FINAL TECHNICAL REPORT

FOR

RECREATION RESOURCES

Yale Hydroelectric Project
FERC Project No. 2071

Prepared by:
EDAW, Inc.
Seattle, Washington

Prepared for:
PacifiCorp
Portland, Oregon

April 1999

CONTENTS

CONTENTS (continued)

APPENDICES

FIGURES

TABLES

TABLES (continued)

ACRONYMS AND ABBREVIATIONS

4WD	4-wheel-drive
ADA	Americans with Disabilities Act
ADAAG	ADA Accessibility Guidelines
ATV	all-terrain vehicle
BBQ	barbecue
BLM	Bureau of Land Management
BOR	Bureau of Outdoor Recreation
CFR	Code of Federal Regulations
CRGC	Columbia River Gorge Commission
CRGNSA	Columbia River Gorge National Scenic Area
DNR	Washington State Department of Natural Resources
FERC	Federal Energy Regulatory Commission
FSCD	First Stage Consultation Document
FTR	Final Technical Report
GIS	Geographic Information System
GPNF	Gifford Pinchot National Forest
IAC	Inter-Agency Committee for Outdoor Recreation
ILM	Integrated Landscape Management
I-5	Interstate 5
IP	International Paper
ITR	Interim Technical Report
LAC	Limits of Acceptable Change
LRPM	Land and Resource Management Plan
MOA	memorandum of Agreement
Monument	Mount St. Helens National Volcanic Monument
msl	mean sea level
NPS	National Park Service
O&M	Operations and Maintenance
OHV	Off-Highway Vehicle
ORV	Off-Road Vehicle
PAOT	persons-at-one-time
PFD	personal floatation device
PHS	Priority Habitat Species
PM&E	Protection, mitigation, and enhancement
PNRRC	Pacific Northwest Regional Recreation Committee
PP&L	Pacific Power & Light Company

ACRONYMS AND ABBREVIATIONS (continued)

PUD	Public Utility District
PWC	personal watercraft
ROS	Recreation Opportunity Spectrum
ROW	right-of-way
RTE	rare, threatened, or endangered
RV	recreational vehicle
RVD	recreation visitor day (12-hour period)
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SR	State Route
USFS	U.S. Department of Agriculture Forest Service
USFWS	U.S. Fish and Wildlife Service
VAOT	vehicles at one time
WDFW	Washington State Department of Fish and Wildlife
WSPRC	Washington State Parks and Recreation Commission

1.0 INTRODUCTION

The Yale Hydroelectric Project is owned and operated by PacifiCorp under the authority of the Federal Energy Regulatory Commission (FERC; Project No. 2071). The project is 1 of 4 hydroelectric projects located on the North Fork of the Lewis River in southwestern Washington. Three of the projects--Yale, Merwin, and Swift No. 1--are owned and operated by PacifiCorp (Figure 1.0-1). The fourth project, Swift No. 2, is owned by Public Utility District (PUD) No. 1 of Cowlitz County, and is operated and maintained by PacifiCorp for the PUD. The Yale Project is located in Cowlitz and Clark counties, approximately 23 miles east of Woodland, Washington, and 45 miles northeast of Portland, Oregon.

The construction of the Yale Hydroelectric Project on the Lewis River created a recreation resource of regional significance in southwestern Washington. Yale Lake offers developed and dispersed recreation opportunities, particularly water-based activities such as boating, personal watercraft (PWC) use, and fishing, in proximity to major population centers in Clark County, Washington and the Portland, Oregon vicinity.

1.1 SCOPE OF REPORT

The Yale Project currently operates under a license from the FERC that expires on April 30, 2001. PacifiCorp is seeking a new license to continue to operate the project and (as required by the FERC) issued a Notice of Intent on February 7, 1996 to apply for a new license. FERC regulations establish a 3-stage process of consultation between the applicant, state and federal resource agencies, and tribes. The regulations also establish a process for obtaining public comment during relicensing. PacifiCorp began the first stage of consultation by issuing a First Stage Consultation Document (FSCD) (PacifiCorp 1996) that described the facilities, operation, and environmental setting of the existing Yale Project. This document also described studies that PacifiCorp planned to conduct in the areas of aquatic (water quality and fisheries), terrestrial, land use, aesthetics, recreation, and cultural resources in accordance with Title 18, Part 4, Section 51 of the Code of Federal Regulations (18 CFR 4.51): Application for Major Project-Existing Dam.

Study results for 1996 were described in the Interim Technical Report (ITR) (PacifiCorp 1997a), which covered all resource disciplines. Results of studies conducted in 1997 are combined with those for 1996 and presented in final technical reports (FTRs) that are resource specific. This FTR for Recreation Resources describes environmental studies conducted during 1996 and 1997 for the Yale Project. This report focuses only on recreation resources. Three other reports have been issued separately, 1 each to describe terrestrial, aquatics, and cultural resources.

The FTR for Recreation Resources describes the area of each study, detailed methods and procedures used to conduct each analysis, and results and discussion. A draft FTR was distributed for agency review in January 1998. Based on agency comments received on the draft document, this final FTR for Recreation Resources was prepared and integrated

into the draft License Application, which was distributed to agencies and public in July 1998.

1.2 SCOPE OF ANALYSES

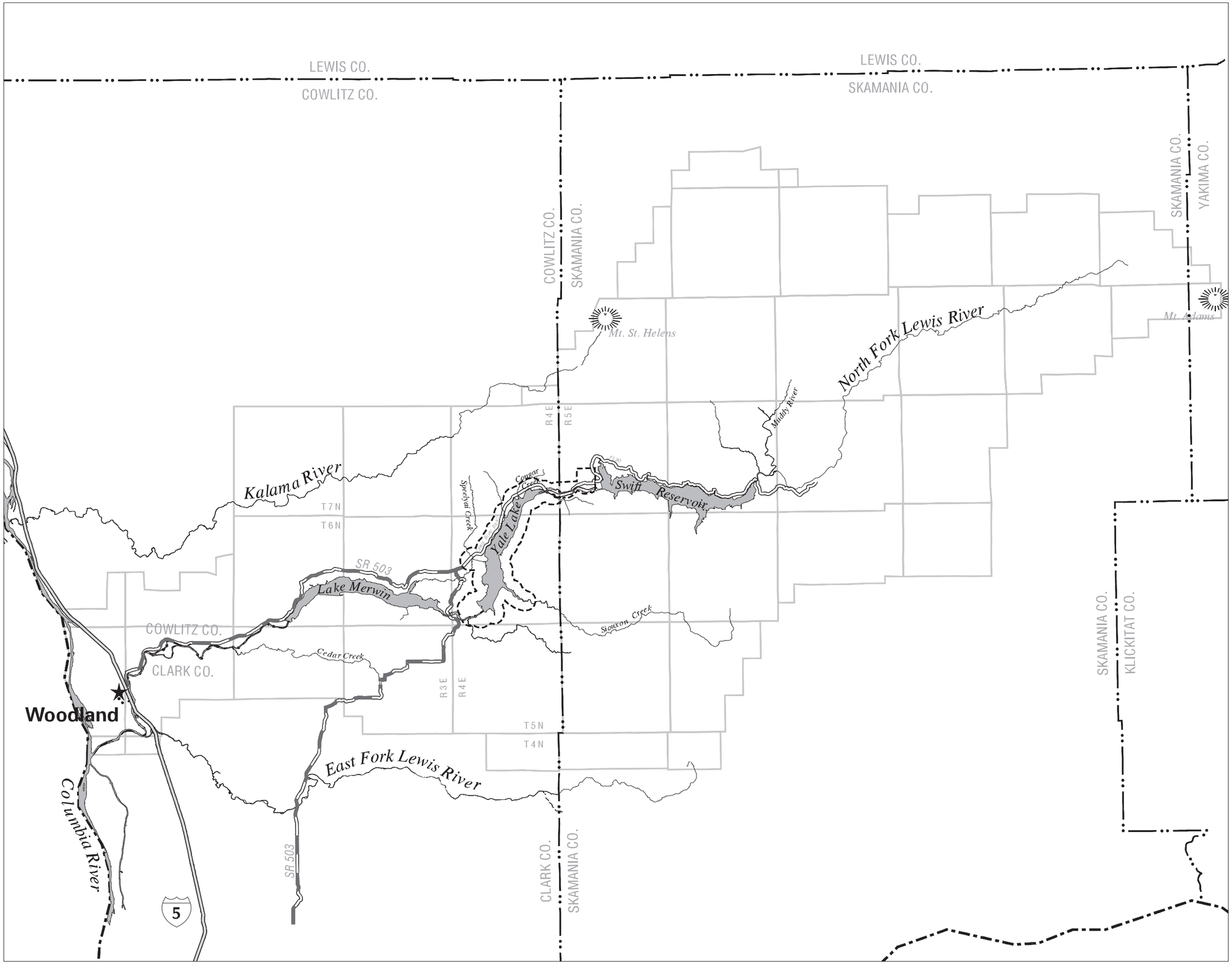
Based on studies proposed in the FSCD and subsequent agency comments, PacifiCorp conducted the following analyses to describe existing recreation resources in the project vicinity, and to make informed decisions regarding the environmental effects of continued operation and maintenance of the Yale Project. The results of Stage 2 studies were used to: (1) characterize and describe the resources associated with the project in Exhibit E (environmental report) of the License Application; and (2) prepare the license application for this project.

PacifiCorp's relicensing studies of recreation resources at Yale Lake are presented in this FTR for Recreation Resources and include 2 main elements: (1) a recreation supply - demand = needs analysis that identifies existing and future need for recreation facilities, use areas, and programs; and (2) a recreation capacity and suitability analysis that looks at recreation facility and use area capacity and considers various competing resource opportunities and constraints to recreation development. Four specific recreation analyses were conducted to address these 2 elements:

1. Recreation Supply: The recreation supply analysis (Section 2.0) involves an inventory of existing recreation sites and facilities in the study area and an assessment of their condition. Facilities and use areas in the region are also described to place the project facilities in context with other resources. The results of this analysis are used in the follow-on needs assessment.

2. Recreation Demand: The recreation demand analysis (Section 3.0) assesses visitor use and identifies and projects existing and future demand for recreation activities in the region and at Yale Lake. This analysis also involves conducting a recreation survey that includes 2 main parts: user and activity counts, and visitor preferences and perceptions. Regional and future demand for recreation activities in the Washington SCORP is also assessed. The results of this analysis will be used in the follow-on needs assessment.

3. Recreation Capacity and Suitability: The recreation suitability analysis (Section 4.0) involves 2 components: a recreation capacity analysis and a recreation development suitability analysis using geographic information system (GIS) technology. The capacity analysis examines facility occupancy rates and the suitability of existing facilities and use areas to accommodate existing and future



Legend

- Study Area
- Public Land Survey

ADMINISTRATIVE BOUNDARIES
- County Line
- State Line

HYDROGRAPHY
- Water
- Stream

TRANSPORTATION
- Primary Road
- Secondary Road
- Light Duty Road

NORTH

0 5 10 Miles

Scale 1:325000

Yale Hydroelectric Project

Figure 1.0-1

Project Vicinity

Created by VESTRA Resources for PacifiCorp

/p1/proj_map/projects/yale/license/ftr/recreatn/project_vicinity.map

January 29, 1999

recreation use based on factors including physical, facility, social, and ecological impacts. Applicable agency plans and policies are also reviewed for consistency related to recreation use. A GIS-based development suitability analysis is also used to identify high to low suitability areas in the study area using a 5-point scale. The results of this analysis and the previous needs assessment will be used to help prepare the License Application that will include enhancement measures, if needed.

4. Recreation Needs: The recreation needs assessment (Section 5.0) is based on the general formula (Supply - Demand = Needs) and uses the results of 3 previous studies. Indicators of recreation supply (e.g., presence or lack of facilities, location and condition of facilities, accessibility for the physically disabled) and recreation demand (e.g., annual percent increase in demand for activities, survey results on visitor perceptions and crowding, occupancy rates, capacity utilization) are assessed to identify existing recreation needs and to project future recreation needs in the study area.

The 4 recreation resource analyses are interrelated and each contributes a portion of the information necessary to develop an understanding of recreation resources in the study area. Results for the recreation supply analysis (Section 2.0) and partial results for the demand analysis (Section 3.0) were presented in the ITR (PacifiCorp 1997a). The recreation survey for the demand analysis (Section 3.0), as well as new analyses related to recreation capacity and suitability (Section 4.0) and recreation needs (Section 5.0), were completed in 1997 and were presented in the draft FTR. Additional updates were also made in 1997 to the previous supply and demand analyses results presented in the ITR.

Terrestrial, aquatics, and cultural resource studies were presented in separate reports, as stated above. Aesthetic and visual resource studies, and land management and use studies, have been comprehensively reported in the ITR (PacifiCorp 1997a) and will not be presented in a FTR, but instead will be summarized in the Exhibit E.

2.0 RECREATION SUPPLY

Outdoor recreation supply is generally defined as the lands and facilities available to the public for leisure activities. Use of these lands and facilities depends on factors such as access, information, and the public's interest in the opportunity. The recreation supply analysis focuses on 2 main elements: identification of existing recreation opportunities and facilities, and management of those facilities and lands. The purpose of the recreation supply analysis is to document and describe existing recreation resources in the project vicinity; this information will be used to determine if these resources need to be maintained, improved, or expanded based on an analysis of their current and anticipated future condition. Although the supply of recreation resources is examined for both the region and the project vicinity, the focus is developed and dispersed sites in the immediate vicinity of Yale Lake. It includes the identification of undeveloped dispersed sites surrounding Yale Lake, as well as developed facilities, regardless of ownership and management responsibility. The analysis takes into consideration the condition of the sites and facilities, especially in regard to safety concerns, access for the physically disabled, and impacts on natural resources.

The facilities inventory conducted as part of the recreation supply analysis will be used in conjunction with public and agency input on facility improvements, the public's perception of crowding from the recreation demand analysis (Section 3.0), and a GIS-based analysis to assess site suitability (Section 4.0).

2.1 STUDY AREA

The study area for the recreation supply analysis consists of 3 areas ranging from the general to the specific: (1) a regional area to provide a broad context for recreation opportunities in the region (see Figure 1.0-1); (2) the Lewis River corridor, with a focus on PacifiCorp's 3 reservoirs (i.e., Lake Merwin, Yale Lake, Swift Reservoir) (Figure 2.1-1); and (3) a project-specific recreation resources study area consisting of a 0.5-mile radius surrounding Yale Lake totaling 14,568 acres (Figure 2.1-1). Results presented in this FTR are broader for the regional portion of the study area and more detailed for the Yale Lake vicinity. Site-specific information is provided for relevant portions of the Lewis River corridor, including: (1) facilities located at Lake Merwin to the west and Swift Reservoir to the northeast, (2) Washington State Department of Natural Resources (DNR) Siouxon lands to the southeast and Merrill Lake to the northwest, (3) Clark County's Siouxon County Park site on Yale Lake, and (4) Gifford Pinchot National Forest (GPNF) and Mount St. Helens National Volcanic Monument (the Monument) lands to the north and east managed by the U.S. Forest Service (USFS).

The regional portion of the study area extends beyond the operation and maintenance effects of the project. This larger area provides a broader context of recreational use in the project vicinity. The Lewis River corridor and Yale Lake portions of the study area help delineate the area of potential effect of project operations on recreation resources and is the focus of field studies and data collection. Facilities along the river upstream and downstream of the Yale Project were included to provide a perspective of available

recreation development in the study area. Specifically, the recreation surveys are focused on the Yale Lake portion of the study area. Data pertaining to the larger study areas provide a context for the analyses and are generally based on existing published sources.

2.2 METHODS

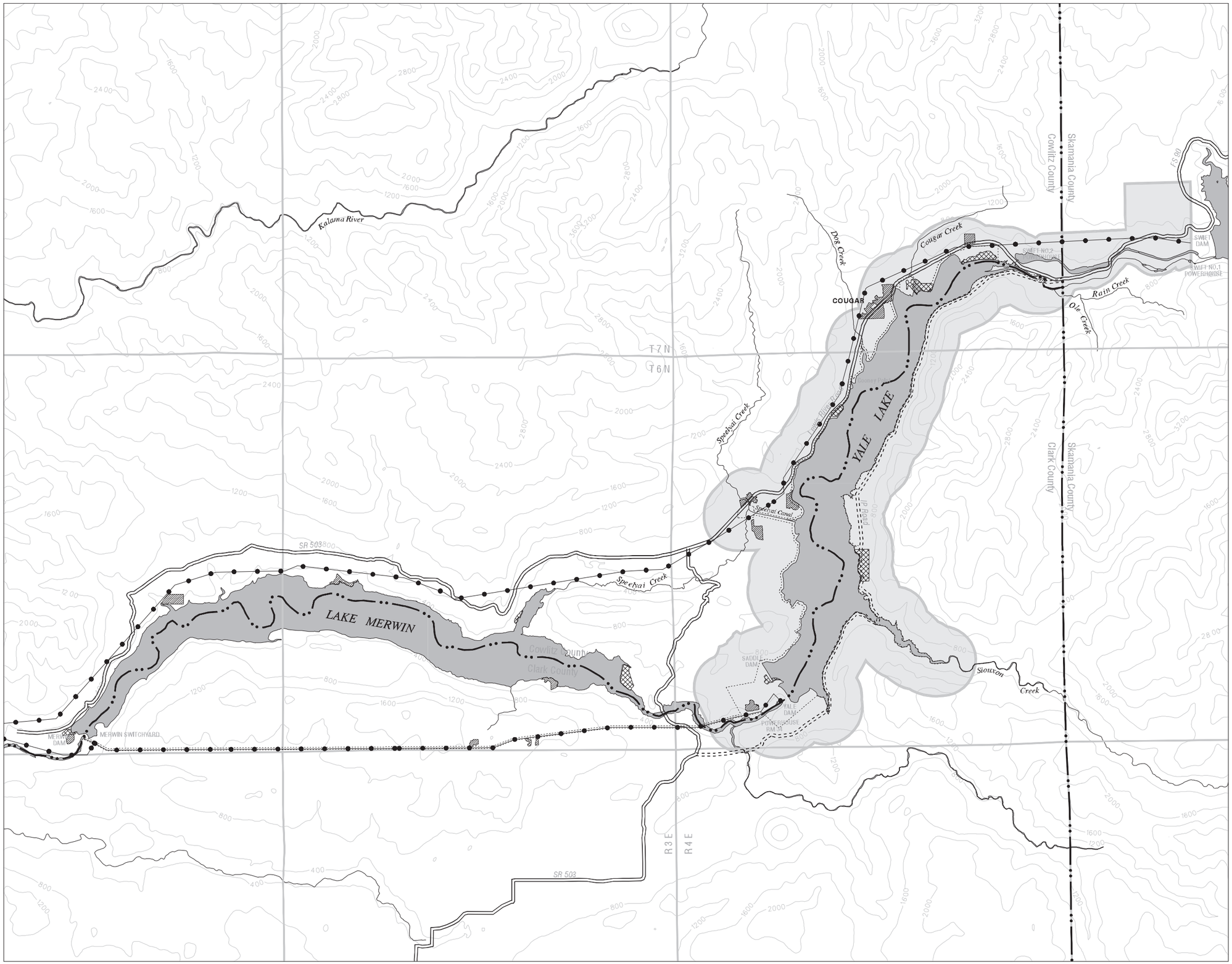
Methods for the recreation supply study involved review of published information, consultation with agencies, and site-specific field investigations. Existing conditions were systematically identified and documented through extensive field notes. All existing facilities and access points were identified and documented on maps and summarized tabularly. All sites and facilities were also photographed.

Sites were categorized into "developed" recreation sites or "dispersed" use areas. Developed sites are designated through signs and public information materials, and typically have extensive built facilities (e.g., campgrounds, day-use picnic sites, boat launches). Dispersed use areas are generally not designated as recreation sites by signs, and have limited or no facilities; dispersed use areas are often only accessible by boat (i.e., boat-in campsites and day-use sites, trails). Recreation facilities and support services were identified and recorded at each site or area.

To evaluate facilities covered by the inventory, 4 criteria were used: (1) needs replacement (broken or missing components, or non-functional); (2) needs repair (structural damage or otherwise in obvious disrepair); (3) needs maintenance (primarily cleaning); and (4) is in good condition (functional and well-maintained). Unsafe conditions and signs of overuse were noted. The existence of facilities designed to accommodate the physically disabled, such as PacifiCorp's new restroom facilities, were also identified.

2.3 RESULTS AND DISCUSSION

Results presented in this FTR form both a regional and project-specific perspective. Information presented focuses on current levels and types of recreation use, as well as existing and future availability of recreation facilities. Information presented for the regional study area addresses both available recreation resources, as well as existing federal, state, and local plans to manage those resources. Information presented for the Lewis River corridor and, in particular, Yale Lake, is more site-specific and focuses on an inventory and evaluation of condition of existing recreation facilities and use areas in the study area (see Figure 2.1-1).



Legend

- Study Area
- FERC Project Boundary
- Transmission Line
- Public Land Survey
- County Line
- Topography
- Recreation
- Residential

HYDROGRAPHY

- Water
- Stream

TRANSPORTATION

- Primary Road
- Secondary Road

NORTH

0 1 2 3 Miles

Scale 1:90000

Yale Hydroelectric Project

Figure 2.1-1 Study Area

Created by VESTRA Resources for PacifiCorp

/p1/proj_map/projects/yale/license/ftr/recreatn/studyarea.map

February 09, 1999

2.3.1 Regional Recreation Resources

PacifiCorp's Yale Project is located in southwestern Washington, in the vicinity of both the Cascade Mountain range and the Columbia River (Figure 1.0-1). It is indirectly accessed by Interstate 5 (I-5), a major north-south interstate freeway linking the metropolitan centers of Seattle and Tacoma, Washington to the north and Portland, Oregon and Vancouver, Washington to the south, and beyond. As the project is only 45 miles from the major population center of Portland/Vancouver, the area receives a significant amount of recreation use, particularly during the peak summer season of July and August.

Recreation resources in the regional study area are managed by a variety of federal, state, and local government entities, as well as the private sector (including PacifiCorp). Recreation resource management at the various levels is summarized below, starting with the largest statewide recreation provider - the State of Washington.

2.3.1.1 Recreation Management at the State Level

At the state level, recreation resources in Washington are managed primarily by the Washington State Parks and Recreation Commission (State Parks). Assisting State Parks and others, the Interagency Committee for Outdoor Recreation (IAC) is a state agency that services the public through 2 major areas of responsibility: (1) statewide planning and policy research and recommendations, including maintaining the Statewide Comprehensive Outdoor Recreation Planning (SCORP) program and its various documents; and (2) providing grant funding and technical assistance to other public agencies for recreation development. Other state agencies that participate in recreation management include the DNR, and to a lesser degree the Washington Department of Fish and Wildlife (WDFW), Department of Ecology, and Department of Transportation. State agencies provide 75 percent of the dedicated recreation acreage statewide (IAC 1990).

Interagency Committee for Outdoor Recreation

In 1990, the IAC published data concerning public participation in and growth of different outdoor activities. The data were taken from a study conducted by IAC and the Pacific Northwest Regional Recreation Committee (PNRRC). The study, with results presented in *Washington Outdoors: Assessment and Policy Plan 1990-1995* (IAC 1990), examined outdoor recreation in 4 geographic regions around the state; recreation use, supply, demand, visitor preferences, and needs were identified. Demand data are presented primarily by region (of which there are 4), whereas supply data are presented by the smaller planning districts (of which there are 13).

The Yale Project is located in PNRRC Region 2 and SCORP Planning District 6. PNRRC Region 2 is a 12-county area that covers primarily non-coastal Western Washington and straddles the major portion of the Cascade Mountain range (Figure 2.3-1). The natural resources in PNRRC Region 2 on which outdoor recreation demand is based include adjacent mountainous forest lands, as well as both Mt. Rainier National Park and the Monument, both managed by the federal government, as well as the

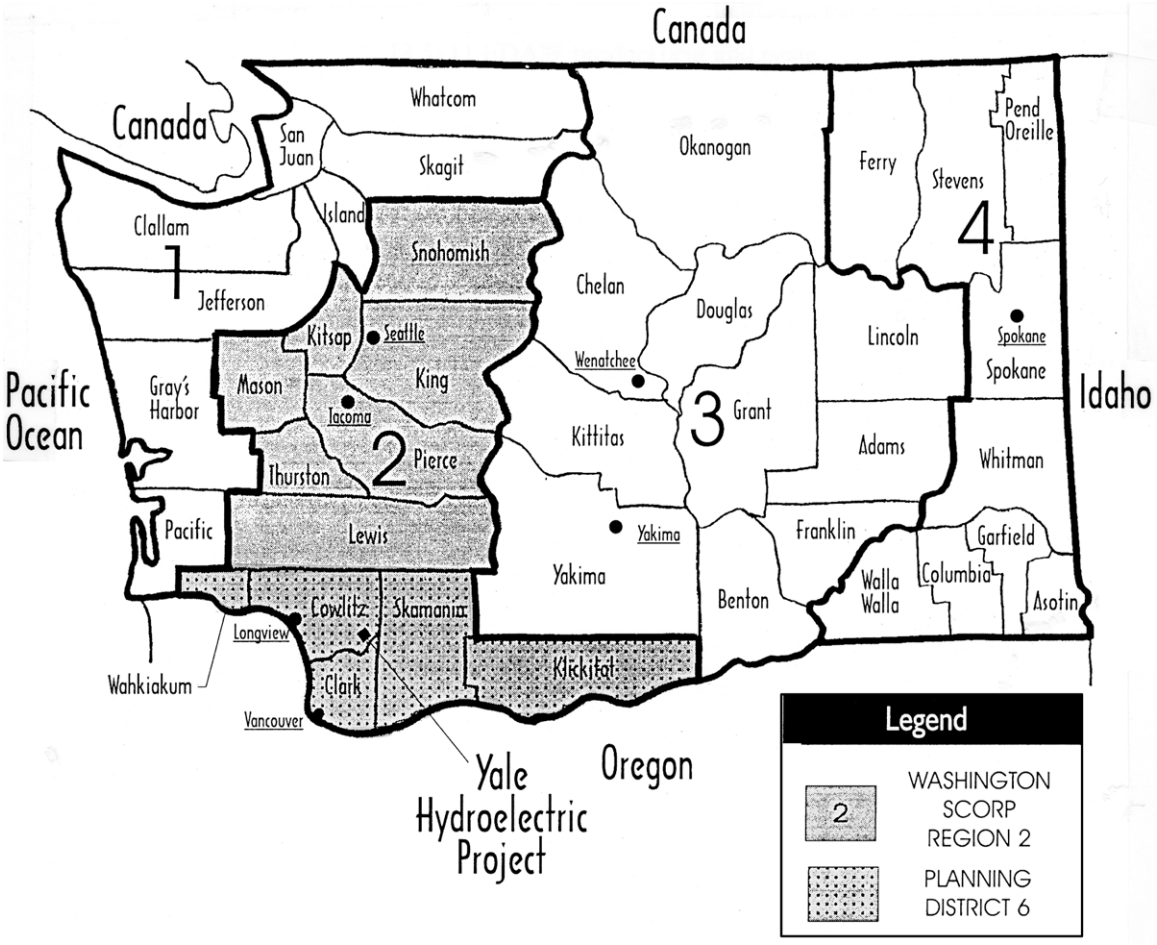


Figure 2.3-1. Washington PNRRC Region 2 and SCORP Planning District 6

Columbia River Gorge National Scenic Area (CRGNSA), also managed by the federal government. Both PNRRC Region 2 and SCORP Planning District 6 provide recreation opportunities for all recreation activity categories studied by the IAC:

- Fishing (bank and boat)
- Water activities (swimming, sailing, power boating, other boating)
- Nature study (wildlife observation, interpretive centers, food gathering)
- Sightseeing and picnicking
- Camping (Recreational Vehicle [RV] and tent)
- Motorized off-road vehicle use
- Non-motorized riding (e.g., cycling)
- Hiking, walking, and climbing (day-hiking, backpacking)
- Snow activities (skiing, snowboarding, snowmobiling)
- Hunting (big game, waterfowl)
- Sports (football, baseball, golf, etc.)

Table 2.3-1 presents an inventory of developed recreation facilities (i.e., recreation supply) in Planning District 6. Demand data, assessed by region, are presented in Section 3.0 of this FTR.

Table 2.3-1. Recreation supply in SCORP Planning District 6 - public/private suppliers.

Facilities	Local	State	Federal	Private	Total
General					
Number of Sites	309	51	91	51	502
Developed Acreage	8,814	21,824	16,782	1,175	48,595
Length of Shoreline (feet)	199,517	394,925	220,520	12,380	827,342
Boating					
Moorage Slips	703	61	0	328	1,092
Moorage Buoys	0	5	0	0	5
Launch Lanes	53	33	13	7	106
Trailer Parking	1,135	699	258	570	2,662
Developed Camping/Day Use					
Total Camping Units	481	514	606	2,917	4,518
Camp Units w/ Hookups	53	89	0	2,367	2,509
Day-Use Picnic Tables	1,724	436	420	NS	2,580
Day-Use Picnic Shelters	65	13	8	NS	86
Swimming					
Length of Swim Beach (feet)	2,250	605	0	590	3,445
Trails					
Hiking (miles)	77	52	576	NS	705
Horse (miles)	4	45	460	NS	509
Off-Road Vehicle (ORV) Motorcycle	0	13	332	NS	345

NS = not surveyed
Source: IAC 1990

In 1995, the IAC published an update of its 1990 SCORP studies - the *Assessment and Policy Plan 1995-2001* (IAC 1995). In this update, the IAC stated that data presented in the 1990 SCORP documents remain up to date, and that projections to the year 2000 remain accurate. Therefore, the IAC did not conduct new surveys to develop supply and demand data.

Washington State Department of Natural Resources

Although the agency is the trustee of state timber and aquatic lands, which are managed to generate revenue from timber harvest for public education, the DNR also manages some state recreation resources. Secondarily, DNR manages public use of its lands and is a recreation provider. The DNR manages approximately 5 million acres of public trust lands - 3 million acres of uplands and 2 million acres of aquatic lands. DNR lands include developed recreation opportunities on 3,306 acres (IAC 1990). Hiking, equestrian use, mountain biking, off-road vehicle use (4-wheel-drive [4WD] and motorcycles), and other dispersed recreation opportunities occur on its 2.1 million acres of forest lands. The agency also manages Natural Resources Conservation Areas that may support recreation activities. DNR-managed lands offering recreation resources in the vicinity of Yale Lake include both Merrill Lake and the Siouxon Landscape Area (Figure 2.3-2).

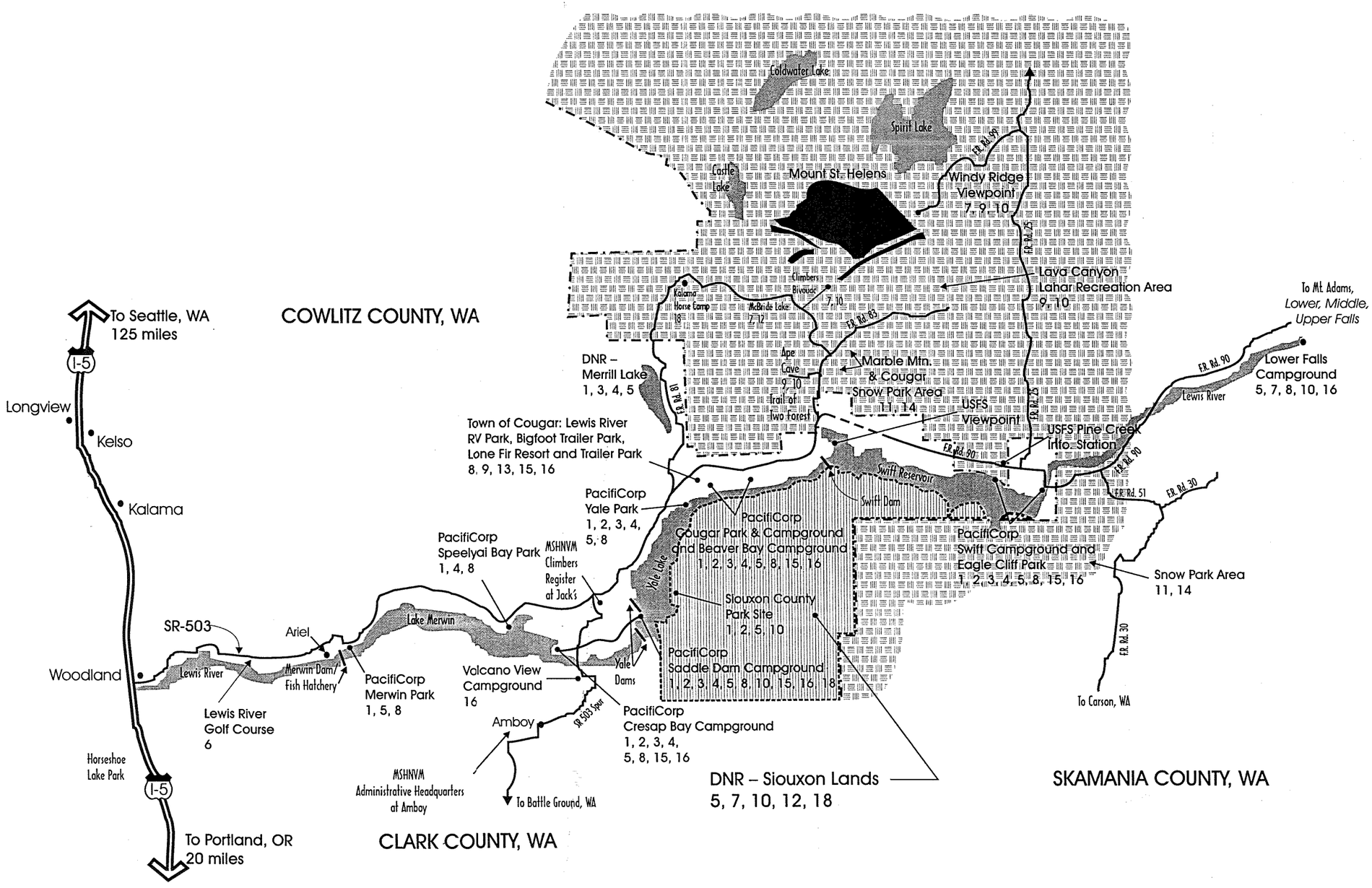
Merrill Lake - Merrill Lake, approximately 6 miles north of Cougar, Washington off of Forest Road 81, is a 300-acre lake that supports a trout fishery (fly-fishing only). Recreation facilities include 11 camp and picnic sites (no fee), 2 picnic-only sites, a toilet,

and a boat launch. The campground, which was closed most of 1996 and 1997 due to damage sustained from the February 1996 flood, is typically open April through October. The campground and boat launch have been rebuilt by DNR. Located near the border of the Monument, Merrill Lake provides access to several points of interest including Kalama Falls, Kalama Horse Camp, Blue Lake Trailhead, Kalama Springs, McBride Lake, and several viewpoints of Mount St. Helens.

Siouxon Lands - The Siouxon Landscape Area, located 20 miles east of Woodland in Clark and Skamania counties, is a 32,000-acre landscape managed by the Southwest Region of the DNR. DNR's management goal is to enhance public recreational opportunities without impacting trust obligations, which include timber management and protection of aquatic systems, wildlife habitat (e.g., for elk and bald eagle), and historical resources. The Siouxon Landscape Area is bounded on the north by Swift Reservoir and on the west by Yale Lake. Siouxon Peak, Iron Mountain, and Mitchell Peak are the prominent topographic features. The majority of the landscape is forested with a mixture of 60- to 90-year old stands of Douglas-fir and western hemlock, and some true fir at higher elevations. The landscape area has many miles of streams and wetlands that provide important water quality, fish, and wildlife habitat elements. Major streams include the lower portion of the mainstem of Siouxon Creek, the North Fork Siouxon Creek, Ole Creek, and Rain Creek.

Historically, hunting and fishing have been the primary recreation activities in the Siouxon Landscape Area; however, other types of trail-related recreation use have increased dramatically in the last several years, including horseback riding and hiking (DNR 1996). Several hiking groups are promoting the use of this area for day hikes close to the population centers of Portland and Vancouver. Other new users of the Siouxon Landscape Area include mountain bikers. DNR maintains the 11-mile Mitchell Peak hiking trail, completed in 1988. The trail descends to the Siouxon River and follows it several miles, crossing the river and passing Black Hole Waterfall before climbing to the peak of Mt. Mitchell, with spectacular views of Mount St. Helens. The trail begins on the S-2000 Road and ends at the old Mitchell Peak fire lookout site. The first 2 miles are built to horse-trail standards; the remaining 9 miles are built to hiking trail standards.

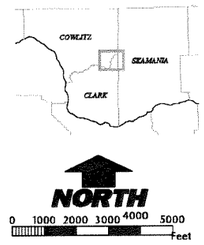
Access to the Siouxon Landscape Area is primarily by boat and logging roads. Boat access is possible from both Yale Lake and Swift Reservoir; vehicle access is possible from the south by private logging roads and State Route (SR) 503. DNR holds an easement along what is called the International Paper (IP) Road, which parallels the eastern shoreline of Yale Lake, for timber/fiber production access, but not for recreation use. Consequently, the IP Road may not be suitable for recreational use due to occasional truck traffic and bridge structural considerations at Siouxon Creek. Currently, the public uses the IP Road to gain unauthorized vehicle access to the eastern shoreline of Yale Lake. Locked gates generally block public access to the road; however, public use does occur when the gates are not operational or are left open. In addition, public access to the IP Road may be gained from ungated dirt roads on DNR timber property east of Yale Lake.



Legend

- Lakes/Rivers
- Boundary Line for Monument/GPNP
- MP = Milepost F.R. = Forest Service Road
- Federal Land (GPNF/Monument)
- DNR Siouxon Lands

1. Swimming
2. Water Skiing
3. Sailing
4. Boating & Boat Launch
5. Fishing
6. Golf
7. Viewpoints & lookouts
8. Picnic Area accessible
9. Interpretive trail & displays
10. Hiking accessible
11. Snow Mobile accessible
12. Hunting
13. Helicopter Tours
14. Cross Country Skiing
15. RV dump
16. Campground
17. Bicycle trails
18. Horse trails



Yale Hydroelectric Project

Figure 2.3-2
Recreation Resources in the Lewis River Basin

DNR recently completed a master plan for the Siouxon Landscape Area. Public meetings on the Siouxon Landscape Plan (DNR 1996) revealed greater recreation use of the lands than anticipated by DNR staff and an interest in increased opportunities for recreational use in the Siouxon. Equestrian groups in particular have been very active and are helping maintain trails. This is positive since DNR must rely upon volunteers to meet its goals. In response, DNR formed a Recreation Subgroup for the Siouxon. The group's goals are to work with the GPNF and others to expand trail opportunities, to develop trail maintenance agreements, and to meet future recreation needs. PacifiCorp is a member of this group.

As stated in the Siouxon Landscape Plan, DNR has the following plans for the Siouxon Landscape Area: (1) maintain vehicular access to the Siouxon, in cooperation with other public agencies; (2) reduce human pressures on wildlife populations; (3) provide quality hunting; (4) protect water quality; and (5) reduce road maintenance cost. Recreation opportunities, such as hunting, fishing, horseback riding, and hiking, will continue. In addition, DNR plans to develop a long-term trail maintenance plan.

Washington Department of Fish and Wildlife

In addition to the IAC and DNR, the WDFW has addressed environmental and habitat concerns within the watershed involving existing and future recreation uses. WDFW has completed a pilot project called the Integrated Landscape Management (ILM) plan for the Lewis and Kalama River Watersheds (WDFW 1995). The key objectives for the ILM are to develop an integrated plan for managing fish and wildlife in the Lewis-Kalama River watershed on a landscape basis over the next 20 years; the plan is intended to be a cooperative management plan developed between landowners, the public, and fish and wildlife managers. As such, the ILM plan was developed by the WDFW with the input and participation of a Citizen's Advisory Group that included PacifiCorp.

Specific goals related to recreation as stated in the ILM plan include:

- Provide for significant recreational opportunities (e.g., hunting and fishing) through artificial propagation programs.

- Secure, maintain, and enhance lands and sites for public wildlife and fishing recreational access and opportunity.

- Achieve public involvement from citizens interested in Washington's wildlife.

WDFW follows the mandate of the Washington Fish and Wildlife Commission to "maximize recreational opportunities for fish and wildlife constituents with the preservation, protection and perpetuation of the fish and wildlife resources" (WDFW 1995). The ILM focuses its recreation considerations on biological resources, particularly fish and wildlife species important for recreation (e.g., elk, deer, kokanee, steelhead, and coho). A key ILM concept is to establish acceptable biological limits for recreational opportunities consistent with naturally sustainable aquatic and marine animal populations, and provide for significant recreational opportunities through artificial propagation

programs. The plan notes the importance of steelhead, chinook, and coho salmon in the Lewis River in general, and kokanee for Yale Lake in particular. The plan also identifies the anticipated degradation of elk winter range due to human encroachment near the town of Cougar.

The Recreation Plan identified in the ILM focuses on the need to minimize and manage potential wildlife-recreation conflicts in the watershed, including Yale Lake. Critical habitat areas identified in the plan should be protected from all development, including recreation. Key habitats include caves, wintering areas for elk below 1,000 feet mean sea level (msl), and riparian areas. Other important habitats, such as cliffs and meadows, need to have recreational events carefully managed to avoid confrontations with wildlife during critical stages. Damaging activities such as riding all-terrain vehicles (ATVs), snowmobiles, and horses should not be allowed in these habitats (WDFW 1995).

2.3.1.2 Recreation Resources Managed at the Federal Level

The region surrounding the Yale Project contains 3 of the most significant recreation resources in the state managed by the federal government - GPNF, the Monument, and the CRGNSA. In addition to these significant resources in the immediate vicinity of the Yale Project, there are also several wilderness areas farther east of the project area (e.g., Mt. Adams and Indian Heaven), as well as Mt. Rainier National Park to the north. The most significant of these recreation resources are discussed below.

Gifford Pinchot National Forest

The GPNF, managed by the USFS, stretches along the western slopes of the Cascade Mountains from the Columbia River on the south to Mt. Rainier National Park on the north. Included among the 1.37 million-acre forest are Mount St. Helens and a portion of Mt. Adams. PacifiCorp's 3 Lewis River projects occur just south and west of the national forest boundary, in the vicinity of the forest's southwest flank. The headwaters of the Lewis River flow from within the national forest.

The forest contributes recreation opportunities to over 3 million people who live within a 2-hour drive. Outdoor recreation opportunities are abundant and range from primitive backpacking to highly developed campground sites. Old-growth trees provide aesthetic and recreation values. Scenery includes snow-capped mountains, glaciers, lakes, streams, waterfalls, and rock outcrops. Hiking trails offer people an opportunity for solitude. The forest also offers subsistence recreation opportunities including firewood gathering, hunting, fishing, and berry picking (USFS 1990). Water-related opportunities abound, with over 400 lakes, 200 waterfalls, and 1,360 miles of fish-bearing streams in the GPNF (USFS 1990).

Developed facilities in the GPNF include 55 campgrounds, 7 picnic grounds, 22 interpretive sites, 15 trailheads, and numerous swimming, boating, and observation sites (USFS 1990). Most of the White Pass Ski area is within the forest but is administered by the Wenatchee National Forest. Dispersed opportunities include 1,275 miles of road that can accommodate all vehicle types; a 1,068-mile network of trails to meet the needs of

different user types (e.g., hikers, equestrians), including a portion of the Pacific Crest National Scenic Trail; 270 miles of trails suitable for off-road vehicles (ORVs); and 1,360-miles of fish-bearing streams accessible to anglers. The Lewis River Trail (#31) and the Pacific Crest National Scenic Trail are located east of Swift Reservoir, over 15 miles from Yale Lake. Winter parking areas are also available for snowshoeing, cross-country skiing, and other winter sports (USFS 1990). In 1984, the forest received over 2 million recreation visitor days (RVDs) of use; 36 percent of these occurred in developed sites, while the remainder (64 percent) occurred as dispersed recreation (USFS 1990).

As noted above, the headwaters of the Lewis River are within the GPNF boundary. Recently, portions of the Lewis River have been recommended by the USFS for protection under the federal Wild and Scenic River Act. Between the river source in the Mt. Adams Wilderness and the maximum pool at the mouth of Swift Reservoir, 4 miles of the river have been recommended for designation as Wild, and 29 miles have been recommended for designation as Scenic (USFS 1990). The scenic value of the Lewis River is outstanding because of 5 large waterfalls on the river, as well as many waterfalls on the side streams. Recreation values are considered outstanding due to excellent trout fishing and challenging river rafting opportunities. In addition, the East Fork Lewis River, which is the heaviest used river in the forest, is also considered eligible for inclusion in the federal Wild and Scenic River System, from the source to its confluence with the Lewis River (43 miles) (USFS 1990). The East Fork provides year-round opportunities for drift boat fishing, as well as outstanding opportunities for rafting, kayaking, fishing, and boating.

The USFS manages the national forest according to the Land and Resource Management Plan (LRMP) for the GPNF (USFS 1990, with updates). The LRMP establishes forest-wide goals and objectives; standards and guidelines applying to future activities; management direction; and monitoring and evaluation requirements for the multiple uses of the forest, including recreation. None of the management considerations relate directly to the Yale Project, as PacifiCorp's project lands are entirely outside of the national forest boundary. Management of the Monument, which is within the GPNF, is addressed under a separate management plan, as discussed below.

Mount St. Helens National Volcanic Monument

The 1980 eruption of Mount St. Helens created a recreation resource of international significance directly northeast of the Yale Project. The eruption devastated a 235 square mile area and produced one of the most spectacular landmarks in the nation. The volcano blew to the north, sparing the Yale Lake area. However, some mud flows entered the Lewis River basin. The project vicinity, however, provides access to the southeastern flank of the volcano via SR 503, Lewis River Road, and a series of USFS roads; this portion of the Monument is the main access for climbers, and includes a number of sightseeing opportunities such as Ape Cave and Lava Canyon; access to other areas of the Monument, including the Windy Ridge Viewpoint, are provided by more distant but linked routes from the Yale Project vicinity (the Mount St. Helens "loop").

In August 1982, Congress created the 110,330-acre Monument within lands previously designated part of the GPNF plus other lands. The purpose of Monument designation is to protect geologic, ecologic, and cultural resources for scientific study and research, while providing for compatible recreation and interpretation. The Congressional act designated the USFS as the federal agency responsible for managing this unique resource, and it established a special management unit to manage the Monument within the GPNF. The Monument is located in the Central Skill Area of the GPNF, 1 of 4 geographical management units designated by the USFS. The Monument provides a variety of recreation opportunities, including developed facilities such as campgrounds, interpretive centers and viewpoints, and maintained trails, as well as dispersed activities such as fishing, hunting and trapping, horseback riding, mountain climbing, cross-country skiing, snowboarding, snowmobiling, and subsistence use.

The Monument is a significant visitor attraction in the region, with approximately 4.2 million visitors in the Central Skill Area in 1995, and interest is increasing (pers. comm., D. Siegel, the Monument, Amboy, WA, November 18, 1996). It has become a world famous tourist attraction in the last 19 years since the volcano erupted. Three newly constructed visitor interpretive centers operated by the USFS, Cowlitz County, and the Weyerhaeuser Company have focused the majority of visitors to the northwest side's blast devastation area. These world-class visitor centers are located along SR 504 (the Spirit Lake Memorial Highway). The scenic undevastated south side of the mountain, however, still receives extensive visitor use and the southern boundary of the Monument is within a very short drive of the Yale Project. PacifiCorp owns approximately 300 acres within the Monument boundary which are located in 2 parcels north of Beaver Bay Campground and the Swift No. 2 power canal. Many visitors to the Monument use Lewis River Road to access the southern and eastern portions of the Monument's Windy Ridge observation area or to "do the loop." Sightseers, climbers, hikers, backpackers, cave explorers, snowmobilers, and cross-country skiers use the southern route to access destinations within the Monument and GPNF. Many of these visitors stop at project facilities as they travel along the roadway, especially Yale Park.

From the Cougar area, visitors may travel northward on Forest Road 81 to Kalama Horse Camp, Goat Mountain Research Natural Area, and Sheep Canyon located inside the Monument or GPNF. Just north of Swift No. 1 dam, visitors may also travel north on Road 83 to several more destinations including Ape Cave, Climbers' Bivouac, 2 snow areas, Lava Canyon day use area, and several trailheads. Climbers receive USFS permits to climb Mount St. Helens at a location west of Yale Park on Lewis River Road. Still other visitors travel farther east on Lewis River Road stopping near Swift Reservoir at the GPNF Pine Creek Information Station. The GPNF directs many campers at this location to area campgrounds, including PacifiCorp and GPNF facilities. Other recreation facilities used by visitors to the Monument include the Kalama Springs Campground, Lava Cast Picnic Area, Windy Ridge, and Lahar Viewpoint.

Columbia River Gorge National Scenic Area

The Columbia River has provided a multitude of outdoor recreation opportunities for residents of the Pacific Northwest for decades. Its magnificent panoramas, waterfalls, and rock formations have awed sightseers in large numbers since the construction of the Historic Columbia River Highway during and after World War I. Excellent opportunities for wind surfing, fishing, hiking, boating, sightseeing, and other outdoor activities abound. In recent years, the recreation identity of the Gorge has expanded with the international recognition of its provision of prime windsurfing waters and access (USFS and CRGC 1992). The Columbia River Gorge is approximately 26 miles south of the Yale Project, accessible to visitors via SR 503, heading south from the Lewis River projects.

To protect and enhance the recreation, scenic, cultural, aesthetic, and economic resources in the Gorge, Congress established the Columbia River Gorge National Scenic Area (CRGNSA) in 1986, the only such National Scenic Area in the country. The CRGNSA covers portions of Oregon and Washington, including 3 Washington counties (Clark, Skamania, and Klickitat) and 84 miles of river frontage. Only the southeast corner of Clark County contains lands designated as CRGNSA. All of the Columbia River shoreline located within Skamania County, however, is within the National Scenic Area designation. None of PacifiCorp's Lewis River Hydroelectric project lands are within or directly adjacent to CRGNSA-designated lands; Swift Reservoir to the east is the closest PacifiCorp project to the National Scenic Area boundary.

The USFS and the Columbia River Gorge Commission (CRGC) are the designated lead agencies responsible for implementing the CRGNSA Act, which provides for the protection and enhancement of recreation resources and river access through coordinated and controlled land use and development. Management of recreation resources in the CRGNSA is specified in the Management Plan for the Columbia River Gorge National Scenic Area (USFS and CRGC 1992). The plan specifies goals, policies, and objectives for protecting recreation resources in the CRGNSA. However, none of the management directions relate directly to the Yale Project given the 26-mile distance between the 2 resource areas.

2.3.1.3 Recreation Resources Managed at the Local Level

PacifiCorp's Lewis River hydroelectric projects (i.e., Merwin, Yale, and Swift) are located within 3 Washington counties - Clark, Cowlitz, and Skamania - all of which have some form of designated plans that identify public recreation resources in the area and plans for future facilities. Existing recreation resource opportunities in each of these counties are summarized below, along with a description of each county's management plan(s) addressing parks, open space, and recreation.

Clark County

The south or eastern shorelines of PacifiCorp's Lewis River projects (including Yale Lake) are located in Clark County, a 630-square mile county bordered on the south by the

Columbia River and on the north by the Lewis River (see Figure 2.1-1). The Yale Project is in the northeast corner of the county. The 1990 county population was 238,058 (U.S. Bureau of the Census 1992), with the largest incorporated city (Vancouver, Washington) contributing a population of approximately 46,380. The county's topography and natural resources provide numerous and varied recreation opportunities; a countywide survey in 1992 identified hiking, picnicking, wildlife observation, camping, and swimming as the key recreation opportunities and interests.

Clark County owns and manages approximately 3,349 acres of park and open space land, including 10 regional parks (1,797 acres), 3 special facilities (162 acres), and 1,390 acres of conservation and greenway systems (Clark County 1994b). The DNR is the largest public land owner in Clark County; the DNR's most extensive land holdings in Clark County include approximately 60,000 acres in the Yacolt Burn Multiple Use Area in east Clark County, as well as the Siouxon Landscape Area, both of which offer recreation opportunities such as fishing, hiking, hunting, horseback riding, off-road vehicle use, and motorcycle riding. In addition, approximately 1,180 acres of the GPNF, managed by the USFS, are located within east and north Clark County; national forest lands provide opportunities such as camping, hiking, hunting, fishing, and horseback riding (Clark County 1994b). Other public lands in the county that are more distant from the Yale Project include wildlife habitat lands managed by the U.S. Fish and Wildlife Service (USFWS) and the WDFW. Numerous privately owned and operated recreation facilities exist throughout Clark County, including those associated with PacifiCorp's Lewis River hydroelectric projects; however, a comprehensive inventory of private facilities in the county has not been conducted.

Clark County owns an undeveloped park site on the eastern shoreline of Yale Lake adjacent to DNR and PacifiCorp property in an area called the "Siouxon flats" (Figure 2.3-2). The site has approximately 0.5 mile of shoreline and is accessed by the privately owned IP Road or by boat. No utilities are currently available to the flats area. The County constructed 8 boat-in campsites at this location in the 1960s. However, because of difficulties maintaining the remote site, an economic recession, and uncertainty surrounding continued road access for park maintenance use, the County removed the facilities in the early 1980s. Clark County is considering re-establishing a boat-in campground and day-use picnic area at this location sometime in the future, possibly in conjunction with DNR and/or PacifiCorp.

The County also envisions a multi-use nonmotorized trail along the eastern shoreline of Yale Lake, with 2 day-use sites and toilet facilities. These improvements are not in the County's 6-year Capital Facilities Plan, but are included in the Clark County Trails & Bikeway System Plan (Clark County 1992b). The County's concept is to convert the existing paved road to a trail from Yale Dam north to the Cowlitz County line. The long-range objective would be to connect La Center on the west to Yale Dam on the east and north to the Monument. The County also identifies the Yale transmission line right-of-way (ROW) corridor as a possible trail route extending along the south side of Lake Merwin. The County's plan identifies coordination with PacifiCorp as instrumental to this process.

Management of parkland and open space in Clark County is specified in the 1994 Clark County Parks, Recreation, and Open Space Plan (Clark County 1994b). As stated in the plan, the County's mission regarding parks and open space is:

> "to maximize the quality of life in Clark County by providing regional open space, trails, parks and recreational opportunities and facilities, and to plan for, acquire, restore, enhance, preserve, develop, and manage these facilities and natural resources in such a manner as to afford the maximum benefit to the community."

The plan includes an inventory of existing conditions in the county, as well as identifying desired future conditions and goals, policies, and objectives. The plan specifies an acquisition goal of 20 acres of regional parkland per 1,000 residents for the future, which will provide natural and/or artificial qualities for outdoor recreation activities such as picnicking, boating, fishing, and camping. Overall long-term goals of the County include providing a park, recreation, and open space system providing personal, social, economic, and environmental benefits to county residents. Funding strategies for land acquisition and preservation include county bonds, state funds, park impact fees, real estate excise taxes, sales taxes, and regular property taxes. Cooperation with PacifiCorp on parks and open space lands is not specifically mentioned in the plan, but it does mention the acquisition of regional parkland along upper Merwin, lower Merwin, and the North Fork Lewis River as County objectives to improve camping, boat launch, and water access facilities. The County's focus now is on close-in urban parks in the Vancouver area; its future focus will be on additional regional parks countywide.

Cowlitz County

The entire north and western shoreline of Yale Lake is located in Cowlitz County. The 1,146 square mile county is bordered on its southeastern edge by the Lewis River, on its southwestern edge by the Columbia River, and on the east edge by the Cascade Mountain range (including a portion of the Monument and the GPNF). The northern boundary is near the SR 504 corridor, which runs parallel to the Toutle River and provides access to the northwestern portion of the Monument. The county topography is quite varied, with elevations ranging from approximately sea level along the Columbia River to approximately 4,000 feet on the western slopes of Mount St. Helens. The county's natural resources provide numerous and varied recreation opportunities, including hiking, camping, visiting interpretive centers, fishing, picnicking, river boating, flatwater recreation, hunting, off-road vehicle use, and bicycling. The 1990 county population was 81,806 (U.S. Bureau of the Census 1992).

As documented in the 1994 Cowlitz County Comprehensive Park Plan (Cowlitz County 1994), county recreation supply and management focus on 3 separate areas in the county: (1) sites along the Columbia River; (2) along the SR 504 corridor, which extends to the northwestern flank of Mount St. Helens; and (3) along the I-5 corridor. All high and moderate priority recreation sites occur in these 3 areas, which do not include the Lewis River corridor. Key recreation sites addressed in detail in the plan include Riverside County Park (along the I-5 corridor near Lexington), Willow Grove Beach (on the

Columbia River), Hoffstadt Bluffs (on the SR 504 corridor), Woodbrook Park (east of the I-5 corridor near Kelso), a viewpoint near Mount St. Helens on the Spirit Lake Highway, and the Silver Lake Mount St. Helens National Volcanic Monument Visitor Center, which the County participated with the USFS to construct.

The County plan references and relies on IAC data to estimate recreation participation and future demand for recreation needs in the region (these same data are summarized in Section 3.3.11). The plan, however, does not include statistics such as acreage of County-owned or managed open space, parkland, or recreation sites.

Although the entire northern shore of the Lewis River corridor is in Cowlitz County, the County does not own or manage significant recreation resources (i.e., parkland or open space) along the Lewis River. The plan lists no existing or proposed County sites or priorities in the Lewis River corridor, with the exception of the Finn Hall Historical Marker - an historical site 3 miles east of Woodland commemorating the early Finnish settlers in Cowlitz County. The plan does mention private industry (such as PacifiCorp and others in the Cougar area) as providers of recreation opportunities along the Lewis River corridor.

All of PacifiCorp's developed recreation facilities associated with the Merwin and Yale projects are located in Cowlitz County. The plan identifies Saddle Dam Campground, Yale Park, Cougar Park, Beaver Bay Campground, Merwin Park, Speelyai Bay, and Cresap Bay Campground as "public" parks provided by private industry. According to the plan, "Merwin, Yale, and Swift reservoirs and parks operated by Pacific Power & Light Company (PP&L, a PacifiCorp division) are providing extensive and valuable recreation facilities to the Southwest Washington region. Cowlitz County should continue to work with PP&L to meet community needs" (Cowlitz County 1994).

The plan also lists the following privately owned recreation resources along the Lewis River corridor:

- Big Foot Trailer Park (18 campsites) in Cougar
- Lewis River RV Park (70 campsites) on Lewis River Road east of Woodland
- Lone Fir Resort and Trailer Park (32 campsites) in Cougar
- Volcano View Campground (75 campsites) at SR 503/Speelyai Hill near Saddle Dam Campground (was closed in 1998)
- Lewis River Golf Course on Lewis River Road in Woodland

In addition to providing an inventory of recreation resources in the county, the plan identifies the following long-range goals and objectives:

- Enhance and supplement Cowlitz County's quality of life by providing a variety of lands for open space, recreation facilities, shoreline access, and to ensure a land base for future public needs.

- Continue a high quality maintenance and operation of existing facilities, pursuing cost effectiveness and durability in new facility construction to ensure maintenance costs are kept as low as possible.

- Promote tourism by development of viewpoints, picnic sites, interpretive information, and other services to enhance a visitor's experience.

- Create "land bank" sites for future generations to utilize for various programs to benefit the public health, safety and welfare; and provide for open space, shoreline access, park, and recreation sites (Cowlitz County 1994).

Skamania County

Skamania County, which covers 1,672 square miles, is bordered on the south by the Columbia River, on the east by Klickitat and Yakima counties, on the west by Clark and Cowlitz counties, and on the north by Lewis County. The Yale Project is just west of Skamania County; the only portion of the study area located within the county is the Swift bypass reach. However, all of Swift Reservoir is within the county. Portions of 2 federally managed recreation resources occur within Skamania County - the CRGNSA and the Monument. In addition, portions of the GPNF are located in Skamania County. The county is sparsely populated with a 1990 population of 7,975 (U.S. Bureau of the Census 1992).

Key recreation-related priorities identified in Skamania County's Parks and Recreation Comprehensive Plan (Skamania County 1991) include waterfront facilities, neighborhood and community parks, sports fields, off-road vehicle use, historical resources, scenic areas, open space, specific programs, special use areas, and sailboarding. Skamania County is also diversifying its local economy by placing greater emphasis on the recreation industry as a means to replace jobs lost in the declining timber industry. As with Cowlitz County, Skamania County's plan focuses management attention in areas outside of the Lewis River corridor-in particular the CRGNSA and the Mount St. Helens area. Recreation sites identified as significant to local populations are all located along the gorge, and no capital improvement needs identified for the county are in areas near PacifiCorp facilities.

Although the County has not published statistical data such as acreage of County-owned or managed open space, parkland, or recreation sites, the plan does list the top 10 recreation activities of local residents:

- picnicking
- fishing
- camping
- bicycling
- nature walking
- hunting
- sightseeing
- movies
- swimming (indoors)
- swimming (outdoors)

Existing recreation facilities in Skamania County in the vicinity of Swift Reservoir include Swift Campground (20 acres, owned by DNR and leased to and operated by

PacifiCorp), North Woods Track (88 acres), Eagle Cliff Park (1 acre, owned and operated by PacifiCorp), and Pine Creek Center. In addition, the eastern portion of the Monument is located in Skamania County; recreation sites in the Skamania County portion of the Monument include Ape Cave, Lava Canyon, the Climbers' Bivouac, Windy Ridge, Spirit Lake, and Ryan Lake. Other recreation facilities and resources in the county but outside the Yale Project vicinity include numerous camps and sites in the GPNF, managed by the USFS (e.g., Pole Patch, Adams, Cat Creek, and Spring Creek camps); and many shoreline and hillside sites along the Columbia River Gorge provided by federal, state, and local agencies as well as private industry. Other federally managed areas providing recreation opportunities in the county include the Trapper Creek Wilderness, Wind River Experimental Forest, Indian Heaven, and the Mt. Adams Wilderness. Skamania Lodge, a successful new resort and conference center located within the CRGNSA, is a new recreation resource in the county.

2.3.2 Lewis River Corridor Recreation Resources

Recreation resources along the Lewis River corridor are offered primarily by the private sector, with the majority of developed facilities associated with PacifiCorp's 3 Lewis River hydroelectric projects. In addition to recreation opportunities provided by PacifiCorp, several other notable facilities are located along Lewis River Road from Woodland to Cougar (see Figure 2.3-2). This section focuses on private sector recreation facilities in the Lewis River corridor, providing a slightly broader focus than the 0.5-mile buffer surrounding Yale Lake. Information on Yale Lake facilities is provided in Section 2.3.3; recreation facilities outside the Lewis River corridor (including the Monument), or associated with the 3-county area in the project vicinity, are addressed above in Section 2.3.1, including publicly managed facilities in the Lewis River corridor.

2.3.2.1 Lewis River Hydroelectric Projects

Yale Lake is the middle lake in a series of 3 large PacifiCorp hydroelectric projects on the Lewis River that have extensive recreational use. The construction of Merwin, Yale, and Swift dams on the Lewis River created scenic reservoirs that offer exceptional recreational opportunity in a unique, rugged natural environment close to a large urban population in Clark County and Portland. For many years, PacifiCorp's developed recreation facilities on the 3 projects have provided public access to project lands and waters offering exceptional recreational opportunities including boating, camping, picnicking, and fishing.

Recreation development at the 3 lakes ranges from more intense/active recreation activities and a day-use orientation at Lake Merwin, closest to the I-5 corridor (approximately 12 miles) and the population base, to more primitive/rural recreation activities and a camping orientation at Swift Reservoir, farthest from the I-5 corridor (approximately 32 miles). Yale Lake, in the middle of this continuum, offers a balance between day use and camping activity, and is close enough to the major highways and the population base to be a popular recreation destination for urban residents. Developed recreation facilities for PacifiCorp's 3 Lewis River hydroelectric projects are summarized in Table 2.3-2.

Table 2.3-2. Total developed recreation facilities at PacifiCorp's 3 Lewis River hydroelectric projects.

Project	Campsites	Group Sites	Picnic Sites	Boat Launches (Lanes)
Lake Merwin	58	15 (1 site)	180	2 (5 lanes) + 3 below dam
Yale Lake	123	30 (2 sites)	66	4 (9 lanes)
Swift Reservoir	93	0	16	1 (2 lanes)
Total	274	45	262	10

Information for Lake Merwin and Swift Reservoir is presented in this FTR to provide a broader context for management decisions for the Yale Project. Developed and dispersed recreation facilities associated with the Merwin and Swift projects are summarized below; more detailed information on recreation resources associated with the Yale Project (the project study area) is provided in Section 2.3.3.

Merwin Project

The Merwin Project, located west of Yale Lake, is bisected by Clark County to the south and Cowlitz County to the north. Of the 3 PacifiCorp Lewis River Projects, it is closest to the I-5 corridor and therefore most easily accessible to the major metropolitan areas of Portland and Vancouver. Licensed in 1929 and relicensed in 1983, the Merwin Project (FERC Project No. 935) offers the most developed recreation facilities in the corridor, with a focus on day-use activities such as picnicking, swimming, and boating.

Lake Merwin is 12 miles long and covers 4,404 surface acres at elevation 240 feet msl; the reservoir provides approximately 32 miles of shoreline. The surrounding terrain is steep and heavily wooded. Recreation development on the reservoir has been limited because of the steep topography. Although vehicle access to the area is relatively good from the west, east, and north, direct access to the south shoreline is limited.

The 3 main developed recreation sites on the reservoir include Merwin Park at the west end near the dam, Speelyai Bay Park on the north shore, and Cresap Bay Campground on the east end (see Figure 2.3-2). Built in 1934 (nearly 30 years before federal regulations required recreation facilities at hydro projects), Merwin Park is the oldest recreation development in PacifiCorp's Lewis River system. It is a 16-acre day-use park with 900 feet of shoreline and developed facilities for picnicking and swimming. It is located on the north abutment of the dam and includes parking for approximately 500 vehicles. Speelyai Bay Park, built in 1958, is a 4-acre park used for picnicking, swimming, and boat launching; the parking area is capable of handling about 250 vehicles, or 100 vehicles with boat trailers. The newest of the 3 main facilities, Cresap Bay Campground, is a combination campground and day-use site with boat launch facilities and approximately 1 mile of shoreline access. The 120-acre facility includes 58 campsites, 20 picnic sites, 1 group campsite (with 15 individual sites), and 1 boat launch with 3 lanes. Road access to Cresap Bay is directly opposite the access road (Frasier Road) to Saddle Dam Campground at Yale Lake off of the SR 503 Spur (see Figure 2.3-2). In addition to these developed facilities, the Merwin Project also provides dispersed opportunities such

as boat-in camping and day use, fishing, and bike riding. In addition, there is a 1.5-mile hiking trail with a trailhead at Cresap Bay Campground.

Swift Project

Set in steep, wooded terrain east of Yale Lake, Swift Reservoir is 12 miles long with a water surface area of 4,620 acres at full pool elevation (1,000 feet msl). Shoreline length at full pool is approximately 35 miles. Like the Merwin Project, steep terrain limits access to much of Swift Reservoir. The Swift Project (FERC Project No. 2111) was licensed in 1956 and is located entirely in Skamania County.

PacifiCorp operates 2 developed recreation sites on Swift Reservoir - Swift Campground and Eagle Cliff Park, both at the east end of the reservoir (see Figure 2.3-2). Swift Campground, built in 1959, is a 40-acre site with 3,500 feet of shoreline. Most of the site is committed to existing recreation development with 93 campsite units in the wooded areas, and a boat launch, parking lot, day-use area, and swimming beach on the open area at the west end of the site. Eagle Cliff Park, also built in 1959, is a day-use only facility located at the extreme eastern end of the reservoir (directly where USFS Road 90 crosses the Lewis River). The site was partially destroyed by flooding associated with the Mount St. Helens eruption, but was repaired and reopened by PacifiCorp. The new site is approximately 1 acre in size and offers approximately 10 picnic sites, a restroom, and a parking area. Nearby is Eagle Cliff Store, a private business. Above the western end of the reservoir, there is a USFS viewpoint with views of Mount St. Helens and Swift Reservoir.

In addition to these developed facilities, Swift Reservoir offers numerous dispersed recreation opportunities, mostly related to fishing. Popular nearby dispersed sites include the Swift No. 2 power canal, Marble Creek, Drift Creek, Diamond Creek, and Camp Creek. The Swift Reservoir area also offers hiking opportunities, including the USFS Lewis River Trail (#31), which runs parallel to the Lewis River and connects to numerous other trails in the GPNF. The Curly Creek trailhead is located just east of the reservoir.

2.3.2.2 Other Private Sector Recreation Facilities Along SR 503 and Lewis River Road

SR 503 and Lewis River Road connect the I-5 corridor to the west with the southern and eastern portions of Mount St. Helens, as well as access to Mt. Adams and the Columbia River Gorge. Access to all developed recreation facilities along PacifiCorp's 3 Lewis River hydroelectric projects is provided directly via SR 503 and Lewis River Road. To support the increasing demand of recreationists traveling to these destinations and beyond, private sector development along Lewis River Road has increased steadily over the years. In addition to PacifiCorp-owned and operated campgrounds and day-use areas on the Lewis River, there are numerous private campground facilities in the vicinity, the majority catering to RV campers by providing hookups. The Volcano View Campground (75 campsites) is located along the SR 503 Spur which also provides access to Saddle Dam and Cresap Bay and beyond (closed in 1998); the Lewis River RV Park offers 70 campsites directly adjacent to Lewis River Road. There are several campsites offered in the immediate vicinity of the town of Cougar as well, including the Bigfoot Trailer Park

(18 campsites) and the Lone Fir Resort and Trailer Park (32 campsites, plus 17 motel units). A few smaller motels and bed and breakfasts, such as the Lone Fir Resort, operate along Lewis River Road, primarily concentrated near Woodland and Ariel.

In addition, there are a number of private developments along the 3 reservoirs. The Northwoods development includes approximately 75 summer homes on Swift Reservoir, some of which include boat docks; some of the homes are used year round. Also on Swift Reservoir, 48 home sites on private property are located at the Swift Creek Estates, which is near the access road to the Swift Campground. Approximately 1/3 of these private lots are on shoreline property and include private docks; a community docking facility is available for the remainder of the lots. At Lake Merwin, the King's Landing development includes approximately 15 to 20 permanent residential homes and trailers on the north shore, some with docks; all of these are on private land. Also on the north shore, 40 acres of PacifiCorp-owned land is leased for residential use at a development called Woodland Park. Woodland Park contains 32 units, some with private permitted docks. On the south shore of Lake Merwin, Campers' Hideaway includes approximately 1,500 permanent trailers on private property. The waterfront area is leased to Camper's Hideaway by PacifiCorp. The leases include reservoir access, a boat launch, a marina, and parking. At Yale Lake, in the vicinity of Speelyai Canal on the west shore, the Neville residential subdivision includes approximately 10 permanent lots. Although direct waterfront access is provided for some lots, there are no permits for dock facilities.

A variety of other private businesses support visitor activity in the corridor as well. Bluebird Helicopters, in Cougar, provides helicopter tours of Mount St. Helens. Several restaurants and services are sustained by recreation-related traffic in the project vicinity. Jack's Restaurant, at the intersection of Lewis River Road and the SR 503 Spur to Amboy, is also the location of the USFS's climber registration for regulated ascents up Mount St. Helens. General stores selling recreation equipment, souvenirs, guidebooks and maps, and local crafts are concentrated in the town of Cougar. Farther west, developed facilities such as hotels, motels, and large stores are concentrated in the Woodland area; the Yale Project is an approximate 40-minute drive from Woodland.

In February 1996, several days of heavy rain-on-snow events in the Cascade Mountains triggered severe slides in the Lewis River corridor. In addition to peak flows that flooded downstream communities such as Woodland, several key access roads to the Monument, GPNF, Merrill Lake, and locations east of Swift Dam were washed out. Notable road closures included Forest Roads 90 and 83, and Forest Road 81. These roads have been repaired and are essential for access to Mount St. Helens from the southeast. Although the economic impacts to private sector businesses have not been calculated, it is clear from talking to business operators that the closed access roads along and beyond the Lewis River corridor resulted in decreased tourism oriented to the Monument and Swift Reservoir in the summer of 1996. As roads were reopened in 1997, business levels increased.

In 1995, interested residents and business leaders of the Lewis River Valley in Cowlitz County joined together to prepare a Strategic Action Plan specifically for the Lewis River

corridor (Lewis River Action Committee 1995). The working vision statement for the Action Plan is stated as follows:

> "The Lewis River Valley is a community which offers its diverse residents a rural lifestyle, open space, wildlife habitat, forests, recreation, public services and increased revenues from tourism through creative land use planning and respect for private property."

The Action Plan includes an element specifically addressing recreation resources in the Lewis River corridor, with a goal statement to "improve recreational access for local residents with particular focus on youth activities and cultural events, and encourage recreation for visitors such as trails, tour routes and natural experiences that will have low impact on community and environmental resources." In its Action Plan, the committee identified the following priority recreation projects in the Yale Project study area:

- Designating SR 503 (Lewis River Road) as part of a 2- or 3-mountain scenic loop with Mount St. Helens, Mount Rainier, and (perhaps) Mount Adams. SR 503 was designated as a State Scenic and Recreation Route Highway in 1993.

- Creating hiking, nature, and fitness trails throughout the Lewis River corridor, including along lakes and within USFS lands - A potential trail linking the town of Cougar to Cougar Park was identified as a priority, as well as organized day hikes from Cougar Park to Beaver Bay.

- Creating kokanee and elk viewing/interpretive education areas – Fish viewing would be ideal along Cougar Creek, particularly if parking is provided. Interpretive signing for elk viewing could occur at several areas in the valley (WDFW and USFWS should be consulted).

- Expand campground facilities - The Action Plan calls for an evaluation of opportunities and resources to expand local area campgrounds, including potential public/private partnerships. It identifies a need for group campgrounds to serve educational users.

- Expand youth activities - The Action Plan calls for expanding summer recreation programs for youth, including hiking opportunities.

These priority projects are examined as part of the recreation needs assessment (Section 5.0) and in potential enhancement measures to be included in the License Application.

2.3.3 Yale Lake Recreation Resources

The focus of the recreation analyses conducted as part of the relicensing process is on Yale Lake. Yale Lake offers a variety of water- and land-based recreation opportunities for both day-use and overnight visitors. Ten miles long, the lake covers 3,800 surface acres and has 27 miles of shoreline at recreation pool level. Popular recreation activities include picnicking, boat and bank fishing, power boating, small boat sailing,

windsurfing/sailboarding, canoeing/kayaking, swimming, water skiing, PWC/jet ski use, hiking and walking, horseback riding, bicycling, group camping, and RV and tent camping. Trail use by hikers and mountain bikers is generally limited to existing roads, such as the IP Road and Lewis River Road, and a trail south of Speelyai Canal. Horseback riding occurs primarily along a trail from the Saddle Dam area to Speelyai Canal and in the Siouxon drainage. Dispersed camping occurs primarily along the eastern lake shoreline and Siouxon Creek; some dispersed camping does occur along the bypass reach of the Lewis River upstream of the Yale Project. Sightseeing, nature observation, and outdoor photography are also popular activities. Cave exploration and rock climbing are also popular because of lava flows and caves in the eastern part of the area and nearby Ape Cave.

The focus of recreation at the Yale Project is on water-based activities on the reservoir. Yale Lake is open for water-based recreation use year round. Pool level varies from approximately 470 feet msl during the non-peak season at drawdown to a maximum of 490 feet msl; PacifiCorp maintains a recreation pool level of between 480 and 490 feet msl during the peak recreation season (Memorial Day to Labor Day weekends) to accommodate boaters. Most vessels on Yale Lake are power boats that are trailered by vehicles to the water. These boaters are primarily fishing for kokanee, picnicking on the shoreline, and water skiing. Other vessel types used on the lake include inflatable rafts, canoes, jet skis/PWC, small sailboats, kayaks, sailboards, and pontoon boats. Annual sailboat regattas are held during 2 or more summer weekends. Regatta participants launch from Cougar Camp and total between 25 and 75 boats (small trailered sailboats such as Hobie Cats). Boating markers are placed in the water to mark hazards.

Both developed and dispersed recreation facilities occurring in the Yale Lake portion of the study area are summarized below. In addition to describing the recreation activities available at these developed and dispersed sites, this section of the FTR also summarizes the condition of these facilities; facility condition will be a key factor in future management decisions, and is directly linked to the recreation needs assessment portion of the recreation analyses (Section 5.0).

2.3.3.1 Developed Facilities

As illustrated in Figure 2.3-3, PacifiCorp owns and operates 5 developed recreation facilities on Yale Lake: Saddle Dam Campground, Yale Park, Cougar Park, Cougar Campground, and Beaver Bay Campground. Key elements of the developed facilities are discussed below, organized by facility type - campgrounds and day-use facilities. Compliance with guidelines of the Americans with Disabilities Act (ADA) is addressed in a separate subsection following the discussion of dispersed facilities. A detailed inventory of existing recreation facilities is presented in Table 2.3-3; the condition of these same facilities is summarized in Table 2.3-4.

Campgrounds

PacifiCorp owns and operates 3 developed campgrounds on Yale Lake: Saddle Dam, Cougar Camp, and Beaver Bay (Figure 2.3-3). Cougar Camp and Saddle Dam

Campground are open for the peak recreation season occurring from late May (Memorial Day weekend) to early September (Labor Day weekend). Beaver Bay Campground is typically open longer, from late April to late September, to accommodate early spring fishing season and fall hunting season visitors. Recreation facilities at each of the campgrounds are discussed below.

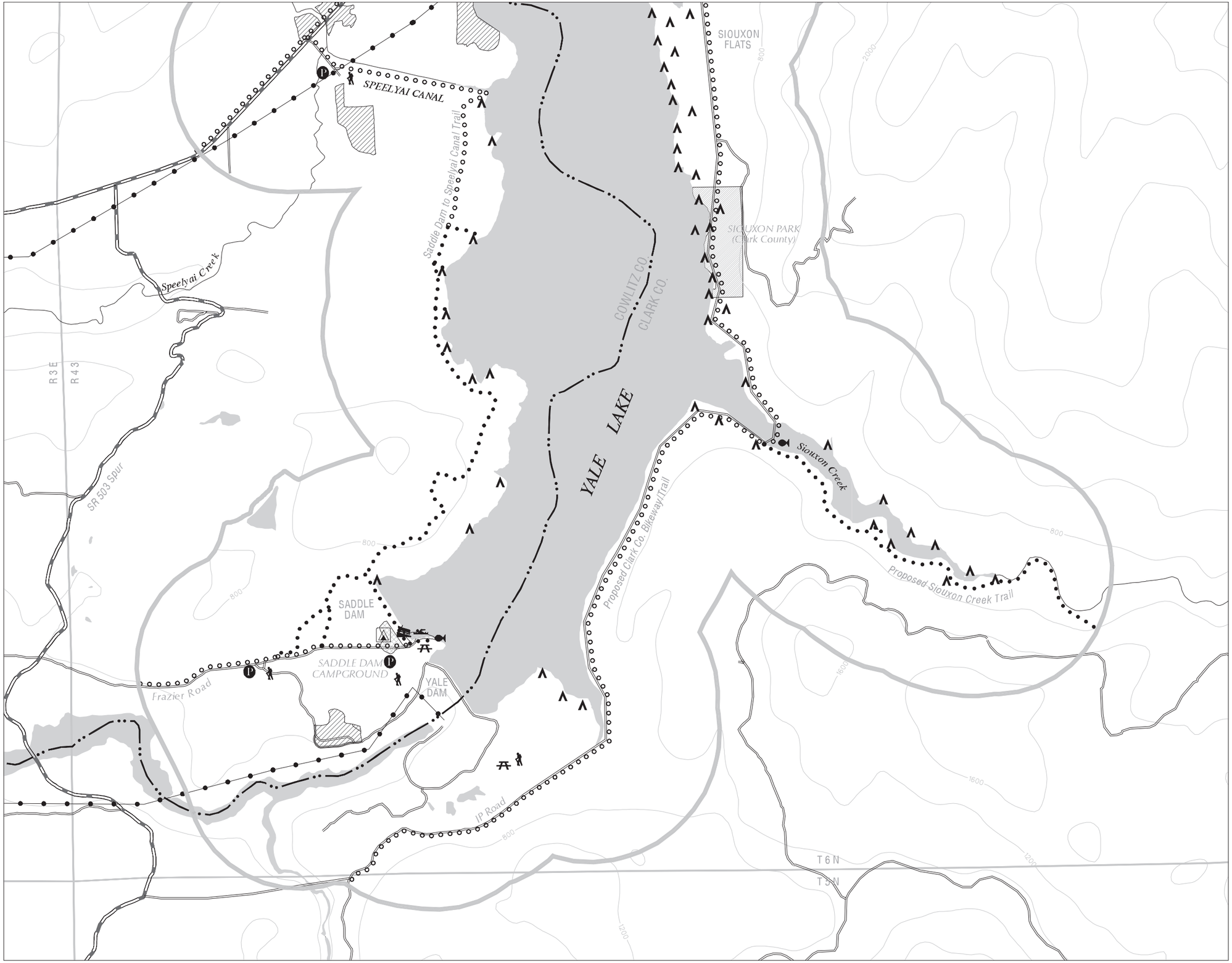
Saddle Dam Campground - Of the 3 PacifiCorp campgrounds, Saddle Dam Campground is the smallest (10 acres) and offers 15 individual tent or RV campsites (with no hookups) (Table 2.3-3). During 1997, Saddle Dam was open between Memorial Day and Labor Day weekends. Built in 1960, it is the only 1 of the 3 PacifiCorp campgrounds that does not include a separate group campsite. Saddle Dam Campground has little topography or screening vegetation between campsites; the sites are primarily laid out around the perimeter of a large gravel parking area with a central restroom. The campground is accessed via Frasier Road, a paved road connecting the site with the SR 503 Spur that runs between the Lewis River Road and Amboy to the south. The entrance to Frasier Road is across the SR 503 Spur from the entrance to PacifiCorp's Cresap Bay Campground, which is part of the Merwin Project. Saddle Dam Campground is located immediately southwest of the Saddle Dam, and is surrounded by a day-use parking facility and picnic area, Saddle Dam farm (part of the Merwin Wildlife Habitat Management Area), and a forested area.

Direct reservoir access is provided by the Saddle Dam day-use area, adjacent to the campground, but there are no views of the water from the campground itself, which is located behind the earthen dam. Improvements to the campground were made in 1995 and included a new restroom facility with modernized flush toilets, showers, and potable water.

Based on an inventory and evaluation of facilities conducted during 1996, the majority of developed facilities at Saddle Dam Campground are in good condition, including the pay station, picnic tables, swimming area, signage, and restroom. Some of the individual campsites are in need of minor repairs, as are portions of the access road. The parking area is not well defined in some locations, resulting in parking inefficiency. The large gravel parking area is unlandscaped and is barren in appearance.

PacifiCorp temporarily closed the Saddle Dam recreation site in 1998 due to crowding and on-site management problems. This site will reopen in 1999. Long-term reuse and redesign of the facility are being considered.

Cougar Campground - Cougar Campground offers 45 tent-only campsites with no hookups (Table 2.3-3). During 1997, Cougar Camp was open between Memorial Day and Labor Day weekends. Most of the sites are screened with vegetation (primarily tall conifer trees), giving the site a more rustic and natural feel; this sense is augmented by the lack of RVs. Although the campground is accessed directly off of Lewis River Road, a forested buffer separates the campground from the road. The 30-acre site is laid out in a horse-shoe shape with a winding one-way access road, and some individual campsites include private beaches along the reservoir. Direct access to the reservoir is also provided by the adjacent Cougar boat launch day-use area. Cougar Campground is the only site



Legend

- PacifiCorp Developed Recreation Facilities
- Clark County Recreation Site
- Residential
- Bike Route/Multi-use Trail on Roadway Right-of-Way
- Nature Trail Route
- Boat Access
- Campground
- Day Use - Picnic
- Dispersed Camping
- Fishing Access
- Food/Lodging
- Group Camping
- Interpretive
- Parking/Turnout
- RV Park
- Special Interest
- Swimming
- Trailhead
- Study Area Boundary
- Transmission Line
- County Line
- Public Land Survey

Hydrography
- Water
- Stream

TRANSPORTATION
- Primary Road
- Secondary Road

Sheet 1

NORTH

0 1000 2000 3000 4000 Feet

Scale 1:26000

Yale Hydroelectric Project

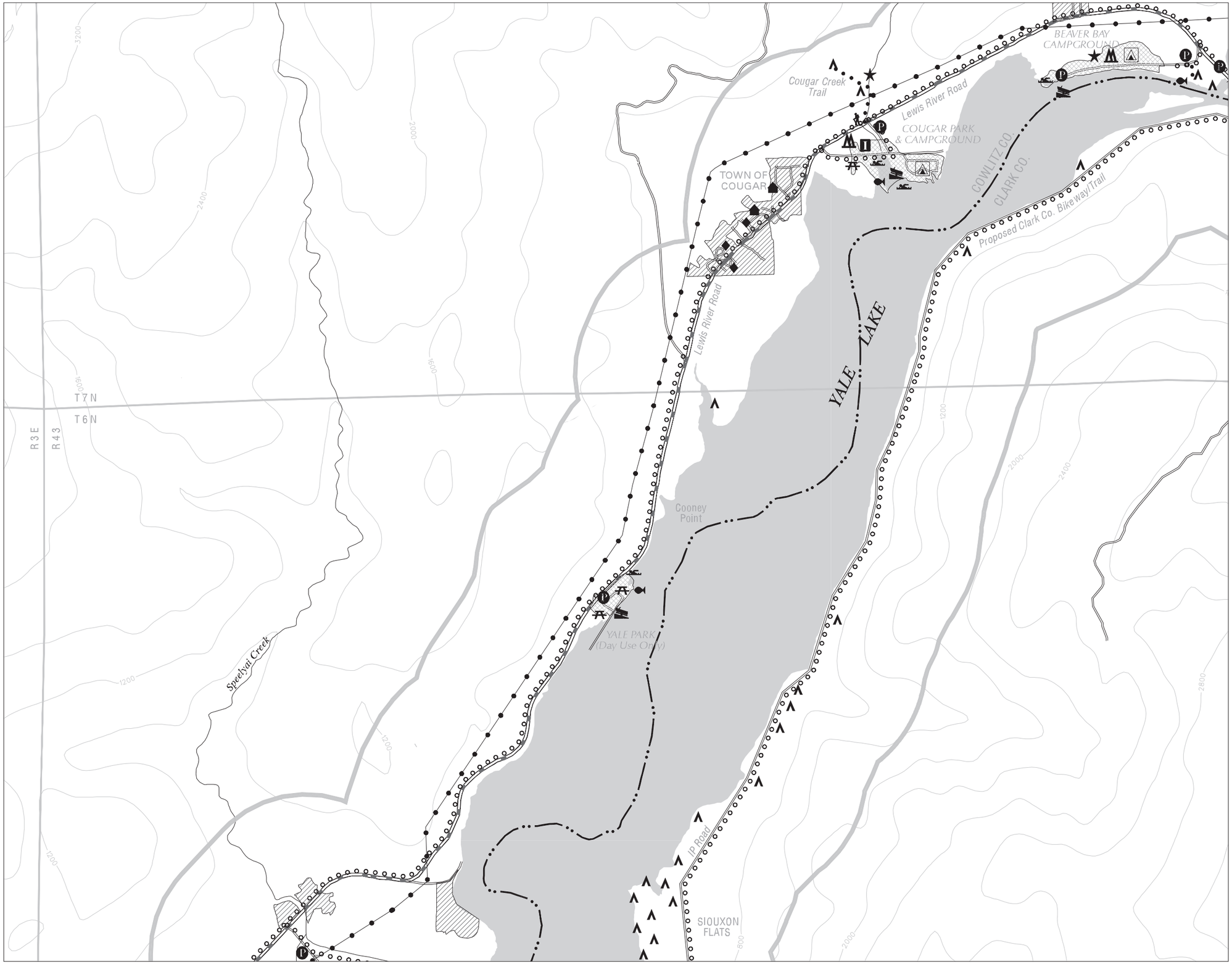
Figure 2.3-3
Yale Lake Recreation Sites and Facilities

PACIFICORP

Created by VESTRA Resources for PacifiCorp

/p1/proj_map/projects/yale/license/ftr/recreatn/rec_site.batchmap

March 29, 1999



Legend

- PacifiCorp Developed Recreation Facilities
- Clark County Recreation Site
- Residential
- Bike Route/Multi-use Trail on Roadway Right-of-Way
- Nature Trail Route
- Boat Access
- Campground
- Day Use - Picnic
- Dispersed Camping
- Fishing Access
- Food/Lodging
- Group Camping
- Interpretive
- Parking/Turnout
- RV Park
- Special Interest
- Swimming
- Trailhead
- Study Area Boundary
- Transmission Line
- County Line
- Public Land Survey

Hydrography

- Water
- Stream

TRANSPORTATION

- Primary Road
- Secondary Road

Sheet 2

NORTH

0 1000 2000 3000 4000 Feet

Scale 1:26000

Yale Hydroelectric Project

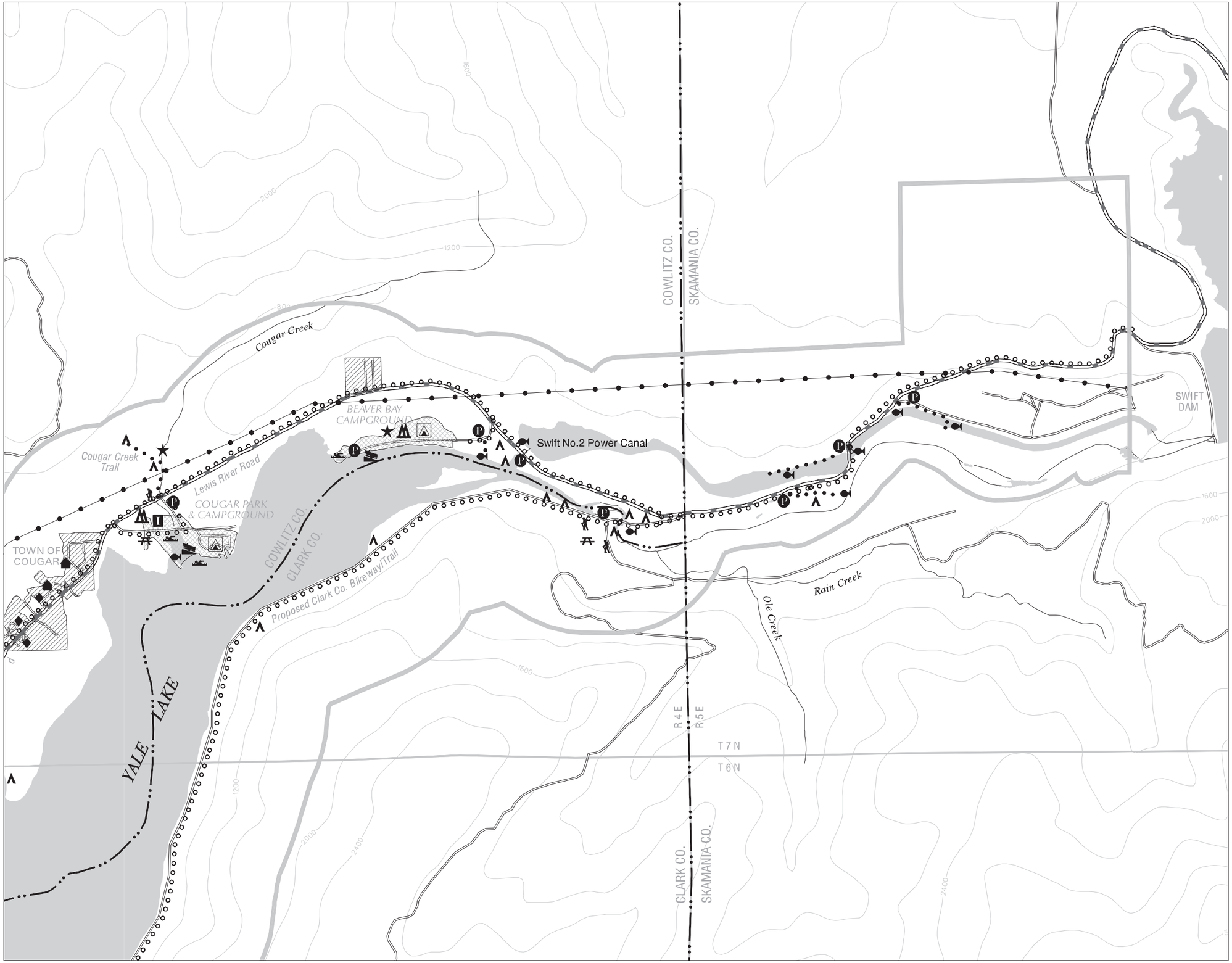
Figure 2.3-3 Yale Lake Recreation Sites and Facilities

PACIFICORP

Created by VESTRA Resources for PacifiCorp

/p1/proj_map/projects/yale/license/ftr/recreatn/rec_site.batchmap

March 29, 1999



Legend

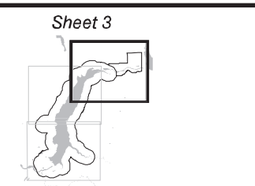
- PacifiCorp Developed Recreation Facilities
- Clark County Recreation Site
- Residential
- Bike Route/Multi-use Trail on Roadway Right-of-Way
- Nature Trail Route
- Boat Access
- Campground
- Day Use - Picnic
- Dispersed Camping
- Fishing Access
- Food/Lodging
- Group Camping
- Interpretive
- Parking/Turnout
- RV Park
- Special Interest
- Swimming
- Trailhead
- Study Area Boundary
- Transmission Line
- County Line
- Public Land Survey

Hydrography

- Water
- Stream

TRANSPORTATION

- Primary Road
- Secondary Road



Scale 1:26000

Yale Hydroelectric Project

Figure 2.3-3
Yale Lake Recreation Sites and Facilities

PACIFICORP
Created by VESTRA Resources for PacifiCorp
/p1/proj_map/projects/yale/license/ftr/recreatn/rec_site.batchmap
March 29, 1999

Table 2.3-3. Inventory of existing developed recreation facilities and dispersed sites and use areas at the Yale Hydroelectric Project.

Recreation Facilities/Areas	Recreation Facilities: Camping: Pay Stations	Camping: Group Reservation Sites (# spaces)	Camping: Campsites w/ Table/Fire Ring	Camping: Campsites	Picnicking: Playground	Picnicking: Picnic Tables	Picnicking: Picnic Fire Rings/BBQs	Picnicking: Shade Trees	Picnicking: Grass Area	Swim/Sunbath.: Designated Swim Area w/ Boom	Swim/Sunbath.: Swimming Beach	Swim/Sunbath.: Sign/Safety Apparatus	Service Facilities: Sanitary: Restrooms-ADA Accessible	Sanitary: Restrooms-non-ADA Accessible	Sanitary: RV Tank Disposal Station	Water: Water/Drinking Faucets	Water: Hot Water Available	Water: Showers	Disposal: Trash Receptacles/Dumpsters	Disposal: Grey Water Sumps	Services: Telephone	Services: Camp Hosts	Services: Security Guards	Services: Firewood Distribution Site	Access Facilities: Vehicular: Main Paved Access Roads	Vehicular: Secondary Gravel Roads	Vehicular: Gravel Parking Area (# veh.)	Vehicular: Boat Trailer Parking	Trails: Multi-use Trails	Trails: Trail Signs	Trails: Trailhead Parking	Angler: Shoreline Fishing	Angler: Dock Fishing	Boating/PWC: Unimproved Boat Launches	Boating/PWC: Improved Boat Launches (# lanes)	Boating/PWC: w/ Dock	Boating/PWC: Floating Booms	Boating/PWC: Navigation/Info. Buoys	Boating/PWC: Information Signs Onshore	Comments
DEVELOPED FACILITIES																																							
Saddle Dam Campground	1		15			10	9						1		1	6		6	6		1	1	1				200							2	1	1		1	New central restroom; 15 sites (RV&tent) surround large gravel area; site good for trailer pkg. next to campsites; mix of day and overnight users.
Beaver Bay Campground	2	15	63		1	6							1	1	1	20		8	21	7	1	2	1				40							1	1			2	New central restroom; 63 sites (RV&tent) in 3 loops off of a central spine road; lots of campsite flexibility; day-use area at end of road; primarily all overnight campers.
Cougar Campground	1		45										1			7		6	6	5		2	1	1			100							2	1	1		1	New central restroom; 45 sites (all tent) off of a loop drive; good campsite definition; adjacent Cougar Park available for day use; boat launch.
Yale Park (Day-use)	1					44	2						1			4		2	3		1		2				280							4	2			2	Central day-use site; open all year; popular boat launch and picnic site; new restroom; 2 picnic areas; good access.
Cougar Park (Day-use)	1	15			1	15							1			3		2	3	1			1				80								1			1	Day-use site adjacent to Cougar Camp; large older restroom; group campsite; mix of visitors from group campsite, adjacent campground, and day use.
DISPERSED SITES AND USE AREAS																																							
Saddle Dam Cove North Area				1																																			Boat-in site; common day-use area; can walk to site across dam.
Main Dam Point Area				3																																			Boat-in site; can walk to sites from barricaded road; almost always in use; handles large groups.
Siouxon Creek Area				9																																			Scattered boat-in and drive-in sites; very popular, scenic corridor; privacy available.
Siouxon County Park				7																																			Boat-in sites; once had several developed sites and dock; access from IP Road; flat areas; currently undeveloped.
Siouxon Flats Area				20																																			Similar to County property; most popular boat-in sites; good beaches; handles large groups.
North Lewis River Bridge Area				7																							10												Scenic area; access from IP Road; pools, beaches; swimming and tubing.
General East Shoreline				5																																			Scattered boat-in sites available to get away from crowds; little or no beaches.
General West Shoreline				14																																			Scattered boat-in sites available to get away from crowds; little or no beaches.
Swift No. 2 Power Canal/Bypass Area				1																							20												Day-use, fishing; one large dispersed site; access from Lewis River Rd.

Note: Shaded areas denote that facilities or services exist at this location. A number denotes the inventory of that facility type, if applicable. Refer to Comments column for other information.

Table 2.3-4. Condition of existing developed recreation facilities and dispersed sites and use areas at the Yale Hydroelectric Project.

	Recreation Facilities												Service Facilities										Access Facilities													
	Camping				Picnicking					Swim/Sunbath.			Sanitary			Water			Disposal		Services				Vehicular				Trails			Angler		Boating/PWC						
Recreation Facilities/Areas	Pay Stations	Group Reservation Sites (# spaces)	Campsites w/ Table/Fire Ring	Campsites	Playground	Picnic Tables	Picnic Fire Rings/BBQs	Shade Trees	Grass Area	Designated Swim Area w/ Boom	Swimming Beach	Sign/Safety Apparatus	Restrooms-ADA Accessible	Restrooms-non-ADA Accessible	RV Tank Disposal Station	Water/Drinking Faucets	Hot Water Available	Showers	Trash Receptacles/Dumpsters	Grey Water Sumps	Telephone	Camp Hosts	Security Guards	Firewood Distribution Site	Main Paved Access Roads	Secondary Gravel Roads	Gravel Parking Area	Boat Trailer Parking	Multi-use Trails	Trail Signs	Trailhead Parking	Shoreline Fishing	Dock Fishing	Unimproved Boat Launches	Improved Boat Launches (# lanes)	w/ Dock	Floating Booms	Navigation/Info. Buoys	Information Signs Onshore	**Comments**
DEVELOPED FACILITIES																																							
Saddle Dam Campground	4		2			4	4	4	3	4	4	4	4		4	4	4	4	4		4				2	4	4	4	4		4	4			2	2	4		1	Some tables need repair; parking area is not well defined; road needs repair; boat launch needs repairs -- too short and drop-off.
Beaver Bay Campground	4	2	2		2	4		4	3	4	4	4	4	1	4	4	4	1	4	2	4				2	2	2	2				4			2	1			1	Some tables and playground need repair; older restrooms, not ADA accessible; signs needed for grey water sumps; sign at boat launch needs replacement; campsites and parking not well defined; parking lot receives runoff; road needs repair.
Cougar Campground	4		4										4			4	4	4	4	4					2	4	4	4				4			2	1	1		1	Roads need repair; boat launch needs repair; dock needs replacement; signs need replacement.
Yale Park (Day-use)	4					4	4	4	3	4	4	4	4			4	4	4	4		4					4	4	4				4			2	1			1	RV disposal station needs repair; boat launches need repair; dock needs replacement; signs need replacement.
Cougar Park (Day-use)	4	4			4	4		4	4	2	4	4	4			4	4	4	4	4					2	2	3	4	4			4							1	Swim lagoon next to wetland seep; road/path between Park and Camp needs repair; signs need replacement.
DISPERSED SITES AND USE AREAS																																							
Saddle Dam Cove North Area																																							Generally in good condition; no sanitation facilities.
Main Dam Point Area																																							Generally in good condition; no sanitation facilities; some bank erosion; high use area.
Siouxon Creek Area																																							Several small scattered sites; generally in good condition; no sanitation facilities; some bank erosion
Siouxon County Park																																							High use area; several sites in former developed campground; some bank erosion; trash accumulation; no sanitation facilities; generally in good condition; former dock piles visible.
Siouxon Flats Area																																							High use area; several scattered sites -- large and small; some bank erosion; trash accumulation; no sanitation facilities.
North Lewis River Bridge Area																																							Several scattered sites; generally in good condition; no sanitation facilities; trail erosion; unsafe road bridge railing.
General East Shoreline																																							Small scattered sites; generally in good condition; used as over-flow sites; some bank erosion; no sanitation facilities.
General West Shoreline																																							Small scattered sites; generally in good condition; used as over-flow sites; some bank erosion; no sanitation facilities.
Swift No. 2 Power Canal/Bypass Area																																							One large site used often; generally in good condition facilities; no sanitation; some trash accumulation.

Note: Shaded areas denote that facilities or services exist at this location. Condition codes are defined as :(1) Needs Replacement, (2) Needs Repair, (3) Needs Maintenance, and (4) In Good Condition.
Developed facilities were evaluated in detail only. Refer to Comments column for other information.

that offers firewood for sale; therefore, visitors to other campgrounds must drive here if they need firewood. Cougar Campground was originally constructed in 1958, with improvements made in 1994 that included the installation of a modern restroom facility (flush toilets, showers, and potable water). The 15-space Cougar Park Group Campsite is located approximately 0.25 mile from the main campground next to Cougar Park and is accessed by a footbridge over Cougar Creek and road through Cougar Park.

Based on an inventory and evaluation of facilities conducted during 1996, all the developed facilities at Cougar Campground are in good condition, including the pay station, group campsites, individual campsites, and restrooms. Portions of the access road are currently in need of minor repair. Some shoreline erosion may require a couple of campsites to be abandoned or have shoreline protection added (Table 2.3-4).

Beaver Bay Campground - Beaver Bay, PacifiCorp's largest Yale Lake campground, is laid out in a primarily linear fashion along an inlet at the north end of Yale Lake. The 40-acre campground, built in 1959, includes 63 individual campsites with no hookups and is accessed directly off of Lewis River Road, approximately 2 miles east of the town of Cougar (Table 2.3-3). During 1997, Beaver Bay was open between April 22 and September 30. The campground is screened from the road by trees; the campground is flanked on one side by the reservoir, and on the other side by an extensive wetland complex. Beaver Bay includes 3,300 feet of shoreline. Campsites are laid out in 3 distinct loop areas, but there is little or no screening vegetation between individual sites. In 1995 and 1996, timber in the campground was thinned to promote growth of understory vegetation and enhance screening. None of the sites offer direct reservoir access; campers must either cross the main access road to reach relatively private beaches along the lake, or use the adjacent day-use site at the southwest end of Beaver Bay. Shoreline campsites were eliminated several years ago due to erosion problems.

The campground includes a separate 15-space group campsite along its northern edge, adjacent to the wetland complex. The most recent improvements to the campground included installation of a modern central restroom facility in 1995 (RV tank disposal, flush toilets, showers, and potable water). A total of 3 RV tank disposal points are available.

Based on an inventory and evaluation of facilities conducted during 1996, many of the developed facilities at Beaver Bay Campground are in good condition. Two of the campground's restrooms are older facilities built in the 1950s using a State Parks design and are in need of eventual replacement. Other facilities in need of maintenance and/or repair include some of the individual and group campsites (e.g., the picnic tables), the playground, and the main access road (Table 2.3-4). PacifiCorp repaired problematic septic drainfield problems in 1998.

Day-Use Sites

Each of the 3 campgrounds associated with Yale Lake includes an adjacent day-use site, offering both campers and day users direct access to the reservoir. In addition, PacifiCorp

owns and operates Yale Park, a large day-use site on the west side of the reservoir (Figure 2.3-3).

Saddle Dam Day-Use Site - The day-use site at Saddle Dam includes a separate gravel parking lot and road shoulder that accommodates approximately 200 vehicles, a boat launch with 2 lanes, a designated swimming area with floating boom, 10 picnic tables and 9 barbecues (BBQs), drinking water, 1 RV tank disposal facility, and a modern restroom facility (located at the campground) (Table 2.3-3). During 1997, the site was open to the public between Memorial Day and Labor Day weekends. Access across the dam itself is restricted. The day-use site is shared with campers at Saddle Dam Campground. Parking is generally segregated for these 2 visitor groups. The Saddle Dam area is also a popular parking area for boat-in campers using dispersed sites along the reservoir. These campers must park their vehicles and trailers along the shoulder of the main access road (Frasier Road); no overnight parking is permitted in the main day-use parking lot. There is an unsigned dirt trail in the vicinity of the day-use site that is often used by equestrians riding to the Speelyai Canal area and back; the trailhead is approximately 0.4 mile from the dam and campground. Equestrians with horse trailers are requested to park at the "Y" along Frasier Road, approximately 0.5 mile from Saddle Dam. The Saddle Dam day-use area is particularly popular with jetski/PWC users and power boaters.

Based on an inventory and evaluation of facilities conducted during 1996, the majority of the developed facilities at the Saddle Dam day-use site are in good condition, including the picnic tables, swimming area and boom, beach, signs, and trash receptacles. The boat launch, however, is currently in need of modifications. The launch has a drop off at the end and is not long enough to adequately accommodate boat and jet ski/PWC trailers during the full range of the recreation pool (480 to 490 feet msl) (Table 2.3-4).

In 1998, the Saddle Dam recreation site was temporarily closed by PacifiCorp due to problems with crowding and on-site management. This site will reopen in 1999. Long-term reuse and redesign of the facility are being considered.

Cougar Camp/Park Boat Launch and Day-Use Sites - The Cougar boat launch area is located south of the Cougar Campground and offers parking for approximately 100 vehicles and 1 boat launch with 2 lanes. Cougar Park is just south of the boat launch, accessed by a foot bridge over Cougar Creek and a separate road. In 1997, the sites were open to the public between Memorial Day and Labor Day weekends. The 40-acre park includes a designated swimming beach with floating boom, a picnic area with 6 tables, a grassy area used for sun-bathing and relaxing, a short trail through a forested peninsula, a boat dock accessed via this trail, a gravel parking lot that can accommodate approximately 80 vehicles, and a large relatively modern restroom facility with showers (Table 2.3-3). The Cougar group camp is located adjacent to Cougar Park. The day-use areas are used both by campers, as well as day-use visitors. Most sailboat launches into Yale Lake occur from the Cougar boat launch due to its location in a protected cove. Two or more annual regatta events (hosted by the Hobie and Willamette Sailing Clubs) launch from the Cougar area, each with an annual attendance of approximately 200 people. Across from Lewis River Road, there is a short 0.4-mile trail along Cougar Creek

that leads to several dispersed campsites, an old cabin or home foundation, and a fishing area. The 2 Cougar day-use areas are accessed by separate turnoffs from Lewis River Road - 1 on each side of Cougar Creek. Visitors occasionally enter the wrong access road searching for the campground or day-use site, which have the same name (i.e., Cougar). Built in 1958, Cougar Park was last renovated in 1994, including the restroom facility. New signs were installed in 1997 which help visitors identify the location that they desire.

Based on an inventory and evaluation of facilities conducted during 1996, the majority of the developed facilities at Cougar Park are in good condition, including the picnic tables, restroom, boat launch, and parking area. Facilities in need of maintenance or repair include the access road/pathway between Cougar Park and Camp. The septic drainfield was repaired in 1998.

Beaver Bay Day-Use Site - The Beaver Bay day-use site contains a parking area for approximately 40 vehicles, a boat launch with 1 lane, a designated swimming area with a beach and floating boom, a picnic area with 6 tables, and drinking water (Table 2.3-3). In 1997, the site was open to the public from April 22 to September 30. A restroom is located nearby in the southwestern portion of the campground. Due to its location away from Lewis River Road and at the extreme northern end of the reservoir, this day-use site is mostly used by campers at Beaver Bay Campground. Both the day-use site and the campground provide wildlife observation opportunities, as Beaver Bay is adjacent to a large wetland complex that provides habitat for a variety of species.

Based on an inventory and evaluation of facilities conducted during 1996, some of the developed facilities at the Beaver Bay day-use site are in good condition, including the picnic tables and swimming beach. Facilities in need of maintenance and/or repair include the access road, parking area which receives wetland runoff (a temporary berm was placed here in 1998), slope stabilization at the boat launch, and an informational sign (Table 2.3-4).

Yale Park - Yale Park is PacifiCorp's only day-use facility at Yale Lake that is open year round. The park covers 10 acres and was originally built in 1958. The heavily used site offers a large (4.5-acre) grass and gravel parking area (for approximately 280 cars and trailers), 2 lawn areas for picnicking and volleyball, swimming area with beach and floating boom, 1,500 feet of shoreline offering relatively private areas for relaxing, 1 boat launch with 4 lanes, and a modern restroom facility that was built in 1994 (Table 2.3-3). The launches at Yale Park provide the primary boat access to the lake; they have long paved ramps to accommodate lower lake levels (470 feet msl), are open year round, are easy to access, have available parking, and are near Lewis River Road. Apart from a small forested parcel in the northern picnic area, the site is flat and contains little vegetative screening. No camping facilities are provided or allowed at Yale Park; however, overnight parking is allowed for boat-in dispersed campers. When the parking area is full during some summer weekends, some users park along Lewis River Road. Such use is discouraged because it causes potential safety hazards along the road.

Based on an inventory and evaluation of facilities conducted during 1996, the majority of the developed facilities at Yale Park are in good condition, including the picnic tables,

BBQs, swim area, beach, and restroom facility. Facilities in need of maintenance and/or repair include the main picnic grass area, boat launch and docks, and signs. In addition, the parking area could be redesigned or reconfigured for greater parking efficiency (Table 2.3-4). The adjacent RV dump station was deactivated by PacifiCorp in 1997.

2.3.3.2 Dispersed Recreation Use Areas

In addition to the developed recreation facilities provided by PacifiCorp in the Yale Lake study area, the reservoir and adjacent shoreline provides numerous dispersed recreation use opportunities, both for land-based and water-based use. Significant supplies of dispersed recreation activities in the study area are described below.

Land-Based Dispersed Use

Numerous people use the reservoir shorelines and areas along Lewis River Road for dispersed picnicking and camping, horseback riding, hiking, hunting, and fishing. By their nature, dispersed use sites are not designated for use by signs or other means, with the exception of trailheads. Developed facilities, such as restrooms, are not available at dispersed use areas. Fires are not permitted except in developed campsites, and the no-fire policy is enforced by the Marine Patrol.

Dispersed Picnicking and Camping - PacifiCorp has identified and mapped approximately 67 (varies year to year) separate shoreline sites used for dispersed day-use picnicking and overnight camping; most sites are on the eastern shoreline, particularly in the vicinity of Siouxon Creek and Siouxon Flats (Figure 2.3-3). Dispersed use occurs on both sides of the reservoir. These sites typically have a fire ring of rocks and an area to beach or anchor a small boat. No water or toilet facilities are available at these sites.

Most shoreline dispersed sites are primarily accessed by boat, although the privately owned IP Road provides some access along the eastern shore of the reservoir. The IP Road, however, does not provide authorized access to the study area; the road is generally gated both near Yale Dam and at the reservoir's extreme northeast end. The gates, however, are frequently vandalized or left open and provide unauthorized access. The road can also be accessed at points via various DNR logging roads in the vicinity. A landslide that occurred in 1996 currently blocks continuous access along the IP Road, except for some 4WD vehicles or ATVs.

Concentrations of dispersed sites are found in the vicinity of a point east of Yale Dam, up Siouxon Creek on the east side of the reservoir, along the IP Road and at Siouxon Flats and Siouxon County Park (also on the east side of the reservoir), and at a few locations on the west side of the reservoir, primarily south of Speelyai Canal and at Cooney Point. Though fires are not longer permitted, most of the documented sites have a user-constructed fire rings, room for 1 or 2 tents, and provide an area for short-term boat moorage; a few sites have swings, ladders, or other makeshift amenities. Other sites, particularly along the east side of the lake at Siouxon Flats (Siouxon County Park and the shoreline to the north), offer stretches of beach that can accommodate larger parties (several dozen people), with room for several tents and boats.

In addition to the reservoir shoreline sites, there are a few dispersed campsites along Lewis River Road, just inland from the reservoir, and near the Swift No. 2 power canal. Southwest of the Swift No. 2 power canal off of Lewis River Road, dispersed camping and use occurs in the vicinity of a bridge along the IP Road that crosses the Lewis River. The bridge spans a stretch of the bypass reach at the northern end of the reservoir, and campsites are accessed down a short but steep trail segment to the river's shoreline. As many as 5 tents were observed in the vicinity at one time during the 1996 recreation surveys. Day-use fishing, swimming, and tubing also occur in this stretch of the river. The bridge is relatively high (approximately 100 feet above the river), with a partial guardrail on 1 side and no guardrail on the other. The condition of the guard rails is a potential safety hazard. Immediately southwest of the canal along Lewis River Road, there is another road pullout overlooking the project bypass reach, a mostly dewatered riparian area. Dispersed camping occurs at this site as there is room for several tent sites. Several dispersed sites are also located along Cougar Creek via a trail.

Trails - Although Yale Lake lacks a major designated lakeshore trail, there are some trails in the immediate vicinity and in the surrounding area. These trails are owned and maintained by a variety of entities, including PacifiCorp and other private owners, the DNR, and the USFS (see Figure 2.3-3). Although not officially designated as hiking or biking trails, Lewis River Road and the IP Road are often used by bikers and hikers. During the 1996 recreation surveys, large groups of bicyclists were observed cycling around the lake using Lewis River Road and the IP Road.

PacifiCorp maintains shoreline trail segments at some of its campgrounds and day-use areas, including Beaver Bay and Cougar Park. In many cases these trails provide access to the reservoir and other portions of the campground. In addition, there is a short trail (0.4 mile) along Cougar Creek, accessed from Cougar Park on the opposite side of Lewis River Road.

The longest trail in the study area is located on the western shore, connecting an area on Frasier Road near Saddle Dam with Speelyai Canal (see Figure 2.3-3). This trail, approximately 4 miles long, is popular with equestrians and, to a lesser extent, hikers. As the trail meanders through primarily forested areas and is steep in some locations, it is seldom used by anglers. Several small spur trails, however, provide access to the water. Anglers do use informal trails on PacifiCorp land in the vicinity of the Swift No. 2 power canal to access fishing areas.

In addition to PacifiCorp trails, the broader study area beyond Yale Lake offers trail hiking opportunities on lands managed by both the USFS and DNR. Two popular, short trails - access to Ape Cave (USFS trail #239) and the Trail of the Two Forests (trail #233) - are located in the Monument, a short drive north from the Swift No. 2 power canal area. South of Swift Reservoir, both the DNR and USFS manage primitive trails to such scenic destinations as Mitchell and Huffman peaks (in the Siouxon Landscape Area and GPNF, respectively). The DNR has noted a significant increase in the use of its Mitchell Peak trail in the Siouxon Landscape Area, which is becoming a popular day hike destination for recreationists from the Portland area (DNR 1996). East of Swift Reservoir the USFS

maintains the Lewis River Trail (#31). Accessed by Curly Creek trailhead east of the reservoir, this trail follows the Lewis River and connects to numerous other trails in the GPNF, such as trails #58 and #184.

Additional trails have been proposed in the project study area. Clark County has proposed to develop 3 trails on County and other adjacent lands: (1) a non-motorized, multi-use trail along the existing IP Road that would ultimately connect to the Monument in the vicinity of Swift Reservoir, with day-use sites and restrooms at either end of Yale Lake; (2) a proposed hiking trail up Siouxon Creek extending into the Siouxon Landscape Area from the IP Road; and (3) a trail along the Yale transmission line ROW to the Merwin Dam area. In addition, the Lewis River Action Committee has expressed a desire for a trail along Lewis River Road that would connect the town of Cougar and Cougar Camp (Lewis River Action Committee 1995). None of these proposed trail routes have been funded, designed, or analyzed in detail, but offer good trail opportunities.

Other Land-Based Dispersed Use - Other land-based dispersed use in the study area includes ATV and 4WD use, as well as hunting and fishing. People use the area at the northeast end of the project study area, along the Swift No. 2 power canal, for fishing; parking in this area occurs at 2 road pullouts. In addition, an annual fishing derby for disabled recreationists is held here, and the canal is stocked with fish for the event. The event is sponsored by the USFS during National Fishing Week. WDFW stocks the power canal with fish and PacifiCorp provides portable toilets for the event. Further discussion of fishing is found in the FTR for Aquatic Resources (PacifiCorp 1997b), including a discussion of the Yale Lake creel surveys.

Although not authorized for public use, the IP Road provides the main access for ATV and 4WD use in the project study area, as well as access to dispersed fishing locations. In general, PacifiCorp and other land owners discourage 4WD and ATV use in the project vicinity due to the deteriorating road condition, occasional log truck traffic, concern for fire hazard, minimal available law enforcement, and the extremely steep topography of hillsides rising from the lake shore. PacifiCorp has an easement from the private party that owns the IP Road. This easement, however, does not include public recreational access. Access roads are generally gated and locked; however, some motorists do get into the shoreline area at times through unlocked or vandalized gates, or through ungated DNR timber roads. ATV and 4WD opportunities may be found on DNR, GPNF, and Monument lands in the surrounding area.

Portions of the project study area and the broader study area are also used for hunting big game, primarily deer and elk, as well as waterfowl. Hunting occurs in the DNR Siouxon lands, GPNF, and on private land in the study area, primarily in the fall months.

Water-Based Dispersed Use

The primary recreational opportunities offered by the Yale Project involve water-based recreation, including several boating activities, and shoreline access by boat. Visitors use PacifiCorp's 4 boat launches with 9 lanes to gain access to the entire reservoir shoreline,

as well as to the open water. All boat launches may be accessed at or near full pool (490 feet msl). The minimum launch elevations of the 4 Yale Lake boat launches are:

- Saddle Dam 487 feet msl
- Yale Park 470 feet msl
- Cougar 484 feet msl
- Beaver Bay 476 feet msl

With a peak season recreation pool level of between 480 and 490 feet msl, use of Saddle Dam and Cougar boat launches becomes problematic when the reservoir level approaches or drops below the current minimum ramp elevation. At minimum pool elevation (470 feet msl), the Beaver Bay boat launch is above pool level. The Yale Park boat launch at 470 feet msl is the only launch on Yale Lake that can accommodate all pool elevations (470 feet to 490 feet msl). Because of its longer length, this launch is open to the public year round.

In 1996, PacifiCorp conducted boater surveys on the reservoir, documenting concentrations and locations of boater use. As shown in Figure 2.3-4, boater concentrations occur, as expected, in the areas nearest the boat launches. Jetski/PWC use occurs primarily in the vicinity of Yale Park and Saddle Dam, with some use in the vicinity of Cougar Park. Power boating, including water skiing and fishing, occurs on the entire lake, with use also concentrated near the launches and near Siouxon Creek. Sailboat use occurs primarily near Cougar Park and extends south toward Yale Park. Anglers using boats tend to motor to areas distant from the launches and away from fast-moving boats and jetskis/PWCs, particularly the lake's eastern shoreline and northeast area. The least used boating areas of the lake are south of Speelyai Canal to a point northwest of Saddle Dam, and the far northern end of the lake. Boating use on Yale Lake is busiest during hot summer weekends and during sailboat regattas.

2.3.3.3 Compliance with ADA Guidelines

The Americans with Disabilities Act (ADA), signed into law in 1990, protects individuals with disabilities by specifying that adequate access to facilities be provided to the physically disabled, including recreation facilities. In 1991, *Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities* (ADAAG) was published. ADAAG specified guidelines, not standards, to consider when designing facilities, including recreation facilities. Since then, design guidelines specifically for recreation facilities have been documented in *Universal Access to Outdoor Recreation - A Design Guide* (PLAE 1993), which is considered state-of-the art in the field of universal design for outdoor recreation facilities.

These guidelines were developed in cooperation with the USFS, the agency which has taken the lead in addressing the needs of universal access in recreation settings. As noted in PLAE (1993), however, universal design is a discipline still in its infancy. These outdoor recreation facility guidelines have not been adopted as regulations by law, but are used as guidelines for compliance with the ADA. Building facilities such as restrooms, however, are specifically identified under ADAAG and must be in compliance.

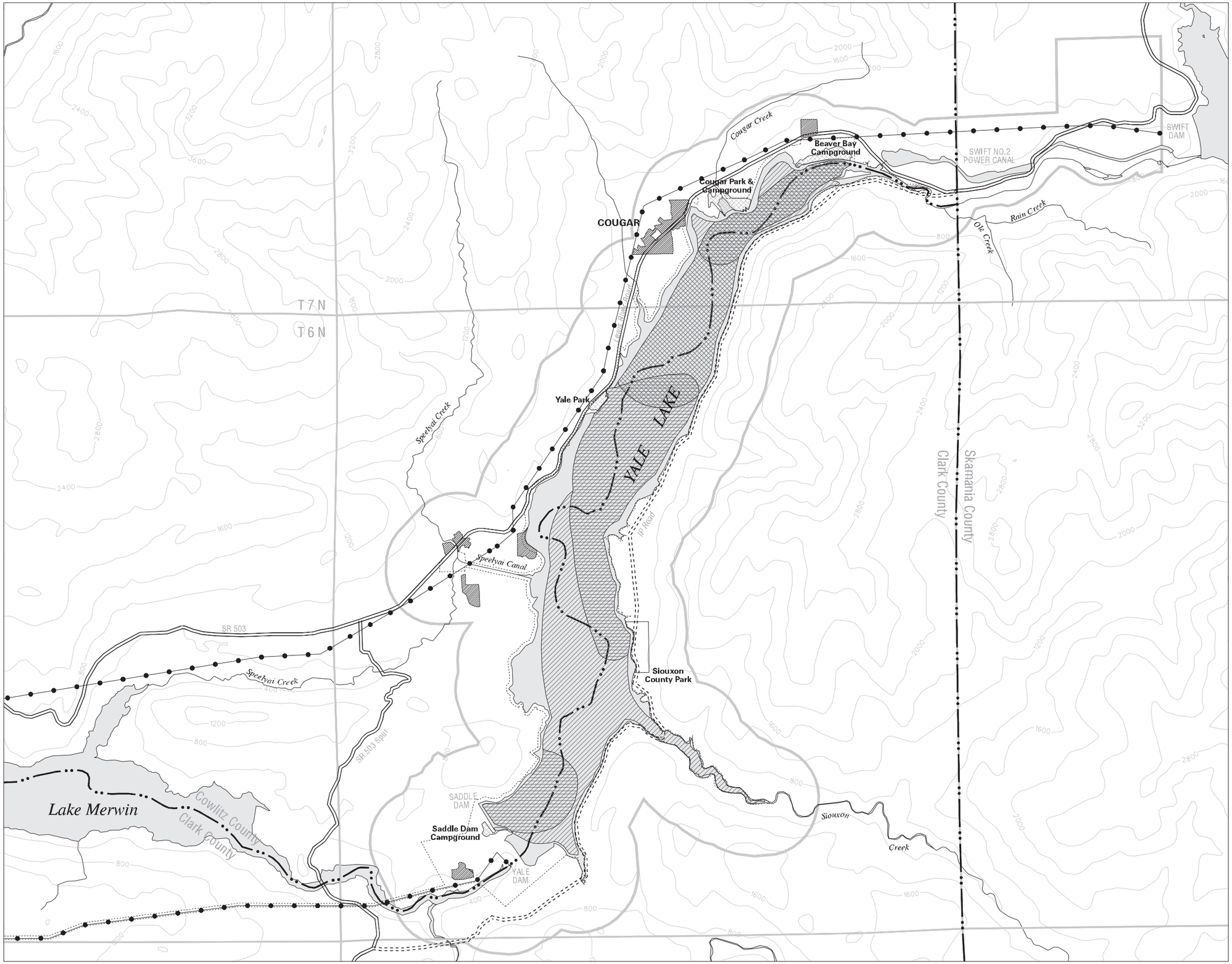
PacifiCorp has renovated its restroom facilities (at least 1) at each of its 5 recreation facilities at Yale Lake and is therefore in compliance with the ADAAG.

Using the USFS's Recreation Opportunity Spectrum (ROS) perspective as noted in the PLAE (1993), a recreation site should be developed in a manner that achieves harmony between recreation expectations and the environment. ADA-accessible facilities should be tailored to complement the setting. The Yale Project study area would be categorized as a "Roaded Natural" experience; therefore, accessibility expectations are "moderate." ADA-related elements to be assessed include restroom facilities, outdoor access routes to primary elements, recreation trails to non-primary elements, parking, picnic areas, campsites, water sources, trash receptacles, fishing facilities, and boating and swimming areas.

In 1992, PacifiCorp conducted a comprehensive review all of its recreation facilities at the Lewis River projects for ADA compliance (prior to publication of PLAE [1993]). This review focused on developed facilities. Due to the nature of dispersed facilities (i.e., they are undeveloped), they are generally not required to comply with ADA guidelines for universal access. As a result of this review, all of the developed facilities at the Yale Project have been upgraded in the past 3 years, including a major overhaul and/or replacement of campground and day-use area restrooms and paths/parking areas near these restrooms. One of the 3 restrooms at Beaver Bay Campground was completely renovated.

Design guidelines relevant to the developed recreation facilities at the Yale Project are summarized below, as well as suggestions made to improve those facilities as documented in PacifiCorp (1992) and as part of the Yale Project relicensing process. These include access to primary elements, elements and space in the recreation environment, parking areas, boat launches and boarding docks, and access to recreation trails.

In 1997, the federal Outdoor Developed Areas Regulatory Negotiating Committee was established and charged with developing proposed accessibility guidelines for trails, picnic and camping areas, and beaches. The committee has been working on new guidelines and is expected to present its report to the U.S. Architectural and Transportation Barriers Compliance Board (U.S. Access Board) in July 1999. This will be the basis for a proposed rule that will be published for public comment in 1999 or 2000. Proposed guidelines specifically for play areas have been published by the U.S. Access Board in July 1998. Based on its review of comments received, the U.S. Access Board will revise the play area access guidelines as necessary and will publish them in final form in 1999. The U.S. Access Board has also completed work on proposed guidelines for certain other recreation facilities (sports facilities, places of amusement, golf, and boating and fishing facilities). These other guidelines will be published for public comment in 1999 by the U.S. Access Board. When adopted, these new additional rules will provide clarification regarding the mandate to provide ADA accessible recreation facilities and opportunities in the United States.



Legend

- Power Boat- Waterskiing/Fishing
- Personal Watercraft/Jet Ski
- Small Sail Boat
- PacifiCorp Developed Recreation Facilities
- Residential
- Study Area
- FERC Project Boundary
- Transmission Line
- Public Land Survey
- County Line
- Topography

HYDROGRAPHY
- Water
- Stream

TRANSPORTATION
- Primary Road
- Secondary Road

NORTH

0 1000 2000 3000 4000 5000 Feet

Scale 1:56500

Yale Hydroelectric Project

Figure 2.3-4
Yale Lake Watercraft Use Areas

Created by VESTRA Resources for PacifiCorp

/p1/proj_map/projects/yale/license/ftr/recreatn/h2o_craft.map

February 09, 1999

Access to Primary Elements

To the maximum extent feasible, accessibility guidelines require at least 1 outdoor recreation access route between the parking lot and a primary activity area. When practicable, such a route should coincide with the route for the general public. This access route should be at least 36 inches wide and be stable, firm, and slip-resistant (PLAE 1993). Not all developed recreation facilities at the Yale Project provide such access to the physically disabled. No slip-resistant access route currently exists at any of the 5 developed recreation sites; however, such an access route could be added in the future at any 1 of the facilities, except Saddle Dam due to the steepness of the dam face.

Elements and Space in the Recreation Environment

Primary design elements to consider at recreation sites include restrooms, telephones, trash receptacles, drinking fountains, benches, picnic tables, swimming areas, and fishing facilities. Each of these is described below, as well as an evaluation of current conditions at Yale Project recreation facilities. In general, the new restrooms at the 5 facilities satisfy many of these ADA guidelines.

Restrooms - To the maximum extent feasible, restrooms at developed sites must be accessible and located on an accessible route (PLAE 1993). Almost all current restrooms at the Yale Project facilities do accommodate the physically disabled because they are accessed by a firm, slip-resistant surface that can be easily used by a person in a wheelchair. As mentioned above, PacifiCorp has recently upgraded toilet facilities at its recreation facilities to make them accessible in accord with ADA requirements, including upgrading them to flush-type toilets. Every PacifiCorp recreation facility has at least 1 restroom that meets ADA requirements. The only remaining restroom facilities that do not meet ADA requirements are 2 of the 3 facilities at Beaver Bay.

Telephones - Telephones should be able to be easily reached by a person in a wheelchair, and should include a volume control for people with hearing difficulties. Telephone service in the Yale Project study area is provided by Lewis River Telephone, which is responsible for installation and repair of phone systems at the campgrounds and day-use facilities. In the past, PacifiCorp has routinely coordinated with the company to ensure the installation of appropriate systems at its facilities. All but 1 of the phones currently in use at the developed recreation facilities are accessible to people in wheelchairs (i.e., they are of the appropriate height and the cord is of adequate length), and are equipped with volume controls. The phone at the entrance to Beaver Bay Campground does not meet ADA guidelines; however, another phone at the campground does.

Trash Receptacles - Elements such as location, height, and operating mechanisms are important to consider when designing trash receptacles. For example, dumpsters are generally difficult for the physically disabled to access and use. Trash receptacles at new restrooms are accessible to the disabled; however, others located elsewhere are not, including dumpsters.

Drinking Fountains - Elements to consider when designing drinking fountains include spout height and location, controls and operating mechanisms, and ground clearance. Drinking fountains at new restrooms are accessible to the disabled; however, others elsewhere are not.

Picnic Tables - Picnic tables provide a basic recreation opportunity for many people, allowing them to enjoy the outdoors, as well as friends and family. To the maximum extent possible, picnic table design should allow people of all ages and abilities to sit together at the same table. Important design elements to consider include number, location, seating for people using wheelchairs, and table height. Picnic tables are provided at all of PacifiCorp's Yale Project developed recreation facilities, both at individual campsites and in common spaces at day-use areas and group campsites. Some of the tables currently in use at Beaver Bay Campground are in need of replacement. None of the picnic tables at the 5 developed facilities are specifically designed for wheelchair access.

Swimming Areas - Design elements to consider for ADA acceptable swimming areas include ramps into the water, gentle slope, clear width, landings, handrails, and stairs into the water. Designated swimming areas occur at Beaver Bay, Cougar Park, Yale Park, and Saddle Dam. These designated swim areas meet basic swimming needs; that is, they are generally segregated from boating areas by floating booms but do not include stairs, constructed ramps, or handrails. The slope of these swimming facilities is gentle, and all are accessed via a sandy beach. None of the swimming areas are accessible by a pathway or provide wheelchair access to the water.

Fishing Facilities - Design elements to consider for fishing facilities include designated fishing stations, location, safety rails, curbs, seating, shade, and fishing rod holders. Most of the fishing at the Yale Project, however, occurs as boat angling. Bank angling generally occurs at unimproved beaches or impromptu shoreline access points. There are no designated fishing stations at developed recreation sites that are accessible to the disabled. PacifiCorp does, however, host an annual fishing derby in the vicinity of the Swift No. 2 power canal with a focus on providing access to the disabled. This dispersed site is open year-round for fishing and does provide convenient access. No fishing piers or docks are provided for the disabled.

Access to Parking Areas

Most people travel to recreation sites in cars, vans, and buses. Therefore, it is important that parking areas and loading zones be designed and constructed in accordance with the appropriate design guidelines. Accessible parking spaces should be located on the shortest accessible route to restrooms and to the recreation site or activity. Handicapped accessible parking is provided at all but 1 of the restrooms at Beaver Bay, and at some of the boat launches, including Beaver Bay and Cougar Camp.

Access to Boat Launches and Boarding Docks

Boat launches serve 2 purposes; the primary purpose is to facilitate the launch and retrieval of boats. The second purpose is to serve as an access route to the boarding dock. Design elements to consider include boarding docks and gangways, and skid piers. None of the 4 boat launches or their associated docks are accessible to the disabled, except for parking at 2 of the launches.

Access to Recreational Trails

Whenever developed recreation trails are provided in a Roaded Natural setting for use by the general public, at least 1 recreation trail connecting each of the site's developed recreation elements and spaces must be accessible (PLAE 1993). As detailed earlier, however, there are few recreation trails associated with PacifiCorp's Yale Project recreation facilities. None of the existing trails at the 5 developed facilities are ADA accessible. None of the trails associated with the Yale Project developed facilities are ADA accessible.

In summary, recent restroom facility upgrades at PacifiCorp's campgrounds and day-use facilities have significantly improved universal access, particularly for parking, pathways to restrooms, toilets, showers, drinking fountains, telephones, and trash receptacles. For other elements, such as primary access routes, swimming areas, picnic tables, fishing access, and boat launch access, improvements are needed at 1 or more of the 5 developed facilities on Yale Lake to meet ADA guidelines. These issues are addressed in the recreation needs study (Section 4.0) and will be addressed in the License Application.

2.3.3.4 Operations and Maintenance of Recreation Facilities

PacifiCorp's operations and maintenance practices for both its developed and dispersed facilities are described below. Topics covered include campgrounds, facility maintenance/opening/closing, lake operations, security/fire services, and utilities.

Campgrounds and Day-Use Sites

Campground operations and maintenance include scheduling, the campground host program, reservation system, and fees. As described earlier, campgrounds are open during the peak summer recreation season; some campgrounds are open earlier (i.e., late April) and later (i.e., through September) to accommodate off-peak season hunting and fishing use. No Yale Project campgrounds are open year-round due to weather. Nearby private RV campgrounds in the town of Cougar, however, are open year-round.

In 1996, user fees for the campgrounds were $12/night per site. Other fees are also charged for additional vehicles and campsite occupants. In 1997, PacifiCorp increased the fee to $15/night to be in line with State Park fees for comparable facilities. These fees cover approximately one half of maintenance costs and the salaries of the campground hosts. Also, PacifiCorp attempts to charge near market rate for campground use to avoid under-pricing other private providers in the vicinity, principally private sector businesses

along Lewis River Road and SR 503. To date, PacifiCorp has not charged for use of any of its day-use facilities at Yale Lake. However, in 1999, PacifiCorp plans to charge approximately $5 per day per car for the use of its day-use facilities. These fees are meant to cover some of the operating costs, but generally do not cover development costs such as the new restroom facilities.

Individual campsites are not on a reservation system; they are available on a first-come, first-served basis, except for Memorial Day weekend at Cougar Camp (the opening weekend of the peak use season). PacifiCorp does take reservations for group campsites (i.e., at Beaver Bay and Cougar Campground). In 1997, the start date for reservations by phone or in person was January 13.

Each of the 3 PacifiCorp campgrounds is maintained by at least 1 campground host who answers visitor questions; distributes firewood; enforces policies and quiet hours; oversees registration, cleanup, and general minor maintenance; and acts as "peace keeper" in the event of minor disturbances or user conflicts. Periodic maintenance (such as lawn mowing, painting, etc.) is conducted by PacifiCorp maintenance crews or contractors hired on an as-needed basis.

Facility Maintenance/Opening/Closure

PacifiCorp crews are responsible for all major facility maintenance, including mowing lawn areas and upkeep of day-use areas, restrooms, campground sites, parking (e.g., gravel), and miscellaneous grounds keeping. They are also responsible for opening and closing the day-use facilities and campgrounds via gating and signs. Periodic maintenance includes removing hazard trees, cleaning littered areas and the restrooms, thinning the overstory canopy at the campgrounds to increase sunlight, and major maintenance items such as dock and boat launch repair. Major facilities, such as docks, roads, and parking lots, are inspected annually, including hazard tree inspections, and repaired on an as-needed basis. Crews also repair vandalism damage on an ongoing basis.

Security/Fire

PacifiCorp employs 10 security personnel for the Lewis River hydroelectric projects, hired as contractors, who generally work during weekends and holidays of the peak recreation season. Three contractor security guards generally work out of Yale Park and Saddle Dam. Security is primarily land-based; there are no permanent security or law enforcement measures on the reservoir itself. PacifiCorp owns a power boat, stored at Merwin Park, which is periodically used to inspect dispersed facilities and use areas on the 3 reservoirs. PacifiCorp has an agreement with Clark County for marine law enforcement and safety patrol on Lake Merwin and Yale Lake 4 days per week including weekends (from May through September). PacifiCorp provides financial support to the County for this service. In 1997, the Clark County Sheriff's Department Marine Patrol issued 140 citations to Yale Lake visitors. These citations were issued for violations related to boat speed, personal flotation device (PFD) usage, fishing regulations, water skiing/PWC use, and intoxication. PacifiCorp has been negotiating with Cowlitz County

to provide increased policing support of land-based recreation areas; however, no agreements have been reached to date. PacifiCorp currently has no special agreements regarding fire protection services; however, local fire protection services are available in the area.

Lake Level Operations

PacifiCorp maintains Yale Lake at a pool level of 480 to 490 feet msl during the peak use recreation season (Memorial Day to Labor Day weekends). This level is voluntarily maintained; that is, there are no formal requirements to maintain the pool at this level for recreation use. During the non-peak season, the pool level typically drops to 470 feet msl. However, the pool level may occasionally go down to 460 feet msl. To facilitate additional boater safety on the reservoir, PacifiCorp maintenance staff set buoys to warn boaters of shallow areas, and patrol the reservoir periodically for floating debris, particularly early in the season. Regulatory markers are placed by the appropriate county (Clark and Cowlitz counties).

Utilities

Utility service at PacifiCorp facilities includes water (provided by local wells), telephone (provided by Lewis River Telephone), electric (provided by Cowlitz County Public Utility District [PUD]), trash removal (provided by Vancouver Sanitary), and septic pumping at the campgrounds (provided by Skeeks Honey Wagon of Brush Prairie, Washington). For the most part, utility condition and service are adequate. Some drain fields are in need of repair (e.g., at Cougar Park and Beaver Bay), and water wells could be expanded in some areas.

3.0 RECREATION DEMAND

The purpose of the recreation demand analysis is to estimate existing and future visitor demand for recreation opportunities and resources, both regionally and within the Yale Lake study area. The recreation demand analysis consists of 2 components. The first component is a regional and future demand analysis using Washington SCORP and other available sources of regional data to estimate existing and future demand for various activities in the Yale Lake area. The second component is a recreation survey consisting of 2 main components: (1) a group of user count observations targeting the Yale Lake study area, including campground and day-use area usage, parked vehicles, dispersed use, boating, and a creel survey; and (2) a recreation visitor attitudes and preferences survey of Yale Lake visitors. Preliminary results of the demand analysis were presented in the ITR (PacifiCorp 1997a). Results presented in the ITR focused on regional demand as determined by SCORP and other existing data sources. Results of the demand assessment presented in this FTR supplement the ITR, focusing on analysis of the recreation user count surveys and the visitor attitudes and preferences survey conducted in 1996 and 1997.

Additional recreation survey work was conducted by PacifiCorp in 1998 at the 4 hydroelectric projects and vicinity. This survey work, plus additional work in 1999, will be used during the relicensing of the 4 hydroelectric projects in the upcoming years. The results of this additional survey work will be presented in future reports by PacifiCorp and Cowlitz County PUD.

3.1 STUDY AREA

The study area for the first component of the demand analysis, the regional and future demand analysis, is Washington SCORP Region 2 (see Figure 2.3-1), a 12-county area that covers primarily non-coastal Western Washington and straddles the major portion of the Cascade Mountain range.

The study area for the second component of the demand analysis, the recreation survey, is identified in Figure 2.1-1. Specifically, the study area for the campground user counts includes PacifiCorp's Lewis River Project campgrounds–the 3 campgrounds associated with the Yale Project (i.e., Saddle Dam Campground, Cougar Campground, and Beaver Bay Campground), as well as Cresap Bay Campground (Merwin Project) and the Swift Campground (Swift Project). Data were included for non-Yale Project recreation facilities (i.e., Swift and Cresap) in this portion of the demand analysis due to the interrelated nature of campgrounds and their proximity; for example, if a family stopped at Saddle Dam and the campground was full, they would likely proceed and/or be directed to nearby Cresap Bay Campground. Vehicle counts were also collected at these Lewis River Project campgrounds, as well as the Yale Park, Cougar Park, and Merwin Park day-use areas. From these vehicle counts, numbers of visitors are estimated.

Recreation user counts were collected specifically in the Yale Lake area (Figure 2.1-1). These count areas include: all developed Yale Lake campgrounds and day-use areas/boat

launches, Swift No. 2 power canal area, East Lewis River bridge crossing area, Speelyai Canal area, Siouxon Creek bridge/IP Road area, dispersed use areas near the Main Dam and Saddle Dam, and recreation use out on the water and along the shoreline.

The study area for the recreation visitor attitudes and preferences survey included the 5 PacifiCorp campground and day-use sites at Yale Lake (Beaver Bay Campground and Day-Use Site, Cougar Camp, Cougar Park, Yale Park, and Saddle Dam Campground and Day-use Site). Distribution of survey forms occurred only at these locations.

3.2 METHODS

The methodology for the 2-part demand analysis is described below. These 2 parts include: (1) a regional and future demand analysis, and (2) a recreation survey consisting of 2 main components: user count observations, and a visitor attitudes and preference survey.

3.2.1 Methodology for Assessing Regional and Future Demand

The first part of the demand analysis, a regional and future demand analysis, provides an understanding of the demand for all recreation activities occurring in this part of Washington State. Recreation activity demand data are primarily from the IAC's SCORP document for Region 2, as identified in the *Washington Outdoors: Assessment and Policy Plan (1990-1995)* (IAC 1990). IAC updated its SCORP in 1995, primarily as a policy and strategic planning update. No new statewide demand surveys were conducted for the 1995 update because the previously reported results remain valid. The IAC did, however, conduct limited demand surveys in 1990 and 1994 to determine participation in and growth of different outdoor activities and to identify the most popular outdoor recreation activities statewide, as documented in IAC (1995). The SCORP data were used to understand existing and projected recreation use, facility needs, and visitor preferences for specific activities and facilities.

The SCORP demand data are available by region (i.e., not by the smaller planning districts as used in the previous recreation supply analysis). The Yale Project study area, however, is also influenced by the proximity of the GPNF and the Monument. Therefore, the USFS, the federal agency that administers both the GPNF and the Monument, was contacted in 1996 to provide input on existing demand and future demand projections in the vicinity of the Monument and the GPNF. According to the USFS, activity-specific demand data are not available for either the GPNF or the Monument to use as the basis for projecting annual increases (pers. comm., S. Nelson, Recreation Planner, USFS, Vancouver, WA, November 22, 1996). The USFS recommended using SCORP Region 2 data to estimate demand in the Yale Project study area.

Using the SCORP data, a table was developed for the project listing annual percentage increases in recreation use by activity type found in the study area. These percentages are used later to estimate future recreation needs (Section 5.0).

3.2.2 Methodology for Conducting Recreation Surveys

The second part of the demand analysis, a recreation survey, documents existing recreation use and visitor attitudes and preferences in the Yale Project study area. This multiple-year survey effort included: (1) user count observations (recreation facilities, dispersed use areas, activities, vehicles, boats, and a creel survey); and (2) a visitor attitudes and preference survey. The primary focus was on the peak season survey effort, which estimated use levels for camping, boating, fishing, and day-use activities.

Objectives of the recreation user count observations and the visitor attitudes and preference survey were to:

- Identify the types, levels, and distribution of use per location and over time;
- Determine if visitors feel crowded;
- Determine the frequency, timing, and length of stay of visitors to the study area;
- Determine visitor satisfaction and factors that influence that satisfaction;
- Identify preferences for facility improvements and new facilities;
- Determine visitors' willingness to pay for improved facilities;
- Identify demographic characteristics of the visitors;
- Identify factors that contribute to conflicts between users; and
- Identify what percentage of use may be attributable to the Monument or other areas.

3.2.2.1 Recreation User Count Observations Methodology

Overall recreation visitation was first assessed at the 3 PacifiCorp reservoirs on the Lewis River: Lake Merwin, Yale Lake, and Swift Reservoir. Developed recreation facility use at these 3 reservoirs were analyzed in a broader sense to provide context to the Yale Lake recreation experience. Campground host counts and vehicle count data collected at PacifiCorp counters from 1994 through 1997 were used in this effort. Campground host counts were used to assess annual, weekday, weekend, and holiday occupancy levels at PacifiCorp campgrounds. A conversion factor was used to estimate total numbers of people at campgrounds and day-use areas based on vehicle counts. Seasonal and annual visitation were analyzed over this 4-year period.

A more detailed analysis was then conducted for the Yale Lake study area. Estimates of recreation use at day-use areas, campgrounds, and dispersed use areas were calculated based on vehicle and boat counts, camp host counts, activity observations, and professional judgment. These estimates were calculated for: (1) the peak recreation use season (Memorial Day weekend to Labor Day weekend) in 1996, and Memorial Day in 1997, and (2) the non-peak season or "shoulder season" (September 1996 and May 1997). A separate creel survey was conducted by Harza and is summarized in this FTR. Detailed methodology, study area, and results of the creel survey are presented in a separate FTR for Aquatic Resources (PacifiCorp 1997b). The Yale Lake survey was conducted in the study area identified in Section 3.1.

Specific components of the recreation user count observations methodology are presented below. These include campground user counts, vehicle user counts, total visitor

estimates, lake boater counts, other recreation activity and use area counts, and the separate creel survey.

Lewis River Projects - Facility Occupancy and Total Visitor Estimates

Data on use of campgrounds and day-use areas at Lake Merwin, Yale Lake, and Swift Reservoir were collected by PacifiCorp from 1994 through 1997. This information is used to provide context for the Yale Lake recreation experience. Two sources of data are collected: (1) campground host counts from information presented on the campground registration forms and end-of-the-day tallies, and (2) counts from vehicle counters positioned at the entry roads of all PacifiCorp developed recreation facilities. Campground host data were used to estimate campground occupancy levels at specific period of time. Data from vehicle counters were used to estimate total annual and seasonal (peak and non-peak) visitation at all campground and day-use areas. Percent occupancy is considered a key indicator of demand levels (e.g., a 90 percent occupancy rate would indicate a high level of demand; a 15 percent occupancy rate would indicate low demand).

Data on vehicle use of PacifiCorp's Lewis River facilities were collected for typical weekend, typical weekday, peak holiday weekends, and non-peak season periods of time. Automated vehicle counters (i.e., buried loop counters) were used to record vehicles entering and exiting the developed facilities. PacifiCorp staff (either maintenance crew staff or the campground hosts) were responsible for reading the automated counters on a predetermined schedule (e.g., before and after weekends; before and after holidays), and data were hand tabulated for later analysis. The total number of visitors was estimated by dividing the number of counted vehicles by 2 to determine the number of actual visits (i.e., to compensate for a given vehicle both entering and exiting the site; also, counters can distinguish between single vehicles and vehicles with trailers), then multiplying by a vehicle occupancy factor of 3.4 to estimate the number of visitors (the 3.4 factor is a National Park Service estimate of the average number of persons per vehicle).

Yale Lake Peak Period Boater Counts

The lake boater counts were conducted to determine the level of watercraft use on the reservoir during peak use periods, as well as identify where on the lake different types of watercraft concentrate. Five lake boater counts were conducted while on the reservoir in a boat during the peak recreation season of 1996. Counts were conducted on the following dates:

- June 2 (non-holiday weekend)
- July 6 (July 4th holiday weekend)
- July 21 (non-holiday weekend)
- August 18 (non-holiday weekend)
- August 31 (Labor Day holiday weekend)

Methods consisted of observing and counting all water craft using Yale Lake, as well as shoreline dispersed camping and day-use sites, from a PacifiCorp boat. Launching from

Yale Park, the boat followed the shoreline perimeter of the entire lake, while observers recorded water craft and shoreline use. Surveys typically lasted 2 to 3 hours to record use on the entire lake. Data recorded for the lake boater use counts included weather; time; type and number of water craft (e.g., power boat, sail boat, jet ski, inflatables); and number of boat and bank anglers. Data were recorded on standardized forms. In addition, observers noted concentrations of use associated with particular areas, and recorded these areas on a map of Yale Lake. Additional boat counts were conducted from the shoreline; the methodology is discussed below.

Yale Lake - Recreation Activity and Use Area Counts

Peak Season - Peak season surveys (May 25 to September 2, 1996 and May 24, 1997) consisted of detailed recreation user counts by vehicle/foot at PacifiCorp's developed facilities (Saddle Dam, Yale Park, Cougar Park and Camp, and Beaver Bay), as well as drive-in or boat-in dispersed use areas and sites (East Lewis River bridge crossing and the bypass reach, Swift No. 2 power canal, IP Road/Siouxon Creek bridge area, Speelyai Canal area, and coves/points near Yale Dam and Saddle Dam areas). Predetermined stops, survey routes, and protocols were established to ensure sampling consistency and coverage. At each stop, visitors, boats, and/or vehicles using the study area were counted, with data recorded on project-specific data forms. Each non-campground area or site was visited 3 times daily (morning, mid-day, and late afternoon or early evening) during a 10-hour survey period. Campgrounds were surveyed once during a survey period to reduce disturbance to visitors.

During the peak season, 1 weekend day was surveyed each week plus 5 holiday days (3-Memorial Day [1996-2, 1997-1], 2- Labor Day, and 1- July 4th) totaling 19 days (excluding 5 boater surveys). The number of persons participating in identified activities was recorded on standardized forms and included locations surveyed, time, sites occupied, weather, non-power boats, power boats (angler, non-angler), anglers (boat, bank), parked vehicles, dispersed day users, dispersed campers, trail users, swimmers, sunbathers, bikers, picnickers, and group site users. Copies of the blank survey forms are included in Appendix 3.2-1: Recreation Survey Forms in this FTR.

Dispersed boat-in sites (day use and overnight) are more difficult to count, especially along the eastern shoreline. As part of the relicensing studies, PacifiCorp conducted surveys by boat to: (1) perform a 1-day inventory of dispersed sites along the entire shoreline; and (2) collect 5 use counts during peak season weekend days. These included 1 count each for Memorial Day weekend and Labor Day weekend, and 1 typical weekend count each in June, July, and August. Weekday use at the Yale Project is minimal and was therefore estimated. These 5 boat counts will help prepare shoreline management recommendations as well as characterize and estimate existing lake use outside of the developed sites.

Recreation user count forms and vehicle counts for the peak season surveys were compiled, with count data entered into a personal computer database using Microsoft Access. Data were cross-tabulated by activity type, date, day of week (weekend versus weekday), location, time of day, and weather. These data were analyzed to characterize

existing visitor use by location, timeframe, and weather conditions. Results were used to determine activity demand projections and to estimate future occupancy levels at identified sites. Total visitation during the peak season was estimated using these counts by applying average daily and weekend use factors for each month.

Non-Peak Season - Surveys during the non-peak season were conducted in September 1996 (2 weekend days after Labor Day weekend) to May 1997 (1 weekend day before Memorial Day weekend). One survey day on May 24, 1997 was shifted from the non-peak to peak season categories due to weather and logistics. The fall season effort (2 days) identified use occurring during mid to late September. Beaver Bay Campground was open, Saddle Dam, Cougar Park and Camp were closed, and Yale Park was open (year round). The spring season effort (1 day) identified use occurring during the early fishing season (prior to Memorial Day weekend). Minimal use of the Yale Project occurs from mid-September to mid-May, except for short day-use stops at Yale Park during good weather conditions.

These surveys occurred during weekend days by vehicle/foot. No boat surveys were conducted during this period. The survey route included developed sites that were open and drive-in dispersed sites and use areas (bypass reach, Swift No. 2 power canal, Siouxon Creek bridge, and Speelyai Canal). The same general user count survey protocol was followed as during the peak season survey period, but fewer sites were covered due to facility closures.

Yale Lake Visitation Estimate - Total annual and seasonal visitation at Yale Lake is estimated based upon vehicle counts averaged from 1994 to 1997 and application of a conversion factor of 3.4 persons per vehicle for developed facilities. The peak season is defined as Memorial Day weekend to Labor Day weekend. For dispersed use, estimates are made by season based on professional judgment and knowledge of the area, uses, and level of activity by season. Activities considered for the dispersed use estimate include trail use, hunting, and bank angling. No vehicle count data exist for these activities.

Yale Lake - Creel Survey

In conjunction with aquatic studies, an angler creel survey was conducted by Harza Northwest as part of the relicensing studies. The 1-year creel survey included boat and bank anglers. The survey began on April 1, 1996 and was completed on March 31, 1997. During this 1-year period, surveyors conducted sampling on 75 days (morning, afternoon, or both). The species of gamefish caught (kokanee, cutthroat trout, and rainbow trout) were noted. Additional information collected includes: how long it took to catch a fish (catch rate), where the fish were caught, how the fish were caught (boat and bank), length of the fish, time of day caught, and date. Results are presented in the FTR for Aquatic Resources (PacifiCorp 1997b) and are briefly summarized in this FTR.

3.2.2.2 Visitor Attitudes and Preferences Survey Methodology

Visitor attitudes and preferences were estimated by distributing a recreation survey or questionnaire to visitors at the 5 Yale Lake developed facilities. This survey was

conducted to document attitudes and perceptions concerning the quality of the recreation experience and conflicts encountered in the study area. Several survey techniques are available for use including mail surveys, verbal contact surveys, and others. Due to the volume of visitor use and the need for an efficient cost-effective survey, a windshield/drop box survey with mail-in option was selected.

The survey document was tested and revised based on initial visitor responses. A test survey was conducted during 1 day prior to Memorial Day weekend 1996 so that the survey questions would not change during the course of the survey effort. A blank copy of the survey form used in this study is included in Appendix 3.2-1.

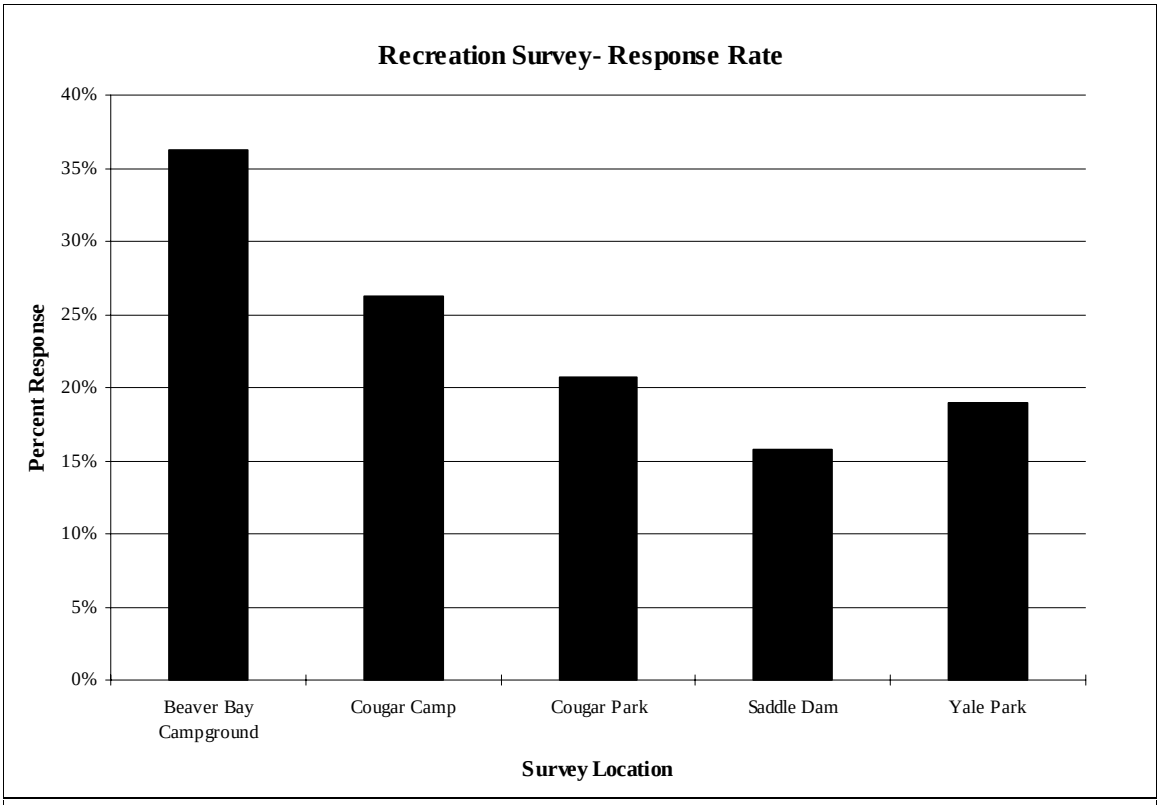
Survey forms were placed on visitors' vehicle windshields or picnic tables and/or handed to visitors directly (1 per family). When possible, visitors or family groups were approached and encouraged to complete the survey form at that time. Nearby drop boxes were conveniently placed and clearly signed at each site surveyed. Survey respondents could also take the survey with them and complete it at their leisure, mailing it to PacifiCorp at a later date.

Survey forms were distributed at the 5 developed sites only (when open) whenever user counts were taken. A total of 19 peak season days and 3 non-peak season days were surveyed. Forms were collected daily from the drop boxes at the survey sites or via mail. Group reservation sites received 1 survey form per group visit.

Each respondent (day-use site and campground visitor) was asked to complete a general section of the questionnaire. Because campground and day-use visitors were mixed at each site and because the sites were close to one another (except Yale Park), 1 survey form was used for both day-use and camper groups. To ensure that a recreationist/group was interviewed only once during the survey period, they were asked if they had been previously surveyed. If so, the survey would end at that point.

A total of 3,150 survey forms were distributed to Yale Lake visitors in 1996-1997. Out of this total, 801 survey forms were returned by the cut-off date of June 4, 1997 for a return rate of 25 percent. After review of each of these survey forms for completeness, 776 (25 percent) were deemed complete enough for entering into a relational database. The total number of survey forms (776) entered into the database is above the minimum 200-300 survey forms needed for a statistically valid sample size. As presented in Figure 3.2-1, over 600 forms were distributed each to Beaver Bay Campground, Cougar Camp, Saddle Dam Campground and Day-use Site, and Yale Park. Fewer survey forms (200) were distributed at Cougar Park due to lower use levels at this facility. Response rates at each of the 5 sites varied, with Beaver Bay Campground and Cougar Park having the highest return rate (26 to 36 percent).

To facilitate data analysis, open-ended responses to questions were assigned to categories and entered into a database. After entry, tests were run to validate the data and any unusual data values were cross checked against the original survey forms and corrected as needed.



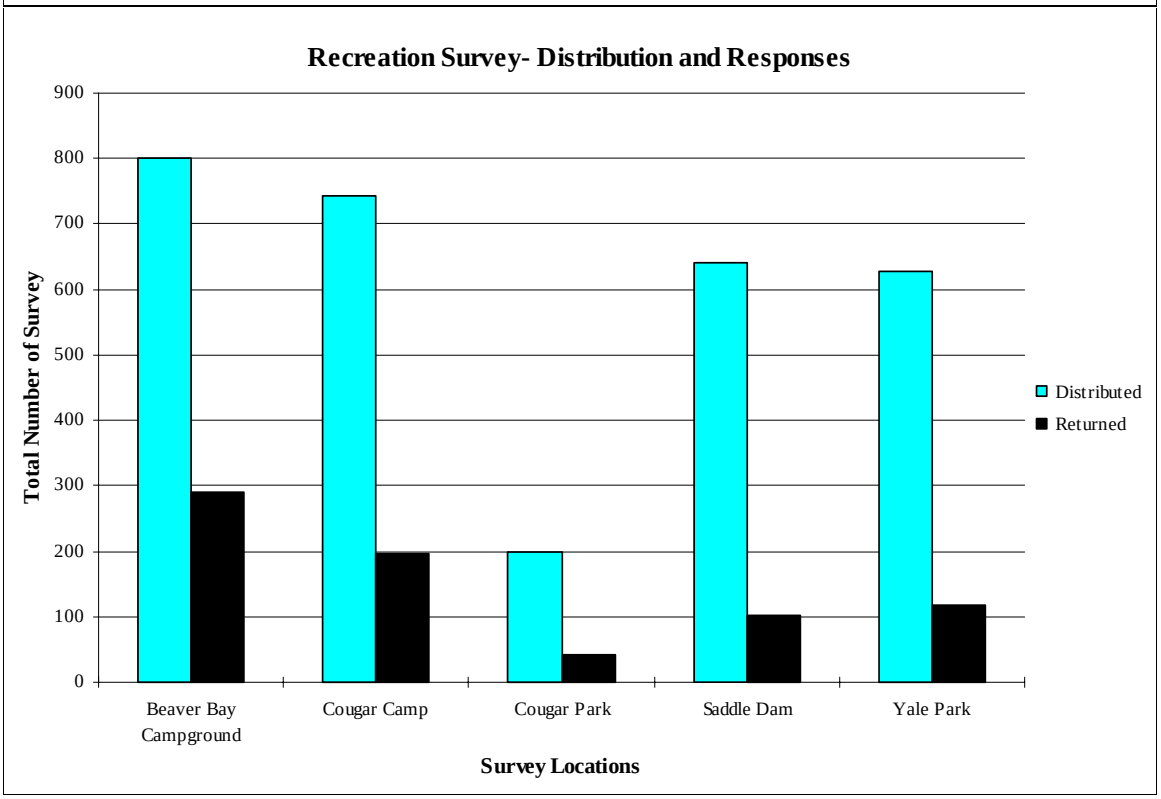


Figure 3.2-1. Recreation survey distribution and responses by survey location.

3.3 RESULTS AND DISCUSSION

Results are presented below for the 2 components of the demand analysis: (1) regional and future demand analysis; and (2) recreation survey, including user count observations and visitor attitudes and preference survey.

3.3.1 Regional and Future Demand Analysis

Results for the regional and future demand analysis are summarized below, organized by Washington SCORP data, other data sources, and projected increase in demand by activity type for the Yale Project study area.

3.3.1.1 Washington SCORP

Projections of regional demand were based primarily on data in the Washington SCORP. IAC (1990) presents SCORP demand data for 57 recreation activities, including 28 that occur in the Yale Project study area:

- Fishing (boat)
- Fishing (bank)
- Swimming (beach)
- Water skiing
- Sailing
- Windsurfing
- Power boating (lake)
- Non-motor boating (lake)
- Visiting Interpretive Displays
- Nature Study
- Outdoor photography
- Day hiking
- Backpacking (trail)
- Backpacking (off-trail)
- Climbing/mountaineering
- Group camping
- Tent camping
- RV camping
- ATV driving
- 4WD driving
- Bicycle riding (road)
- Bicycle riding (off-road)
- Horseback riding
- Sightseeing/exploring
- Picnicking
- Big game hunting
- Small game and waterfowl hunting
- Bow hunting

The IAC's baseline (i.e., 1987) and projected demand data for activities relevant to the Yale Project through the year 2000 are presented in Table 3.3-1.

As indicated in Table 3.3-1, demand is expected to increase for all recreation activities in PNRRC Region 2 (which includes the Yale Project study area), with increases projected to range from just under 1 percent per year for some activities to over 3 percent per year for other activities.

The highest percentage increases are for such activities as visiting interpretive displays (3.12 percent), on-road bicycle riding (2.98 percent), and day hiking (2.73 percent). Much lower increases are seen for activities such as upland bird/small game/waterfowl hunting (0.88 percent) and bow hunting (1.09 percent). The majority of recreation activities that occur in the study area are projected to increase at levels over 2 percent per year.

Table 3.3-1. Projected increase in recreation demand in PNRRC Region 2 by activity - by household trips.

Activity (SCORP)	Baseline Conditions in Region 2 (1987) (in 1,000s)	Projected Increase in Demand-Year 2000 (in 1,000s)	Percentage Increase - Total (1987-2000)	Percentage Increase - Annually (%)
Fishing				
Fishing (boat)	713	912	28	1.91
Fishing (bank)	1,338	1,659	24	1.67
Water Activities				
Swimming (beach)	2,793	3,708	33	2.20
Water Skiing	484	635	31	2.11
Sailing	293	400	36	2.42
Windsurfing	55	72	29	2.09
Lake Power Boating	799	1,036	30	2.02
Lake Non-motorized boating	568	769	36	2.36
Nature Study				
Visiting Interp. Displays	990	1,476	49	3.12
Nature Study and Wildlife Observation	1,595	2,247	41	2.67
Outdoor Photography	5,555	8,094	46	2.94
Hiking, Walking, Climbing				
Day Hiking	1,731	2,456	42	2.73
Backpacking (trail)	713	946	33	2.20
Backpacking (off-trail)	96	131	35	2.42
Climbing and Mountaineering	141	195	39	2.52
Camping				
Organized Group Camping	70	90	29	1.95
Tent Camping w/ Motorized Vehicle	315	432	37	2.46
RV Camping	493	680	38	2.50
Off-Road Vehicle Use				
ATV Driving	194	261	35	2.31
4-WD Vehicles	337	470	40	2.59
Non-Motorized Riding				
Bicycle Riding (on road)	2,812	4,120	46	2.98
Bicycle Riding (off road)	741	1036	40	2.61
Horseback Riding	337	419	24	1.69
Sightseeing, Picnicking				
Sightseeing and Exploring	3,678	5,091	38	2.53
Picnicking	1,968	2,878	46	2.97
Hunting				
Big Game	261	318	22	1.53
Upland Birds, Small Game, and Waterfowl	190	213	12	0.88
Bow Hunting	33	38	16	1.09
Source: IAC (1990)				

As evident from the SCORP data, even a modest (e.g., 2 percent) annual increase can represent a substantial increase over time. For example, day hiking is projected to increase 2.7 percent per year, which translates to a growth of over 40 percent from IAC baseline conditions (1987) to the year 2000. This and other results will be instrumental in planning for long-term recreation facility needs in the study area.

It is also notable that visiting interpretive centers represents the largest increase of any activity in the region. This information is particularly relevant to the broader study area, as Mount St. Helens is one of the state's and the nation's most significant tourist attractions. Although the majority of visitation to the Monument occurs to the north along SR 504, access to the volcano's southeast flank is provided by the Lewis River Road through the study area. Interpretive locations such as Ape Cave and Lahar Canyon are just outside the study area, and access to Windy Ridge is possible from the project via "the loop." According to the USFS, projected increases in visitation to the Monument as a whole are estimated to be as high as 5 to 6 percent per year (pers. comm., D. Siegel, USFS, the Monument, November 19, 1996). Increases of this magnitude are relevant to the southeast portion of the Monument as well as the Yale Project.

As a supplement to the SCORP demand data presented in IAC (1990), the IAC conducted limited demand surveys in 1990 and 1994 to determine participation in and growth of different outdoor activities and the most popular outdoor recreation activities statewide. These surveys, with results presented in IAC (1995), indicate 2 significant trends: (1) continued popularity of trail-based linear opportunities such as walking, bicycling, and hiking; and (2) ongoing demand for water-based access and opportunities. Both of these trends are particularly relevant to the Yale Project. The IAC noted that development of water access sites needs to emphasize pedestrian facilities such as footpaths or trails, picnic sites, hand launch facilities, and water's edge view points with interpretive features. For motorized boating, launch ramps and lanes are a clear priority in the state. The IAC noted that state-supported trail projects should be evaluated based on criteria such as a demonstrated high need in a specific area; well-designed trails that offer barrier-free opportunities; trails that link with other trails and between and among communities; and trails that meet the demand for water access, provide wildlife corridors, and offer scenic values (IAC 1995). All of these are relevant to the Yale Lake study area.

3.3.1.2 Other Regional/Local Data Sources

While the SCORP data present a relevant picture of projected demand levels in the region, other sources of recreation demand data also exist in the project vicinity.

An additional data source used to estimate regional demand was published WDFW data concerning recreation demand levels in the project vicinity, specifically in Clark and Cowlitz counties. As noted in WDFW (1995), hunting license demand has increased dramatically in these 2 counties, far outpacing the average statewide growth. From 1987 to 1990, resident hunting license sales in Clark and Cowlitz counties increased 17 percent and 16 percent, respectively, and non-resident license sales increased 38 and 70 percent, respectively. Fishing license data also indicate that these counties' participation exceeds the state average, or that these counties are destination sites for out-of-county anglers.

Additional local indicators of recreation demand are evident in Clark County's proposed trail segments on the east side of Yale Lake along the IP Road, and in the Lewis River Action Committee's identified priority trail projects near the town of Cougar.

3.3.1.3 Projected Future Increases in Demand

Based on the data from the SCORP, WDFW, and counties, PacifiCorp has developed projected demand increases for recreation activities occurring in the Yale Project study area (Table 3.3-2).

Demand projections (i.e., projected increased in demand, in percent) were calculated for the potential term of the new license - through 2030. Due to the dynamic nature of recreation demand, these projections should be revisited every 10 years to ensure correlation with actual conditions. These projections, however, do provide some relative indication of increasing demand in the study area.

As shown in Table 3.3-2, increases in demand through the year 2030 are anticipated to range from a low of approximately 35 percent (for hunting of upland birds, small game, and waterfowl) to a high of 184 percent (for visiting interpretive displays). For most recreation activities, demand is expected to nearly or more than double over the term of the new license. Out of the 28 activities, only 4 activities show projected increases less than 90 percent (i.e., nearly doubling); 3 of these 4 activities are hunting-related, and the fourth is bank fishing.

For many of the activities, demand is expected to significantly increase by 100 percent or more by 2030. For example, visiting interpretive displays, sailing, nature study, day hiking, outdoor photography, and picnicking are expected to increase at levels greater than 125 percent over the course of the potential new license. Activities particularly relevant for the Yale Project are all expected to increase more than 100 percent over the license period, including power boating, boat fishing, tent camping, sightseeing, and picnicking.

3.3.2 Recreation Survey Results

PacifiCorp collected 4 years of visitation data at its 3 Lewis River Projects and conducted a new recreation survey at Yale Lake in conjunction with the relicensing effort. Data collection and analysis included recreation facility and user area counts, vehicle counts, boat counts, and creel counts. PacifiCorp tabulated campground use and occupancy rates and estimated total visitation based on vehicle count data in the project vicinity for 1994 through 1997. These results are presented in this FTR, and in the separate FTR for Aquatic Resources (PacifiCorp 1997b) for the creel survey. Examination of these data provide both a picture of existing use levels, as well as emerging trends and conditions that affect visitation at Yale Lake and in the broader corridor.

Table 3.3-2. Projected increase in demand for recreation activities in the Yale Project study area to 2030.

Yale Lake Recreation Activity	Projected Annual % Increase in Demand	Projected Percent Increase in Demand to 1996-2000	Projected Percent Increase in Demand to 1996-2010	Projected Percent Increase in Demand to 1996-2020	Projected Percent Increase in Demand to 1996-2030
Fishing					
Fishing (boat)	1.91	7.86	30.3	57.4	90.3
Fishing (bank)	1.67	6.8	26.1	48.8	75.6
Water Activities					
Swimming (beach)	2.20	9.1	35.6	68.6	109.6
Water Skiing	2.11	8.7	33.9	65.1	103.4
Sailing	2.42	10	39.8	77.5	125.5
Windsurfing	2.09	8.6	33.6	64.3	102
Lake Power Boating	2.02	8.3	32.3	61.6	97.4
Lake Non-motorized boating	2.36	9.8	38.6	75	121
Nature Study					
Visiting Interp. Displays	3.12	13.1	53.7	109	184.2
Nature Study and Wildlife Observation	2.67	11.1	44.6	88.2	144.9
Outdoor Photography	2.94	12.3	50	100.4	167.8
Hiking, Walking, Climbing					
Day Hiking	2.73	11.4	45.8	90.9	149.9
Backpacking (trail)	2.2	9.1	35.6	68.6	109.6
Backpacking (off trail)	2.42	10	39.8	77.5	125.5
Climbing and Mountaineering	2.52	10.5	41.7	81.7	133.1
Camping					
Organized Group Camping	1.95	8	31	59	92.8
Tent Camping w/ Motorized Vehicle	2.46	10.2	40.5	79.2	128.5
RV Camping	2.50	10.4	41.3	80.9	131.5
Off-Road Vehicle Use					
ATV Driving	2.31	9.6	37.7	73	117.4
4-WD Vehicles	2.59	10.8	43	84.7	138.5
Non-Motorized Riding					
Bicycle Riding (on road)	2.98	12.5	50.8	102.3	171.4
Bicycle Riding (off road)	2.61	10.8	43.4	85.6	140.1
Horseback Riding	1.69	6.9	26.4	49.5	76.8
Sightseeing, Picnicking					
Sightseeing and Exploring	2.53	10.5	41.9	82.1	133.8
Picnicking	2.97	12.4	50.6	101.9	170.5
Hunting					
Big Game	1.53	6.3	23.7	44	67.6
Upland Birds, Small Game, Waterfowl	0.88	3.6	13	23.4	34.7
Bow Hunting	1.09	4.4	16.4	29.7	44.6
Note: Demand projections should be revalidated every 10 years. Sources: IAC (1990)					

3.3.2.1 Recreation User Count Observations Results

This section presents overall visitation and occupancy data for the 3 PacifiCorp Lewis River Projects (Merwin, Yale, and Swift), which provides a context for the Yale Lake recreation experience, and then presents specific user data for the Yale Lake study area.

Lewis River Projects - Campground Occupancy and Overall Visitation Estimate at Developed Facilities

Campground occupancy and overall visitation estimates at developed facilities for the 3 Lewis River Projects are discussed below.

Campground Occupancy at the 3 Lewis River Projects - All overnight campgrounds at the 3 PacifiCorp Lewis River Projects (Yale, Merwin, and Swift) are open during the peak summer recreation season; some campgrounds are open in late April and others are open through late September or early October (varies year to year) to accommodate off-peak season fishing and hunting use. Results for the campground use analysis are therefore presented from April through October.

As evident in Table 3.3-3, demand (as measured by occupancy rates) varies in the study area, with use fluctuating according to a number of factors. As expected, campground use is higher on holidays and weekends than during the weekdays. Use is also higher during the summer months (June, July, and August) than during April, May, September, and October (also see Figures 3.3-1 through 3.3-3, which were generated from the data presented in Table 3.3-3). Furthermore, the hottest months (July and August) received the highest visitation percentages.

Also evident from Table 3.3-3 is that campground use in both 1994 and 1996 was generally higher than in 1995 and 1997; however, early 1996 and 1997 (April through June) occupancy was lower than this period for the 2 previous years. A contributing factor to these results is that 1995 and early 1996 and 1997 were relatively wet and rainy on the Lewis River, which appeared to keep campers away from the area. For example, the July 4 weekend was overcast and rainy in 1995; as seen in Table 3.3-3, percent occupancy during the July 4th weekend in 1995 was much lower (averaging 71 percent), compared with the same holiday in 1994 and 1996 (averaging 103 and 99 percent, respectively). As with other campgrounds in the Pacific Northwest, visitation is often weather dependent. This is particularly evident in the Upper Lewis River Valley where rainfall is high, averaging above 140 inches per year.

Weekend campground occupancy for 1994 and 1996 was similar (74 to 75 percent) with a dip in occupancy in 1995 and 1997 (67 percent), primarily due to weather conditions. Weekday campground occupancy for 1994 and 1996 was also similar (42 to 43 percent) with another dip in occupancy in 1995 and 1997 (34 to 35 percent), again assumed to be weather related. Holiday campground occupancy, however, has shown a decline from a high in 1994 of 97 percent to 85 to 88 percent in 1995 through 1997. The reason for this decrease in occupancy also appears to be weather related.

Table 3.3-3. Lewis River Projects campground occupancy for 1994 to 1997 by day type.

Day Type	Month	Percent Occupancy			
		1994	**1995**	**1996**	**1997**
Weekend	April	57%	50%	13%	51%
	May	84%	51%	29%	23%
	June	61%	55%	79%	48%
	July	103%	85%	99%	95%
	August	100%	95%	97%	97%
	September	45%	57%	29%	61%
	October	21%	14%	NA	NA
	Summary (Weekend)	**75%**	**67%**	**74%**	**67%**
Weekday	April	9%	19%	1%	5%
	May	24%	18%	6%	9%
	June	30%	27%	22%	16%
	July	65%	52%	72%	57%
	August	67%	56%	77%	61%
	September	21%	12%	10%	14%
	October	5%	4%	NA	NA
	Summary (Weekday)	**42%**	**34%**	**43%**	**35%**
Holiday	May	100%	100%	92%	86%
	July	103%	71%	99%	95%
	September	88%	81%	77%	76%
	Summary (Holiday)	**97%**	**85%**	**88%**	**86%**

NA = Not available.

Another conclusion of the survey is that the campgrounds in general at PacifiCorp's Lewis River Projects appear to be functioning at or near capacity levels during summer weekends and above capacity during most summer holidays. As an example of peak demand and use, Table 3.3-4 presents percent occupancy levels for the July 4th holiday weekend for 1994 through 1997. Use levels for 1995 were significantly lower than the other 3 years of study, with percent occupancy ranging from 64 percent at Saddle Dam Campground to 88 percent at Cougar Campground.

In 1994, 1996, and 1997, however, most campgrounds were at or above capacity for this peak holiday weekend, ranging from a low of 91 percent at Swift Campground in 1997 and 94 percent at Cresap Bay Campground in 1994, Beaver Bay Campground in 1994, and Cougar Campground in 1997, to a high of 149 percent at Saddle Dam Campground in 1994 and 100 percent at several other campgrounds.

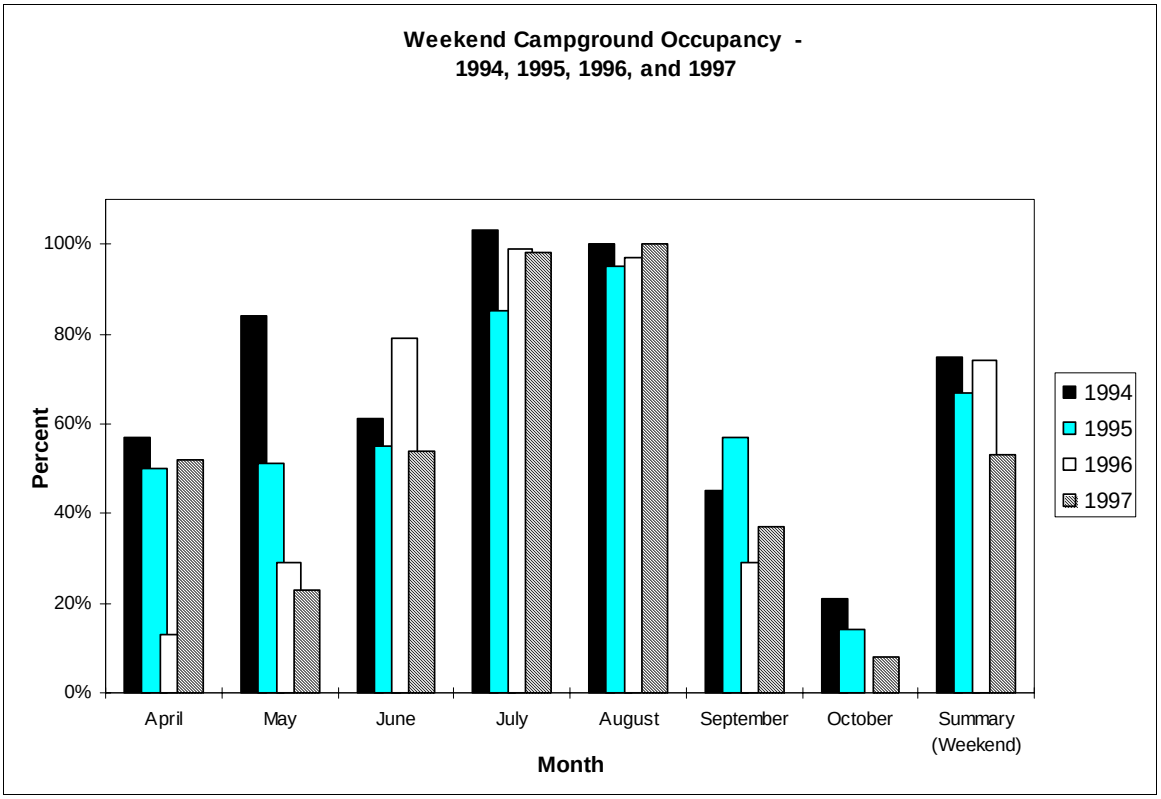


Figure 3.3-1. Weekend campground occupancy - 1994 through 1997.

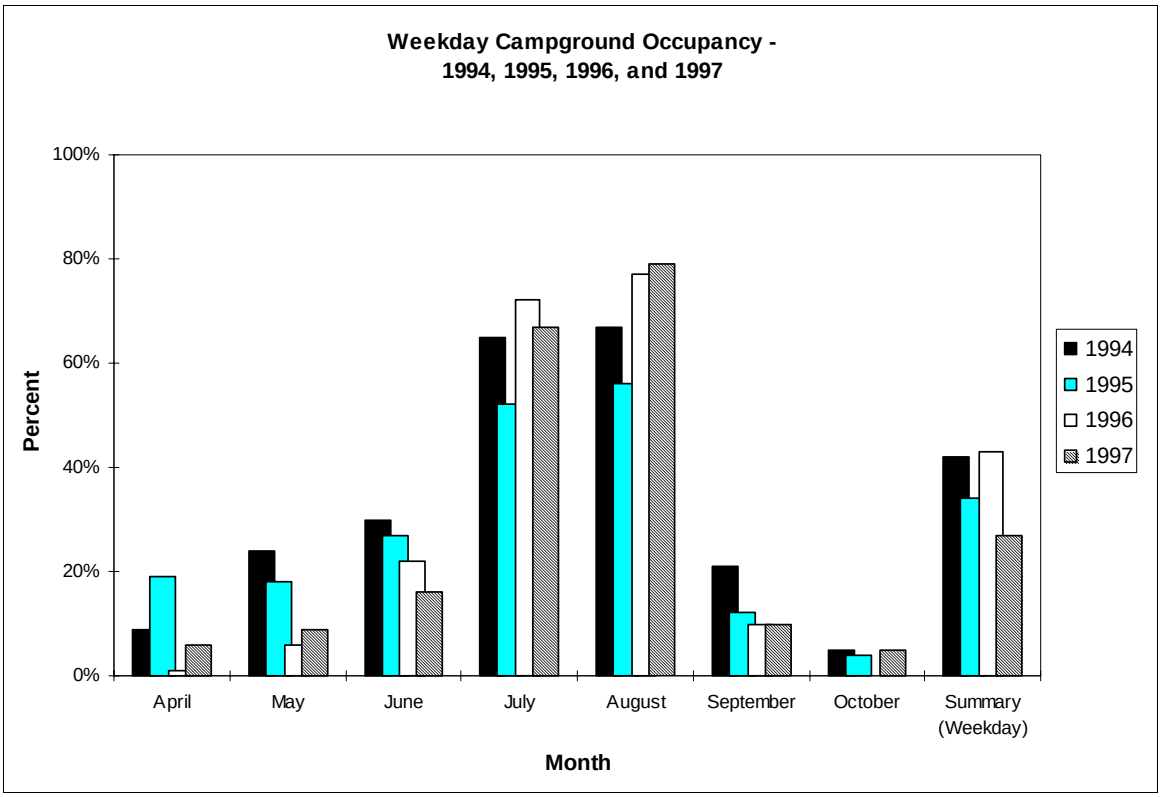


Figure 3.3-2. Weekday campground occupancy - 1994 through 1997.

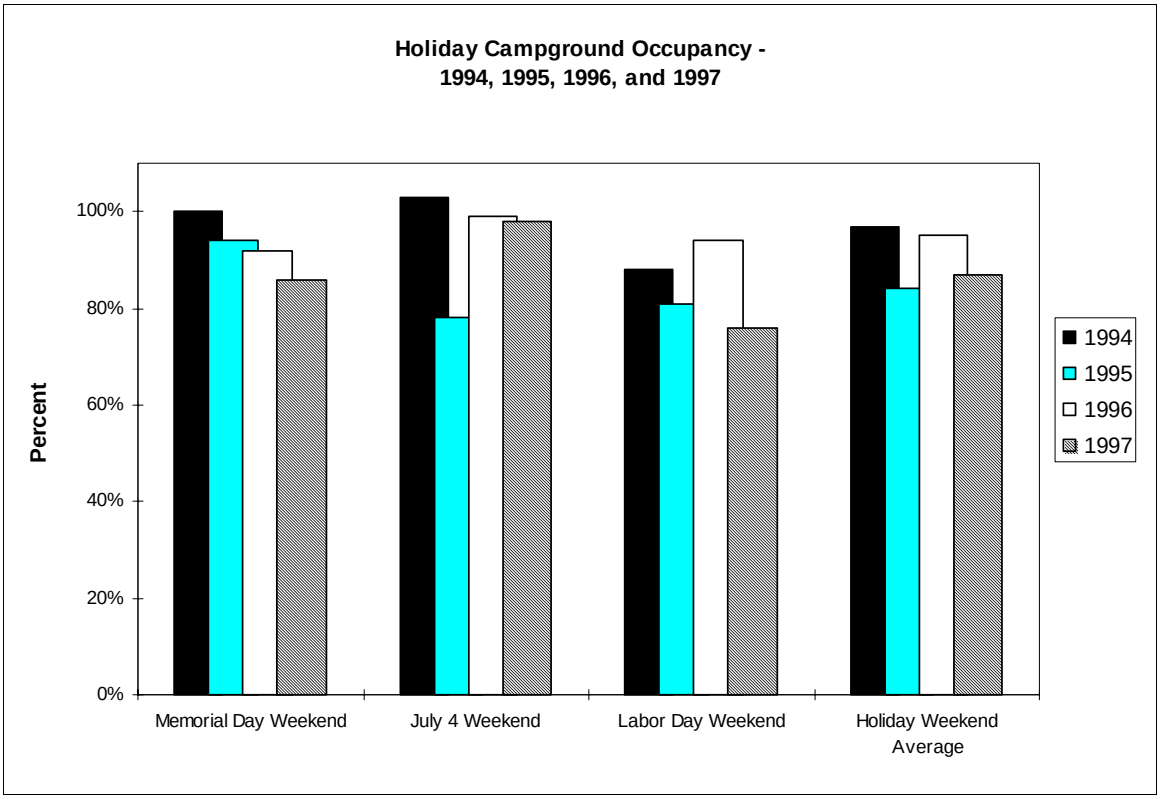


Figure 3.3-3. Holiday campground occupancy - 1994 through 1997.

Table 3.3-4. Holiday weekend occupancy (July 4) at PacifiCorp's 5 campgrounds at the Lewis River Projects-1994 through 1997.

Campground	1994	1995	1996	1997
Beaver Bay Campground (Yale)	94%	67%	100%	100%
Cougar Campground (Yale)	100%	88%	100%	94%
Saddle Dam Campground (Yale)	149%	64%	100%	98%
Cresap Bay Campground (Merwin)	94%	72%	99%	96%
Swift Campground (Swift)	109%	66%	NA	91%
NA = Not Available.				

Another notable result from the 4-year period of record is that demand for PacifiCorp's campground facilities along the Lewis River did not significantly decrease in 1996, despite the fact that roads providing access to the southeast portion of the Monument were closed due to washouts resulting from February 1996 floods. Annual campground occupancy rates were significantly higher in 1994 and 1996 than in 1995 and 1997. Percent occupancy rates for periods when campgrounds were open ranged from a total of 46 percent in 1995 and 1997 to a total of 54 percent in 1994; the 1996 average at 53 percent was higher than 1995 and 1997 and essentially identical to 1994 (Table 3.3-5). Weekend and holiday average percent occupancy were also very high in 1996, ranging from 74 percent (weekend total average) to 88 percent (holiday total average).

Table 3.3-5. Annual campground occupancy for PacifiCorp's 5 campgrounds at the 3 Lewis River Projects from 1994 to 1997 based on observed occupied sites.

Campground	1994	1995	1996	1997	1998
Beaver Bay Campground (Yale)	57%	44%	41%	46%	45%
Cougar Campground (Yale)	78%	73%	72%	68%	66%
Saddle Dam Campground (Yale)	69%	34%	48%	46%	35%
Cresap Bay Campground (Merwin)	76%	64%	59%	64%	63%
Swift Campground (Swift)	37%	33%	NA	31%	28-29%
Total Annual Occupancy	**54%**	**46%**	**53%**	**46%**	**43.73%**
NA = Not available.					

The relatively high level of use in 1996 would indicate that demand for PacifiCorp's Lewis River Projects campground facilities is high. As recreation use continues to grow in the Monument, this added demand will likely place further demand pressure on the Lewis River Projects recreation facilities, particularly because the Monument and GPNF contain few developed campsites in the Upper Lewis River Valley.

Overall Visitation Estimate at Developed Facilities at the 3 Lewis River Projects - In addition to collecting campground use data, PacifiCorp collects vehicle count data at the developed recreation facilities at its 3 Lewis River Projects. The purpose of this data collection is to gain an understanding of the overall use and demand for these facilities. Vehicle count data are converted to visitor numbers based on a conversion factor (3.4 average visitors per vehicle). Visitation results for 1994, 1995, 1996, and 1997 are summarized in Table 3.3-6, based on traffic count data.

As shown in Table 3.3-6, use of PacifiCorp's 3 Lewis River Projects recreation facilities from 1994 through 1997 declined and then rose again during the 4 years; however, average peak season visits per day remained fairly constant during the last 3 years. Some facilities saw increased use while others saw decreased use, which was a function of weather, construction projects, and opening and closing dates. The biggest decline can be found at Swift Campground in 1996 due to the road closures and flood damage. Total visitation is highest for the year-round Yale Park and Merwin Park, as would be expected.

Total visitation at these facilities ranged from nearly 119,000 for Yale Park in 1996, to nearly 156,000 for Merwin Park in 1994. Average visits per day during the peak season were also highest for these 2 facilities, averaging at or above 200 vehicles per day in all study years, or 680 to 823 visitors per day. Cresap Bay Campground also received very high use (total visitation), ranging up to approximately 98,000 per year; this new facility also received well over 200 vehicles average per day during the peak recreation season, or 768 to 881 visitors per day. Use levels dropped in 1997 due to several possible reasons including weather, installation of a new entry gate, and/or counter malfunction.

Table 3.3-6. Developed recreational facility annual and seasonal visitation at PacifiCorp's 3 Lewis River Projects for 1994 to 1997.

	Developed Facility Annual Visitation				Developed Facility Average Peak Season Visits/Day				Developed Facility Average Non-Peak Season Visits/Day			
Facility	**1994**	**1995**	**1996**	**1997**	**1994**	**1995**	**1996**	**1997**	**1994**	**1995**	**1996**	**1997**
Saddle Dam Campground (Yale)	59,288	NA	56,753	50,102	507	432	530	490	95	NA	37	68
Cougar Campground (Yale)	57,253	44,168	61,549	55,146	554	427	581	546	24	7	20	NA
Cougar Park (Yale)	NA	NA	44,543	31,209	NA	NA	422	309	NA	NA	17	NA
Yale Park (Yale)	142,750	135,408	118,686	137,990	799	751	680	718	235	241	269	248
Beaver Bay Campground (Yale)	83,990	81,176	64,719	79,421	666	632	677	642	381	241	153	239
Merwin Park (Merwin)	155,638	134,947	118,874	150,444	779	785	823	708	296	313	323	299
Speelyai Bay (Merwin)	76,432	83,099	72,323	59,214	541	496	534	534	88	139	112	20
Cresap Bay (Merwin)	90,829	96,356	98,178	64,839	881	830	768	561	7	143	17	282
Eagle Cliff Park (Swift)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Swift Camp-ground (Swift)	101,344	102,241	34,490	90,750	670	663	NA	550	303	265	NA	320
Total	**767,524**	**677,395**	**710,135**	**719,115**	**5,397**	**5,016**	**5,015**	**5,058**	**1,429**	**1,349**	**948**	**1,476**

NA = Not available/not applicable.
Note: Based on vehicle counts and a conversion factor of 3.4 persons per vehicle.

As expected, use levels drop off significantly during the non-peak season. For example, use levels at Yale Park dropped from 799 to 680 visitors per day during the peak season to between 235 to 269 visitors per day during the non-peak season, a decrease of two-thirds (60 to 66 percent decrease). At campground facilities, use levels decline dramatically (over 90 percent) during the non-peak season because most facilities were closed or open only during the shoulder season. Use levels rebounded in 1997 after the roads were reopened.

Unlike the campground use data discussed previously, traffic counts indicate that use levels did decline slightly in 1996 as compared to the previous years of record. This is expected because of road closures leading into the Monument during most of 1996. For example, visitation at Yale Park dropped from over 135,000 total visits in 1995 to almost 119,000 visits in 1996. Counts at Swift Campground decreased from over 102,000 total visits in 1995 to only about 34,000 in 1996. This facility was most affected by the 1996 road closures; access to Swift Reservoir from the west was closed during the entire 1996 peak recreation season. Use levels rebounded in 1997 after the roads were reopened.

Yale Lake - Recreation User Count Observations

This section presents the results of user count observations conducted at Yale Lake in 1996 and 1997 including:

- Developed fee campground counts
- RV versus tent camping counts
- Boat launch and day-use area vehicle counts
- Boat and bank angler counts
- Boat and watercraft counts and density
- Miscellaneous activity counts at developed facility sites
- Miscellaneous activity counts at undeveloped dispersed sites
- Estimate of annual and seasonal recreation visitation at Yale Lake
- Creel survey

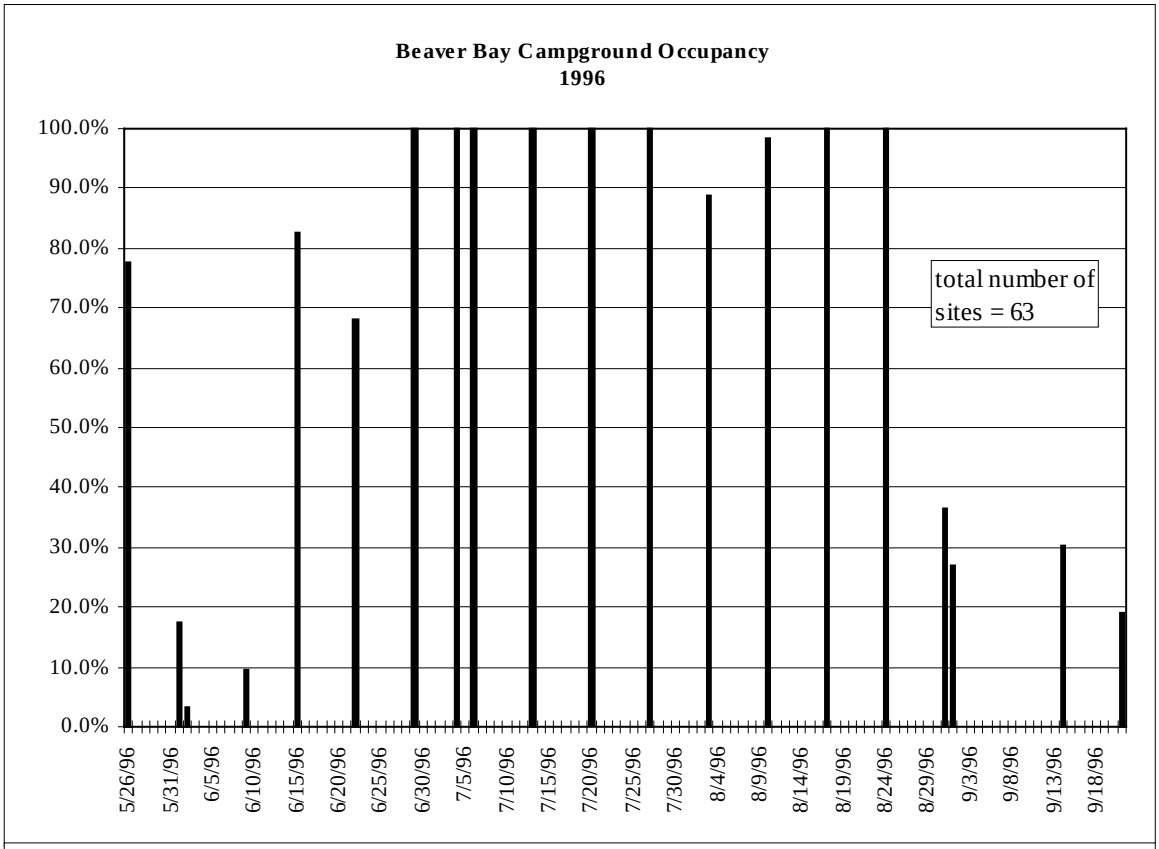
Yale Lake Developed Fee Campground Counts - The previous section discussed campground occupancy rates for all 3 Lewis River Projects. Occupancy rates for PacifiCorp campgrounds at the 3 hydroelectric projects for the last 4 years include: annual (46 to 54 percent), weekday (34 to 43 percent), weekend (67 to 75 percent), and holiday (85 to 97 percent). Results for the 3 Yale Lake campgrounds (Beaver Bay, Cougar Camp, and Saddle Dam) are presented in Table 3.3-7 below.

Table 3.3-7. Occupancy rates at Yale Lake campgrounds during the last 4 years (1994 to 1997).

Campground	Annual Seasonal Occupancy	Weekday Seasonal Occupancy*	Weekend Seasonal Occupancy*	Summer Holiday Occupancy
Beaver Bay	Range 41-59% (47% avg.)	Range 34-52% (39% avg.)	Range 67-83% (71% avg.)	Range 67-100% (98% avg.)
Cougar Camp	Range 71-78% (73% avg.)	Range 34-52% (39% avg.)	Range 67-83% (71% avg.)	Range 88-100% (98% avg.)
Saddle Dam	Range 34-69% (49% avg.)	Range 34-52% (39% avg.)	Range 67-83% (71% avg.)	Range 64-149% (100% avg.)
* Occupancy rates derived from total Lewis River Projects.				

As shown in Table 3.3-7, Yale Lake campground occupancy rates vary by site and timeframe. Annually, Cougar Camp receives the highest amount of use at an average occupancy of 73%, or about three-quarters full. The other 2 campgrounds have similar annual occupancy rates at 47 to 49 percent, or about half full. Weekday occupancy rates for each campground averaged 39 percent and weekend occupancy rates averaged 71 percent, resulting in a 32 percent difference between weekend and weekday rates (totals for all PacifiCorp campgrounds combined). Summer holiday weekends (Memorial Day, July 4, and Labor Day) showed the highest occupancy rates, as expected, with full or near full conditions (98 to 100 percent). Saddle Dam was the most full and occasionally over capacity during the 4-year period. This is likely due to the number of campsites available (15 versus 63, respectively). Weather played a big role in occupancy rates over the entire season.

During the 20 weekend or holiday days surveyed in 1996 for this study, campground occupancy at PacifiCorp's 3 campgrounds (Beaver Bay, Cougar Camp, and Saddle Dam) was high, as evidenced in Figure 3.3-4 and includes the following percent of times above threshold levels:



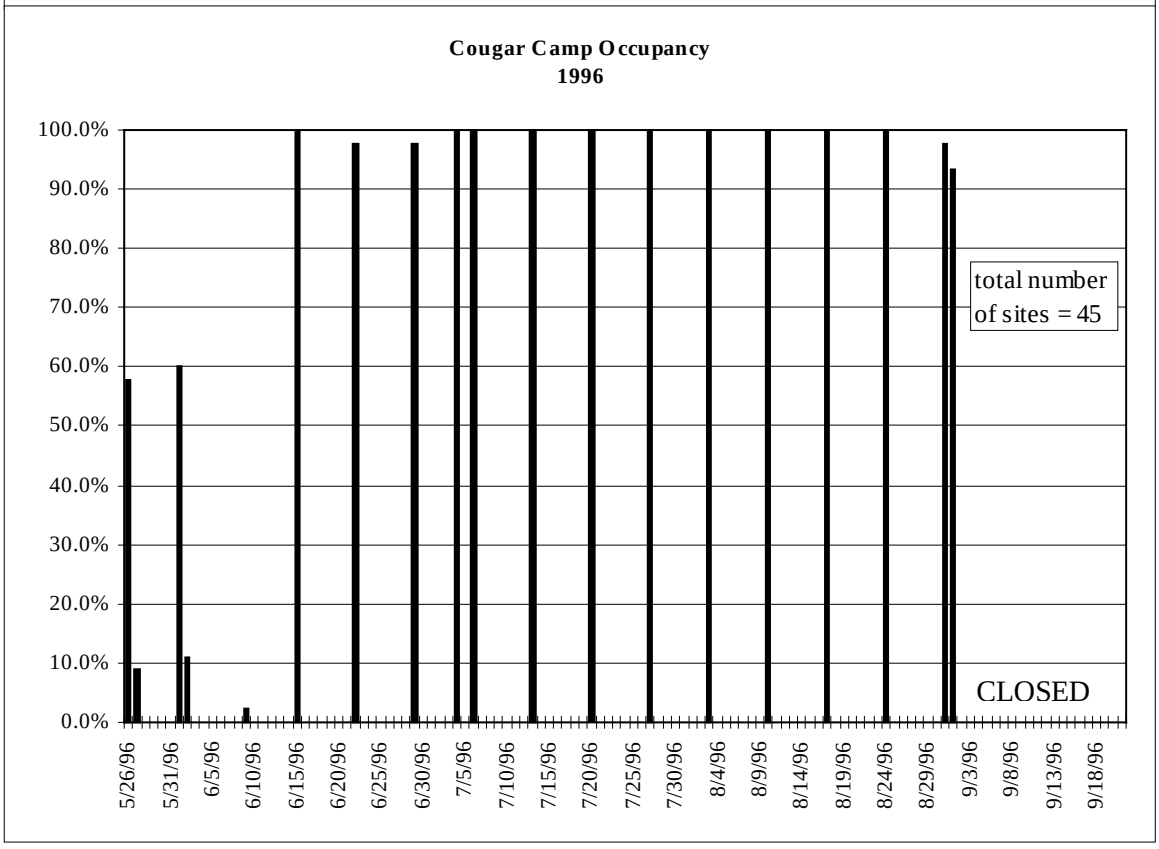


Figure 3.3-4. Number of Yale Lake campsites occupied on days surveyed, 1996.

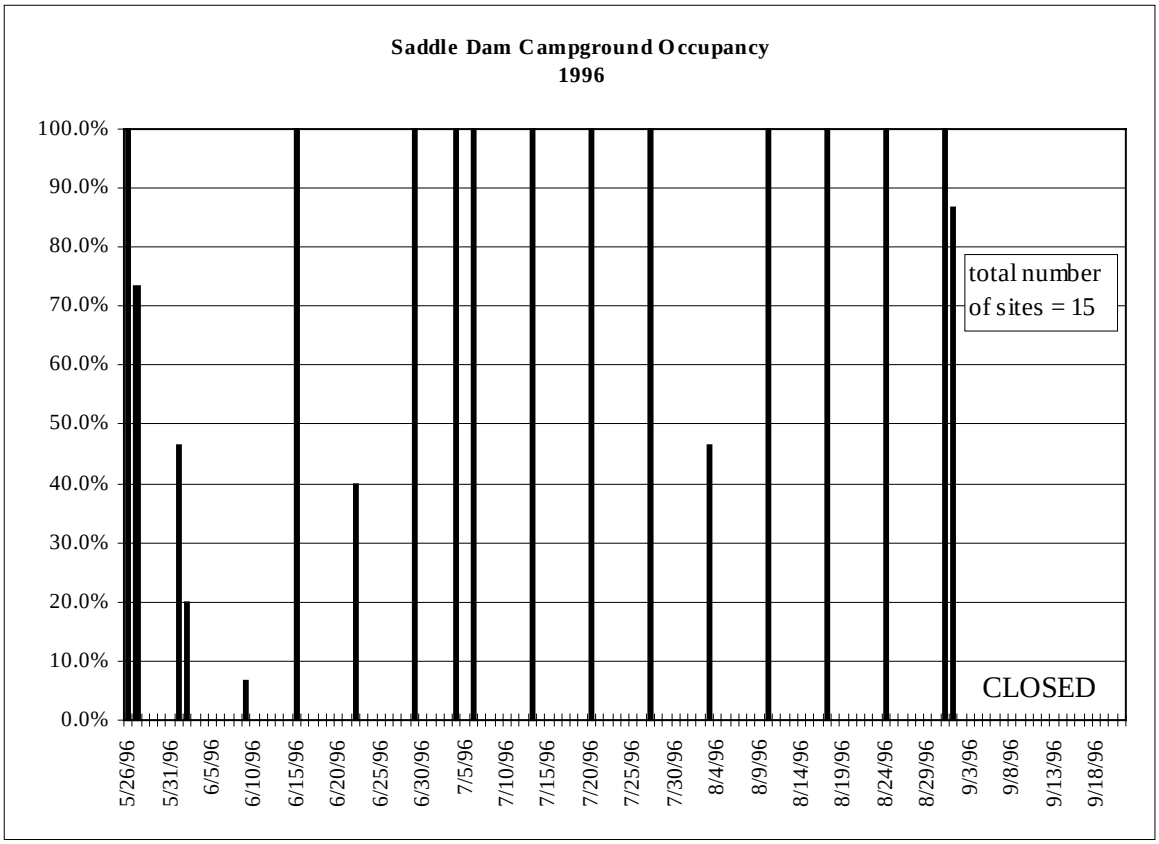


Figure 3.3-4. Number of Yale Lake campsites occupied on days surveyed, 1996 (continued).

- Percent of time that occupancy levels were above 60 percent: Beaver Bay (65 percent), Cougar Camp (75 percent), and Saddle Dam (70 percent).
- Above 70 percent: Beaver Bay (60 percent), Cougar Camp (70 percent), and Saddle Dam (70 percent).
- Above 80 percent: Beaver Bay (55 percent), Cougar Camp (70 percent), and Saddle Dam (65 percent).
- Above 90 percent: Beaver Bay (50 percent), Cougar Camp (70 percent), and Saddle Dam (60 percent).
- At or above 100 percent: Beaver Bay (45 percent), Cougar Camp (65 percent), and Saddle Dam (60 percent).

RV Versus Tent Camping at Yale Lake - Yale Lake campgrounds were surveyed to determine the mix of RV campers versus tent campers at each site. Overall, about 3 out of 4 campers use tents; however, this high number includes Cougar Camp, which is tent-camping only. In addition, campgrounds do not provide hook-ups which are desired by some RV campers. RV use at Beaver Bay and Saddle Dam campgrounds accounts for a

third to less than half of the use. The split of RV versus tent camping at Yale Lake campgrounds for holiday and non-holiday periods includes:

- Beaver Bay - Holiday periods: tents (52 percent), RVs (48 percent); Non-holiday periods: tents (62 percent), RVs (38 percent)
- Cougar Camp - Holiday and non-holiday periods: tents (100 percent, no RVs are allowed)
- Saddle Dam - Holiday periods: tents (54 percent), RVs (46 percent); Non-holiday periods: tents (64 percent), RVs (36 percent)
- All Campgrounds Combined - Holiday periods: tents (71 percent), RVs (29 percent); Non-holiday periods: tents (76 percent), RVs (24 percent)

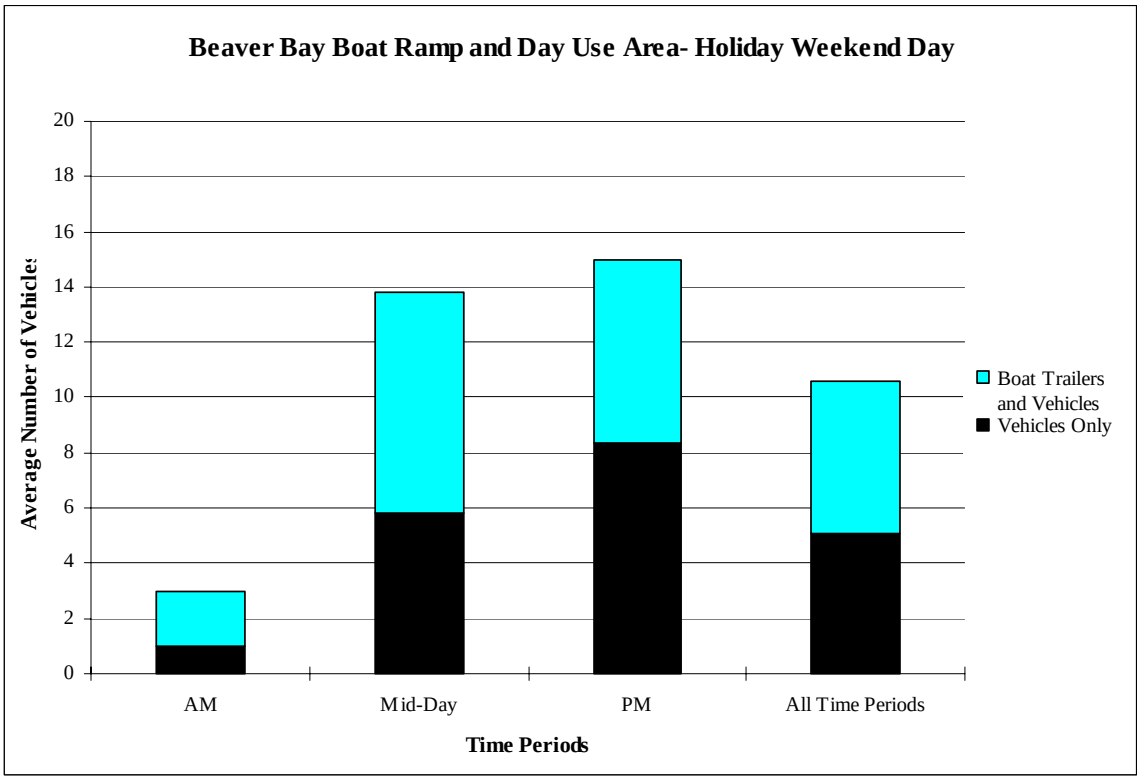
Yale Lake Boat Launch and Day-Use Area Parking - Vehicles and vehicles with boat trailers were counted at Yale Lake boat launches 3 times a day (morning, mid-day, and afternoon) during the survey period. The results of these survey counts for holiday and non-holiday weekends are presented in Figures 3.3-5 through 3.3-9. Wait times for boat launches are discussed in Section 3.3.2.2.

Beaver Bay - During holiday weekends, the day-use area/boat launch parking lot typically had 3 to 15 vehicles parked, with an average of 11 vehicles. Most vehicles were parked during the warmer mid-day to afternoon timeframe. Slightly over half (55 percent) of the vehicles parked were vehicles with boat trailers.

At peak times of the day during holiday weekends, parking lot occupancy averaged only 38 percent, assuming a capacity of 40 vehicles. This lot was rarely full, despite the adjacent picnic and swim area. July 4 and Labor Day weekends saw higher occupancy rates than Memorial Day weekend.

During non-holiday weekends, use was similar to holiday weekends with 8 to 14 vehicles parked averaging 12 vehicles during the day. Most vehicles were again parked during the warmer mid-day to afternoon timeframe. Over half (58 percent) of the vehicles parked were vehicles with boat trailers. At peak times of the day during non-holiday weekends, parking lot occupancy averaged only 35 percent.

Cougar Camp - During holiday weekends, the boat launch parking lot typically had 24 to 29 vehicles parked, with an average of 25 vehicles. Vehicles were parked fairly evenly during the day, which was different from other Yale Lake sites. This is partly due to overflow parking from the adjacent Cougar Camp and sailing regatta participants who arrived in the mornings. Three out of 5 (60 percent) vehicles parked were without trailers due to overflow campground parking. At peak times of the day during holiday weekends (mid-day), parking lot occupancy averaged only 28 percent, assuming a capacity of 100 vehicles. July 4 and Labor Day weekends saw higher occupancy rates than Memorial Day weekend. This lot was rarely full, despite the adjacent campground parking overflow.



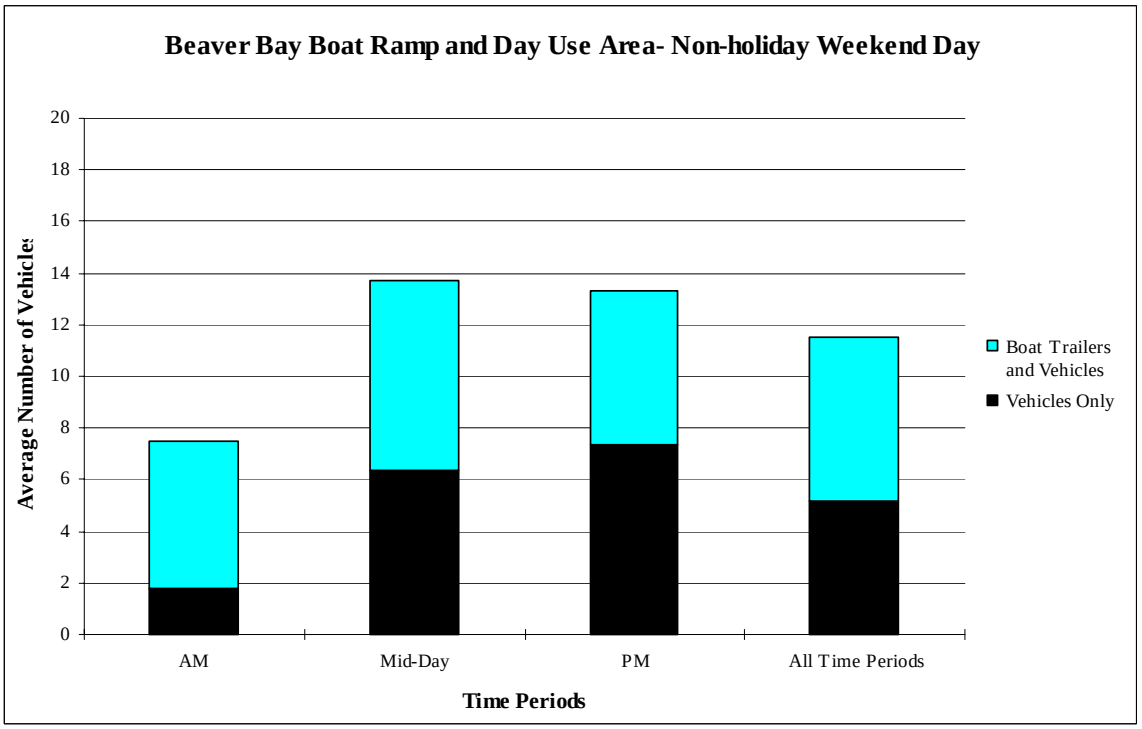
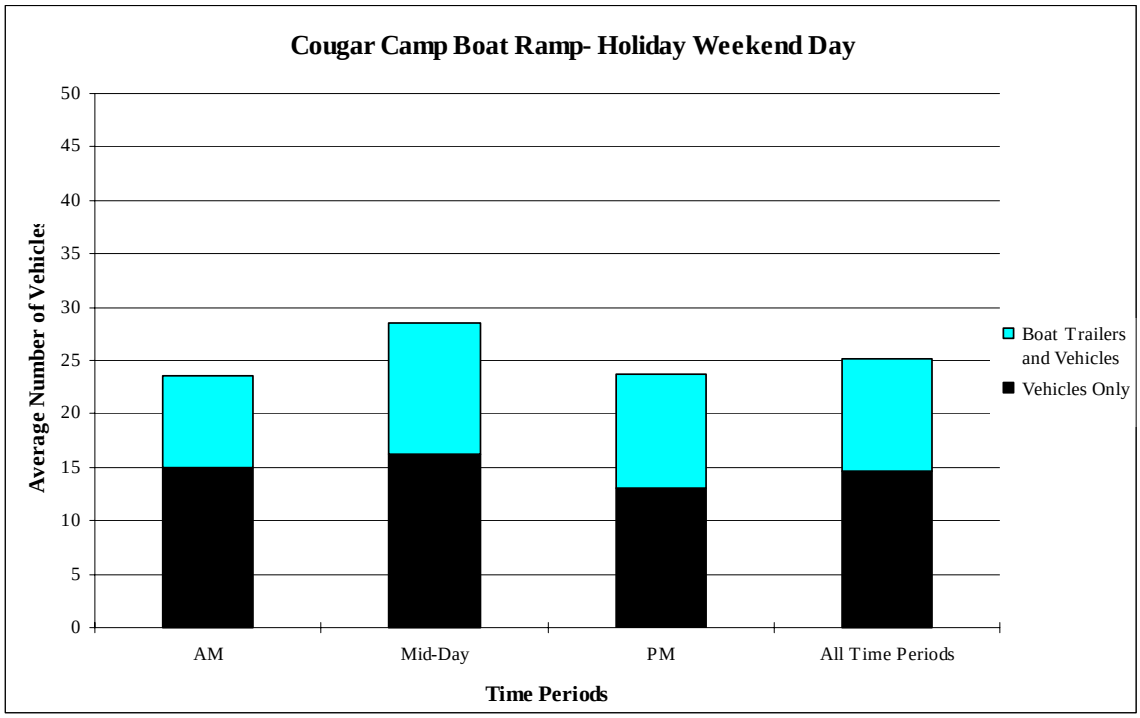


Figure 3.3-5. Average number of vehicles and boat trailers parked at the Beaver Bay boat launch and day-use area, 1996-1997.



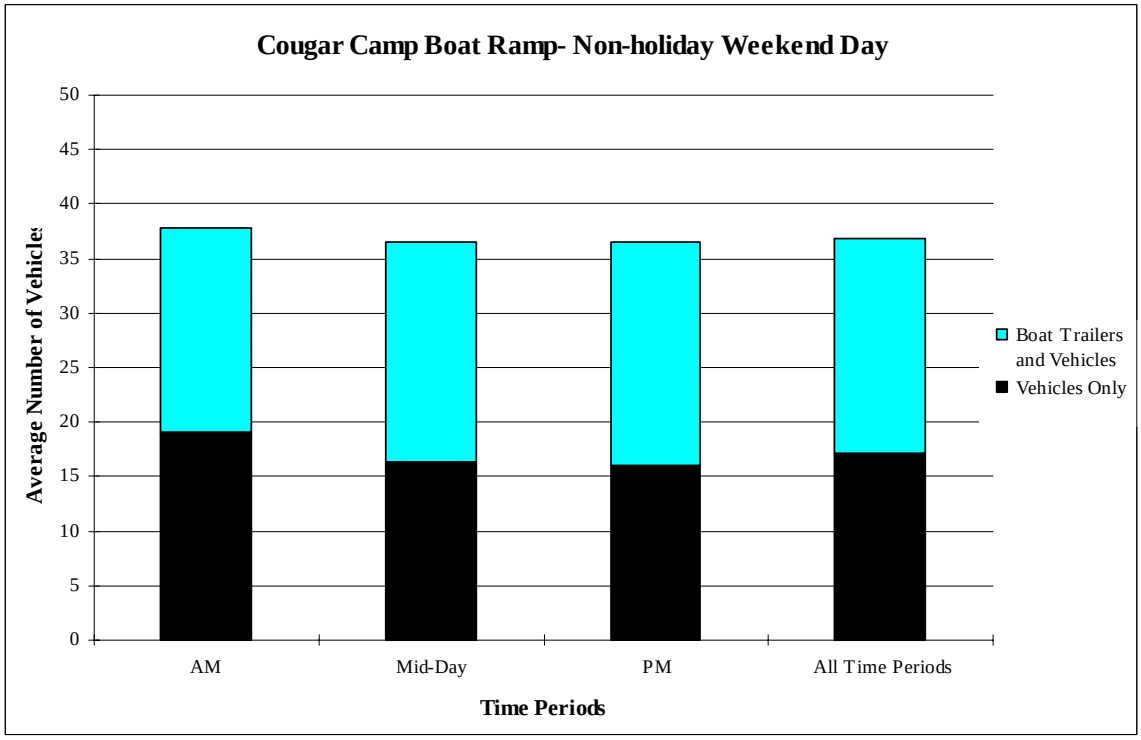
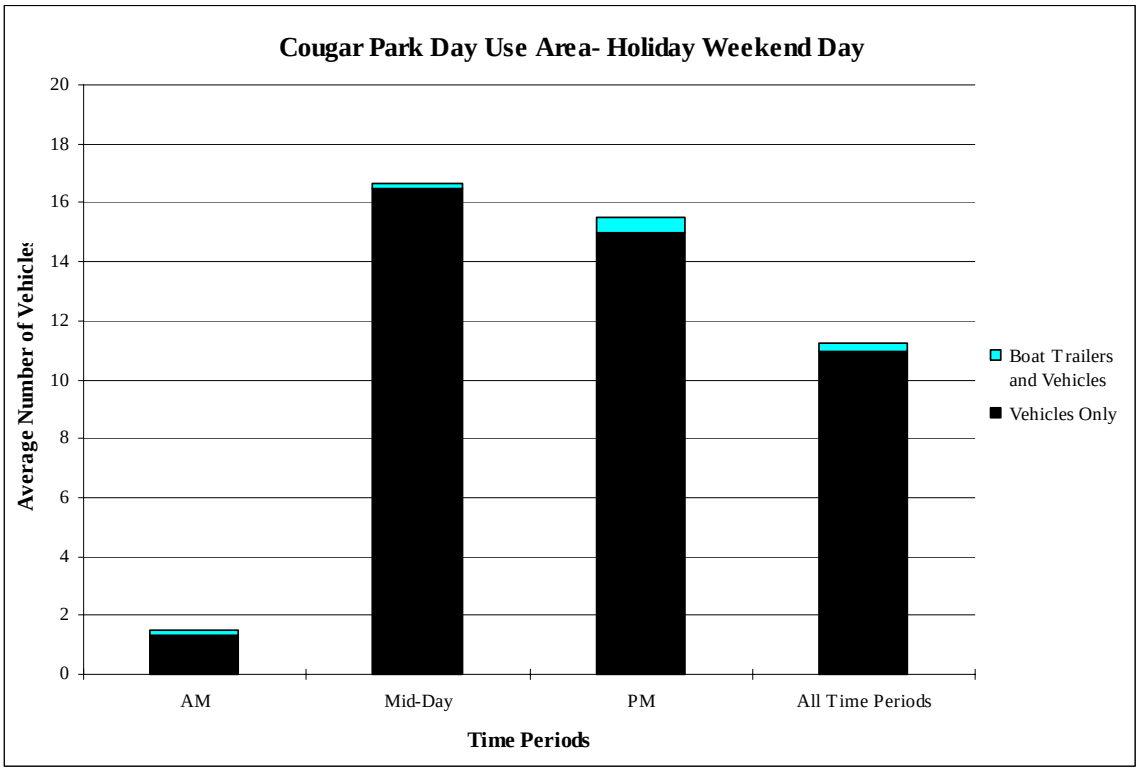


Figure 3.3-6. Average number of vehicles and boat trailers parked at the Cougar Camp/Park boat launch area, 1996-1997.



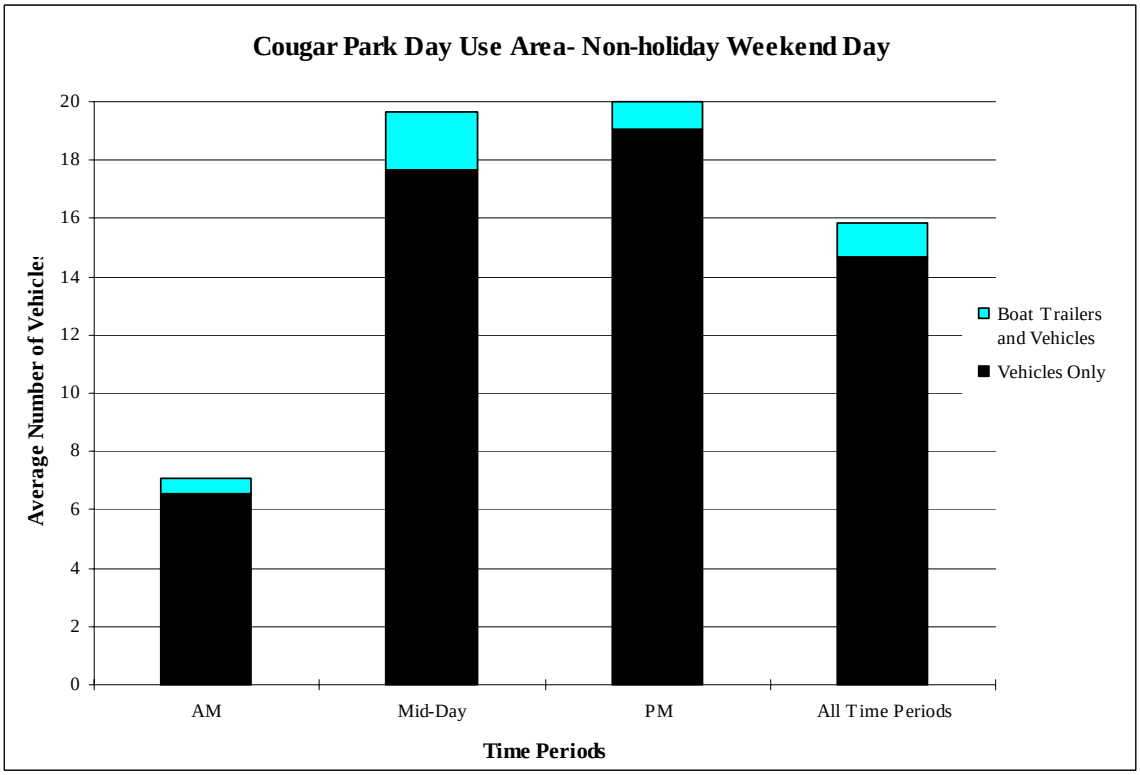
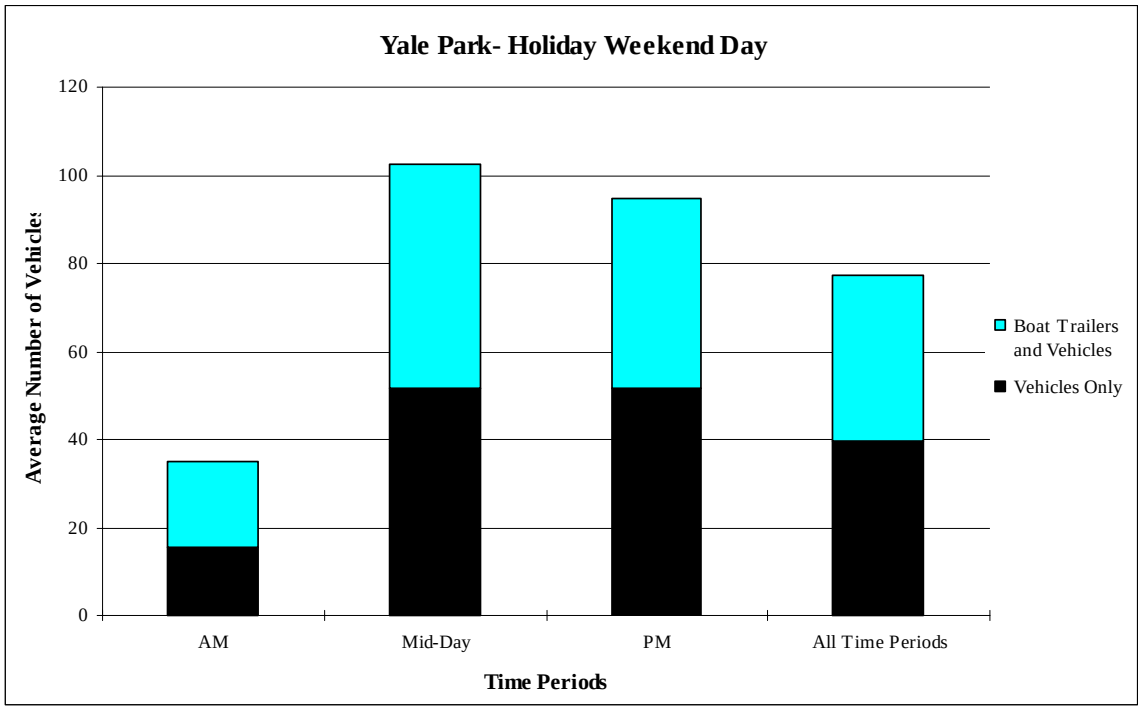


Figure 3.3-7. Average number of vehicles and boat trailers parked at the Cougar Park day-use area, 1996-1997.



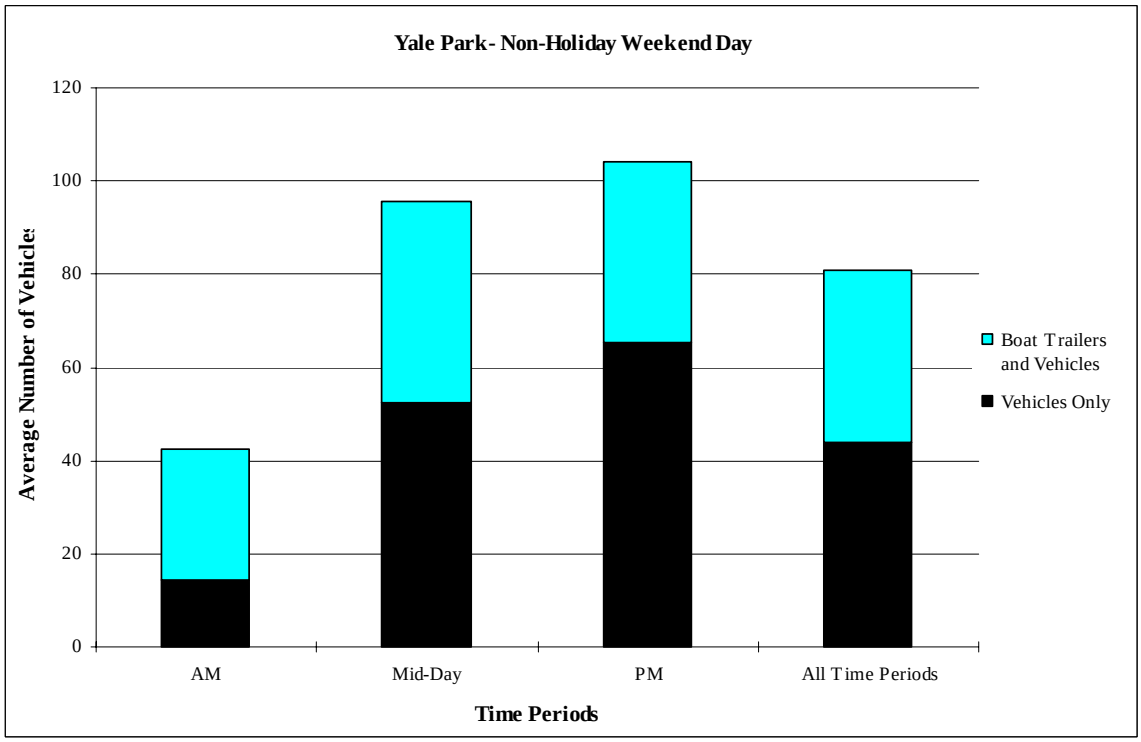
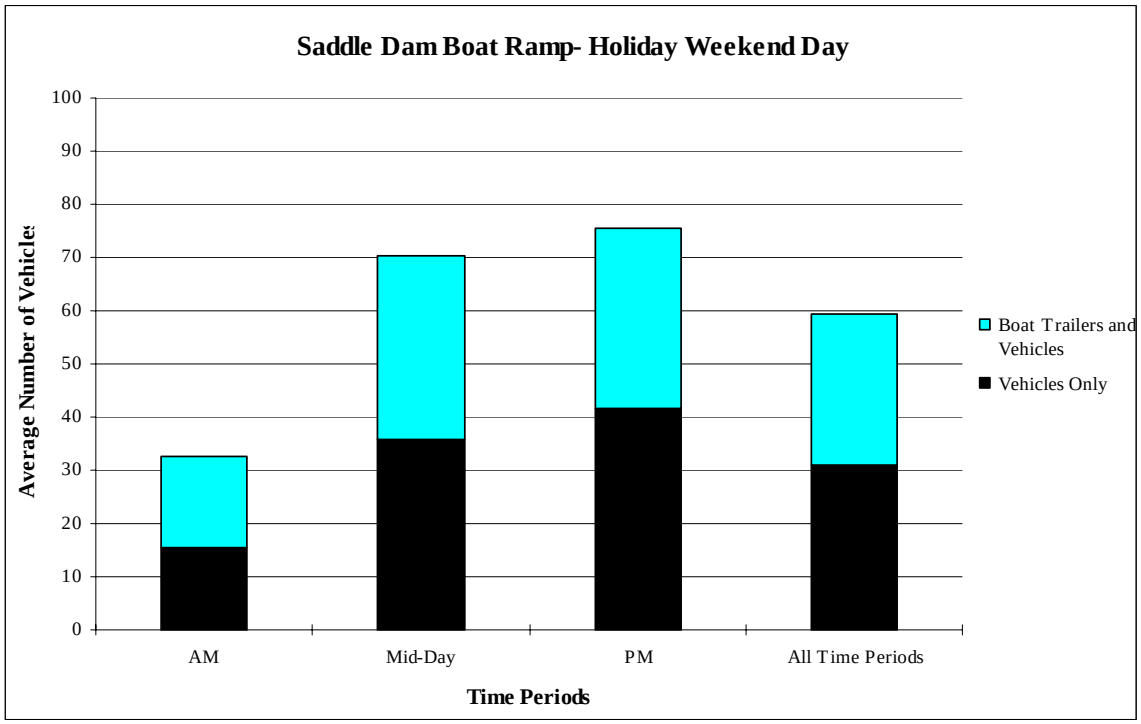


Figure 3.3-8. Average number of vehicles and boat trailers parked at the Yale Park boat launch and day-use area, 1996-1997.



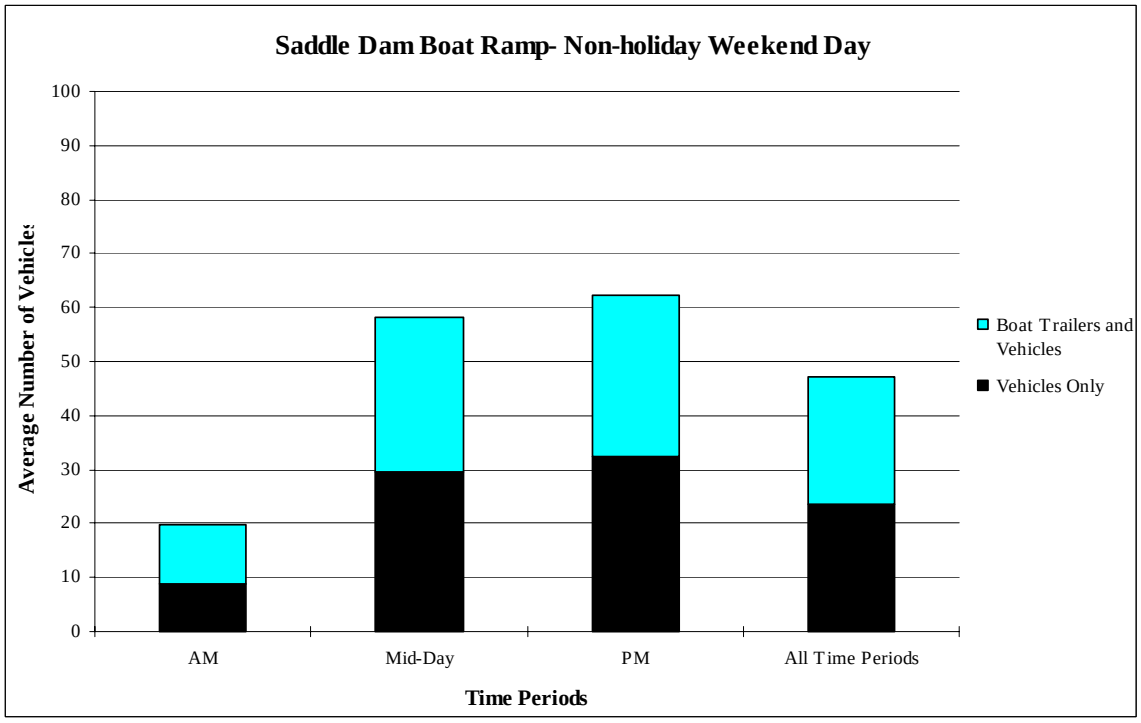


Figure 3.3-9. Average number of vehicles and boat trailers parked at the Saddle Dam boat launch and day-use area, 1996-1997.

During non-holiday weekends, use was higher than during holiday weekends because of sailing regattas with 37 vehicles parked during the day. Most vehicles were again parked during the entire day with little variance. Unlike the holiday weekends, over half (54 percent) of the vehicles parked were vehicles with boat trailers. The parking lot occupancy averaged only 38 percent; however, the lot was full during sailing regattas and parking was exacerbated by the configuration of the lot and the lack of designated parking stalls.

Cougar Park - During holiday weekends, the day-use area parking lot typically had 2 to 17 vehicles parked, with an average of 12 vehicles. Most vehicles were parked during the warmer mid-day to afternoon timeframe. Almost all (92 percent) of the vehicles parked were vehicles without boat trailers. At peak times of the day during holiday weekends, parking lot occupancy averaged only 22 percent, assuming a capacity of 80 vehicles. This lot was rarely full, despite the adjacent picnic and swim area. July 4 and Labor Day weekends saw higher occupancy rates than Memorial Day weekend.

During non-holiday weekends, use was similar to but slightly higher than holiday weekends, with 7 to 20 vehicles parked averaging 16 vehicles during the day. Most vehicles were again parked during the warmer mid-day to afternoon timeframe. Most (88 percent) of the vehicles parked were vehicles without boat trailers. At peak times of the day during non-holiday weekends, parking lot occupancy averaged only 25 percent.

Yale Park - During holiday weekends, the day-use area/boat launch parking lot typically had 37 to 102 vehicles parked, with an average of 79 vehicles. Most vehicles were parked during the warmer mid-day to afternoon timeframe. Slightly over half (51 percent) of the vehicles parked were vehicles without boat trailers. At peak times of the day during holiday weekends, parking lot occupancy averaged 37 percent, assuming a capacity of 280 vehicles. This lot was generally not full, unless the weekend weather was very hot which sometimes resulted in overflow conditions with vehicles parked along the highway. July 4 and Labor Day weekends saw higher occupancy rates than Memorial Day weekend.

During non-holiday weekends, use was similar to holiday weekends, with 42 to 103 vehicles parked averaging 81 vehicles during the day. Most vehicles were again parked during the warmer mid-day to afternoon timeframe. Over half (53 percent) of the vehicles parked were vehicles without boat trailers. At peak times of the day during non-holiday weekends, parking lot occupancy averaged 37 percent. Again, overflow conditions would sometimes arise during very hot late summer weekend days (up to about 305 vehicles or 109 percent occupancy).

Saddle Dam - During holiday weekends, the day-use area/boat launch parking lot and adjacent road shoulder (parking was allowed and encouraged on the road shoulder) typically had 33 to 75 vehicles parked, with an average of 60 vehicles. Most vehicles were parked during the warmer mid-day to afternoon timeframe. Half (50 percent) of the vehicles parked were vehicles with boat trailers. At peak times of the day during holiday weekends, parking lot occupancy averaged only 38 percent, assuming a capacity of 200 vehicles. If the late summer weather is very hot, overflow conditions do occur resulting

in the entry gate having to be closed. Such closures occurred up to 5 times per year. July 4 and Labor Day weekends see higher occupancy rates than Memorial Day weekend.

During non-holiday weekends, use was lower than holiday weekends with 20 to 62 vehicles parked averaging 48 vehicles during the day. Most vehicles were again parked during the warmer mid-day to afternoon timeframe. Over half (52 percent) of the vehicles parked were vehicles with boat trailers. At peak times of the day during non-holiday weekends, parking lot occupancy averaged only 31 percent. However, very hot late summer weather could result in overflow conditions.

In 1998, PacifiCorp temporarily closed the Saddle Dam recreation site because of crowding, site design, and on-site management problems. Reuse and redesign of this site are being considered by PacifiCorp. The site is scheduled to be reopened in 1999.

Yale Lake Angler Counts - During survey periods, boat and bank anglers were counted 3 times per day from the 5 developed recreation sites. These counts included all anglers visible from those sites during a single snapshot timeframe. The results are presented below in Table 3.3-8 for holiday and non-holiday weekends and peak and average counts by site.

As seen in Table 3.3-8, most anglers observed were boat fishing (3.7 boat anglers compared to 0.8 bank anglers on average). Most boat anglers were observed from Yale Park in the central portion of the reservoir. Cougar Camp was the next highest site for boat angler observations. An average of about 4 boat anglers were observed at any location during both holiday and non-holiday weekends.

Table 3.3-8. Average boat and bank anglers observed during holiday and non-holiday weekends at Yale Lake recreation sites, 1996-1997.

	Maximum No. of Anglers Observed		Average No. of Anglers Observed	
Location	**Holiday**	**Non-Holiday**	**Holiday**	**Non-Holiday**
Beaver Bay				
Boat	5.5	3.2	3.9	3.0
Bank	1.0	2.0	0.5	1.8
Cougar Camp				
Boat	8.8	4.8	6.5	4.4
Bank	2.0	2.2	1.5	2.0
Cougar Park				
Boat	0.0	0.0	0.0	0.0
Bank	1.0	0.9	0.4	0.6
Yale Park				
Boat	15.8	13.0	10.2	11.7
Bank	2.9	2.9	2.1	2.1
Saddle Dam				
Boat	5.8	3.9	4.2	2.5
Bank	0.5	0.4	0.3	0.3
AVG TOTAL				
Boat	6.8	5.9	4.1	3.7
Bank	1.3	1.3	0.8	0.8

Bank anglers were observed somewhat more during non-holiday weekends than holiday weekends; however, the difference was not great. Like boat anglers, most bank anglers were also observed at Yale Park, followed by Beaver Bay and Cougar Camp for the most bank anglers observed.

Yale Lake Boat Counts - As summarized in Table 3.3-9, results of lake boater counts during 5 summer days in 1996 indicate that on typical non-sailboat regatta days, Yale Lake is most heavily used by power boaters, followed by jet skis/PWC and, to a lesser extent, inflatables and other craft. As expected, summer weekends and holidays with hot weather have the highest watercraft use. Maximum observed watercraft use on the lake during the survey period was around 138 boats during the 3 peak use days (July 6, July 21, and August 31) which resulted in a density of 25 surface reservoir acres per watercraft. The minimum observed watercraft use on the lake was 48 boats on August 18, an overcast summer day, which resulted in a density of 73 surface reservoir acres per watercraft.

Power boat use on the reservoir accounts for about 2 out of 3 boats (65 percent). The number of power boats at any one time averaged 70 and ranged from 36 boats on August 18 (an overcast, breezy day) to 90 boats on July 21 (a typical warm, sunny day), suggesting that weather conditions generally influence demand. Power boats were observed at or near all developed sites, with the most power boats (average of 15 to 17) observed at or near Yale Park at any one time.

Table 3.3-9. Watercraft and angler use of Yale Lake during 1996 lake boater counts.

Survey Date	Power boats	Sail boats (non-regatta)	Jet skis/ PWC	Row-boat/ Canoe/ Kayaks	Infla-tables	Total No. of Boats on Reservoir	Boat Anglers	Bank Anglers
June 2	58	2	15	2	0	77	40	10
July 6 (holiday weekend)	88	2	23	7	19	139	30	8
July 21	90	7	20	11	10	138	19	1
August 18	36	0	3	5	4	48	0	0
August 31 (holiday weekend)	77	0	52	4	3	136	32	4
Average of 5 days	70	2	23	5	7	107	23	5

Jet ski/PWC use (21 percent of the total) averaged 23 watercraft at any one time and ranged from 3 observed watercraft on August 18 to 52 jetskis/PWC on August 31 (Labor Day weekend). Jetskis/PWC were observed at all developed sites, with the most PWC (average 5 to 7) observed at or near Saddle Dam. Yale Park averaged slightly fewer PWC at 3 to 7.

Inflatable use on the reservoir averaged 7 percent at any one time and ranged from 0 to a high of 19 inflatables (on July 6). Most inflatables were found near shore at the campgrounds and at dispersed campsites. One or more inflatables were observed at each site, with Cougar Park generally having the highest number.

Other watercraft types (e.g., sailboats, kayaks, canoes, and row boats) were seldom observed on the water. Seven sailboats were observed on the water on the July 21 count; all other days showed 2 or less sail boats. However, on sailboat regatta weekends, the number of small sailboats on the water can reach 25 to 75 during larger events. Sailboats were mostly observed in and around the Cougar Camp/Park launch during non-holiday weekends. Sailboats actually edged out power boats at the Cougar Camp/Park launch for the largest percentage of craft-type observed (38 versus 30, respectively). Overall, power boats account for about two-thirds of the use at Yale Lake.

Observations of boat anglers averaged 23 at any one time and ranged from 40 on the June 2 count to 0 on the August 18 count. With the exception of Labor Day weekend, boat angling is highest early in the season and then declines as the weather warms, catch rates decrease, and other boat users dominate lake usage. An average of 5 bank anglers were observed at any one time, with twice that number observed early in the season. Snapshot averages for other recreationists or activities observed during the 5 on-water boat survey days include: dispersed campers (38), swimmers/sunbathers (27), picnickers and those relaxing (16), and bicyclists (5).

As previously indicated in Figure 2.3-4, watercraft use on Yale Lake varies according to location. Power boating occurs virtually everywhere on the reservoir, with use concentrated near the main boat launches (i.e., Yale Park and Saddle Dam Campground). Anglers in particular tend to motor to more remote areas of the lake, such as the northeastern tip, away from water skiers and jetskiers/PWC users. Jetski/PWC use is heavily concentrated near the boat launches, including Yale Park, Saddle Dam Campground, and Cougar Camp/Park. Less jetski/PWC use was observed in the vicinity of Beaver Bay Campground. Like jetski/PWC use, water skiing occurred mostly in the vicinity of Saddle Dam Campground and Yale Park. Sailboats, when observed primarily during regattas, were in the vicinity of Cougar Camp/Park, with their range extending to the vicinity of Yale Park to the south. Most sailboats on the reservoir are typically launched from the Cougar Camp boat launch.

Yale Lake Miscellaneous Activity Counts at Developed Sites - While surveying developed sites, counts were taken of various non-camping/boating or miscellaneous activities occurring in the area including picnicking, swimming/sunbathing, relaxing, bicycling, equestrian activities, taking a rest stop, and hunting. The dominant activity observed was relaxing, followed by swimming and picnicking.

Relaxing was observed at all developed sites, particularly at Yale Park and Saddle Dam day-use areas. Overall, relaxing accounted for 57 percent of the holiday miscellaneous activities observed. During the non-holiday weekends, relaxing accounted for half (50 percent) of the observed miscellaneous activity. Swimming was the second-most popular miscellaneous activity, accounting for 14 percent of the holiday weekend use and 26 percent of the non-holiday weekend use. Picnicking was the third most popular miscellaneous activity, accounting for 14 percent of the holiday weekend use and 18 percent of the non-holiday weekend use. The other miscellaneous activities (bicycling,

equestrian activities, taking a rest stop, and hunting) were not observed or accounted for only 1 to 2 percent of the use.

Yale Lake Miscellaneous Activity Counts at Dispersed Use Areas - Counts were taken at 6 undeveloped dispersed sites including: (1) the East Lewis River bridge crossing area, (2) the cove/point near Yale Dam, (3) the cove near Saddle Dam, (4) Siouxon Creek bridge/IP Road area, (5) Swift No. 2 power canal, and (6) the Speelyai Canal. Counts were taken of boating activities (including type of craft), fishing (boat and bank), picnicking, swimming/sunbathing, camping, number of parked vehicles, equestrian activities, hunting, bicycling, and relaxing. The dominant activities observed at each of these locations are summarized below.

East Lewis River Bridge Crossing Area - At this beautiful river location immediately upstream from Yale Lake, an occasional inflatable boat was observed in the river near the bridge. An average of 2 bank anglers were seen fishing along the shoreline. A few camping parties were typically observed, averaging 9 people (2 to 3 parties) during holiday weekends and 6 people (1 to 2 parties) during non-holiday weekends. An average number of parked vehicles at this location was 4 during holiday and non-holiday weekends. One or more swimmers/sunbathers and 3 to 5 people relaxing were also observed on a continuous basis.

Cove/Point Near Yale Dam - This prime site on the reservoir near the main dam is a very popular camping location and is almost always occupied, sometimes for days or weeks. At this location, an average of 3.1 to 3.6 powerboats were observed during the holiday and non-holiday weekends, respectively. Jetskis/PWC were observed occasionally as well. An average of 2.5 to 4 boat anglers were observed during these 2 timeframes. During holiday weekends, an average of 13 campers (3 to 4 groups) were observed; during non-holiday weekends, an average of 8 campers (2 to 3 groups) were observed. Campers may boat-in or walk-in from the nearby IP Road.

Cove Near Saddle Dam - This site near Saddle Dam is a convenient shoreline area but receives minimal use; an occasional power boat, jetski/PWC, and inflatable boat may also be observed. Boat anglers may also be observed occasionally, along with a few picnickers, campers, and people relaxing. This site's proximity and visibility from the sometimes crowded and noisy boat launch area may detract from its desirability as a dispersed site.

Siouxon Creek Bridge/IP Road Area - Siouxon Creek Arm is a scenic area of the reservoir where the creek has been inundated. Boat-in access is the primary way to access this reach. An average of 2 to 3 power boats were observed during visits, with an occasional PWC and inflatable boat also seen. One to 2 boat anglers were also observed during each visit. This area is a popular boat-in camping area with an average of 13 people (3 to 4 parties) observed during holiday weekends and 2 people (1 party) observed during non-holiday weekends. Parties were also observed relaxing. It should be noted that not all shoreline sites may be observed from the IP Road. Several sites occur farther upstream and require a boat to observe. These sites were documented in the Yale Lake Boat Counts Survey while in a boat.

Swift No. 2 Power Canal - Upstream of the project is the Swift No. 2 power canal. Bank angling is a popular activity here with an average of 3 to 5 anglers observed during each visit. Several vehicles were observed parked in this area near the power canal--approximately 10 during holiday weekends and 4 during non-holiday weekends. Dispersed campers may also be found near the power canal with an average of 6 persons (1 to 2 parties) during holiday weekends and 2 persons (1 party) during non-holiday weekends. Swimmers/sunbathers are also found along the power canal, averaging 1 to 3 per visit. People relaxing is also a common site.

Speelyai Canal - No persons were observed recreating at or near the Speelyai Canal. Vehicle access is restricted by a locked gate; therefore, this site is a boat-in or walk-in site only.

Yale Lake Recreation Visitation Estimate - Table 3.3-10 presents an estimate of developed and dispersed recreation visitation at Yale Lake. Developed facility use estimates are based on PacifiCorp vehicle counts (4-year average) during peak and non-peak seasons and the application of a conversion factor. Other dispersed use where no vehicle counters exist is estimated based on anticipated vehicles accessing the eastern IP Road area and East Lewis River bridge crossing area, also with the application of a conversion factor. In addition, other non-counted equestrian, hiking, biking, hunting, and fishing activity is assumed and estimated during the peak and non-peak seasons. Annual visitation (1997) is estimated at 372,665 recreation visits, of which 96 percent is accounted for at the existing 5 developed facilities and 4 percent is an estimate of additional dispersed use (use not based on vehicle counts).

Table 3.3-10. Estimated current annual and seasonal recreation visitation at Yale Lake.

Facilities	Estimated Annual Visitation*(%)	Estimated Average Peak Season Visits/Day*	Estimated Avg. Non-Peak Season Visits/Day*
Dispersed Use	13,843 (04%)	78	23
Saddle Dam	55,381 (15%)	490	67
Cougar Camp	54,529 (15%)	527	22
Cougar Park	37,876 (10%)	366	17
Yale Park	133,709 (35%)	737	248
Beaver Bay	77,327 (21%)	655	254
Total	372,665 (100%)	2,853	631

* Developed facility use based on a 4-year average of actual vehicle counts and a conversion factor of 3.4 persons per vehicle. Dispersed use is based on estimated seasonal trail use, hunting, and bank fishing (no vehicle count data).

During the peak recreation season (Memorial Day to Labor Day weekend), the average number of visits per day is estimated at 2,853 people. During the non-peak season (number of days vary by site), the number of average visits per day drops to an estimated 631 people or 22 percent of the average peak season.

Dispersed use is estimated at 13,843 recreation visits annually (7,904 peak season and 5,939 non-peak season) and includes use not accounted for by existing vehicle counters at the 5 developed sites. These uncounted activities include estimated recreation use at the East Lewis River bridge crossing area, along the eastern IP Road corridor and Siouxon, bicycling, hiking and equestrian trail activity, seasonal hunting, and roadside bank fishing. Activities at the Swift No. 2 power canal and the dewatered Swift bypass reach are not included as these areas are part of the upstream Swift Project. Other dispersed use is also accounted for at boat launches where vehicles are counted, which would account for activities such as boat-in camping and other day-use activities.

Yale Park receives the most visitation annually as it is the only facility open year round--about 134,000 visitors annually or 35 percent of total visitation at Yale Lake. Beaver Bay comes in second with about 77,000 visitors annually or 21 percent of total visitation. Visitation at Saddle Dam and Cougar Camp are both estimated at about 55,000 annually each and account for about 15 percent of total visitation each. Visitation at Cougar Park is estimated at about 38,000 annually or 10 percent of total visitation.

Yale Lake Creel Survey Results - This section provides a brief summary of the results of a year-long creel survey (75 days of sampling) conducted by Harza Northwest for PacifiCorp as a part of the aquatic resource studies for Yale relicensing. Detailed results are presented in the FTR for Aquatic Resources (PacifiCorp 1997b). Contacted boat anglers (341) and bank anglers (326) fished for 1,935 hours and caught 604 gamefish. Gamefish caught include kokanee (73 percent), rainbow trout (23 percent), and cutthroat trout (4 percent). Boat anglers caught most (96 percent) of the creeled kokanee, less than half (44 percent) of the creeled cutthroat trout, and about a quarter (23 percent) of the creeled rainbow trout. The mean catch rate of all gamefish was 0.30 fish per angler hour. Boat and bank anglers had about the same catch rate (0.30 versus 0.31, respectively). The total harvest was estimated at 4,789 gamefish (3,656 kokanee, 221 cutthroat trout, and 912 rainbow trout). A reduction in angler success was observed during the time of the annual drawdown of Yale Lake (typically between the end of September through mid-April).

3.3.2.2 Recreation Visitor Attitudes and Preference Survey Results

Recreation survey forms (questionnaires) were distributed at the 5 Yale Lake developed recreation sites (Beaver Bay, Cougar Camp, Cougar Park, Saddle Dam, and Yale Park) during the spring, summer, and fall of 1996 and the spring of 1997. A total of 776 surveys were completed sufficiently to be entered into a relational database. Survey results are divided into 5 main groups: overall visitor preferences and perceptions, camping, fishing, boating/jetskiing/PWC, and general visitor information. The results of the 1996-1997 Recreation Visitor Attitudes and Preference Survey are presented below.

Overall Visitor Preferences and Perceptions

Overall visitor preferences and perceptions were surveyed at Yale Lake. The results are summarized in 13 categories including:

- Activity participation
- Main activity of visitors overall
- Main activity of visitors by recreation site
- Main activity participation by timeframe
- Satisfaction with main activity by timeframe
- Overall satisfaction by timeframe
- Overall satisfaction by location
- Visitor perceptions of crowding
- Visitor perceptions of crowding by location
- Conflicts or complaints about other visitors
- Visitor perceptions of facility condition
- Additional facilities desired at Yale Lake
- Visitor destination habits

Activity Participation - Visitors were asked what activities (from a list of 19 activities) did they participate in during their stay at Yale Lake (multiple answers were allowed). Visitor responses include:

• RV/tent camping	75 percent
• Sunbathing/swimming	65 percent
• Hiking/walking	51 percent
• Sightseeing	50 percent
• Picnicking	47 percent
• Fishing	37 percent
• Power boating	29 percent
• Water skiing	24 percent
• Kayaking/canoeing/rowing/rafting	18 percent
• Mountain/road bicycling	17 percent
• Caving/rock climbing	16 percent
• Nature study/photography	15 percent
• Jetskiing/PWC use	14 percent
• 6 others	<10 percent

RV/tent camping was enjoyed by 3 out of 4 (75 percent) visitors surveyed at Yale Lake during the survey season. Camping activity increased over the summer months as use levels increased, from 66 percent in May to 85 percent in September.

Sunbathing was enjoyed by about 2 out of 3 visitors (65 percent) surveyed at Yale Lake and use was generally weather dependent, peaking in July and August during warmer periods and declining during cooler periods.

Walking and hiking were enjoyed by over half (51 percent) of those surveyed at Yale Lake. Activity increased during the warmer months peaking in September, with 2 out of 3 (68 percent) visitors indicating that they participated in this activity.

Half (50 percent) of those surveyed said they participated in sightseeing at Yale Lake. This activity was fairly constant all during the survey season (48 to 56 percent). This high percentage is to be expected given the proximity to the Monument.

Picnicking was enjoyed by almost half (47 percent) of those surveyed at Yale Lake. Participation remained fairly constant (50-53 percent), except for a drop in June (40 percent) due to cooler weather.

Fishing was enjoyed by over a third (37 percent) of those surveyed at Yale Lake. Participation was greater during the early part of the survey period with about half of those surveyed indicating that they were fishing in May (51 percent) and June (49 percent). Participation declined as crowds and temperatures increased and as fishing success apparently declined during July (34 percent) and August (29 percent). Activity picked up again in September (41 percent).

Power boating (excluding PWC) was enjoyed by less than a third (29 percent) of those surveyed at Yale Lake. Participation increased during the later summer months (August [32 percent], September [38 percent]).

Water skiing participation tended to mirror power boating activities with 1 out of 4 (24 percent) visitors participating in this sport, particularly during the warmer months. The majority (83 percent) of power boaters also said they went water skiing. During the cooler months, water skiing activity was light (May [13 percent], June [16 percent]).

Kayaking, canoeing, rowing, and rafting activities were enjoyed by about 1 in 5 (18 percent) visitors to Yale Lake. Participation peaked in the later summer months as temperatures warmed.

Mountain and road bicycling remained fairly constant (17-20 percent) during the survey period and averaged about 17 percent, with the coolest month (June) showing a decline of about half at 10 percent.

Caving and rock climbing participation showed a higher than expected rate of participation at 16 percent, likely due to the proximity of Ape Cave and Lava Canyon (USFS/Monument resource areas). Other self-exploration areas are available in the area. Participation was highest during the later summer months.

Nature study/photography was enjoyed by 15 percent of those surveyed at Yale Lake. Participation remained fairly constant all during the survey period, except during September when it dropped to 6 percent for reasons unknown.

Jetskiing/PWC use was similar to nature study at 14 percent; however, participation appeared to peak during holiday months (15-20 percent) and was lower during other months (10-12 percent).

Six categories of activities (hunting, sailing, backpacking, horseback riding, use of rest stops, and other [relaxation, family time, partying, windsurfing, and others]) all received

under 10 percent collectively in this survey. Yale Lake facilities were not surveyed during the late fall hunting season; therefore, hunters would not be expected to be counted in this survey. Those who came to go sailing (50 respondents surveyed) generally did so in July and August during organized regattas or sailing events centered out of the Cougar Camp launch. Backpackers were generally not surveyed because they would not likely be staying at Yale Lake facilities. Equestrians generally stayed on trails between Saddle Dam and Speelyai Canal and were not found in the recreation sites; therefore, their numbers are low. Those using rest stops at Yale Park and Cougar Park (71 survey respondents) tended to be in and out quickly and most did not take the time to fill out and return surveys; however, 8-9 percent of those surveyed indicated that they did use the rest stops provided. Of those indicating participating in an "other" activity, most (38 percent) were relaxing.

Main Activity of Visitors Overall - Visitors were asked what their main activity was during their stay at Yale Lake (using a list of 19 activities). Rank ordered activity priorities include:

- RV/tent camping 46 percent
- Fishing 10 percent
- Sunbathing/swimming 9 percent
- Power boating 8 percent
- Water skiing 5 percent
- Picnicking 5 percent
- Jetskiing/PWC use 4 percent
- Sailing 4 percent
- 11 others <4 percent

Main Activity of Visitors by Recreation Site - The main activity that visitors indicated that they participated in while at Yale Lake is presented in Table 3.3-11 by site surveyed.

The main activity response by those surveyed was RV/tent camping by a wide margin. About half of the visitors surveyed identified RV/tent camping as their main activity at Cougar Camp (55 percent) and Beaver Bay Campground (46 percent). Far fewer respondents identified camping as their main activity at Saddle Dam Campground (34 percent), Cougar Park (23 percent), and Yale Park (6 percent), each having other significant day-use opportunities and fewer or no camping facilities present.

Most respondents (30 percent) identifying fishing as their main activity were surveyed at Yale Park, a popular boat launch site for the entire lake. All other sites surveyed showed lower main activity responses for fishing, in the 5 to 10 percent range.

Sunbathing/swimming responses were fairly constant at the 5 sites surveyed, ranging from 8 to 13 percent, with the most responses (13 percent) tallied at Cougar Park.

Respondents identifying power boating as a main activity were mostly surveyed at Yale Park and Saddle Dam Campground (13-15 percent). Main activity responses for power boating were lower (3-8 percent) at the other sites surveyed.

Table 3.3-11. Main activity participation by recreation site at Yale Lake, 1996-97.

Recreation Site	Activity	Percent Participation
Beaver Bay Campground	RV/tent camping	46%
	Fishing	10%
	Sunbathing/swim	09%
	Power boating	08%
	Picnicking	05%
	Water skiing	05%
	Hiking/walking	04%
Cougar Camp	RV/tent camping	55%
	Sunbathing/swim	09%
	Sailing	09%
	Power boating	06%
	Fishing	05%
	Hiking/walking	05%
Cougar Park	RV/tent camping	23%
	Picnicking	23%
	Sailing	20%
	Sunbathing/swim	13%
	Fishing	08%
	Power boating	03%
Saddle Dam Campground/ Day Use Area	RV/tent camping	34%
	Water skiing	17%
	Power boating	13%
	Jetskiing/PWC	12%
	Sunbathing/swim	09%
	Fishing	06%
Yale Park	Fishing	30%
	Picnicking	17%
	Power boating	15%
	Water skiing	08%
	Jetskiing/PWC	08%
	Sunbathing/swim	08%
	RV/tent camping	06%

Not surprisingly, respondents identifying picnicking as their main activity were almost all encountered at the 2 day-use sites: Yale Park (17 percent) and Cougar Park (23 percent). The only campground with a significant amount (5 percent) of respondents indicating picnicking as a main activity was Beaver Bay Campground, which has a separate picnic/swimming area.

Most respondents indicating water skiing as their main activity were observed at Yale Park (8 percent) and Saddle Dam Campground (17 percent). These are the 2 most popular areas for motorized craft use. On the opposite end of the lake to the east, Beaver Bay Campground respondents indicated water skiing as their main activity 5 percent of the time. Responses for jetskiing/PWC use as a main activity were very similar to responses for water skiing with Yale Park at 8 percent and Saddle Dam Campground at 12 percent.

Sailing responses were tallied most often at Cougar Park where organized events or regattas are held. Cougar Park respondents (counts included the boat launch area) said that sailing was their main activity 20 percent of the time, while Cougar Camp respondents indicated sailing 9 percent of the time.

Finally, hiking/walking responses were greatest (5 percent) at Cougar Camp, a tent-only campground with some trail opportunities in the area up Cougar Creek; and at Beaver Bay Campground (4 percent), the closest campground to USFS/Monument trails to the east. All other sites had insignificant responses which are not surprising due to the lack of trails in the area.

Main Activity Participation by Timeframe - RV/tent camping responses did not change significantly throughout the recreation season; it was still the number 1 activity identified, ranging from 40 to 47 percent. RV/tent camping responses by timeframe include: Memorial Day weekend (45 percent), July 4 weekend (40 percent), Labor Day weekend (46 percent), and non-holiday weekends (47 percent).

Fishing as a main activity was identified mostly early in the season, coinciding with increased fishing success (18 percent during Memorial Day weekend); however, fishing as a main activity was also fairly significant (10 percent) during non-holiday weekends throughout the season when other power boating or jetskiing/PWC activities occurring on the lake were less.

Power boating, water skiing, and jetskiing/PWC use as a main activity tended to be greater during holiday weekends than non-holiday weekends, and responses were greater during the warmer months than the cooler months. All other main activities were identified by less than 3 percent of survey respondents.

Satisfaction With Main Activity by Timeframe - Responses to visitor satisfaction with their “main activity” are presented in Table 3.3-12, rated from poor to perfect on a 6-point scale. Most visitors surveyed indicated that they had a good (or better) experience. No 1 activity group stands out as being particularly negative, while responses to several activities are quite positive.

Campers tended to enjoy their experience, particularly early in the season. As presented in Table 3.3-12, most campers (96 percent) rated their camping experience as good to perfect, a very positive rating, with only 4 percent saying that it was poor to fair. Camper experiences tended to be better during May (85 percent very good to excellent rating, compared to 69 percent) and somewhat lower during the rest of the season, possibly due to increased crowds.

Visitors tended to enjoy their sightseeing and picnicking experiences. Most respondents (95 percent) rated their experience as good to perfect. Only 5 percent indicated a poor to fair rating. All picnickers (100 percent) rated their experience as good (or better), most (44 percent) indicating that it was an excellent experience.

Table 3.3-12. Visitor satisfaction with their main activity at Yale Lake, 1996-97.

Activity	Overall Satisfaction Rating (% rounded)					
	Poor	Fair	Good	Very Good	Excellent	Perfect
RV/tent camping	1	3	17	35	34	11
Sightseeing	0	5	19	29	29	19
Picnicking	0	0	22	28	44	6
Fishing	3	8	24	33	28	4
Power Boating	0	2	17	27	47	7
Water skiing	0	14	5	43	35	3
Sailing	0	10	17	23	40	10
Jetskiing/PWC use	7	3	19	32	32	3
Kayaking/canoeing/etc	0	25	0	25	50	0
Sunbathing/swimming	3	6	15	27	40	10
Mtn./road bicycling	0	0	20	20	40	20
Hiking/walking	0	4	30	39	17	9
Caving/rock climbing	0	0	60	20	20	0
Rest stop use	0	0	20	0	60	20
Other/relaxation	0	7	13	13	47	20

Most anglers enjoyed their fishing experience with 85 percent of respondents indicating a rating of good to excellent. Eleven percent of respondents said that their experience was only poor to fair.

Those engaged in motorized water sports tended to enjoy their particular activities as well. Power boaters rated their main activity high with 98 percent saying their experience was good or better, most (47 percent) indicating it was excellent. Water skiers indicated that their experience was quite good also, but not as good as power boaters in general with 86 percent indicating a good or better experience. Most of these responses (78 percent) were rated as very good to excellent; however, 19 percent indicated their experience as only fair to good. Jetskiers/PWC users also indicated that their experiences were quite good with 90 percent indicating a good or better experience; however, 10 percent indicated only a poor or fair rating.

Visitors who indicated sailing as their main activity also tended to be quite pleased with their experience. A 90 percent rating of good (or better) was received by respondents and half (50 percent) said that their experience was excellent to perfect. A small percentage (10 percent), however, had only a fair experience. Other non-motorized boaters, including kayakers, canoeists, and rafters, also tended to have a good experience. Three out of 4 respondents (75 percent) indicated that they had a very good to excellent experience. At the same time, 1 out of 4 respondents (25 percent) indicated that they only had a fair experience at Yale Lake.

Sunbathers and swimmers were generally pleased, with 91 percent indicating that they had a good to perfect experience. Only 9 percent of respondents indicated that their experience was poor to fair, possibly due to weather conditions.

Other non-motorized activities also rated well as main activities. Few mountain/road bikers (5) and hikers/walkers (23) indicated that their main activity was 1 of these 2 categories of sports; however, those that did indicated that they were generally pleased with their experience. All (100 percent) of the mountain/road bikers and most (96 percent) of the hikers and walkers indicated a good or better experience. All (100 percent) of the cavers and rock climbers indicated that they had a good to excellent experience, most (60 percent) having a middle rating of good. These experiences would have occurred outside of the immediate Yale Lake area, probably at Ape Cave or Lava Canyon.

Few persons (5) indicated that their main activity was visiting a rest stop; however, those that did indicated that their experience was excellent to perfect (80 percent). PacifiCorp's newly constructed or modernized restrooms probably influenced this high rating.

Finally, those indicating that their main activity was "other," typically relaxation (write in), most (93 percent) responded that their experience was good (or better). Almost half (47 percent) responded that they had an excellent experience.

Overall Satisfaction by Timeframe - Most (95 percent) of the visitors surveyed indicated that they had a good (or better) experience while visiting Yale Lake. Two out of 3 respondents (67 percent) indicated that they had a very good to excellent experience and 9 percent indicated a perfect experience. These numbers are quite high, indicating a great deal of satisfaction. During the season, this high level of satisfaction did not diminish. Ratings of very good to excellent for each month of the season include: May (70 percent), June (66 percent), July (68 percent), August (69 percent), and September (66 percent). In addition, overall satisfaction did not tend to be significantly different between holiday and non-holiday weekends. This is indicated in the following percentage of visitors surveyed who noted a very good to perfect experience during the following timeframes: total non-holiday weekends (77 percent), as compared to Memorial Day weekend (79 percent), July 4 weekend (73 percent), and Labor Day weekend (77 percent).

Overall Satisfaction by Location - Visitors surveyed indicated that they were satisfied overall with each of the recreation sites. Ratings for very good to perfect experiences by location include: Beaver Bay Campground (79 percent), Cougar Camp (80 percent), Cougar Park (70 percent), Saddle Dam Campground (72 percent), and Yale Park (74 percent). Visitors surveyed were most pleased with Cougar Camp and Beaver Bay Campground, and to a lesser extent with the other 3 locations. Poor to fair ratings for each of these locations include: Beaver Bay Campground (3 percent), Cougar Camp (5 percent), Cougar Park (5 percent), Saddle Dam Campground (7 percent), and Yale Park (9 percent). Yale Park and Saddle Dam Campground have slightly more numbers of dissatisfied visitors as compared to the other 3 locations, but only by a few percentage points.

Visitor Perceptions of Crowding - Visitor perceptions of crowding at Yale Lake were ranked on a 7-point scale from not at all crowded to extremely crowded. For this summary, visitor responses were condensed to 4 general categories and are presented in Table 3.3-13. Overall, about 2 out of 5 (41 percent) visitors surveyed felt not at all crowded (or slightly above); about 1 out of 4 (28 percent) visitors surveyed felt slightly crowded (or slightly above), and 1 out of 4 (25 percent) visitors felt moderately crowded (or slightly above). A small percentage (6 percent) of visitors surveyed felt extremely crowded. Combined together, about 1 out of 3 (31 percent) visitors surveyed felt moderately to extremely crowded during their visit to Yale Lake. As expected, visitor perceptions of crowding increased with the occurrence of greater numbers of visitors during July and August. During these 2 months, those responding that crowding was moderate to extreme increased from the seasonal average of 31 percent to a higher 35 to 38 percent during these months. During the cooler months of May and June, those responding that crowding was moderate to extreme decreased from the seasonal average of 31 percent to a lower 16 to 24 percent during these months.

Table 3.3-13. Visitor perceptions of crowding at Yale Lake by month, 1996-97.

Category	Responses	Responses by Month (% rounded)				
	Total (%)	May	June	July	August	September
Not at all crowded	41	56	56	37	30	41
Slightly crowded	28	28	20	28	32	32
Moderately crowded	25	15	19	27	31	24
Extremely crowded	6	1	5	8	7	3

Visitor Perceptions of Crowding by Location - Perceptions of crowding vary from location to location as presented in Table 3.3-14. Overall, survey respondents indicated that Saddle Dam (Campground and Day-Use Area) was perceived to be the most crowded of the 5 sites surveyed, while Yale Park was perceived to be the least crowded. Responses for the 3 remaining sites (Beaver Bay, Cougar Camp and Cougar Park) were less extreme.

Yale Park was perceived to be the least crowded site by survey respondents. About 3 out of 5 (61 percent) visitors surveyed indicated that Yale Park was not at all crowded, 1 out of 5 (20 percent) visitors indicated that it was slightly crowded, and only 1 out of 5 (19 percent) visitors indicated that it was either moderately or extremely crowded. This perception may be caused by a number of factors including: (1) visitors surveyed tended to launch from Yale Park and did not stay to witness crowded conditions, avoiding the peak periods; (2) visitors surveyed expected the main launch area to be crowded and were conditioned to this fact; (3) Yale Park is generally not crowded except for very warm or hot weekend days; and (4) during extreme peak conditions, visitors tended to not complete a survey form due to their other needs at the time.

Table 3.3-14. Visitor perceptions of crowding at Yale Lake by location, 1996-97.

Category and Location	Response (% rounded)
Not at all crowded:	
-Beaver Bay	39
-Cougar Camp	38
-Cougar Park	40
-Saddle Dam	32
-Yale Park	61
Slightly crowded:	
-Beaver Bay	31
-Cougar Camp	29
-Cougar Park	35
-Saddle Dam	24
-Yale Park	20
Moderately crowded:	
-Beaver Bay	24
-Cougar Camp	28
-Cougar Park	20
-Saddle Dam	34
-Yale Park	15
Extremely crowded:	
-Beaver Bay	6
-Cougar Camp	5
-Cougar Park	5
-Saddle Dam	11
-Yale Park	4

In contrast, visitors to Saddle Dam indicated that this site was perceived as being more crowded than the other sites. This site had the lowest percentage (32 percent) of responses for being not at all crowded and the highest percentage (11 percent) of responses for being extremely crowded. These responses may be due to: (1) the relative small size of Saddle Dam facilities (15 campsites; 1 ramp lane), (2) proximity to urban areas resulting in earlier occupancy, (3) noise generated by a larger number of jetskis/PWC and power boats, (4) lack of separation between some campsites, and (5) constrained circulation system and parking area.

In general, visitors perceive that the other 3 sites (Beaver Bay, Cougar Camp, and Cougar Creek) are fairly similar with regards to crowding. About 2 out of 5 (38-40 percent) visitors indicated that these 3 sites were not at all crowded; however, about 1 out of 3 (29-35 percent) visitors indicated that these sites were slightly crowded and about 1 out of 4 (20-28 percent) visitors indicated that the sites were moderately crowded. In total, about a quarter to a third (25-33 percent) of all visitors to these 3 sites felt that they were moderately to extremely crowded, a fairly high percentage. Occupancy levels discussed in the FTR confirm that these sites are well used and are operating at or above capacity levels during peak-use weekends and holidays.

Conflicts or Complaints About Other Visitors - About 3 out of 4 (71 percent) visitors surveyed indicated that they did not have any conflicts or complaints with other visitors at Yale Lake. However, despite having a relatively high satisfaction rating as previously

discussed, over 1 out of 4 (29 percent) visitors surveyed did have some conflict or complaint to report. These types of conflicts, for example, could have reduced a perfect trip to a very good or good trip. The top 5 complaint responses include:

- After hours disturbances, noise/lights 30 percent
- Uncooperative neighboring campers 21 percent
- Off-leash pets causing problems 15 percent
- Improve/expand camping areas 05 percent
- Improve/expand boat launches 05 percent

By far, the biggest problem (30 percent) that visitors encountered, primarily by campers, was being disturbed at night after posted quiet hours. Visitors reported too much noise, glaring lights, and vehicles driving by that disturbed sleep. Occasionally, parties kept nearby campers awake. Camp hosts sometimes addressed this problem and sometimes not. Visitors desired more restrictions and adequate enforcement to deal with this apparently common problem.

Similar to the noise problem, about 1 out of 5 (21 percent) campers experienced uncooperative neighboring campers. Problems reported include the use of foul language, parties and loud music, rudeness, and drunkenness. The lack of separation between some campsites and the generally high occupancy rates at campgrounds may exacerbate the problem. Also, high numbers of people at each site can increase conflicts between camping groups.

About 15 percent of the respondents reported problems with pets, particularly off-leash dogs. Problems reported include loud barking, wandering through campsites, and defecating in public areas, such as a beach, or in campsites. Current policy allows for pets if kept on a leash. Apparently, this rule is not always followed.

About 5 percent of respondents wanted more and/or improved campsites, while another 5 percent wanted more and/or improved boat launches.

As expected, the rate of complaints by respondents increased with campground occupancy rates. More visitors complained during the later 3 summer months which are more congested: May (26 percent) and June (22 percent) as compared to July (31 percent), August (30 percent), and September (44 percent, primarily Labor Day weekend). These later percentages indicate that about a third of all visitors have some complaints when occupancy levels are highest.

Complaints or conflicts by location are fairly consistent, except for Yale Park which is quite a bit lower. The percentage of complaint or conflict responses by location include: Beaver Bay (34 percent), Cougar Camp (31 percent), Cougar Park (25 percent), Saddle Dam (29 percent), and Yale Park (11 percent). Yale Park, which was perceived by respondents as being the least crowded, had the lowest percentage of complaints compared to the other sites surveyed. One out of 4 (25 percent) visitors surveyed offered complaints at Cougar Park, while about 1 out of 3 (29-34 percent) visitors surveyed offered complaints at Beaver Bay, Cougar Camp, and Saddle Dam.

Visitor Perceptions of Facility Condition - Visitors were asked to rank the overall condition of facilities using a 6-point rating system. In general, survey respondents rated the condition of facilities favorably, including: poor (1 percent), fair (4 percent), good (19 percent), very good (34 percent), excellent (34 percent), and perfect (8 percent). Combining categories, 95 percent of respondents indicated that facilities were good (or better). Of this total, 2 out of 3 (68 percent) respondents rated the facilities at very good or excellent, a very positive rating. Ratings on a month-to-month basis did not change significantly and remained close to the seasonal average, indicating that facility condition remains good throughout the season due to proper maintenance.

On a site-by-site basis, visitor perception of facility condition varied somewhat. All sites rated comparatively well, with the exception of Cougar Park which rated lower. Cougar Camp located nearby is the top-rated site. Ratings of very good to perfect by site include: Beaver Bay (75 percent), Cougar Camp (82 percent), Cougar Park (50 percent), Saddle Dam (71 percent), and Yale Park (75 percent). Half of the visitors surveyed at Cougar Park rated the condition of facilities as poor to good, with most of these responses (75 percent) falling into the good category. While still a respectable rating, the older facilities at Cougar Park may have reduced the rating. Cougar Camp, located across Cougar Creek, may have scored higher in this category because of its better campsites with more vegetation, open views, ample shoreline access, and new restrooms and firewood sales area. In general, however, all sites except Cougar Park scored well with 3 out of 4 respondents (71-82 percent) or more indicating that a site's condition was very good (or better).

Additional Facilities Desired at Yale Lake - Visitors to Yale Lake were asked if any additional recreation facilities should be provided. Over half (53 percent) of those surveyed indicated that they desired additional facilities. Top rated requests include:

- Expand or improve restrooms, such as adding more showers, hot water, mirrors, and changing rooms (15 percent).
- Expand camping areas, improve the campsites, and provide more lakeside camping opportunities (11 percent).
- Add additional moorage, such as more docks, tie-ups, evening moorage, sailboat access, and dredging (9 percent).
- Provide new and improved playground equipment (9 percent).
- Expand boat launch areas, improve ramps and docks, provide more tie-ups, and deepen the launch sites (8 percent).
- Provide boat and jetski/PWC rentals (7 percent).
- Provide expanded sporting opportunities such as ball courts and fields and horseshoe pits (4 percent).

- Provide improved beach access with more swimming areas and sandy beaches (4 percent).

- Provide more electrical outlets and hookups (3 percent).

Visitor Destination Habits - Visitors to Yale Lake did not always remain at Yale Lake during their visit. Visitors were asked if they planned to visit other recreation areas during their trip other than Yale Lake. Over half (55 percent) of those surveyed said that they would remain solely at Yale Lake during their visit. The remaining respondents (45 percent) indicated that they had plans to visit or have already visited other locations during their trip. This split points to the dynamic nature of recreation use along the Lewis River corridor with multiple destinations and attractions.

Other primary destinations listed by visitors surveyed included the Monument, GPNF, Lake Merwin, and Swift Reservoir. A small number of respondents (3 percent) listed other primary destinations including the town of Cougar, Merrill Lake, Lewis River Falls, and the Siouxon. Of those responding that they have or would visit other areas, most (34 percent) listed the Monument as their primary destination. This high percentage is not surprising due to the proximity of the Monument to Yale Lake, including several site attractions such as Windy Ridge, Ape Cave, Lava Canyon, and other destinations. Other primary destinations identified by those surveyed include the GPNF (15 percent) which surrounds the project area, and PacifiCorp's Lake Merwin (19 percent) and Swift Reservoir (17 percent).

Monument and GPNF visitors had similar habits. Most visitors going to the Monument did so during August and September and almost half (47 percent) were surveyed at Beaver Bay Campground, an RV campground nearest the Monument. The second largest group (33 percent) of Monument visitors were surveyed at Cougar Camp, a tent-only campground being the next closest campground to the Monument. Visitors to the GPNF had similar habits, tending to visit the GPNF during the warmer months (June through August) and going to Beaver Bay Campground (54 percent) and Cougar Camp (26 percent) more often than the other 3 Yale Lake sites.

Visitors to Lake Merwin and Swift Reservoir had somewhat different habits. Visitation to Lake Merwin tended to peak during the warmest months (July and August), while Swift Reservoir visitation tended to be fairly constant during the survey period. This pattern may be caused by Lake Merwin's more urbanized orientation with a greater focus and use of motorized water craft, such as power boats and jetskis/PWC, compared to Swift Reservoir's emphasis on fishing which is less dependent on warmer weather conditions. Visitors whose primary destination was Lake Merwin were surveyed more often at Beaver Bay (37 percent) and Saddle Dam (26 percent). The high percentage of visitors at Saddle Dam is not surprising because of its proximity to nearby Cresap Bay and Lake Merwin; however, Beaver Bay is located farthest away from Lake Merwin. Its higher percentage may be explained by its larger capacity and RV campsites. Visitors whose primary destination was Swift Reservoir were surveyed more often (51 percent) at Beaver Bay, with Cougar Camp (16 percent) and Saddle Dam (17 percent) seeing similar visitation.

Camping

Several questions were asked of campers at Yale Lake who were surveyed at any of the 5 developed sites. The results are summarized in 7 categories including:

- Annual campground visits
- Difficulty in finding campsites
- Interest in an expanded reservation system
- Factors in choosing a campsite
- Camping fee preference
- Boat launching disturbances at campgrounds
- Desired improvements at campgrounds

Annual Campground Visits - Visitors were asked how many times they visited Yale Lake campgrounds per year. About 3 out of 4 respondents (77 percent) visited Yale Lake campgrounds 1 to 5 times per year and about 1 out of 4 visitors (23 percent) came more than 6 times per year. Some visitors (13 percent) were frequent recreationists at Yale Lake coming more than 10 times per year.

Beaver Bay, Cougar Camp, and Cougar Park had similar (82-88 percent) visitation rates, with respondents indicating that they visited Yale Lake 1 to 5 times per year. At Saddle Dam and Yale Park, however, there was more of a mix of visitation rates observed with more frequent visits. Saddle Dam visitation rates include: 1 to 5 times per year (58 percent), 6 to 10 times (14 percent), and over 10 times (28 percent). These visitation patterns are likely due to the proximity of Saddle Dam to the Vancouver/Battle Ground metropolitan area to the south and the SR 503 spur. Yale Park, the only site that is open year round, was similar to Saddle Dam with visitation rates of: 1 to 5 times per year (52 percent), 6 to 10 times (17 percent), and over 10 times (31 percent).

A series of questions related to camping were also asked of visitors to Yale Lake recreation sites. Almost 4 out of 5 respondents (78 percent) filled out these camping questions.

Difficulty in Finding Campsites - Finding an available campsite was difficult for many visitors, especially in July and August, the 2 peak use months. Visitors to campgrounds and day-use areas were asked during their stay at Yale Lake if it was difficult to find an available campsite. Over half (54 percent) of those surveyed responded that it was difficult or somewhat difficult to find a campsite during the survey period. Of these visitors, 30 percent said it was difficult and 24 percent said it was somewhat difficult during the season. As expected, those indicating that it was difficult or somewhat difficult to find a campsite increased during the peak July and August months. During these 2 months, about 2 out of 3 (63-67 percent) visitors indicated it was difficult or somewhat difficult finding a campsite. Of this group of respondents, 44 percent indicated it was difficult in August and 35 percent in July. Responses to difficulty in finding a campsite by campground at Yale Lake are presented in Table 3.3-15.

Table 3.3-15. Difficulty in finding a campsite at Yale Lake during the recreation season by site surveyed, 1996-97.

Categories	Responses (% rounded) by Site Surveyed				
	Beaver Bay	**Cougar Camp**	**Cougar Park**	**Saddle Dam**	**Yale Park**
Not difficult	49	41	58	44	52
Somewhat difficult	27	25	16	19	16
Difficult	24	34	26	37	32

About half (49-58 percent) of the visitors surveyed at Beaver Bay, Cougar Park, and Yale Park indicated that it was not difficult to find a campsite, with Cougar Park visitors indicating the least (58 percent) difficulty. About a third (32-37 percent) of the visitors surveyed at Cougar Camp, Saddle Dam, and Yale Park indicated the most difficulty finding a campsite.

Interest in an Expanded Reservation System - Visitors are mixed in their desire to see an expanded campsite reservation system implemented by PacifiCorp. Visitors to Yale Lake were asked if they would like to see the existing holiday (Memorial Day weekend at Cougar Camp only) and group campsite reservation system at Yale Lake expanded. Of those responding, about a third (35 percent) indicated that they did not want to see the existing reservation system expanded, while 26 percent of the visitors were somewhat interested and 39 percent were interested. Totaling the last 2 categories, it would appear that about 2 out of 3 visitors (65 percent) would like to see some increased form of reservation system implemented at Yale Lake. However, there is no clear indication of a desire for a full reservation system at this time. As expected, the desire for an expanded reservation was greatest during the peak use months of July and August. Survey respondents' interest for an expanded reservation system by site surveyed is presented in Table 3.3-16.

Table 3.3-16. Interest in expanding the existing campsite reservation system at Yale Lake during the recreation season by location by site surveyed, 1996-97.

Categories	Responses (% rounded) by Site Surveyed				
	Beaver Bay	**Cougar Camp**	**Cougar Park**	**Saddle Dam**	**Yale Park**
Not interested	41	30	29	29	30
Somewhat interested	26	27	29	24	26
Interested	34	42	41	47	43

The most visitors not interested (41 percent) in an expanded reservation system were found at Beaver Bay, while all other sites had similar levels of non-interest (29-30 percent). Similarly, visitors at all 5 sites were somewhat interested in roughly the same proportion (24-29 percent). Conversely, interest level in an expanded reservation system was least at Beaver Bay (34 percent) and roughly the same for all other sites (41-47 percent).

Factors in Choosing a Campsite - The importance of various factors to Yale Lake visitors when choosing a campsite differed depending upon the factor considered. Fourteen

factors were listed in the survey form and visitors were asked to rank them on a 5-point scale. Visitor preference for each of these factors is presented in Table 3.3-17.

Table 3.3-17. Visitor preferences when choosing a campsite at Yale Lake, 1996-97.

Category	Responses (% rounded) by Site Surveyed				
	Not at all Important	Somewhat Important	Important	Somewhat Very Important	Very Important
Distance from a boat ramp	46	12	20	12	10
Distance between campsites	5	4	21	28	43
Camping within view of the lake	7	12	31	24	27
Quality of the surrounding scenery	2	3	20	31	45
Noise in the campground	4	6	23	23	44
Picnic facilities	14	13	33	25	15
Quality of rest rooms and showers	2	3	11	26	59
Availability of drinking water	3	3	16	27	52
Availability of electrical hookups	47	12	20	7	15
Convenient garbage cans and pickup	6	11	31	28	25
Adequate RV parking and pull-through space	45	9	13	14	19
Distance to a swimming area	15	16	34	21	15
Availability of a sewage dump station	54	11	12	10	13

The most important factors (rated very important in Table 3.3-17) to Yale Lake campers when selecting a campsite are:

- Quality of rest rooms and showers (59 percent)
- Availability of drinking water (52 percent)
- Quality of the surrounding scenery (45 percent)
- Noise in the campground (44 percent)
- Distance between campsites (43 percent)

The first 2 items listed above were very important to Yale Lake campers and are generally in abundance. The high visitor satisfaction ratings previously discussed tend to confirm the notion that PacifiCorp is doing a very good job of providing quality restrooms and drinking water facilities. Most of its restroom facilities are new and are of quality design and construction. Future campground facility decisions should continue to consider these important factors. In addition, the scenic quality of campsites should be a major consideration in future decision making, not just how many campsites are provided.

Noise is a growing concern within campgrounds, particularly during peak use periods. Campers actively seek out what they hope will be quieter campsites. When their decisions do not result in quiet camping trips, conflicts and complaints may result.

Complaints about noise, as previously discussed, should be taken seriously. Finally, in relation to noise levels and scenic quality, campers actively seek out campsites that are not crowded and allow for buffering between sites. This buffering reduces noise conflicts and improves the scenic quality of the campground. Some existing campsites at Beaver Bay and Saddle Dam, for example, have minimal site separation. Consideration should be given to improving campsite design and layout at some locations to meet camper expectations.

The least important factors (rated not at all important in Table 3.3-17) to Yale Lake campers when selecting a campsite are:

- Availability of a sewage dump station (54 percent)
- Availability of electrical hookups (47 percent)
- Distance from a boat ramp (46 percent)
- Adequate RV parking and pull-through space (45 percent)

These conclusions, except for distance from a boat ramp, relate to RV camping. Respondents may feel that existing RV campsites are adequate and/or campers surveyed may be tent campers and do not desire these types of facilities. Distance from a boat ramp was also a less important factor to campers surveyed. Existing launch facilities are generally close to campsites; therefore, this is not a perceived problem for Yale Lake campers. It should be noted, however, that while a high percentage of campers did not feel that these factors were important to them, a significant percentage of campers (35-42 percent) rated these factors as important, somewhat very important, or very important.

Other important factors (mid-range responses including somewhat important, important, and somewhat very important ratings in Table 3.3-17) to Yale Lake campers when selecting a campsite are:

- Picnic facilities (71 percent)
- Distance to a swimming area (70 percent)
- Convenient garbage cans and pickup (69 percent)
- Camping within view of the lake (61 percent)

These factors generally relate to convenience and are fairly important to campers; however, they are not necessarily critical to their overall satisfaction. Coupled with other positive responses, however, they remain important considerations in decision making about existing and future campsites.

Camping Fee Preferences - Camper opinions on fees charged were varied, with more positive responses than negatives ones. Campers were asked if they felt that camping fees were okay, too high, or too low. Almost 2 out of 3 visitors (63 percent) surveyed indicated that camping fees were okay. Alternatively, about 1 out of 3 visitors (36 percent) surveyed felt that the fees were too high. A small percentage (1 percent) of visitors felt that the fees were too low. It is interesting to note that this question was asked at a time when campsite fees were recently raised significantly to be in line with

fees charged by state agencies for comparable campsites. The majority of visitors surveyed apparently felt that the fees charged were fair, particularly given the location next to a major reservoir and recreation area. The negative responses received may have been in reaction to the recent raise in fees or a desire or need for additional no/low cost camping opportunities.

Campers indicating that the campground fee schedule was okay differed somewhat by site surveyed; however, they were all greater than 50 percent positive. Positive opinions by site include: Beaver Bay (66 percent), Cougar Camp (64 percent), Cougar Park (56 percent), Saddle Dam (52 percent), and Yale Park (61 percent). Saddle Dam campers were the least satisfied (52 percent) with the fee schedule when compared with the other sites, potentially due to the type or condition of campsites currently being provided at this site.

Boat Launching Disturbances at Campgrounds - Due to the proximity of boat launches to campsites at the 3 campgrounds, campers were asked if boat launching was disturbing their camping experience. An overwhelming majority (90 percent) indicated that they were not being disturbed by this activity. A small group of campers (6 percent) indicated that they were slightly disturbed by boat launching. Only a very small percentage of visitors (6 percent) at Beaver Bay were either disturbed or slightly disturbed by boat launching. This is interesting to note since access to the launch site at Beaver Bay requires driving through the entire campground to get to the ramp, yet almost all (94 percent) of the campers were not disturbed.

Desired Improvements at Campgrounds - Yale Lake campers were asked if they desired any new improvements. As a result, 2 out of 3 visitors surveyed (67 percent) indicated that they had a desire to see some improvements. Overall response varied somewhat by site surveyed: yes responses by site include Beaver Bay (69 percent), Cougar Camp (65 percent), Cougar Park (56 percent), Saddle Dam (75 percent), and Yale Park (44 percent). The lowest response for desired improvements occurred at Yale Park (44 percent), while the highest was at Saddle Dam (75 percent). The high response rate at Saddle Dam points to a number of desired improvements at that site. These and other desired improvements, on a site-by-site basis, are presented in Tables 3.3-18 through 3.3-22.

Desired improvements at Beaver Bay focus on improving the restrooms, specifically the showers which received numerous complaints, and improving individual campsites by providing more vegetation and buffer and adding more campsites. Improved enforcement of quiet hours was mentioned. Other facility improvements include the playground, boat launch, swim and beach area, and access roads. Some RV campers desired utility hookups. These and other desired improvements are listed in Table 3.3-18 below.

Table 3.3-18. Desired improvements at Beaver Bay Campground, 1996-1997.

Desired Improvement (# comments)	"Yes" Responses
Improved showers (cleaner, closer, better, more, temp. and pressure control, add mats, and better maintenance) (38)	15%
Improve campsites by providing better vegetation and screening of campsites, more grass in tent areas, and more and bigger sites (36)	14%
Improved restrooms (more, bigger, better maintenance, upgrades, hotter water, supplies, ADA access) (26)	10%
Provide improved playground (17)	7%
Provide electricity to sites (15)	6%
Improve the boat launch (11)	4%
Provide full RV hookups (9)	4%
Provide or improve access to firewood (8)	3%
Provide improved water faucets and drains (8)	3%
Provide improved security, enforcement of quiet hours (8)	3%
Provide a better swim area (sand, cleaner water) (7)	3%
Pave the roads to reduce dust, provide ADA access (7)	3%
Provide a fish cleaning station (6)	2%

Similar to Beaver Bay, desired improvements at Cougar Camp also focus on improving the restrooms, specifically the showers, and improving individual campsites by providing more vegetation and buffer and adding more campsites. Other facility improvements include the boat launch, swim and beach area, parking, trails, and signs. Improved enforcement of quiet hours was mentioned. Some campers called for greater restrictions on boat/jetski/PWC use. These and other desired improvements are listed in Table 3.3-19.

Very few desired improvements at Cougar Park were mentioned. Of those related to this day-use area, a few visitors desired better maintenance of the restroom/shower facility. These comments are also presented in Table 3.3-20.

Five principal desired improvements were mentioned by visitors at Saddle Dam (Campground and Day Use Area). The majority (56 percent) of comments received focused on needs at the boat launch area. Like the other campgrounds, visitors desired better campsites with more trees, vegetative buffer, and separation. Some visitors mentioned the need to better enforce the No Wake Zone for boats, specifically jetskis/PWC, in and around the swim area and launch. These comments are presented in Table 3.3-21.

Few visitors identified any desired improvements at Yale Park. Of those that did, additional space was desired. These comments are presented in Table 3.3-22.

Table 3.3-19. Desired improvements at Cougar Camp, 1996-1997.

Desired Improvement (# comments)	"Yes" Responses
Improve campsites by providing better vegetation and screening of campsites, more grass in tent areas, and more and bigger campsites (28)	28%
Improved restrooms (more, bigger, better maintenance, upgrades, hotter water, supplies, ADA access) (27)	27%
Improved showers (cleaner, closer, better, more, temp. and pressure control, add mats, and better maintenance) (12)	12%
Improve the boat launch (11)	11%
Restrict jetskis/PWC and boats (7)	7%
Enforce quiet hours (6)	6%
Provide electricity at campsites (4)	4%
Provide more parking at campsites (3)	3%
Provide firewood (3)	3%
Provide improved beaches and swim areas (3)	3%
Sign the trail to the restroom (3)	3%

Table 3.3-20. Desired improvements at Cougar Park, 1996-1997.

Desired Improvement (# comments)	"Yes" Responses
Cleaner restrooms (3)	38%
More campsites in the area (2)	25%

Table 3.3-21. Desired improvements at Saddle Dam Campground, 1996-1997.

Desired Improvement (# comments)	"Yes" Responses
Improve the boat launch ramp and dock (replace, extend, deepen, improve, and maintain) (38)	56%
Provide more and better campsites, increase distances between sites, add screening, add more grass and trees (16)	24%
Improve and enforce the No Wake Zone (near dam, swim area, launch) (4)	6%
Provide additional parking (3)	4%
Provide a playground (3)	4%

Table 3.3-22. Desired improvements at Yale Park, 1996-1997.

Desired Improvement (# comments)	"Yes" Responses
More natural area, open space, and quiet area (3)	50%
Expand the available area (2)	33%

Fishing

Several questions were asked of anglers at Yale Lake. The results are summarized in 3 categories including:

- Lake level disturbance to fishing
- Importance of factors to fishing
- Type of fishing

Lake Level Disturbance to Fishing - Anglers at Yale Lake were asked if the pool level possibly affected their fishing experience. Most anglers (85 percent) on the lake responded that the pool level did not affect their fishing experience. Approximately 15 percent of anglers surveyed, however, responded that they were affected. Most of those who were affected were surveyed at the north and east end of the lake at Beaver Bay (21 percent) and Cougar Camp (21 percent). Of the 42 anglers who indicated that they were affected by pool level, primary responses include: the water was too shallow, too low, or there was no beach (35 percent); there was too much debris in the water or the water was too murky (18 percent); and no fish were caught due to the low or high pool level (21 percent).

Importance of Factors to Fishing - Anglers were asked about the importance of 4 factors relative to fishing (landing fish, seeing or hooking fish, water level of the lake, and proximity to other anglers) using a 5-point scale. Most anglers believed that landing a fish was important to their fishing experience. Only 16 percent of anglers surveyed indicated that landing a fish was not at all important to somewhat important. More than 4 out of 5 anglers surveyed (84 percent) felt that landing a fish was important to very important. Seeing or hooking a fish was similarly important to anglers, with only 12 percent indicating that this factor was not at all important or somewhat important.

Anglers also were asked about the importance of the pool level. About 2 out of 5 (42 percent) anglers felt it was an important (mid-range) factor. However, an almost equal number felt that this factor was less important (28 percent) versus more important (29 percent) to their fishing experience.

More important to anglers was proximity to other anglers. Over half (53 percent) of anglers surveyed felt that proximity was somewhat very important to very important.

Type of Fishing - Anglers were asked if they were wading or bank fishing, boat fishing, or both boat and bank fishing while at Yale Lake. Two out of 5 (40 percent) anglers were wading or bank fishing only. About 1 out of 3 (32 percent) anglers were boat and bank fishing. The remainder (28 percent) were boat fishing only. Most (46 percent) wading or bank anglers were surveyed at Beaver Bay. Most boat-only anglers were surveyed at Yale Park (43 percent) and Beaver Bay (33 percent). Most boat and bank anglers were surveyed at Beaver Bay (56 percent) and Cougar Camp (21 percent).

Boating/Jetskiing/PWC Use

Several questions were asked of boaters and jetski/PWC users at Yale Lake. The results are summarized in 4 categories including:

- Boating problems due to pool level
- Importance of factors to boaters
- Launch ramp waiting
- Boater shoreline activities

Boating Problems Due to Pool Level - Visitors were asked if the pool level of the reservoir affected their boating experience while at Yale Lake. Most (70 percent) surveyed indicated that the pool level did not cause any boating problems during their stay at Yale Lake. The remainder (30 percent) indicated that they did experience problems because of the pool level. Most of these respondents were surveyed at Beaver Bay (32 percent) and Cougar Camp (32 percent). It should be noted that the survey was conducted primarily during the peak season when the pool level is high. As a result, this response is biased to that timeframe. If ramps were dewatered during the peak season, more complaints could be expected.

Of those surveyed who felt they did experience a boating-related problem because of the pool level, 8 primary responses were given (some boaters gave more than 1 answer) and are presented in Table 3.3-23. The most notable problem was difficulty launching boats during low pool and related ramp problems such as the ramp being too short. Most of these comments were provided by boaters surveyed at Saddle Dam (53 percent) and Cougar Camp/Park (41 percent).

Table 3.3-23. Perceived problems reported by boaters at Yale Lake due to pool level, 1996-1997.

Category (# responses)	Response (% rounded)
Difficult to launch a boat during low pool, had ramp problems (34)	33%
Water level was too low, caused general undefined boater problems (16)	15%
Worried about boat hitting submerged rocks, stumps, and logs (11)	11%
Floating debris was a boating hazard, increased by high pool level (11)	11%
Lack of safety markers present to identify hazards at low pool level (7)	7%
High pool level affected the use of the shoreline, there was no beach (7)	7%
Boat propeller or other boat damage caused by low pool level (7)	7%
Too many stumps, stumps are a big hazard at low pool level (6)	6%

About 15 percent of the boaters who had problems cited general undefined problems with the low pool level. Another 21 percent of boaters who had problems were worried about hitting submerged rocks, stumps, or logs and/or hitting floating debris. These comments were mostly (50 percent) reported by boaters at Beaver Bay.

Importance of Factors to Boaters - Boaters were asked to comment on the importance of 4 boating/jetskiing/PWC use factors using a 5-point scale. These 4 factors include: water level of the lake, number of other water craft, speed of other water craft, and waiting time

at the boat launch. Out of 541 responses, most (84 percent) boaters surveyed felt that the lake water level was important to very important to their experience. Only 16 percent of boaters responded that water level was not at all important to somewhat important. One out of 5 (21 percent) respondents felt that it was very important.

A similar response was given by boaters when asked about the importance of the number of other water craft on the lake. Out of 420 responses, most (82 percent) boaters surveyed felt that the number of other water craft on the lake was important to very important; 18 percent felt that this factor was not at all important to somewhat important; and 21 percent felt this factor was very important.

Boaters felt that waiting time at the ramp was an important factor; however, it was not as significant as water level or the number of other boats on the lake. Out of 417 responses, most (30 percent) responses fell in the middle of the 5-point scale. One out of 3 (33 percent) boaters felt that ramp waiting time was not at all important or somewhat important. Alternatively, only 17 percent of boaters felt that it was a very important factor.

Boaters tended to respond more urgently when asked if the speed of other water craft on the lake was an important factor. Out of 419 responses, over half (51 percent) of the boaters surveyed felt that water craft speed was very important or somewhat very important; 28 percent felt that it was important; and 22 percent felt that is was not an important factor to consider.

Other responses (write-ins) given by boaters as other possible factors to consider include: debris in the water or at the ramps (7 responses), need to restrict jetskiis/PWC (6 responses), good boat ramps and docks (4 responses), boater safety and courtesy (4 responses), and moorage and anchorage areas (4 responses).

Launch Ramp Waiting - Boaters were asked if they had to wait to launch their water craft while at Yale Lake; and if yes, how long did they have to wait. About 2 out of 3 boaters (69 percent) reported that they did not have to wait at all to launch. Boater responses indicating no ramp waiting were fairly consistent at each site surveyed (27-32 percent), except for Saddle Dam which had a low percentage (12 percent) indicating 2 to 3 times more waiting at this ramp.

Of those boaters indicating that they did have to wait at the ramp to launch (31 percent), most (36 percent) boaters reported having to wait only a short while (1-5 minutes). Other responses include: 5-10 minute wait (29 percent), 10-15 minute wait (16 percent), 15-20 minute wait (6 percent), and a wait greater than 20 minutes (12 percent).

As an indication of the degree of waiting time at each ramp site, the percentage of boaters waiting 10 minutes or more include:

- Beaver Bay 25 percent
- Cougar Camp/Park 33 percent

- Saddle Dam 44 percent
- Yale Park 0 percent

Boaters waiting 15 minutes or more to launch at ramps include:

- Beaver Bay 13 percent
- Cougar Camp/Park 0 percent
- Saddle Dam 17 percent
- Yale Park 0 percent

As expected, Saddle Dam and Beaver Bay which have the smallest ramps (1 lane each) have the longest waiting times.

Boater Shoreline Activities - Boaters were asked about their shoreline use habits while at Yale Lake. One out of 4 (25 percent) boaters indicated that they did not go ashore while boating. Of the remaining 75 percent of boaters who did go ashore, 8 primary shoreline activities were noted:

- Shoreline swimming and sunbathing 27 percent
- Shoreline picnicking 25 percent
- General hiking or walking 23 percent
- Using the shoreline while water skiing 12 percent
- Shoreline fishing 9 percent
- Using the shoreline while riding jetskis/PWC 8 percent
- Shoreline overnight camping 2 percent
- Using rest rooms/toilets 2 percent

The 3 shoreline activities mentioned most often by boaters include swimming and sunbathing (27 percent), picnicking (25 percent), and hiking or walking (23 percent). A particularly low response was identified for shoreline campers, which may be a result of the survey methodology since visitors to dispersed camping sites were not specifically surveyed.

General Visitor Information

Two logistical questions were asked of all visitors at Yale Lake related to party size and the origin of visitors. The results are presented below.

Visitor Party Size - Visitors were asked to indicate the size of their party. Average party sizes at Yale Lake include:

- 1 to 2 persons 20 percent
- 3 to 4 persons 30 percent
- 5 to 6 persons 22 percent
- 7 to 8 persons 8 percent
- 9 to 10 persons 8 percent

- 11 to 15 persons 5 percent
- 16 to 20 persons 3 percent
- 21 to 50 persons 2 percent
- >50 persons 2 percent

About 3 out of 4 (72 percent) parties include up to 6 people, with about half (52 percent) of the parties having only 3 to 6 persons. One out of 5 (20 percent) parties are quite small with 1 or 2 people only, and very large groups (over 50 people) accounted for 2 percent of the parties surveyed (group sites).

Origin of Visitors - Visitors were asked to identify the postal Zip Code of their primary residence. A summary of the results is presented in Table 3.3-24. Almost all (97 percent) of the visitors to Yale Lake reside in either Washington State or Oregon.

Table 3.3-24. Visitor origin of Yale Lake recreationists, 1996-1997.

Major Origin of Visitor	County of Origin	Percent (rounded)
Washington State	Subtotal	**68**
	Clark	43
	Cowlitz	14
	King	4
	Thurston	2
	Pierce	1
	Klickitat	1
	Snohomish	1
	Other Counties	2
Oregon	Subtotal	**29**
	Multnomah	17
	Washington	5
	Clackamas	4
	Clatsop	1
	Columbia	1
	Yamhill	1
	Other Counties	1
Other States		**2**
Outside the United States		**1**

Most visitors to Yale Lake did not drive far. Assessed at the county level, about 3 out of 4 visitors (73 percent) came from 3 local or nearby counties: Clark County, WA (43 percent) including Vancouver; Multnomah County, OR (17 percent) including Portland; and Cowlitz County, WA (14 percent) including Kelso/Longview.

About 2 out of 3 (68 percent) visitors to Yale Lake reside in Washington State. Most of these residents came from 2 local counties with major metropolitan areas along the I-5 corridor: Clark County (43 percent) and Cowlitz County (14 percent). Another group of

Washington residents who visited Yale Lake came from the Seattle/Tacoma metropolitan area and include about 5 percent of the total visitors.

Oregon residents make up the other major place of origin with 29 percent of the total visitation. Most of these residents came from the Portland metropolitan area: Multnomah County (17 percent), Washington County (5 percent), and Clackamas County (4 percent).

4.0 RECREATION CAPACITY AND SUITABILITY

Like most reservoir recreation areas, particularly near urban areas, there are limits to how much recreation use existing facilities can accommodate, as well as how much use various areas, such as reservoirs, can accommodate. At some point, recreation demand cannot be met without negatively affecting sensitive resources in the area and/or the recreation experience that people seek when they come to Yale Lake.

The purposes of this recreation capacity and suitability analysis are to: (1) investigate the existing capacity of recreation resources; and (2) investigate whether new recreation facilities and activities are suitable in the Yale Lake study area while maintaining the integrity of the resources and meeting the long-term needs of visitors. This type of analysis is sometimes called a carrying capacity analysis. Recreation "carrying capacity" has been defined in a number of ways, but a useful definition is "the level of use beyond which impacts exceed standards" (Shelby and Heberlin 1986).

This study consists of 2 interrelated analyses: (1) an analysis of recreation capacity using facility and use area occupancy levels, capacity utilization, and management and impact parameters; and (2) an analysis of recreation development suitability using GIS technology that assesses opportunities and constraints to recreation development in the study area. The analysis assesses the suitability of the existing level of recreation use at Yale Lake, as well as increasing demand for recreation activities and resulting development that might be implemented to satisfy future demand. Potential suitable locations for recreation facilities and use at Yale Lake are identified for discussion purposes only and are not proposals for recreation development. The capacity and suitability information will be used in the later Needs Analysis (Section 5.0). It provides additional factors or indicators to consider in that analysis, along with other demand and supply factors from Sections 2.0 and 3.0.

4.1 STUDY AREA

The study area for this analysis is Yale Lake and a 0.5-mile buffer zone surrounding the lake (see Figure 2.1-1).

4.2 METHODS

Methodology for the 2 interrelated components - recreation capacity and recreation suitability using GIS - are described below. The first analysis is a goal or policy-based analysis, while the second analysis is a resource database overlay analysis. Both are complementary to addressing carrying capacity issues.

4.2.1 Methodology for Assessing Recreation Capacity

The first part of this overall analysis assesses recreation capacity from a goal or policy-based perspective. In this analysis, recreation capacity was analyzed using 2 methodologies: (1) analysis of existing recreation facility occupancy and capacity

utilization in the study area; and (2) analysis of recreation facilities, use areas, and activities in the study area using management and impact parameters that address social, ecological, and other concerns, with a focus on identifying the limiting factor(s). These 2 methodologies are described below.

4.2.1.1 Recreation Facility Occupancy and Capacity Utilization Analysis

This analysis focuses on the capacity of developed recreation facilities because they receive the greatest amount of visitation and are subject to increased crowding problems and potential resource degradation. These resources include developed campgrounds, picnic day-use areas, and lake boater facilities. The following steps were used in analyzing recreation facility and use area occupancy and capacity utilization:

- Review recreation supply and demand data for use in the capacity analysis.
- Define capacity indicators for use in the analysis.
- Analyze facilities using these indicators and identify the limiting factors.
- Based on these indicators, prioritize facilities as to their capacity levels.

The capacity analysis uses recreation use and facility data obtained in the demand analysis (Section 3.0), site and facility inventory (Section 2.0), and visitor attitudes and preferences survey (Section 3.3.2). These analyses provide an understanding of area opportunities, existing use patterns, responses to questions regarding crowding, and facility capacities.

To assess developed facilities, indicators of capacity problems were identified based on review of existing documentation and recreation resource studies. Use of more than 1 indicator was important so that the results are not biased. Three primary types of capacity indicators are used in this analysis and include:

- Campground Occupancy Rates - These include weekday, weekend, weekly, and peak day rates for campgrounds and are used to measure facility capacity during different time frames. Actual rates were calculated based on camp host counts and vehicle count observations (Section 3.3.2).

- Survey Crowding Responses - These include responses to specific survey questions dealing with visitor crowding, facility needs, and user attitudes (Section 3.3.2). These responses indicate how visitors feel about existing facility use and whether capacity levels may be exceeded. This indicator focuses on the percentage of respondents who felt crowded to some degree. Perceived crowding assessment judgments were based on research (Shelby and Heberlin 1986) conducted independently of the Yale Project relicensing. This research utilized responses from more than 17,000 individuals in 35 studies. The research resulted in a 5-category ranking of capacity judgment:

Suppressed Crowding	0-35	percent feel crowded
Low Normal	35-50	percent feel crowded
High Normal	50-65	percent feel crowded

More than Capacity	65-80 percent feel crowded
Much More than Capacity	80-100 percent feel crowded

Crowded responses from the 1996-1997 survey of the study area were then compared against these judgment rankings to identify potential capacity problems.

- Facility Capacity Utilization - These include percentage measurements of facility utilization developed in this analysis. This methodology was adapted from indicators used by federal agencies (USFS, BLM, and others) including persons-at-one-time (PAOTs), recreation visitor days (RVDs), and facility capacity utilization percentages. Indicators are applied to what is called the "season" which is defined as when facilities are open to the public and/or when use primarily occurs.

  Seasonal facility capacity threshold level definitions adapted from similar levels used by federal land management agencies and used in this analysis include:

  - 40 percent - "Optimal Use" - Allows a facility or use area to rest and revegetate during slow periods or periods of closure. Peak capacity is typically reached during summer holiday weekends and during a few summer weekends. This level of use is optimal for many older facilities and those in sensitive resource areas. Newer facilities can often accommodate higher percentages of use due to the incorporation of sensitive design features and siting.

  - 60 percent - "Well Utilized" - Indicates a well utilized facility or use area which reaches capacity during summer holidays, most summer weekends, and a few summer weekdays. A newer well-designed facility should function satisfactorily at this level of use, if allowed to rest during the off-season. An older facility will likely not be able to accommodate this level of use without significant impact or degradation of the user experience. Many visitors will perceive some crowding; however, off-peak periods are still available for those visitors who desire more solitude. Some impacts may be expected and will likely need to be addressed.

  - 80 percent - "Heavily Utilized" - Indicates a very high level of use with capacity reached or exceeded during all summer weekends, many summer weekdays, and all summer holidays. The visitor experience is more urban with fewer opportunities for solitude. Many more visitors will perceive some crowding and many will likely go elsewhere. Sustained use at this level requires hardened or paved facilities, increased levels of management and crowd control, a full reservation system, and a more aggressive monitoring program. Impacts and maintenance levels increase substantially at this higher level.

  - 100 percent - "Extreme Use" - Indicates an extreme use level with facilities always at or above capacity, even during weekdays. The visitor experience

becomes much more urban in nature with little or no opportunities for solitude. Most visitors will perceive some crowding and many will likely go elsewhere. Sustained use at this level requires more hardened or paved facilities, increased levels of management, full reservations, and increased levels of monitoring and crowd control. Impacts and maintenance levels likely increase substantially at this higher level.

Facility use indicators, such as maximum number of campsites and parking spaces, were used to determine the maximum amount of people a site could accommodate at any one time. This is called a PAOT measurement. This measure is a common theoretical capacity measurement used for developed facilities. When the number of days the facility is open for public use is taken into account, another capacity measure (the PAOT day) may be identified for each facility. Multiplying the total PAOT days by 2 for overnight facilities or by 1 for day-use areas provides an estimate of maximum theoretical capacity utilization (or capacity utilization) in a second unit measure called RVDs. The RVD measure is utilized by the federal land management agencies when measuring visitor use over time, such as total RVDs per season or year. It recognizes a smaller unit of time (12 hours).

To summarize this analysis using facility capacity indicators, facilities and use areas are prioritized from highest to lowest concern as follows:

- Priority 1 - High use facility that likely requires some action, such as facility expansion, construction of a new facility elsewhere, or additional management actions, to address problems associated with high occupancy levels, perceived crowding, or high capacity utilization.

- Priority 2 - Moderately high use facility that likely requires monitoring to assess growing capacity concerns and planning to meet anticipated future needs that may include development or management actions in the near future.

- Priority 3 - Low to moderate use facility that likely requires monitoring only.

4.2.1.2 Recreation Capacity Analysis Based on Management and Impact Parameters

Limits of Acceptable Change (LAC) is a federal wilderness-based recreation capacity and suitability methodology that has been adapted over the years for use in other situations including developed recreation environments. It is particularly well suited for larger areas such as wildernesses, reservoirs, trail corridors, shorelines, and Recreation Opportunity Spectrum (ROS) category areas (such as a Roaded Natural area). The LAC approach is based on the premise that ecological and social change will occur in natural areas as a result of changes in natural factors and/or human use. A goal of many resource managers is to keep the amount of change that results from human use within acceptable levels consistent with objectives for each use area or for specific resources such as wildlife habitat (USFS et al. 1992).

A LAC-based approach was used in this analysis which considers several applicable management and impact parameters as a planning tool to analyze the capacity of recreation facilities, use areas, and activities at Yale Lake. This approach selects 1 or more parameters as a limiting factor(s) affecting capacity. This analysis looks at broader use areas or activities, such as boating, as well as developed facilities such as specific campgrounds. Following this analysis, facilities, use areas, and activities are prioritized (3-point scale) as to their capacity sensitivity and likely need for possible actions now or in the future.

Management parameters considered in this analysis include such things as regional demand levels from the IAC, recreation, planning, design, capacity and suitability standards, and applicable agency and PacifiCorp plans and policies. Management parameters also include plans and policies from planning documents including the Lewis and Kalama River Watershed ILM-Recreation Plan (WDFW 1995), the Siouxon Landscape Plan (DNR 1996), 3 county comprehensive plans (Clark, Cowlitz, and Skamania counties), and the Lewis River Valley Action Plan (Action Plan Committee 1995).

Impact parameters considered in this analysis include 4 types: ecological, physical space (spatial), facility, and social. Ecological capacity is concerned with impacts on natural resources such as wildlife and vegetation; physical space or spatial capacity is concerned with the number of users that can be physically accommodated by an area or resource; facility capacity is concerned with the number of users that can be accommodated by developed areas; and social capacity is concerned with the effects of crowding and congestion on visitor experiences.

Management and impact parameters are then listed in a matrix format for review and comparison. Parameters are selected and described in summary fashion for each activity type including: camping, picnicking and using rest stops, boating, swimming and sunbathing, interpretive/environmental education activities, trail activities, fishing, and other open space uses such as nature/wildlife observation, photography, sightseeing, hunting, and food/berry collecting. Some activities considered not to be project-related were not included in this review including snow-related activities, caving, rock climbing, and hang gliding. All of these parameters are then reviewed and the most significant one or ones are identified as a limiting factor(s). Normally, only 1 or 2 management or impact parameters become the critical "limiting factors."

To summarize this capacity analysis, recreation facilities, use areas, and activities are prioritized from highest to lowest capacity concern and likely need for possible action as follows:

- Priority 1 - A fairly intense level of human activity is likely to be negatively affecting a resource. A negative impact to the current visitor experience is likely to be occurring frequently, or management objectives are likely not being met at this time. Potential actions may be considered at this time to address the capacity or management issues. Potential considerations may include modifications to facilities or programs or new construction, implementation of use restrictions, temporary or

permanent closure of areas or services, and/or other possible additional management actions.

- Priority 2 - A moderately high level of human activity appears to be affecting a resource to some degree, negative impact to the visitor experience is occurring during certain portions of the season, or management objectives may not be met in the future based on projections. Potential actions may be considered now to address growing capacity or management concerns. Potential increased management of the human activity, or its intensity, appears likely in the future as conditions warrant.

- Priority 3 - A low to moderate level of human activity appears to have little or no significant impact on resources or social behavior or enjoyment at this time. Human activity may continue with periodic monitoring as use levels increase in the future.

4.2.2 Methodology for Assessing Recreation Suitability

The second part of this overall analysis assesses recreation suitability from a resource database overlay perspective. The ability of the Yale Lake study area to accommodate any new potential recreation development was assessed using GIS-based technology. This analysis looked at a number of opportunities and constraints to recreation development at Yale Lake. This tool is a macro-scale approach and is not meant to replace on-the-ground siting techniques that may be used to develop specific PM&Es in the future. Rather, this tool is used to answer broader questions relating to potential recreation facility siting (for example, if a new campground is needed in the future to satisfy needs at Yale Lake, where should it be sited; or there is no suitable site at Yale Lake for a new campground to satisfy identified needs).

Opportunities and constraints to recreation site development were assessed using a series of available data layers contained in PacifiCorp's GIS database. Opportunity and constraint GIS data layers used in this analysis are listed in Appendix 4.2-1.

Opportunities for potential recreation development areas at Yale Lake that were considered in this analysis include:

Natural Factors

- Relatively flat slopes of 0 to 10 percent.
- Average to favorable soil properties (minimization of erosion potential).

Man-made Factors

- Public land (Cowlitz County, DNR, USFS, and BLM).

- PacifiCorp-owned land.

- Areas with potential views of Mount St. Helens.

- Areas with potential views of Yale Lake.

- Clark County's undeveloped Siouxon County Park site.

- Land within 1,000 feet of existing roads (increased potential for road and utility access and minimization of new road cuts).

- Proximity to existing campgrounds/day-use areas (increased potential for expansion or infill of existing facilities).

- Proximity to the Yale Lake shoreline (with ¼ mile) (visitors desire a shoreline experience).

Constraints to potential recreation development areas at Yale Lake that were considered in this analysis include:

Natural Factors

- Beaver dam areas.
- Spotted owl observation points and buffer areas.
- WDFW Priority Habitat Species (PHS) sites and buffer areas.
- Bald eagle observation points and buffer areas.
- Raptor nest sites, critical areas, and buffer areas.
- Elk winter range areas.
- High erosion/slope failure areas (slope greater than 20 percent).
- Moderate slope (slope 10 to 20 percent).
- Difficult to extreme soil conditions.
- Creeks, streams, and buffer.
- Shallow bathymetry (less than a 5 percent slope) which limits boating/boat access within 500 feet of shore.
- Wetlands and buffer.
- Old-growth vegetation.
- Riparian deciduous vegetation.
- Riparian mixed conifer/deciduous vegetation.
- Rock outcrops.
- Rock talus.

Man-made Features

- PacifiCorp and Cowlitz County PUD project facilities.
- Residential areas.
- Within 2,000 feet of residential areas (buffer).
- Monument lands.
- Non-PacifiCorp private land.
- Speelyai Canal and Swift No. 2 power canal and buffer.
- Existing roads (roads and utilities are costly to relocate).
- Transmission line ROWs and buffer.
- Areas greater than ¼ mile from the shoreline (visitor preference is for shoreline).
- Merwin Wildlife Habitat Management Area.

- Eastern Yale Lake shoreline which has limited access, no utilities, and no current developed facilities, as compared with the western shoreline.

Each GIS data layer noted above, and buffer area if applicable, was ranked from 1 to 5 (low to high priority weights) to develop opportunity and constraint maps that depicted a range of low to high values. Overlapping data layer weights were summed with higher value areas and multiple "hit" areas receiving a higher cumulative rating than lower value and single "hit" areas. These opportunity and constraints maps were then overlayed using GIS technology to develop a composite suitability map depicting low to high suitability for recreation development. In the creation of the suitability map, higher value areas and multiple "hit" areas (positive or negative) dominate, which result in a map that shows the best and worse sites (or polygons) for recreation development. Due to the pixel size and macro-scale of some of the data layers used, this type of analysis tends to work well for identifying suitable larger polygons (campgrounds and day-use sites), but is less successful in locating linear polygons such as trail corridors or small points.

Following completion of the suitability mapping, recommendations are made concerning potential recreation development to satisfy all or a portion of the growing demand for recreation at Yale Lake.

4.3 RESULTS AND DISCUSSION

The results for the 2 interrelated components–the goal or policy-based capacity analysis, and the resource database overlay-based suitability analysis–are described below. The recreation capacity analysis addresses specific facility capacities, as well as broader social and environmental capacities of facilities, use areas, and activities using management and impact parameters. The recreation suitability analysis uses GIS technology to identify areas that may be potentially suitable for recreation development, if needed in the future.

4.3.1 Recreation Capacity Analysis

The results of this analysis focus on the capacity of recreation facilities and use areas at Yale Lake using 2 approaches: (1) identifying the capacity of existing developed recreation facilities; and (2) identifying the capacity of facilities, use areas, and activities using management and impact parameters including broader social and environmental concerns. The results of these 2 approaches are presented below.

4.3.1.1 Facility Capacity Analysis

The results of this analysis are based on the use of 3 categories of indicators of facility capacity: (1) campground occupancy rates, (2) survey results from questions regarding perceived crowding at facilities, and (3) recreation facility capacity utilization. Results of the facility capacity analysis using these 3 indicators are then summarized by prioritizing facilities from highest to lowest capacity concern and potential need for actions.

Yale Lake Campground Occupancy Rates

Seasonal occupancy rates for Yale Lake campgrounds (Beaver Bay, Cougar Camp, and Saddle Dam) are presented in Table 4.3-1. Occupancy at Yale Lake campgrounds was calculated for different time frames to understand overall seasonal use levels, as well as peak use levels. These time frames include: season (when they are open or primarily used), weekday average, weekend average, peak holiday (July 4th weekend), and during the busiest 2 months (July and August). In general, the 3 campgrounds receive the majority of their use during the very warmest and driest periods of the year, which is typical for the western Cascade Range area. The overall seasonal occupancy level (57 percent) is over half that of a typical weekend occupancy level during July and August (95 to 100 percent).

Table 4.3-1. Seasonal occupancy rates for Yale Lake campgrounds by week, weekday, weekend, and peak day.

Sites and Areas	Seasonal Weekly Occupancy Rate		Seasonal Weekday Occupancy Rate [1]		Seasonal Weekend Occupancy Rate [1]		Peak Holiday Occupancy	Peak Use Days During the 1996 Season (Occupancy Rate and How Often)	
Developed Campsites (# Sites)	**Total**	**July-August**	**Total**	**July-August**	**Total**	**July-August**			
Beaver Bay Campground (63)	47%	88%	39%	70%	71%	95%	98%	95-100%	10 times
Cougar Camp (45)	73%	90%	39%	70%	71%	95%	98%	95-100%	15 times
Saddle Dam Campground (15)	49%	92%	39%	70%	71%	95%	100%	95-100%	14 times
Campground Subtotal (123)	57%	89%	39%	70%	71%	95%	98%	95-100%	13 times

[1] Occupancy rate average derived from all Lewis River project campgrounds during the period that they were open in 1994-1997.

During the course of the entire season, campground occupancy averaged 57 percent. Occupancy ranged from a low of 47 to 49 percent at Beaver Bay and Saddle Dam, respectively, to a high of 73 percent at Cougar Camp, a tent-only campground. During the 2 peak summer months (July and August), however, occupancy rates were much higher and more similar as compared to the season as a whole. Occupancy during these 2 months averaged 89 percent for all 3 campgrounds and ranged from 88 to 92 percent.

Weekday occupancy rates, typically lower than the season average, averaged 39 percent for the season for all 3 campgrounds. During July and August, however, occupancy was much higher at 70 percent.

Weekend occupancy rates, typically higher than the season average, averaged 71 percent for all 3 campgrounds. During July and August, occupancy was almost at full capacity (95 percent).

During the July 4th weekend, typically the highest use holiday, occupancy at the 3 campgrounds was at full capacity (98 to 100 percent). Because of some spillover camping, Saddle Dam Campground has experienced levels above 100 percent. Memorial Day and Labor Day weekends may also experience this high level of use, but during these holidays occupancy is more dependent upon good weather conditions.

Peak capacity levels are reached many times during the season at all 3 campgrounds, including non-holiday weekends. During the 1996 season, for example, campground occupancy levels reached peak levels (95 to 100 percent) 13 times based on camp host counts. These included both non-holiday and holiday weekends. Other years are similar, depending upon good weather conditions. A very wet year will likely see lower numbers of peak counts, while a very dry year will likely see somewhat higher counts. Beaver Bay saw a fewer number of peak days (10), likely because of its larger capacity (63 campsites) and farther distance from the I-5 corridor. Cougar Camp (at 15 times) and Saddle Dam (at 14 times) saw a slightly larger number of peak days, likely due to their smaller size (fill up quicker) and closer distance to the I-5 corridor.

Two group campsites are located at Beaver Bay Campground and Cougar Park. These 15-site facilities may be reserved with PacifiCorp and are popular facilities that are booked well in advance, beginning in January of each year for the upcoming season. The group campsites are generally booked every weekend, except during June when it is cooler. They have a weekend occupancy rate for the season of about 80 percent. During May, July, and August, these facilities are booked 100 percent on weekends. During weekdays (Tuesday to Thursday), the facilities are generally vacant.

Perceived Crowding at Recreation Facilities

With high occupancy levels at Yale Lake campgrounds during periods of the year, as previously discussed, visitors may perceive that crowding is negatively affecting their recreation experience at campgrounds and day-use sites. To determine if crowding is a problem, visitors to Yale Lake recreation facilities were asked to indicate their perception of crowding using a 7-point scale ("not at all crowded" to "extremely crowded," refer to Table 3.3-13 in the Demand Analysis). In this analysis, visitors indicating that they were slightly, moderately, or extremely crowded are deemed to feel crowded to some degree.

Overall, for the months of May through September, about 3 out of 5 (59 percent) visitors felt crowded to some degree. Based on other studies of recreational crowding, a 5-category ranking of capacity was developed to judge social capacity based on perceived crowding (Shelby and Heberlin 1986). This ranking assumes perceived crowding to any degree. The perception of crowding at Yale Lake, taken during the entire season, is considered "High Normal" (Shelby and Heberlin 1986) - high, but generally within acceptable social capacity. During the warmer month of July, perceived crowding increased to 63 percent, but is still considered to be in the "High Normal" range (almost

into the next higher category - "More Than Capacity" at 65 percent). During the month of August, perceived crowding increased to 70 percent, which is considered to be in the "More Than Capacity" level (Shelby and Heberlin 1986) - high, and exceeds social capacity.

Looking at perceived crowding on a site-by-site basis for the entire season, campgrounds and day-use sites varied including:

- More Than Capacity — Saddle Dam (68 percent felt crowded)
- High Normal Capacity — Beaver Bay, Cougar Camp, Cougar Park (60-62 percent felt crowded)
- Low Normal Capacity — Yale Park (39 percent) felt crowded

Saddle Dam, the smallest and most compact site, was perceived to be crowded by more than 2 out of 3 visitors (68 percent) during the season. During the peak July and August period, perceived crowding was even higher.

At Beaver Bay, Cougar Camp, and Cougar Park, about 3 out of 5 visitors (60 to 62 percent) perceived use to be crowded during the season, but generally within their social capacity. During the peak July and August period, however, perceived crowding was higher and exceeded social capacity (fell within the "More Than Capacity" level).

Yale Park responses tended to pull down the average for all 5 recreation facilities. Despite its peak use conditions with overflowing parking on occasion, Yale Park responses were unique when compared to the other facilities. Perceived crowding at Yale Park remained in the "Low Normal" or "High Normal" levels during the entire season. It is likely that part of the reason for this is that many boaters surveyed launched and left the area, but may not have returned until crowding declined. Another reason for a lowered perception of crowding was the typical length of time to launch a boat at Yale Park. The wait time at Yale Park was much shorter (all responses under 10 minutes) than the other launch sites because of its greater capacity (4 ramps, compared to 1 or 2 ramps), as well as nearby parking. Those who use Yale Park during peak periods, however, are more likely to indicate that there is crowding, at least on peak days. During weekdays, however, use is very low with only a few vehicles parked in the very large parking area.

Recreation Facility Capacity Utilization During the Season

Campground and day-use site capacity utilization for the season in PAOTs and RVDs is presented in Table 4.3-2. Capacity utilization is determined by multiplying the average number of occupied campsites in campgrounds and parking spaces in day-use sites by a conversion factor typically used by the National Park Service and/or USFS (3.4 persons per campsite or vehicle) and comparing this number to a maximum theoretical capacity. This comparison is meant to be a general indicator and may be subject to site-specific conditions which may affect the conclusion.

During the season, campground capacity was utilized at approximately 57 percent. This capacity utilization level is just below the 60 percent level which indicates well-used

facilities. A well-designed facility should function fine at this level, if it is allowed to rest during the off-season and the site is designed to accommodate higher use levels.

Table 4.3-2. Seasonal capacity of Yale Lake recreation facilities in PAOTs and RVDs.

Sites/Areas	# Sites Available	Season Days Open to the Public	Maximum PAOT Days Capacity per Season[1]	Maximum RVD Capacity per Season[2]	Estimated Average # of Sites Occupied per Day (Rounded)	Current PAOT Days (Seasonal Use)	Current RVD Seasonal Use	Current RVD Capacity Utilization/ % Seasonal Occupancy
Campground Facilities	Campsites							
Beaver Bay	63	162	34,700	69,400	30	16,524	33,048	47%
Cougar Camp	45	102	15,606	31,212	33	11,444	22,888	73%
Saddle Dam	15	102	5,202	10,404	7	2,428	4,856	49%
SUBTOTAL	123	102-162	55,508	111,016	70	30,396	60,792	57%
Day-Use Facilities	Parking							
Beaver Bay Boat Launch, Picnic Area, and Swim Area	40	162	22,032	22,032	5	2,754	2,754	13%
Cougar Camp Boat Launch Area	100	102	34,680	34,680	16	5,549	5,549	16%
Yale Park Picnic Area, Boat Launch, and Rest Stop	280	365	347,480	347,480	20	24,820	24,820	8%
Cougar Park Picnic Area and Rest Stop	80	102	27,744	27,744	8	2,775	2,775	10%
Saddle Dam Picnic Area and Boat Launch	200	102	69,360	69,360	28	9,710	9,710	14%
SUBTOTAL	700	102-365	501,296	501,296	77	45,608	45,608	10%
TOTAL	---	---	556,804	612,312	---	76,004	106,400	17%

Note: [1] Assumes an average of 3.4 persons per campsite and vehicle.
[2] Recreation Visitor Day (RVD) is an overnight visit or 2 times a PAOT.

Cougar Camp is operating well above this average level at 73 percent for the season. Cougar Camp, the only tent-only campground with shoreline camping opportunities, is perhaps the most popular site and the most attractive. However, it is showing signs of some degradation such as shoreline erosion, and excess vehicles often crowd campsites creating problems. Capacity utilization at Beaver Bay and Saddle Dam is lower at 47 to 49 percent, respectively. These campgrounds, as well as Cougar Camp, however, are operating above an optimal level (40 percent) allowing for rest during the off-season. As a result, monitoring is needed (as is currently done by PacifiCorp) and older facilities, such as some campsites, may require modifications to accommodate higher use levels.

Unlike campgrounds, day-use facilities are generally used during shorter periods of time (for a few hours or less) and during good weather conditions (picnicking, swimming, and sunbathing require warm sunny days). As a result, capacity utilization of day-use

facilities, such as picnic areas, swimming and sunbathing areas, and boat launches, is much smaller as compared to campgrounds. These sites sit vacant most of the year waiting for those few sunny days when people flock to them. The concern here is to have adequate parking and other facilities for these brief peak periods of time. Based on seasonal parking capacity, day-use sites are being utilized at only 10 percent of their seasonal capacity. Yale Park (8 percent) and Cougar Park (10 percent), both with lower utilization of parking capacity, tend to pull down the overall utilization rate. Cougar Camp boat launch (16 percent), Saddle Dam day-use site (14 percent), and Beaver Bay day-use site (13 percent) are operating at a somewhat higher utilization rate. Obviously, because of typical use patterns, peak weekend usage, during July and August in particular, is critical to planning facility capacity, not just the entire season as these and other figures demonstrate. Parking capacity utilization at day-use sites during the weekends was 2 to 4 times greater than the season as a whole. Four of the 5 day-use sites during weekends were similar, with Cougar Park having a lower utilization rate. Capacity utilization at these sites during holiday and non-holiday weekends during 1996 includes:

- Beaver Bay holiday (38 percent) and non-holiday (35 percent)
- Cougar Camp holiday (28 percent) and non-holiday (38 percent)
- Cougar Park holiday (22 percent) and non-holiday (25 percent)
- Yale Park holiday (37 percent) and non-holiday (37 percent)
- Saddle Dam holiday (38 percent) and non-holiday (31 percent)

As evidenced above, all day-use sites remain at a fairly moderate level of capacity utilization (below 40 percent) during weekends on average. This level of use is considered optimal; however, the numbers do not tell the whole story and other indicators should be considered.

There are peak use weekend days when parking capacity is inadequate to handle the influx of day users, particularly during periods of very hot weather. Most people in the Pacific Northwest do not have air conditioning; therefore, during hot weather, they occasionally seek the comfort of nearby lakes such as Yale Lake. On these particular days in July and August, visitors must be turned away at the entry gates or must remain in long lines before they may enter PacifiCorp's facilities. This situation occurs particularly at Saddle Dam and Yale Park. Overflow parking and lines of vehicles have been known to clog SR 503 creating traffic problems. During these days, generally up to 5 days a year, additional parking and launch facilities are needed to handle the surge of visitors. PacifiCorp has implemented a number of crowd control measures during these times to handle the large number of visitors. This is a growing problem that is likely to increase in intensity and repeat itself year after year as the population increases. The nearby Portland and Vancouver/Longview/Kelso areas are fast-growing, which exacerbates the problem.

Recreation Facility Capacity Priorities

To summarize this analysis of facility capacity indicators, existing recreation facilities are prioritized from highest to lowest (1 to 3) capacity concern and need for potential actions.

Based on professional judgment and the occupancy and capacity data previously presented, the 3 levels of priority and associated facilities with those priority levels include:

- Priority 1 - Two Priority 1 facilities have been identified–Saddle Dam Campground/ Boat Launch, and Cougar Camp (campground portion). The high use levels of these facilities suggest that some actions are warranted in the near future to address problems associated with high occupancy levels and related impacts, perceived crowding by visitors, and/or safety improvements related to vehicle traffic or parking. Potential actions that may be considered include: facility expansion and/or redesign; possible new facility construction elsewhere; and management actions such as an expanded reservation system, entry controls, and/or improved communications.

- Priority 2 - Two Priority 2 facilities have been identified–Yale Park and Beaver Bay Campground. The moderately high use level of these facilities and perceived crowding by visitors and parking and congestion at peak periods suggest that additional planning should be initiated to address capacity issues and the visitor experience. Potential actions that may be considered as a result of further planning include some development expansion or redesign of the existing campground and management actions such as an expanded partial reservation system.

- Priority 3 - Three Priority 3 facilities have been identified–Cougar Park, Cougar Camp boat launch, and Beaver Bay boat launch and picnic area. These comparatively low to moderate use facilities require only continued monitoring at this time.

4.3.1.2 Recreation Capacity Based on Management and Impact Parameters

The purpose of the capacity analysis is to augment capacity planning data from the previous analysis (Section 4.3.1.1), focusing more on social and environmental capacity issues. This analysis uses a modified LAC approach which considers a range of management and impact parameters and identifies limiting factors and priorities. The results of this analysis are presented in matrix format in Appendix 4.3-1 of this FTR.

Management parameters include such elements as agency plans and policies, capacity standards, and regional demand projections and use levels. Impact parameters include 4 types: ecological, physical space (spatial), facility, and social. Facility capacity data from the previous analysis are used. The capacity analysis applies these parameters to recreational use areas and activities, such as boating, as well as developed facilities, such as campgrounds. Normally, only 1 or 2 of the parameter categories become the critical "limiting factor(s)." Such factors are identified in this analysis. As a summary, recreational facilities, use areas, and/or activities are prioritized as to their capacity sensitivity and potential need for actions using a 3-point scale (Priority 1, 2, or 3). Resource areas (activities and facilities/use areas) addressed in the analysis include camping, picnicking, boating, swimming/sunbathing, trail use, fishing, and other open space uses. Following a discussion of each of these, the analysis presents a summary of capacity issues and identified priorities.

Camping

Camping involves 3 activity areas and 6 facilities/use areas. Camping activities include:

- RV and tent camping
- Group camping
- Undeveloped dispersed camping

Camping facilities and use areas include:

- Beaver Bay Campground (63 sites)
- Cougar Camp (45 sites)
- Saddle Dam Campground (15 sites)
- 2 RV dump stations at Beaver Bay and Saddle Dam
- 2 group campsites - Cougar Park and Beaver Bay (15 sites each)
- Dispersed shoreline campsites (approx. 67); primary use areas include:
    - Siouxon Creek area
    - Cove/Point near Yale Dam
    - Cove near Saddle Dam
    - Siouxon Flats area
    - Swift No. 2 power canal
    - North Lewis River bridge area (northeast of project)

Limiting parameters or standards related to camping by site or area include:

- Beaver Bay - Facility and social parameters are the limiting factors. Main considerations include the number of campsites, high occupancy rate during July-August, and perceived crowding during these 2 months. However, most visitors are satisfied with their experience.

- Cougar Camp - Facility and social parameters are the limiting factors. Main considerations include the number of campsites, high occupancy during July-August, and perceived crowding during these 2 months. However, most visitors are satisfied with their experience.

- Saddle Dam - Facility and social parameters are the limiting factors. Considerations include the number of campsites available, high occupancy during July-August, perceived crowding all season, traffic, and design problems/limitations.

- Group Campsites - Facility and social parameters are the limiting factors. Considerations include number of group campsites and high occupancy rate during July-August. Some capacity remains in June (not booked every weekend).

- Dispersed Shoreline Camping - Environmental parameters are the limiting factor, including observed problems associated with sanitation, litter, fire hazard, trash, and personal safety.

Picnicking/Using Rest Stop

Picnicking involves 4 activities and 5 facility/use areas. Activities include:

- Barbecuing
- Picnicking
- Resting/relaxing
- Making rest stops along SR 503

Picnic facilities/rest stops include:

- Beaver Bay day-use area
- Cougar Park
- Yale Park
- Saddle Dam day-use area
- Dispersed shoreline day-use sites

Limiting parameters or standards related to picnicking/rest stops include:

- Yale Park Picnic Area - The physical space parameter is the limiting factor; little area exists to develop new picnic sites and parking space is limited.

- Cougar Park Picnic Area - The facility parameter is the limiting factor. There is some expansion room to the west, however.

- Saddle Dam Picnic Area - The physical space parameter is the limiting factor; no more area exists to develop picnic sites.

- Beaver Bay Picnic Area - The physical space parameter is the limiting factor; no more area exists to develop as picnic space.

- Dispersed Shoreline Day-Use Sites - The ecological and physical space parameters are the limiting factors; observed erosion, sanitation, litter, and fire hazard are concerns, and little space exists for shoreline use due to topography.

Boating

Boating involves 5 activities and 5 facilities/services. Boating activities include:

- Power boating
- Water skiing
- Jetskiing/PWC use
- Sail boating
- Canoeing, kayaking, row boating, and use of inflatables

Boating facilities/services include:

- Beaver Bay boat launch and parking (40 parking spaces, 1-lane ramp, 1 dock)
- Cougar Camp boat launch and parking (100 parking spaces, 2-lane ramp, 1 dock)

- Yale Park boat launch and parking (280 parking spaces, 4-lane ramp, 2 docks)
- Saddle Dam boat launch and parking (200 parking spaces, 2-lane ramp, 1 dock)
- Clark County Sheriff's Dept. Marine Patrol (2 days/week)

Limiting parameters or standards related to boating include:

- Overall Reservoir - Facility parameters are the limiting factor, particularly ramp access and parking. The reservoir has additional capacity (surface acres) for more boats.

- Beaver Bay Boat Launch - Facility parameters are the limiting factor; a single ramp causes higher wait times, and its condition is fair.

- Cougar Camp Boat Launch - Facility parameters are the limiting factor; the launch condition is fair to poor, and the ramp is too short to accommodate the range of pool levels. The launch ramp is physically limited by Cougar Creek.

- Yale Park Boat Launch - Facility parameters are the limiting factor; the length of the ramp does not provide access at lowest year-round pool level (460 feet msl), and parking is exceeded during extreme peak use days causing overflow/safety concerns along SR 503.

- Saddle Dam Boat Launch - Facility parameters are the limiting factor; the length of the ramp does not provide access at the low recreation pool level (480 feet msl), parking and queing area is exceeded during peak use days causing access and safety problems, and the launch and dock are in fair to poor condition.

Swimming/Sunbathing

Swimming and sunbathing involves 2 activities and 6 facilities or use areas. Activities include:

- Swimming/floating in designated swim areas and along the shoreline
- Sunbathing/relaxing on sandy beaches at designated swim areas and along the shoreline

Swimming and beach facilities and use areas include:

- Beaver Bay swim area with floating boom, sandy beach
- Cougar Park swim area with floating boom, sandy beach
- Yale Park swim area with floating boom, sandy beach
- Saddle Dam swim area with floating boom, sandy beach
- Safety apparatus, signs
- Dispersed undeveloped shoreline areas

Limiting parameters or standards related to swimming and sunbathing include:

- Yale Park Swim/Beach Area - The physical space parameter is the limiting factor; little area exists to develop new swim/beach area without impacting other uses.

- Cougar Park Swim/Beach Area - The facility parameter is the limiting factor; the area available for swimming is limited at the existing site on Cougar Creek.

- Saddle Dam Swim/Beach Area - The physical space parameter is the limiting factor; no more area to develop as beach area without impacting other uses.

- Beaver Bay Swim/Beach Area - The physical space parameter is the limiting factor; no more area exists to develop as swim/beach area.

- Shoreline Dispersed Day Use Swimming/ Sunbathing - The ecological and physical space parameters are the limiting factors; erosion, sanitation, litter, and fire hazard are concerns; little additional space exists for developed shoreline use due to topography.

Interpretive Opportunities/Environmental Education

Interpretive/environmental education opportunities involve 3 activities and 4 facilities and services. Activities include:

- Learning about nature, the hydroelectric projects, and the area's history
- Taking nature walks
- Attending Ranger campfire talks

Interpretive/environmental education facilities/services (existing and potential) include:

- Informational/directional signs at recreation sites
- Interpretive signs/kiosks (none at this time)
- Nature trails and signs (none at this time)
- Campfire program provided by USFS Rangers

Limiting parameters or standards related to interpretive/environmental education include:

- Developed Sites - The management parameter is the limiting factor. Demand is very high for interpretive opportunities statewide and in the Monument. No opportunities currently exist on project lands except Ranger campfire talks.

Trail Use

Trail use (non-motorized and motorized) involves 2 main types of activities and 7 trail corridors/routes. Activities include:

- Non-motorized trail use
    - Hiking/walking
    - Mountain biking
    - Bicycling
    - Horseback riding
    - Backpacking
- Motorized trail use
    - 4WD driving
    - ATV/motorcycle use

Trail corridors and routes may include:

- Saddle Dam to Speelyai Canal–informal dirt trail
- Cougar Creek–informal dirt trail
- Swift No. 2 power canal–informal dirt trail/canal crossings
- SR 503 bicycle route (possible future expansion with bike lane or path added)
- IP Road paved route (some existing use, but no recreation access easement exists)
- Yale-Merwin transmission line ROW (potential trail route, no current use)
- Cougar Camp/Park to the town of Cougar (potential dirt/paved trail route, possible extension to Beaver Bay)

Limiting parameters or standards related to trail use include:

- Trail Opportunities - The management parameter is the limiting factor. Demand is very high for trail-related opportunities; agency and organization plans identify trails as a high priority. No formal trails and no ADA-accessible recreation trails exist at the project, yet most visitors are satisfied with their experiences. Several informal trails exist

Fishing

Fishing involves 2 activities and 5 facilities/areas. Fishing activities include:

- Boat fishing (majority of activity)
- Bank fishing

Fishing-related facilities/areas (existing and potential) include:

- Boating facilities (see above)
- Access piers (none)
- ADA angler access (none)
- Fish cleaning facilities (none)
- Shoreline access to project lands (almost all)

Limiting parameters or standards related to fishing include:

- Fishing Opportunities - The management and facility parameters are the limiting factors. Demand for fishing in the region is high, particularly in Clark and Cowlitz counties; agency plans identify fishing opportunities as a high priority. WDFW has created a very good kokanee fishery through previous stocking programs and current management in the region. Most anglers use boats (see Boating above). No facilities currently exist for ADA-accessible bank or boat fishing.

Other Open Space Activities

Other open space use involves 5 activities and 3 use areas. Other open space-related activities include:

- Nature/wildlife observation
- Photography
- Sightseeing
- Hunting
- Food collecting/berry picking

Other open space-related facilities/use areas include:

- Undeveloped tracts of open space and shoreline
- Views from SR 503
- Merwin Wildlife Management Area

Limiting parameters or standards related to other open space-related use include:

- Open Space Management - The management and physical space parameters are the limiting factors. Demand is very high for developed recreation facilities and activities. However, these needs must be balanced with the needs for open space and wildlife habitat management and for land to be set aside for future needs. Undeveloped land is limited.

Capacity Issues and Priorities

The results of the analysis based on management and impact parameters presented in Appendix 4.3-1 are summarized below. Resources or activities are prioritized from highest to lowest capacity concern and possible need for actions using 3 priority levels: Priority 1 - represents a fairly intense level of human activity, a high level of regional demand, or a management objective that suggests consideration of some action in the near future to modify human behavior, to help satisfy demand, or to meet a management objective; Priority 2 - represents a moderately high level of human activity that suggests consideration of some future action or planning to modify increasing human activity, to help satisfy future demand, or to meet a management objective; and Priority 3 - represents a low to moderate level of human activity that appears to have little or no impact at this time such that human activity may continue with only periodic monitoring. Priority levels and actions to consider are listed below. For further detail, see the detailed matrix in Appendix 4.3-1 in this FTR.

Priority 1 Resources/Activities - Priority 1 facilities, use areas, and activities and possible actions to consider include:

- Saddle Dam - Campground – PacifiCorp temporarily closed this facility in 1998 and will reopen it in 1999. Use of this camping facility exceeds capacity. Consider continued closure or potential redesign and/or new site development elsewhere. May also consider conversion of the existing campground to day-use only or group use only. Boat Launch - This site becomes heavily congested, has long launch wait times, and affects the adjacent campground. Consider closure or various design alternatives including parking and ramp expansion, lengthening the ramp to provide lake access at a pool level of 480 feet msl, and/or redesign or reuse of the combined Saddle Dam facility.

- Cougar Camp - Campground - The Cougar Camp campground is at capacity. Consider expansion and/or new site development to alleviate crowding in the near future. Consider expanding the reservation system at this time. Boat Launch - Parking at this launch site is adequate; however, the launch ramp is not adequate during the complete range of full pool. Consider ramp and dock improvements and lengthening the ramp for use at pool of 480 feet msl.

- Yale Park - Boat Launch - As the main launch site, the parking area exceeds capacity several times a year. Consider more efficient parking methods and additional parking over-flow expansion for peak use days to minimize safety concerns on SR 503. Consider lengthening the ramps to provide year-round launch access at pool level 460 feet msl (a large boulder at the end of the ramp prohibits extension of the ramp for some of the lanes; however, 1 of the 4 lanes could possibly be extended). Consider providing additional ramp maintenance with periodic removal of debris and large rocks that block the end of the ramp making it unusable at times.

- Shoreline Use - Dispersed Campsites - Dispersed camping along the shoreline at many of the existing 67 dispersed sites appears to have reached capacity. Consider increased shoreline management to minimize ongoing impacts. Dispersed Day-Use Sites - Like camping, dispersed day use of the shoreline is causing some ecological impacts. Consider increased management of the eastern shoreline and maintenance actions. Consider providing increased management presence. Day-Use Swimming/ Sunbathing - Dispersed use of the shoreline is causing observed ecological impacts. Consider increased management of the eastern shoreline and maintenance actions.

Priority 2 Resources/Activities - Priority 2 facilities, use areas, and activities and possible actions to consider include:

- Beaver Bay - Campground - Beaver Bay Campground is approaching capacity. Consider planning for possible expansion, redesign, and/or new site development to relieve congestion, reduce perceived crowding, and add additional campground capacity. Consider expanding the reservation system at this time. Boat Launch - The launch site has adequate parking capacity; however, consider minor improvements to this launch ramp and dock.

- Group Campsites - Group reservation campsites are approaching full capacity. Consider planning for expansion and/or new site development at Yale Lake.

- Interpretive/Environmental Education at Developed Sites - Few opportunities currently exist to meet high statewide demand and to satisfy agency management objectives. Consider planning for implementation of new opportunities, such as nature trails and interpretive displays at existing and future developed recreation sites.

- Trail Opportunities - Yale Lake does not have developed trail opportunities, capacity, or facilities to help meet the growing statewide demand for trail-related activities and to satisfy agency management objectives. Few opportunities exist to help meet demand, satisfy management objectives, and meet ADA trail guidelines. Consider planning and implementing possible new or formalized trail opportunities. Potential trail projects to consider include: ADA-accessible trails at developed sites, use of the IP Road as a formal non-motorized trail (requires a recreation easement and private land owner approval) or development of a parallel trail upslope, formalize a trail from Cresap Bay to Saddle Dam to Speelyai Canal, create a bike lane or path along portions of SR 503, and develop a new trail between the town of Cougar and Cougar Park, and possibly to Beaver Bay.

- Fishing Opportunities - Good recreational fishing opportunities currently exist. Continued WDFW fishery management programs are assumed to maintain the fishing experience. As most anglers are boat anglers, consider possible boating actions listed elsewhere. Also, consider planning and implementing new angler access facilities per ADA recreation trail guidelines.

- Open Space Management - An adequate supply of land for various open space-related recreation activities appears to exist. However, consider planning for the long-term retention of open space to meet future needs due to existing and future development in the valley. Focus new development only in areas that are highly suitable for recreation development.

Priority 3 Resources/Activities - Priority 3 facilities, use areas, and activities and possible actions to consider include:

- Yale Park - Picnic Area - Existing capacity is adequate for picnicking; however, parking is a concern when peak boat launching activities occur. Swim/Beach Area - Existing capacity is adequate for swimming/sunbathing; however, parking is a concern when peak boat launching activity occurs.

- Cougar Park - Picnic Area - Existing capacity remains for picnicking, with adequate parking. Swim/Beach Area - Existing capacity remains for swimming/sunbathing, with adequate parking.

- Saddle Dam - Picnic Area - Use of the small picnic area exceeds capacity during peak boating use periods. Consider continued closure or site reuse/redesign.

Consider new parking/traffic controls and redesign or reuse of the Saddle Dam area. Swim/Beach Area - Use of the small swim/beach area exceeds capacity during peak boating use periods only. Consider new parking/traffic controls, and redesign or reuse of the Saddle Dam area.

- Beaver Bay - Picnic Area - The site functions within capacity. Swim/Beach Area - The site functions within capacity.

- Overall Reservoir Boating - Overall boating capacity is adequate and well below Bureau of Outdoor Recreation (BOR) capacity standards. Increased enforcement of boating regulations (boat and jetski/PWC use in the shoreline no wake zone) should be considered.

4.3.2 Recreation Suitability Analysis

Recreation development suitability at Yale Lake was assessed using GIS technology to overlay and prioritize (high to low) a number of important opportunity and constraint factors identified in Section 4.3.1. Three GIS mapping products were developed including a Recreation Opportunity map (Figure 4.3-1), Recreation Constraints map (Figure 4.3-2), and Recreation Suitability map (Figure 4.3-3). This GIS-based analysis is a planning tool intended to identify potential areas for possible recreation development in the 14,568-acre study area, should such areas be needed to satisfy existing or future needs. Because of the larger pixel size and larger scale of some of the GIS data layers, this analysis is not intended to be used to site small-scale development such as trails. In this planning analysis, surface water area (Water) is not rated and is shown as a blue color; however, bathymetry (underwater elevations and slope) was considered. Another category of planning area, called Kick Out, was not considered in this analysis. Kick Out areas include: hydroelectric facilities, clustered residential areas, and the developed portions of the town of Cougar. Kick Out and Water areas account for approximately 28 percent of the study area. The remaining 10,551 acres (72 percent) in the study area are addressed in this planning analysis.

The results of this analysis are presented below in 4 parts: recreation development opportunity areas, recreation development constraint areas, recreation development suitability areas, and recommended areas for potential future recreation development.

Recreation opportunities include areas of possible opportunity without regard to possible constraints. Opportunity areas considered are listed in Section 4.2.2. Possible recreation constraints are also listed in Section 4.2.2. Overlaying these 2 contrasting data sets produces a third planning map–Recreation Suitability. A composite of higher-ranked opportunity data layers and lower-ranked constraint data layers produces areas which are more suitable for potential recreation development. Conclusions may be drawn from this third overlay map, with the other 2 maps representing the "building blocks" of the analysis.

4.3.2.1 Potential Recreation Development Opportunity Areas

Opportunities for potential recreation development are graphically presented in Figure 4.3-1, Recreation Opportunity. Categories of recreational development opportunity are presented using a 5-level scale: high (dark green), moderately high (light green), moderate (yellow), moderately low (orange), and low (red). A complete list of opportunity factors and rankings is presented in Appendix 4.2-1.

Possible areas of high to low opportunity for recreation development within the study area (excluding Water and Kick Out) include the following acreage totals and percentage mix:

- 2 percent High Opportunity — 192 acres
- 32 percent Moderately High Opportunity — 3,359 acres
- 54 percent Moderate Opportunity — 5,672 acres
- 12 percent Moderately Low Opportunity — 1,321 acres
- 0 percent Low Opportunity — 0 acres

From this GIS-based analysis, only 2 percent of the area is ranked high opportunity. Areas of highest-ranked opportunities (only opportunity factors were considered in this portion of the analysis, no constraint factors) for possible recreation development include the following (from north to south):

- Possible expansion in and around the Beaver Bay Campground, Cougar Camp, and Cougar Park areas on the west shoreline;

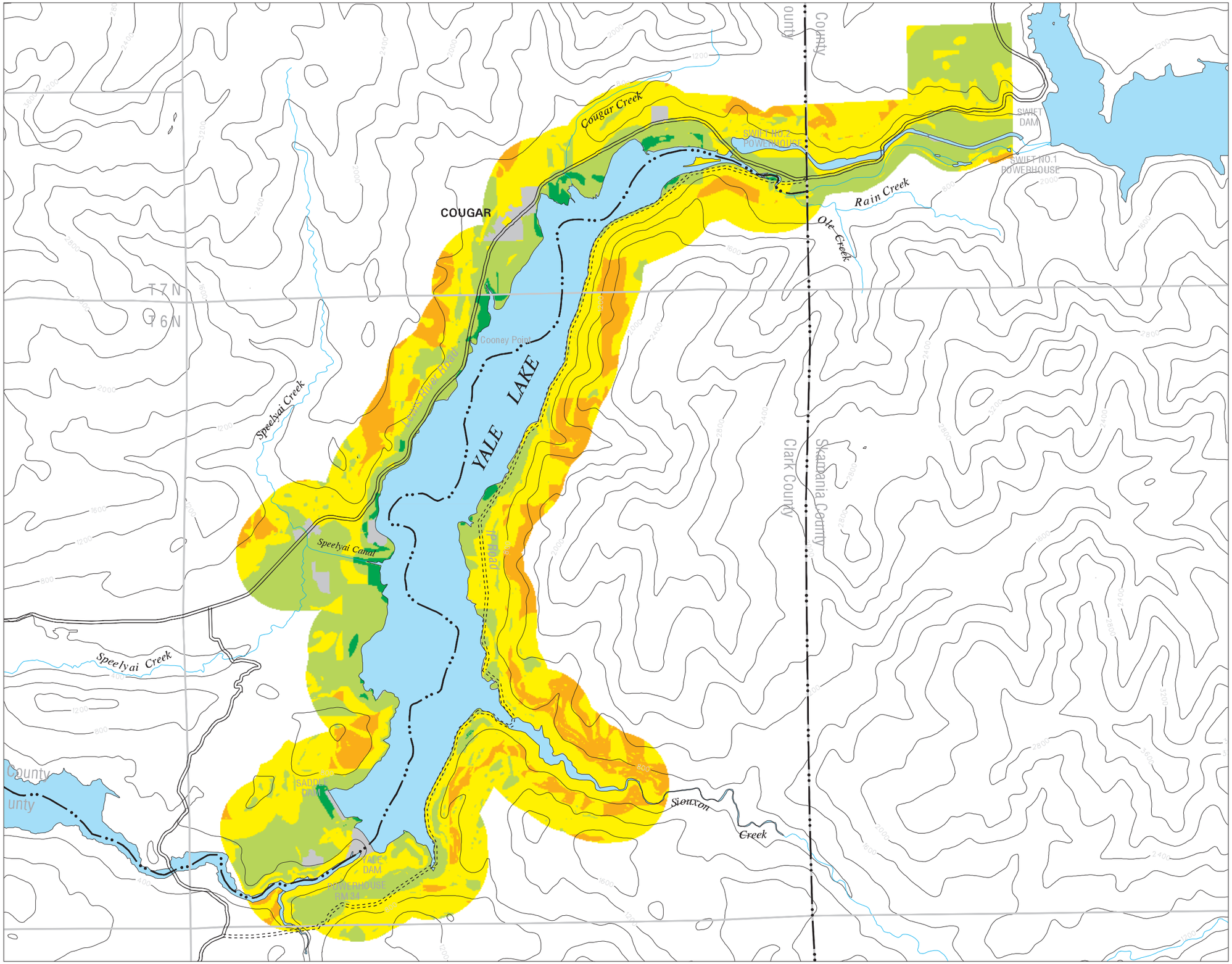
- Possible new development north of Cooney Point on the west shoreline, between Yale Park and Cougar Park;

- Possible new development south of the Speelyai Canal area on the west shoreline;

- Possible expansion in and around the Saddle Dam Campground area at the southern end of the study area; and

- Possible development in the northern Siouxon Flats area on the east shoreline.

The 2 largest potential recreation development opportunity areas are categorized as moderately high and moderate. Moderately high opportunity areas (32 percent) generally extend along the west shoreline, in the Siouxon Flats area, near Saddle Dam, and along the river upstream of Yale Lake. Moderate (mid-range) opportunity areas (54 percent) extend along the east shoreline and east of SR 503 to the west. The lowest-ranked opportunity areas are found along the hillsides above both west and east shorelines.



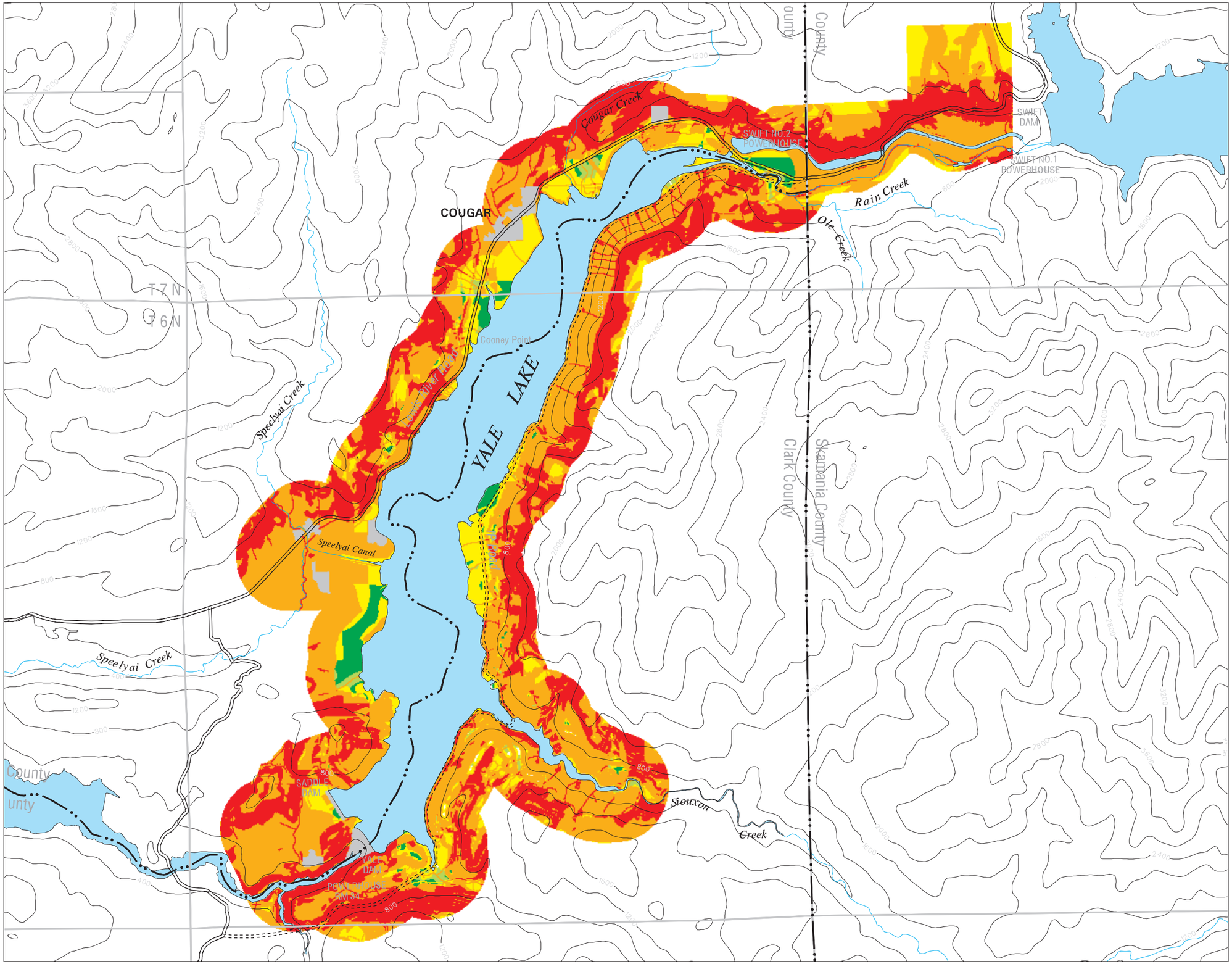
Legend

- High Opportunity
- Moderately High Opportunity
- Moderate Opportunity
- Moderately Low Opportunity
- Low Opportunity
- Kick Out
- Public Land Survey
- County Line
- Topography
- Water
- Stream
- Primary Road
- Secondary Road

Yale Hydroelectric Project

Figure 4.3-1 Recreation Opportunity

Created by VESTRA Resources for PacifiCorp
/p1/proj_spl/yalercp/mapmkr/opp5_11x17.map
October 31, 1997

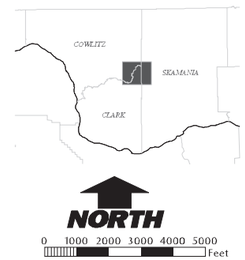


Legend

Suitability Ranking

- High Constraint
- Moderately High Constraint
- Moderate Constraint
- Moderately Low Constraint
- Low Constraint
- Kick Out

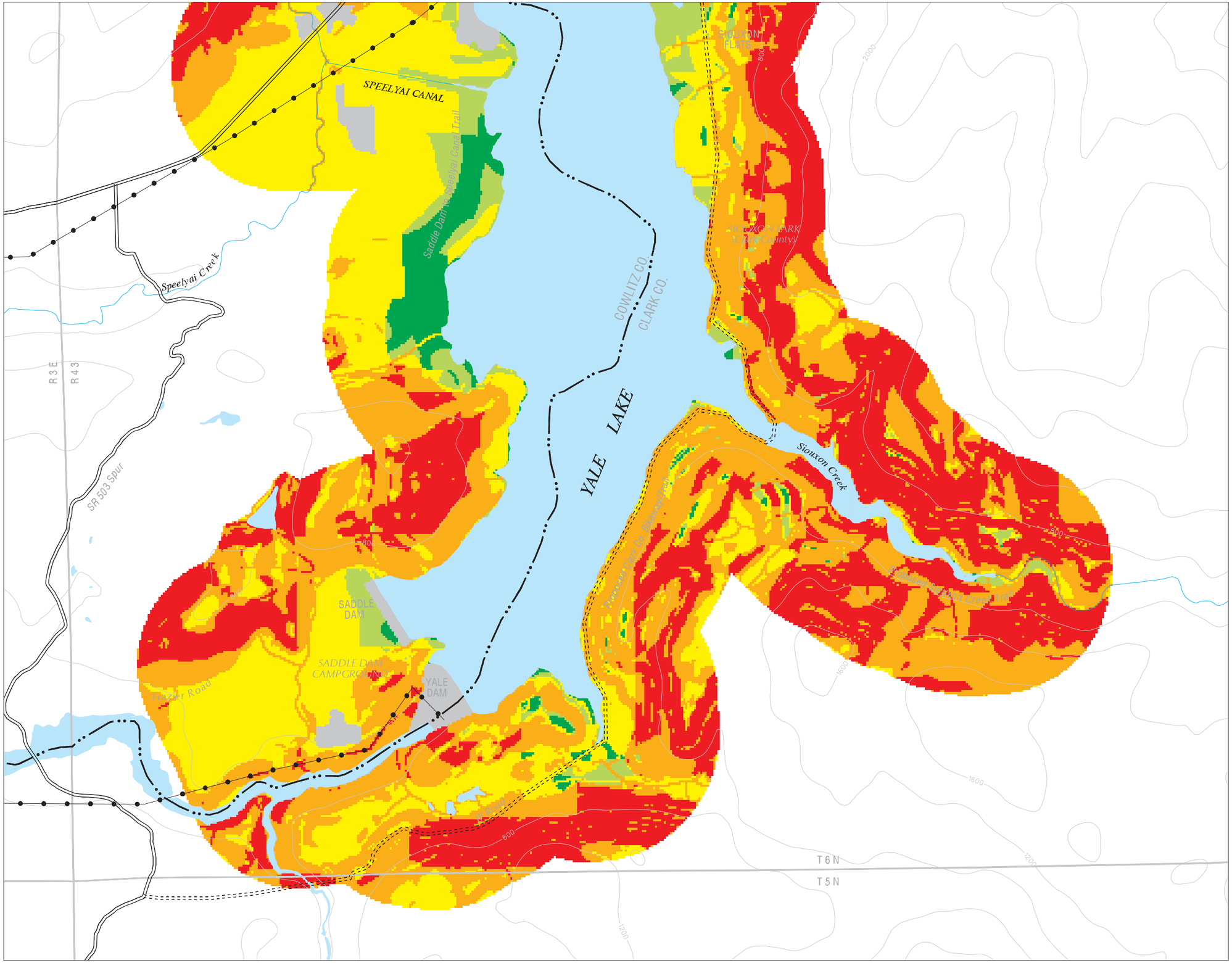
- Public Land Survey
- County Line
- Topography
- Water
- Stream
- Primary Road
- Secondary Road



Yale Hydroelectric Project

Figure 4.3-2
Recreation Constraints

Created by VESTRA Resources for PacifiCorp
/p1/proj_spl/yalercp/mapmkr/con5_11x17.map
October 31, 1997



Legend

- High Suitability
- Moderately High Suitability
- Moderate Suitability
- Moderately Low Suitability
- Low Suitability
- Kick Out

- Topography
- County Line
- Township/Range Line
- Transmission Line

HYDROGRAPHY
- Waterbody
- Stream

TRANSPORTATION
- Primary Road
- Secondary Road

Sheet 1

NORTH

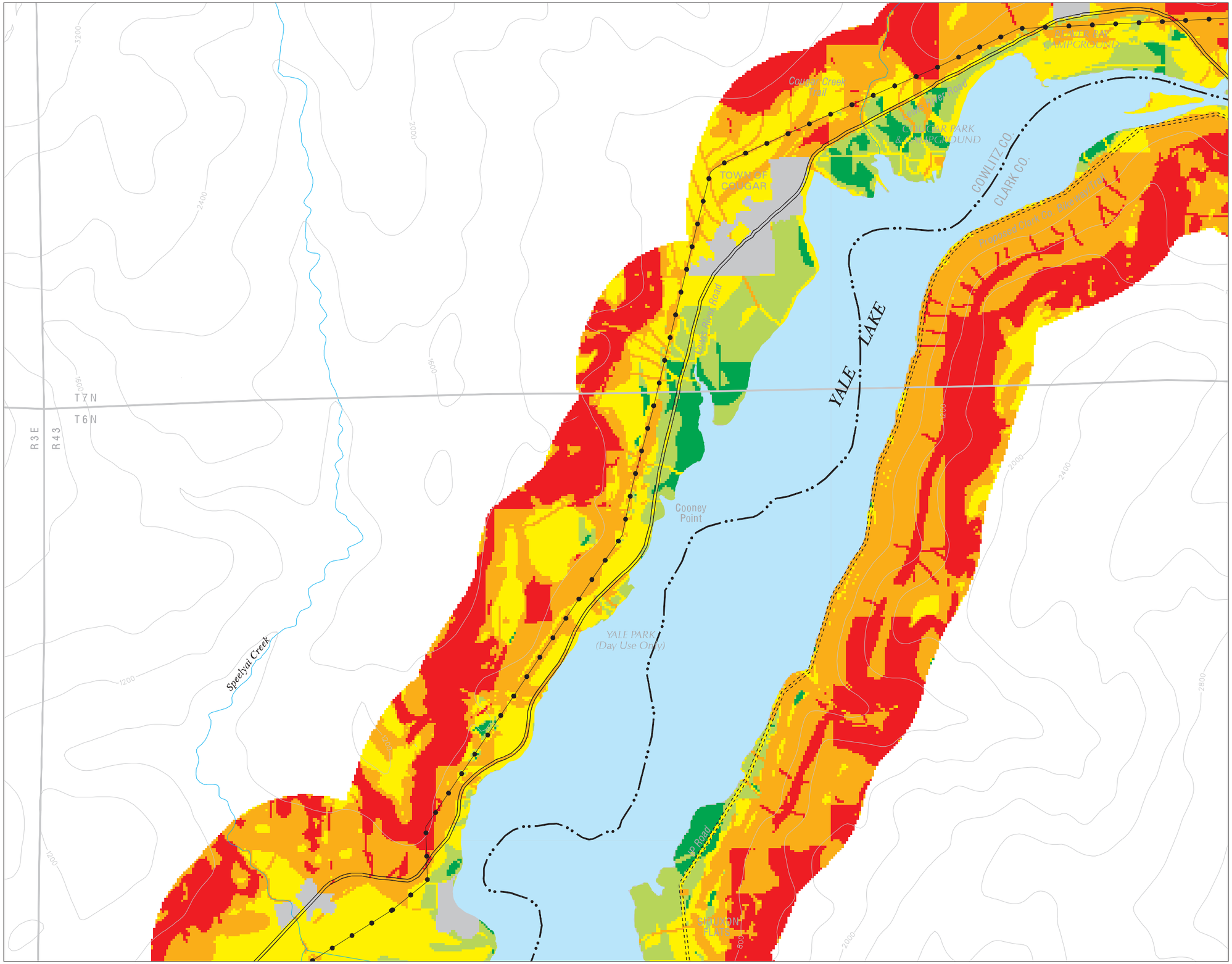
0 1000 2000 3000 4000 Feet

Scale 1:26000

Yale Hydroelectric Project

Figure 4.3-3 (1 of 3) Recreation Suitability

 PACIFICORP Created by VESTRA Resources for PacifiCorp /p1/proj_map/projects/yale/license/ftr/recreatn/suit_model.batchmap March 16, 1999



Legend

- High Suitability
- Moderately High Suitability
- Moderate Suitability
- Moderately Low Suitability
- Low Suitability
- Kick Out

- Topography
- County Line
- Township/Range Line
- Transmission Line

HYDROGRAPHY
- Waterbody
- Stream

TRANSPORTATION
- Primary Road
- Secondary Road

Sheet 2

NORTH

0 1000 2000 3000 4000 Feet

Scale 1:26000

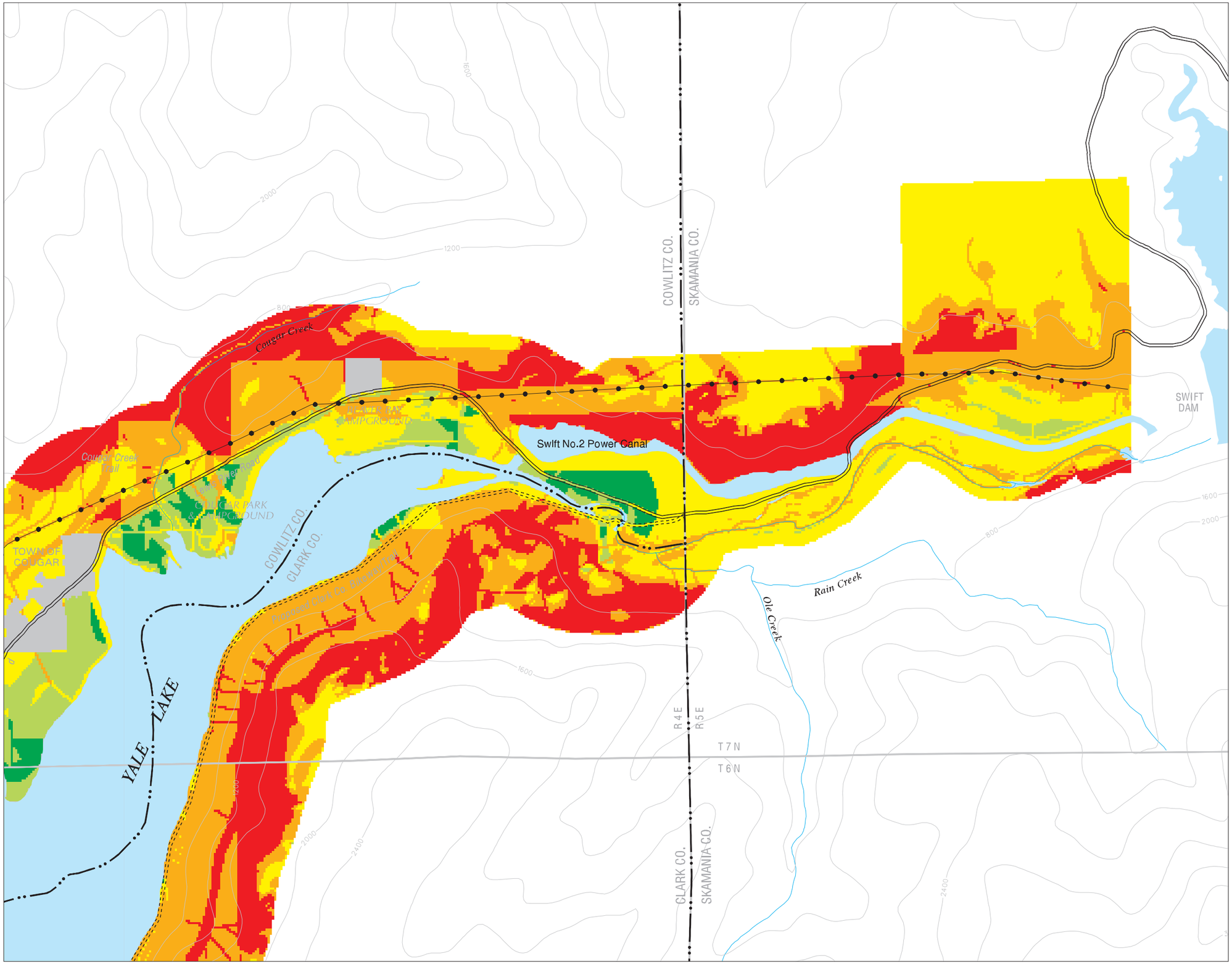
Yale Hydroelectric Project

Figure 4.3-3 (2 of 3) Recreation Suitability

Created by VESTRA Resources for PacifiCorp

/p1/proj_map/projects/yale/license/ftr/recreatn/suit_model.batchmap

March 16, 1999



Legend

- High Suitability
- Moderately High Suitability
- Moderate Suitability
- Moderately Low Suitability
- Low Suitability
- Kick Out

- Topography
- County Line
- Township/Range Line
- Transmission Line

HYDROGRAPHY
- Waterbody
- Stream

TRANSPORTATION
- Primary Road
- Secondary Road

Sheet 3

NORTH

0 1000 2000 3000 4000 Feet

Scale 1:26000

Yale Hydroelectric Project

Figure 4.3-3 (3 of 3) Recreation Suitability

PACIFICORP

Created by VESTRA Resources for PacifiCorp

/p1/proj_map/projects/yale/license/ftr/recreatn/suit_model.batchmap

March 16, 1999

4.3.2.2 Potential Recreation Development Constraint Areas

Constraints to potential recreation development are graphically presented in Figure 4.3-2, Recreation Constraints. Categories of constraints to recreational development are again presented using a 5-level scale, but reverse from opportunities as previously shown: high (red), moderately high (orange), moderate (yellow), moderately low (light green), and low (dark green). A complete list of constraint factors and rankings is presented in Appendix 4.2-1.

Areas of potential high to low constraint for recreation development within the study area (excluding Water and Kick Out) include the following acreage totals and percentage mix:

- 36 percent High Constraint 3,772 acres
- 50 percent Moderately High Constraint 5,315 acres
- 11 percent Moderate Constraint 1,142 acres
- 1 percent Moderately Low Constraint 76 acres
- 2 percent Low Constraint 230 acres

Potential high constraint areas make up a large portion (36 percent) of the study area. From this GIS-based analysis, potential areas of highest-ranked constraints (only constraint factors were considered in this portion of the analysis, no opportunity factors) include the following (from north to south):

- Possible corridor from the Swift Dam area west to the Cougar Creek area to the north, including steep slopes near the Swift No. 2 power canal;

- Possible upper slope areas between the town of Cougar and Speelyai Canal and above Yale Park on the west shoreline;

- Possible upper slope areas west of Saddle Dam and the canyon area and slopes near Yale Dam; and

- Possible upper slope areas above the east shoreline.

Moderately high-ranked constraint areas make up the largest portion (50 percent) of the study area. These areas include the river corridor upstream of Yale Lake, most of the east shoreline and Siouxon Creek area, areas west of the town of Cougar, areas north and west of Speelyai Canal, and areas west of Saddle Dam.

Moderate-ranked (mid-range) constraint areas are located in the far northern part of the study area, areas between Cooney Point and Beaver Bay on the west shoreline, near Speelyai Canal, and in the Siouxon Flats area. Moderately low to low-ranked constraint areas include the north end of Yale Lake below the Swift No. 2 power canal, the cove area north of Cooney Point on the west shoreline, the northern portion of the Siouxon Flats on the east shoreline, and a large area south of Speelyai Canal.

4.3.2.3 Potential Recreation Development Suitability Areas

Suitability for potential recreation development is graphically presented in Figure 4.3-3, Recreation Suitability. Categories of suitability for recreational development are again presented using a 5-level scale, similar to the recreation development opportunities analysis: high (dark green), moderately high (light green), moderate (yellow), moderately low (orange), and low (red). A complete list of opportunity and constraint factors and rankings that were compiled to create the suitability analysis is presented in Appendix 4.2-1.

Potential areas of high to low suitability for recreation development in the study area (excluding Water and Kick Out) include the following acreage totals and percentage mix:

- 3 percent High Suitability 309 acres
- 5 percent Moderately High Suitability 539 acres
- 28 percent Moderate Suitability 3,020 acres
- 34 percent Moderately Low Suitability 3,734 acres
- 30 percent Low Suitability 2,949 acres

Potential areas of high suitability for recreation development make up a very small portion (309 acres or 3 percent) of the study area. The majority (92 percent) of the area is rated lower (moderate to low categories) in suitability for recreation development. The 2 lowest-ranked categories (moderately low and low suitability), in fact, account for almost two-thirds (64 percent) of the area.

From this GIS-based analysis, potential areas of highest-ranked suitability areas (a composite of higher-ranked opportunity data layers and lower-ranked constraint data layers) include the following (from north to south):

- A potential large area at the north end of Yale Lake and south of the Swift No. 2 power canal which is currently undeveloped;

- A potential small area at the east end of Beaver Bay Campground on the west shore away from the existing wetlands complex near the campground entrance area;

- Several potential large areas surrounding Cougar Camp and Cougar Park on the west shore;

- Several potential large areas north of Cooney Point on the west shore which are currently undeveloped;

- A potential 2,000-foot stretch of eastern shoreline at the north end of the Siouxon Flats area;

- A potential large mile-long corridor south of Speelyai Canal on the west shore; and

- A potential small area at the south end of the lake east of Yale Dam on an inlet near the IP Road.

Potential moderately high-ranked constraint areas also make up a small percentage (5 percent) of the study area, totaling 539 acres. These areas are found near high suitability polygons in the following areas: east of Beaver Bay Campground, in the Cougar Camp and Cougar Park areas, between Cougar Park and Cooney Point, south of Speelyai Canal, behind Saddle Dam, and in the Siouxon Flats area.

Moderate (mid-range) suitability areas make up less than a third (28 percent) of the study area. These areas include the northern block of the study area, the river corridor upstream of Yale Lake to Swift Dam, west of the town of Cougar, the Speelyai Canal portion of the study area, the southern portion of Siouxon Flats, and west of Saddle Dam and south of Yale Dam.

Moderately low-ranked suitability areas make up over a third (34 percent) of the study area. This category is the largest size in the analysis and accounts for most of the east shoreline and upland slopes. These areas are located along SR 503 in the northern block area, along a corridor north of SR 503 from Swift No. 2 power canal to Cougar Creek, the majority of the east shoreline and Siouxon Creek area, upland areas along SR 503 west of the town of Cougar, and areas north and west of Saddle Dam and west and south of Yale Dam.

Low-ranked suitability areas account for less than a third (30 percent) of the area. These areas include the north end of the Swift No. 2 power canal and other steeper slope areas surrounding all sides of the reservoir.

4.3.2.4 Potential Suitable Areas for Future Recreation Development (If Needed)

Based on the Suitability Map (Figure 4.3-3), larger high suitability areas may be considered for potential future recreation development, if needed. No development proposals should be assumed from these conclusions. The type of potential future recreation development that may be considered in this analysis includes larger public recreation facilities such as developed campgrounds, group campsites, boat-in campsites, picnic areas, swimming and sunbathing areas, and boat launches and parking. In general, the GIS-based analysis is not suited for selecting sites for uses such as trail activities and dispersed camping or day-use activities because of their mobility and small size.

High suitability areas make up a very small portion (309 acres or 3 percent) of the study area (excluding Water and Kick Out areas). Some adjoining moderately high-ranked areas may also be considered if necessary. One area of high suitability in Figure 4.3.3, however, has been excluded from consideration. This area includes a ½-mile long polygon at the north end of Yale Lake and south of the Swift No. 2 power canal that is currently undeveloped. It has been excluded because it has limited lakeshore access for recreation use and is constrained by SR 503 and the adjacent Cowlitz County PUD project (Swift No. 2). All other high suitability areas may be considered.

Based on the results of this GIS-based analysis (Figure 4.3-3) (on the ground reconnaissance is still needed), larger areas to consider for potential future recreation development if needed include:

- Beaver Bay Campground Expansion Potential - This area offers some potential for redesign of the existing campground in an area away from the existing wetlands complex.

- Cougar Camp and Cougar Park Expansion Potential - Several potential large areas surrounding these existing facilities present possible expansion potential. At Cougar Camp, the best areas to expand are located north of the campground. At Cougar Park, a large area west of the picnic area offers some potential for either day use or overnight facilities. However, the shoreline west of Cougar Park is shallow and has many stumps.

- Cooney Point Area New Development Potential - Two large areas surrounding an inlet on the west shore near Cooney Point offer potential for new site development. These areas are currently undeveloped. Locating a potential new recreation site near 2 existing ones (Yale Park and Cougar Park/Camp) may be problematic because of potential increased boater congestion; however a smaller facility may be appropriate at this location.

- Siouxon Flats Boat-in Use Area Potential - On the east shore, a 2,000-foot stretch of shoreline at the north end of the Siouxon Flats area offers potential for improved boat-in facilities, such as boat-in camping or day use. The undeveloped Clark County Siouxon Park site, located to the south, is rated at moderate suitability because of constraints such as nearby sensitive habitat areas.

- South of Speelyai Canal New Development Potential - A large 1.2-mile-long corridor south of Speelyai Canal on the west shore offers perhaps the greatest potential for a new recreation development(s) because of its size and location. This area of the lake receives the least amount of boater use; therefore, congestion from new boats would be minimal. There are few environmental constraints during the peak recreation season in this area.

- IP Road Corridor Use Potential - The IP Road has always had potential for formalized non-motorized trail use if such use may be allowed through implementation of a recreation access easement or other mechanism. From the GIS analysis, however, potential sites for 1 or more rest areas, as noted in the Clark County Comprehensive Plan (Clark County 1994a), are visible on Figure 4.3-3. Possible rest area locations include at the end of the inlet east of Yale Dam, north of the Siouxon Creek bridge, at Siouxon Flats, directly across from Beaver Bay on the east shoreline, and near the East Lewis River bridge.

- Yale Park Expansion Potential - The Yale Park site is already constrained by SR 503. Potential exists to expand parking to the west; however, loss of some existing picnic area (little used except as overflow) would likely result.

- Saddle Dam Campground/Day-Use Site Expansion Potential – This site was temporarily closed by PacifiCorp in 1998, but will be reopened in 1999. The Saddle Dam site is already constrained by the dam, slopes, and the adjoining Merwin Wildlife Habitat Management Area. Reuse or reconfiguration of the existing site, however, is possible.

5.0 RECREATION NEEDS ANALYSIS

The purpose of the recreation needs analysis is to present a range of options for addressing existing and future recreation needs in the Yale Project study area. Existing needs have been identified and future needs have been projected for future increments or phases of time (i.e., 10-year periods) from 2000 to 2030. Needs have been assessed for existing and potential future developed recreation facilities (i.e., Saddle Dam, Yale Park, Cougar Park, Cougar Camp, Beaver Bay, and non-existing facilities), as well as dispersed use areas and activities within and surrounding Yale Lake. Recreation needs identified for the study area will need to be coordinated with other resource needs, as well as the results of the broader Watershed Studies Approach during follow-on studies being conducted by PacifiCorp and Cowlitz County PUD. The recreation needs identified in this analysis should not be considered proposed PM&E measures. Rather, they should be considered options for addressing the needs of 1 resource area which must be balanced with other resource needs identified for the Yale Hydroelectric Project and the watershed.

5.1 STUDY AREA

The study area for the recreation needs analysis is Yale Lake and a 0.5-mile buffer zone surrounding the lake (Figure 2.1-1).

5.2 METHODS

This section describes the methodology for analyzing, identifying, and projecting existing and future recreation needs in the study area. The methodology is comprised of 3 parts:

1. Overall analysis of recreation needs in the study area over time (i.e., number of total campsites needed during the term of the new license [assumed to be 30 years] versus those needed on a site-by-site basis).

2. Identification of recreation needs on a site-by-site basis, both existing (current to 2000) and future (2000 to 2030, in 10-year increments).

3. Discussion of project-related recreation needs.

5.2.1 Methodology for Assessing Overall Recreation Needs in the Study Area

Overall recreation needs in the study area are assessed using an analysis that compares and contrasts demand, supply, capacity, and suitability factors to arrive at conclusions regarding needs. This process essentially follows a formula: supply - demand = needs. Existing data for the study area from the demand and supply analyses (Sections 2.0 and 3.0) and the capacity and suitability analysis (Section 4.0) are used in this exercise. This first task focuses on the overall need for camping in the study area, for example, without specifying where that need may be specifically met.

A number of inter-related factors are considered in this overall needs analysis. These include factors such as recreation facility occupancy criteria and management and impact parameters as presented in Appendix 4.3-1. Sources of data for these factors include:

- Recreation visitor survey responses
- Visitor perceptions of crowding and crowding criteria
- Projected increases in demand for various activities (annual and 30 year)
- Seasonal and weekday/weekend occupancy rates
- Facility and use area capacity utilization
- Physical and spatial arrangement of existing facilities and use areas
- Existing facility conditions and ADA guidelines and report recommendations
- Suitability analysis depicting potential sites or areas (Figure 4.3-3)
- Opportunities for infill, redesign, or expansion of existing facilities
- Management goals and objectives of published plans
- Visual observations and observed impacts from existing use
- Professional judgment

Camping is a key activity at Yale Lake and is the primary activity of most visitors. The need for additional campground facilities is partially based on facility utilization. As a planning tool, 2 planning threshold levels were determined to represent camping capacity for the Yale Project: (1) 60 percent utilization over the season for combined facilities in an area, and (2) 90 percent weekly (weekday and weekend) occupancy during the 2 peak use months (July and August). Other camping capacity indicators considered include observed impacts, facility conditions, visitor perceptions, available use area, and others.

Future camping needs are projected assuming existing camping needs have been met. Future needs are projected based on increased demand for various activities (i.e., 130 percent increase in demand for camping through 2030) and other indicators including available suitable sites.

Overall needs have been identified and projected for the following types of recreation activities:

- Camping Activities
    - RV and tent camping
    - Group camping
    - Undeveloped dispersed camping
- Picnicking Activities
- Boating Activities
    - Power boating
    - Water skiing
    - Jetskiing/PWC use
    - Sailboating
    - Canoeing, kayaking, row boating, and inflatable boat use
- Swimming/Sunbathing Activities
- Interpretive/Environmental Education Activities
    - Signs and kiosks
    - Nature trails
    - Staffed programs/campfire talks
    - Sightseeing

- Trail-related Activities
    - Non-motorized trails
    - Motorized trails
- Fishing Activities
    - Boat angling
    - Bank angling
    - Access piers and docks
    - Fish cleaning facilities
    - Shoreline access
- General Open Space Activities
    - Nature/wildlife observation
    - Photography
    - Hunting
    - Food gathering/berry picking

5.2.2 Methodology for Identifying Recreation Needs on a Site-by-Site Basis

The previous analysis (Section 5.2.1) looked at the broader context of needs within the study area, generally by activity type. This analysis builds off these broader needs within the study area by addressing or accommodating those needs on a site-by-site basis. The timeframe for existing needs is defined as current to 2000. Site-specific needs are identified through review and analysis of several data sources, including:

- Recreation survey responses about specific sites
- Seasonal and weekday/weekend occupancy rates at specific sites
- Spatial arrangement of sites and design problems observed
- Facility conditions
- ADA compliance and guideline recommendations at sites
- Potential sites as identified in the GIS-based suitability analysis (Figure 4.3-3)
- Opportunities for infill, redesign, or expansion at each site
- Observed impacts of use at each site
- Professional judgment

The identification of future needs builds off of the list of identified existing needs. This analysis projects overall recreation needs into the future for 3 timeframes: 2000 to 2010, 2010 to 2020, and 2020 to 2030. Where new facilities should be considered in a given area to satisfy demand, their anticipated implementation date is projected. Primary indicators used in defining future needs for developed facilities are projected increases in demand over 30 years and anticipated capacity utilization. Projected future needs are estimated for each developed facility, use area, and activity. This need is based on an understanding of existing need plus a projection of future utilization based on the Demand Analysis (Section 3.0) and potential suitable sites based on the Capacity and Suitability Analysis (Section 4.0).

5.2.3 Methodology for Assessing Project-Related Recreation Needs

Not all needs identified in the preceding 2 analyses should be assumed to be project-related impacts. Associating recreation needs associated with the project, or project-related recreation needs, entails consideration of 2 factors:

1. Proximity to the Project - One factor is the geographic proximity of the recreation need to project features, such as the dams, reservoir, project recreation facilities, or the FERC project boundary. Needs associated with the project are based on proximity to project features. If the need is close to a project feature, such as along the shoreline or inside the FERC project boundary, it may be identified as project-related. If it is more regional in nature, such as a regional trail system, the need is not necessarily project-related.

2. Direct Project Cause - A second factor is the cause or type of facility, activity, or use area creating the need. To address this factor, the cause of the need is identified. If the cause is associated with the project, the need may be project-related. Causes of project-related needs may include recreation use or its impacts, either induced by the attraction of the reservoir (water-based activities and related shoreline use) or by increased access into areas that would not ordinarily have access as a result of project roads. Activities that are not considered project-related are assumed to include snow-related activities, hunting, caving, rock climbing, hang gliding, and visitation at adjacent federal and state recreation areas and attractions (Monument, GPNF, Merrill Lake, and Siouxon) where those areas are the primary destination.

To better address this issue, PacifiCorp and Cowlitz County PUD are conducting additional studies in 1998 and 1999. The results of these studies will be presented in future reports.

5.3 RESULTS AND DISCUSSION

The results of the recreation needs analysis are presented in this section and are organized into 3 sections as previously described: (1) overall analysis of recreation needs in the study area, (2) identification of existing and future recreation needs on a site-by-site basis, and (3) discussion of project-related recreation needs.

5.3.1 Overall Recreation Needs in the Study Area

This section provides an analysis of overall recreation needs within the study area by facility, activity, use area, or program type. Recreation resources analyzed include those identified in Section 5.2, Methods. Factors or indicators considered are organized into 3 categories: demand, supply, and capacity/suitability. Based on a comparison and review of these factors and professional judgment, conclusions are presented for overall existing and future recreation needs in the study area. Site-specific needs are further addressed in Section 5.3.2. Topics examined included overall needs for camping, picnicking, boating, swimming/sunbathing, interpretive/environmental education, trail use, fishing, and general open space activities.

5.3.1.1 Overall Camping Needs

Overall camping demand, supply, and capacity/suitability factors are presented below, followed by a discussion of overall needs. Camping needs analyzed in the study area include:

- RV and tent campgrounds
- Group campsites
- Undeveloped dispersed campsites

Camping Demand Factors

Important camping demand factors to consider are summarized below.

- Camping at Yale Lake was the number 1 activity of survey respondents and was enjoyed by 75 percent of visitors surveyed. Almost half (46 percent) of respondents identified camping as their main activity. Given these high percentages, camping is a very important activity to consider when analyzing needs and drives other needs.

- Demand for camping is increasing with population growth. Annual increases in demand based on IAC data include: RV camping (2.50 percent), tent camping with motorized vehicle (2.46 percent), and organized group camping (1.95 percent). By the year 2000, demand for camping will increase 8 to 10 percent from 1996 levels.

- Over the next 30 years to 2030, demand for camping is projected to increase substantially: RV camping (132 percent), tent camping with motorized vehicle (129 percent), and organized group camping (93 percent). Campsites on lakes will be particularly sought after as demand for water-based recreation is very high in the region.

- Recreation visitation in the Upper Lewis River Valley is dynamic with multiple destinations and attractions available to visitors. The Monument, an international attraction to the north, is a significant recreation area with visitation increasing 5 to 6 percent annually on both sides (north and south) of the volcano. Numbers of visitors driving "the loop" around the volcano are increasing as new interpretive centers are opened to the north and east and as new roads are constructed. Nearby Ape Cave and Lava Canyon are particularly noteworthy attractions. The GPNF is also a significant visitor destination. Visitors in the valley also travel between the 3 Lewis River reservoirs. Many (45 percent) visitors surveyed at Yale Lake facilities had plans to visit or already had visited other locations during their trip. Of these mobile visitors, primary destinations include: the Monument (34 percent), GPNF (15 percent), Lake Merwin (19 percent), Swift Reservoir (17 percent), and other (15 percent). About 1 out of 5 (22 percent) visitors surveyed (49 percent of 45 percent) indicated that their primary destination was the Monument or GPNF.

- Because of the study area's weather conditions, demand for camping occurs predominantly during a peak 14-week recreation season (Memorial Day to Labor Day weekends). During this period, demand is greatest during July and August and on holiday weekends.

- Some shoulder season demand occurs earlier (April and May) due to angler activity and later (September and October) due to hunting activity. PacifiCorp opens Beaver Bay Campground and/or Cresap Bay Campground at Lake Merwin during a longer period of time to accommodate these needs.

- Visitation is variable and weather dependent, given the area's 140 inches of rainfall annually and its northern latitude west of the Cascades in Washington State. If the weather is poor, visitation declines considerably, even during holiday weekends. A lack of hook-ups (electricity to keep warm) and a high percentage of tent campers (3 out of 4 groups) also makes camping in poor weather more difficult for some campers.

- Demand for camping facilities at all of PacifiCorp's 3 hydroelectric projects is partially evident by looking at occupancy rates from 1994 to 1997 for different time frames. These include: total weekends (67 to 75 percent), total weekdays (34 to 43 percent), and holidays (85 to 97 percent). The year 1994 had the highest occupancy levels, apparently due to good weather conditions. During 1995, occupancy levels were lowest, apparently due to poorer weather conditions. The years 1996 and 1997 saw increased visitation, but were lower than the 1994 peak year due to somewhat poorer weather conditions during the seasons.

- Group campsites are booked every weekend during July and August, and all holiday weekends. Demand is less during June when it is cooler and wetter.

- Most (82 to 88 percent) visitors come to Yale Lake between 1 and 5 times/year and half (50 percent) have 2 to 4 people in their party. About 2 out of 3 (68 percent) visitors are from Washington State and about a third (29 percent) are from Oregon. Most visitors are from the nearby Vancouver/Kelso/Longview area in Washington and the Portland area in Oregon. As a result, trips to Yale Lake typically take less time and effort. More day trips are also a likely result. Visitors can get here quicker and leave quicker if weather deteriorates as well.

- There are also many dispersed sites surrounding Yale Lake, some of which are used for dispersed camping. Additional dispersed sites are located near the Swift No. 2 power canal and the North Lewis River bridge area. Approximately 16 percent of these sites (largest and best sites with good access) are used regularly, with more used during holidays and hot summer weekends when demand is highest.

- Latent demand is demand for facilities, activities, or experiences that are not currently available or being provided. Identifying latent demand is difficult since the visitors surveyed are there because many of their expectations are being met. Larger surveys, such as regional or statewide SCORP surveys, provide insight on this topic. More limited surveys, such as the one at Yale Lake, however, do provide some indication of latent demand based on responses to questions related to satisfaction and desire for new or improved facilities or programs. Most (95 percent) visitors surveyed indicated that they had a good (or better) overall experience (responses dropped to 73 percent during more crowded holidays). Over half (53 percent) of respondents, however, indicated they desired additional facilities. Survey responses

related to desired facilities include: restroom/shower improvements (15 percent), expanding or improving campsites (11 percent), adding new moorage and docking facilities (9 percent), providing new playground equipment (9 percent), expanding boat launches (8 percent), providing jetski/PWC rentals (7 percent), providing expanded sport field and horseshoe facilities (4 percent), providing more or better swim areas and sandy beaches (4 percent), and providing electricity (3 percent).

- PacifiCorp operates a partial campsite reservation system at this time. Group campsites may be reserved beginning in January of each year. For Memorial Day weekend only, campsites at Cougar Camp may be reserved. This was done to minimize parking along SR 503 prior to opening day. Campsites are available on a first come/first served basis. Interest has been expressed by visitors surveyed to expand the current partial reservation system; however, support for a full reservation system was much less. The percentage of visitors by site surveyed who were "somewhat interested" to "interested" include: Beaver Bay (59 percent), Cougar Camp/Park (71 percent), Saddle Dam (71 percent), and Yale Park (70 percent).

- Finally, building new campgrounds both satisfies demand (relieves crowding at existing campgrounds) as well as generates new demand (new facilities and access create new opportunities and may stimulate use). Key considerations include maintaining or improving the visitor experience and building up to only sustainable levels. The old adage - "build it and they will come" - is a phenomenon that needs to be considered.

Camping Supply Factors

Important camping supply factors to consider are summarized below.

- Developed campsites are available for a fee only. PacifiCorp charges a $15 fee per day for campsites. Other additional fees apply related to numbers of vehicles and people. About 2 out of 3 (63 percent) visitors surveyed indicated that the fee schedule was okay. In the past, no fees were charged for day-use sites; however, an approximate $4.00 fee per vehicle is planned beginning in the 1999 recreation season.

- In the Upper Lewis River Valley, there are approximately 469 developed campsites that are operated by PacifiCorp and other private companies. At the 3 Lewis River projects, PacifiCorp provides 274 campsites (58 percent) that serve RV and tent campers who seek to be on 1 of the 3 reservoirs. The remaining 195 campsites (42 percent) are other private developed fee campsites at 4 RV parks (Big Foot Trailer Park, Lewis River RV Park, Lone Fir Resort and Trailer Park, and Volcano View Campground [closed in 1998]). These facilities serve visitors who seek campsites with RV hook-ups or do not desire to be on the lake. PacifiCorp does not compete in this market. No non-fee developed campsites, typically without water service, are currently provided at Yale Lake.

- Within the Yale Lake study area itself are 123 developed fee campsites with no hook-ups at 3 PacifiCorp campgrounds (Beaver Bay, Cougar Camp, and Saddle Dam). Most (63 percent) of these campsites may be used for RV or tent camping.

Cougar Camp (45 sites) is a tent-camping only facility. Campsites include a picnic table, fire grill, and vehicle pad. Facilities and services located nearby include restrooms and showers, drinking water, gray water sumps, trash receptacles and dumpsters, boat launch and docks, picnic area, swim area with floating boom and a sunbathing beach, overflow parking, informational signs, firewood sales (Cougar Camp only), and camp host(s). At Yale Lake there are 2 RV dump stations (Beaver Bay and Saddle Dam [Yale Park station has been closed]) and 2 15-site group reservation campsites (Beaver Bay and Cougar Park/Camp).

- There are also many (approximately 67) dispersed shoreline sites surrounding Yale Lake, some of which are used for dispersed camping. Almost all of these sites may be accessed by boat. Additional dispersed sites (approximately 8) are located near the Swift No. 2 power canal and the North Lewis River bridge area and are accessible by vehicle. About 12 (16 percent) of these sites are prime locations and are used regularly.

- Clark County owns the Siouxon County Park site, an undeveloped 40-acre site on the eastern shoreline of Yale Lake. During the 1960s, this site had 8 campsites available for boat-in and unauthorized drive-in use. The site was abandoned in later years due to maintenance problems, a severe economic recession, and lack of a recreation access easement along the IP Road. The site is currently used for boat-in day use activities and boat-in camping (2 to 3 sites), but is not maintained or actively managed.

- No ADA-accessible developed or dispersed campsites currently exist at Yale Lake.

Camping Capacity/Suitability Factors

Important camping capacity/suitability factors to consider are summarized below.

- Retention or expansion of wildlife and fish habitat is an important factor in the study area. This topic is specifically discussed in the ILM Plan (WDFW 1995). The objectives of the ILM Plan are to develop an integrated plan for cooperatively managing fish and wildlife resources on a landscape basis for the next 20 years. The plan's goals are to establish acceptable biological limits for recreation opportunities consistent with aquatic and wildlife populations, provide for fishing opportunities and access, minimize recreation fish/wildlife conflicts, and protect critical habitat areas.

- More than half of the visitors surveyed had difficulty finding campsites: Beaver Bay (51%), Cougar Camp (59%), and Saddle Dam (56%). This level of difficulty indicates that developed campgrounds are approaching capacity for the season.

- Visitors surveyed had preferences for shoreline camping, water views, quality scenery, quality nearby restrooms/showers, and drinking water.

- The campgrounds are getting older and some renovation should be considered at some locations in the future. In general, newer camping facilities, or renovated campgrounds with proper design, may accommodate more visitors with less impact than older facilities. PacifiCorp's Yale campgrounds were built in 1958 to 1960 for

fewer numbers of people and are beginning to show their age with various impacts being observed.

- Larger numbers of campers are beginning to feel crowded. Most (59 percent) campground visitors felt crowded to some extent, considered "High Normal." During the July-August peak period, up to 70 percent felt crowded which is considered "More Than Capacity," with Saddle Dam visitors feeling the most crowded.

- Crowding reduces solitude as visitors find it increasingly difficult to enjoy their camping experience. Noise is a common concern of many campground visitors. This is a result of crowding, site design (lack of buffer), and management of "quiet hours" time.

- If needed, adequate PacifiCorp-owned land appears to be available to expand existing campground facilities or to build a new campground. Areas considered for potential future recreation development may be found in larger high suitability category polygons (see Figure 4.3-3). High suitability areas, however, make up a very small portion (309 acres or 3 percent) of the study area (excluding Water and Kick Out Areas). Some adjoining moderately high-ranked areas may also be considered. Based on the results of the GIS-based suitability analysis (Section 4.0) and on-the-ground observations of these potential areas, locations to potentially consider include: (1) Beaver Bay Campground (for expansion), (2) Cougar Camp and Cougar Park (for expansion), (3) the Cooney Point area (for new development), (4) the Siouxon Flats area (for a boat-in area), and (5) south of Speelyai Canal (for new development). These potential areas would be closed during big game wintering periods; therefore, they could potentially be designed and planned for joint recreation-wildlife use as appropriate.

- A potential new developed fee campground (approximately 60 non-hook up sites) with associated boat launch, group campsite, and day-use area, would require an area approximately 100 to 120 acres in size if developed, similar in size to the new Cresap Bay Campground at Lake Merwin.

- The Yale Lake developed campgrounds as a whole are at or near capacity at this time. The need for additional campground facilities or capacity may be assessed by comparing existing utilization and occupancy levels with capacity standards. For this analysis, 2 planning threshold levels have been identified to account for season-long use, as well as the peak July-August period: (1) 60 percent utilization over the season for combined facilities in an area, and (2) 90 percent weekly (weekday and weekend) occupancy rate during the 2 peak use months (July and August). Based on these 2 thresholds, the 3 developed campgrounds at Yale Lake are very nearly approaching capacity. For the first threshold level, Beaver Bay and Saddle Dam are under the seasonal level at 47 to 49 percent capacity utilization. Cougar Camp is well above this seasonal level at 73 percent capacity utilization. On average, they are at 57 percent and are approaching the seasonal threshold level of 60 percent. For the second threshold level, the set of campgrounds are essentially at capacity at 89 percent. Beaver Bay is slightly under this level at 88 percent capacity utilization. Cougar Camp and Saddle Dam (temporarily closed in 1998) are slightly above this

level at 90 to 92 percent capacity utilization. On average, they are at 89 percent, approaching the July-August threshold level of 90 percent.

Overall Camping Needs Results

As with many recreation needs analyses, there are both positives and negatives to consider. Camping needs in this study area are no exception. As a result, no single factor or indicator should be used to make conclusions. Rather, many factors considered as a whole are appropriate for this analysis. These pros and cons are discussed below.

Indicators of Existing Camping Needs Being Met - Several factors indicate that camping needs are being met, at least at this time. These factors include:

- PacifiCorp has voluntarily constructed and operated the 3 Yale Lake campgrounds for over 35 years, providing shoreline camping opportunities at its hydroelectric project and meeting the needs of the public during this period of time. Additional camping facilities also exist at Lake Merwin and Swift Reservoir.

- The period of peak use is approximately 2 months long, primarily limited to summer holiday weekends and the July-August timeframes. This peak use period is typical in the Pacific Northwest. The remainder of the season sees lower visitation rates.

- Weather will always be a limiting factor affecting visitation from year to year and restricting use primarily to a period from Memorial Day to Labor Day weekend. PacifiCorp has set its schedule of facility openings and closing to reflect this use pattern. In addition, it opens Beaver Bay Campground and Cresap Bay Campground a few weeks earlier and later to accommodate the needs of shoulder season anglers, hunters, and others.

- Visitation over the last several years has been somewhat variable–being high, declining, then increasing again. There is not a constant upward trend in visitation from year to year. Use levels appear to have basically peaked; however, weather and road closures have also affected visitation. These facilities are essentially at capacity during July, August, and holidays.

- Most (95 percent) visitors appear to be satisfied overall with their experience (rated good or better). About 3 out of 4 (76 percent) visitors rated their experience as very good or better.

- As a general rule, building new facilities may both satisfy demand as well as generate new demand (i.e., build it and they will come).

- Finally, recreation needs must be weighed against other resource needs, particularly wildlife. Good campground locations may also be good big game wintering areas. These types of competing needs must be balanced. As a result, no new recreation sites may be available if all undeveloped land suitable for recreation is set aside for habitat-only use. At the same time, the periods of use (wildlife and recreation) are

generally different and joint use can be a design factor, as seen at the new Cresap Bay Campground on Lake Merwin.

Indicators of Camping Needs Not Being Met - Despite the preceding comments, several factors also indicate that there are at least growing camping needs that should be addressed–if not now, in the near future. In the longer term, there are definite needs over a 30-year period. These factors include:

- The Monument to the north has become an international visitor attraction since 1982, with over 4.2 million visitors in 1995 and visitation increasing about 4 to 5 percent annually. The GPNF is also a major visitor attraction in the region. About 1 in 5 (22 percent) visitors surveyed at Yale Lake indicated that the Monument or GPNF were their primary destinations. Some of these visitors were staying at Yale Lake campgrounds using up campground capacity meant for visitors whose primary destination was Yale Lake. Overall, the Monument and GPNF have few developed campgrounds on the south side of the volcano near SR 503. As more and more visitor centers are built to the north and new roads are built or improved, visitors are increasingly driving the loop road around the volcano, and many are likely to stay at PacifiCorp's campgrounds. Conversely, Monument staff have commented that during the peak season, some Yale Lake visitors may camp within the nearby Monument or on other USFS lands. In 1998 and 1999, PacifiCorp will be conducting surveys to document potential project-related impacts to the Monument or other USFS lands, and vice versa. PacifiCorp and Cowlitz County PUD are responsible for addressing a portion of the needs of campers in the Upper Lewis River Valley related to the 4 hydroelectric projects. For the remainder of the camping needs, the USFS will continue to rely upon private commercial recreation providers in the watershed to meet future needs of campers relative to the Monument (USFS 1985). The USFS does not plan to construct any new campgrounds at this time.

- Most (59 to 71 percent) visitors surveyed were interested in expanding the existing partial reservation system, indicating a need for increased management. There was little support, however, for a full reservation system.

- Based on planning standards, campgrounds at Yale Lake are considered at or near capacity at this time. Some individual campgrounds exceed standards; however, as a whole, campgrounds are approaching capacity. The seasonal capacity utilization is 57 percent with a threshold of 60 percent (40 percent is considered optimal by some federal standards). Occupancy during the July-August peak period (weekends and weekdays) is 89 percent with a threshold of 90 percent. Campgrounds were at 95 to 100 percent occupancy 10 to 15 days in 1997. In 1994, use levels were even higher than in 1997. Group sites are approaching capacity, with some unreserved time in June only.

- Camping is the number 1 visitor activity at Yale Lake and should be considered a high priority for planning purposes. Demand for camping will more than double (130 percent) during the approximate term of the new license (to 2030), with tent and RV camping having about the same level of demand. A total of 283 developed campsites are projected to be needed at Yale Lake through 2030; currently there are

123 developed campsites. At this time, there are no current plans to increase capacity by adding more campsites.

- Over half (53 percent) of visitors surveyed desire some improvements. The campgrounds are older, having been built during 1958 to 1960. At least 1 restroom at each site has been rebuilt; however, many campsites lack adequate buffer, and noise is a common complaint of campers.

- Over half (51 to 59 percent) of visitors surveyed had difficulty finding a campsite. During peak days, many visitors are turned away.

- There are many (67) dispersed sites (camping and day use) along the Yale Lake shoreline. To date, many of these sites have not been routinely managed and observed impacts have been discussed or observed at some locations (sanitary, litter, erosion, fire hazard, and personal safety).

- During the season, about 3 out of 5 (59 percent) visitors on average surveyed felt crowded to some extent. During July and August, this percentage increased to about 70 percent, which is considered above capacity based on standards.

- Several options exist to potentially expand existing facilities or construct new ones. Over 300 acres have been identified as potential opportunity areas (Figure 4.3-3). At least 2 locations are potentially available for a new campground in the future.

- No ADA-accessible campsites currently exist. Accessibility guidelines are currently being revised by the U.S. Access Board.

Identified Overall Camping Needs - Based on review of all of these factors and indicators, both pro and con, potential actions to address overall camping needs have been identified in the study area. It should not be assumed that these are proposed PM&E measures. As such, the word "consider" is used throughout this section. Site-specific camping needs are discussed in Section 5.3.2. Potential actions to satisfy overall camping needs include:

- Consider Implementing a Developed Campground Program Over the Term of the New License. Camping capacity is likely to be reached around the year 2000. During the term of the new license, camping demand will increase approximately 130 percent. An estimated total of up to 283 developed campsites (no hookups) will be needed by the year 2030. This represents up to 160 new additional developed campsites in the Yale Lake area to be phased in over a 30-year period. In addition, older campsites will need to be modernized to provide more buffer between sites and minimize noise conflicts. Older restrooms that have not already been modernized will need to be renovated. Older RV dump stations will need to be modernized. As improvements are made to the older campgrounds, additional universal access improvement should be considered if practicable and feasible. Because campground capacity is anticipated to be exceeded in the future, campground use should be monitored to determine when new facilities should be constructed or existing ones expanded. A monitoring program should be developed which identifies threshold

criteria or triggering mechanisms. Preliminary threshold criteria may include the 2 used in this analysis: (1) a 60 percent seasonal capacity utilization, and (2) a 90 percent occupancy rate during the peak July-August timeframe. These threshold levels should be exceeded for 2 years before actions are taken to ensure that the need is actual. Monitoring should be conducted on a regular basis as needed. Existing campgrounds, such as Cougar Camp, should be modernized and expanded first, if feasible. It is anticipated that a new developed campground with no hookups should be considered at Yale Lake in future phases. The location of this potential new campground will need to be coordinated with other resource needs, principally big game wintering area. Because of the 4 hydroelectric projects and the Monument and GPNF, there is a combined responsibility for addressing the long-term camping needs in the Upper Lewis River Valley. These combined needs should be addressed based upon further coordination and negotiations. PacifiCorp may consider seeking outside partnerships concerning the future operation of existing or future campgrounds, either in fee ownership or on a lease basis.

- Consider Implementing a Group Campsite Program Over the Term of the New License. Capacity for group camping is likely to be reached around the year 2000. During the term of the new license, group camping demand will likely double. In addition to individual campsites, a total of up to 4 group reservation campsites will be needed by the year 2030. This represents an additional 2 new group campsites to be phased in over a 30-year period. Older group campsites will need to be modernized over this period. As improvements are made to older group campsites, universal access should be considered if practicable and feasible. Potential new group sites at or near existing campgrounds should be modernized and expanded first, if feasible. The location of a potential new group campsite at a possible new campground will need to be coordinated with other resource needs, principally big game wintering area.

- Consider Implementing a Boat-in Campsite Program Over the Term of the New License. Many of the 67 dispersed shoreline sites are used by boat-in campers as well as for day use. Capacity for dispersed camping appears to have been reached due to ongoing impacts observed and discussed, such as sanitation, litter, erosion, fire hazard, and personal safety. During the term of the new license, boat-in camping demand will increase as boating and camping demand doubles, thereby exacerbating existing shoreline use problems. As a portion of the total number of developed campsites needed in the future, up to 20 boat-in campsites may be developed during the term of the new license in a phased program. To meet boat-in camping demand and to resolve shoreline use impacts, existing shoreline campsites and other new sites suitable for boat-in use will need to be developed and then managed. Sanitation, litter, fire hazard, and safety concerns will need to be addressed through proper design, maintenance, and management. Sites should be clustered in appropriate areas, such as the Siouxon Flats, to minimize impacts and maintenance and development costs. The clustered boat-in campsites should include picnic tables, fire rings, and sanitation facilities. As improvements are made, universal access should be considered for some of these campsites if practicable and feasible. These 20 or so developed campsites, as well as the remaining 47 or dispersed shoreline sites (day use and over-

night), will need to be monitored and patrolled by marine and/or shoreline patrols. The location of these boat-in campsites will need to be coordinated with other resource needs, principally big game wintering area and raptor habitat.

- Consider Implementing an Expanded Reservation System. Visitors have expressed a high degree of interest in a partial (not full) reservation system. The current partial reservation system should be expanded, if possible, to allow campers the opportunity to reserve a portion of the campsites. Group campsite reservations would remain unchanged. A portion of the developed campsites (25 to 50 percent for example) should be available by reservation only. Managers will likely need to experiment with this new program and adjust it over time as needed. A full reservation system may be desirable sometime in the future. This system may have the effect of spreading out visitation over a longer period of time, minimizing traffic problems along SR 503, and will give campers who make a reservation and drive longer distances assurance that there will be available campsites when they arrive.

- Consider Implementing an Expanded Universal Access Program. In 1992, PacifiCorp conducted a detailed assessment of recreation access needs in compliance with ADA guidelines for universal access. As a result, PacifiCorp has made several significant improvements to restroom facilities and parking access at its 5 developed recreation facilities and is currently in compliance with the ADA regulations. During the term of the license, ADA guidelines will change and new requirements, not just guidelines, will need to be addressed. The U.S. Access Board is likely to propose new rules in 1999 and 2000. As a result, these new rules and other recommendations contained in a 1992 accessibility report should be considered over time. These recommendations, based on ADA guidelines, include actions such as universal access at boat launches, picnic areas, campsites, shoreline fishing areas, trails, and swim areas. As improvements are made to new and older campgrounds, universal access should be provided if practicable and feasible.

5.3.1.2 Overall Picnicking Needs

Overall picnicking and rest-stop/relaxing demand, supply, and capacity/suitability factors are presented below, followed by a discussion of overall needs.

Picnicking Demand Factors

Important picnicking demand factors to consider are summarized below.

- Visitation at picnic facilities was fairly low during the season. Part of the reason is that most visitors surveyed were camping and conducted their picnic-related activities at their campsite. The average number of picnickers at all developed sites was only 10 to 12 persons at one time. The average number of visitors just relaxing, however, was much higher at 36 to 42 persons at one time. The average number of rest-stop visitors was also low at only 4 persons at any one time. These average levels of use remained fairly constant all season, except for a drop in June due to poorer weather conditions.

- Demand for picnicking is increasing annually at almost 3 percent. Over the term of the new license or 30 years, demand for picnicking is projected to increase 171 percent. This level of increase is higher than for camping.

- Demand for rest-stop visits, such as at Yale Park and Cougar Park, can be estimated by looking at demand for sightseeing. Sightseeing statewide is increasing in demand at 2.53 percent annually. This level, however, is about half of the 5 to 6 percent annual increases in visitation that is occurring at the nearby Monument.

- Picnicking, relaxing, and using rest areas was low (<10 percent) on the list of visitor's main activities. While not considered a main activity, however, almost half (47 percent) of the visitors surveyed participated in this activity making it an important planning consideration.

- All (100 percent) picnickers surveyed rated their satisfaction as good or better. Other activities were also rated good or better for satisfaction including sightseeing (95 percent), use of rest areas (100 percent), and relaxing (93 percent).

Picnicking Supply Factors

Important picnicking supply factors to consider are summarized below.

- One of the goals of the Cowlitz County Comprehensive Park Plan (Cowlitz County 1994) is to promote tourism by developing picnic areas and providing other related services.

- Developed and dispersed shoreline picnic and day-use area opportunities are provided, including boat-in and drive-in types. Approximately 66 picnic sites are provided at 4 locations (Beaver Bay, Saddle Dam, Yale Park, and Cougar Park). Most (44) picnic tables are located at Yale Park, which is open all year long. Eleven of these picnic sites also have fire rings or BBQs at 2 locations (Saddle Dam and Yale Park).

- Two locations (Beaver Bay and Cougar Park) have playground equipment.

- Four locations (all except Cougar Campground) have shoreline areas with shade trees and grassy areas.

- Picnic and rest-stop facilities are available all year long at Yale Park. Additional day-use areas are open at Beaver Bay, Cougar Park, and Saddle Dam during the peak season. Yale Park and Cougar Park are in proximity to and are visible from SR 503, a route used by visitors to the Monument, GPNF, and the Lewis River projects.

Picnicking Capacity/Suitability Factors

Important picnicking capacity/suitability factors to consider are summarized below.

- Sanitary facility capacity/septic system design have been problematic at 2 sites; however problems at Beaver Bay and Cougar Park were repaired in 1998.

- Sanitation, litter, and erosion problems were observed along the shoreline, principally the eastern side, due to dispersed shoreline use and low levels of management.

- Grassy areas occasionally become over-used or vandalism occurs. Such problems were observed at Yale Park.

- Parking capacity during the recreation season at developed day-use sites was not exceeded as a whole. The average number of parked weekend vehicles at each site at a single time and its parking capacity includes: Cougar Park (20 out of 80 spaces or 25 percent), Saddle Dam (75 out of 200 spaces or 38 percent), Yale Park (106 out of 280 spaces or 38 percent), and Beaver Bay (15 out of 40 spaces or 38 percent). However, during hot summer days on holiday weekends, (up to 5 times per year), day-use site and boating parking needs competed, resulting in overflow conditions.

- Visitors surveyed at day-use sites perceive some level of crowding including: Yale Park (39 percent) and Cougar Park (60 percent). Yale Park was perceived as the least crowded site, possibly because many visitors surveyed left the site by boat during peak periods.

- Some (9 percent) visitors want new or improved playground equipment. Equipment at Beaver Bay needs replacement (half of swings missing).

- Areas for potential new day-use sites exist (see Figure 4.3-3).

Overall Picnicking Need Results

Based on review of all of these factors and indicators, potential actions to address overall picnicking needs have been identified in the study area. It should be noted that these are not proposed PM&E measures. As such, the word "consider" is used in this section. Site-specific picnicking needs are discussed in Section 5.3.2. Potential actions to address overall needs include:

- Consider Implementing a Developed Day-Use Site Program Over the Term of the New License. Day-use areas, excluding boat launching (discussed below), are currently within capacity and should remain so for many years. During the term of the new license, however, demand for picnicking will increase approximately 170 percent. The current average number of persons who are picnicking, relaxing, and using restrooms at one time is approximately 60. It is estimated that this average number of people will increase to approximately 160 within 30 years. Peak use days will see much higher visitation levels with several hundred visitors. Based on this increase, a new shoreline developed day-use site will be needed with approximately 12 picnic tables and open space with shade for relaxing. Older day-use sites will need to be modernized over time. Older restrooms will need to be renovated. Problem septic systems were repaired by PacifiCorp in 1998. As improvements are made to older day-use sites, universal access should be considered if practicable and feasible. Existing day-use sites should be modernized and expanded first, if feasible. A potential new developed day-use site at the potential new campground should be considered in

future phases. The location of this potential new day-use site will need to be coordinated with other resource needs, principally big game wintering area.

- Consider Implementing a Boat-in Day-Use Site Program Over the Term of the New License. Many of the existing 67 dispersed shoreline sites are used by boat-in campers and day users. Capacity for these dispersed sites appears to have been reached due to ongoing impacts observed and discussed such as sanitation, litter, erosion, fire hazard, and personal safety. During the term of the new license, boat-in day-use picnicking demand will increase as boating and picnicking demand increases, thereby exacerbating existing problems. To help satisfy future boat-in day-use picnicking needs and to resolve existing shoreline use impacts, approximately 10 or so developed shoreline day-use sites should be phased in over time. Picnic sites should be clustered in appropriate areas, such as the Siouxon Flats and Siouxon Creek areas where existing use is greatest, to minimize impacts and maintenance costs. The clustered boat-in picnic sites should include a picnic table and fire ring and would be pack-it-in/pack-it-out type for litter control. To address sanitation concerns, up to 2 floating restrooms should be considered and barged to the Siouxon Flats area and the Siouxon Creek Arm area during the peak season and maintained regularly. As improvements are made to these sites, universal access should be considered for a few of the 10 day-use sites if practicable and feasible. These improved sites, as well as the remaining dispersed shoreline sites (day-use and overnight), will need to be monitored and patrolled by marine and/or shoreline patrols. The location of these boat-in day-use sites will need to be coordinated with other resource needs, principally big game wintering area and raptor habitat.

5.3.1.3 Overall Boating Needs

Overall boating demand, supply, and capacity/suitability factors are presented below, followed by a discussion of overall needs. Boating facility needs that were analyzed in the study area include:

- Restricted boating use areas
- Boat launches, ramps, and docks
- Parking

Boating Demand Factors

Important boating demand factors to consider are summarized below.

- Water-based recreation opportunities are in high demand. Annual increases in demand include: power boating (2.02 percent), sailing (2.42 percent), and non-motorized boating (2.36 percent).

- During the term of the new license or 30 years, demand for boating and water-based recreation activities will increase substantially including: water skiing (103 percent), sailing (126 percent), windsurfing (102 percent), lake power boating/PWC use (97 percent), angler boating (90 percent), and lake non-motorized boating (121 percent).

The IAC indicates that water-based recreation, along with trails, are in very high demand.

- The level of boater participation among visitors surveyed at Yale Lake includes: power boating (29 percent), non-motorized boating (18 percent), and jetskiing/PWC use (14 percent).

- The average summer weekend mix of boats includes: 65 percent power boats, 21 percent jetskis/PWC, 7 percent inflatables, 5 percent rowboat/canoe/kayak, and 2 percent sailboats.

- The number of boats on the lake during a typical sailboat Regatta weekend are higher (worst case). During Regattas (2 to 4 times per year), the high number of sailboats (up to 50) pushes the total number of boats on the reservoir up to 170 (overall reservoir surface area density of 20 to 22 acres/boat).

Boating Supply Factors

Important boating supply factors to consider are summarized below.

- PacifiCorp operates 4 boat launches at Beaver Bay, Saddle Dam, Cougar Camp, and Yale Park. There are a total of 9 ramp lanes at these locations in the southern, central, and northern portions of the reservoir. There are 6 boat docks (including Cougar Park) and floating booms are located at Saddle Dam and Cougar Camp. Informational signs are located at all locations. All ramps are concrete or concrete ties. None of the boat launches or docks provide universal access.

- PacifiCorp provides parking for approximately 700 vehicles and vehicles with trailers. Most spaces are provided at Yale Park (280), which is open year-round, and Saddle Dam (200). Approximately 550 to 600 of these parking spaces are used by boaters, the remaining spaces by other day-use visitors.

- The pool elevation is voluntarily held high when possible by PacifiCorp during the peak recreation season - Memorial Day to Labor Day weekend (480 feet to 490 feet msl). During the non-peak season, the pool elevation ranges from 470 feet to 490 feet msl, but may drop to 460 feet msl.

- The size of the reservoir is large and long: 3,800 surface acres, 27 miles of shoreline, and 10 miles long.

- The ability to launch a boat at a ramp is dependent upon the pool level, the ramp location, and debris accumulation. The Saddle Dam and Cougar Camp launches do not operate adequately at minimum recreation pool (480 feet msl). Minimum launch elevations of ramps include: Saddle Dam (487 feet), Yale Park (470 feet), Cougar Camp (484 feet), and Beaver Bay (476 feet). The Yale Park ramp operates to 470 feet msl (if debris is cleared). No ramps operate well at the lowest pool level -- 460 feet msl.

- Overall satisfaction with water-based activities is high. Visitors surveyed were generally satisfied with ratings of good or better for the following activities: fishing (89 percent), power boating (98 percent), water skiing (86 percent), sailing (90 percent), and jetskiing/PWC use (75 percent).

- Complaints by visitors were relatively low. Only 5 percent of survey respondents indicated that boat launches need to be improved. Most of these comments were directed at the Saddle Dam launch. It should be noted, however, that the pool level was high when most visitors were surveyed, which could bias the results. When the pool level was lower, more problems could likely be encountered by boaters.

Boating Capacity/Suitability Factors

Important boating capacity/suitability factors to consider are summarized below.

- Launch wait times were generally low at most sites, indicating adequate capacity. Boaters at Saddle Dam and Beaver Bay (fewer lanes) had to wait the longest, indicating lesser capacity.

- Seasonal parking capacity for boating appears adequate, except during extreme use days (up to 5 days per year) when boating and day-use site parking needs compete. On average during the season, parking capacity utilization at launch sites was relatively low. Utilization during holiday and non-holiday weekends includes: Beaver Bay (38 percent holiday, 35 percent non-holiday weekends), Cougar Camp (28 percent holiday, 38 percent non-holiday weekends), Yale Park (37 percent holiday, 37 percent non-holiday weekends), and Saddle Dam (38 percent holiday, 31 percent non-holiday weekends).

- Year-round launch access to the reservoir is provided under typical conditions. Yale Park with a large launch facility is open year-round. The launch at Yale Park is operable (when clear of debris) down to approximately 470 feet msl. The pool elevation can drop below this level to about 460 feet msl, making launching difficult or impossible, except for smaller car-top boats. During extreme peak use days (up to about 5 times per year), vehicle access to launch sites may be closed when lots are full.

- The siting of boat launches affects access and use of the reservoir. The type, design, and location of launch facilities controls the maximum number of boats on the lake at any one time and where boats congregate. Boaters also tend to concentrate near the boat launches, particularly jetski/PWC users. The area near Speelyai Canal is the least used area and would be the best area to site a new launch facility that would not affect existing boating patterns and densities (see Figure 2.3-4).

- Existing boat launch parking space is limited at all sites. Expansion potential is limited; however, some additional space could be developed for parking if needed at some locations.

- During the peak recreation season when most of the survey was conducted, the pool level did not affect most boaters. Most (70 percent) survey respondents indicated that the pool level did not affect their boating experience. Of the 30 percent who indicated that they were affected, most (33 percent) problems related to ramp length or condition at Saddle Dam and Cougar Camp. Other survey responses include: 15 percent had general undefined problems, 11 percent were worried about hitting submerged objects such as stumps and rocks, and 11 percent said floating debris was a hazard, particularly early in the season. Most respondents (84 percent) said that the pool level was important to their experience. It should be noted that the survey was not conducted when the pool level was very low; however, very few boaters are on the lake during this period.

- Several boating capacity standards exist which may be considered in this analysis. These standards range from a liberal 4 to 7 boats/acre for primarily stationary angler boats (Soil Conservation Service) to a much more conservative and generalized 33 acres/boat (State Organization of Boating Administrators). These 2 standards indicate a range of density to be considered for planning purposes. The Yale Lake condition includes a mix of watercraft type with peak periods occurring during sunny weekends in July and August and during holidays. In addition, sailboat regattas occur with high numbers of sailboats on a few summer weekends. For the remainder of the season, Yale Lake boat counts are much lower (around 15 boats). To account for the Yale Lake experience, Bureau of Outdoor Recreation (BOR) standards are used in this analysis. These standards fall between the range of standards previously described, tending to be more conservative than liberal.

- During the non-peak season, the number of boats on the reservoir ranged from a low of 0 to a high of 15 (density of 253 acres/boat). During the peak season, the average number of boats were: Holiday weekends (140, density of 27 acres/boat); and non-holiday weekends (120, density of 32 acres/boat). The surface area available for boaters was analyzed using BOR standards for boating capacity. The standards used in this analysis include: angler boats (minimum 3.4 acres/boat) and non-angler boats (minimum 7.1 acres/boat). Based on these standards, water surface capacity used during 2 selected peak (worst-case) timeframes includes: non-holiday Regatta weekend with up to 170 boats (30 percent capacity or 1,133 minimum surface acres needed) and summer holiday weekend with up to 140 boats (24 percent capacity or 920 minimum surface acres needed). A non-peak day, however, during the season will yield up to about 15 boats at one time and will utilize only about 2 percent of capacity.

- Parking and launch needs for boating use will increase in the future during the term of the new license or 30 years. Based on a planning scenario during a sailboat Regatta on a non-holiday summer weekend (Regattas are never on holiday weekends), the maximum number of 170 boats assumed at this time (includes 50 sailboats in a Regatta) would approximately double by the year 2030 to an estimated 340 boats. This future 2030 mix of boats is estimated to include: 100 sailboats (assumes a maximum number of boats), 58 jetskis/PWC, 138 power boats, 22 inflatable craft, and 22 canoes, kayaks, or row boats. Of these boats, about 300 would be trailered

and 40 would be car-topped to the launch site. Assuming a turnover ratio of 3 (accounts for a variety of uses including boat-in camping, boat-in day-use, and differing craft type, except for Regatta participants which is 1), a total of about 820 parking spaces would be needed by 2030 for boating use during a Regatta day. This would represent a worst-case need of up to 270 additional parking spaces for boating (assumes 550 of the 700 existing spaces are for boating use and 150 are for other day use or campground overflow use). Alternatively, based on an average 1996 summer weekend day planning scenario with 120 boats out on the water at one time, the total number of boats estimated in the future at 2030 would double to about 240 boats (200 trailered and 40 car-top). This future planning scenario would require up to 720 parking spaces for boating using a turnover factor of 3. This would require about 170 new parking spaces for boating use (assumes 550 existing spaces), indicating the need for a new launch site with 2 or 3 ramp lanes. Some additional parking could potentially be developed at Yale Park and Saddle Dam. For Regatta days (assuming up to 100 sailboats) by 2030, potential overflow capacity could be provided for an additional 100 vehicles with trailers.

- By the year 2030, the number of boats out on the water is expected to double. The worst-case boating capacity utilization of the reservoir water surface is projected to increase from 24 to 42 percent during non-Regatta summer weekends, and from 30 to 63 percent during Regatta summer weekends. These future capacity levels are approaching maximum capacity, allowing for greater concentrations of use in some coves and near launch sites and lower concentrations of use elsewhere. During a non-peak day, however, boating use levels should still remain very low with an increase in capacity utilization of only 3 percent up to a 5 percent level (up to 30 boats on the water at one time).

Overall Boating Needs Results

Based on review of all of these factors and indicators, potential actions to address overall boating needs have been identified in the study area. It should be noted that these are not proposed PM&E measures. As such, the word "consider" is used in this section. Site-specific boating needs are discussed in Section 5.3.2. Potential actions to address overall boating needs include:

- Consider Implementing a Boat Launch Program Over the Term of the New License. Day-use area parking, including parking for boaters, is currently within capacity, except for up to 5 times per year when capacity is exceeded. During the term of the new license, however, demand for boating will likely double the number of boats on the water at one time. A summer weekend in 2030 will likely require a new launch site with 3 ramp lanes and approximately 170 new parking spaces. During Regatta weekends, up to 100 additional overflow parking spaces would be needed, depending upon the size of the Regatta. Some additional parking could be created at Yale Park in the near term by formalizing parking spaces and expanding the area to the west. A potential new boat launch site at the potential new campground should be considered in future phases. The location of this potential new boat launch site will need to be coordinated with other resource needs, principally big game wintering area. As these

new improvements are considered, universal access to docks should be provided if practicable and feasible.

- Consider Implementing a Boat Ramp Extension and Maintenance Program. Accessibility to the reservoir is sometimes hampered by the length of several of the ramps and debris which collects at the end of the ramps at lower pool levels. Ramps which should be lengthened to function adequately at various pool levels include: Yale Park (1 lane out of 4 due to a boulder obstruction 460 feet msl pool level), and Cougar Camp and Saddle Dam (480 feet msl pool level). The older existing boat launches will need to be modernized over time. As improvements are made to older day-use sites, universal access to docks should be considered if practicable and feasible. Additional effort should be considered to routinely clear debris from the end of the boat ramps, including large rocks, silt, and woody debris.

- Consider Increasing Reservoir Marine Patrol and Management Presence. With a doubling of the numbers of boats and jetskis/PWC in the future (2030), additional management presence will be needed beyond the current 2 days/week during the peak season. Increased enforcement of No Wake Zone boating regulations is needed as use levels increase. Marine Patrols should be increased over time, particularly during July and August. Other actions should also be taken as needed to address boating activities. In the future, zoning (temporal or spatial) of various types of watercraft may need to be considered if health and safety issues warrant such actions.

5.3.1.4 Overall Swimming and Sunbathing Needs

Overall swimming and sunbathing demand, supply, and capacity/suitability factors are presented below, followed by a discussion of overall needs.

Swimming/Sunbathing Demand Factors

Important swimming/sunbathing demand factors to consider are summarized below.

- The current use of swim/beach day-use areas generally indicates the level of demand. The average number of swimmers and sunbathers using swim areas and adjacent sandy beaches during holiday and non-holiday weekends includes: Beaver Bay (9 holiday, 14 non-holiday), Cougar Camp (2 holiday, 12 non-holiday), Cougar Park (11 holiday, 17 non-holiday), Yale Park (14 holiday, 29 non-holiday), and Saddle Dam (12 holiday, 19 non-holiday). The total average for all 5 sites is 48 visitors (holiday weekends) and 91 visitors (non-holiday weekends).

- The demand for swimming and sunbathing is increasing at 2.20 percent annually. Over a 30-year period, demand is projected to increase 110 percent.

- Like other activities, use levels are dependent upon good weather conditions; rain and wind are key factors. As a result, July and August are primary use months.

- Swimming/sunbathing is the #2 most popular activity behind camping. As a result, this activity deserves planning consideration. While a popular activity at Yale Lake,

it was listed by only 9 percent of visitors surveyed as their main activity, making it a secondary activity.

- About 4 percent of survey respondents wanted improved beach access with more swimming areas and sandy beaches. The distance to a swimming area was important to many (70 percent) visitors surveyed.

Swimming/Sunbathing Supply Factors

Important swimming/sunbathing supply factors to consider are summarized below.

- All developed sites (except Cougar Camp) have swim areas with floating booms, sandy beaches, signs, and safety apparatus. The facilities are in good condition. No lifeguards are provided. Cougar Creek and an undeveloped cove at Cougar Camp, however, are also use areas.

- Most visitors were satisfied with their swimming/sunbathing experience; 91 percent rated it good or better.

- Swimming/sunbathing areas are open for use during the same periods of time as the larger campground or day-use facilities. Yale Park is open year-round. These areas are accessible by foot only. No swimming/sunbathing facilities provide universal access at this time.

- Land and cove area is constrained; however, water area within the floating boom may be varied as needed.

Swimming and Sunbathing Capacity/Suitability Factors

Important swimming and sunbathing capacity/suitability factors to consider are summarized below.

- No sites exceed capacity based on average existing use levels. The average number of swimmers and sunbathers at all sites during holiday and non-holiday weekends is 48 (holiday weekends) and 91 (non-holiday weekends). All developed sites have a combined capacity to accommodate approximately 150 swimmers in the water and 250 sunbathers on land. Existing average use levels during weekends only consume about 12 to 23 percent of capacity. However, during very hot weekend days (about 5 per year), capacity can be completely consumed or even exceeded for several hours, particularly at Saddle Dam.

- At Saddle Dam, jetskis/PWC riders were observed on several occasions riding very near the floating boom that separates the swimming area while swimmers were present. This presents a potential safety hazard.

Overall Swimming/Sunbathing Needs Results

Based on review of all of these factors and indicators, potential actions to address overall swimming/sunbathing needs have been identified in the study area. It should be noted

that these are not proposed PM&E measures. As such, the word "consider" is used in this section. Site-specific swimming/sunbathing needs are discussed in Section 5.3.2. Potential actions to address overall swimming/sunbathing needs include:

- Consider Providing a Swimming/Sunbathing Area at a Potential New Campground Over the Term of the New License. Existing swimming and sunbathing area capacity is adequate for the near future. However, consider constructing a potential new swimming and sunbathing area at a new campground facility, if developed.

5.3.1.5 Overall Interpretive/Environmental Education Needs

Overall interpretive/environmental education facility or program demand, supply, and capacity/suitability factors are presented below, followed by a discussion of overall needs. Interpretive program and facility needs that were analyzed in the study area include:

- Signs and kiosks
- Viewpoints
- Nature trails
- Hydroelectric facility tours
- Manned programs/campfire talks

Interpretive/Environmental Education Demand Factors

Important interpretive/environmental education demand factors to consider are summarized below.

- Visiting interpretive displays is very high in demand in the region (3.12 percent annual increase in demand). Other related activity demand increases are: nature study/wildlife observation (2.67 percent), outdoor photography (2.94 percent), and sightseeing and exploring (2.53 percent).

- Some visitors in the valley are likely desiring and/or predisposed to environmental education activities due to existing visitor centers located along SR 504 to the north, and in the Monument at Ape Cave, Lava Canyon, and elsewhere. Approximately 4.2 million visitors went to the Monument in 1995. Monument visitation is increasing 5 to 6 percent annually.

- The Lewis River corridor offers multiple sightseeing and learning opportunities near Yale Lake. Almost half (45 percent) of all survey respondents indicated that they had plans to or have already visited other locations during their trip. Of the 45 percent, most (34 percent) of these respondents listed the Monument (including Ape Cave, Windy Ridge, Lava Canyon, etc.) as their primary destination. The GPNF was also mentioned by 15 percent of visitors as their primary destination.

- One of the goals of the Cowlitz County Comprehensive Park Plan (Cowlitz County 1994) is to promote tourism by development of viewpoints, interpretive information, and other related services.

- One of the priorities of the Skamania County Park and Recreation Comprehensive Plan (Skamania County 1991) is to enhance tourism as a replacement of lost timber industry jobs, including interpreting historic resources.

- Some of the goals of the Lewis River Valley Strategic Action Plan (Action Plan Committee 1995) are to increase the number of cultural events in Cougar, designate SR 503 as part of a state scenic byway loop, and create fish and elk viewing and interpretive areas near Cougar including Cougar Creek and elk wintering meadows (coordination is needed with WDFW and USFWS).

- Half (50 percent) of the visitors surveyed participated in sightseeing and 15 percent participated in nature study/photography. Participation remained fairly constant from May through August, then dropped in September. While half the visitors participated in sightseeing, it was not listed as a main activity.

Interpretive/Environmental Education Supply Factors

Important interpretive/environmental education supply factors to consider are summarized below.

- No interpretive facilities exist now in this project area, such as interpretive signs and kiosks, viewpoints or overlooks, and nature trails. There are no hydroelectric facility tours. No signs exist explaining how the hydroelectric project works and its benefits.

- PacifiCorp has contracted with the USFS to provide Ranger campfire talks during the summer months. This program has been fairly successful. Some talks are conducted at a small amphitheater seating area located at Cougar Park.

- The Monument and USFS are adept at providing interpretive/environmental education programs and services and may be best suited to meet the needs of many of the visitors in the region. WDFW and DNR are also capable of providing similar services and programs.

Interpretive/Environmental Education Capacity/Suitability Factors

Space exists at all developed sites to develop potential future interpretive signs or kiosks. Nature trails could be developed at some locations, such as Beaver Bay. Space for expanding the existing small amphitheater seating area at Cougar Park is available.

Overall Interpretive/Environmental Education Needs Results

Based on review of these factors and indicators, potential actions to address overall interpretive/environmental education needs have been identified in the study area. It should be noted that these are not proposed PM&E measures. As a result, the word "consider" is used in this section. Site-specific interpretive/ environmental education needs are discussed in Section 5.3.2. Potential actions to address overall interpretive/environmental education needs include:

- Consider Implementing an Interpretive/Environmental Education Program. A potential series of interpretive displays depicting how the hydroelectric project works and its benefits should be considered at some or all of the 5 developed sites and a potential new campground, if developed in the future. This installation of bull trout identification and information signs should be considered in consultation with the agencies.

- Consider Upgrading Facilities for Ranger Campfire Talks. Consider providing improved facilities for Ranger campfire talks, environmental education programs, and group uses. Facilities should accommodate about 50 people with expansion capability for larger groups as needed.

- Consider Providing Nature Trail Opportunities. Where appropriate, consider potential self-guided nature trails at or near campgrounds. Areas of opportunity may include the Beaver Bay wetland and Cougar Creek.

5.3.1.6 Overall Recreational Trail-related Needs

Overall recreation trail demand, supply, and capacity/suitability factors are presented below, followed by a discussion of overall needs. Recreational trail facility needs analyzed in the study area include:

- Non-motorized trails
- Motorized trails

Trail-related Demand Factors

Important trail-related demand factors to consider are summarized below.

- Existing undesignated trails are generally lightly used. The IP Road route is lightly used on occasion by road bicyclists, mountain bikers, 4WD/ATV riders, anglers, and hikers. The Saddle Dam to Speelyai Canal trail is lightly used by smaller groups of equestrians and a few hikers and mountain bikers. At the Swift No. 2 power canal, anglers regularly use trails following the canal and foot bridges to access fishing areas. The Yale-Merwin transmission line ROW has been recommended by Clark County as a potential trail route; however, there is no known use at this time. Along Cougar Creek is an informal angler access trail used for fishing and dispersed camping that gets regular use. Pedestrians walk from the town of Cougar to Cougar Park/Camp using primarily the shoulder of the highway.

- Trail-related recreation opportunities are in high demand now and in the future. Annual increases in demand include: day hiking (2.73 percent), off-roading (4WD, ATV) (2.31 to 2.59 percent), bicycling (2.98 percent), mountain biking (2.61 percent), and horseback riding (1.69 percent). Over 30 years, demand for these activities is expected to increase substantially including: day hiking (150 percent), off-roading (4WD, ATV) (117 to 139 percent), bicycling (171 percent), mountain biking (140 percent), and horseback riding (77 percent). One of the 2 greatest needs ac-

cording to the IAC is trail opportunities due to this high demand (hiking, bicycling, and walking). The IAC sees new trail development as a top priority.

- Visitors surveyed listed hiking/walking as their third highest (51 percent) activity that they participated in during their visit. Hiking/walking activity increased in the later summer months to 68 percent. Mountain biking and road bicycling was 17 percent. Few (<4 percent) listed trail use as a main activity, likely due to the water as a main attraction and a lack of designated trails known to visitors.

- Partial goals of the Siouxon Landscape Plan (DNR 1996) include expansion of trail opportunities (equestrian, hiking, and mountain biking), development of trail maintenance agreements and plans, meeting future recreation needs, maintaining vehicle access, but at a reduced cost, and providing for hunting opportunities and access.

- Partial goals of the ILM Plan (WDFW 1995) include providing recreation opportunities (mainly hunting and fishing), providing public access, securing open space, and minimizing wildlife-recreation conflicts. Damaging activities, such as ATV riding, snow mobiling, and horseback riding, should not be allowed, according to the ILM Plan, in sensitive areas including caves, riparian zones, and big game wintering areas.

- The Clark County Park, Recreation, and Open Space Plan (Clark County 1994a) and the Clark County Trail and Bikeway System Plan (Clark County 1994b) indicate the need for new trail opportunities. Potential trail improvements in these plans include: (1) development of the IP Road into a non-motorized trail with 2 rest areas/toilets which would create a regional trail from La Center, Washington to the Monument, and (2) use of the existing Yale-Merwin transmission line ROW as a trail corridor.

- The Lewis River Valley Action Plan (Action Plan Committee 1995) identifies priorities including a new trail from the town of Cougar to Cougar Park/Camp, opportunities for day hikes from Cougar to Beaver Bay, creation of nature trails, and creation of wildlife viewing areas along Cougar Creek and elk wintering areas (with input from WDFW and USFWS).

Trail-related Supply Factors

Important trail-related supply factors to consider are summarized below.

- No formal trails currently exist. No ADA-accessible recreation trails exist. Informal unmarked trails appear to function adequately for those who use them and know about them. Informal walking can occur at all sites and along the shoreline in most areas.

- No recreation access easement exists along the privately owned IP Road.

- Most (96 percent) walkers/hikers surveyed were satisfied (rated good to perfect) with their walking experience. All (100 percent) mountain bikers/road bikers rated their experience as good to perfect. Many visitors went to the Monument and/or GPNF

where many hiking opportunities exist. As a result, the high level of satisfaction may have resulted from experiences outside of the project area.

Trail-related Capacity/Suitability Factors

Important trail-related capacity/suitability factors to consider are summarized below.

- New trails could be developed in most areas. The existing ROW along SR 503 may be limiting if a bike path or lane was to be considered along the highway.

- Use of the IP Road for recreation appears to be problematic. The current IP Road paved surface is deteriorating and the bridge is narrow and old. A slide has partially blocked the road and no entity has removed or contained the slide. Heavy truck traffic is a potential problem along the IP Road; however, traffic is very light except during logging activities. There is no existing recreation access easement along the IP Road. This is one of the reasons why Clark County discontinued active use of Siouxon County Park. If these obstacles could be potentially overcome, the IP Road remains a tremendous trail opportunity. If not, a parallel trail upslope of the IP Road is a possibility. Development of such a trail would need to be coordinated with appropriate land owners and managers. Wildlife habitat, including raptor nest sites, will need to be considered.

- Dispersed recreation use in wildlife habitat areas is a potential concern; however, visitor use levels are very low when wildlife are present because of poor weather conditions. New trail development and management must be coordinated with wildlife managers.

Overall Trail-related Needs Results

Based on review of all of these factors and indicators, potential actions to address overall trail-related needs have been identified in the study area. It should be noted that these are not proposed PM&E measures. As such, the word "consider" is used in this section. Site-specific trail-related needs are discussed in Section 5.3.2. Potential actions to address overall trail-related needs include:

- Consider Investigating Potential Trail Use of the IP Road. Consider investigating opportunities and mechanisms to potentially develop a formal non-motorized trail along the IP Road for use by hikers, walkers, road bicyclists, mountain bikers, anglers, and equestrians. If this route is infeasible, consider developing a parallel trail upslope from the IP Road. Investigate potential implementation of a cooperative agreement between Clark County, PacifiCorp, DNR, and private land owners to possibly construct, operate, and maintain the trail. Consider providing 2 rest areas/toilets at either end of Yale Lake along the trail route. Investigate ways to possibly increase management presence along the trail route by the Clark County Sheriff's Department and/or private security contractors. Investigate potential safety hazards due to user conflicts at times.

- Consider Formalizing Existing Trails and Routes to Develop a Lake Loop Trail. Consider preparing a trails plan that formalizes existing informal trails and routes with a goal to create a lake loop trail. This potential lake loop trail may include a trail route from Cresap Bay Campground (at Lake Merwin) to Saddle Dam, the Saddle Dam to Speelyai Canal trail, the SR 503/Lewis River Road route, and the IP Road. The plan should investigate implementation of a cooperative agreement between Clark County, Cowlitz County, PacifiCorp, DNR, and private land owners to construct, operate, and maintain the proposed trail loop. Investigate ways to possibly increase management presence along the trail route by the Clark and/or Cowlitz County Sheriff's Department(s), private security contractors, equestrian groups, and others.

- Consider Use of the Yale-Merwin Transmission Line ROW as a Trail Corridor. Consider investigating the potential for use of the transmission line ROW for use as part of a regional recreation trail for use by hikers, mountain bikers, and equestrians. Investigate implementation of a cooperative agreement between Clark County, PacifiCorp, DNR, and private land owners to construct, operate, and maintain the trail. Investigate ways to increase management presence along the trail route by the Clark County Sheriff's Department, equestrian groups, and others.

- Consider Providing ADA-Accessible Recreation Trails at Developed Sites. No ADA-accessible trails currently exist. As existing campgrounds and day-use areas are modernized or new ones are potentially developed, consider constructing and maintaining ADA-accessible recreation trails if practicable and feasible.

- Consider Implementing a Trail Sign Program. Consider providing signs for formalized trail routes at all PacifiCorp developed sites and in the town of Cougar to communicate trail opportunities to Yale Lake visitors.

5.3.1.7 Overall Fishing-related Needs

Overall fishing demand, supply, and capacity/suitability factors are presented below, followed by a discussion of overall needs. Fishing activity and facility needs analyzed in the study area include:

- Fishery management
- Access piers and docks
- Fish cleaning facilities

Fishing Demand Factors

Important fishing demand factors to consider are summarized below.

- Fishing is increasing in demand annually at 1.91 percent for boat angling and 1.67 percent for bank angling. Over 30 years, demand will increase 90 percent for boat angling and 76 percent for bank angling. The number of fishing licenses issued in the Cowlitz and Clark County areas exceeds the state average. About 57 percent of visitors come from these 2 counties.

- The maximum number of boat anglers observed at one time was 40. The maximum number of bank anglers observed was 10. Average counts are less.

- Over a third (37 percent) of visitors surveyed during May to September went fishing. More visitors went fishing early in the season (May [51 percent] and June [49 percent]) and late in the season (September [41 percent]) as compared to the middle of the season (July [34 percent] and August [29 percent]). For 10 percent of visitors surveyed, fishing was their main activity. Most of these respondents were surveyed at Yale Park.

- Most (89 percent) anglers surveyed were satisfied with their fishing experience (rated good or better); most (84 percent) felt that landing a fish was important, and most (53 percent) felt that proximity to another angler was important.

- Anglers used a variety of methods to catch fish: 40 percent of anglers surveyed were wading or bank fishing, 32 percent were boat and bank fishing, and 28 percent were boat fishing only (60 percent total used a boat).

Fishing Supply Factors

Important fishing supply factors to consider are summarized below.

- PacifiCorp, in cooperation with the USFS and WDFW, jointly provide an annual fishing derby at the Swift No. 2 power canal.

- There are no designated angler access piers or docks, no ADA-accessible fishing opportunities, and no fish cleaning facilities. Fishing is prohibited from boat docks, however, 1 dock at Cougar Park is used for this purpose.

- Most of the reservoir shoreline and river is fairly accessible. Only a few angler access trails have been developed by anglers as most fish are caught by boat.

- Launch wait times were generally low. Saddle Dam and Beaver Bay had longer wait times (fewer lanes).

- The fishery is managed by WDFW. Yale Lake is considered a very good kokanee fishery. Fish are managed under an agreement between PacifiCorp and the WDFW. Hatcheries are located in the Lewis River Valley, including the Merwin Project.

- Most fish caught are kokanee (73 percent), followed by rainbow trout (23 percent) and cutthroat trout (4 percent). The mean catch rate is 0.3 fish/hour. Most anglers are boat anglers. Boat anglers caught 96 percent of the kokanee landed, and 44 percent of the cutthroat and 23 percent of the rainbow trout.

Fishing Capacity/Suitability Factors

Important fishing capacity/suitability factors to consider are summarized below.

- The ILM Plan (WDFW 1995) goals seek to: (1) develop an integrated plan for cooperatively managing fish on a landscape basis for the next 20 years, (2) establish acceptable biological limits for recreation opportunities consistent with aquatic populations, (3) provide for fishing opportunities and access, (4) minimize recreation/fish conflicts, and (5) protect critical habitat areas.

- Boat anglers use the entire reservoir area, but tend to concentrate in areas away from boat launches where fewer boats are located, particularly the eastern shoreline (see Figure 2.3-4). Bank anglers have most of the 27-mile shoreline for fishing but tend to concentrate near creeks entering the reservoir, developed recreation sites, and day-use dispersed sites.

- Most anglers (85 percent) indicated that the pool level did not affect their fishing experience. This is to be expected since the survey was conducted mostly when the pool level was high.

Overall Fishing Needs Results

Based on review of all of these factors and indicators, potential actions to address overall fishing needs have been identified in the study area. It should be noted that these are not proposed PM&E measures. As such, the word "consider" is used in this section. Site-specific fishing needs are discussed in Section 5.3.2. Potential actions to address overall fishing needs include:

- Consider Continued Fishery Management Programs. Good recreational fishing opportunities currently exist. To meet future demand, continued and/or expanded fishery management programs will be needed to maintain and enhance the sport fishery.

- Consider Needs Identified Under Boating. As most anglers are boat anglers, consider needs identified under Boating.

- Consider Providing ADA-accessible Angler Access Piers. As older developed facilities are modernized or new sites are developed, consider constructing new shoreline angler access pier facilities if practicable and feasible per ADA guidelines.

5.3.1.8 Overall General Open Space Activity Needs

Overall general open space activity demand, supply, and capacity/suitability factors are presented below, followed by a discussion of overall needs. General open space activities analyzed include:

- Hunting
- Wildlife/nature observation
- Photography
- Food gathering/berry picking

General Open Space Activity Demand Factors

Important general open space activity demand factors to consider are summarized below.

- Open space lands surrounding Yale Lake receive relatively low levels of use because of steep topography, steep cut banks, and dense forest cover. These lands are owned and managed by PacifiCorp, DNR, and other private land owners.

- According to the IAC, annual increases in demand for related activities include: nature study/wildlife observation (2.67 percent), outdoor photography (2.94 percent), sightseeing and exploring (2.53 percent), big game hunting (1.53 percent), bow hunting (1.09 percent), and bird hunting (0.88 percent). Over 30 years, demand is projected to increase the following amounts: nature study/wildlife observation (145 percent), outdoor photography (168 percent), sightseeing and exploring (134 percent), big game hunting (68 percent), bow hunting (45 percent), and bird hunting (35 percent). In addition, the number of hunting licenses issued in the Cowlitz and Clark County areas exceeds the state average. The number of hunting licenses issued has increasing sharply in this area at 5 to 6 percent annually. About 57 percent of Yale Lake visitors surveyed came from these 2 counties.

General Open Space Activity Supply Factors

Most of the land in the study area is open space used for wildlife habitat, timber production, and hydropower production. Refer to the Land Use section of the draft License Application (PacifiCorp 1998) for further details. Hunting is allowed on some PacifiCorp lands, public lands, and private lands with permission.

General Open Space Activity Capacity/Suitability Factors

Important general open space activity capacity/suitability factors to consider are summarized below.

- One of the goals of the Siouxon Landscape Plan (DNR 1996) is to provide quality hunting opportunities and continued public access.

- Objectives of the ILM Plan (WDFW 1995) include, among others: (1) development of an integrated plan to cooperatively manage wildlife on a landscape basis for the next 20 years, (2) establishment of acceptable biological limits for recreation opportunities consistent with wildlife populations, (3) provision for hunting and fishing opportunities and access, (4) minimizing recreation/wildlife conflicts, and (5) protecting critical habitat areas as open space.

Overall General Open Space Activity Needs Results

Based on review of these factors and indicators, potential actions to address overall general open space activity needs have been identified in the study area. Site-specific general open space activity needs are discussed in Section 5.3.2. It should be noted that

these are not proposed PM&E measures. As such, the word "consider" is used in this section. These overall needs include:

- Consider Setting Aside Adequate Open Space Lands. An adequate supply of land for open space-related recreation activities appears to exist. As the area develops, the quantity and quality of open space will likely diminish. Consider planning for long-term retention of open space to meet future physical and visual recreation open space needs. Consider focusing development only in areas that are highly suitable for recreation development (see Figure 4.3-3).

5.3.2 Existing and Future Recreation Needs on a Site-by-Site Basis

Existing and future recreation needs on a site-by-site basis have been identified within the study area and are discussed below. It should be noted that these are not proposed PM&E measures. As such, the word "consider" is used in this section. These results are summarized in Table 5.3-1.

These needs are organized and presented by overnight campgrounds, day-use and boat launch sites, and trails and general open space activities. Each site or area is discussed below.

5.3.2.1 Overnight Campgrounds and Campsites

Beaver Bay Campground

A few minor improvements should be considered through 2000, including repairing playground equipment and repairing some picnic tables.

In the longer term, the Beaver Bay Campground is approaching capacity. To function better and to meet the needs of current and future visitors, renovation and modernization of this older campground will need to be considered in the future. A plan should be developed with the goal of improving the main circulation system, providing greater buffer between campsites and increasing the amount of vegetation, hardening gravel or paving the campsites, and renovating the 2 remaining older restrooms and drain fields as needed. ADA-accessible improvements should also be considered when renovating the campground where practicable and feasible. It is anticipated that a few campsites may be lost due to the redesign of the facility. Following renovation, approximately 60 well-designed campsites should be available to meet visitor needs through the term of the new license. Some of these campsites may be located near the shoreline if erosion is controlled and the main access road relocated.

Table 5.3-1. Existing and future recreation needs on a site-by-site basis in the Yale Lake study area, current to 2030.

Sites and Activities	Existing Needs		Projected Future Needs	
	Current	2000 to 2010	2010 to 2020	2020 to 2030
Overnight Campgrounds				
Beaver Bay	• Consider repairing playground equipment. • Consider repairing some campsite picnic tables.	• Consider possible renovation of the campground, focusing on the main circulation system, providing additional buffer and vegetation between campsites, and hardening and delineating sites - possibly reducing the # of sites, increasing the buffer area, and developing shoreline campsites again. • Consider renovating the remaining 2 older restrooms.	• Assumed to remain at about 60 campsites, less than the current level.	• Assumed to remain at about 60 campsites, less than the current level.
Cougar Camp (East Cougar)	• No action.	• Consider possible expansion of the campground toward SR 503 by a minimum of 15 new campsites. • Consider repairing the access road. • Consider renovating some of the campsites, including those along the shoreline.	• Assumed to remain at about 60 campsites, 15 more than the current level.	• Assumed to remain at 60 campsites, 15 more than the current level.
Cougar Park (West Cougar)	• No action.	• Consider possible expansion of existing facilities with approximately 25 new campsites to the west of the existing day-use site.	• Assumed to remain at about 25 campsites, 25 more than the current level.	• Assumed to remain at about 25 campsites, 25 more than the current level.

Table 5.3-1. Existing and future recreation needs on a site-by-site basis in the Yale Lake study area, current to 2030 (continued).

Sites and Activities	Existing Needs		Projected Future Needs	
	Current	2000 to 2010	2010 to 2020	2020 to 2030
Overnight Campgrounds (continued)				
Saddle Dam	• Determine if all or a portion of this site should remain open to the public. Assess options for reuse. • Consider repairing some of the picnic tables.	• Implement appropriate actions to address crowding, design, and on-site management problems. Redesign and/or reallocate use at this site.	• Continue to manage redesigned facility.	• Continue to manage redesigned facility.
New Potential PacifiCorp Campground	• No actions.	• No actions.	• Based on monitoring results, consider implementing a first phase of 30 campsites at a new 60-site campground, possibly south of Speelyai Canal.	• Based on monitoring results, consider implementing a second phase of 30 campsites at a new 60-site campground, possibly south of Speelyai Canal.
New Potential Campsites by Other Recreation Providers	• No action.	• Promote development of additional developed campsites in the Upper Lewis River Valley by others to accommodate Monument and GPNF visitors who travel along SR 503.	• Promote future campsite development by others as needed.	• Promote future campsite development by others as needed.
Group Campsites	• Consider hardening and regraveling the group site at Beaver Bay and Cougar Park.	• Consider constructing a 3rd group campsite.	• Consider constructing a 4th group campsite at a possible new campground.	• No actions.
Boat-in Dispersed Shoreline Campsites	• No action.	• Consider providing 10 new developed boat-in campsites.	• Consider providing 5 additional new developed boat-in campsites (total of 15).	• Consider providing 5 additional new developed boat-in campsites (total of 20).

Table 5.3-1. Existing and future recreation needs on a site-by-site basis in the Yale Lake study area, current to 2030 (continued).

Sites and Activities	Existing Needs		Projected Future Needs	
	Current	2000 to 2010	2010 to 2020	2020 to 2030
Overnight Campgrounds (continued)				
Boat-in Dispersed Shoreline Campsites (continued)		• Consider increasing Marine Patrol and other management presence along the shoreline as needed.	• Consider increasing Marine Patrol and other management presence along the shoreline as needed.	• Consider increasing Marine Patrol and other management presence along the shoreline as needed.
Overall Camping Program	• No action.	• Consider implementing a partial campsite reservation system (25-50%). • Consider implementing ADA-accessible improvements as older facilities are renovated and new ones are constructed. • Consider renovating the RV dump stations. • Consider implementing a new interpretive/ environmental education program at campgrounds.	• Consider monitoring the reservation system and adjusting as needed. • Consider implementing ADA-accessible improvements as older facilities are renovated and new ones are constructed.	• Consider monitoring the reservation system and adjusting as needed.
Day-Use and Boat Launch Sites				
Beaver Bay	• Consider repairing and stabilizing the side slopes at the boat launch. • Consider modifying or berming the day-use parking lot or diverting water from the wetland around the parking area.	• Consider repairing or replacing the main road (per new plan). • Consider replacing the dock.	• No action.	• No action.

Table 5.3-1. Existing and future recreation needs on a site-by-site basis in the Yale Lake study area, current to 2030 (continued).

Sites and Activities	Existing Needs		Projected Future Needs	
	Current	2000 to 2010	2010 to 2020	2020 to 2030
Day-Use and Boat Launch Sites (continued)				
Cougar Camp (Boat Launch)	• Consider lengthening the boat ramp, increasing maintenance, and regraveling the parking lot.	• Consider formalizing the parking area at the boat launch to improve efficiency. • Consider replacing the dock.	• No action.	• No action.
Cougar Park	• Consider renovating the pathway and foot bridge between Cougar Camp and Cougar Park. • Consider repairing gravel parking areas and road. • Consider constructing a fee collection station.	• Consider upgrading facilities for Ranger campfire talks and other educational or group opportunities.	• No action.	• No action.
Yale Park	• Consider lengthening at least 1 lane of the boat ramp and increasing low pool maintenance. • Consider formalizing the parking area to improve efficiency, expand to the west if feasible. • Consider constructing a fee collection station.	• Consider replacing the docks.	• No action.	• No action.
Saddle Dam	• Determine if all or a portion of this site should remain open to the public. Assess options for reuse.	• Implement appropriate actions to address crowding, design, and on-site management problems. Redesign and/or reallocate use at this site.	• No action.	• No action.

Table 5.3-1. Existing and future recreation needs on a site-by-site basis in the Yale Lake study area, current to 2030 (continued).

Sites and Activities	Existing Needs		Projected Future Needs	
	Current	2000 to 2010	2010 to 2020	2020 to 2030
Day-Use and Boat Launch Sites (continued)				
Potential New Day-Use Site	• No action.	• No action.	• Consider constructing a new day-use site at a potential new campground with a swim area and beach, picnic area (min. 12 sites), and boat launch (min. 2 to 3 ramp lanes and parking for approx. 170 vehicles, plus overflow).	• No action.
Dispersed Shoreline Day-Use Sites	• No action.	• Consider providing 5 dispersed boat-in shoreline day-use picnic sites and placing up to 2 floating restrooms on barges near main dispensed sites. • Consider increasing the Marine Patrol and other management presence along the shoreline as needed.	• Consider providing 3 additional dispersed boat-in shoreline day-use picnic sites (total of 8). • Consider increasing the Marine Patrol and other management presence along the shoreline as needed.	• Consider providing 2 additional developed dispersed boat-in shoreline day-use picnic sites (total of 10). • Consider increasing the Marine Patrol and other management presence along the shoreline as needed.
Overall Day-Use Area Program	• No action.	• Consider implementing a new interpretive and informational sign program at all day-use areas. • Consider implementing ADA-accessible improvements as older facilities are renovated and new ones are constructed.	• Consider implementing ADA-accessible improvements as older facilities are renovated and new ones are constructed.	• No actions.

Table 5.3-1. Existing and future recreation needs on a site-by-site basis in the Yale Lake study area, current to 2030 (continued).

Sites and Activities	Existing Needs		Projected Future Needs	
	Current	2000 to 2010	2010 to 2020	2020 to 2030
Day-Use and Boat Launch Sites (continued)				
Trails and General Open Space Activities	• Consider investigating the potential use of the IP Road (or parallel trail upslope) as a trail corridor and the Yale-Merwin T-line ROW as a trail corridor. • Consider developing a lake loop trails plan formalizing many of the existing trails into a loop system including: IP Road, SR 503, Cresap Bay to Saddle Dam route, and Saddle Dam to Speelyai Canal trail. • Consider developing bull trout identification and information signs, and locating them at appropriate sites, such as Cougar Creek.	• Consider implementing the lake loop trails plan. • Consider providing ADA-accessible recreation trails and fishing access piers at developed sites as they are renovated. • Consider implementing a trail sign program as trails are developed. • Consider constructing a self-guided nature trail at the Beaver Bay wetland. • Consider setting aside adequate recreation open space for future needs.	• Consider providing ADA-accessible recreation trails and fishing access piers at developed sites as they are renovated.	• No actions.

Cougar Camp

The Cougar Camp campground (referred to as East Cougar) is realistically at capacity now. As a result, consideration should be given to expanding the campground to the north toward SR 503. A suitable expansion area is available for another loop in this area. Renovation of some of the existing campsites should be considered, focusing on the shoreline campsites and erosion control. ADA-accessible improvements should also be considered when renovating the campground if practicable and feasible. The possible 15 new campsites and the renovation would be constructed between 2000 and 2010. In addition, the entry road should be repaired. Following possible expansion and renovation, approximately 60 well-designed campsites should be available to meet visitor needs through the term of the new license.

Cougar Park

To meet the need for developed camping facilities through 2010, consideration should be given to possibly constructing a campground expansion of approximately 25 developed fee campsites (no hookups) adjacent to and west of Cougar Park in a currently undeveloped area, referred to as West Cougar. This potential new campground expansion would be designed with ADA-accessible facilities and be constructed between 2000 and 2010.

Saddle Dam Campground

This camping facility has been experiencing capacity, design, and on-site management problems and was temporarily closed by PacifiCorp in 1998. It is scheduled to be reopened in 1999. Consideration should be given to rethinking its use, with the potential that the facility be modified. Lost campsites could potentially be rebuilt at Cougar Camp. A plan should be developed in the near future to direct future actions at this constrained site.

New Potential PacifiCorp Campground

To meet future demand, a totally new campground should be considered at Yale Lake in the out years based on monitoring threshold criteria being met. A 2-phase program may be considered, with 30 campsites built during 2010 to 2020 and a second phase of 30 campsites constructed during 2020 and 2030. It is envisioned that this campground would also have a day-use area with swimming area, sandy beach, boat launch, and group campsite. In Figure 4.3-3, 2 sites with adequate size appear promising for siting this potential new campground: north of Cooney Point and south of Speelyai Canal. The site south of Speelyai Canal appears to be superior because of its size, this portion of the lake would not likely become congested with boats in the future, the land is owned by PacifiCorp, and the site has a long shoreline area. Access would be gained along the Speelyai Canal corridor to the site (see Figure 4.3-3). Approximately 60 new developed fee campsites (no hookups) may be considered at this location. The campground could be designed and operated to be compatible with wildlife needs, similar to Cresap Bay Campground at Lake Merwin.

New Campsites by Others

To satisfy the projected future demand for campsites at Yale Lake and to accommodate future visitors who travel the SR 503 corridor (and whose primary destination is the Monument and/or GPNF), other recreation providers should consider constructing and operating additional campsites in the Upper Lewis River Valley. Approximately 60 additional campsites should be considered in the out years. The Comprehensive Management Plan for Mount St. Helens National Volcanic Monument (USFS 1985) specifies that development of campgrounds on the south side of the Monument be provided by commercial private interests. The USFS does not have any plans to develop any new campgrounds in the watershed (letter from Gloria D. Brown, Monument Manager, to PacifiCorp, February 27, 1998).

Group Campsites

Group reservation campsites are approaching full capacity. Consideration should be given to constructing 2 additional group campsites for a total of 4. A possible alternative is to add a group campsite at a potential new campground, possibly south of Speelyai Canal. In the near term, the 2 existing group campsites should be hardened and regraveled at Beaver Bay and Cougar Park.

Boat-in Developed Dispersed Shoreline Campsites

Dispersed camping along the shoreline at many of the existing 67 dispersed sites appears to have reached capacity because of observed ecological impacts. Consideration should be given to increasing shoreline management to help minimize ongoing impacts. Approximately 20 future developed boat-in dispersed campsites are envisioned to be phased between 2000 and 2030. Each site could have a picnic table and fire ring, but no water. Sites could be clustered in appropriate areas, such as the Siouxon Flats area, where centralized toilet facilities could be provided on land.

Overall Camping Program

Several actions may be considered at all campgrounds. Support has been expressed for a partial (not full) campsite reservation system. Consideration should be given to testing and implementing an expanded system starting around 2000 (i.e., 25 to 50 percent of sites). Consideration should be given to implementing an interpretive/environmental education program at all developed campgrounds. Additional ADA-accessible facilities should be considered for all new facilities and older ones as they are renovated if practicable and feasible. RV dump stations should be considered for renovation as well. Alternatives for partnering with other recreation providers to operate existing and/or future recreation facilities may be considered.

5.3.2.2 Day-Use and Boat Launch Sites

Beaver Bay Day-Use Area and Boat Launch

In the near future, the shoreline should be stabilized at the boat launch and the parking area should be modified or bermed and the runoff rerouted from the wetland around the parking lot. From 2000 to 2010, the main road should be repaired or rerouted (per a new plan) and the boat dock replaced.

Cougar Camp Boat Launch

In the near future, the boat ramp should be lengthened to accommodate the 480 feet msl pool level and the parking area should be regraveled. After 2000, consideration should be given to increasing the efficiency of the parking area and replacing the boat dock.

Cougar Park Day-Use Area

At Cougar Park, in the near future, the pathway and foot bridge between Cougar Park and Cougar Camp and the gravel parking area should be repaired. A fee station needs to be

constructed as new day-use fees are planned to go in effect in 1999. After 2000, improved facilities for Ranger talks or other group interpretation should be considered. The drain field of the restroom facility should also be repaired as needed.

Yale Park Day-Use Area and Boat Launch

At Yale Park, consideration should be given to lengthening at least 1 lane of the boat ramp (due to a boulder obstruction) to accommodate lower pool levels (460 feet msl pool) and constructing a fee station since day-use fees are planned to go in effect in 1999. In addition, the gravel parking area should be redesigned to be more efficient and expanded to the west. Beyond 2000 the boat docks should be replaced.

Saddle Dam Day-Use Area and Boat Launch

Refer to the previous discussion about Saddle Dam. This small site becomes heavily congested at times and has longer launch wait times. PacifiCorp temporarily closed this site in 1998, but is planning on reopening it in 1999. Consideration should be given to various management and/or design alternatives. Appropriate actions should be taken in the near future.

Potential New Day-Use Site

A possible new day-use site should be considered at a new potential campground. The day-use site would include a swim area and sandy beach, a picnic area with a minimum of 12 sites, and a boat launch. The boat launch should be designed for a typical summer weekend. The launch site would require about 170 new parking spaces for boating use and a new launch site with 2 to 3 ramp lanes. For Regatta days, overflow capacity for an additional 100 vehicles with trailers may possibly be considered. This potential new day-use site should be constructed between 2010 and 2020.

Dispersed Shoreline Day-Use Sites

Consideration should be given to providing approximately 10 dispersed boat-in day-use sites for picnicking to be phased in between 2000 and 2030. These sites should have picnic tables and fire rings, but no water or toilets. Up to 2 floating restrooms on barges should be considered and placed on the lake at or near Siouxon Flats and at Siouxon Creek Arm near the bridge. Day-use sites should be clustered for efficiency and to minimize impacts. Additional management presence, such as the Clark County Sheriff's Department Marine Patrol, should be phased in as needed over a 30-year period.

Overall Day-Use Area Program

Few opportunities currently exist to meet existing and future demand for interpretive and environmental education programs. Consider a new cooperative program with the USFS, WDFW, and/or DNR to provide additional Ranger campfire talks, as well as new interpretive displays and kiosks, new nature trails and literature, and other programs. Interpret the hydroelectric project through displays and talks.

Consider providing additional ADA-accessible facilities as older day-use facilities are renovated and new ones are constructed. Also consider providing a new angler access facility per ADA guidelines, such as a fishing pier.

5.3.2.3 Trails and General Open Space Activities

Yale Lake does not have any designated developed trail facilities to help satisfy increasing demand for trail-related activities. Few opportunities exist to help meet demand, satisfy management objectives, and meet ADA guidelines. As a result, development of a trails plan should be considered. In the trails plan, consider providing possible new trail opportunities, such as: (1) new ADA-accessible fishing piers and trails at developed sites; (2) investigating non-motorized recreation trail use of the IP Road and securing a recreation easement (or developing a parallel trail upslope); (3) investigating the potential of a designated lake loop trail that may include a trail from Cresap Bay to Saddle Dam, Saddle Dam to Speelyai Canal, portions of SR 503, and the IP Road; (4) development of potential self-guided nature trail at the Beaver Bay wetland and a sign at Cougar Creek; (5) providing adequate trail signs where needed; (6) investigating potential trail use of the Yale-Merwin transmission line ROW; and (7) providing a trail from the town of Cougar to Cougar Park/Camp.

An adequate supply of land for other open space-related recreation activities appears to currently exist; however, as the valley becomes more and more developed in the future, open space quality and quantity will diminish. Consider planning for long-term retention of open space to meet future physical and visual recreation needs. Focus new or expanded development only in areas that are highly suitable for recreation development (see Figure 4.3-3). Preserve other open space as appropriate, including multiple use.

Good recreational sport fishing opportunities currently exist. Continued fishery management programs are needed to maintain or enhance the fishing experience as demand increases in the future. As most anglers are boat anglers; therefore, also consider boating-related actions listed above.

5.3.3 Project-Related Recreation Needs

This section identifies those needs in the study area that are project-related from the list of total existing and future needs previously presented in Section 5.3.2. Criteria used to identify project-related needs include: (1) proximity to the project features, and (2) direct project cause (see Section 5.2.3). These 2 criteria are discussed below.

5.3.3.1 Proximity to Project Features

For recreation needs to be project-related, they should be in proximity to project features. Project features include lands within the FERC project boundary, the reservoir, the 2 dams, Speelyai Canal, the Yale-Merwin transmission line ROW, the powerhouse, project access roads, and PacifiCorp's 5 developed recreation facilities. Existing and future needs listed in Table 5.3-1 fall within this criterion; however, some trail corridors outside of this area would not be considered project-related. Some of these trail corridors or segments would be the responsibility of adjoining property owners and federal and state

land management agencies. Other potential needs (listed previously or not) that are not considered project-related include needs related to hunting, snow-related activities, caving, rock climbing, hang gliding, and visitation to non-project regional attractions, such as the Monument and GPNF.

5.3.3.2 Direct Project Cause

Recreation demand in the Upper Lewis River Valley is dynamic with multiple destinations and attractions available to visitors. The Monument, an international attraction to the north, is a significant recreation area with visitation increasing 5 to 6 percent annually on both sides (north and south) of the volcano. Numbers of visitors driving "the loop" around the volcano are increasing as new interpretive centers are opened to the north and east and as new roads are constructed. Nearby Ape Cave and Lava Canyon are particularly noteworthy attractions. The GPNF is also a significant visitor destination. Visitors in the valley also travel between the 3 Lewis River reservoirs. Many (45 percent) visitors staying at Yale Lake facilities had plans to visit or had already visited other locations during their trip. Of these mobile visitors, primary destinations include the Monument (34 percent), GPNF (15 percent), Lake Merwin (19 percent), Swift Reservoir (17 percent), and other (15 percent). About 1 out of 5 (22 percent) visitors surveyed at Yale Lake (49 percent of 45 percent) indicated that their primary destination was the Monument or GPNF.

As a result, approximately 22 percent (as noted above) of existing and future camping demand can be attributed to the attraction of the Monument and GPNF and not due to the attraction of Yale Lake or the other PacifiCorp reservoirs. Since the USFS does not provide developed camping facilities along the SR 503 corridor near Yale Lake, Monument and GPNF visitors, particularly those driving the loop, must sometimes use PacifiCorp campgrounds, thereby reducing the facility capacity available to visitors whose primary destination is Yale Lake.

To account for the ongoing and future impacts of Monument and GPNF visitors on PacifiCorp developed facilities, a new 60-site developed campground should be considered as a means to help satisfy federal land-related demand in the Upper Lewis River Valley. Rest-stop use may also be attributed to visitors going to and from the Monument along SR 503; however, such use has not been a significant impact to date. Evaluation of need by PacifiCorp, agencies, and interested parties should consider this 78/22 split in future discussions and negotiations.

Alternatively, USFS staff have indicated that Yale Lake visitors may camp within the Monument or GPNF, particularly when Yale Lake campgrounds are full during peak use times. Additional surveys are being conducted by PacifiCorp in 1998 and 1999 to further address this issue. The results of these surveys will be presented in future reports.

6.0 LITERATURE CITED

Clark County. 1992a. Clark County Open Space Commission - Final Report. Clark County, Washington. August 1992.

Clark County. 1992b. Clark County Trails and Bikeway System Plan. Clark County, Washington. December 1992.

Clark County. 1994a. Clark County 20-Year Comprehensive Growth Management Plan. December, 1994.

Clark County. 1994b. Clark County Parks, Recreation, and Open Space Plan. Clark County, Washington. June 1994.

Cowlitz County. 1977. Shoreline Management Master Program.

Cowlitz County. 1981. Cowlitz County Comprehensive Plan. Kelso, Washington. May 1981.

Cowlitz County. 1994. Cowlitz County Comprehensive Park Plan. Prepared by the Cowlitz County Park and Recreation Advisory Board. Cowlitz County, Washington.

DNR (Washington State Department of Natural Resources). 1996. Siouxon Landscape Plan. Objectives and Summary. Southwest Region. Olympia, Washington. September 1996.

IAC (Interagency Committee for Outdoor Recreation). 1990. Washington Outdoors: Assessment and Policy Plan (1990-1995). An Element of Washington's SCORP Program. Tumwater, Washington. April 1990.

IAC. 1995. State of Washington Outdoor Recreation and Habitat Assessment and Policy Plan (1995-2001). A Washington SCORP document. 1995. Tumwater, Washington.

Lewis River Action Committee. 1995. Lewis River Valley Strategic Action Plan. Prepared for the Lewis River Action Committee by E.D. Hovee and Company. Vancouver, Washington. July 1995.

PacifiCorp. 1990. Merwin Wildlife Habitat Management Program. Standard Operating Procedures. Portland, Oregon.

PacifiCorp. 1992. ADA Evaluation and Transitional Plan for Lewis River Recreation Area - Pacific Power. Prepared for PacifiCorp by Access Opportunities. Portland, Oregon. December 1992.

PacifiCorp. 1996. First Stage Consultation Document. Yale Hydroelectric Project, FERC Project No. 2071. Portland, Oregon. May 1996.

PacifiCorp. 1997a. Interim Technical Report (ITR). Yale Hydroelectric Project, FERC Project No. 2071. Portland, Oregon.

PacifiCorp. 1997b. Final Technical Report (FTR) for Aquatic Resources. Yale Hydroelectric Project, FERC Project No. 2071. Portland, Oregon.

PacifiCorp. 1998. Draft Application for New License for Major Project, Volume II, Exhibit E. Yale Hydroelectric Project, FERC Project No. 2071. Portland, Oregon.

PLAE. 1993. Universal Access to Outdoor Recreation - A Design Guide. Prepared by PLAE, Inc. in conjunction with other public and private partners, including the Forest Service. Berkeley, California.

Shelby, B., and T.A. Heberlein. 1986. Carrying Capacity in Recreational Settings. Oregon State University Press. Corvallis, Oregon.

Skamania County. 1977. Comprehensive Plan A. County Planning Commission. Stevenson, Washington. July 11, 1977 as amended.

Skamania County. 1986. Shoreline Management Master Program. Stevenson, Washington.

Skamania County. 1991. Parks and Recreation Comprehensive Plan: 1991-1997. An Element of the Skamania County Comprehensive Planning Program. Skamania County.

U.S. Bureau of the Census. 1992. Census of Housing and Population: 1990.

USFS (U.S. Forest Service) and CRCG (Columbia River Gorge Commission). 1992. Management Plan for the Columbia River Gorge National Scenic Area. CRGC, White Salmon, Washington and USDA Forest Service, Hood River, Oregon.

USFS. 1985. Mount St. Helens National Volcanic Monument - Final Environmental Impact Statement - Comprehensive Management Plan. USDA Forest Service, Gifford Pinchot National Forest, Vancouver, Washington.

USFS. 1990. Final Environmental Impact Statement, Land and Resource Management Plan and Appendices. Gifford Pinchot National Forest. U.S. Department of Agriculture, Pacific Northwest Region. Vancouver, Washington.

WDFW (Washington Department of Fish and Wildlife). 1995. Integrated Landscape Management for Fish and Wildlife - An Integrated Plan for Managing Fish and Wildlife. Pilot Project in the Lewis-Kalama River Watershed, WRIA#27. Includes Recreation Plan. Prepared by the ILM Core Team, WDFW, Olympia, Washington. September 14, 1995.