National Recreation and Park Association. Special Publication Series No. 15001.

Gatto, L.W., C.J. Merry, H.L. McKim and D.E. Larson. 1980. Environmental Analysis of the Upper Susitna River Basin Using Landsat Imagery. CRREL Report 80-4. Hanover, New Hampshire.

Hamill, L. 1975. Analysis of Leopold's Comparisons of Landscape Esthetics. Journal of Leisure Research.

Henning, G., Editor. 1980. The Milepost. Alaska Northwest Publishing Company, Anchorage, Alaska.

Johnson, L. 1976. Off-Road Vehicle Use and Its Impact on Soils and Vegetation on Bureau of Land Management Lands Along the Denali Highway, Alaska: A Report on the 1975 Outdoor Recreation Survey. Agricultural Experiment Station, University of Alaska, Fairbanks, Alaska.

Jones & Jones. 1975. An Inventory and Evaluation of the Environmental, Aesthetic and Recreational Resources of the Upper Susitna River, Alaska. United States Army Corps of Engineers, Anchorage, Alaska.

Jubenville, A. 1981. Role Segregation: A Conceptual Framework for Recreation Management Research. Recreation Research Review, Volume 9, No. 1.

Leopold, L.B. 1969. Quantitative Comparison of Some Aesthetic Factors Among Rivers. Geologic Survey Circular No. 620. Washington, D.C.

Lynch, K. 1971. Site Planning. The Massachusetts Institute of Technology Press, Cambridge, Massachusetts.

Marsh, W.M. 1978. Environmental Analysis for Land Use and Site Planning. McGraw-Hill Book Company, New York.

Pewe, T.L. 1975. Quarternary Geology of Alaska. Geological Survey Professional Paper No. 835. U.S. Government Printing Office, Washington, D.C.

Sparrow, S.D., F.J. Wooding and E.H. Whiting. 1978. Effects of Off-Road Vehicle Traffic on Soils and Vegetation in the Denali Highway Region of Alaska. Journal of Soil and Water Conservation, Volume 33, No. 1.

Spurr, S.H. 1960. Photogrammetry and Photo-Interpretation. The Ronald Press Company, New York.

Tatsuoka, M.M. 1971. Multivariate Analyses. John Wiley and Sons, New York.

USACOE. 1975. South Central Railbelt Area, Alaska, Upper Susitna River Basin Interim Feasibility Report Appendix 1, Parts 1 and 2. United States Army Corps of Engineers, Anchorage, Alaska.

USDA (FS). 1974. Guide to Public Involvement in Decision Making. United States Department of Agriculture, Forest Service, Washington, D.C.

USDA (FS). 1978. The Forest Ecosystem of Southeast Alaska, Outdoor Recreation and Scenic Resources. General Technical Report PNW-66. United States Department of Agriculture, Forest Service, Portland, Oregon.

USDA (FS). 1980. RIM Cost Figures for Selected Facilities. United States Department of Agriculture, Forest Service, Washington, D.C.

USDA (FS). 1981. Chugach Cost Data Guide for Engineering and Road Construction. United States Department of Agriculture, Forest Service, Chugach National Forest, Anchorage, Alaska.

USDA (SCS). 1979. Alaska Rivers Cooperative Study, Beluga and Upper Susitna Sub-Basins. Plan of Work, Addendum. United States Department of Agriculture, Soil Conservation Service, Anchorage, Alaska.

USDA (SCS). 1979. Exploratory Soil Survey of Alaska. United States Department of Agriculture, Soil Conservation Service, Anchorage, Alaska.

USDI (BLM). 1980. BLM Land Use Plan for Southcentral Alaska: A Summary. United States Department of the Interior, Bureau of Land Management, Anchorage, Alaska.

USDI. Bureau of Reclamation. 1952. Susitna River Basin. United States Department of the Interior, Bureau of Reclamation, Anchorage, Alaska.

USDI (FWS). 1978. Reservoir Ecosystems and Western Coal Development in the Upper Missouri River Basin. United States Department of the Interior, Fish and Wildlife Service, Fort Collins, Colorado.

USDI (NPS). 1980. Bighorn Canyon. United States Department of the Interior, National Park Service, Denver, Colorado.

USDI (HCRS). 1980. A Proposal for Protection of Eleven Alaskan Rivers. United States Department of the Interior, Heritage Conservation and Recreation Service, Washington, D.C.

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  Division of Habitat Protection
    - Phil Brna: Habitat Biologist II
    - Joe Sautner: Biologist
    - Carl Yanagawa: Regional Supervisor
  Division of Sport Fisheries
    - Michael Mills: Senior Fisheries Biometrician III
    - Thomas Trent: Regional Supervisor, Susitna Aquatic Studies Coordinator, Vice-Chairman of Susitna Steering Committee

Alaska Department of Natural Resources
    - Robert LeResche: Commissioner
  Division of Forest, Land and Water Management
    - Ted Smith: Director
    - Frank Mielke: Chief of Land Management
    - Jim Fichione: Land Management Officer
    - Michael Franger: Special Projects Officer
    - Mary Lou Harle: Water Management Officer
    - Joe Joiner: Land Management Officer
    - Raymond Mann: Land Management Officer II
    - Debbie Robertson: Land Management Officer II
  Division of Geological and Geophysical Survey
    - Roy Merritt: Geologist
  Division of Minerals and Energy
    - Glen Harrison: Director
  Division of Parks
    - Jack Wiles: Chief
    - Ronald Crenshaw: State Park Planner
    - Liza Holzapple: Park Planner
    - Pete Marten: Park Planner II
    - Al Miner: Student Intern
    - Doug Reger: State Archeologist
    - Sandy Robinowitz: Park Planner
    - Robert Shaw: State Historic Preservation Officer
    - Larry Snarsky: District Manager
    - Vicky Sung: Regional Planner/Landscape Architect
    - Larry Wilde: District Manager
  District of Research and Development
    - Linda Arndt: Land Management Officer
    - William Beatty: Planning Supervisor, Land Resources
    - Christopher Beck: Planner III
    - Al Carson: Deputy Director

- Randy Cowart: Planner V
- Ronald Swanson: Land Management Officer, Policy Research Land Entitlement Unit

Division of Transportation and Public Facilities
- John Miller

Alaska Department of Public Safety
Division of Fish and Wildlife Protection
- Col. Robert Stickles: Director
- Wayne Fleek: Region III Commander
- Lt. Rod Mills: Administrative Officer
- Lt. Col. Tetzlaff: Deputy Director

Alaska Department of Transportation
- Jay Bergstrand: Transportation Planner IV
- Cathy Derickson: Transportation Planner
- Reed Gibby: Transportation Planner

Office of the Governor
Division of Policy Development and Planning
- Frances Ulmer: Director
- David Allison: Policy and Planning Specialist

University of Alaska
Arctic Environmental Information and Data Center
- Chuck Evans: Research Associate Wildlife Biologist
- William Wilson: Fisheries Biologist

Local Agencies

City of Houston, Alaska
- Elsie O'Brien: City Clerk

City of Palmer
- David Soulak: City Manager

Fairbanks North Star Borough
- Paula Twelker: Planner II

Mantuska-Susitna Borough
Borough Office
- Rick Feller: Planner
- Rodney Schulling: Planning Director
- Lee Wyatt: Acting Borough Manager, Planning Director

Other Institutions, Organizations and Individuals

Ahtna, Incorporated
- Robert Goldberg: Attorney
- Douglas MacArthur: Special Projects Director

Bob's Service Unlimited
  - Bob Brown: Owner
Chickaloon Village
  - Jess Landsman: President
Cook Inlet Region, Incorporated
  - Agnes Brown: Executive
  - Lynda Hays: Shareholder and Community Relations Coordinator
  - Robert Rude: Senior Vice-President
  - Roland Shanks: Manager of Land Administration
  - John Youngblood: Executive Director
Fairbanks Environmental Center
  - Jeff Weltzin: Energy Coordinator
Keual Village
  - James Shoalwolfer: President
Knikatnu Incorporated
  - Paul Theadore: Chief
Knik Canoers and Kayakers
  - Bruce Stanford: Member
Land Field Services, Incorporated
  - P. J. Sullivan: Representative
Ninilchik Native Association, Incorporated
  - Arnold Orhdhoff: President
Ninilchik Village
  - Arnold Orhdhoff: Chief
Norsk Hydro, Sweden
  - Iver Hagen: Public Relations
Salamatoff Native Association, Incorporated
  - Andy Johnson: President
Seldovia Native Assocation, Incorporated
  - James Segura: Chief
Susitna Power Now
  - E. Dischner: Executive Director
Tyonek Native Corporation
  - Agnes Brown: President

Appendix A

Extent and Limitations of Principal Soil Associations Present in the Upper Susitna Basin

EXTENT AND LIMITATIONS OF PRINCIPAL SOIL ASSOCIATIONS PRESENT IN UPPER SUSITNA BASIN

Soil Association	General Location	Limitations (a)			
		roads	buildings	recreation (b)	off-road use
INCEPTISOLS					
Histic Pergelic Cryaquepts, clayey nearly level to rolling	Copper River Lowland; west to Goose Creek, north to Denali along Susitna River	very severe: wet soils, permafrost	very severe: wet soils, permafrost	severe: wet soils	severe: wet soils
Histic Pergelic Cryaquepts, loamy nearly level to rolling	Widespread in lowlands of northern and eastern Susitna Basin	very severe: wet soils permafrost	very severe: wet soils permafrost	severe: wet soils	severe: wet soils
Histic Pergelic Cryaquepts, gravelly, nearly level to rolling	Low-lying areas of central Fog Lakes Upland, Stephan Lake NE to upper Tsusena, Deadman and Watana Creeks	severe: wet soils, permafrost	severe: wet soils, permafrost	severe: wet soils	severe: wet soils
Histic Pergelic Cryaquepts, gravelly, hilly to steep	Higher elevations of Clarence Lake Upland	severe: wet soils, steep slopes	severe: wet soils, steep slopes	severe: wet soils, steep slopes	severe: wet soils, steep slopes
Pergelic Cryumbrepts, gravelly hilly to steep	Higher elevations throughout Fog Lakes and Clarence Lake Uplands	severe: steep slopes	severe: steep slopes	severe: steep slopes	severe: steep slopes
SPODOSOLS					
Humic Cryorthods, gravelly, hilly to steep	Terraces and uplands of Devil Canyon area; west of longitude 149°W	severe: steep slopes	severe: steep slopes	severe: steep slopes	severe: steep slopes
Pergelic Cryorthods, gravelly, nearly level to rolling	Well-drained areas of central Fog Lakes Upland, Stephan Lake NE to upper Tsusena, Deadman and Watana Creeks	moderate: permafrost	moderate: permafrost	moderate: stony	slight
Pergelic Cryorthods, gravelly, hilly to steep	Widespread on uplands of northern and eastern Susitna Basin	severe: steep slopes	severe: steep slopes	severe: steep slopes	severe: steep slopes
OTHER					
Rough Mountainous Land	Extensive above 4,000 feet elevation throughout Talkeetna Mountains	very severe: steep slopes	very severe: steep slopes	very severe: steep slopes	very severe: steep slopes

a. Limitation Ratings: Slight - soil limitations, if any, are easily overcome; Moderate - soil limitations need to be recognized, but can be overcome; Severe - soil limitations difficult to overcome; Very Severe-soil limitations too severe to overcome.
b. Recreational uses requiring site development.
SOURCE: USDA 1979

Appendix B

Field Data Forms

Site _____ Date _____

Location _____

Area _____ Elevation _____ Slope _____ Aspect _____

Exposure: Exposed Moderate Sheltered

Distance to Water Supply _____ Water Source _____

Distance to Reservoir Shoreline _____

Scenic or Unique Natural Features: yes no

Describe _____

_____

Distance _____ Direction _____

Evidence of Prior Human Use: yes no

Describe _____

Access to Fishing? yes no

Access to Hunting? yes no Species _____

Moose Browse (proportion of available browse):

0-25% 26-50% 51-75% 76-100%

Other Animal Sign _____

Potential Hazards: yes no

Describe _____

_____

Remarks _____

_____

Site _____ Date _____

Vegetation Type _____

_____

_____

_____

Species of Interest _____

_____

Suitability for Recreational Use: good fair poor

Soil Depth: organic _____ mineral _____

Mineral Soil Texture _____

Stoniness: Abundance _____ angular rounded

Size Range (proportions) _____

Soil Frost Features: yes no

Type _____

Extent _____

Drainage: xeric dry mesic mesic wet mesic hydric

Erosion Potential: high moderate low

Exposed Bedrock: yes no Extent _____

Other Soil Features _____

_____

_____

(Add map designating features, photo points)

Appendix C

Recreation Concept Plan Survey

Questionnaire

UNIVERSITY OF ALASKA, FAIRBANKS
Fairbanks, Alaska 99701
School of Agriculture and Land Resources Management
Agricultural Experiment Station

October 30, 1980

Dear Questionnaire Recipient:

The University of Alaska is preparing a tentative recreation plan for the proposed Susitna River hydroelectric project. This plan is one phase of a preliminary investigation of various aspects of the Susitna proposal that is being carried out for the Alaska Power Authority. No decision has been reached on the feasibility of the power project but, if it proceeds, we intend to develop the best possible plan for public recreational use of the project's lands and waters. We need your suggestions during the investigative process if our plan is to properly reflect the interests and desires of all potential users of the area. Please will you assist by completing the enclosed questionnaire?

The goal of this questionnaire is to determine how you would like the project area to be developed for recreation. Each part of the form has its own instructions. Please begin by reviewing the introductory information and accompanying map. Then go on to carefully consider the merits of each of the 5 proposed approaches to recreation development and the possible access routes that have been suggested. Evaluate each of these possible approaches and routes according to your own interests remembering that none of the approaches are tied to a specific access route.

We think you will find the experience of answering this questionnaire to be quite interesting since it provides an opportunity for you to make a direct contribution to planning a potentially new state recreation area. If you wish to comment on any topic not covered by the form, write your suggestions on a separate sheet of paper and return them with the completed questionnaire in the enclosed stamped, self-addressed envelope. Your answers will be considered completely confidential and will only be used to produce totals and averages. Thank you for your cooperation.

Sincerely,

J. K. Feyhl

J. K. Feyhl
Project Coordinator

JKF:ks

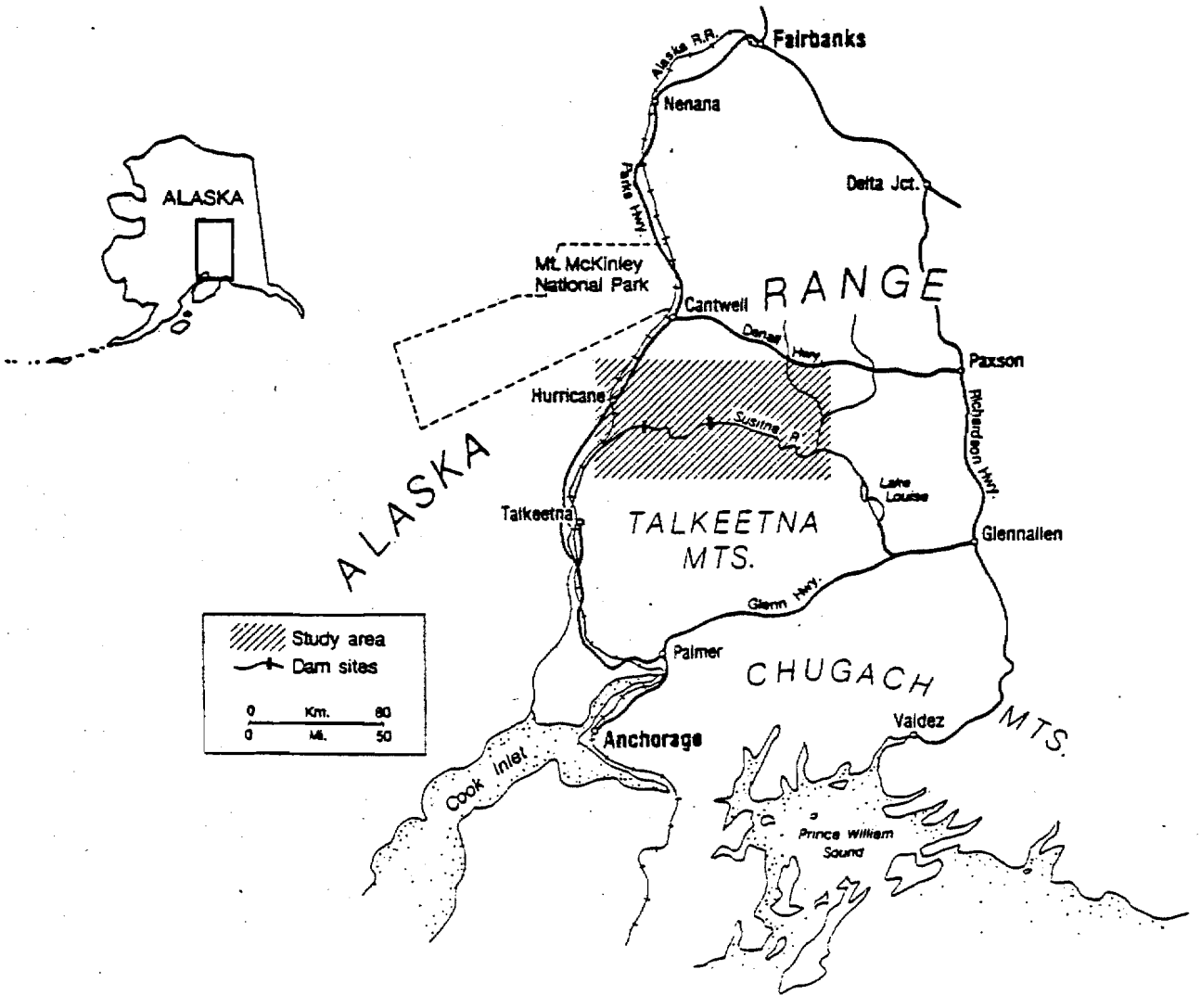
PART I—BACKGROUND INFORMATION ON PROPOSED SUSITNA HYDROELECTRIC PROJECT

1. Location: The proposed Susitna River hydroelectric project is located on the upper Susitna River, approximately 125 air miles northeast of Anchorage and 150 miles southwest of Fairbanks as shown on the map below.

2. Dams: Two dams are being considered for the Susitna River; a 635-foot-high concrete dam in Devil Canyon and a 810-foot-high earth-filled dam between Tsusena and Deadman Creeks (hereinafter referred to as the Watana dam). Of the alternatives being considered, it is possible that this scheme or some modification of this scheme would be recommended. A preliminary plan of recreational use of the projects land and water will be based upon this scheme with the understanding that modification will occur depending upon the outcome of other phases of the Susitna study.

3. Reservoirs: If built, these dams would create two reservoirs, the Devils Canyon reservoir being approximately 30 miles in length and no more than ½ mile in width, covering an area of approximately 6500 acres to a maximum depth of 650 feet. The Watana reservoir being approximately 50 miles long and range from ½ mile to 5 miles wide, covering an area of approximately 55,000 acres to a maximum depth of 800 feet.

4. Present Land Use: The project area is presently used by trappers, white water enthusiasts and guided hunters. Scattered private cabins are present on most of the larger lakes in the upper Susitna basin. In addition, mining claims have been filed on many of the tributary streams within the drainage. Access to the area is presently limited largely to aircraft, although there is access by river from the east. Because of the hazardous nature of much of the Susitna River within the project area, it receives relatively light use by boats, canoes, and other watercraft.



PART II—POSSIBLE RECREATION DEVELOPMENT APPROACHES

Please review the five possible development approaches described on the pages that follow and indicate the acceptability of each approach independently. If you feel some modifications can improve the acceptability of an approach, include your suggestions in the space provided. The key given below explains the type of development represented by the various symbols used on each of the maps.

(1)  Visitor Center: services would probably include information, natural history and resources interpretive displays, tour schedules, gift shop/bookstore, restrooms, and a parking area all designed and operated to meet the needs of the majority of visitors. The most strategic location for a visitor center would be along the Parks Highway.

(2)  Information: interpretive displays and oral and written information concerning facilities and services available to the public in sheltered locations.

(3)  Picnic Area: would likely include picnic tables, a picnic shelter, a drinking water source, restrooms, and a parking area.

(4)  Campground (Primitive/Boat-in): these sites would be relatively small and include 5-10 campsites spread over an area of 2 to 3 acres. Facilities available would probably be: picnic tables, pit toilets, bear-proof food caches, and boat tie-ups where necessary.

(5)  Campground (Developed): improved campsites consisting of parking spurs for vehicles, trailers and motor homes, picnic tables, fireplaces, and complete water and sanitary facilities.

(6)  Campground (Group): organizational campground that could be either developed or primitive depending on location. Developed group facilities would include tent sites, tables, fireplaces, campfire circle, parking, restrooms, water supply and cooking shelters. Minimal facilities would be available at the primitive, backcountry group campgrounds.

(7)  Boat Ramp: a concrete boat ramp providing accesss to a reservoir; including parking for vehicles and boat trailers.

(8)  Docking/Marina: simple docking facilities providing mooring and docking space. A developed marina would also offer parking and docking space for boats and storage of vehicles and boat trailers, on-shore restrooms, water and electric services, boat sanitary dump station, and boat fuel, as well as rentals and supplies. Developed marinas would probably be constructed only at major developments near the damsites.

(9)  Store: groceries, dry goods, and souvenirs.

(10)  Service Station: full service for all types of recreation area users' vehicles.

(11)  Lodging: complete overnight accommodations.

(12)  Food Service: restaurants and other food outlets that may or may not be associated with lodging facilities.

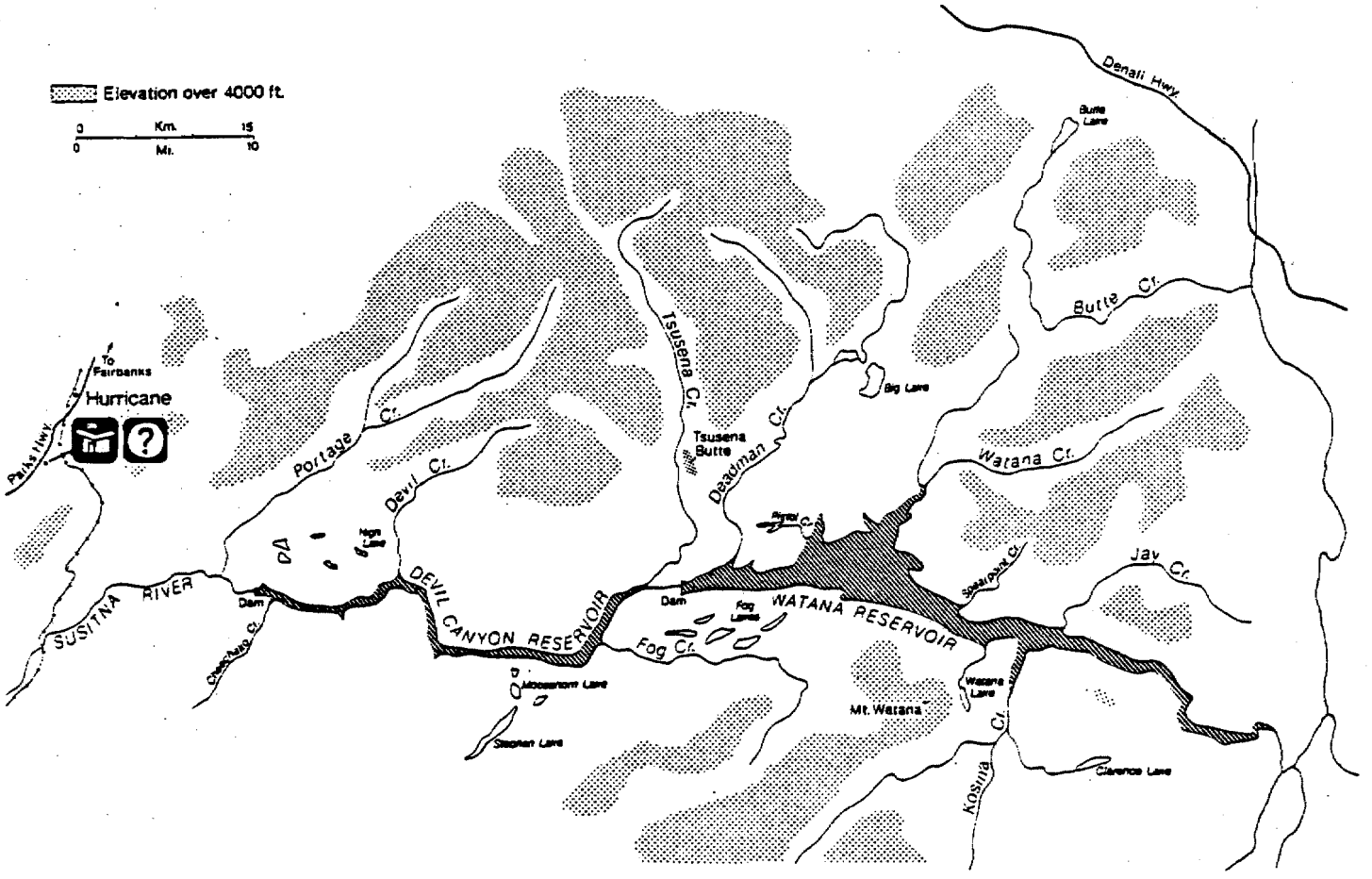
(13)  Float Plane Access: suitable access, shelter, mooring and aviation fuel supplies provided at areas used heavily by aircraft.

(14)  Guided Boat Tour: would probably be tied in with a bus tour originating at a visitor center or overnight accommodations complex. It might include a one-day tour of the Devil Canyon Reservoir.

(15)  Scenic Trail: short, (one or two mile) day-use trails to scenic areas or interesting natural features.

APPROACH "A"—A MINIMALLY DEVELOPED AND MANAGED WILDERNESS

This approach could be used in the event that public access by road to the Susitna reservoir areas is restricted or not permitted at all. In this case, development will probably be limited to a visitor information center on the Parks Highway. Access by float plane would likely be extended to include the reservoirs. Access by canoe, kayak, and riverboat via the upper Susitna, Maclaren, and Tyone rivers would continue. Land use within the project area would probably be much the same as at present with management limited to fish and game management and the regulation of mining activities.



QUESTIONS:

1. Do you find this plan to be (check only one).
   - ☐ Not acceptable?
   - ☐ Acceptable?
   - ☐ Acceptable with modifications?

2. If any modifications (additions or deletions) are suggested, mark the location with an "X" and briefly describe the proposed modifications below:

   Deletions _____

   _____

   Additions _____

   _____

OFFICE USE ONLY

[ ] 1—4

[ ] 5—10

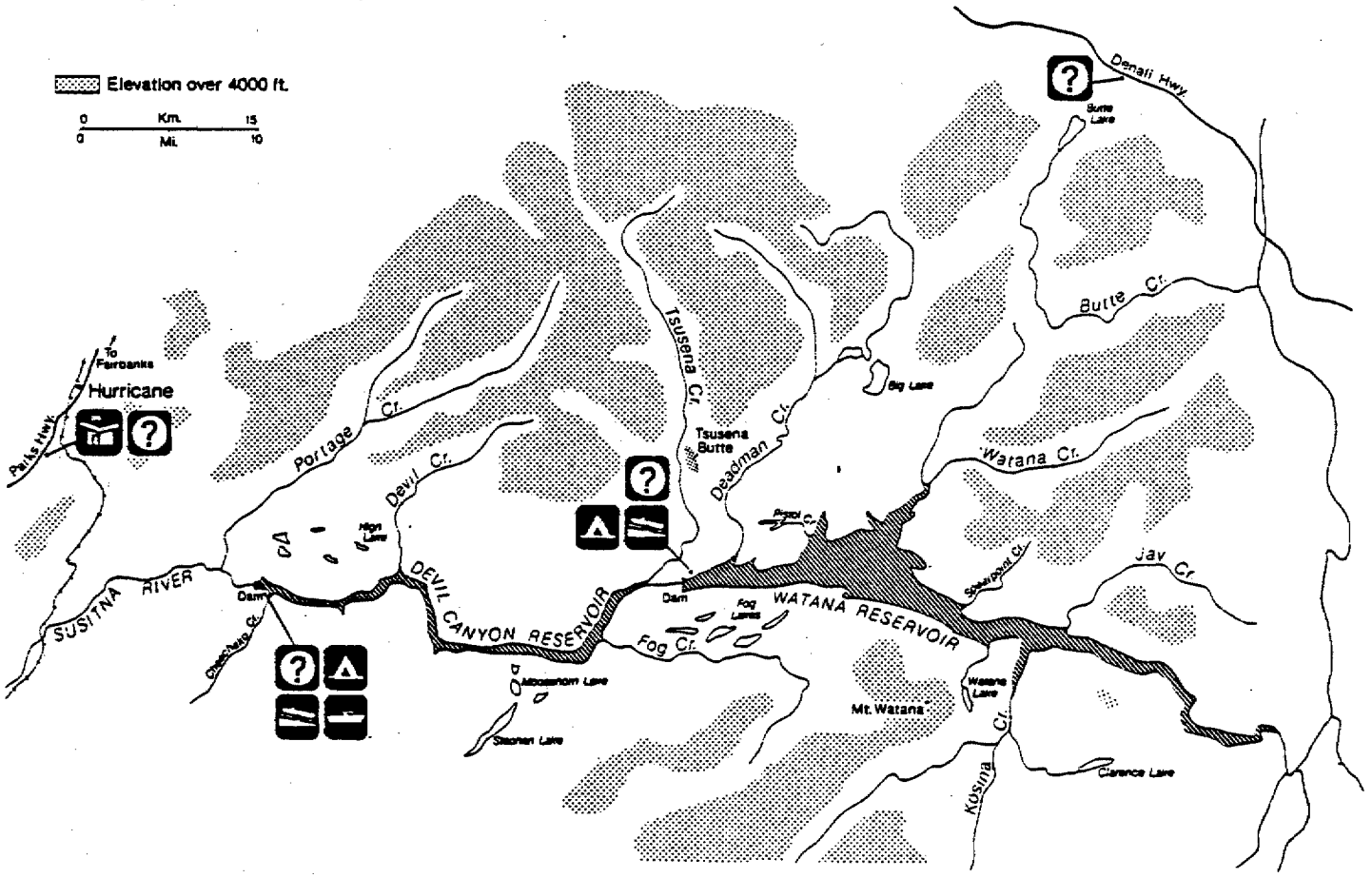
[ ] 11

[ ] 12, 13

[ ] 14, 15

APPROACH "B"—MANAGED WILDERNESS WITH LIMITED ACCESS

In the event that road access to both reservoirs is possible, the area could be managed as a wilderness recreation area, with development limited to minimal interpretive services, primitive campgrounds, and simple boat ramps at both damsites. These ramps would facilitate access by boat to the reservoir shorelines and adjacent areas for camping, hunting, fishing, and other backcountry activities. As in Approach "A", a visitor center would be built on the Parks Highway. Information would be provided on the Denali Highway should access be available at this location (see access map). A tour boat service would be offered at the Devil Canyon damsite for day tours of the reservoir.



QUESTIONS:

1. Do you find this plan to be (check only one).
   - ☐ Not acceptable?
   - ☐ Acceptable?
   - ☐ Acceptable with modifications?

2. If any modifications (additions or deletions) are suggested, mark the location with an "X" and briefly describe the proposed modifications below:

   Deletions _____

   _____

   Additions _____

   _____

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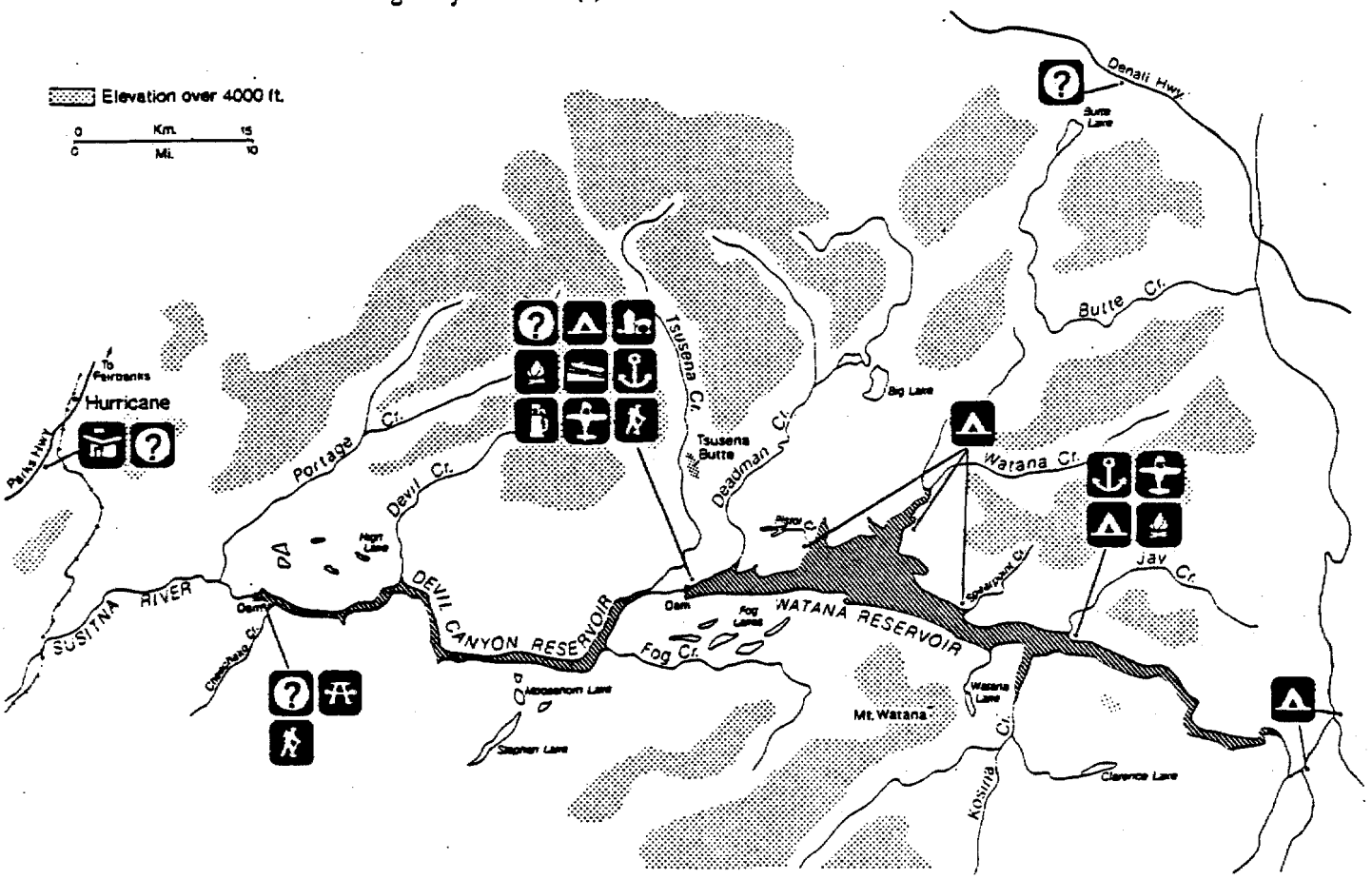
[ ] 16

[ ] 17, 18

[ ] 19, 20

APPROACH "C"—WATANA RESERVOIR DEVELOPMENT

One possible approach to more extensive recreational development is to offer highly developed facilities at the Watana damsite and only minimal interpretive services at the Devil Canyon damsite. In addition to the services offered at both reservoirs in Approach "B", there would be greater development at the Watana damsite to accommodate increased visitor use. Simple backcountry campsites would be provided at selected locations around the Watana reservoir, with additional improvements being made at the mouth of Jay Creek. More intensive resource management would be necessary around the Watana reservoir but the remaining project area would still be managed as wilderness. As in Approaches "A" and "B", visitor information would be available at highway entrance(s).



QUESTIONS:

1. Do you find this plan to be (check only one).
   - ☐ Not acceptable?
   - ☐ Acceptable?
   - ☐ Acceptable with modifications?

2. If any modifications (additions or deletions) are suggested, mark the location with an "X" and briefly describe the proposed modifications below:

   Deletions _____

   _____

   Additions _____

   _____

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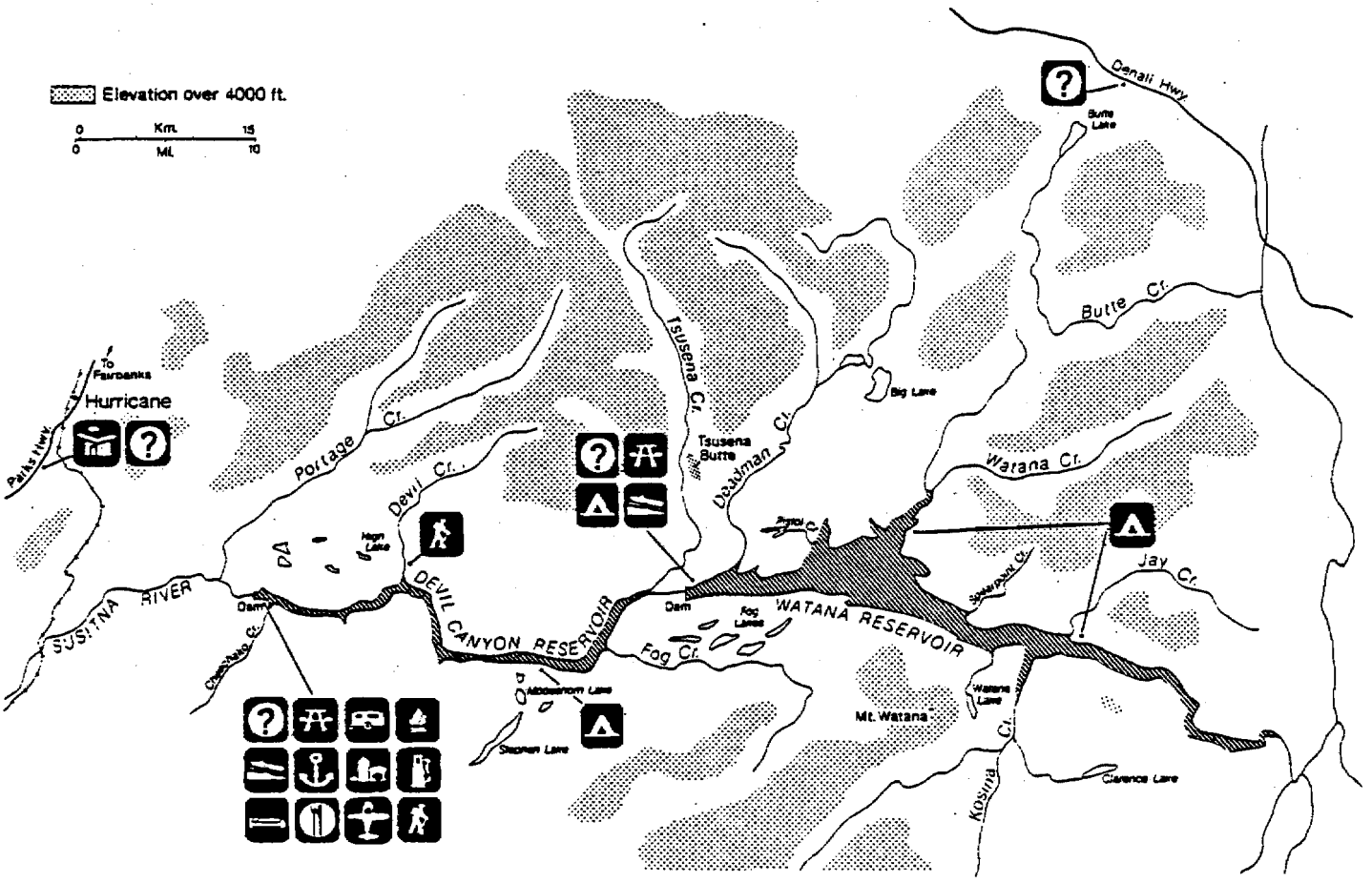
[ ] 21

[ ] 22, 23

[ ] 24, 25

APPROACH "D"–DEVIL CANYON RESERVOIR DEVELOPMENT

In this approach highly developed facilities would be offered at the Devil Canyon reservoir and damsite and only minimal facilities at the Watana damsite. The Devil Canyon area would be developed and managed intensively to provide a diversity of recreational opportunities, while the Watana reservoir area could be developed and managed in a manner that would maintain its wilderness character.



QUESTIONS:

1. Do you find this plan to be (check only one).
   - ☐ Not acceptable?
   - ☐ Acceptable?
   - ☐ Acceptable with modifications?

2. If any modifications (additions or deletions) are suggested, mark the location with an "X" and briefly describe the proposed modifications below:

   Deletions _____

   _____

   Additions _____

   _____

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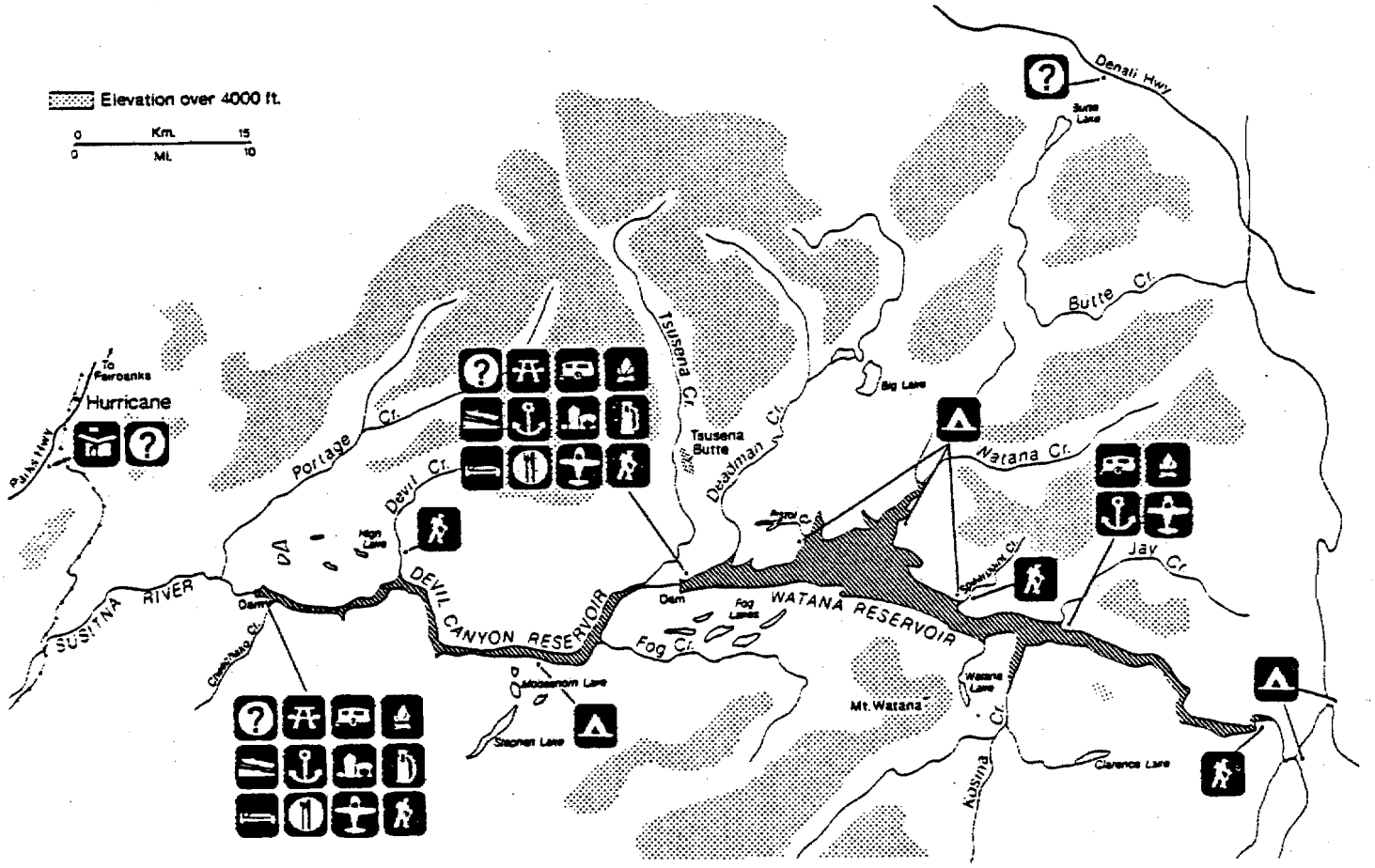
[ ] 26

[ ] 27, 28

[ ] 29, 30

APPROACH "E"—HIGHLY DEVELOPED AND MANAGED THROUGHOUT

This approach involves a high level of recreational development and offers a wide variety of recreation activities around both reservoirs. Complete visitor facilities would be located at the damsites, with additional improvements made at the Jay Creek site, and backcountry boat-in campsites built at 5 locations. Intensive resource management would be necessary throughout much of the recreation area to reduce conflicts between uses and to maintain the quality of the environment.



QUESTIONS:

1. Do you find this plan to be (check only one).
   - ☐ Not acceptable?
   - ☐ Acceptable?
   - ☐ Acceptable with modifications?

2. If any modifications (additions or deletions) are suggested, mark the location with an "X" and briefly describe the proposed modifications below:

   Deletions _____

   _____

   Additions _____

   _____

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[ ] 31

[ ] 32, 33

[ ] 34, 35

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PART III—WHICH APPROACH, KINDS OF ACTIVITY, AND LEVEL OF SERVICE WOULD BE BEST FOR YOU?

Now that you have had an opportunity to read the background information and review 5 different approaches to recreation development at the Susitna River project, please think about which approach would best serve your needs.

1. Rank the five approaches in order of each one's value to you personally. (Number 1 being of greatest value and Number 5 of least value).

RANKING

APPROACH "A"—A MINIMALLY DEVELOPED AND MANAGED WILDERNESS ..... _____
APPROACH "B"—MANAGED WILDERNESS WITH LIMITED ACCESS .. _____
APPROACH "C"—WATANA RESERVOIR DEVELOPMENT ..... _____
APPROACH "D"—DEVIL CANYON RESERVOIR DEVELOPMENT ..... _____
APPROACH "E"—HIGHLY DEVELOPED AND MANAGED THROUGHOUT ..... _____

2. Now, please list the main kinds of recreational activities in which you would take part in at the Susitna project if it were developed according to the approach which you ranked first in Question 1 above. Then for each activity you checked, please give the number of years of experience for that activity.

Recreational Activity	Years of Experience		Recreational Activity	Years of Experience
☐ All terrain vehicle use			☐ Motorcycling	
☐ Backpacking			☐ Picking wild foods	
☐ Boating—motorized			☐ Picnicking	
☐ Boating—nonmotorized			☐ Photography	
☐ Camping			☐ Rock hounding	
☐ Dog-sledding			☐ Sightseeing	
☐ Fishing			☐ Skiing	
☐ Flying			☐ Snow-mobiling	
☐ Four-wheel driving			☐ Snow-shoeing	
☐ Hiking			☐ Other activities	
☐ Horseback riding				
☐ Hunting				

[ ] 36
[ ] 37
[ ] 38
[ ] 39
[ ] 40
[ ] 41 [ ] 42
[ ] 43 [ ] 44
[ ] 45 [ ] 46
[ ] 47 [ ] 48
[ ] 49 [ ] 50
[ ] 51 [ ] 52
[ ] 53 [ ] 54
[ ] 55 [ ] 56
[ ] 57 [ ] 58
[ ] 59 [ ] 60
[ ] 61 [ ] 62
[ ] 63 [ ] 64
[ ] 65 [ ] 66
[ ] 67 [ ] 68
[ ] 69 [ ] 70
[ ] 71 [ ] 72
[ ] 73 [ ] 74
[ ] 75 [ ] 76
[ ] 77 [ ] 78
[ ] 79 [ ] 80
[ ] 81 [ ] 82
[ ] 83 [ ] 84

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3. Please indicate the level of services you would like to be offered at the reservoirs. (Check only one). [ ] 85

- ☐ Minimal (only an access road to the reservoir is adequate).
- ☐ Some simple boat launching ramps, parking areas, and campgrounds provided but with minimum supervision by operating personnel.
- ☐ Small marina, visitor center, and improved campgrounds for RV's. More personnel provided for supervision of operations, maintenance, information services, and on-water safety.
- ☐ Large marina, boat storage, restaurant facility, motels, and gift shops provided plus the substantial numbers of personnel needed to staff such facilities and assist visitors.

4. Now, please indicate the approximate amount of money (if any) you would be prepared to pay each day for the level of service checked in Question 3 above for each of the amenities listed. Check $0 if you are not willing to pay for a service or N/A (not appropriate) if you don't feel the service is appropriate for the level of development that you prefer.

Primitive Campsite (pit toilets only) [ ] 86
(Check only one).

☐ $0	☐ $6.00-$10.00
☐ $1.00-$2.00	☐ more than $10.00
☐ $3.00-$5.00	☐ N/A

Developed Campsite (water and sanitary facilities) [ ] 87
(Check only one).

☐ $0	☐ $6.00-$10.00
☐ $1.00-$2.00	☐ more than $10.00
☐ $3.00-$5.00	☐ N/A

Simple Boat Launching Ramp [ ] 88
(Check only one).

☐ $0	☐ $6.00-$10.00
☐ $1.00-$2.00	☐ more than $10.00
☐ $3.00-$5.00	☐ N/A

Small Marina (with minimal services) [ ] 89
(Check only one).

☐ $0	☐ $6.00-$10.00
☐ $1.00-$2.00	☐ more than $10.00
☐ $3.00-$5.00	☐ N/A

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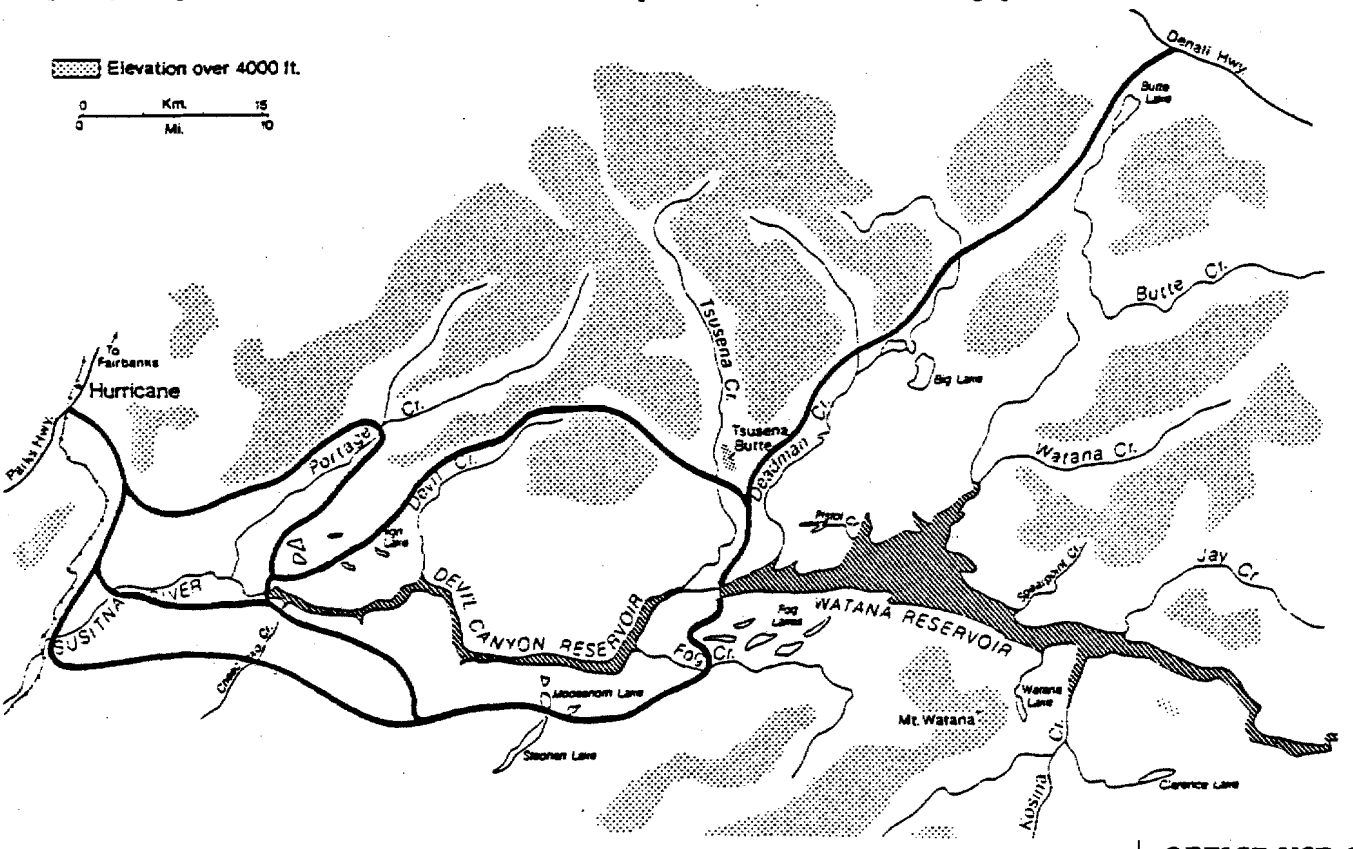
PART IV—GENERAL DESIRABILITY OF FACILITIES

Now, not thinking in terms of any particular approach to recreational development at the Susitna project, please check the desirability of each of the following facilities.

Facility	Very Desirable	Desirable	Not Desirable	Undecided	
Paved, high-speed roads					[ ] 90
Paved, lower speed roads					[ ] 91
Gravel roads					[ ] 92
Bicycle trails					[ ] 93
Nature trails					[ ] 94
Short hiking trails (a mile or two)					[ ] 95
Long distance hiking trails (several miles)					[ ] 96
Off-road vehicle trails					[ ] 97
Recreational vehicle campgrounds					[ ] 98
Less developed campgrounds accessible by auto					[ ] 99
Organizational/group campgrounds					[ ] 100
Boat-in campgrounds					[ ] 101
Simple boat launching ramps					[ ] 102
Full service marinas					[ ] 103
Canoe trails					[ ] 104
Float plane moorings					[ ] 105
Auto-oriented picnic grounds					[ ] 106
Group picnic shelters					[ ] 107
Restaurant/dining facilities					[ ] 108
Motel accommodations					[ ] 109
Vistior centers					[ ] 110
Scenic overlooks					[ ] 111
Amphitheater for nature talks					[ ] 112
Boat tours					[ ] 113

PART V—PROPOSED ACCESS ROUTES

Several routes as shown in the map below have been proposed for access to the Susitna reservoirs. Final selection of access routes will be made on the basis of environmental impact studies, cost analysis, public input and level of site development. The degree to which recreational facilities might be developed may also influence route selection. A final access plan would probably include only a single route to each of the damsites but it is possible that separate routes, one from the Parks Highway and the other from the Denali Highway, might be included. Please review this map and answer the succeeding question.



If road access is developed to the Devil Canyon and Watana damsites, where should the routes begin to each of the damsites?

a. Devils Canyon damsite:
- ☐ Denali Highway
- ☐ Parks Highway
- ☐ No preference
- ☐ No public access by road

b. Watana damsite:
- ☐ Denali Highway
- ☐ Parks Highway
- ☐ No preference
- ☐ No public access by road

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PART VI—BACKGROUND INFORMATION

OFFICE USE ONLY [ ] 115

Please check the appropriate response for each of the following questions.

1. In which region of the state do you live?
   - ☐ Anchorage area
   - ☐ Fairbanks area
   - ☐ Railbelt (between Anchorage and Fairbanks)

OFFICE USE ONLY [ ] 116

2. How would you classify the place where you live?
   - ☐ Urban
   - ☐ Rural
   - ☐ Remote rural
   - ☐ Other (Explain) _____

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[ ] 118

COMMENTS

IN THE SPACE BELOW, PLEASE WRITE ANY COMMENTS OR SUGGESTIONS YOU MAY HAVE CONCERNING THIS QUESTIONNAIRE (If you need more space, please attach another sheet of paper).

THANK YOU FOR YOUR ASSISTANCE

If you accidentally misplace the return envelope provided, please mail to:

Susitna Recreation Project
School of Agriculture and Land Resources Management
University of Alaska
Fairbanks, Alaska 99701

Appendix D

Public Forum Questionnaire

SUSITNA HYDROELECTRIC PROJECT

RECREATION PLAN

Public Forum Questionnaire

1. The development approach I most prefer is _____. (List only one.)
(letter)

2. Do you have any suggested modification to the above selected approach? Please number each suggestion.

_____

_____

_____

_____

3. Why did you choose your particular approach?

_____

_____

_____

4. a. In which region of the state do you live:

_____ Anchorage

_____ Fairbanks

_____ Railbelt (between Anchorage and Fairbanks)

b. How would you classify the place where you live?

_____ Urban _____ Small town

_____ Rural _____ Rural remote

_____ Other...list _____

c. Do you represent a particular interest group? If so, please list. _____

You may use the back side for any additional comments.

Thank you.

Appendix E

Recreation Participation Survey

Questionnaire

Terrestrial Environmental Specialists, inc.
2207 SPENARD ROAD, ANCHORAGE, AK 99503

April 9, 1982

Dear Alaskan Resident:

Terrestrial Environmental Specialists, Inc. is preparing a preliminary recreation plan for the Alaska Power Authority's proposed Susitna hydroelectric project. By completing the attached survey questionnaire, you will assist us in estimating the potential recreational use of the area. The results of this survey will not affect, in any way, the decision to approve or disapprove the proposed Susitna hydroelectric project.

Construction of the two dams, reservoirs, and access road would create new recreation opportunities for sightseeing, boating, camping, hunting, fishing, hiking, backpacking, and winter activities. The dams themselves would be an attraction - Watana would be one of the highest dams in North America. The amount and type of recreational development that are proposed were determined from a previous public survey and from a series of public workshops, both of which indicated a preference for minimal recreational development. The results of the present survey will permit us to adjust planned developments on the basis of type and number of anticipated users. Please review the maps and description of proposed recreational facilities and complete the questionnaire on the last page.

We ask you to take the time to complete the questionnaire and mail it as soon as possible. Even if you do not expect that you would visit the project area, your response is important. Thank you for your assistance.

Sincerely,

Robert L. Anderson
Group Leader, Recreation Planning

RLA:sa
Enclosures

DESCRIPTION OF AREA

RESERVOIRS

Devil Canyon would be 28 miles long, a half mile wide; average water level would rise 50 feet from June to September. Watana would be 54 miles long, one to six miles wide; average water level would rise 30 feet from June to September. Reservoirs would be cold, and perhaps silty, and ice-free about five months of the year. Fishing is expected to be fair.

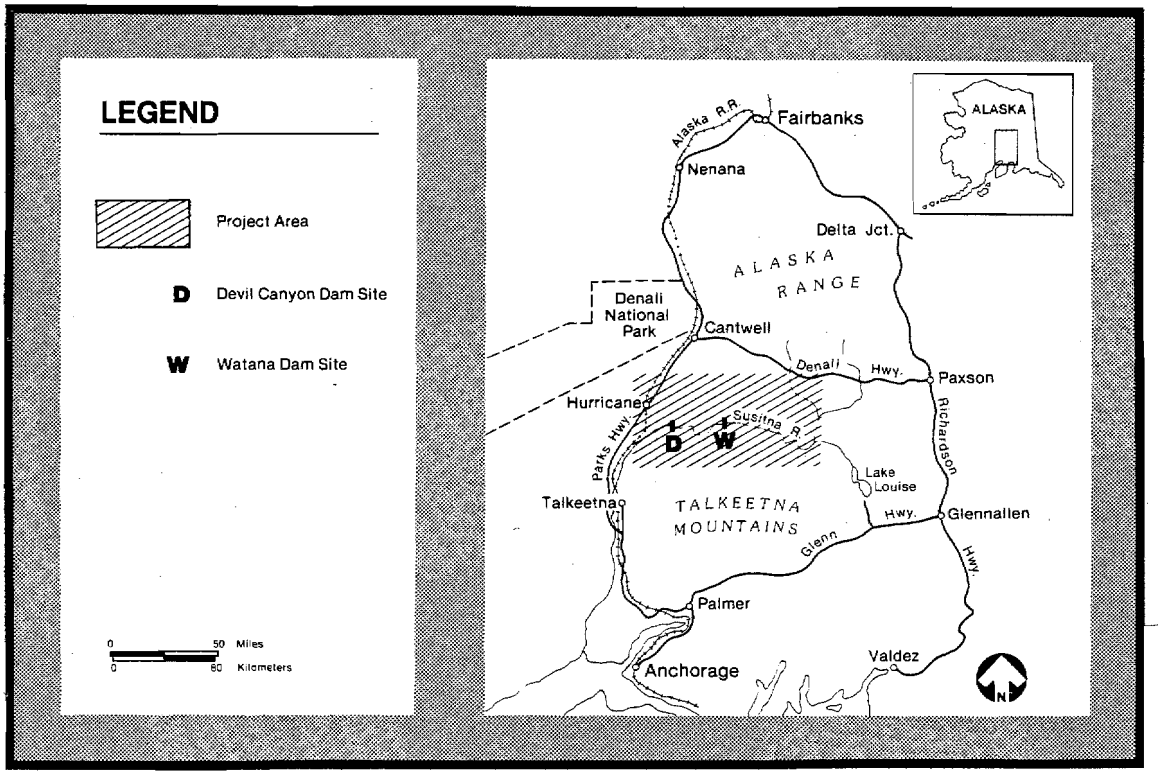
ACCESS

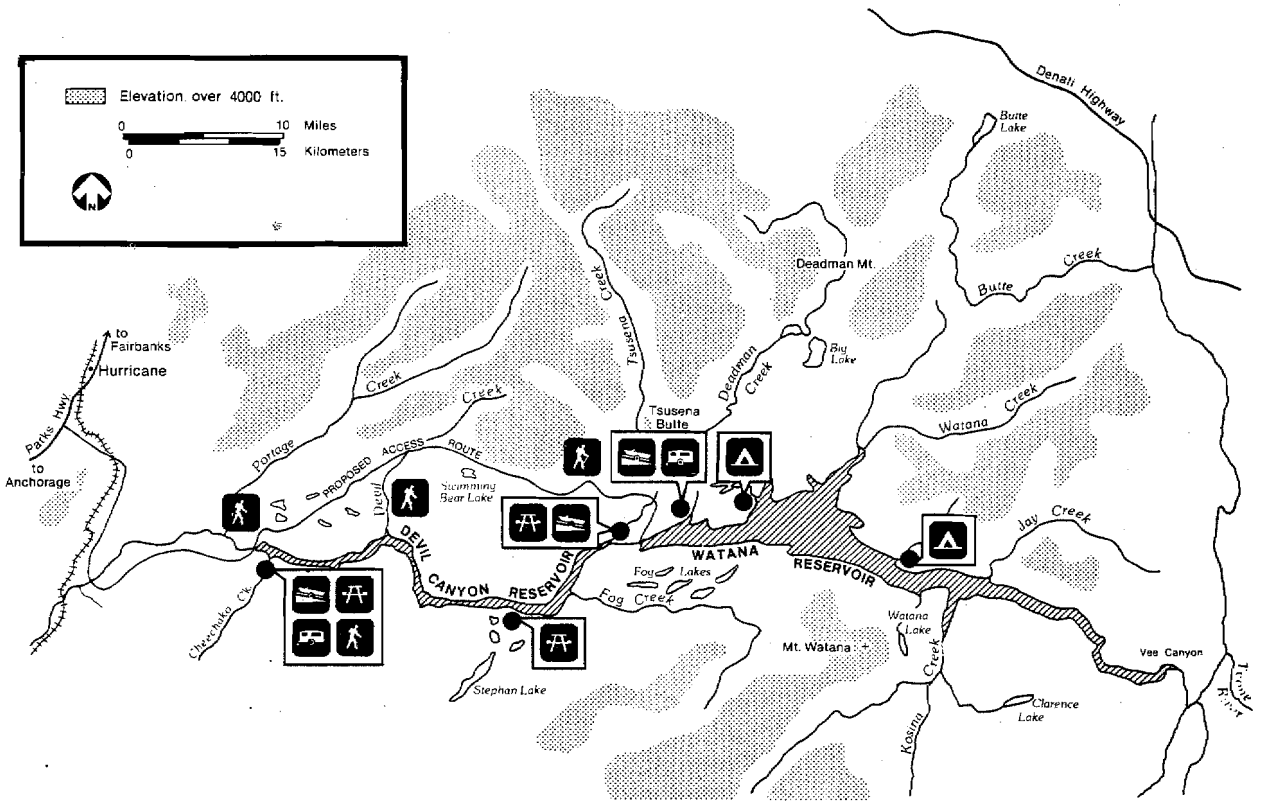
A 68-mile gravel road would be constructed from Hurricane on the Parks Highway to the dam sites. The portion of the road between the two dam sites would traverse a scenic alpine zone and would afford some distant viewing of the Alaska and Talkeetna ranges. Travel time by auto to the Devil Canyon dam would be about five hours from Anchorage or Fairbanks; Watana would be an additional hour's drive. Round-trip travel time, including stops on the Parks Highway for food and gas, would average some 12 hours. Restroom facilities are planned for the project area, but no facilities for food or gas are planned.

SETTING

Elevation of the surrounding landscape varies from 1200 to 5500 feet, with some higher points. Much of the access road between the dams would be above timberline, where vegetation tends to be shrub or tundra. Vegetation adjacent to reservoirs and other low elevations is predominantly wooded.

There are numerous small, clear lakes and streams in the area, many with resident populations of grayling, Dolly Varden, rainbow trout, and lake trout. Salmon migrate up Indian River and the Susitna as far as Portage Creek. The project area has populations of moose, caribou, black and brown bears, and Dall sheep.





PROPOSED SUSITNA RECREATION DEVELOPMENTS*

DEVELOPED CAMPGROUNDS will have campsites that include picnic tables, fireplaces, parking, tenting areas, water, and restrooms.

PICNIC AREAS will have tables, water, and restrooms. Some will be accessible by car; some, by boat.

BOAT RAMPS will provide access to both reservoirs. Parking areas for vehicles and boat trailers will be available.

TRAILS will be short (one or two miles) leading to scenic waterfalls, and other interesting natural features. Several alpine lakes within one mile of the road will have canoe portages.

BOAT-IN CAMPGROUNDS will include five campsites with picnic tables, bear-proof food caches, pit toilets, and boat tie-ups.

*Some facilities will be designed for use by the physically handicapped.

QUESTIONNAIRE

1. a. Do you currently use the proposed project area (see map) for recreation?

_____Yes _____No

b. If the proposed Susitna hydroelectric project is approved and the recreation facilities as described are developed, do you think you will travel to the area to see it or to participate in any recreational activities:

_____Yes _____No

If you answered No to Question 1b, you have completed the survey. Please fold and mail. If you answered Yes to Question 1b, please go on.

2. a. How often would you expect to visit the site? (Check only one response).

_____Just once
_____More than once, but not every year
_____Once a year
_____Twice a year
_____Three to five times a year
_____More than five times a year

b. Would you visit: (Please indicate by number:
1 - most often; 2 - next often; and 3 - least often or never)

_____By yourself
_____With your family
_____With friends

c. How long would you expect to stay? (Please indicate by number:
1 - most often; 2 - next often; and 3 - least often or never)

_____One day or less
_____Two days
_____Three or more days

d. What activities would you expect to engage in? (Check as many as apply).

_____Driving for pleasure, sightseeing
_____Camping
_____Boating (except canoeing)
_____Canoeing
_____Hunting
_____Others _____
_____Hiking or backpacking
_____Fishing
_____Picnicking
_____Photography
_____Cross-country skiing

e. What facilities would you expect to use? (Check as many as apply).

_____Access road
_____Scenic pullouts
_____Reservoirs themselves
(for boating or fishing, etc.)
_____Boat launch
_____Campground (accessible by auto)
_____Boat-in campground
_____Picnic area
_____Trails
_____Existing lakes and streams in area

3. Additional comments:

PLEASE FOLD THIS PAGE AS SHOWN AND MAIL. THANK YOU FOR YOUR ASSISTANCE.