IDAHO COMPREHENSIVE STATE WATER PLAN

North Fork Clearwater Basin

Idaho Water Resource Board

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BEFORE THE WATER RESOURCE BOARD
OF THE STATE OF IDAHO

IN THE MATTER OF THE NORTH FORK CLEARWATER BASIN COMPONENT OF THE COMPREHENSIVE STATE WATER PLAN	))))	A RESOLUTION

WHEREAS, the Board, pursuant to its planning authorities in 42-1734A and 42-1734B, Idaho Code, has developed a Comprehensive State Water Plan for the North Fork Clearwater Basin; and

WHEREAS, the Board is directed to identify goals and objectives, as well as make recommendations for improving, developing or conserving the water resources of the planning area; and

WHEREAS, the Board as part of its planning process is authorized to designate protected river reaches as "natural" or "recreational" and to prohibit certain activities within the stream bed; and

WHEREAS, the Board has sought and received substantial public participation throughout the planning process for the North Fork Clearwater Basin component of the Comprehensive State Water Plan.

NOW, THEREFORE, BE IT RESOLVED that, having considered the draft plan and the public comment received, the Board hereby adopts the Comprehensive State Water Plan - North Fork Clearwater Basin, containing Board actions designating certain protected river reaches and stating the water policies and related management recommendations of the Board for this component of the Comprehensive State Water Plan.

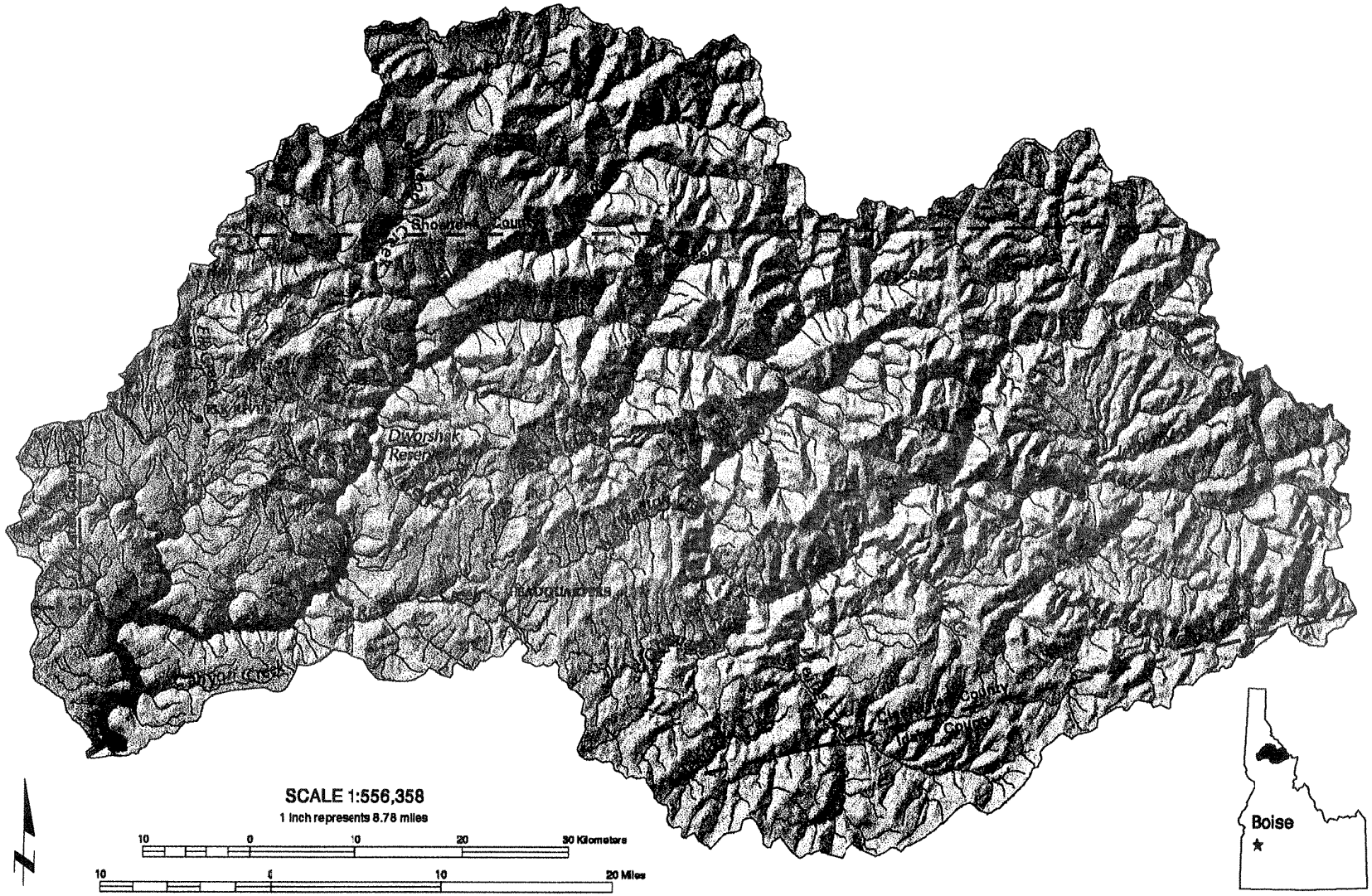
PASSED AND APPROVED January 12, 1996.

CLARENCE PARR, Chairman

ATTEST:

J. DAVID ERICKSON, Secretary

North Fork Clearwater Basin



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EXECUTIVE SUMMARY

The Idaho Water Resource Board prepared this component of the Comprehensive State Water Plan for the North Fork Clearwater River Basin. The purpose of this plan is to provide guidance for the development, management, and protection of water and related resources in the North Fork Clearwater River Basin in compliance with provisions of the Idaho State Constitution and Idaho State Code. This document describes and evaluates the water resources and related economic, cultural, and natural resources of the basin. It recognizes past actions, addresses present issues and opportunities, and seeks to ensure that uses of the water will complement state goals of achieving a high quality of life in Idaho.

The North Fork Clearwater River Basin, from its headwaters in the Bitterroot Mountains on the Idaho-Montana border to its western boundary at the confluence with the main Clearwater River below Orofino, encompasses 1,575,445 acres, or approximately 2462 square miles. The basin includes a large portion of Clearwater County and smaller portions of Shoshone County to the north, Latah County to the west, and Idaho County to the south. Above Dworshak Reservoir, the basin is predominantly public land managed by the U.S. Forest Service (90%), with private property making up the remainder. The lower portion is a fairly even mix of private, federally managed, and state owned land.

Timber is the predominant land use and industry in the basin; recreation is a major use and a growing industry. Elk River is the only incorporated town in the basin, with a population of 149 in 1992 (Fig. 1). Orofino, the largest town in the immediate vicinity with a population of 2868 (1990), is just outside the basin.

Water quality throughout the basin is generally considered excellent, but local residents are concerned about the potential for degradation. Certain beneficial uses, such as coldwater biota and primary contact recreation, are not fully supported on all or portions of Dworshak Reservoir, North Fork Clearwater River, Long Meadow, Elk, Cranberry, Swamp, Beaver, Skull, Quartz, Meadow, and Vanderbilt Gulch creeks. Logging activities in certain watersheds, such as Elk Creek, frequently degrade water quality, primarily by excessive erosion and silt deposition.

The amount and schedule of releases from Dworshak Reservoir have become a major concern in the basin due to drought and the drawdown of the reservoir for salmon flushes. Currently, water uses in the basin are largely nonconsumptive (e.g., flow augmentation for fish, power generation, flood control, and recreation), so virtually all the average annual runoff remains in the stream. Originally, power generation at Dworshak (3.4 million AF/annum) constituted the largest use of water. Releases for flow augmentation now exceed releases based on power demand. Water claims for fish and wildlife and channel maintenance, filed by the federal government, Nez Perce, and Shoshone-Bannock Tribes in the Snake River Adjudication, comprise the largest water right claims (4.0 million acre-feet/annum) in the basin.

Local residents recognize that healthy ecosystems and watersheds are critical to sustaining natural resources and a viable economy, but disagreement has arisen between

public and private sectors as to how this goal can be achieved. The future of the basin and its resources hinges on cooperation among the public land management agencies, private corporations, and the citizenry.

Many locals believe that the area economy, while shifting from strictly timber to timber and recreation-based, has indirectly suffered because of the Endangered Species Act's effects on the industry and legal challenges to the Clearwater Forest Plan's proposed yields. The locals also feel that the shift toward a more recreation-based economy has been hampered by Dworshak Reservoir drawdowns, which have resulted in a reduced usage of the reservoir. According to studies, reduced water levels have adversely impacted recreational opportunities, thereby drastically depressing regional revenues. Consequently, there is genuine concern by the local citizens about ensuring economic viability and sustainability in this time of transition.

New development options regarding water use in the basin were not raised at public meetings. Improvement opportunities focused on options to protect stream water quality. Goals and objectives support continued use of the basin's natural resources for long-term sustainable timber harvest and outdoor recreation. The Board promotes critical fish and wildlife habitat protection, management and monitoring programs to maintain and enhance water quality in the basin, and encourages local land use planning to foster orderly development and preserve the basin's outstanding natural resources.

State law provides that the Comprehensive State Water Plan may not adversely impact existing water rights and uses, timber harvest, stockwater use, or other vested rights. A river reach is designated to protect the waterway from disturbances that are not in the public interest. Vested private property rights outside the riparian area (within 100 linear feet of the mean high water mark) are not impacted by this plan because the designated reaches cannot extend beyond the riparian waterway.

A waterway that has been given a protection designation can impact specific future non-vested activities, such as mining, that occur within the streambed. In addition to designations, the Board can also make recommendations regarding public and private activities that occur within the riparian area and the entire watershed that may directly or indirectly affect the streambed.

Plan Actions

Interest in maintaining the primitive character and aesthetic quality of the basin, preserving valuable fish and wildlife habitat in the basin rivers and streams, and maximizing recreational opportunities, led to protected river designations on basin rivers and streams. Waterways within the North Fork Clearwater Basin designated as a State Natural or Recreational River are listed in Table 1 and shown in Figure 1. Natural River designation prohibits the following activities within the streambed [Idaho Code 1734A-5]:

- construction or expansion of dams or impoundments;
- construction of hydropower projects;
- construction of water diversion works;
- dredge or placer mining;
- alteration of the streambed, and
- mineral or sand and gravel extraction within the streambed.

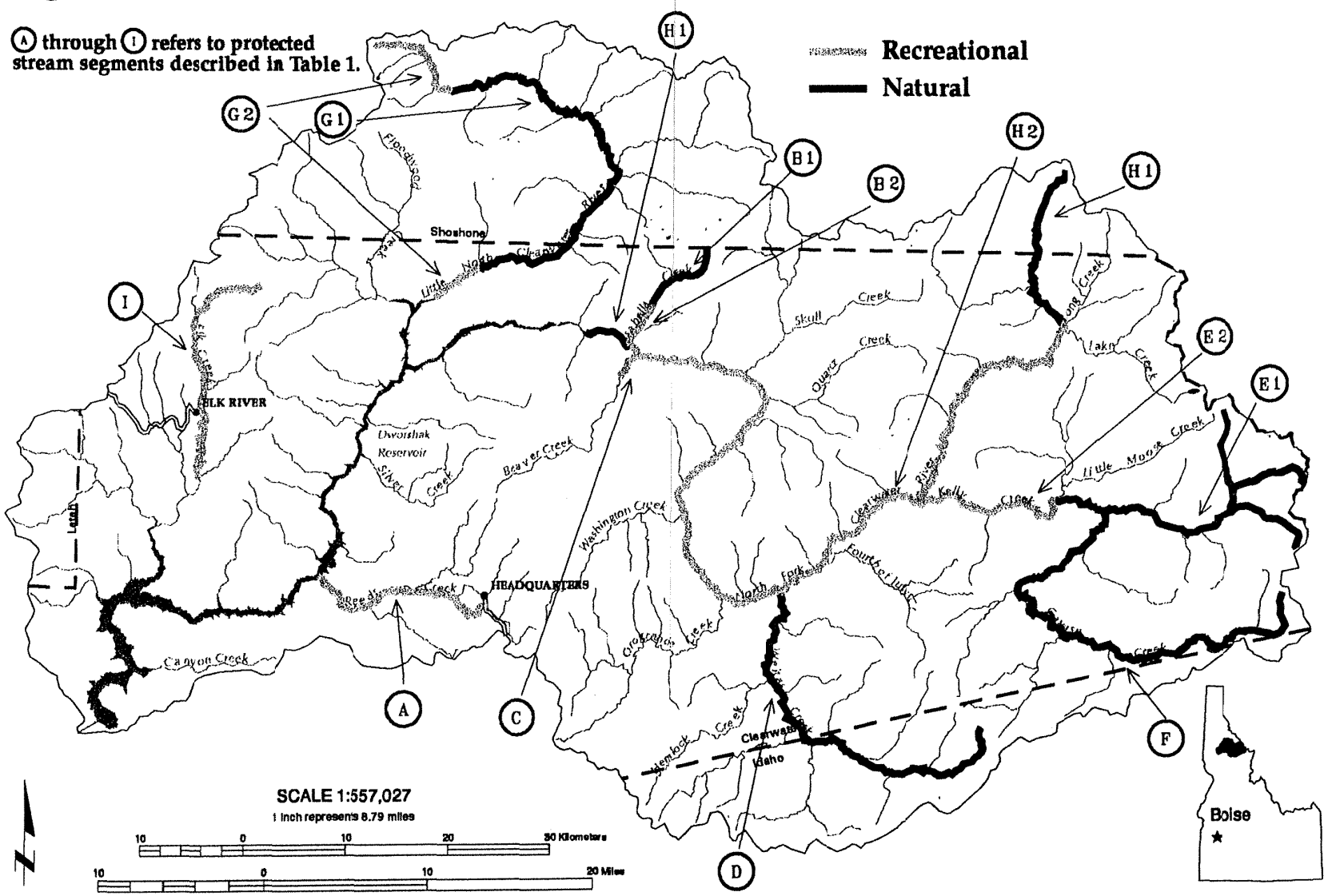
In designating a Recreational River, the Board determines which of the activities listed above will be prohibited and may specify the terms and conditions under which activities that are not prohibited may go forward [Idaho Code Section 42-1734A-6].

Table 1. State Protected River Designations — North Fork Clearwater Basin (see accompanying Fig 1).

ID No.	River Reach	Length (miles)	Values	Designation	Conditions
B1	Isabella Creek (headwaters to Black Creek	5.4	Species of Concern Salmonid Spawning Recreation Use Scenic Area	Natural River	***Prohibits —*** Construction or expansion of: dams or impoundments, hydropower projects, or water diversion works; new dredge or placer mining; new mineral or sand and gravel extraction within the stream bed; stream bed alteration.
D	Weitas Creek (headwaters to mouth)	27.7	Species of Concern Salmonid Spawning Scenic Area	Natural River	Same as above
E1	Kelly Creek (headwaters to Moose Creek)	31.6	Species of Concern Salmonid Spawning Recreation Use Scenic Area	Natural River	Same as above
F	Cayuse Creek (headwaters to mouth)	34.9	Same as above	Natural River	Same as above
G1	Little North Fork Clearwater River (Meadow Creek to Cedar Creek)	28.6	Species of Concern Boating Opportunity Scenic Area	Natural River	Same as above
H1	North Fork Clearwater River (headwaters to Wrangle Creek and from Isabella Creek to the backwaters of Dworshak Reservoir (Thompson Creek)	15.0	Species of Concern Scenic Area	Natural River	Same as above
A	Reeds Creek (Calhoun Creek to mouth)	13.5	Species of Concern Salmonid Spawning Scenic Area	Recreational River	Same as above **except:** allows for alteration of the stream bed for maintenance and construction of bridges and culverts, and installation of fisheries enhancement structures.
B2	Isabella Creek (Black Creek to mouth)	3.1	Same as above	Recreational River	Same as above
C	Beaver Creek (Charlie Creek to mouth)	1.8	Same as above	Recreational River	Same as above

ID No.	River Reach	Length (miles)	Values	Designation	Conditions
E2	Kelly Creek (Moose Creek to mouth)	11.0	Species of Concern Salmonid Spawning Recreation Use Scenic Area	Recreational River	Same as above
G2	Little North Fork Clearwater River (Headwaters to Meadow Creek and Cedar Creek to backwaters of Dworshak Reservoir at Meadows Creek)	11.2	Species of Concern Salmonid Spawning Boating opportunity Scenic Area	Recreational River	Same as above
I	Elk Creek (headwaters to Deep Creek)	17.5	Recreational Use	Recreational River	Same as above
H2	North Fork Clearwater River (Wrangle Creek to Isabella Creek)	64.0	Species of Concern Boating Opportunity Scenic Area Geological Features Boating opportunity	Recreational River	Same as above **except**: allows for recreational dredge mining as regulated by the Idaho Departments of Lands and Water Resources.

Figure 1. State Protected Rivers



Recreational River designations allow for the Board to specify the terms and conditions under which activities such as streambed alteration for construction and maintenance of bridges and culverts; cleaning, maintenance, and replacement of water diversion works; installation of fisheries enhancement structures; and mineral or sand and gravel extraction can proceed (see Table 1).

The Federal Revised Statute 2477 was originally enacted under the 1866 Mining Act to grant rights-of-way for constructing highways across unreserved public land. The State of Idaho [Idaho Code, Sections 40-107 and 40-204A,] has attempted to define and perhaps expand the scope of allowable claims under the federal law to include waterways, which were not within the original language of the federal statute. Furthermore, because the reach of R.S. 2477 claims are limited to rights-of-way across federal lands, there is little opportunity that issues considered under the CSWP will cause an impact on potential rights-of-way for highways. The Board will consider the State's needs if and when rights-of-way have been adjudicated.

The Idaho Water Resource Board, after consultation with local and state officials, and an ad hoc committee appointed by the Governor, have developed new state water policies governing the operation of Dworshak Reservoir. The policies address several key elements, with the main emphasis on a more balanced management of the Project. Dworshak needs to be operated at full summer pool. During the spring and fall, the outflows should be managed for optimal benefit to the B-run steelhead. Consideration will be given to establishing a committee of state and local representatives, in consultation with the CoE, to develop a managment plan for the Dworshak Project.

The Board has authority to plan for the water resources of the basin and, consequently, has concerns about impacts to that water, both direct and indirect. Because of this, the Board makes specific management recommendations, enumerated in Section VI of the plan, to private and public entities managing natural resources in the basin. These recommendations are intended to encourage agencies such as Idaho Department of Lands, Idaho Department of Fish and Game, Division of Environmental Quality, U.S. Forest Service, U.S. Fish and Wildlife Service, and the Corps of Engineers to implement, strengthen, or develop practices and programs to ensure the attainment of the goals of this plan.

The Board will pursue a new information and education program in the basin in conjunction with the U.S. Forest Service and the Corps of Engineers (CoE) to inform the public about the North Fork Clearwater River Basin, its values, and the Comprehensive State Water Plan.

The Board recommends certain modifications, detailed in Section VI, to the Northwest Power Planning Council's protected areas designations, and further seeks to protect water quality by requesting monitoring efforts, urging strict adherence to Best Management Practices, and through public education.

Board recommendations in Section VI support water quality, optimizing water quantity to benefit all users, ecologic health, and a viable, sustainable economy.

I. INTRODUCTION

The Idaho Water Resource Board is a constitutional agency responsible for developing a plan for the State's water resources (Article XV, Section 7 of the Idaho Constitution). Legislation in 1988 redirected planning efforts by providing for the development of a "comprehensive state water plan" based upon river basins or other geographic considerations. Each basin or waterway plan becomes a component of the State Water Plan.

The North Fork Clearwater Basin plan examines existing and planned resource use in the basin, and discusses the goals, objectives, and recommendations of the Board concerning improving, developing, and conserving water resources in the public interest. Plans must consider:

-Navigation;
-Power Development;
-Energy Conservation;
-Fish and Wildlife;
-Recreational Opportunities;
-Irrigation;
-Flood Control;
-Water Supply;
-Timber;
-Mining;
-Livestock Watering;
-Scenic Values;
-Natural or Cultural Features;
-Domestic, Municipal, Commercial, or Industrial Uses; and
-Other Aspects of Environmental Quality and Economic Development.

The 1988 legislation authorized the Water Resource Board to preserve highly-valued waterways as state protected rivers. If the Board decides that the values of preserving a waterway in its existing condition outweigh the values of continued development, it can, subject to legislative approval, designate that waterway either a Natural or a Recreational River to protect existing values and resources.

Because public concerns, values, and demands change over time, the Comprehensive State Water Plan must be reevaluated and may be amended. The Board will review and reevaluate the Comprehensive State Water Plan at least every five years [Idaho Code 42-1734B(7)].

Planning Process

The planning process encompasses five steps: (1) developing an inventory of resource attributes, (2) assessing current and potential water uses and constraints, (3) identifying local issues, concerns, and goals specific to water use in the North Fork Clearwater Basin, (4) formulating development, improvement, and/or conservation policy alternatives, and (5) guided by public interest, setting forth actions and recommendations relative to improving, developing, and conserving the water resources of the North Fork Clearwater Basin.

The plan must identify and assess river segments with outstanding fish and wildlife, recreational, aesthetic or geologic value for State protection. This involves an evaluation of existing and potential water uses, constraints, and public concern for each stream reach.

Information, figures, and statistics for this plan were obtained through literature review, field reconnaissance, contact with management agency personnel, and public meetings. Maps of resource data were prepared at a scale of 1:100,000 using a geographic information system (GIS). Resource data were reviewed for accuracy by the local advisory group, government agencies, and interested public.

Public Involvement

Public involvement is an important component of the Board's water planning process. The U.S. Forest Service conducted a series of five public scoping meetings held in Kooskia, Orofino, Lewiston, Moscow, and Grangeville from April through June, 1993, to introduce their Wild & Scenic Suitability process for the North Fork Clearwater River Basin. The Idaho Water Resource Board informed the public of the state's planning process during the Forest Service scoping meetings. On September 27, 1993, the Board held its own public scoping meeting in Orofino to introduce the state planning effort and to receive public comment regarding basin issues.

A North Fork Clearwater River Basin Local Advisory Group was formed in December, 1993 to "inform the Board of local concerns" (Rule 30.01.b, Comprehensive State Water Plan Rules, Idaho Water Resource Board, 1992). The group met seven times to identify local issues and provide input to proposed management actions and recommendations. The local advisory group represented local governments (city and county), conservation groups, timber and mining interests, and other concerned parties. A listing of the local advisory group members and a summary of public and local advisory group meetings is provided in the Appendix.

A final plan will be presented to the Idaho Legislature for its consideration as required by Section Idaho Code 42-1734B. The schedule for public review and plan approval is:

Public Hearing at Orofino -November 1995
Public Comment Period -
October 26 - December 26, 1995
Board Adoption of the Plan -
December 1995 through January 1996
Legislative Approval - January 1996

✦ ✦ ✦

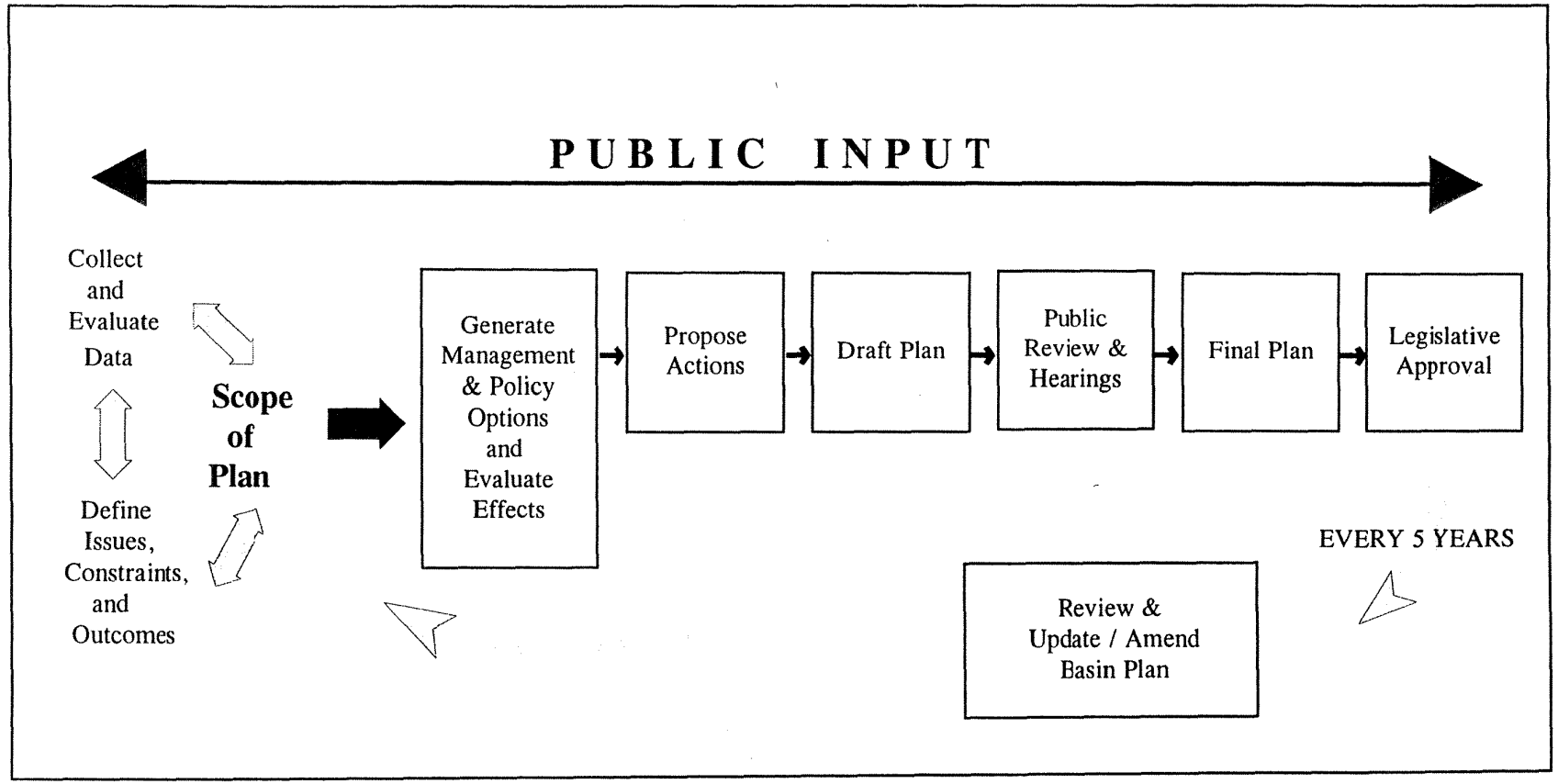


Figure 2. Idaho Water Resource Board Planning Process for the Comprehensive State Water Plan

II. BASIN DESCRIPTION

Area Overview

The North Fork Clearwater River Basin, from its headwaters in the Bitterroot Mountains on the Idaho-Montana border to its western boundary at the confluence with the main Clearwater River below Orofino, encompasses 1,575,450 acres (2,460 square miles). The basin includes a good portion of Clearwater County and smaller portions of Shoshone to the north, Latah to the west, and Idaho to the south.

GEOLOGY AND SOILS

Country rock of the region consists of the Precambrian Belt Supergroup and some pre-Belt rocks (USDA, Clearwater National Forest, 1994). The Idaho batholith is a body of granitic rock intruded into the meta-sedimentary rocks of the Belt series. Emplacement of the batholith began in the Cretaceous and continued through the Tertiary periods (3 to 60 million years ago). Most of the intrusions are of Tertiary age. Younger rhyolitic volcanic rocks overlie some of the intrusive rocks in the headwaters of the basin.

In general, soils in the upper basin on north-facing slopes are more productive than those on south-facing slopes along the North Fork Clearwater River because of differences in temperature and moisture retention. Kelly and Cayuse creeks are characterized as having a volcanic ash surface horizon deposited over a weakly developed subsoil (USDA, Clearwater National Forest, 1994). Most of the ash has been eroded away or mixed with the original soil on many steep southerly aspects. Most erosion and mixing followed intense wild fires almost 100 years ago. Pure volcanic ash has a silty loam texture. Mixed ash has the texture of sandy loam.

The geology of the lower half of the Clearwater basin is complex (Peterson, et. al., 1986). The Clearwater River now flows on Columbia River basalts most of the distance between Kooski and Lewiston, but the basalt is not present in the North Fork canyon (Alt and Hyndman, 1989). Exposures of highly sheared gneisses form a zone about a mile thick just north of Orofino along the Clearwater River.

Bedrock around Dworshak Reservoir include meta-sedimentary gneiss and schist, granitic gneiss and shist, granitic anorthosite, amphobolite, quartzite, kyanite, and Columbia River basalt (Peterson, et. al., 1986). The highly metamorphosed rock types are evident along the reservoir in various outcroppings. In the Dworshak Reservoir area, unstable soils have developed over the metamorphosed rock (Peterson, et.al., 1986). Volcanic ash and wind-blown silts are the other dominant parent materials around Dworshak. The volcanic ash appears as a mantle or cap and is predominantly on the north slopes.

GEOMORPHOLOGY

The present landscape is characterized by a westward sloping, mature upland surface that has been deeply dissected (USDA, Clearwater National Forest, 1994). The drainage pattern tends to be dendritic with steep, V-shaped profiles. The region's larger rivers, the North Fork of the Clearwater, Lochsa, and Middle Fork of the Clearwater, flow westward from the Bitterroot Mountain Range to merge with the Snake River at Lewiston.

Throughout the Miocene period (10-20 million years ago), the Bitterroot Mountains were gradually uplifted on the eastern edge of the Idaho Batholith. This uplift caused rapid downcutting in the drainage. Following uplifting and downcutting, some of the highest ridges were glaciated.

Mountain glaciers modified the landscape by cutting cirques and U-shaped valleys in the highest elevations and deposited debris in the

valleys below (USDA, Clearwater National Forest, 1994). The ridges of the mountains are as narrow and sinuous as the river bottoms. Most of the terrain is steeply sloped. Topographic relief of 3,000 feet or more is common. Flatlands are either non-existent or restricted to ridgetops and valley bottoms. Since the end of glaciation, water erosion and mass wasting (slumping) are the primary land forming processes.

The topography around Dworshak Reservoir, in the lower half of the basin, consists of steep mountain and canyon sideslopes, old dissected terraces, moderately sloping ridgetops, and nearly level stream terraces and bottoms (Peterson, et. al., 1986).

CLIMATE AND VEGETATION

Northern Idaho is dominated by Pacific maritime air masses and prevailing westerly winds. The climate of the area is subhumid with warm, dry summers, and cool, moist winters (Peterson, et.al., 1986). This "inland maritime" climate is characterized by prolonged gentle rains, deep snow accumulations at higher elevations, fog, cloudiness, and high humidity. Mean annual temperatures range from 0°C (32° F) in the mountains to over 10°C (50° F) at low elevations. Winter temperatures in the basin are significantly warmer than continental locations at the same latitude.

Storm systems are normally of low intensity and long duration. Most precipitation occurs during the fall, winter, and spring months; snowfall accumulates from November through April. Summers are relatively dry, with thunderstorms providing most of the precipitation during this period. Average annual precipitation in the North Fork basin ranges from 25 inches near Ahsahka to 70 inches in the Bitteroot Range; the variation within the basin is caused primarily by topographic relief. Elevations in the basin climb from 1000 feet in the lower canyons to approximately 7000 feet at the higher mountain peaks.

A cedar-hemlock-white pine vegetation type dominates the landscape, typical of steep slopes in North Central Idaho. Coastal disjunct species (plant species normally found in west coast rainforest communities) are common in this basin because of the moisture, long growing season, low elevations, and ash soils. Forest communities in the basin include whitepine-western red cedar (23.3%), grand fir (13.9%), lodgepole pine (11.9%), mountain hemlock (9.0%), Douglas fir (8.7%), and subalpine fir (5.9%) (Caicco, 1989).

Vegetation in the lower basin, the Dworshak Reservoir area, varies with soil types and aspect (Peterson, et. al., 1986). Western red cedar dominates on the north and east slopes with western hemlock occurring in the draws, toe slopes, and on north slopes along narrower drainages such as the Little North Fork Clearwater River. Western red cedar is also on the dissected terraces and also in the draws along southeast exposures. Grand fir and Douglas fir dominate on the south and west aspects with ponderosa pine occurring in the drier areas. Certain south exposures have only tall bracken fern with little to no canopy overstory. Some of the most productive growth ever measured in North Idaho was recorded on certain north slopes along Dworshak Reservoir.

LAND OWNERSHIP AND USE

The North Fork Clearwater River Basin is subdivided by the U.S. Geological Survey (for cataloging purposes) into two hydrologic units. The break between the units divides the basin at the upper end of Dworshak Reservoir, which coincides with an ownership shift in the basin (Fig. 3). The land above Dworshak is predominantly managed by the U.S. Forest Service (90%), with private lands (10%) making up the remainder. Ownership within the lower portion of the basin is a fairly even mix of private (35%), USFS (27%), and state (21%) land, with smaller portions owned or managed by the BIA, BLM, and Corps of Engineers (Table 2).

Figure 3. Land Ownership

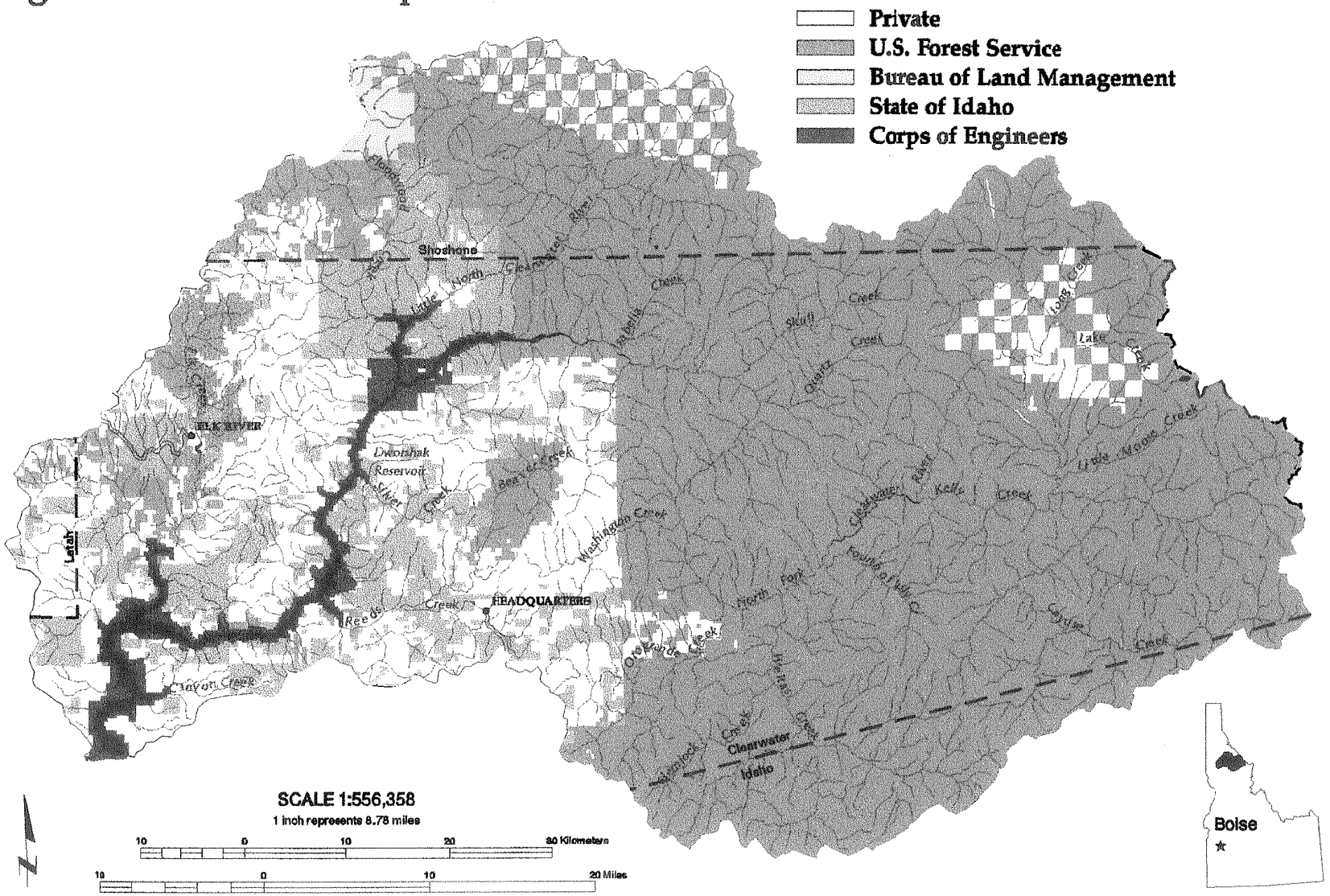


Table 2. Land ownership in the North Fork Clearwater Basin

Ownership	Acreage
USFS	946,818 acres (60.1%)
Private	335,501 acres (21.3%)
State	169,472 acres (10.8%)
US Army Corps Engineers	29,814 land acres (1.9%)
BLM	13,613 acres (0.9%)
BIA	351 acres (0.0%)

Timber is the predominant land use in the basin, whether the land is managed by the USFS, Idaho, or Potlatch. Nearly all private land in Clearwater County is utilized for cattle and sheep summer pasture, with additional allotments on USFS, BLM, BIA, and State lands (Clearwater Board of County Commissioners and Planning and Zoning Commission, 1992). Recreation is a major use of the entire basin, with public access provided on USFS, BLM, State, and Corps of Engineers land, as well as some private land.

ENERGY SUPPLY AND CONSERVATION

Washington Water Power, an investor-owned utility based in Spokane Washington, serves the communities of Elk River, Weippe, Pierce and Orofino. Washington Water Power's service includes all commercial accounts within the basin. Clearwater Power Company, based in Lewiston, Idaho, provides electric power to rural residents in the basin and several industrial clients. The company acquires power from the Bonneville Power Administration.

Since the 1980s, demand for additional power in the area has been low due to stagnant or slow economic growth and the implementation of energy conservation programs. Demand in the area has grown about two percent per year during the last five years (Wendy Bonnalie, Clearwater Power Company; Terry Kolb, Washington Water Power Company, personal communication).

Natural gas via pipeline is not provided to the basin. Other petroleum products, such as gasoline, heating oil and LP gas, are transported into the basin from terminal facilities in Spokane, and are currently available in adequate amounts to meet transportation, space heating and other energy needs.

Conservation Programs

Conservation programs have played a major role in meeting current and future electrical energy needs. The Northwest Energy Code and Super Good Cents programs support model conservation standards for new residential structures. Bonneville Power Administration funds both programs.

Existing facilities are eligible for energy conservation upgrading through several programs sponsored by state and federal agencies, and the public utilities. These programs promote conservation upgrades by providing low-interest loans to fund the conservation measure installation costs. Existing public nonprofit schools and hospitals are eligible for energy conservation grants under the Institutional Conservation Program, funded by the U.S. Department of Energy and administered by the IDWR Energy Division.

Energy conservation is a limited resource in the North Fork Clearwater River Basin due to low population density and limited industrial development. However, conservation measures will benefit individual consumers and are encouraged.

Water Resources

WATER QUANTITY

The North Fork Clearwater River drains a mountainous, densely timbered 2,440 square mile watershed. The North Fork drainage represents about 25 percent of the Clearwater Basin, and two percent of the Snake River drainage area above Lower Granite Dam. An extensive network of perennial streams (2,500 miles) transecting the watershed, supplies approximately a third of the average annual discharge of the Clearwater River at Spaulding, Idaho.

Primary tributaries to the North Fork are Elk, Reeds, Breakfast, Skull, Orogrande, Weitas, Kelly, and Cayuse creeks, and the Little North Fork Clearwater River. Over 75 alpine lakes dot the basin, with an average surface area of less than 10 acres. Fish Lake, along the eastern border of the basin in the Bitteroot Range, is the largest lake with a surface area of approximately 100 acres. Dworshak Reservoir, 53 miles in length with a surface area of 17,000 acres, is the largest body of water in the North Fork basin.

Streamflow in the basin originates largely from snowmelt during the spring and early summer months. Basin streamflows follow a pattern of low flows during the late summer, fall, and winter months, and high flows in the spring and early summer months. Winter low flow periods are occasionally interrupted by high peak flows of short duration resulting from heavy rains and rapid snowmelt. About 60 percent of the basin runoff occurs between April and June; flows gradually increase in March, peak usually between April and June, then progressively regress to base flow by the end of July.

Temperature, to a large extent, controls discharge rates during the spring runoff season. High-water flows average 8,500 cfs at the Canyon Ranger Station gauge, and 18,000 cfs into Dworshak Reservoir. Typical low flows are generally in the range of 500 to 700 cfs at the Canyon gauge, and 1,000 to 2,000 cfs at the head of Dworshak Reservoir. Average annual runoff from the basin is about 4,000,000 acre-feet.

Runoff from the North Fork basin is stored in Dworshak Reservoir. Dworshak is a multipurpose project constructed and owned by the CoE at river mile 1.9 on the North Fork of the Clearwater River. Reservoir capacity is 3,453,000 acre-feet, of which 2,000,000 acre-feet are usable under normal operating conditions. Peak discharges from 14,600 to 25,000 cfs below the dam generally occur during the months of April-May and July-August. The minimum instream flow of 1,000 cfs below the dam occurs during the remaining months.

Ground Water

The steep mountains and narrow river valleys of the North Fork drainage are underlain by Precambrian metamorphic rocks, granitic intrusions of the Idaho Batholith, and in the southwest corner of the basin, lavas of the Columbia Plateau Group. The generally impervious parent rock is a principal factor of the basin's high runoff characteristics.

Weathered zones, talus, and colluvium form a shallow ground-water system in the mountains that maintains the base flow of streams. Metamorphic rocks generally yield small or moderate supplies to wells and springs for domestic and stock use. Fractured crystalline rocks and coarse grained sedimentary and pyroclastic rocks may yield moderate supplies at some places.

Water is contained in and moves through interflow zones of the Columbia River basalts, yielding moderate to large supplies where several permeable interflow zones are penetrated. Much of the area that is underlain by basalt is high above the major streams, and, consequently, the water table may be hundreds of feet below the land surface, so that high pumping lifts are required. Major sources of ground-water recharge are probably downward percolation of precipitation, snowmelt from surrounding uplands, and seepage from the North Fork Clearwater and tributaries.

Thermal springs have not been identified in the North Fork Clearwater Basin (Mitchell et al., 1980). Very little is known of the geothermal potential of this area. Thermal springs to the south, in the Lochsa drainage, occur within granitic rocks or near contacts of other rock types with granitic rocks, and all are associated with known faults or linear features.

WATER QUALITY

Water quality throughout the North Fork Clearwater River Basin is generally considered to be excellent. In the upper basin (above Dworshak Reservoir), water quality monitoring has not been as extensive as in the lower basin, but the EPA, USGS, and the Forest Service, collectively, have sampled at 61 separate sites, mostly on the North Fork Clearwater River. The temperature maximum for most of the reservoir and river stations was below the 22°C maximum needed to support cold-water biota (salmonid fishes, aquatic insects and other species that require cool, well-oxygenated water). High dissolved oxygen levels measured on the reservoir and downstream at Ahsahka support the fact that Dworshak has good water quality. During July, 1994, supersaturated water was released from the dam resulting in a temporary spike in the dissolved oxygen curve.

Stream pollution in the basin is most typically from nonpoint sources, such as logging activities and agriculture, and is usually diffuse and intermittent. Sediment and thermal increases are the main nonpoint source pollutants in the North Fork basin. In recent years, the Forest Service conducted water quality monitoring on several tributaries of the North Fork. Tributaries including Quartz Creek, Isabella Creek, and South Fork Beaver Creek are regularly sampled for sediment loading. Data show that sediment levels are low in those tributaries. The Clearwater National Forest reports that sediment levels in the North Fork Clearwater River are low (USDA, Clearwater National Forest, 1994).

The 1989 Summary for the Clearwater Basin Antidegradation Agreement stated that salmonid spawning and cold water biota beneficial uses of the Little North Fork Clearwater River and many of its lower tributaries were potentially at risk (IDHW and IDFG, 1989). Grazing, forest road construction and maintenance, timber harvesting activities and some non-irrigated crop production have been reported as sources of sediment, bacteria, and thermal pollution, as well as flow and habitat alterations.

The 1992 DEQ Idaho Water Quality Status Report identified ten streams in the basin, and Dworshak Reservoir, as not fully supporting all beneficial uses as a result of nonpoint sources of pollution (IDHW, 1992). The streams, their affected beneficial uses, and status, are listed in the Resource Inventory.

Dworshak Reservoir Water Quality Summary

In the early 1970s, there were several water quality studies done on Dworshak (Lingg, 1973; Falter, Skille, and Ringe, 1973). In 1983, Dworshak was described as having a 94% forested watershed with clean water and low nutrient loads (Milligan, et. al., 1983). Dworshak's great depth and low nutrient loads combine to give it its high water quality status. Water samples taken just below Dworshak Dam at the Dworshak National Fish Hatchery at Ahsahka (confluence with the main Clearwater) have indicated low alkalinity, hardness, dissolved solids and fecal coliform levels (USDA, Clearwater National Forest, 1994).

Several water quality issues have emerged with the drawdowns of Dworshak the past few years. Concerns have been expressed that with the lower lake level more sediment may be suspended in the water column and possibly accelerate eutrophication (Bellatty, 1994, pers. comm.). DEQ and IDFG were concerned about the thermal shock created when 25,000 cfs of 8°C water was released from the dam during the entire month of July 1994. This also caused the water below Dworshak to be supersaturated in dissolved gas.

WATER USE AND ALLOCATIONS

Water use in the North Fork Clearwater Basin is markedly nonconsumptive. Water claims for fish and wildlife and channel maintenance, filed by the federal government, Nez Perce, and Shoshone-Bannock in the Snake River Basin Adjudication, comprise the largest potential water use. The largest current use of water in the North Fork Clearwater Basin is for flow augmentation. Appropriations for mining are the largest consumptive uses in the basin. Mining

diversions are clustered in the Moose Creek drainage.

Irrigation developments in the North Fork Clearwater Basin constitute a small percentage of total water use. Scattered parcels of pasture, all under 20 acres in size, are irrigated for cattle and horse forage. Basin irrigation relies primarily on surface water and springs. Stockwater appropriations and applications total 1200 acre-feet, however, annual livestock water use in the basin is estimated at 38 acre-feet from stock numbers and a consumption rate of 10 gallons/day per head. Surface water is the source for 46 percent of the stockwater developments in the basin, springs are the source for 34 percent, and ground water the remaining 20 percent.

A minimum stream-flow water right is held by the Idaho Water Resource Board for Elk Creek in the Elk Creek Falls Recreation Area. The appropriation of 120 cfs from the first of March through June is for fish habitat, and a 40 cfs instream flow, applicable from July through February, is for scenic purposes. Instream flows for recreation, claimed by the U.S. Forest Service in the Snake River Basin Adjudication, are applicable to the North Fork Clearwater, and the lower sections of Kelly, Weitas, and Cayuse creeks. Fish habitat and channel maintenance claims, filed by the federal government, Nez Perce, and Shoshone-Bannock in the Snake River Basin Adjudication, encase the North Fork Clearwater River, from mouth to headwaters, and all major tributaries. These claims reflect natural flows in quantity and duration. Seventy-five water right claims for specific lake levels (elevation), filed by the U.S. Forest Service, list recreation, stockwater, timber production, watershed protection, and fish and wildlife as beneficial uses.

Less than one percent of the basin's dedicated water is from ground water, but it is relied on heavily for domestic and municipal supplies. Ground water supplies approximately 37 percent of the domestic, commercial, and municipal consumers in the basin; springs supply 32 percent of the users and surface water, primarily from tributary creeks of the North Fork, supplies the remainder.

HYDROPOWER DEVELOPMENT

Hydropower has been the primary electric generation technology used in the Pacific Northwest because of the region's abundance of flowing water and favorable generating sites. The North Fork Clearwater Basin contains one active hydroelectric generating plant, projects that have been actively pursued in the recent past, and a number of potential sites that may not be practicable at this time.

Existing Power Plant

The 400 megawatt Dworshak power plant is located at the base of Dworshak Dam on the North Fork Clearwater River approximately two miles above its confluence with the Clearwater River. The project was constructed by the Corps of Engineers between 1963 and 1973, and named for Idaho's late Senator Henry C. Dworshak. The project was authorized for flood control and hydroelectric power production, with consideration for recreation and navigation. Its primary operation objectives are power and flood control.

The dam is a straight axis concrete gravity structure, the third highest in North America, and the largest ever built by the CoE. Reservoir capacity at full pool is 3,453,000 acre-feet, allowing for a usable capacity 2,000,000 acre-feet. Power comes from three generating units incorporated into the project with a total capacity of 400,000 kilowatts, and the potential for an additional 660,000 kilowatts. Most power is produced during the fall, winter, and early spring with flood control discharges. From April to July, power discharges are planned to be at least 2,000 cubic feet per second.

Expansion of Dworshak's capacity to 1,060,000 kilowatts would require specific Congressional authorization and funding, and installation of a re-regulating dam downstream near Lenore. Previous hearings on this matter generated significant public objection, and no further plant expansion is presently being

planned. Power produced at Dworshak is marketed in the region by the Bonneville Power Administration.

Planned Power Plant

Dworshak Small Hydroelectric (FERC #10819-000), under a FERC Preliminary Permit issued on July 25, 1991 to the Idaho Water Resource Board, would utilize the conduits for fish hatchery water releases from Dworshak Dam. The power plant would be sited atop the energy dissipation and water distribution structure adjacent to the Clearwater and the Dworshak National Fish Hatcheries. Initial plans call for a 2-megawatt generator, but another one of similar size could be installed later. Power would flow to a substation owned by the Clearwater Power Company and then marketed to the Bonneville Power Administration. The Water Resource Board project is awaiting FERC approval of a license application.

Potential Developments

The upper North Fork Clearwater River (above slack water of Dworshak reservoir) and it's tributaries have substantial hydroelectric potential. In an inventory report done for IDWR by the University of Idaho's Water and Energy Resources Research Institute, there has been twenty six separate potential hydroelectric sites identified in the upper basin with a total capacity of 3006.2 megawatts (Heitz, et. al., 1980). Twenty of those sites are located on the North Fork Clearwater River, Kelly Creek, or Cayuse Creek with a total capacity of 2982.6 megawatts. None have water right applications that are currently (1995) active with IDWR.

Other Resources

FISH & WILDLIFE

Fish species that inhabit the basin include: rainbow trout, piute sculpin, speckled dace, longnose dace, torrent sculpin, Columbia River mottled sculpin, shorthead sculpin, tailed frog, mountain whitefish, cutthroat trout, brook trout, bull trout, kokanee salmon, smallmouth bass, largemouth bass, squawfish, nothern chiselmouth, redside shiner, largescale and bridgelip suckers, and carp (USFS, 1994; CoE, 1977). Some of the more important gamefish in the basin are the westslope cutthroat trout, bull trout, rainbow trout, and kokanee.

Since the completion of Dworshak Dam in 1971, the preferred sport fish in the reservoir have been kokanee, smallmouth bass, and rainbow trout (Horton, 1981; Statler, 1988). However, the drawdown the last few years has created a thermal barrier to spawning in tributary streams to the reservoir (Schriever, 1994, pers. comm).

The North Fork Clearwater River supports one of the last strong populations of genetically pure westslope cutthroat trout, now found in less than 4% of its historical range (Johnson, 1992). Rainbow trout are the most abundant salmonid species in most of the tributaries of the basin (Moffitt and Bjornn, 1984). There is evidence of hybridization with the cutthroat on the North Fork Clearwater River and certain tributaries where they coexist (Johnson, 1992). Westslope cutthroat trout are found throughout the entire basin (Johnson, 1992). The spawning habitat of both Kelly and Cayuse creeks is outstanding, which is part of the reason they are nationally recognized for their westslope cutthroat trout fisheries (USFS, 1994). They both have a high total diversity of fish species (11) (USFS, 1994). The Forest Service considers the westslope cutthroat trout a sensitive species. The bull trout has been listed by the U.S Fish and Wildlife Service as a candidate for potential protection under the Endangered Species Act.

The Clearwater National Forest supports more than 350 different species of wildlife. Elk, white-tailed and mule deer, black bear, moose, mountain lion, Rocky Mountain goats, pine marten, mink, beaver, bobcat, goshawk, pileated woodpecker, ruffed grouse, a variety of migratory waterfowl species, osprey, and wintering bald eagles are all relatively common

large vertebrates found in the basin (USDA, 1994).

Critical elk and deer wintering habitat, identified by the Forest Service, occurs along the North Fork River from the backwaters of Dworshak into Black Canyon (USDA, 1987; Fig. 4). Tributaries such as Floodwood Creek, Isabella Creek, portions of Reeds and Beaver creeks, Skull Creek, Quartz Creek, Weitas Creek, Fourth of July Creek, Kelly Creek, Little Moose Creek, and Cayuse Creek all are considered critical elk and deer winter habitat (Hensley , pers. comm., 1993). The major population of mule deer along the North Fork Clearwater River is located between Skull and Weitas creeks (Davis and Butterfield, 1991).

Much of the basin is IDFG Game Management Unit 10 (Fig 5), which is described as having limited habitat potential for mule deer, but more suitable for white-tailed deer and elk. White-tailed deer comprise about 50% of the deer present in the unit, but overall densities of whitetails and mule deer are low (IDFG, 1990). Mountain goat surveys done by IDFG in 1991 found groups in Isabella Creek, Collins Creek (tributary of Skull Creek) to Quartz Creek, Flat Creek to Elizabeth Mountain , Pot Mountain, Moose Mountain, and South Fork Kelly Creek to Williams Creek. The best kid to adult ratio (26:100) was in Isabella Creek (IDFG, 1993).

The basin contains two species (gray wolf, bald eagle) that are federally listed as threatened and endangered by USFWS, and five that are candidates (wolverine, lynx, harlequin duck, northern goshawk, and bull trout).

Figure 4 shows special management areas areas on public lands in the basin designated for their unique biological or recreational values. There are six Research Natural Areas (Aquarius, Chateau, Steep Lakes, Bald Mountain, Bull Run, and Rhodes Peak), one combined with an Area of Critical Environmental Concern (Lund Creek), Mallard-Larkins Pioneer Area, Crater Meadows Priority Wetland, five Special Interest Botanical Areas (Morris Creek Old Growth Cedar Grove, Elk Butte Mountain Hemlock, Oviatt Creek Fossil Beds, Heitage Cedar Grove, and Giant Western Redcedar), and two proposed Wilderness Areas (includes Mallard-Larkins Pioneer Area).

Plant Species of Concern

Because of it's climatic, landform, and elevational characteristics, the North Fork of the Clearwater River is home to a variety of plant communities with unique biodiversity (USFS, 1994). The existing flora of the deep canyons suggests that they may have served as a refuge for warmer-weather, hydrophilic plant species (Caicco, 1987). Several sensitive terrestrial and aquatic plant species are known to exist or have existed in the basin (USFS, 1994). Nine species are candidates for listing under the federal Endangered Species Act (ESA), and 16 additional sensitive plants that are listed by the Conservation Data Center, IDFG.

CULTURAL FEATURES

Archaeological investigations have established human occupation as early as 10,000 years ago (Keeler, 1973; Sappington, 1994). The Clearwater River and tributaries are known to be occupied by the Nez Perce for nearly 6000 years (Sappington, 1994).

Given the secluded nature of the majority of the Clearwater basin, its history is largely shaped by the travel routes. Of these, the Lolo Trail System is most significant and well known. The Clearwater National Forest manages the Lolo Trail System which references a one-half mile wide corridor encompassing several trails -- The Lewis and Clark National Historic Trail, Bird-Truax Wagon Road, Nee-Me-Poo National Historic Trail and Lolo Motorway. In 1962 the Lolo Trail was designated a National Historic Landmark, and listed on the National Register of Historic Places in 1966 (USDA, Clearwater National Forest, 1985). It became a part of the Nez Perce National Historical Park in 1965.

The Lolo Trail originated as a migration route for the Nez Perce between the camas prairies in Idaho and buffalo hunting grounds in Montana and Wyoming. The Nez Perce called the route Khusahna Ishkit, meaning buffalo trail (USDA, Clearwater National Forest, 1985). In 1805 Lewis

Figure 4. Wildlife Habitat and Special Management Areas

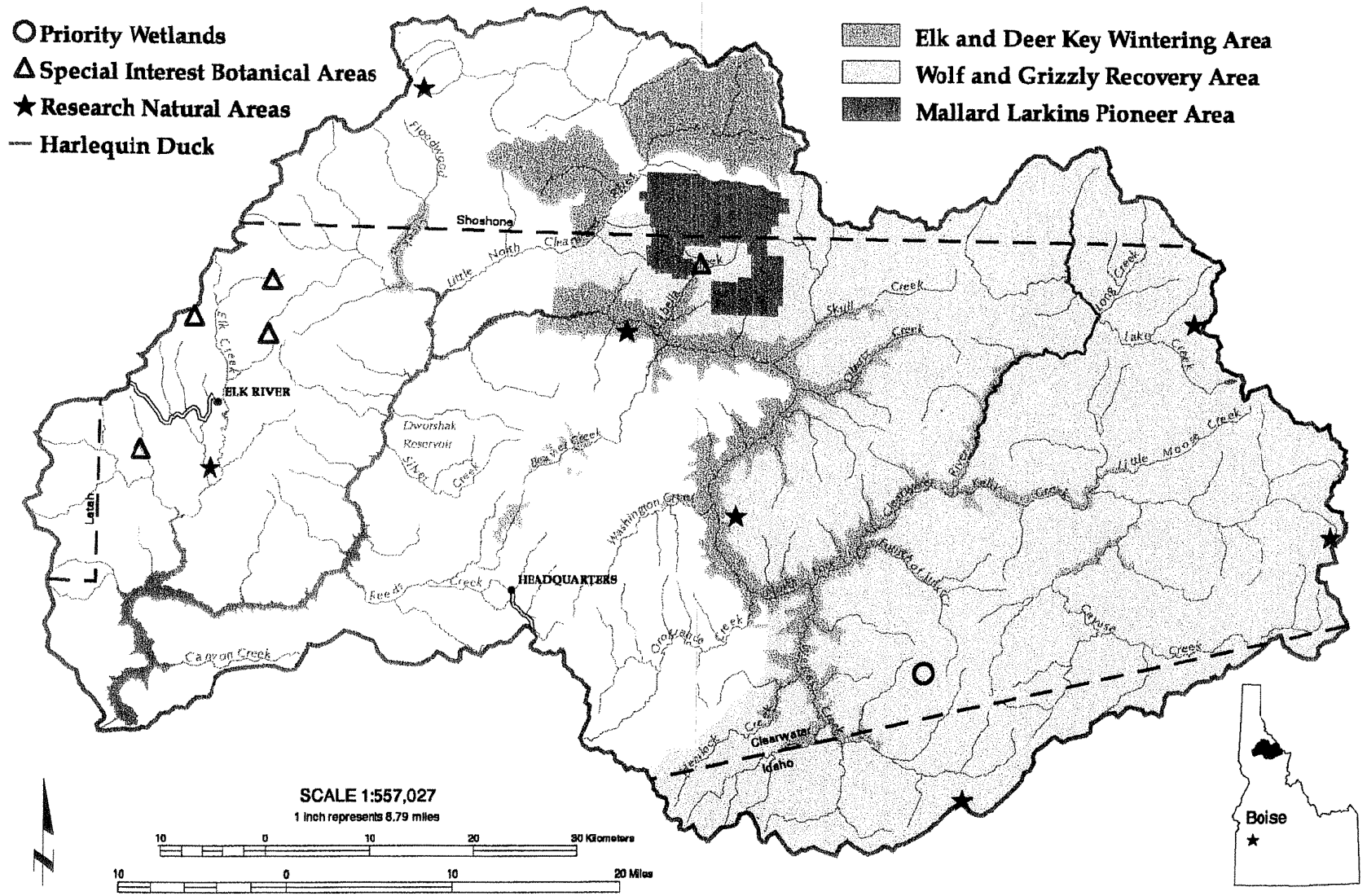
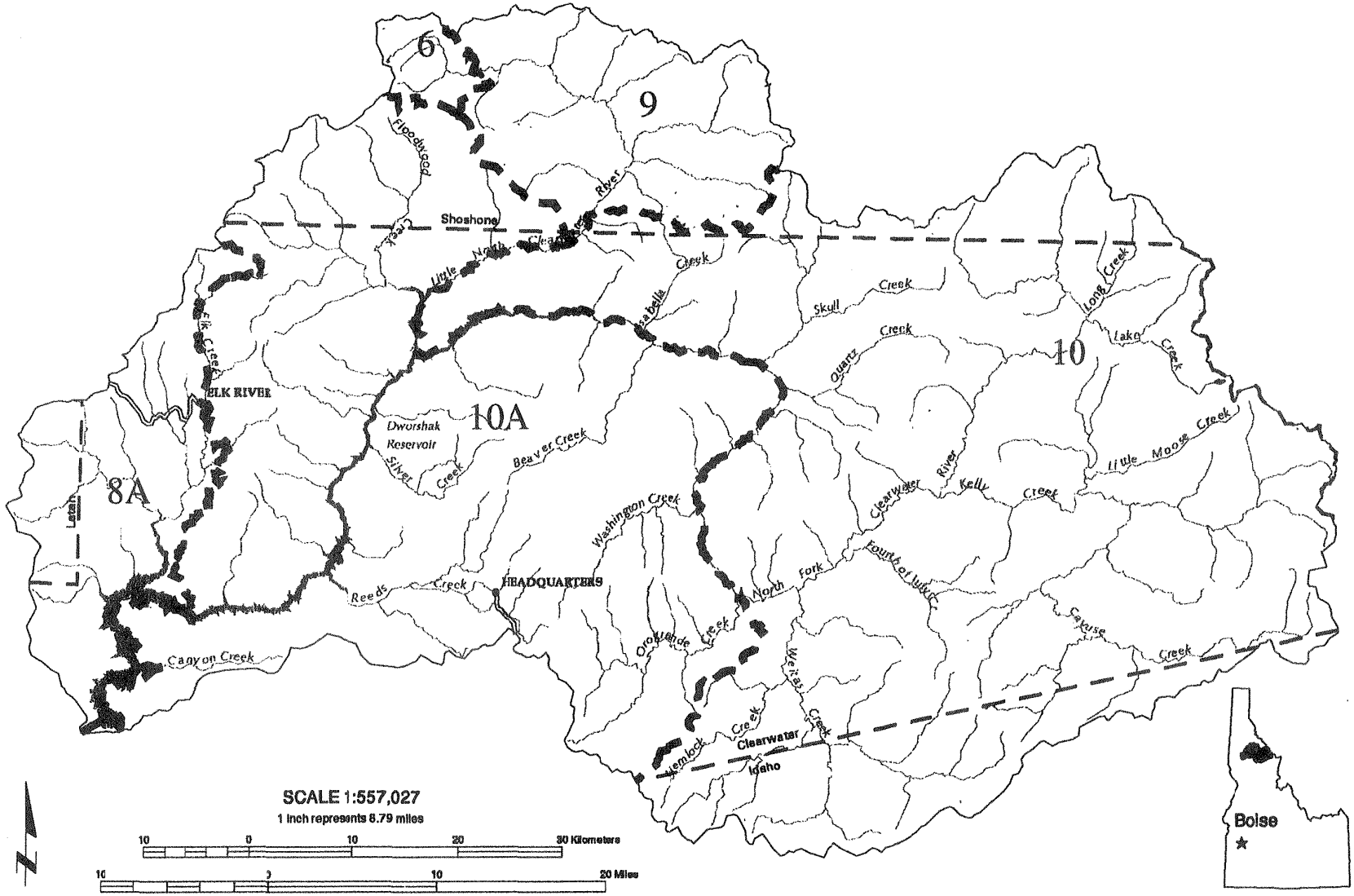


Figure 5. IDFG Management Units



and Clark became the first white men to negotiate the trail during their expedition from St. Louis to the Pacific Ocean (USDI, National Park Service, 1982). The Lewis and Clark Trail was designated a national historic trail in 1978 (USDA, Clearwater National Forest, 1985).

In 1866 Lewis and Clark's route was later upgraded and portions realigned in an attempt to build a road from Lewiston to Missoula, Montana to enable Lewiston merchants to trade with mining towns in Montana. This alignment became known as the Bird-Truax wagon road.

In 1877 Chief Joseph, Looking Glass, and other Nez Perce chiefs led men, women, children, and horses on the Lolo Trail pursued by General Howard. Strained relations between white men and the Nez Perce because of treaty violations, efforts by the federal government to place the Nez Perce on a reservation, and trespass by white settlers and miners into the Nez Perce territory had escalated into the Nez Perce War. The route encompassed 1170 miles near Wallowa Lake, Oregon to the Bear's Paw Battlefield near Chinook, Montana, and includes the Lolo Trail. This route was designated the Nee-Me-Poo National Historic Trail in 1986 (USDA, Northern Region, 1990). The Lolo Trail was rebuilt for the Forest Service by the Civilian Conservation Corps beginning in 1930 and completed in 1934 as the Lolo Motorway. The Motorway matches or parallels the original Lolo Trail route.

In 1860 gold was discovered in Pierce. Discoveries were later made at Moose and Independence creeks in 1862 leading to the establishment of Moose City (Space, 1979; USDA, 1987). Mining activity was strong until the late 1870's when the mines began to fail. Silver ore was discovered in the Blacklead country situated in the headwaters of Cayuse Creek around 1886.

Weyerhauser purchased government land and began logging the lower North Fork Clearwater in the 1900's, establishing the first logging camp at the mouth of Washington Creek (USDA, Clearwater National Forest, 1994). Many timber companies struggled in the 1920's, later merging in 1931 to become Potlatch Forest Products, Incorporated (Dryden, 1972). Huge log drives occurred in the spring on the North Fork Clearwater from 1928 to 1971 to reach the millpond at Lewiston (USDA, Clearwater National Forest, 1994).

Although the North Fork Clearwater River basin is an area rich with history, much of the basin has not been formally surveyed. Most investigations have occurred as part of federal development projects. Over 850 cultural resource sites have been identified within the basin (Idaho State Historic Preservation Office, 1995). Prehistoric sites identified include workshops, camps, villages, projectile points, artifact scatter, house pit depressions and rock shelters. Many sites identified are historic, affiliated with trapping, logging and mining activities. These include numerous Forest Service administrative sites such as ranger stations, camps, lookout towers and work station facilities, as well as cabins, grave sites, mining claims and marten sets, and Lewis and Clark expedition sites.

A number of sites within the basin are listed on the National Register of Historic Places. The National Register is an official list established by the Historic Preservation Act of 1966 and maintained by the National Park Service of archaeological, historic, and architectural properties of national, state and local significance worthy of preservation. Sites listed within the basin include: the Lolo Trail which includes the Nee-Me-Poo and Lewis and Clark National Historic trails; Canoe Camp and Long Camp, two sites associated with the Lewis and Clark Trail; and Mallard Peak Lookout (USDA, Clearwater National Forest, 1987; Idaho State Historic Preservation Office, 1995). A number of other sites are considered eligible for National Register listing.

MINING AND MINERAL RESOURCES

Exploration for, and subsequent development of, the region's mineral resources began with the first discovery of Idaho placer gold along the North Fork of the Clearwater River by E.D. Pierce in February of 1860

(USDI, Geological Survey, 1964). In August of 1860 he returned with a group of prospectors to Orofino Creek, and the following winter the town of Pierce was established. The Orofino mining district was organized in January 1861, and Idaho's mineral industry was officially born. More than 385,000 troy ounces of gold were produced from the area, mostly from placer sources. Load deposits are found in fissure fillings scattered about the basin, mostly in the border zone of the Idaho batholith. Most of the mining activity in the basin has been limited to prospecting with little actual recorded mineral production (USDA, Clearwater National Forest, 1994).

Many other minerals occur in the area. Some may become economically important in the future. Deposits of precious and semiprecious gem stones have been found in the North Fork drainage. Corundum crystals, including a few gem-quality sapphires and rubies have been found in placer deposits within the basin, and some have been rumored from poorly identified localities along the Clearwater and tributary drainages. The main Clearwater Valley itself is one of the few collecting localities in the world for gem quality sillimanite, also known as fibrolite. These are prized by "rock hounds" who gather the stones from gravels along the river beds. Non-placer sources of these materials have not been reported. Also, fire opals have been reported along the Clearwater drainage, as have small zircons (Sinkankas, 1959).

Numerous occurrences of magnetite have been found in the central part of Clearwater County. These consist of veins in metamorphic limestone, quartzite, and schist near intrusive contacts along border zones of the Idaho batholith. Because of its occurrence in discontinuous veins and small irregular deposits, there is no current commercial value to these deposits.

Triassic age limestone occurs in the southwestern part of the planning area, to the west of Dworshak Reservoir. Because of its color and hardness, this rock may have possibilities for use in commercial buildings, particularly as chips for terrazzo (USDI, Geological Survey, 1964).

Pegmatite (feldspar and mica) is related to the batholith and adjacent metamorphic rocks. Pegmatite is particularly abundant along the North Fork of the Clearwater below Quartz Creek. The Wild Rose pegmatite at Pierce contains pink orthoclase, white quartz, and muscovite mica. Currently there is no commercial use for these minerals.

Materials which hold their shapes and chemical properties when subjected to high temperatures, or nonmetallic materials suitable for lining high temperature furnaces, have important application in the electronics, nuclear, chemical, and metallurgical industries. Clay for fire brick production is found throughout the western part of the planning area, and may become important commercially as other nearby deposits play out. Kyanite is found throughout the metamorphic contact zone west and north of the batholith and could have future commercial significance.

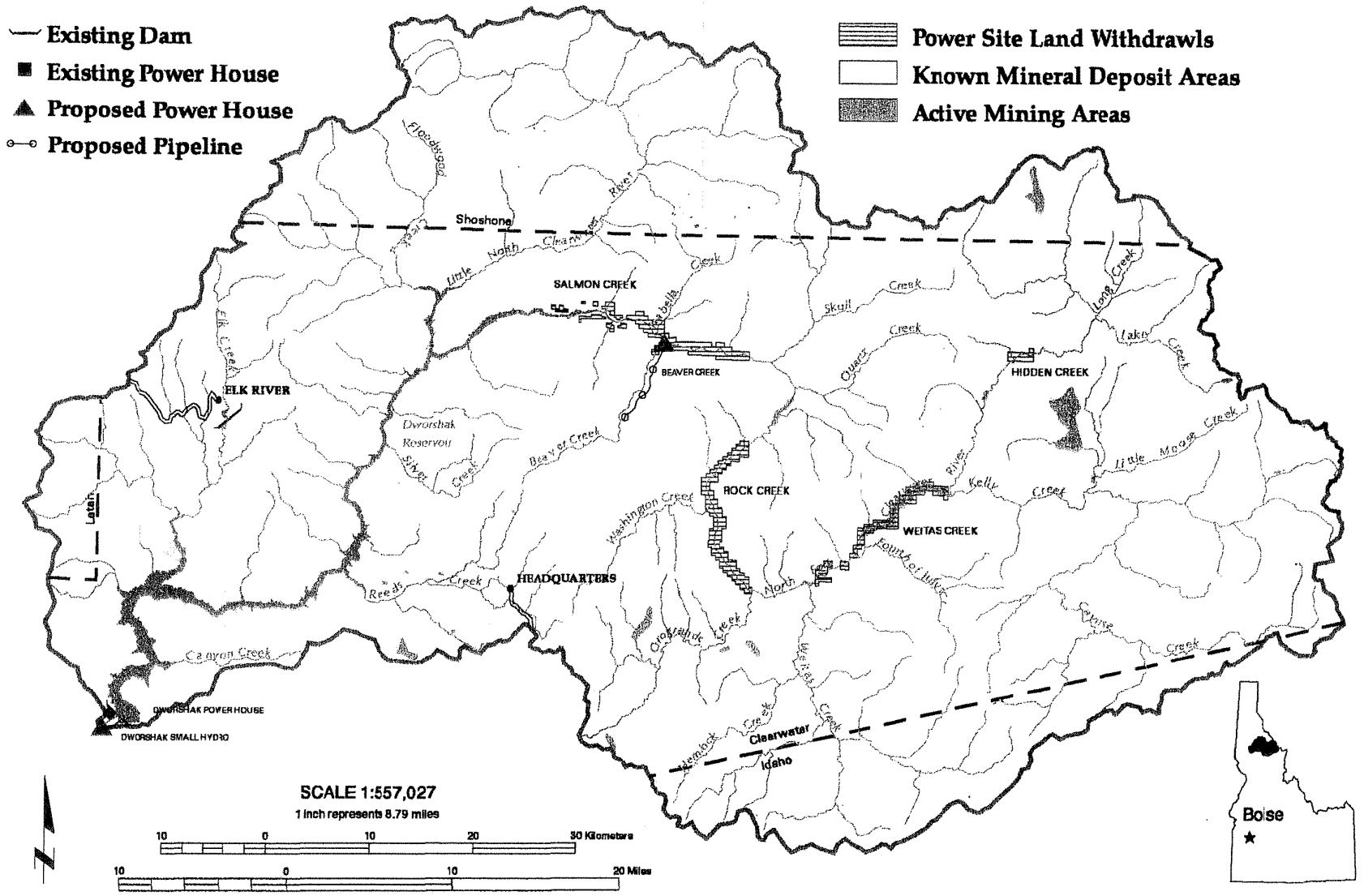
Sand and gravel are naturally occurring construction materials that are often not recognized for their importance. Sand and gravel deposits are found in the basin and their continued use is important for building and highway construction.

Recreational dredge mining occurs in several drainages in the planning basin. Activity is occurring on the North Fork Clearwater between Weitas and Kelly creeks, and in the Moose Creek drainage. Other drainages having recreational activity include Orogande and Independence creeks. The Forest Service has received about a dozen notices of intent for 1995 (Annis, 1995). In the past there has been as many as 25-50 individuals working Moose Creek.

Mining Development

The combined efforts of Federal and State agencies along with private organizations and individuals, have identified areas in which future mineral resource development are most realistic (Lyman, 1994, 1995, pers. comm.; Gillerman, 1995, pers. comm.; Fig. 6). While activities by "rock hounds", recreational prospectors, and a

Figure 6. Mineral and Hydropower Development



few individual developers continue at random locations throughout the region, the most promising areas of mineral occurrence have been defined after many years of systematic and scientific exploration. Future development of these resources will depend upon economics and the availability of adequate water supplies.

Mineral resources of the area were evaluated from 1990 through 1992 by the United States Bureau of Mines, Idaho Geologic Survey, and the United States Geological Survey as a part of the suitability study of public lands for wilderness designation (USDA, Clearwater National Forest, 1994). The study looked at potential for metallic minerals, nonmetallic minerals, rare earths, and geothermal resources. The reports published as a result of these studies conclude that further prospecting is warranted in certain areas.

Little specific information is available concerning the known mineral areas on private lands west of Dworshak Reservoir and along Elk Creek. Mineral deposits are known to be in those areas. Similarly, the state, federal, and private lands along Little North Fork of the Clearwater and the upper reaches of Floodwood Creek demonstrate potential for a variety of mineral resources. The mineral-rich Reed's Creek and Orogrande Creek basins continue to be significant sites for extensive mining developments, including sand and gravel and gold. As economic conditions change, these areas could see significant expansions in mineral development activities.

Several long placer gold locations along the North Fork Clearwater have considerable importance in the area. Areas just upstream of Quartz Creek, near the mouth of Weitas Creek, and an extensive area upstream from Fourth of July Creek continue to be mining areas for rock-hounds, casual prospectors, and other mining interests.

Renewed mining interest has been shown for the areas along the upper reaches of the North Fork Clearwater River and its major tributaries, Long Creek, Lake Creek, Kelly Creek, and Little Moose Creek. The headwater basins and lower stretches of Kelly Creek are rich in several mineral varieties. As exploration activities continue, the extent of the mineral reserves in the area will become better known.

RECREATION

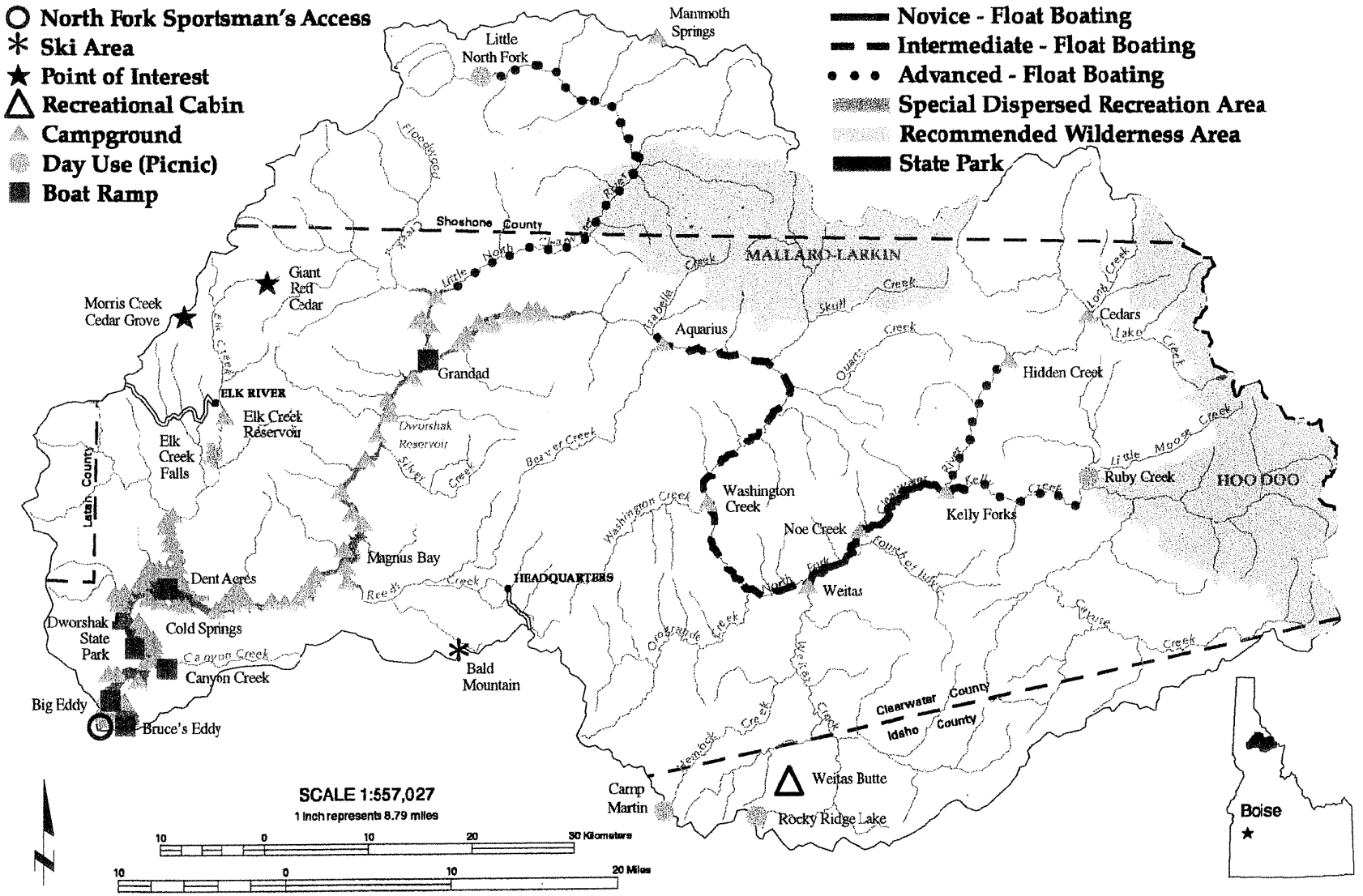
Several federal, state and local entities provide recreation services and facilities in the planning area. Primary recreation providers in the basin are the Clearwater National Forest, having the largest land area to manage in the basin, and the U. S. Army Corp of Engineers (CoE) through its facilities at Dworshak Reservoir. Additional public recreation opportunities are available from Idaho Department of Parks and Recreation, Idaho Department of Fish and Game, Coeur d'Alene Bureau of Land Management, and Idaho Panhandle National Forests. Opportunities through private entities include developed campgrounds on Potlatch lands.

The basin supports a wide diversity of recreation settings and experiences, ranging from natural undeveloped settings to areas with facilities (Fig. 7). Most of the developed recreation facilities are located along watercourses, providing access for fishing, boating, swimming and other water-based recreation opportunities. The majority are located along Dworshak Reservoir, the North Fork Clearwater and Kelly Creek.

The Forest Service facilities consist largely of campgrounds located along the North Fork Clearwater River, Kelly Creek and the Little North Fork Clearwater. Several picnic areas are found in the planning basin as well. The Clearwater and Idaho Panhandle national forests estimate only 16% and 36%, respectively, of total recreation use occurred in developed sites (USDA, Clearwater National Forest, 1987; USDA, Idaho Panhandle National Forests, 1987)

Of the developed facilities, those affiliated with Dworshak Reservoir usually receive most of the recreational use in the basin. However, this use has fluctuated greatly over the last few years

Figure 7. Recreation Opportunities



because of early drawdowns of the reservoir. The effects of the drawdown on recreation are discussed in greater detail in the Recreation section of the Resource Inventory document. At full pool the reservoir offers 184 miles of accessible shoreline. The most popular activities include fishing for kokanee, smallmouth bass, cutthroat and rainbow trout, and boating. The reservoir is used year round.

Dworshak State Park is located on the western shore of Dworshak Reservoir and operates under a 25-year lease acquired from the CoE beginning in June 1989. The park is 843 acres encompassing the Freeman Creek and Three Meadows Group Camp. A 1993 survey of campers found the most popular activities engaged in by visitors were relaxing, fishing, boating and swimming (IDPR, 1993). The majority of visitors were attracted to Dworshak State Park because of the scenery (60%). These results are based on a small number of returned surveys and may not be statistically valid. On summer weekends when the pool elevations are up, visitors are predominately families engaging in swimming and picnicking (McElhatton, 1995).

The IDFG manages several sportsman's access areas within or near the planning basin including Ahsahka, North Fork and Elk Creek Reservoir (IDFG, 1993). Sportsman's access areas are funded through the purchase of fishing and hunting licenses and tags to provide fishing and hunting access throughout the state. Ahsahka, located just outside planning basin boundaries, is situated on the north shore of the Clearwater River. The site is used predominately for access to steelhead fishing on the mainstem Clearwater (McNeil, 1993). The North Fork sportsman's access facility is located at the confluence of the North Fork Clearwater and mainstem of the Clearwater. The North Fork sportsman's access has a boat ramp to provide access to fishing opportunities in the North Fork Clearwater below the dam.

The IDFG acquired Elk Creek Reservoir through a land donation from Potlatch Corporation. The reservoir is located south of the community of Elk River. The Elk River Recreation District has managed the campground and picnic area under a 25-year lease from the IDFG since 1992. Camping facilities located around the reservoir are usually open from Memorial Day weekend through the end of October. The majority of users come to fish in the reservoir which contains rainbow and brook trout, smallmouth and largemouth bass, and Lahontan cutthroat trout (Winters, 1994; IDFG, 1991). Most recreationists originate from Moscow, Lewiston and Pullman (Winters, 1994).

The IDFG also manages the fishery and wildlife providing recreational opportunities in the form of fishing, hunting and wildlife observation. Most notable are the cutthroat fishery on Kelly Creek considered one of the top trout streams in the United States (Pero and Yuskavitch, 1989). Additionally, the basin is considered to be one of the quality elk hunting areas in Idaho.

Dispersed recreation occurs throughout national forest, BLM, state trust and Potlatch lands. The Clearwater National Forest estimates 84% of recreation use on its lands consists of dispersed use (USDA, Clearwater National Forest, 1987). The Idaho Panhandle National Forest estimates approximately 64 percent dispersed recreation use (USDA, Idaho Panhandle National Forests, 1987). Dispersed use includes activities occurring outside developed facilities. Activities may include whitewater boating, canoeing, camping, hunting, hiking, backpacking, mountain biking, berry picking, fishing, gathering firewood, or cutting Christmas trees, to name a few.

SCENIC AREAS

Approximately 60 percent of the North Fork Clearwater Basin has been inventoried for visual resources by the Clearwater and Idaho Panhandle National Forests. Inventories were not available for much of the western half of the basin, and a small section in the northeast corner. These areas are predominately private land or under the jurisdiction of agencies who have not conducted similar inventories.

The Forest Service visual inventory system describes and classifies landscapes by evaluating the variety, contrast, harmony or distinctiveness of landform, rock form, vegetation and water form (USDA, 1974). Landscape features of the North Fork Clearwater Basin were evaluated relative to characteristics found in the Columbia-Rockies subregion, encompassing portions of north-western Montana and Idaho from the Panhandle down to the Salmon River. Subregions are geographical areas with similar landform, rock form, water form, and vegetation characteristics (USDA, Northern Region, 1980).

The majority of landscapes categorized as distinctive or outstanding in the North Fork Clearwater Basin, are water courses. Of the 60 percent of the basin for which visual inventory data is available, 21.6 percent was classified as distinctive (*variety class A*), 44.7 percent as typical (*variety class B*), and 0.9 percent as having little or minimal variety (*variety class C*). Figure 5 , (pg. 30) shows rivers and streams in the North Fork Clearwater Basin having outstanding scenic values; they are also listed in Table 11 (pg. 31). Other outstanding scenic areas in the North Fork Clearwater Basin are the Moose Creek Buttes, the Moose Mountains, Five Lakes Butte, the Little Goat Mountains, the Mallard-Larkins and the headwaters of Kelly and Cayuse creeks along the Bitterroot Divide.

TIMBER

Dominant forest types in the basin include white pine-western redcedar (23.3%), grand fir (13.9%), lodgepole pine (11.9%), mountain hemlock (9.0%), Douglas fir (8.7%), and sub-alpine fir (5.9%) (Caicco, 1989). Economically, the desired marketable species, in order of their preference by the industry, are western redcedar, ponderosa pine, white pine, western larch and Douglas fir (same value), grand fir, Engelmann spruce and lodgepole pine (Western Wood Products Association Index, which is composed of an average for each species price over the entire region; Hensley, pers. comm., 1994).

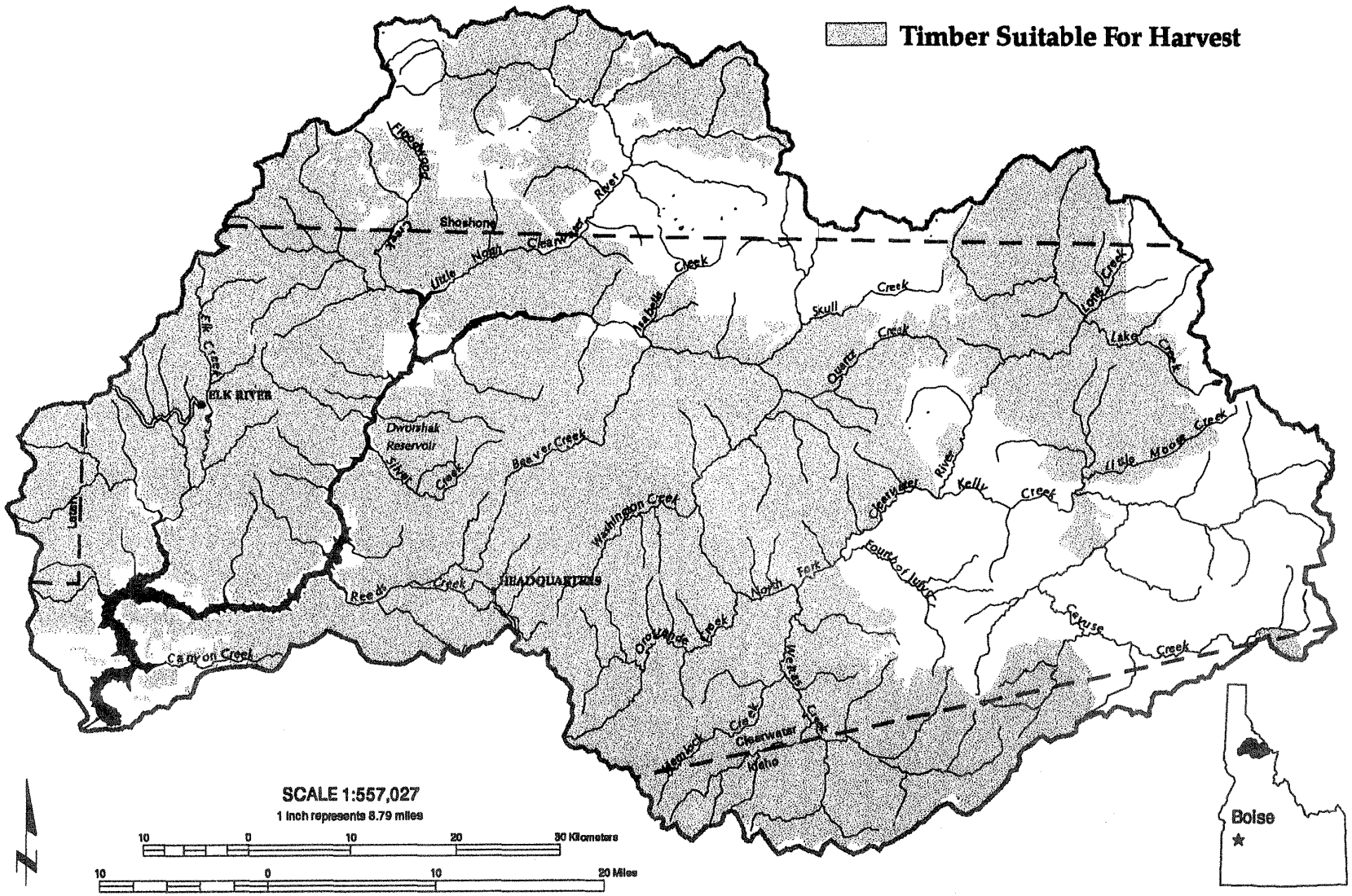
Two national forests, the Clearwater and Panhandle, manage 60 percent of the basin, of which 62% is considered suitable for harvest. The Clearwater is responsible for 83%, the Panhandle for 17%. An additional 11 percent of the basin is state-owned, while 21 percent is private, both of which are considered between 90-95% suitable. According to the Clearwater County Comprehensive Land Use Plan, Clearwater County has soils capable of producing 250 board feet/acre annually, with some areas capable of 600 board feet (Clearwater Board of County Commissioners and Planning and Zoning Commission, 1992). Current production averages 120 board feet, less than half the estimated potential. Figure 8 maps suitable timber in the North Fork Clearwater Basin.

Current Timber Harvest and Forest Practices

The Clearwater National Forest Management Plan will guide the management of the forest through the remainder of this century unless conditions or demands significantly change (USDA, Clearwater National Forest, 1987). The Plan objectives regarding timber harvest on the forest provide for a program of Allowable Sale Quantity (ASQ) of 1.73 billion board-feet on the entire forest from suitable lands over a ten year period. Of this total, 730 million board-feet could be offered for sale from currently roadless land designated suitable for harvest by the Forest Plan.

Timber harvest on the Clearwater National Forest between 1981 to 1985 averaged 170 million board-feet annually. Actual harvest on the North Fork Ranger District, which is the major district in the basin, has steadily declined since 1989. Total volume sold in 1989 was over 50 million board-feet. In 1995 the total volume sold was 5 million board-feet (Case, pers. comm., 1995). This is not a reflection of the Clearwater National Forest's ability to produce timber as much as it is changing political climate. In response to lawsuits and the 1995 Emergency Salvage Timber Sale Program, the Clearwater National Forest's recent five year plan proposed annual sale offerings of 40-50 million board-feet which could be exceeded with salvage timber.

Figure 8. Suitable Timber



A high percentage of state land in the basin is managed for commercial timber production (Eichert, pers. comm., 1993). State lands in the basin fall within two IDL supervisory areas, the St. Joe and the Clearwater. The St. Joe Area, the upper portion of the basin, contains 55,000 acres, of which 40,000 acres (73%), are commercial forest (Johnson, pers. comm., 1993). The Clearwater Area, the lower portion, contains 114,000 acres of which 112,000 (98%) are considered commercial (Eichert, pers. comm., 1993).

State lands in the lower portion of the basin are on predominantly north-facing slopes and are more timbered, while those in the north are south-facing and less timbered, which explains the difference between the two areas (Eichert, pers. comm., 1993). Timber sales from 1989 through 1993, in the St. Joe Area, totaled 11,770 acres, 143,190 board-feet volume, at a net value of $36,257,000. For the Clearwater Area, the total acreage sold from 1989 through 1994 was 16,675 acres, total volume was 211,710 board-feet at a total net value of $37,174,500.

Most of the private land (21%) in the basin is forested and owned by the Potlatch Corporation (Benson, pers. comm, 1994). Of the land owned by Potlatch, it is estimated that virtually all of it is considered suitable timber (Benson, pers. comm., 1994). Crown Pacific in Coeur d'Alene owns timbered land in the Black Canyon area of the upper basin (White, pers. comm., 1993).

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III. DEMOGRAPHICS AND ECONOMICS

Demographics

Almost 77% (1,208,966 acres) of the North Fork Clearwater River Basin is within Clearwater County, with small portions in Shoshone County (246,936 acres, 15.7%), Idaho County (98,254 acres, 6.2%), and Latah County (21,286 acres, 1.4%). Clearwater County is the heart of the basin, Shoshone County contains the headwaters of the North Fork Clearwater River and the Little North Fork Clearwater River, while Idaho County covers the southern portion of the basin.

During the 1980-1990 decade, Idaho's population increased by 6.6 percent while Clearwater County lost 18%, Idaho County 6.7%, and Shoshone County 28% (due to attrition in the mining industry). The 1990 population density for Clearwater County was 3.4 residents per square mile (total land base of 2522 square miles), which is low compared to a state average of 12.2 per square mile (Idaho Department of Commerce, 1994) and a national average of 70.3 per square mile (Statistical Abstract of the United States, 1993).

From 1990 to 1994, Clearwater County's population increased about 5 percent, or 0.9 percent annually. This small population increase in Clearwater County halted a trend of out-migration (Idaho Power Company, 1994). Elk River, the only incorporated community within the basin, lost 44% of its population in the early 1990s (Clearwater County Board of Commissioners, 1992). It registered a population of 149 in the 1990 census, down from 265 in 1980 (Idaho Dept. of Commerce, 1992).

One hundred and eighty Native Americans (1990 Census) live in Clearwater County, mostly around Orofino, accounting for about three percent of the county population. Most of these are members of the Nez Perce Tribe (1,860 live on the reservation). Tribal headquarters is in Lapwai, in Nez Perce County.

Table 3. County Population.

County	1960	1970	1980	1990	Change 1960-1990
Clearwater	8,548	10,871	10,390	8,505	-.5%
Idaho	13,542	12,891	14,769	13,783	+1.8%
Latah	21,170	24,871	28,749	30,617	+44.6%
Shoshone	20,876	19,718	19,226	13,931	-33.3%

Source: U.S Bureau of Census.

Employment and Income

The majority of the basin lies within Clearwater County. Clearwater County's economy is heavily dependent upon the forest & wood products and local government sectors. The county is the home of the administrative headquarters of the Clearwater National Forest, Dworshak Dam and Reservoir, and Dworshak National Fish Hatchery. Federal, state, and local government account for the second largest group of workers in the county, next to manufacturing (lumber and wood products).

The four counties that comprise the basin have natural resource based economies (USDA, Clearwater National Forest, 1994). Agriculture, timber, and recreation are the major economic activities of these counties and many of these products are funneled into the transportation hub at Lewiston. Currently, timber is the basin's greatest economic resource.

Government employment is very important with federal and state lands comprising a large part of the land base. Government employment

ranged from 35% to over 45% of the work force in Clearwater, Idaho, and Latah counties. Clearwater County is also the site of a state prison (1989), a new state fish hatchery (1992), and Ahsahka National Fish Hatchery, which was built in conjunction with Dworshak Dam (1969).

The 1987 Census of agriculture showed there were 134,891 acres of farmland in Clearwater County. At that time, there were 216 farms, with an average size of 624 acres per farm. There were 38,083 acres of non-irrigated cultivated land in Clearwater County. Major crops grown are wheat, barley, oats, peas, lentils, rapeseed, canola, beans, and hay. The market value of all agricultural product sold in 1987 totaled $4 million.

The vast recreation opportunities in Clearwater County draw many outdoor enthusiasts, from both in-state, and out-of-state, throughout the entire year. Much of the recreational enjoyment in the County can be attributed to its natural environment. The mountains, forests, streams, lakes, and rivers, offer a wide variety of recreational opportunities, that attract a host of visitors and local people annually. Recreation is a primary component of Orofino's economic base. The business owner's were asked to indicate whether they directly provided recreation services to local customers or to visitors traveling into the area. Four out of five trade and service sector businesses indicated that they provide recreation-related goods and services while three out of five businesses in construction, manufacturing, utilities, transportation, and financial and real estate services also indicated that they provided recreational-related goods and services. Nearly all respondents to the survey,whether or not they directly provided recreation services, recognized the important linkages between recreation, local economic vitality, and the local labor force and employment base (Corps of Engineers, 1995). Employment statistics for Clearwater County are shown in Table 4.

Approximately one-third of the jobs in Clearwater County are in the trades and services sector. Another one-third of the jobs are in construction, manufacturing, utilities, transportation, and financial and real estate services; and the remaining one-third of the jobs are in agriculture and government" (Corps of Engineers, 1995).

Table 4. Employment Statistics, Clearwater County

Item	1980	1984	1988	1992
Total Employment	4,709	4,292	4,286	4,535
Employment By Industry				
Farm	235	280	243	224
Ag.Serv.,Forest,Fish,& other	144	177	149	169
Manufacturing	1,597	1,152	1,131	1,009
Mining	<10	<10	14	14
Construction	147	117	145	178
Wholesale Trade	51	55	58	35
Retail Trade	610	595	594	665
Finance,Insur.,& Real Estate	134	135	125	130
Services	444	482	534	640
Federal Civilian	417	344	325	317
Federal Military	68	52	60	53
State $ Local Government	669	727	764	945

Source: Idaho Department of Commerce, 1994

Between 1980 and 1987, Clearwater County lost 451 jobs (4,687 down to 4,236; 10%), Shoshone County lost 3,923 (9,100 down to 5,177; 43%), Idaho County lost 171 (6,070 down to 5,899; 3%), while Latah County gained 980 positions (13,895 up to 14,875; 7%). The job losses in Shoshone County are largely attributable to a decline in the mining industry, while in Clearwater County, manufacturing and retail declines account for the majority of the jobs lost. The timber industry shows high unemployment during the winter and spring when logging operations are suspended. Unemployment in 1990 averaged 5.8% for the five-county area. (Idaho Department of Employment, 1994).

According to labor market analyst Doug Tweedy, "Unemployment occurs most often in manufacturing. Eighty percent of these layoff are related to lumber production. About half of these are seasonal layoffs, with workers unemployed for about three months during the year. Technological advances in sawmills, have displaced the other half. Incidentally, displaced sawmill workers have longer periods of unemployment than the average." (Tweedy, 1995b)

Employment in agriculture and manufacturing has been on a downward trend since the first part of the 1980s (Table 4). The lumber industry most directly felt the impact of the national recession. Employment decreases are posted in lumber, manufacturing, and construction. Continued loss of well-paying jobs in the timber-dependent communities would be an economic disaster in the county.

Table 5. Annual Percent Labor Force Unemployed

Year	Percent
1980	16.1
1984	16.3
1988	11.9
1990	12.6
1991	14.0
1993	14.6

Source: Idaho Department of Commerce, 1994

According to statistics compiled by the Idaho Department of Employment, the region is in the middle of a period of substantial growth (IDE, 1994). Department records indicate a four percent growth in population and employment for the area during the period 1990-1992, which is almost double the 30 year average growth in population from 1960-1990.

Personal income and personal income per capita in Clearwater County continues to grow at an annual average rate of 9.3%, and 7.9% over the period of 1990 to 1995, respectively (Table 6). In the entire state of Idaho, personal income is projected to grow at an annual average rate of 7.1% in the same period and reach $24,607 million.

Table 6. Personal Income in Current Dollars

Year	Personal Income	Per Capita Personal Income
1980	$ 92,600,000	$ 8,600
1990	119,000,000	14,050
1992	137,000,000	15,750
1994	173,300,000	19,400
1995	185,800,000	20,550

Source: Idaho Power Company, 1994

Future Trends

The population of Clearwater County is projected to grow at an annual average rate of 0.52 percent reaching 10,030 in the year 2015. Based on updated estimates, north-central Idaho's population will continue to increase in 1995 at a rate of around one percent. A majority of the north-central Idaho population (72 percent) lives in Latah and Nez Perce counties. The population in these two counties has increased at a faster rate than the rest of north-central Idaho. However, even small population increases in Clearwater and Idaho Counties halts a trend of out-migration. (Tweedy, 1995a).

The majority of people moving into north-central Idaho are from high unemployment areas, such as California and the Midwest. They come with little information on the job market. Most are attracted by the low cost of living, the lifestyle, and low crime rates. Idaho Department of Commerce statistics also indicate that many of the people migrating into north-central Idaho are retired (Table 7).

Table 7. Percentage of Total Population at Age 65 and Over

County	Age 65+ Years (%) 1970	1980	1990
Clearwater	6.9	9.6	15.1
Idaho	--	12.5	15.6
Latah	8.6	9.3	9.7
Lewis	11.7	13.7	17.5
Nez Perce	10.2	12.7	16.1
State of Idaho	9.5	9.9	12.0

Source: County Profile of Idaho, Idaho Department of Commerce, 1994

County personal income and personal income per capita (in current dollars) is forcast to grow over the 1995 to 2015 period at annual rates of 6.25 and 5.72 percent respectively. Population, employment, and personal income trends for Clearwater County are outlined in Table 8. However, with the in-migration, the cost of living has gone up, especially in housing, and the population is increasing at a rate faster than the economy can produce new jobs (Tweedy, 1995a).

Non-Agriculture employment growth over the 1995 to 2015 period is 1.88 percent per year. The manufacturing sector is expected to increase at an annual rate of 2.2 percent. Wholesale & retail trade and services are projected to grow at an annual average rate of 2.93 and 2.22 percent respectively.

Until recently, the economy of the basin has been predominantly timber-dependent. Members of the LAG believe that the area economy has suffered because of the Endangered Species Act's impacts on the timber industry and legal challenges to the Clearwater National Forest Plan. Similarly, the LAG feel the shift toward a more diversified economy has been hampered by Dworshak drawdowns. Consequently, there is genuine concern by the local citizens about ensuring economic viability and sustainability in this time of transition.

Income and employment lost in one economic area could be gained in another area by shifting recreational focus from the reservoir to rivers and thereby stimulating a considerable amount of transferred economic activity in the region. High quality natural rivers have positive economic effects on local regions. There is great potential for stimulating additional economic growth in the local region by taking action to increase visits from nonresidents to the rivers. Local people could shift recreational emphasis from the reservoir to the river, and develop facilities to attract greater visitation. Protecting and managing rivers for outdoor recreation may provide a clean, economically viable means for enhancing local economic development, as well as for providing needed recreational opportunities to the nation.

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Table 8. Idaho Regional Economic Forecasts for Clearwater County

	1995	2000	2005	2010	2015	20 year Ann.Ave.%
Population	9,040	9,200	9,380	9,690	10,030	0.52
Households	3,560	3,710	3,860	4,070	4,280	0.93
Persons per household	2.4	2.34	2.29	2.24	2.20	-0.43
Total Non-Ag						
Employment	3,500	3,940	4,360	4,720	5,080	1.88
Manufacturing	970	1,170	1,350	1,440	1,500	2.20
Mining	0	0	0	0	0	--
Construction	90	100	110	110	100	0.53
Transp.,Comm., & Utilities	90	90	80	80	80	-0.59
Finance,Insur., $ Real Est.	90	90	100	100	110	1.01
Wholesale & Retail Trade	550	690	830	920	980	2.93
Services	290	300	330	370	450	2.22
Government	1,430	1,500	1,550	1,700	1,860	1.32
Personal Income						
Current $ (millions)	185.8	252.0	340.2	460.3	625.1	6.25
1987 $ (millions)	137.4	155.5	176.9	199.7	227.1	2.54
Personal Income Per Capita						
Current $	20,500	27,400	36,250	47,500	62,300	5.72
1987 $	15,200	16,900	18,850	20,600	22,650	2.01

Source: County Economic Forecast, Idaho Power Company, Nov.1994

IV. OUTSTANDING VALUES ASSESSMENT

Biological Evaluation

The biological evaluation procedure is based on an ecosystem approach, no one particular biological attribute is given more weight than another. This procedure represents a combination of a number of different stream assessment methodologies, including the EPA's Rapid Bioassessment Protocols (RBP) and Streamwalk, DEQ's Beneficial Use Reconnaissance Procedure (BURP), and IDFG's Idaho Rivers Information System (IRIS) among others.

There were 49 streams evaluated in the basin. These streams had biological information about them available. They were initially evaluated over their entire length because biological information is insufficient to justify further partition. If data later becomes available, the streams can be broken into reaches.

Criteria and Procedure

Biological data were collected from various sources, including Idaho Department of Fish and Game, Idaho Department of Lands, Clearwater National Forest, Potlatch Corporation and IDWR field surveys. The data were compiled for 20 biological attributes on each stream (Table 9). These 20 attributes were organized into four components for ease of collecting and organizing the data:

Aquatic Habitat - physical conditions and water quality associated with the water in the stream channel;

Riparian Habitat - physical conditions and vegetation community characteristics in the floodplain;

Aquatic Species - plant and animal species associated with the water in the stream channel;

Riparian Species - plant and animal species in the floodplain.

Based on available data, each stream was rated on the basis of how many of the 20 attributes it possessed (presence/absence). Basic statistics applied to that data yielded the following for positive responses out of 20: mean value = 8.33; range = 3-12. A high value of 12 out of a possible maximum of 20, is low because data were lacking, not because the streams were in poor condition. Consequently, it was necessary to readjust the evaluation scale. Each stream was placed in one of three classification categories, based on its total of positive responses. Ten streams ranged from 3-5 (20.4%) signifying insufficient data (I). Twenty-six streams ranged from 6-10 (53.1%) rating a Moderate (M) classification, and 13 streams ranged from 11-12 (26.5%) which rated Outstanding (O). Figure 9 depicts stream segments rated Outstanding for fish and wildlife. Table 10 lists the evaluation scores for each stream. The attribute values in each of the four categories refer to a rating with the highest possible being 5 (4 categories x 5 = 20 maximum).

Table 9 . River Biological Screening Procedure data sheet for North Fork Clearwater River Basin.

HABITAT--Aquatic

[ ] 1. Bottom substrate type (observe in channel-forming pool tail-outs [at least 1/3 of stream width] and low gradient riffles): cobble and boulders dominant; fine sediment not dominant
[ ] 2. Instream cover: large woody debris and/or undercut bank
[ ] 3. Instream habitat: complexity of stream channel habitats present (riffles [or bends], runs, pools)
[ ] 4. Water quality: at least one of the following DEQ classifications apply to study reach (circle those that apply):
- Meets all beneficial uses
- Water quality criteria/standards satisfied
- Outstanding Resource Water
- Special Resource Water

Critical spawning habitat:
[ ] 5. spawning

HABITAT--Riparian

[ ] 6. Bank stability: vegetation canopy and roots cover majority of bank and no slumping or eroding occurs
[ ] 7. Riparian vegetation cover: dominated by shrubs and/or trees
[ ] 8. Special management areas: at least one of the following occurs along study reach (circle those that apply):
- Area of Critical Environmental Concern
- Pioneer Area
- Priority Wetlands
- Research Natural Area
- Recovery Area
- Special Interest Botanical Area
- Wild & Scenic River or eligible
- Wildlife Refuge
- Wildlife Management Area
- Wilderness Area or proposed

Critical wildlife habitat:
[ ] 9. wintering
[ ] 10. migratory/roosting

SPECIES--Aquatic

[ ] 11. Fishery classification: at least one of the following IDFG fishery classifications applies to study reach (circle those that apply):
- Trophy
- Preservation
- Quality
- Wild Trout
- Anadromous

[ ] 12. Fish species richness: diversity (no. species with balanced abundances) relatively high
[ ] 13. Fish species composition: predominantly native or game species
[ ] 14. Aquatic insect composition: predominantly species of low pollution/sediment tolerance (e.g., mayflies, stoneflies, caddisflies, etc.)

Rare aquatic biota:
[ ] 15. federal listed species
Names/classification_____

[ ] 16. CDC 1 or 2 listed species
Names/classification_____

SPECIES--Riparian

[ ] 17. Riparian species richness: diversity (total no. species with balanced abundances) relatively high
[ ] 18. Riparian species composition: predominantly native species

Rare riparian biota:
[ ] 19. Federal listed species
Names/classification_____

[ ] 20. CDC 1 or 2 listed species
Names/classification_____

Figure 9. Biological Values

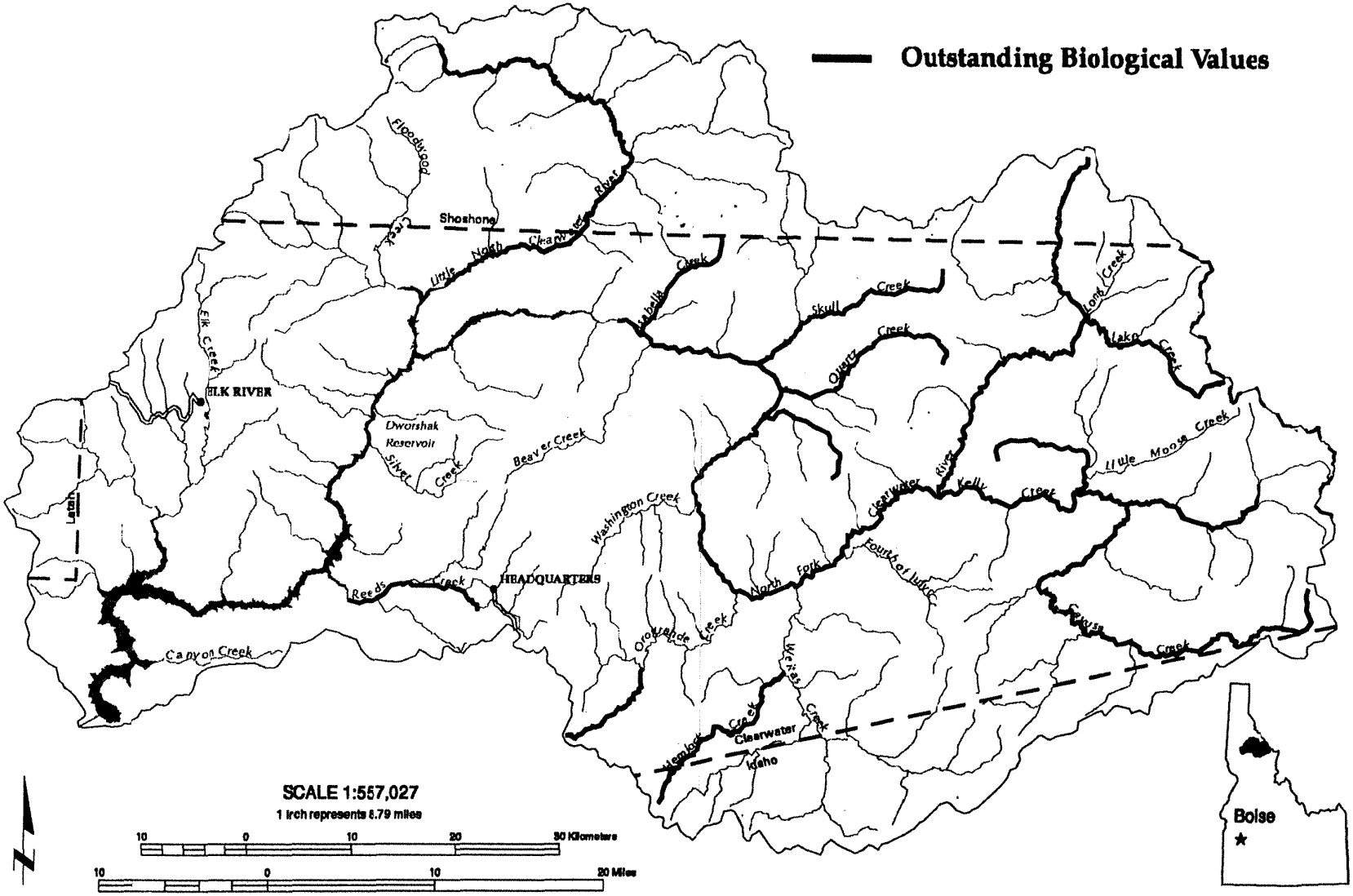

Table 10. Biological Attribute Evaluation for 49 Streams in the North Fork Clearwater Basin.

REACH NAME	BIOLOGICAL ATTRIBUTES				EVALUATION RATING (max = 20) * = outstanding
	HABITAT Aquatic	HABITAT Riparian	SPECIES Aquatic	SPECIES Riparian	
Beaver Creek	2	3	3	2	10
Benton Creek	1	1	2		4
Breakfast Creek	4	2	3		9
Canyon Creek	1	2	2		5
Cayuse Creek	2	3	3	3	11 *
Clover Creek	1	1	2		4
Cold Springs Creek	1	2	3	2	8
Collins Creek	2	3	3	1	9
Cougar Creek	2	2	2		6
Cranberry Creek	1	1	3		5
Dworshak Reservoir	1	2	2	2	7
Elizabeth Creek	2	1	3		6
Elk Creek	1	2	3	2	8
Floodwood Creek	4	2	2	1	9
Foehl Creek	1	1	2		4
Fourth of July Creek	2	3	3	2	10
French Creek	4	2	3	2	11 *
Gravey Creek	1	2	3		6
Hemlock Creek	4	3	3	2	12 *
Isabella Creek	4	3	3	2	12 *
Kelly Creek	3	3	3	3	12 *
Lake Creek	4	2	3	2	11 *
Little Moose Creek	2	3	3	2	10
Little NF Clearwater R	2	3	4	2	11 *
Little Weitas	2	3	3	2	10
Long Creek	2	2	3	2	9
Long Meadow	1	2	2		5
Meadow Creek	3	2	3	2	10
Middle Creek	2	3	3	2	10

REACH NAME	BIOLOGICAL ATTRIBUTES				EVALUATION RATING (max = 20) * = outstanding
	HABITAT Aquatic	HABITAT Riparian	SPECIES Aquatic	SPECIES Riparian	
Monroe Creek	2	2	3	2	9
Moose Creek	4	3	3	2	12 *
NF Clearwater River	3	3	3	3	12 *
Orogrande Creek	3	2	3	2	10
Osier Creek	2	2	3	1	8
Quartz Creek	4	3	3	2	12 *
Reeds Creek	2	3	4	2	11 *
Rock Creek	5	2	3	2	12 *
Rutledge Creek	1		2		3
Sawtooth Creek	1	2	2		5
Silver Creek	1	2	2	2	7
Skull Creek	3	3	3	2	11 *
Sprague Creek	3	2	2	2	9
Stoney Creek	2	1	2		5
Swamp Creek		1	2		3
Toboggan Creek	2	3	3	2	10
Vanderbilt Gulch		2	2	2	6
Washington Creek	2	2	3	2	9
Weitas Creek	2	3	3	2	10
Windy Creek	2	1	3	2	8

Scenic Evaluation

The Idaho Water Resource Board is directed to identify rivers possessing outstanding aesthetic values [Idaho Code 42-1731(7) and (9)]. Landscapes with "outstanding" aesthetic values were determined by reviewing the variety class information contained in visual inventories completed by the Clearwater and Idaho Panhandle National Forests. Inventories were not available for much of the western half of the basin, and a small section in the northeast corner. These areas are private land or under the jurisdiction of agencies who have not conducted similar inventories.

Landscape features of the North Fork Clearwater River basin are evaluated relative to characteristics found in the Columbia-Rockies subregion encompassing portions of northwestern Montana and Idaho from the Panhandle down to the Salmon River. Subregions are a geographical area with similar landform, rock form, water form, and vegetation characteristics (USDA, Northern Region, 1980).

The Forest Service visual inventory system describes landscape scenic values as one of three variety classes. Variety classes are derived by evaluating the variety, contrast, harmony or distinctiveness of the various components of the landscape: landform, rock form, vegetation and water form (USDA, 1974). The three classifications include: 1) *variety class A* that describes landscapes with distinctive characteristics; 2) *variety class B* that describes landscapes with landscape features typical or common for the region; and 3) *variety class C* that describes landscapes with little or minimal variety in the landscape elements (USDA, 1974).

Variety class A landscapes may include one or more of these features: Landforms characterized by peaks or domes with distinctive form and/or color contrast. Rock form may include hanging valleys, cirques or bedrock escarpments; large or unique talus slopes and avalanche chutes; deep canyons, gorges and valleys with vertical or near vertical walls and unusual configuration or color; and massive rock outcrops, cliffs, boulders or groupings of boulders.

Vegetation is characterized by strongly contrasting natural vegetative color or texture patterns; the presence of marshes, meadows and swamps; concentrations of hardwood species with visually attractive characteristics such as aspen, birch or vine maple; areas of concentrations of wildflowers; and western red cedar groves. Water forms are characterized by high mountain lakes in subalpine or higher elevations; rivers or streams dominated by waterfalls, cascades, rapids, meanders and/or pools; unusual or outstanding shorelines with large boulders, rock outcrops, cliffs, islands or unique vegetation; major springs; glaciers and snowfields; and/or a distinctive appearance to the water because of color and/or clarity (USDA, Northern Region, 1980).

Variety class B landscapes possess any of the following characteristics: Landforms would include peaks, ridges or rounded hills that are not visually dominant in the setting. Canyons and drainages lack distinctive configuration or color. Moderate variation in vegetation patterns or moderate contrast in seasonal color. Lakes and reservoirs have shorelines with features representative of the region. Rivers and streams have some waterfalls, cascades, meanders or pools, and shoreline features characteristic for the area (USDA, Northern Region, 1980).

Variety class C landscapes possess the following characteristics: Landforms are characterized by low hills and large areas with minor topographic variation. Geologic features are minor in the setting. Variations in vegetation color and texture patterns are minimal. Water forms consist of isolated ponds, intermittent streams, and/or rivers and streams without distinctive characteristics (USDA, Northern Region, 1980).

River corridors inventoried as variety class A were considered to have outstanding scenic values. The National Forest Visual Management System manual defines the variety class A landscapes as "those areas where features of

landform, vegetative patterns, water forms and rock formation are of unusual or *outstanding* visual quality" (USDA, 1974). Rivers and streams in the North Fork Clearwater Basin having Outstanding scenic values are shown Figure 10 and listed in Table 11. Table 11 is not comprehensive. The western half and north-eastern corner of the basin is predominately private land and has not been inventoried for scenic values. Therefore, information regarding potential outstanding scenic values of drainages is unavailable for these lands. For a detailed listing of all landscapes identified as outstanding, information is available in IDWR files.

Recreation Evaluation

The recreation evaluation focused on recreational opportunities within specific river reaches. River reaches within the North Fork Clearwater were grouped into segments or discrete recreation units delineated on the basis of landform, hydrology, land use patterns, visual character, access and/or recreational use patterns. Each recreation unit was individually evaluated for recreational diversity and the importance of recreational opportunities. The evaluation entailed examination of the recreational diversity and importance of each recreation unit; and categorization of a final evaluation value for each recreation unit (outstanding, high, or moderate to low) based on the diversity and uniqueness of the recreational experiences available on the river.

Recreational diversity is a measure of the variety of recreational activities. Three criteria were assessed to arrive at a diversity value: 1) identification of land-based and water-based recreation opportunities, 2) natural features and 3) level of access. Land-based and water-based recreation activities occurring within the river corridor were identified through review of agency documents, maps describing recreation facilities, and communications with agencies and user groups. Land-based activities include camping, hiking, or hunting. Water-based recreation includes fishing, swimming and boating.

Natural features were identified which enhance recreation opportunities or experiences. These include water characteristics influencing the type of possible boating activity; aesthetic values of the unit; and identification of special wildlife habitat characteristics providing increased opportunities for wildlife observation or other wildlife-related recreation. The level of access was described to provide information regarding the types of recreational activities possible, potential use volume, and opportunities for primitive or isolated versus a more developed recreation experience.

Recreational importance was determined by four criteria: (1) unique or rare features which may enhance the recreation experience such as high quality fisheries or wildlife habitat; (2) public concern for the recreational values of the unit (determined from public and advisory committee input, and agency consultation); (3) use volume based on recreational survey data and agency consultation; and (4) special designations and/or agency recreation management objectives.

The final evaluation class for each unit was based on a combined assessment of diversity and importance. A recreation unit evaluated as "outstanding" provides significant recreation opportunities encompassing a great diversity of activities; provides a unique or rare experience within the region or planning area; and receives the highest use. A recreation unit evaluated as high is characterized by river segments receiving high use; with high diversity; and/or providing an important recreation experience which is unique, but may be typical for the region. Moderate to low designations define river segments with recreational opportunities typical in the region; receiving moderate to low use, and/or having moderate to low recreation diversity.

Figure 11 shows streams rated as outstanding for recreation, and Table 12 summarizes the recreation evaluation by river reach. Many river or stream reaches in the basin lacked sufficient data to evaluate recreation opportunities.

Figure 10. Scenic Values

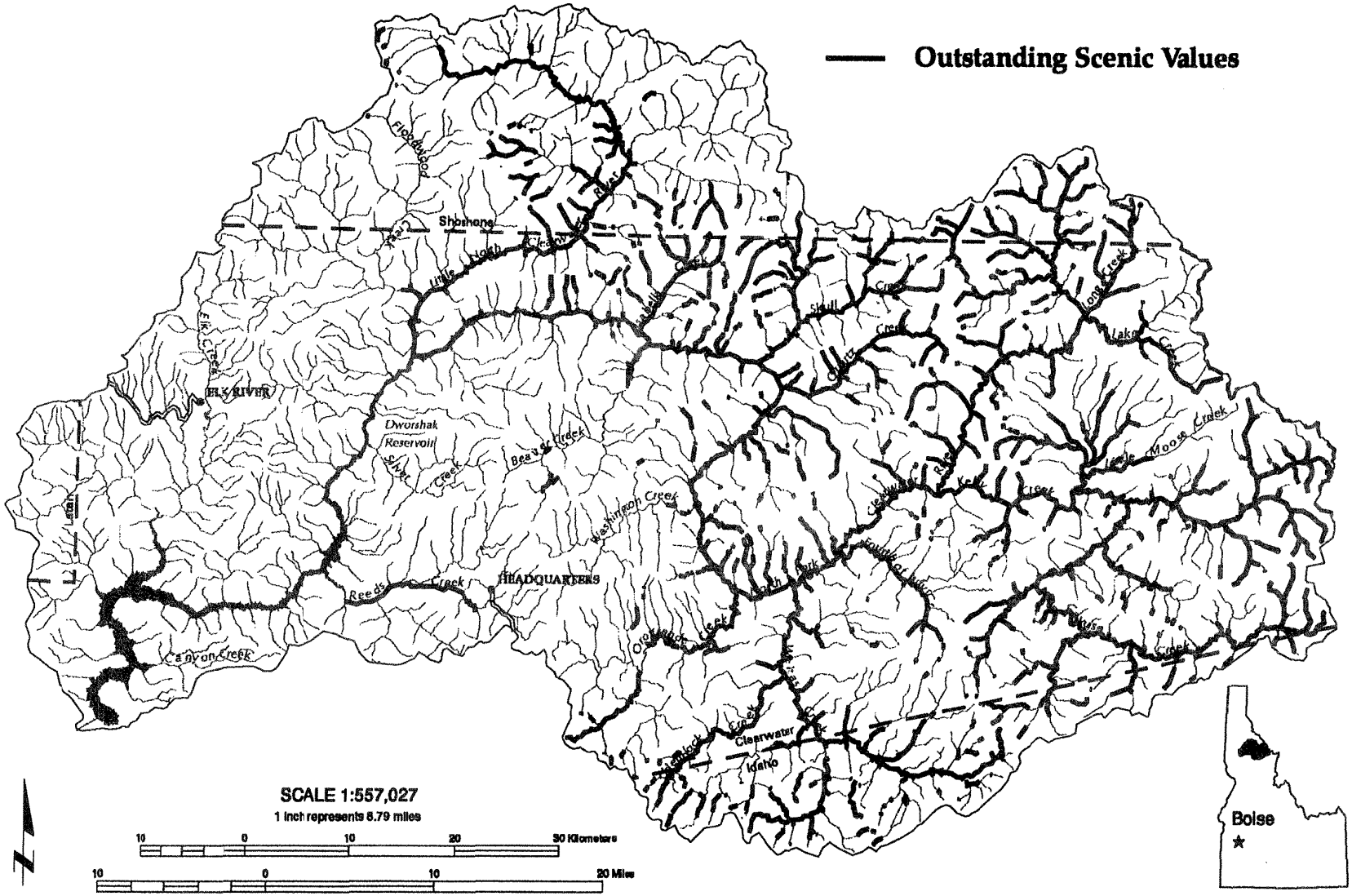

Table 11 . North Fork Clearwater Basin River or Stream Reaches with Outstanding Scenic Values*

North Fork Clearwater - *Headwaters to backwaters of Dworshak Reservoir*
Dworshak Reservoir - *Backwaters to confluence with Little North Fork Clearwater*
Little North Fork Clearwater - *Headwaters; Spotted Lois Creek to mouth*
Lost Lake Creek - *Lake and headwaters*
Foehl Creek - *Headwaters to Tangle Creek confluence*
White Gravel Creek - *Headwaters to mouth*
Isabella Creek - *Headwaters*
Skull Creek - *Headwaters to mouth*
Quartz Creek - *Confluence with Henry Creek to mouth*
Orogrande Creek - *Cache Creek to mouth*
Hemlock Creek - *Mutt Creek to mouth*
Weitas Creek - *Headwaters to mouth*
Little Weitas Creek - *Headwaters to mouth*
Fourth of July Creek - *Just below headwaters to mouth*
Kelly Creek - *Headwaters to mouth*
Cayuse Creek - *Headwaters to mouth*
Toboggan Creek - *Confluence with Rock Garden Creek to mouth*
Monro Creek - *Headwaters to mouth*
Gravey Creek - *Headwaters to mouth*
Marten Creek - *Headwaters to mouth*
Howard Creek - *Above confluence with Moon Creek to mouth*
Silver Creek - *Headwaters to mouth*
Little Moose Creek - *Lower reach*
Moose Creek - *Headwaters to mouth*
Bear Creek - *Headwaters to mouth*
Cub Creek - *Headwaters to mouth*
Deer Creek - *Headwaters to mouth*
Doe Creek - *Headwaters to mouth*
Pete Ott Creek - *Headwaters area and below headwaters to mouth*
Elizabeth Creek - *Headwaters to mouth*
Hidden Creek - *Headwaters to mouth*
Deception Gulch - *Lower reach*
Lake Creek - *Confluence with Goose Creek to mouth*
Long Creek - *Headwaters to mouth*
Short Creek - *Lower reach*
Meadow Creek - *Headwaters to mouth*
Chamberlain Creek *Headwaters to mouth*
Vanderbilt Gulch - *Headwaters to mouth*
Niagara Gulch - *Headwaters to mouth*
Bostonian Creek - *Headwaters to mouth*
Caledonia Creek - *Headwaters to mouth*

* This is not a complete listing of streams inventoried with outstanding scenic values.
Only major streams (at least a second-order stream) were assessed for classification as "outstanding" in this plan. Refer to the *Scenic Values* map on file with the Idaho Department of Water Resources for a complete listing of all stream and river reaches evaluated as Variety class A.

Figure 11. Recreation Values

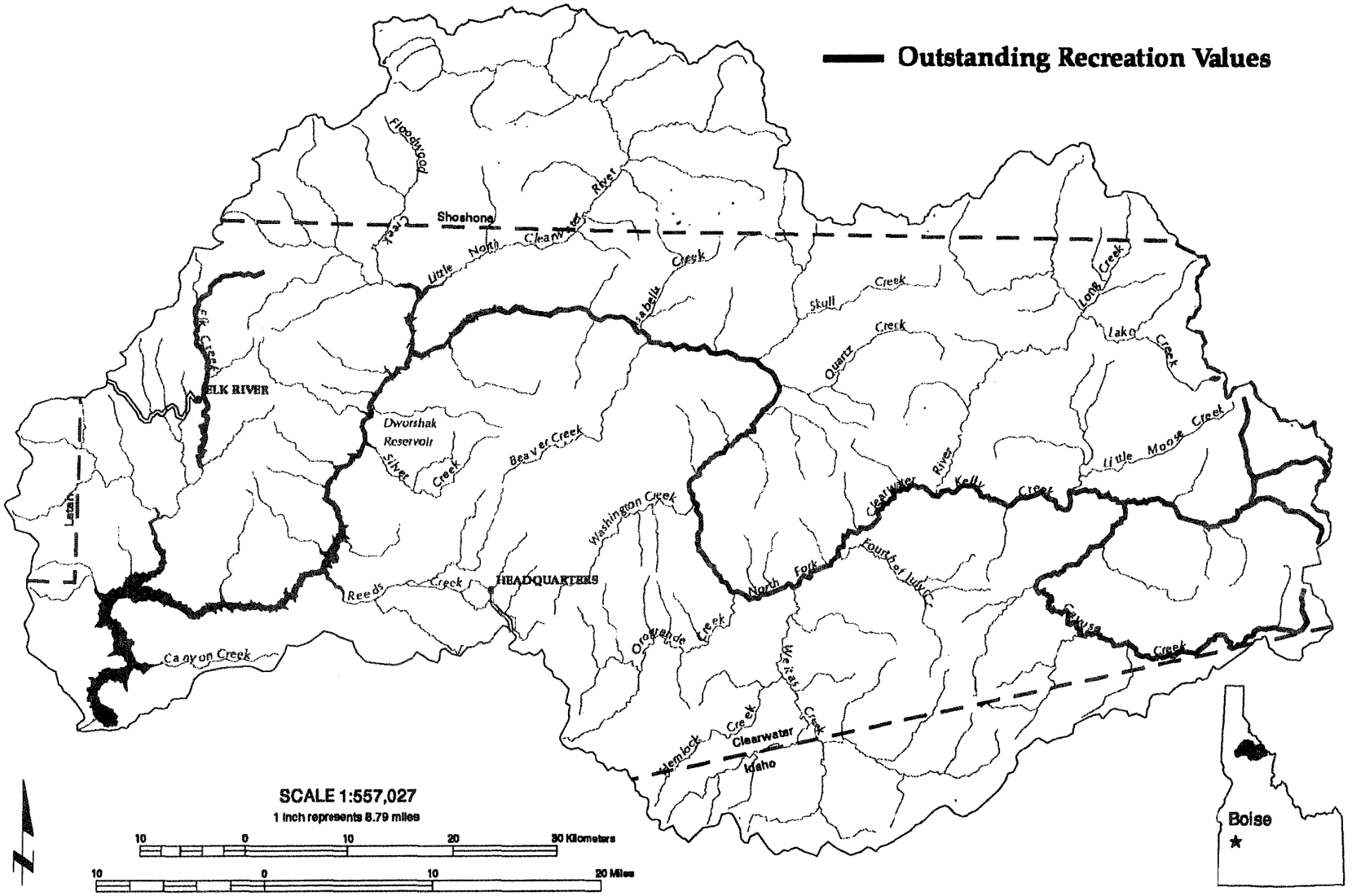

Table 12. Recreation Evaluation Criteria and Results for the North Fork Clearwater River Basin.

EVALUATION CLASS	CRITERIA	RECREATION UNITS
Outstanding	Significant recreational opportunities available as indicated by a great diversity of activities; unique or rare experience; and/or highest use areas.	**North Fork Clearwater** *(Confluence with Kelly Creek to backwaters of Dworshak Reservoir)* - significant diversity of recreational opportunities, unique nature study opportunities in coastal disjunct vegetation community **Dworshak Reservoir** - highest use volume in area **Elk Creek** *(Headwaters to confluence with Deep Creek)* - significant diversity of recreation opportunities including unique experiences **Kelly Creek** *(Headwaters to mouth)* - unique high quality westslope cutthroat trout fishing in both roaded and roadless settings **Cayuse Creek** *(Headwaters to mouth)* - unique high quality westslope cutthroat trout fishery in a roadless setting
High	River segments with a high use volume; high diversity; and/or a recreation opportunity which is unique but typical in the region.	**North Fork Clearwater** *(Headwaters to Kelly Creek confluence)* - high diversity of recreational opportunities and back country quality elk hunting (IDFG Hunting Unit 10) **Weitas Creek** *(Headwaters to mouth)* - high diversity of recreational opportunities in a roadless setting and back country quality elk hunting (IDFG Hunting Unit 10) **Little North Fork Clearwater** *(Headwaters to mouth)* - high diversity of recreational opportunities and back country quality elk hunting (IDFG Hunting Unit 10) **Elk Creek** *(Headwaters to mouth)* - high diversity of recreational opportunities and high use
Moderate and Low	River segments with moderate to low use volume; moderate to low diversity of opportunities; and/or providing recreational opportunities typical and abundant within the region.	**North Fork Clearwater** *(Dworshak Dam to confluence with main stem Clearwater)* - moderate diversity of recreational opportunities **Orogrande Creek** *(Headwaters to mouth)* - moderate diversity of recreational opportunities

V. ISSUES, CONSIDERATIONS, AND OBJECTIVES

Institutional Considerations

Other state, federal, and local entities have major roles in the regulation and institutional aspects of water use. Comprehensive plan consistency is one factor among several considered by the Water Resource Board in its policy decisions. Several city, county, state, federal, and private planning documents produced in recent years concern the North Fork Clearwater River Basin (see below). These documents are too numerous and extensive to summarize, but they have been taken into consideration in the development of this plan.

City and County

- Water System Master Plan and Implementation Program: City of Orofino, Idaho (1992)
- Clearwater Unlimited, Inc. Action Plan (1995)
- Elk River Comprehensive Plan (1978)
- Clearwater County Comprehensive Land Use Plan (1992)
- Shoshone County Comprehensive Plan Draft Copy (1993)

State

- IDFG Fisheries Management Plan 1991-1995
- IDL Forest Practices Cumulative Watershed Effects Process for Idaho (1995)

Federal

- Clearwater National Forest Management Plan 1987
- Clearwater National Forest Monitoring & Evaluation Report Fiscal Year 1992 (1993)
- Panhandle National Forests Management Plan 1987
- Corps of Engineers Dworshak Master Plan (1977)
- Nez Perce Reservation Management Plan
- Corps of Engineers Walla Walla District: The Orofino Business Study (April, 1995)
- Northwest Power Planning Council Protected Areas Designations

Private

- Potlatch Resource Management Plan

FLOOD MANAGEMENT

Floods in the Clearwater River Basin are generally of three types: spring snowmelt with and without spring rainstorms, winter rainstorms accompanied by snowmelt, and ice jams (BPA, 1994). A December 1933 rainstorm produced the highest flow of record, 100,000 cfs, at the Ahsahka gage. Flooding in the North Fork Clearwater basin is most probable December-January and May-June.

Flooding along the North Fork Clearwater and tributaries does not cause major property damage. Although flows on basin streams have reached flood proportions on numerous occasions, the area is largely undeveloped and damage is generally confined to Forest Service roads. While there is degradation of main river spawning bars by the addition of heavy loads of fine sand and silt, there is also scouring and aggradation of new gravel bars which is important for spawning.

Flood control is a major function of the Dworshak project. The reservoir is managed to alleviate flooding of the Clearwater River below Ahsahka, and is a part of the greater flood control system of the Columbia River Basin. Dworshak regulation is considered essential in limiting flood waters to 150,000 cfs or less through Lewiston. The Corps of Engineers regulates the reservoir according to forecast inflow and flows at down-stream points on the Clearwater, Snake, and Columbia rivers.

Natural flood peaks in excess of 25,000 cubic feet per second have been generated on four occasions since 1967 at the Canyon Ranger Station gauge. Significant flood events occurred in 1972 and 1974; 1974 is the year of greatest total runoff on record. During January 13-17, 1974, mild weather with heavy rains on relatively low-elevation snowpacks caused extreme flooding in northern and central Idaho. Dworshak Reservoir registered its maximum inflow at 53,000 cfs. Ice jams contributed to extensive overbank flooding.

During June, new peaks of record and the largest volumes for the month occurred at several gaging stations in the Clearwater basin. Flows greater than 20,000 cfs occurred at the Canyon gauge from June 4 through June 21. The greatest instantaneous discharge was 32,300 cfs on June 16, 1974. Inflow into Dworshak Reservoir was calculated at 1,874,000 acre-feet for the same month. Streamflow continued to be excessive until August and September when streams draining relatively low-elevation basins returned to near-average volumes.

Originally, the Dworshak flood management plan, established by the CoE, involved three seasonal periods of reservoir regulation: (1) reservoir evacuation (September-December) for winter flood control; (2) spring evacuation (January-March) to provide additional space as needed; and (3) reservoir refill (April-July; CoE, 1988).

Currently, the CoE's existing management plan has been modified to provide spring and summer releases for flow augmentation. Flow augmentation now constitutes the largest use of the water, with peak discharges (to 25,000 cfs) occurring during the spring and summer. A minimum flow of 1000 cfs is normally maintained during the remainder of the year.

COLUMBIA RIVER SYSTEM OPERATION REVIEW

The Columbia River System Operation Review (SOR) is a plan which will impact the North Fork Clearwater River. This plan, produced by the CoE, BOR, and the BPA in 1994, identifies seven different System Operation Strategies (SOS) for the operation and management of the major dams in the Columbia River Basin. The operation and management of Dworshak Dam and Reservoir is included in this SOR. Dworshak Dam is located at river mile 1.9 of the North Fork Clearwater River, and the operation of Dworshak Dam directly affects the stream flows downstream from the dam.

The seven different SOSs each represent different management options for the dam and reservoir system. These strategies are under review, and the preferred option has not yet been selected. Each strategy is briefly described below. Dworshak Dam and Reservoir is currently managed according to SOS 2.

SOS 1 - System Operation Strategy 1 represents operation as it existed prior to 1991. SOS 1 represents management for power generation, flood control, navigation, and irrigation, with little attention paid to anadromous fish species.

SOS 2 - This Operation Strategy represents current operations, and reflects operation of the Columbia River System with interim flow improvements made in response to ESA listings of Snake River Salmon. This strategy results in a shorter log transport season that SOS 1.

SOS 3 - This alternative attempts to provide more water to move fish downstream by setting flow targets for each month. This operating strategy is expected to have an adverse effect on resident fish at Dworshak Reservoir, and to result in a much shorter log transport season.

SOS 4 - This alternative is intended to minimize reservoir fluctuations by keeping the storage reservoirs as full as possible for as long as possible in the spring while providing spring

flows for anadromous fish migration. This alternative would result in the longest log transport season of any of the alternatives being considered, however, because the reservoir would be kept full for as long as possible, there would be an increased risk of flooding downstream.

SOS 5 - SOS 5 is intended to make in-river fish migration more closely resemble the conditions before the Columbia and Lower Snake dams were built. This would be accomplished by building by-pass structures at the dams and drawing down the Lower Snake reservoirs. At Dworshak Reservoir, this would result in a log transport season similar to SOS 1.

SOS 6 - SOS 6 also calls for drawdowns at the Lower Snake reservoirs, but they would be much less severe. At Dworshak Reservoir, this would result in a log transport season similar to SOS 1 and SOS 5.

SOS 7 - This strategy features increased river velocity during the anadromous fish migration period through flow augmentation and reservoir drawdowns. At Dworshak Reservoir, this would result in a significant amount of exposed shoreline and a very short log transport season.

RESERVED WATER RIGHTS

In 1908, a U.S. Supreme Court ruling, known as the Winters Doctrine, recognized rights to a quantity of water to fulfill the purposes of reservations set aside by the government. In the Snake River Basin Adjudication the federal government (BIA, BLM, and U.S. Forest Service), Nez Perce Indian Tribe, and Shoshone-Bannock Indian Tribe have filed large water right claims for instream flows on the North Fork Clearwater River, from its mouth to the headwaters, and on major tributaries. If the claims are upheld in the Adjudication, all presently unappropriated surface water could be appropriated to these applicants.

In the 1855 Nez Perce Treaty, the tribe ceded, relinquished and conveyed their rights, title, and interest in and to the country occupied or claimed by them, to the government of United States. The current common interpretation identifies the ceded land boundary to include all of the North Fork Clearwater River Basin (Matthews, 1995. pers. comm.). The Nez Perce Water Resources Division has a draft Water Resource Management Plan, but it has not yet been adopted by the Nez Perce Tribal Executive Committee (Matthews, 1995. pers. comm.).

NORTHWEST POWER PLANNING COUNCIL DESIGNATIONS

Many streams in the basin are designated for protection for fish and/or wildlife by the Northwest Power Planning Council. The NPPC designations must be considered by the FERC in their hydropower project authorization process and by the Bonneville Power Administration when acquiring and transmitting power.

Local Issues

Local issues center on maintaining the primitive character and aesthetic quality of the North Fork Clearwater Basin, maximizing recreation opportunities, and supporting long-term sustainable timber harvest.

The public identified and prioritized 13 issues at a Public Scoping meeting on September 27, 1993, and at the first local advisory group meeting on December 6, 1993.

- timber: supply, transport, etc.
- protection designation impacts on: water rights, mining, instream flow, road maintenance, tributary activities, property resource values
- recreation and scenery
- state and federal protection distinctions
- threatened & endangered species
- anadromous and resident fish
- tribal water rights
- commercial recreation on rivers
- hydroelectric development
- economic stability of area
- river protection/free-flowing rivers
- water quality

- effects of fire on visuals and water quality in corridor
- Dworshak Dam and Reservoir management

Management of Dworshak Reservoir and Dam was added as a major issue when the impact of drought and reservoir drawdowns became apparent. Many of these issues are not directly related to water or stream channels, but do affect the watershed and therefore have an impact on the resource.

DWORSHAK MANAGEMENT

The operation of Dworshak Reservoir has been and is being modified to provide increased flows downstream for salmon. Historically, mangement intent was to keep the reservoir at full pool from Memorial Day to Labor Day. Drawdowns in 1992, 1993, and 1994 were 40-feet, 60-feet, and 110-feet below normal, respectively. The low pool level, resulting from a combination of drought and flow augmentation for salmon flushing, is of major concern to the local citizens, because it is affecting recreation on and around the reservoir, the reservoir fishery, and consequently the local economy.

On Monday, April 10, 1995, the City of Orofino joined with the Clearwater Resource Coalition, Orofino Chamber of Commerce and Clearwater County as litigants in a suit against the federal government concerning the drawdown of Dworshak Reservoir. The suit asserts that:

- Gas supersaturation exceeding water quality standards of 110 percent would be the result of releasing spillway discharges proposed for flow augmentation.

- The Dworshak Project was authorized for flood control, log transportation, power generation, and recreation. Logs cannot be rafted if the reservoir is more than 25 feet below full pool, and alternate transportation is significantly more expensive.

August 1, 1995, the U.S. District Court in Boise ruled in favor of the federal government. August 11, 1995, the litigants filed a motion for reconsideration, and August 28, 1995, the U.S. Attorney General filed a memorandum in opposition to the motion.

Economic and Social Impacts of Dworshak Drawdown

The dramatic drawdowns at Dworshak Reservoir frustrate efforts in this timber-dependent region to diversify its economy with tourism. The drawdowns left campsites, beaches, and boat ramps high-and-dry and inaccessible. Public use of the reservoir decreased substantially, and according to the Orofino Chamber of Commerce, the local economy lost an estimated $15 million.

Respondents to a U.S. Army Corps of Engineers April 1995 survey were asked to estimate the impacts of the drawdowns on their business. The most commonly cited impact was an expected loss in gross business sales with a consequent decline in net business income. It was felt that business sales may decline by as much as 29 to 40 percent, resulting in an estimated loss of $15 million over the three year period (1992 - 1994).

Three out of four business owners indicated that their operations had been affected by drawdowns in one or more of the recent years. The survey indicated that in any given year, between one-third and one-half of the businesses sustained losses. According to the business owners, gross sales losses, estimated at $3.3 million in 1992, $5.0 million in 1993 and $7.1 million in 1994, appeared correlated to the extent of the drawdown. Business owners also estimated a decline in employment as a result of the recent drawdowns, including 20 jobs in 1992, 35 jobs in 1993, and 80 jobs in 1994 (Corps of Engineers, 1995).

Scenic values within the North Fork Clearwater Basin are affected by the drawdown of Dworshak Reservoir. Unsightly barren reservoir walls due to summer drawdowns impact the quality of the recreation experience. Even if facilities are altered to increase access during

future drawdowns, the visual quality of the recreation experience would remain degraded.

Transportation of logs on the Dworshak Reservoir is affected by drawdown. One authorized use of the Dworshak pool consists of rafting logs across the reservoir to a log transfer area near the dam. Logs are cut from the basin, dumped from trucks into the Dworshak pool, and then towed in rafts to a loading area where they are transferred onto trucks. Staging areas have been developed for several pool elevations so that timber operations can continue during periods of normal drawdown. During periods of significant drawdown, the pool becomes unusable for log rafting (BPA, 1994).

NAVIGATION

Idaho has two determinations of navigability: state title and right of way. There is a separate test for each of these two types. The state title determination of navigability uses a "navigability in fact" test. The purpose of this test is to exercise the state's claim of title over the beds of navigable streams. This test states that a stream must have been used as a "highway for commerce" on the date that the State of Idaho was admitted to the Union (July 3, 1890). The North Fork, Clearwater River is considered "navigable in fact" from its mouth to a point near the mouth of Washington Creek. Idaho claims title to the "beds and banks below the ordinary high water mark" [Idaho Code 58-104(9)].

The right of way determination of navigability is defined by Idaho Code 36-1601. "Navigability for a public right of way means that a water body is open for public use as a public highway for travel up or down the stream for business or pleasure, including boating, swimming, fishing, hunting and all recreational purposes." Idaho law further states "the test for public right of way navigability is whether a stream is capable of floating cut timber with a diameter in excess of six inches, or any other commercial of floatable commodity, or is capable of being navigated by water craft. Merely floating six-inch logs experimentally will establish that the waterway is navigable as a right of way."

Prior to the authorization of Dworshak Dam in 1962, reports stated that access to timber in the North Fork basin was vital to proper forest management and harvest (CoE, 1977). The 1977 CoE Master Plan stated that the provision for a long navigable pool in the North Fork made it economically feasible to move logging equipment, men, and supplies into previously inaccessible areas, and also permitted economical downstream log movement through the reservoir.

Timber is logged from public and private land and brought to loading facilities on the reservoir. Reservoir levels must be a minimum between 1570-1590 feet to accommodate log transport (two dumps are operational at 1570 feet; all are operational at 1590 feet). Three log dumps were constructed by the CoE in the upper reservoir and two sites were constructed by the Log Users Association. The logs are stored and removed at the lower end of the reservoir near Merrys Bay and Bruces Eddy boat ramp. Log transport typically occurs on the reservoir from mid-May until early September, with 90% occuring in June through August. In recent years, logs were pulled out in the winter from December through March, but because of the drawdown the last two years, no logs have been transported in the reservoir. Prior to 1993, an average of 24 million board-feet annually were towed down Dworshak, with a peak of 50 million board-feet (Kosciuk, pers. comm., 1994).

OROFINO WATER SUPPLY

The City of Orofino currently has a combination of water right claims and licenses totaling 2.23 million gallons per day (3.45 cfs) on the Clearwater River. At one time, Orofino also had a water right permit and an option to use 3.878 million gallons per day (6 cfs) from the second pipeline to the new proposed Clearwater Fish Hatchery power plant below Dworshak Dam. This permit has lapsed. Development of this source of water would have provided the necessary supply to meet Orofino's current and future peak demands of 1.20 and 1.35 million gallons per day, respectively. The excess supply would also satisfy future peak demands at Konkolville and Riverside, estimated at 1.86

million gallons per day (CH_2M Hill, 1992). Despite the feasibility of the project, the City of Orofino is no longer pursuing this source of water for their anticipated needs.

ELK CREEK WATERSHED

Several citizens of Elk River expressed concern about water quality, scenic values, and clearcutting in the Elk Creek watershed. The clearcuts most in evidence include those on Johnson Creek, Grandad Bridge road between bridge and Elk River, Meadow Ridge, Three Bear, Alderman Ridge, Butterfield Meadow, Shattuck Butte, Little Weitas Creek, and the Swamp-Fisher-Falls creek areas (Kreisher, F. 1995, pers. comm). Several of these areas are within sight of the town of Elk River. There is local interest in public and private efforts to expand and accelerate reforestation efforts in the watershed.

Cattle grazing impacts along Elk Creek, on Forest Service allotments from town to four miles north of town, are also affecting the water quality and scenic value of Elk Creek (Kreisher, F. 1995. pers. comm.). Every year, for the past 20-25 years, the cattle are grazed on the stream and in the undeveloped Forest Service camp sites during the summer (Kreisher, F. 1995. pers. comm).

Goals and Objectives

In adopting a comprehensive state water plan the Board is guided by these criteria from Idaho Code 42-1734A:

1. Existing rights, established duties, and the relative priorities of water established in the Idaho Constitution shall be protected and preserved.

2. Optimum economic development in the interest of and for the benefit of the state as a whole shall be achieved by the integration and coordination of the use of water, the augmentation of existing supplies, and the protection of designated waterways for all beneficial purposes.

3. Adequate and safe water supplies for human consumption and maximum supplies for other beneficial uses shall be preserved and protected.

4. Minimum stream flow for aquatic life, recreation and aesthetics, minimization of pollution, and the protection and preservation of waterways shall be fostered and encouraged, and consideration shall be given to the development and protection of water recreation facilities.

5. Watershed conservation practices consistent with sound engineering and economic principles shall be encouraged.

During the LAG meetings, the members of the LAG recommended that the Comprehensive State Water Plan allow for future mineral exploration and mining development. During the fourth and fifth local advisory group meetings, on November 15, 1994 and January 9, 1995, the Advisory Group developed a list of 25 wants or needs for the basin. The needs fell into five basic areas: water quality protection, water quantity protection, watersheds and ecosystems, the economy, and basin planning.

Water Quality

1. To establish water quality base conditions

2. To allow no additional degradation of water from human activity

3. To address the most water quality impacted watersheds first

Water Quantity

4. To ensure a good municipal and industrial general water source for all future uses for the City of Orofino

5. To protect minimum stream flows and outstanding water resources in the basin

6. To maintain a summer recreation pool behind Dworshak Dam

7. To manage Dworshak for continued product storage and transport

8. To restrict additional dams on the major tributaries and maintain free-flowing character of streams

9. To improve management of Elk Creek Reservoir

Watersheds and Ecosystems

10. To manage watersheds to optimize sustained resources

11. To improve Elk River watershed

12. To manage mining, timber, recreation, and other industries while maintaining or improving a viable watershed

13. To allow use of environmentally acceptable tools to maintain forest health and to consider cumulative and residual long-range effects of management tools

14. To maintain and improve roads in the basin while not allowing degradation

15. To recognize endangered species as a symptom of basin health

Economy

16. To sustain the economy for future generations by maintaining ecological health

17. To consider mining, timber, and recreation in maintaining a viable econom

18. To keep threatened and endangered species from having priority over management of the basin

19. To consider economic impacts for all planning alternatives (current and future activities)

Basin planning

20. To identify and include management entities and plans in the basin planning process

21. To provide an attitude of cooperation in developing the plan (i.e., NO SECRET AGENDAS)

22. To educate public on the multiple-use concept, i.e., "share the space"

23. To consider impacts of increased recreational usage on NF Clearwater River/Dworshak Reservoir

24. To recognize in the Board planning process the federal law (Revised Statute 2477) to grant rights-of-way for constructing highways across public land

25. To protect cultural resources and cultural sites in the basin

Goals and objectives for the North Fork Clearwater Basin plan are a reflection of local issues, basin needs, and the criteria that guide the Board in the Comprehensive State Water Plan. The objectives listed below are intended to provide direction for management of the water and related natural resources in the basin.

1. To promote high quality water, and improve water quality where all beneficial uses are not supported; and to encourage, support and promote optimizing water quantity for the benefit of all users.

2. To manage the water resources to promote and insure ecologically healthy watersheds, ecosystems, other natural resources; and maintain a viable and sustainable economy.

VI. ACTIONS AND RECOMMENDATIONS

Specific or new development options regarding water use in the basin were not suggested at public meetings. The LAG focused their concerns and suggestions on restrictions on Dworshak drawdowns to maintain recreation and log transport at economically viable levels. Improvement opportunities focused on options to protect stream and reservoir water quality. Concern for maintaining the primitive character and aesthetic quality of the basin, maximizing recreational opportunities, and supporting long-term sustainable timber harvest led to protected river designations on basin rivers and streams.

In theory, resource planning from a societal perspective seeks knowledge of the full costs and benefits of each option. In practice, the quantification of many environmental or societal assets in monetary terms is extremely difficult or impossible. As a result, judgment must be exercised regarding the external environmental and societal costs and benefits of any action. Decisions are based on need, compatibility, environmental protection, public safety and health, applicable technical standards, and public opinion.

Actions and recommendations of the Idaho Water Resource Board are consistent with the Idaho Code, private property rights, local and state management plans, and public comment gathered at public meetings, through the local Advisory Group, and public hearings.

Protected River Designations

The Idaho Water Resource Board considered the impacts of protected river designations on the social, economic, and environmental livelihood of the region and determined that the value of preserving outstanding streams and rivers of the North Fork Clearwater Basin, with their current beneficial uses, outweighs the value of further development at this time. The Board, as the State water policy provider, believes that State protected river designations are preferable to federal protection, and are in the best interest of the residents of the State of Idaho. Federal protection limits the flexibility of planning, and removes the option of amending the designation by action of the Board and the Idaho Legislature.

To protect the public interest, current resource use, and the multiple-use character of the basin, and recognizing that no action by the Idaho Water Resource Board using their comprehensive water planning authorities can interfere with vested rights, or the repair, replacement, or continued operation of existing facilities or works, the Idaho Water Resource Board takes the following actions:

1. Designates the following streams as Natural Rivers

Cayuse Creek (34.9 mi.)
from its headwaters to its mouth because of outstanding biological, scenic, and recreational values;

Isabella Creek (5.4 mi.)
from its headwaters to Black Creek because of outstanding scenic and biological values;

Kelly Creek (31.6 mi.)
from its headwaters to Moose Creek because of outstanding biological, scenic, and recreational values;

Little North Fork Clearwater River (28.6 mi.)
from Meadow Creek to Cedar Creek because of outstanding biological and scenic values;

North Fork Clearwater River (15.0 mi.)
from its headwaters to Wrangle Creek and from Isabella Creek to the backwaters of Dworshak Reservoir (Thompson Creek) because of outstanding biological, scenic, and recreational values;

Weitas Creek (27.7 mi.)
from its headwaters to mouth because of outstanding scenic values.

For streams designated as State Natural Rivers, the following activities are prohibited [Idaho Codes, Section 42-1734A]: construction or expansion of dams or impoundments; construction of hydropower projects; construction of water diversion works; dredge or placer mining; alterations of the stream bed; and mineral or sand and gravel extraction within the stream bed.

2. Designates the following streams as Recreational Rivers

Beaver Creek (1.8 mi.)
from Charlie Creek to its mouth because of outstanding scenic values;

Elk Creek (17.5 mi.)
from its headwaters to Deep Creek because of outstanding recreational values;

Isabella Creek (3.1 mi.)
from Black Creek to its mouth because of outstanding scenic and biological values;

Kelly Creek (11.0 mi.)
from Moose Creek to its mouth because of outstanding biological, scenic, and recreational values;

Little North Fork Clearwater River (11.2 mi.)
from its headwaters to Meadow Creek and from Cedar Creek to the backwaters of Dworshak Reservoir (Meadows Creek) because of outstanding biological and scenic values.

North Fork Clearwater River (64.0 miles)
from Wrangle Creek to Isabella Creek because of outstanding biological, scenic, and recreational values;

Reeds Creek (13.5 miles)
from Calhoun Creek to its mouth because of outstanding biological values.

Activities prohibited on Natural Rivers are also prohibited by the Board on these Recreational Rivers with exceptions for alteration of the stream bed to provide for maintenance and construction of bridges and culverts, and installation of fisheries enhancement structures. Bridges and culverts on Recreational Rivers must be constructed and maintained to reduce sedimentation and to allow unrestricted fish passage. Alterations of the streambed must comply with the Idaho Stream Channel Alterations Rules and Regulations and Minimum Standards. For the North Fork Clearwater River, in addition to the above allowances, the Board allows alteration of the streambed for recreational dredge mining as regulated by the Idaho Department of Lands and Department of Water Resources. Figure 1 (page vii) shows streams with State protection designations.

REVISED STATUTE 2477

The Federal Revised Statute 2477 was originally enacted under the 1866 Mining Act to grant rights-of-way for constructing highways across unreserved public land. The State of Idaho [Idaho Code, Sections 40-107 and 40-204A] has attempted to define and perhaps expand the scope of allowable claims under the federal law to include waterways, which were not within the original language of the federal statute. Furthermore, because the scope of R.S. 2477 claims are limited to rights-of-way across federal lands, there is little opportunity that issues considered under the CSWP will cause an impact on potential rights-of-way for highways. However, the Board will consider the State's needs if and when rights-of-way have been adjudicated.

Dworshak Management Policies

The Idaho Water Resource Board, after consultation with local and state officials, and some members of the Local Advisory Group and the Governor's Ad Hoc Committee, establishes the following policies for the State of Idaho concerning management of the Dworshak Project:

(1) **The Dworshak Project will be operated as a multiple use project in full consideration of the current authorizations of flood control, navigation (log transport), recreation, power production and fish and wildlife conservation.**

The Dworshak project management plan must reflect a balanced scenario that optimizes all authorized beneficial uses.

(2) **Summer reservoir levels will be managed to optimize the seasonal beneficial uses of recreation and log transportation.**

It is the goal of the State of Idaho to maintain Dworshak Reservoir at full pool during the months of June, July and August. There should be no releases of water from the Dworshak Project during this period except as necessary to:

- meet minimum outflow conditions
- release excessive inflow that would cause the reservoir to overfill
- avoid electrical power outages

Dworshak reservoir provides substantial recreational opportunity when maintained at full pool and with a constant pool elevation throughout the summer season. Likewise, log transportation, an established beneficial use of the reservoir, is optimized at full pool in regard to utilization of existing log dump sites around the reservoir.

(3) **Dworshak Project outflows, other than during the summer months, will be configured to benefit the Clearwater River population of B-run steelhead.**

Maintenance of a full summer pool is of the utmost importance. Spring and fall outflows should be tailored to optimize benefits to the Clearwater B-run steelhead to prevent future listing under the Endangered Species Act.

(4) **Dworshak Pool will be managed to support reservoir and upper basin fish and wildlife, and to provide a high-quality source of water to the Ahsahka fish hatcheries.**

The Dworshak Project must be managed in consideration of the needs of resident populations of fish and wildlife residing within or near the reservoir and in the upper basin. Project management must also consider the water needs of the Ahsahka fish hatcheries by providing a consistent high-quality supply with appropriate temperature.

(5) **Water released from the Dworshak Project will be in compliance with state water quality standards.**

Past monitoring demonstrated that water released from Dworshak at high discharge rates can exceed the state water quality standards for dissolved gasses. It is the intent of this policy to ensure that dissolved gas levels do not pose an unacceptable risk to the Clearwater fishery.

(6) **A committee consisting of state and local representatives, under consultation with the Corps of Engineers, may develop a management plan for the Dworshak Project that fully addresses these**

policies. The management plan will be reviewed on an annual basis.

The Dworshak management plan must reflect the multiple beneficial uses of the project.

Minimum Stream Flows

The Local Advisory Group (LAG) requested that the Board file a minimum stream flow application for those streams designated for protection in the basin. Idaho Code requires that the Board provide specific data to support the application. The Board does not have the data required by the Code for these streams (excepting Elk Creek which already has a minimum stream flow on file). Therefore, the Board has not filed for these applications. The Board may file the applications if and when the necessary data becomes available.

Public Education

The local advisory group expressed concern that the public was not well aware of the Comprehensive State Water Plan and the water basin planning process. With this plan, it was felt that a public information and education opportunity exists that needs to be pursued by the Board. Consequently, the Board will establish displays at public facilities in the basin to inform and educate the public about the Comprehensive State Water Plan and the North Fork Clearwater Basin plan.

Recommendations

NORTHWEST POWER PLANNING COUNCIL PROTECTED AREAS DESIGNATIONS

The Water Resource Board supports the Northwest Power Planning Council Protected Areas program for the North Fork Clearwater River Basin with the following exceptions:

(1) Protected areas designations for the following streams and reaches should be withdrawn or modified as indicated. This recommendation is based upon information provided in the Idaho Rivers Information System database (Idaho Department of Fish and Game, September 1994).

a. Orogrande Creek from the mouth to unnamed creek should be designated as protected due to wildlife not fish.

b. Orogrande Creek from unnamed creek to the headwaters should be withdrawn.

c. Windy Creek from the mouth to the headwaters should be withdrawn.

d. Gravey Creek from the mouth to the headwaters should be designated as protected due to wildlife but not fish.

e. Osier Creek from the mouth to the headwaters should be designated as protected due to wildlife but not fish.

f. Elizabeth Creek from the mouth to the headwaters should be withdrawn.

g. Cold Springs Creek from the mouth to the headwaters should be withdrawn.

h. Sprague Creek from the mouth to the headwaters should be withdrawn.

i. Larson Creek from the mouth to the headwaters should be withdrawn.

j. Cougar Creek from the mouth to the headwaters should be withdrawn.

k. Spotted Luis Canyon from the mouth to the headwaters should be designated as protected due to wildlife but not fish.

l. Rutledge Creek from the mouth to the headwaters should be withdrawn.

m. Foehl Creek from the mouth to the headwaters should be withdrawn.

(2) Streams and reaches designated for State protection by this comprehensive state water plan should be included in the Northwest Power Planning Council Protected Areas program.

WATER QUALITY

Beneficial Use Assessment

The Board considers it very important for the Division of Environmental Quality to make it a priority to update their Beneficial Use assessment with emphasis on the following reaches: North Fork Clearwater River (Dworshak to Beaver Creek); Long Meadow Creek (headwaters to Dworshak); Elk Creek (headwaters to Dworshak); Cranberry Creek (headwaters to Dworshak); Swamp Creek (headwaters to Dworshak); Beaver Creek (headwaters to mouth); Skull Creek (headwaters to mouth); Quartz Creek (headwaters to Cougar Creek); Meadow Creek (headwaters to mouth); Vanderbilt Gulch (headwaters to mouth); and Dworshak Reservoir. More current hydrological and biological data need to be collected on many of these streams and their watersheds, particularly Elk Creek.

Timber Harvesting and Water Quality

The Board recommends the Clearwater and Panhandle National Forests and the Idaho Department of Lands (IDL) seek strict adherence of their contractors to the Forest Practices Act (FPA), the Antidegradation Agreement, and applicable Best Management Practices involving logging activities. Good watershed management is particularly crucial during periods of forest stress, such as drought and insect infestations. The Board encourages the timber management agencies to follow practices outlined in the FPA, such as use of rolling dips and winter logging, and consider strengthening the Act to improve water quality protection. The Board recommends that both national forests in the basin continue to follow and refine their Forest Management Plan guidelines for riparian and big game habitat management.

Many basin stream beds are steep and armored with rocks and boulders. Riparian growth along the channels is important in the control of high runoff velocities and the protection of the limited soil mantle. Along reaches where the riparian vegetation has been removed, usually by logging activity and road building, channel erosion occurs causing damage to water quality and fish and wildlife. Damage would be minimized and further limited in the basin if protection of the riparian areas along all stream reaches were encouraged. The Board urges the land management agencies to educate contractors and private landowners about the FPA and BMPs. The agencies should strengthen controls on road construction and utilize available existing riparian management research already done by the University of Idaho and Potlatch Corporation.

The Board encourages the U.S. Forest Service and private corporations, such as Potlatch, to develop additional cooperative watershed improvement projects with landowners, and encourage development of inter-entity workgroups to address watershed health. Examples of previous projects that have worked in the basin include the Forest Service Improvement Project on Elk Creek, and the Potlatch Reference Study on Mica Creek.

Logging activity in certain watersheds, such as Elk Creek, frequently degrade water quality, primarily from excessive silt deposition. The Board recommends that the water quality concerns in the Elk Creek watershed be more adequately addressed by the appropriate land

owners. Areas in the watershed, such as Johnson Creek, the town of Elk River to Grandad Bridge, Meadow Ridge, Three Bear, Alderman Ridge, Butterfly Meadow, Shattuck Butte, Little Weitas Creek, and Swamp-Fisher-Falls creeks have been heavily clearcut and need to be more adequately mitigated. This means being attentive to riparian impacts in the future, perhaps by increasing the reforestation efforts and using selective logging practices wherever feasible.

The Board recommends that the U.S. Forest Service evaluate grazing allotments on Elk Creek. In the four miles above the town of Elk River, cattle grazing impacts have affected the water and scenic qualities. Cattle are both in the creek and in dispersed camping areas adjacent to the creek on National Forest land.

WATER QUANTITY

There is a local public perception that the CoE needs to focus on improving their management plan for Dworshak Dam and Reservoir. The Board would like to cooperate with the CoE and local interests, including the Nez Perce Tribe, in modifying the Dworshak Master Plan to fit the current situation.

The CoE has not yet filed a claim for Dworshak storage water in the Snake River Basin Adjudication. The Board encourages the CoE to file for all water quantity and uses in the adjudication process, and when flushing flows are released, to insure that all water quality standards are met below Dworshak Dam.

ECOSYSTEM AND ENDANGERED SPECIES MANAGEMENT

The Board suggests that the U.S. Forest Service take the following steps to address concerns about ecosystem health in the North Fork Clearwater River Basin:

- Educate the public on the cycles of economics and ecology in an area that has been so dependent on natural resources for its livelihood and quality of life.
- Develop a program of forestry research and applications that encourages environmentally acceptable tools, such as natural biological agents and fire, to be used on the national forest to reduce disease and high accumulation of fuels.
- Rely on additional factors besides endangered species that are also indicative of ecosystem health, such as over-grazing, drought, and timber harvest.
- Require grazing permittees to rotate cattle out of riparian areas during ecologically sensitive periods.

The Board recommends that U.S. Fish and Wildlife Service and National Marine Fisheries Service consider supporting Congressional revisions that render the Endangered Species Act more flexible. The ESA should allow for expanded state participation to cooperatively develop conservation plans for species that are not yet listed but are being considered. The Board also endorses the concept that more emphasis needs to be placed on habitat restoration, ecosystem protection, and the control of exotic competitors and predators rather than focusing so heavily on declining local population numbers.

CULTURAL VALUES

The Board encourages the State Historical Preservation Office, the Nez Perce Indian Tribe, and relevant federal agencies, to accelerate their inventory of the cultural resources and sites in the basin.

Impacts of Actions and Recommendations

STREAM DESIGNATIONS

On stream segments designated Natural, the Board must prohibit construction or expansion of dams or impoundments; construction of hydropower projects; construction of water diversion works; dredge or placer mining; alterations of the stream bed; and mineral or sand and gravel extraction within the stream bed.

On segments designated Recreational, the Board prohibits the same activities as those for Natural rivers with the following exceptions: stream bed alteration for maintenance and construction of bridges and culverts and installation of fisheries enhancement structures. The Board is also allowing mineral, or sand and gravel extraction, and recreational dredging in the the North Fork Clearwater River. These conditions on Recreational segements allow existing logging, mining, and recreational activities to continue with minimal impact, but they must be done in accordance with approved permits and procedures.

VESTED RIGHTS

No provision of the Comprehensive State Water Plan will limit, restrict, or conflict with approved applications for the appropriation of water or with any vested property rights, i.e., existing water rights, diversions, mineral rights, and other private property rights. No provision of this plan will prevent a water user or their agent from cleaning, maintaining, or replacing an existing water diversion structure. A water user or their agent may remove any obstructions from the stream channel, if such obstruction interferes with the delivery of, or use of, water under any existing water right. Management of land adjacent to protected rivers remains the responsibility of land owners or managers, and local planning authorities. Designation of waterways as protected rivers will not affect the operation or legal use of any existing hydropower project which does not enlarge existing boundaries or impoundments.

EROSION, SEDIMENTATION, AND WATER QUALITY

Land-disturbing activities, such as logging and road building, can cause erosion and sedimentation, and possible water quality degradation. The recommendations found in this plan regarding forest and grazing practices are provided to address existing or potentially unsuitable land-use practices, and are not intended to adversely affect areas and situations where exemplary land management practices are followed.

Hydrologic modifications that directly impact the stream channel, such as impoundments, diversions, bridges, and culverts, may also harm water quality. Placement of a structure to divert streamflow can alter stream dynamics and the velocity distribution of the flow. Sediment deposition and bedload retention above instream diversion structures and in canals, can result in broadening of the stream channel and increased bank erosion. Channel scour may occur downstream of a dam or powerhouse. Water released from an impoundment or powerhouse can carry a greater sediment load. New diversions could alter flow/velocity distributions in bypassed reaches, and could cause increased deposition in and below the bypassed reach.

HYDROPOWER DEVELOPMENT

By prohibiting new hydropower development on the North Fork Clearwater River and several of its tributaries, this plan reduces the potential negative impacts that can occur from such projects. The impacts of new hydroelectric development vary greatly from project to project. A project may affect water quality, land use, wildlife, or aesthetics, and there are specific negative impacts associated with dam or plant construction. Diversion and/or impoundment of a river or stream alters the hydrologic regime. A hydroelectric project that has an impoundment associated with it would generally have a more severe impact than a run-of-river project, such as the one once proposed for Beaver Creek.

Hydropower projects frequently have positive economic effects, such as providing increased revenue and additional jobs. At this time, there are no proposed hydropower projects impacted by this plan. If any projects are proposed in the future on protected rivers, the Board can consider amending the plan to provide for such projects.

FISH AND WILDLIFE PROTECTION

Alteration of the existing streamflow patterns, reduced flows and consequent changes in water velocity could cause degradation to the stream and riparian communities of the basin.

Construction, dredging, and sand a gravel extraction could disturb river sediments, which could have a substantial negative impact on water quality. Impacts to water quality would vary depending on the location of the disturbance. Operation of hydropower projects can affect both fish and wildlife habitat. The timing and magnitude of bypass flows, ramping rates, and fluctuating pool elevations may have detrimental effects. Potential future operation scenarios for Dworshak Reservoir, proposed in the Columbia River System Operation Review, to meet energy demands and fish flushes, could induce fluctuations in the water level and possibly harm fish, wildlife, and their habitats.

RECREATION DEVELOPMENT

The pristine nature of the basin is an important factor in attracting recreational users to the area. Recreation would likely be enhanced, relative to the drawdown conditions of the past few years, by maintaining the Dworshak Reservoir level in the summer. It is also argued that the recreation in the area can be improved by maintaining higher river flows downstream of the dam, and thereby improving recreational facilities on the Clearwater River.

Many of the resource values attracting recreation use are fragile and susceptible to adverse impacts of too many recreationists. Heavy recreation use can result in disturbance to sensitive riparian areas.

SCENIC VALUES

The recommendations in the plan will not cause detraction from the current scenic nature of the basin, but most likely improve it, particularly in areas such as the Elk Creek watershed.

EMPLOYMENT AND ECONOMICS

The hope for the basin is a continued and sustainable level of timber production and a growing recreation base. This plan and the recommendations in the plan support these concepts.

GLOSSARY

Acre-foot - the volume of water required to cover 1 acre of land (43,560 ft-2) to a depth of 1 foot; this is equivalent to 325,851 gallons.

Adjudicated - ownership or management that has been legally established in a court of law.

Alteration - any activity using mechanized equipment that moves or overturns gravel or earth.

Annual sustained yield - a term typically used in forestry which means the yield harvested in a given year is equivalent to the replacement during that same time period.

Anadromous - fish species, such as salmon, that spend most of their adult life in the ocean and migrate to fresh water to spawn.

Benchmark - a permanent or temporary reference point of known elevation used for vertical control.

Benthic invertebrates - organisms that typically live on the bottoms of streams and lakes.

Best management practices (BMP) - state-of-the-art practices that are efficient and effective, practical, economical, and environmentally sound.

Board - the Idaho Water Resources Board (IWRB).

Bull trout - common name for members of the fish genus *Salvelinus* which include the char and dolly varden trout. The bull trout is the only native char in Idaho.

Coastal disjunct - a population of plants or animals that is isolated from its major distribution range, which in this case are the Northwest coastal communities.

Comprehensive State Water Plan (CSWP) - the plan adopted by the board pursuant to section 43-1734A, Idaho Code, or a component of such plan developed for a particular water resource, waterway or waterways and approved by the legislature.

Conservation - increasing the efficiency of energy and water use, production, or distribution.

Consumptive use - water that is utilized by plants and animals for evapotranspiration and growth.

Confluence - the flowing together of two or more bodies of water.

Director - the director of the Idaho Department of Water Resources.

Ecosystem - a complex system composed of a community of flora and fauna taking into account the chemical and physical environment with which the system is interrelated.

Endangered species - any species or subspecies whose survival is threatened with extinction.

Evapo-transpiration - the loss of moisture by evaporation from land and water surfaces and transpiration from plants.

Head - the elevational difference between the surfaces of water; usually upstream and downstream of a turbine or pump.

Highwater line (mark) - the line that separates the aquatic vegetation from the terrestrial vegetation.

Hydropower project - any development which uses a flow of water as a source of electrical or mechanical power, or which regulates the flow of water for the purpose of generating electrical or mechanical power. A hydropower project development includes all powerhouses, dams, water conduits, transmission lines, water impoundments, roads, and other appurtenant works and structures.

Idaho batholith - the body of intrusive igneous (volcanic) rock in central Idaho about 250 miles long and a maximum of 100 miles wide. It is approximately 100 million years old.

Idaho Code - the Idaho laws, in this case those pertaining to water issues.

Interim protected river - a waterway designated pursuant to section 42-1734D or 42-1734-H, Idaho Code, as protected for up to two (2) years while a component of the Comprehensive State Water Plan is prepared for that waterway.

Kilowatt (kW) - a unit of electric power equal to 1,000 watts, or about 1.34 horsepower.

Low-head dam - a dam with less than 20 meters (66 ft) of head.

Megawatt (MW) - a unit of electrical power equal to 1,000,000 watts, or about 1,340 horsepower.

Minimum stream (instream) flow - water that is not diverted and used but rather remains for wildlife habitat, recreation, navigation, and aestheic beauty.

Natural river - a waterway which posesses outstanding fish and wildlife, recreation, geologic or aesthetic values, which is free of substantial existing man-made impoundments, dams or other structures, and of which the riparian areas are largely undeveloped, although accessible in places by trails and roads.

Penstock - a conduit used to convey water under pressure to the turbines of a hydroelectric plant.

Placer or dredge mining - any dredge or other operation to recover minerals with the use of a dredge boat or sluice washing plant whether fed by bucket line or separate dragline or any other method. This could include, but is not limited to, suction dredges which are capable of moving more than 2 cubic yards per hour of surficial material.

Preliminary permit - a FERC authorization granting priority right to file a license application and authorizing the permittee to conduct studies and analyses necessary to prepare a complete license application. A preliminary permit does not permit any construction.

Publicize - to notify the public through press releases to the media, published notice in local, regional or statewide publications, and other procedures, as may be appropriate to inform and notify the local and general public of an impending action or decision.

Public interest - something that impacts the majority of the people, usually beneficially.

Recreational dredge mining - dredge mining in which the nozzle is 5 inches or less, and moves less than 2 cubic yards per hour.

Recreational river - a waterway which posesses outstanding fish and wildlife, recreation, geologic or aesthetic values, and which might include some man-made development within the waterway or within the riparian area of the waterway.

Riparian area - that area within 100 feet of the mean highwater mark of a waterway.

Riparian vegetation - vegetation that is associated with aquatic (streams, rivers, lakes) habitats.

River basin - total drainage or catchment area of a stream (i.e., the watershed).

River corridor - the area along each side of the river that is being studied.

River reach - a continuous section of a river from one point to another; i.e., a stretch of the river.

State agency - any board, commission, department, executive agency of the state of Idaho.

Streambed - a natural water course of perceptible extent with definite bed and banks, which confines and conducts the water of a waterway which lies below and between the ordinary highwater mark on either side of that waterway.

Subalpine vegetation - mountain vegetation dominated by conifers and just below the alpine tundra vegetation type.

Threatened species - a species, determined by the U.S. Fish and Wildlife Service, which are likely to become endangered within the forseeable future throughout all or a significant portion of their range.

Vegetation types - any of several different plant communities that are found in the region of study.

Vested Rights - those rights that are fixed and not ontingent upon any future actions. For example, a

protected river designation cannot interfere with vested property rights made prior to the designation.

Waterway - a river, stream, creek, lake or spring, or a portion thereof.

Water Table - the highest part of the soil or underlying rock material that is wholly saturated with water. On some places an upper, or perched water table may be separated from a lower one by a dry zone.

Wetlands - lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. Wetlands must have the following three attributes: (1) at least periodically, the land supports predominately hydrophytes; (2) the substrate is predominately undrained hydric soil; and (3) the substrate is on soil and is saturated with water or covered by shallow water at some time during the growing season of each year.

Abbreviations and Acronyms

ACEC means Area of Critical Environmental Concern.

BIA means Bureau of Indian Affairs.

BLM means Bureau of Land Management.

BMP means Best Management Practice.

BOR means Bureau of Reclamation.

BPA means Bonneville Power Administration.

BURP means Beneficial Use Reconnaissance Project.

CSWP means Comprehensive State Water Plan.

CFS means Cubic Foot per Second (ft-3/sec).

CoE means U.S. Army Corps of Engineers

DCMI means Domestic, Commercial, Municipal and Industrial uses.

DEQ means Division of Environmental Quality (within IDHW).

FERC means Federal Energy Regulatory Commission.

IDC means Idaho Department of Commerce.

IDE means Idaho Department of Employment.

IDFG means Idaho Department of Fish and Game.

IDHW means Idaho Department of Health and Welfare.

IDL means Idaho Department of Lands.

IDWR means Idaho Department of Water Resources.

IDPR means Idaho Department of Parks and Recreation.

IRIS means Idaho Rivers Inventory System.

LAG means Local Advisory Group.

NPDES means National Pollutant Discharge Elimination System.

NPPC means Northwest Power Planning Council.

NPS means National Park Service.

RBP means Rapid Bioassessment Protocol.

RNA means Research Natural Area.

RVD means Recreational Visitor Days. One RVD is equivalent to the person spending 12 hours at a particular activity.

SCS means the Soil Conservation Service (now the Natural Resource Conservation Service).

SIBA means Special Interest Botanical Area.

USFS means United States Forest Service.

USFWS means United States Fish and Wildlife Service.

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APPENDIX

PUBLIC INVOLVEMENT

Local Advisory Group

Many special interest groups, private organizations, and political entities have a major interest in the North Fork Clearwater Basin plan. A local advisory group was formed to involve local citizens in the planning process. Individuals with an interest in state water planning were invited to help coordinate local input, review and comment on evaluation studies, and offer suggestions for Board actions and recommendations. Members of the North Fork Clearwater advisory group were:

Alex Irby, Orofino, ID
(Konkolville Lumber Co; Clearwater Resource Coalition)

Doug Wynn, Lewiston, ID
(Kelly Creek Flycasters)

Les Larsen, Kamiah, ID
(Idaho Rivers United)

Jim Wilson, Orofino, ID
(Clearwater County Board of County Commissioners)

Ron Hartig, Pierce, ID
(Mining industry; Clearwater Road & Trail)

Jon Matthews (original member: Darren Olsen)
Lapwai, ID
(Nez Perce tribe)

Luke Aldrich, Orofino, ID
(retired from IDL)

Bob Tondevold (original member: Mark Benson)
Headquarters, ID
(Potlatch Lumber)

Ray F. Coon, Pierce, ID
(retiring president, Assoc. Logging Contractors)

Barbara Opdahl, Pierce, ID
(outfitter, NF basin)

Roy Clay, Orofino, ID
(Mayor, City of Orofino)

Roger Colgan, Orofino, ID
(retired mgr. Dworshak Dam)

Della Kreisher, Elk River, ID
(Mayor, City of Elk River)

Kent Henderson, Lewiston, ID
(Idaho Wildlife Federation)

Bob Burnham, Orofino, ID
(Alternate, Idaho Wildlife Federation)

Norm Steadman, Weippe, ID
(Mayor, City of Weippe)

Public Scoping and LAG Meetings

Public Scoping Meeting
(Monday, September 27, 1993)

This meeting, which initiated the public input aspect of the IWRB planning process, was attended by 31 individuals. This meeting and all Local Advisory Group (LAG) meetings, except the day workshop, were held at the North Fork Ranger Station in Orofino, Idaho.

Mr. Bill Graham, Bureau Chief of the IDWR Planning Bureau, discussed coordinated river basin planning between IDWR and the Forest Service, an overview of the Comprehensive State Water Plan, and the IDWR planning process. Mr. Dennis Griffith (USFS) explained the federal wild & scenic study process. Dave Greegor (IDWR) and Brian Hensley (USFS) discussed differences between state and federal objectives and study areas.

The meeting broke into two groups to identify and discuss local issues and concerns relative to the basin. The issues identified were: timber (supply, transport, etc.), impacts of stream designations (on water rights, mining, instream flow, road maintenance, tributary activities, property-resource values), recreation and scenery, differing state and federal protection, threatened & endangered species, anadromous and resident fish, tribal water rights, commercialization on rivers, hydroelectric development, area economics and economic stability, river protection/free-flowing rivers, water quality, and effects of fire on visuals and water quality in the river corridor.

LAG Meeting
(Monday, December 6, 1993)

Members Present: Irby, Larsen, Wilson, Hartig, Olsen, Aldrich, Benson, Coon, Opdahl, Clay, Colgan, Kreisher, and Burnham

Bill Graham (IDWR) made the introductions and described the role of the LAG. Dave Greegor presented the plan overview, which included the purpose of the meeting, a description of the Comprehensive State Water Plan (CSWP), the planning process and schedule, and basin description to the newly formed LAG. Bill Graham presented a summary of the issues identified at the scoping meeting and these were discussed. Brian Hensley (USFS) briefly explained where the Forest Service was in their Wild & Scenic River Suitability Study process.

LAG Meeting
(Monday, April 18, 1994)

Members Present: Larsen, Kreisher, Coon, Hartig, Irby, Aldrich, Burnham, Olsen, Colgan, Opdahl, and Henderson

The GIS resource inventory maps were presented to the LAG for their inspection and editing. The two issues, ecosystem management and timber, which had been identified as important by the LAG in the previous meeting, were presented and discussed from three different perspectives (federal---USFS, state---Idaho Department of Lands, and private---Potlatch)

LAG Meeting
(Monday, August 29, 1994)

Members Present: Benson, Wilson, Opdahl, Olsen, Colgan, Burnham, Steadman, Kreisher, Hartig, Larsen, and Coon

Randy Ryan and Jim Kosciuk, both with the Army Corps of Engineers at Dworshak, discussed the current and historic management of Dworshak Reservoir and issues, such as drawdown. The revised GIS resource maps were presented to the LAG for their inspection. The GIS maps of the screening results (scenic, recreational, and fish & wildlife outstanding reaches), which the LAG had not previously seen, were also available for their examination and comment.

LAG Workshop
(Tuesday, November 15, 1994 & continued on Monday, January 9, 1995)

Members Present on 11/15/94: Larsen, Wilson, Hartig, Matthews, Aldrich, Tondevold, Opdahl, Clay, Colgan, Kreisher, Henderson, Steadman, and Burnham

Members Present on 1/9/95: Irby, Opdahl, Aldrich, Hartig, Colgan, Coon, Wilson, Matthews, and Tondevold

Dave Greegor discussed the workshop objectives, the process and the brainstorming rules for the day. He also reviewed the concerns (issues) expressed and prioritized in the first LAG meeting. The morning and a portion of the afternoon were spent identifying the wants and needs for the basin. Once the needs were identified, the LAG began the process of enumerating specific solutions for those needs.

WANTS, NEEDS, AND SOLUTIONS

Want or Need:
1) To establish water quality base conditions

Solutions:
1. Compile existing data
2. Fill gaps in data with surveys
3. Do trend analysis monitoring
4. Coordinate data collection processing with other government and private entities
5. Map existing uses

Want or Need:
2) To allow no additional degradation of water from human activity

Solutions:
1. Use and implement Best Management Practices (BMPs)
2. Use various stream protection designations to minimize degradation including: a) state Natural and Recreational River; b) Outstanding Resource Water; c) federal Wild & Scenic River; and Northwest Power Planning Council protected areas
3. Use feedback loop in degradation assessment
4. Develop cooperative improvement projects with land-owners
5. Encourage development of inter-entity workgroups to address watershed improvement
6. Reference existing projects: a) Wildlife Council project; b) Forest Service Improvement Project in Elk Creek; c) Potlatch reference study in Mica; d) Venture 20 projects; and e) cost-share projects

Want or Need:
3) To prioritize clean-up of water-quality impacted watersheds

Solutions:
1. Establish water quality base conditions and beneficial uses not met as first priority
2. Identify the following for data collection: a) areas that have no data; b) impacted watersheds; and c) pristine watersheds

Want or Need:
4) To ensure an adequate municipal and industrial water source for City of Orofino

Solutions:
1. File water right on Dworshak Reservoir because Dworshak is the best source (LAG suggested that Water Resource Board file for minimum conservation pool)
2. Address potential of draw-down effecting water quality and physical and psychological impacts on people
3. Meet compliance with State Safe Drinking Water Act
4. Acquire $6 million funding to upgrade Orofino municipal storage and treatment facility

Want or Need:
5) To protect minimum stream flows and outstanding water resources in basin

Solutions:
1. Address streams both with and without FERC licenses, specifically the following streams: Kelly and Cayuse creeks; Reeds Creek; Beaver Creek; Little North Fork Clearwater River; Weitas Creek; North Fork Clearwater River
2. Put no more impoundment dams on primary streams

Want or Need:
6) To maintain a summer recreation pool behind Dworshak Dam

Solutions:
1. Expect Army Corps of Engineers to honor their original contract and the enabling legislation, which called for a full summer pool from June through September
2. Encourage Idaho Water Resource Board and the Nez Perce Tribal Council to support the original contract, which advocates no summer drawdown

Want or Need:
7) To manage Dworshak for continued log storage and transport

Solutions:
1. Expect Army Corps of Engineers to honor their original contract and the enabling legislation, which called for a full summer pool from June through September

Want or Need:
8) To restrict additional dams on the North Fork Clearwater River and its' major tributaries

Solutions:
1. Address streams both with and without FERC licensed projects, specifically the following streams:

Kelly and Cayuse creeks; Reeds Creek; Beaver Creek; Little North Fork Clearwater River; Weitas Creek; North Fork Clearwater River
2. Put no more impoundment dams on primary streams

Want or Need:
9) To improve management of Elk Creek Reservoir

Solutions:
1. Bring together involved parties (Elk River Recreation District, IDFG, and town of Elk River) to develop integrated management plan

Want or Need:
10) To manage watershed to optimize sustained resources

Solutions:
1. Adhere to: BMPs, strict controls on existing and new road construction; riparian management practices; available research (e.g., University of Idaho, Potlatch Corporation)
2. Implement sustained yield timber harvest
3. Consider fish, wildlife, and plant needs

Want or Need:
11) To improve Elk River watershed

Solutions:
1. Minimize clear cutting practice and use more selective logging
2. Improve reforestation efforts
3. Control grazing, i.e., keep cows out of creeks
4. Consider cloud seeding
5. Obtain good biological/water quality hydrologic information to determine and define status of watershed

Want or Need:
12) To manage mining, timber, recreation, and other industries while maintaining or improving a viable watershed

Solutions:
1. Educate private land owners on Forest Practices Act
2. Make funds available to implement and educate about BMPs, over-grazing, etc.
3. Define commercial recreation and include outfitting as part of basin plan

Want or Need:
13) To allow use of environmentally acceptable tools to maintain forest health and to consider cumulative and residual long-range effect of management tools

Solutions:
1. Use environmentally acceptable herbicides/pesticides to control vegetation and pests
2. Modify National Environmental Protection Act, Endangered Species Act, and Clean Water Act
3. Encourage research in all aspects of environmentally acceptable tools--biological agents, etc.
4. Preserve USFS Research Station in Missoula, MT
5. Support use of controlled burns--use fires, allow natural fires to reduce high amounts of fuels

Want or Need:
14) To maintain and improve roads and uses in basin while not allowing degradation

Solutions:
1. Use Idaho Forest Practices Act and BMPs for guidance

Want or Need:
15) To recognize endangered species as a symptom of basin health

1. Look to additional factors besides threatened & endangered species as indicative of ecosystem health (e.g., humans exterminated the wolf; the habitat was in healthy condition, yet the wolf was removed)

Want or Need:
16) To sustain the economy for future generations by maintaining ecological health

Solutions:
1. Improve forest health by starting immediate forest management and return to Forest Management Plan, Dworshak Master Plan, etc.
2. Strengthen Army Corps of Engineers efforts to manage their timber lands
3. Maintain big game habitat in accordance with Forest Management Plan standards
4. Utilize Idaho Forest Practices Act and BMPs (e.g., follow and use rolling dips and winter logging)
5. Strengthen Forest Practices Act to protect water quality, which is central to ecological health

6. Return Dworshak Reservoir to original Master Plan guidelines--maintain recreation in summer, log transport, and fishery habitat
7. Follow Forest Management Plan specific fishery guidelines and practices to prevent fishery from deteriorating (e.g., squawfish)
8. Educate the public on cycles of economy and ecology

Want or Need:
17) To consider mining, timber, and recreation in maintaining a viable economy

Solutions:
1. Educate private land owners on Forest Practices Act
2. Make funds available to implement and educate about BMPs
3. Define and consider commercial recreation (outfitting) as part of basin economics component of plan

Want or Need:
18) To keep threatened & endangered species from having priority over management of the basin

Solutions:
1. Bring threatened & endangered species management to state control
2. Review how threatened & endangered species are listed and consider possible changes
3. Consider that threatened & endangered species should be a component but not drive basin management
4. Focus Endangered Species Act on habitat rather than population numbers
5. Avoid use of Endangered Species Act to further other (hidden) objectives
6. Encourage continued research and apply the results
7. Watch overpopulation/imbalance of predators and competitors (noxious alien weeds) that could effect endangered species
8. Provide a waiting period for endangered species before listing to allow for local conservation plans to be developed

Want or Need:
19) To consider economic impacts for all planning alternatives (current and future activities)

Solutions:
1. Consider Clearwater County Comprehensive Plan for historic, current, and desired future economic situation
2. Consider Clearwater Forest Plan which contains forecast information
3. Review Orofino Chamber of Commerce Economic Study (relates to Dworshak)
4. Review State Comprehensive Outdoor Recreation and Tourism Plan
5. Review Idaho Outfitters & Guides Association Economic Impact Survey (1995)
10. Review Corps of Engineers recent economic study on Dworshak

Want or Need:
20) To identify and include management entities and plans in the basin planning process

Solutions:
1. Consider following existing plans and planning documents:
-Panhandle and Clearwater NF plans
-Corps of Engineers Master Plan
-Clearwater County Comprehensive Plan
-Idaho Forest Practices Act
-Potlatch Research Management Plan
-IDFG 5 year fisheries and game management plans
-Clearwater Soil & Water Conservation District Plan
-Nez Perce Tribal Reservation Management Plan
-Elk River City Plan
-Orofino Water Procurement Plan

Want or Need:
21) To provide an attitude of cooperation in developing plan (i.e.,no secret agendas)

Solutions:
1. Allow for opportunities in the planning process to provide for this type of cooperation

Want or Need:
22) To educate public on the multiple-use concept, i.e., "share the space"

Solutions:
1. Tie with such programs as Project Learning Tree and Project Wild in public schools which teach respect for others and their concerns

2. Utilize Forest Products Commission educational materials
3. Educate with focus on accepting environmental and economic change and it should not be feared; educate that policies can change
4. Use signing and brochures to educate the public
5. Use Clearwater Resource Coalition materials to educate (signs, education, cooperative projects, library--Konkolville Lumber Co)
6. Provide several centers of public information & education to explain IDWR North Fork Clearwater River Basin Plan (suggested locations: Kelly Creek, Dworshak area, Aquarius bridge) or educate through other agencies such as the USFS and Army Corps of Engineers

Want or Need:
23) To consider impacts of increased recreational usage pressure on North Fork Clearwater River and Dworshak Reservoir

Solutions:
1. Add more campsites along NF Clearwater River
2. Include in basin plan recognition that use is increasing; then add campsites
3. Deny access to degraded areas or restrict use, e.g., use of barriers, additional fees, or enforcement
4. Demonstrate impact on resources
5. Confer with recreational use studies done by University of Idaho

Want or Need:
24) To recognize in the Board planning process the federal law (Revised Statute 2477) to grant rights-of-way for constructing highways across public land

Solutions:
1. Recognize in the basin plan

Want or Need:
25) To protect cultural resources and sites in the basin

Solutions:
1. Identify resources and sites (contact Idaho State Historic Preservation Office and the Nez Perce Tribe)
2. Incorporate Corps of Engineers data from extensive cultural survey along Dworshak Reservoir
3. Incorporate historic Clearwater log drive information

LAG Meeting
(Monday, May 8, 1995)

Members Present: Irby, Hartig, Larsen, Henderson, and Matthews

At the outset of the meeting, group members expressed concern that the Clearwater National Forest had released their Wild & Scenic Suitability Study prior to the completion of the State plan. Dave Greegor suggested that while we were able to collaborate with the Forest Service on data collection and public meetings, that was the extent of cooperation between the agencies.

The purpose of this meeting was to discuss possible Board Actions and Recommendations for the basin plan. These were derived from the needs and solutions identified at the two previous meetings. The following list records actions proposed by LAG members, and group discussion about that action. LAG members were asked to submit additional comments in writing by June 1, 1995 (none submitted).

POSSIBLE BOARD ACTIONS

State Natural & Recreational Protection:
State protection (Natural and Recreational) for Kelly Creek, Cayuse Creek, Reeds Creek, Isabella Creek, Weitas Creek, Little North Fork Clearwater River, and North Fork Clearwater River with possible Recreational designation allowances for dams, hydropower, diversions, mining, stream bed alterations, sand and gravel extraction

- North Fork Clearwater River has many activities which preclude Natural designation where Recreational designation would be OK

- NF Clearwater--will not preclude possible future need for mining

- NF Clearwater--will not preclude possible future need for new bridge crossings

- Kelly Creek and Cayuse Creek should be designated as Recreational and Natural where appropriate

- All streams listed should be either Natural or Recreational where appropriate (no roads, etc.)

- There is some potential for mining in Upper Kelly and Cayuse creeks

- No more dams on the North Fork Clearwater River

- Forest Service has proposed Wild & Scenic on 3 streams in basin and would probably support state protection if not federal (comment made by Forest Service representative at the meeting)

- Department should oversee any of the new mining and construction on Recreational river designations

- Add Beaver Creek to protection list; although area is disturbed, Beaver Creek is a barometer of the area (note: only the very lower portion is considered outstanding)

- Can we protect Elk, Silver, and Canyon creeks through the state process? (note: none have been found to be outstanding by the State)

- LAG will add additional streams that need to be protected to list in the next 2 weeks

- LAG members present supported this action unanimously; agreed that Natural and Recreational designations should be determined where appropriate

- Group felt there should be no allowances on Recreational designations except for those mentioned above

Minimum Stream Flow Protection:
Minimum stream flow designations provided for all the streams previously listed

- This is an excellent idea

- Need to look at MSF on all streams on list

- Should be considered *in addition* to Natural/ Recreational protection

- Additional streams to be considered will be added by LAG over the next 2 weeks

- Those present supported MSF on all streams listed predominantly for the fisheries

Other Forms of Protection:
In addition to state protection and MSFs, there are other types of protection such as federal Wild & Scenic, Outstanding Resource Waters, Northwest Power Planning Council designations, etc.

- Wild & Scenic federal designations are already submitted

Water Rights on Dworshak Reservoir:
IWRB and the City of Orofino, separately, or should file jointly for a water right on Dworshak Reservoir

- the IWRB and City of Orofino file a joint water right on Dworshak Reservoir---is preferred alternative by the LAG (note: this would require a change in the State law)

- Orofino is concerned about applying only for the amount needed for their city water supply

- A collaborative application seems most appropriate (note: this would require a change in the State law)

- Must evaluate the City's needs for current and future water use

- Must also look at state and federal fish hatchery needs and beneficial uses of the reservoir

- Concern about Nez Perce tribal claim in adjudication process; it is necessary to consider this in any action; Tribe must consider and acknowledge. Any effort would not be intended to compete but rather coordinate with Tribe

Orofino Water Treatment Funds:
City of Orofino should seek funding to improve their municipal storage and water treatment facility

- This item should be scratched because the voters of Orofino did not support a bond to fund an upgrade of treatment facilities

Dworshak Management:
Strongly urge Corps of Engineers with the combined support of IDWR, Attorney General's office, and the Nez Perce Tribe to return to their original management contract (enabling legislation) for Dworshak operation

- Army Corps is doing what they are required to do by NMFS

- Problem is they are not taking into consideration entire basin when making decisions for downstream needs (note: this needs to be stated in the Board action statement)

- Concern that we should not be involved as a group in this; concern that we are asking Corps to break federal mandate for drawdown from NMFS

- Want to protect bull trout and west slope cutthroat fisheries

- Let NMFS know that their flow expectations of Dworshak are, or may be, having an adverse impact in the reservoir and upstream

- Action should read: "....strongly encourage Corps, with the combined support of IDWR, Attorney General, and NPTEC, to evaluate impacts on fishery and recreation above dam when considering drawdowns"

Cloud Seeding:
Consider cloud seeding proposals for upper watershed treatment during drought years

- This action should be scratched

Public Information & Education:
Coordinate a public education program on the IWRB basin planning effort with IDFG, USFS, Forest Products Commission, Clearwater Resource Coalition and establish several temporary information centers in the basin

- Excellent idea

- Could utilize locations such as multi-agency (IDFG lead) Myrtle Beach (between Orofino and Lewiston) public information center; but on-site (within basin) information "centers" still good idea

Clearwater County Rights RS-2477:
IWRB will recognize Clearwater County's effort to be given fair consideration when rights-of-way decisions are being made regarding any activities within the stream channel

- County is asking for consideration for anything that happens on these roads, trails, etc.

- Since RS-2477 has not been established as legal, we should not approve

- Perhaps we should say "if and when" this is found legal, it will be revisited

- This action statement should read: " .....that Clearwater Co. be taken into consideration when rights-of-way decisions have been properly adjudicated and found to be legal by the courts"

✦ ✦ ✦

DWORSHAK OPERATION PLAN

Idaho Water Resource Board

ADOPTED DECEMBER 21, 2000

DWORSHAK OPERATION PLAN

Pepared by: Idaho Department of Water Resources
Water Planning Bureau

Prepared for: Idaho Water Resource Board

Joseph L. Jordan, Chairman
Jerry R. Rigby, Vice-Chairman
J. David Erickson, Secretary
Robert Graham
L. Claude Storer
Terry T. Uhling
D. Richard Wyatt

Adopted December 21, 2000

Acknowledgements

The Idaho Water Resource Board would like to acknowledge the Dworshak Operation Plan Committee and key contributors for their efforts in formulation of the Dworshak Operation Plan.

I. Dworshak Operation Plan Committee

Mayor Roy Clay, City of Orofino
Roger Colgan, Board of County Commissioners, Clearwater County
Rep. Charles D. Cuddy, Idaho State Legislature
Alex Irby, Orofino Chamber of Commerce
Rick Laam, City of Orofino
Sen. Marguerite McLaughlin, Idaho State Legislature
Sandy Medley, Orofino Chamber of Commerce
Earl Pickett, Board of County Commissioners, Clearwater County
D. Richard Wyatt, Idaho Water Resource Board, Lewiston, Ad Hoc Member

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INTRODUCTION

The Idaho Water Resource Board (Board) adopted the Comprehensive State Water Plan – North Fork Clearwater River Basin in January 1996. The plan contains a series of policies formulated by the Board, in consultation with local citizens and public officials, to provide direction to the Corps of Engineers (CoE) and other federal agencies regarding the operation of the Dworshak Project (dam and reservoir). The sixth policy in the Plan calls for a committee consisting of state and local representatives, to develop a management plan, in consultation with the CoE, for the Dworshak Project that fully addresses the other five policies, listed below:

(1) The Dworshak Project will be operated as a multiple use project in full consideration of the current authorizations of flood control, navigation (log transport), recreation, power production and fish and wildlife conservation.

(2) Summer reservoir levels will be managed to optimize the seasonal beneficial uses of recreation and log transportation.

(3) Dworshak Project outflows, other than during the summer months, will be configured to benefit the Clearwater River population of B-run steelhead.

(4) Dworshak Pool will be managed to support reservoir and upper basin fish and wildlife, and to provide a high-quality source of water to the Ahsahka fish hatcheries.

(5) Water released from the Dworshak Project will be in compliance with state water quality standards.

Consistent with this policy, the Dworshak Operation Plan is formulated as an amendment to the North Fork Clearwater River Basin plan.

PLAN OBJECTIVE

The objective of the Dworshak Operation Plan is to implement procedures that optimize the use of Dworshak water for all beneficial uses, including flood control, power production, recreation, commercial navigation, fish (both anadromous and resident populations), wildlife, and water quality. The operation plan recognizes the management policies set forth in the North Fork Clearwater Plan.

CURRENT OPERATIONS

Commencing in 1992, spring and summer flow releases from the Dworshak Project were modified to improve out migration conditions for juvenile anadromous fish. Populations of concern are chinook salmon, sockeye salmon, and steelhead originating from Idaho, Oregon and Washington tributaries, as well as the mainstem Snake River. Dworshak releases subsequently contributed to flow objectives for the lower Snake River set out in the 1995 Columbia River Power System Biological Opinion, and in the 1998 supplement to that document. The flow objectives as measured at Lower Granite Dam are:

85,000 – 100,000 cfs from April 1 to June 20.
50,000 – 55,000 cfs from June 21 to August 31.

Within this framework, spring augmentation usually commences around April 10 with Dworshak releases approaching 20,000 cfs. Duration of spring augmentation is normally around 30 days. Releases are then reduced in an attempt to fill the Dworshak pool by June 30. Summer releases typically approach 20,000 cfs by mid-July and often remain high until the end of August. Reservoir elevations begin to decline from the full pool elevation in early July, and continue to recede to elevation 1520 feet. Summer augmentation provides 1.2 million acre-feet of Dworshak storage in addition to reservoir inflows. During six of the nine flow augmentation years, the reservoir pool was lowered to elevation 1,520 feet by August 31. During the remaining three years, the reservoir was lowered to elevation 1,520 feet no later than September 12.

IMPACTS OF PROJECT OPERATIONS

Resident Fishery

Dworshak Reservoir Productivity

The majority of the North Fork Clearwater River drainage is comprised of nutrient-poor granites of the Idaho batholith. Dworshak Reservoir, like most new reservoirs, experienced a few years of higher productivity. Since 1977 the reservoir has gradually become less productive and is now classified as oligotrophic (Reiman and Meyers, 1992). Most of the nutrient budget is probably comprised of recycled phosphorus and nitrogen and inputs from tributary streams and shoreline areas (Bennett, 1997). The current low-nutrient condition of the reservoir does not support rapid fish growth.

Fisheries Mitigation

The CoE has the legal responsibility to mitigate the effects of lost fishing opportunity created by Dworshak Reservoir. Originally that mitigation was defined as 100,000 pounds of hatchery-reared fish. Since 1972 that level of stocking has only been met three times. The average stocking level for those 25 years has been 38,500 lbs. In the past 10 years the stocking level has averaged less than 15,000 lbs. (IDFG stocking records).

When Dworshak Reservoir was new, productivity was relatively high, fish food was relatively abundant and rainbow trout dominated the sport fishery. These rainbow trout were stocked as part of a federal fisheries mitigation requirement. Smallmouth bass and kokanee salmon were introduced to the reservoir a few years later. Originally, smallmouth bass performed very well on the abundant forage of red side shiners. In fact, Dworshak Reservoir produced an Idaho state record smallmouth bass in 1982. However, success and consistency of the two fisheries are limited and widely variable, largely due to the operational effects of Dworshak, and the lack of nutrients. Kokanee populations fluctuate wildly from year to year, mostly controlled by mortality (entrainment) caused by winter releases from Dworshak. Smallmouth bass in Dworshak Reservoir exhibit the slowest growth rate of any population in the region, due primarily to a lack of forage. Water level fluctuations have eliminated successful spawning of redside shiners, the preferred forage of smallmouths in Dworshak. The smallmouth fishery currently produces only limited harvest to Dworshak anglers.

Trout stocking has shown mixed results over the history of Dworshak Reservoir. In years of low kokanee abundance, stocked trout provide the bulk of consumptive fishing opportunity in the reservoir. Hatchery trout also dominate the creel of shoreline anglers at Dworshak.

Fisheries Enhancement

The Idaho Department of Fish and Game (IDFG), CoE, U.S. Fish and Wildlife Service, and Nez Perce Tribe are attempting to work together to provide a reasonable and responsible fisheries program for Dworshak Reservoir. This program recognizes the importance of optimizing the kokanee fishery, enhancing the bass fishery, stocking

trout, and managing native species, primarily bull trout and westslope cutthroat. Reservoir operation and integration of access, recreation, and anadromous fish all play important roles in the Dworshak resident fisheries program.

Historically, fry, fingerling, sub-catchable, and catchable size rainbow trout have been stocked. Rainbow trout stocking has associated risks to native populations and benefits to localized fishery opportunities. Most risks associated with stocking hatchery rainbow trout concern genetics of native cutthroat trout. Hatchery rainbow trout that leave Dworshak Reservoir and ascend tributaries could spawn with native cutthroat and contaminate the genetics of these native fishes. Earlier reservoir research indicates that size at stocking and stocking location are factors in rainbow trout movement (Ball and Pettit, 1974). Stocking catchable size fish downstream of the Dent Bridge may minimize hatchery fish movement into Dworshak tributaries (Maiolie et al., 1992). Stocking catchable size trout at major access points enhances harvest opportunity. Furthermore, development of sterilized rainbow trout to be stocked in Dworshak Reservoir was recently accomplished.

Total angler use averaged approximately 88,000 hours annually from 1972 through 1980. During these years rainbow trout dominated the fishery. Catch rates averaged less than one fish per hour. Following introduction in the 1970's, kokanee salmon became more prevalent in the reservoir and by the 1980's had replaced rainbow trout as the dominant fishery (Horton, 1981). Plentiful populations and liberal bag limits provided annual harvests of up to 200,000 kokanee per year from Dworshak. Harvest of kokanee was 206,000 in 1988 and fell to 98,000 in 1990. Creel surveys indicate the kokanee decline advanced further in 1991 (Maiolie et al., 1992).

The Dworshak kokanee population has not been stable from year to year, and has exhibited exceedingly low annual survival rates, much lower than other kokanee populations in the same geographical region. In some years over 80 percent of yearling kokanee have "died" before entering the fishery the following year, and may have resulted in up to a 60 percent reduction in fishing effort (Maiolie and Elam, 1994).

Research has shown a strong relationship between the quantity of water discharged through the dam on an annual basis and kokanee survival. Recent analysis suggests that dam discharge can be a more important factor in driving the population than the number of spawning fish (Fredricks, 1995). Years with high snow pack forced flood control rule curve evacuations that flushed kokanee from the reservoir because kokanee tend to congregate in the lower six reaches of the reservoir during winter and early spring. Powerhouse operation of up to 10,000 cfs generally flushed yearling fish. Spill during winter and early spring flushed all age classes (Maiolie et al., 1992).

Changes in dam operation associated with summer drafting of Dworshak Reservoir coupled with relatively low flow years have significantly increased kokanee survival and density in Dworshak Reservoir. Although removal of up to 80 feet of water from the reservoir is not popular with people that recreate on Dworshak Reservoir during the summer, it has reduced the loss of kokanee out of the reservoir. Bennett (1997) found a higher correlation between kokanee entrainment and mean daily discharge during January – March than during July – September. When water is released during

the summer kokanee are more active and are not congregated near the dam. Lower numbers of kokanee are lost through the dam under this scenario. In fact, annual kokanee survival during years of summer drafting has been as much as 10 times higher than in years of winter drafting. Unfortunately, this has generally resulted in over abundant kokanee populations, small fish and a decline in angler satisifaction.

Bull Trout

Dworshak Reservoir is in a key watershed for bull trout, currently listed under the Endangered Species Act as threatened, and may provide important over-wintering habitat. Kokanee is a primary food source of bull trout, and both species may congregate near the lower end of the reservoir in the winter. Late winter or early spring spills from the Dworshak Project have been linked to major losses of kokanee through entrainment, and may cause similar losses of bull trout.

Late summer drawdown of the Dworshak pool may also result in negative impacts to North Fork Clearwater bull trout population. Dewatered shorelines can decrease reservoir productivity. Low pool elevations can create both physical and thermal barriers, which may interfere with fall kokanee and bull trout spawning migration.

Anadromous Fishery

Dworshak Dam eliminated access of anadromous fish to all but the lower 1.9 miles of the North Fork Clearwater River. Dworshak hatchery was constructed to mitigate the loss of steelhead caused by the elimination of this production area. Dworshak Hatchery brood stock was developed from wild adult steelhead from the North Fork Clearwater River population. A second hatchery became operational in 1991, primarily to produce B-run steelhead and spring chinook salmon for the Clearwater Basin. Returning adult hatchery steelhead were intended to perpetuate this genetically unique population and provide sport fishing and tribal harvest.

Water released from Dworshak Reservoir during April and May is primarily used to augment flows in the lower Snake River when necessary to meet the NMFS flow target of 85,000 – 100,000 cfs at Lower Granite Dam. In mid-summer, 1.2 million acre-feet (80 feet of pool elevation) from Dworshak Reservoir is used to help meet the NMFS 50,000 – 55,000 cfs flow target at Lower Granite Dam. Summer flow augmentation is for the benefit of juvenile fall chinook salmon. Mid-summer releases from Dworshak Reservoir also cool water temperatures in the lower Snake River. Both increased flow and cooler water temperatures are reported by NMFS to be beneficial for fall chinook salmon juveniles. NMFS uses reservoir elevation 1520 (80 feet down) at Dworshak Reservoir as a target regardless of lower Snake River conditions, fish presence or abundance (Columbia R. dart; Ed Shriever personal communication).

Historically, juvenile fall chinook would have left the lower Snake River by mid-July. Changes to the ecosystem caused by hydro-power development have shifted migration timing of juvenile fish from May-June to July. Providing artificially cold water conditions in the lower Snake River in the summer may further complicate the ecosystem and delay the out-migration of these fish. Some recent evidence indicates that cold-water releases from Dworshak in August and September may be beneficial to immigrating

adult fall chinook and steelhead (Karr et al., 1998). Fall chinook and steelhead upstream migration into the Snake River system begins in mid-August and continues through October 31. Declining water temperature in the lower Snake River result in lower residence time, and may increase adult survival. Releases from Dworshak in November and/or December likely benefit the steelhead sport fishery in the lower Clearwater River.

The Nez Perce Tribe is currently bringing new hatchery facilities near Lenore into production. This facility will produce juvenile fall chinook salmon to supplement the Clearwater stocks. Late summer flow augmentation in the lower Clearwater River would likely enhance out-migration of these fish.

Wildlife

Winter operation of the Dworshak Project may impact wildlife through related icing patterns. Deer and elk have been observed falling through the ice during attempted cross-reservoir migrations. Winter management to retard ice build-up, or to enhance early formation of safe ice cover may have a substantially positive impact on winter deer and elk survival.

Recreation

Recreation Facilities

Approximately 80 minicamp locations provide 125 sites for camping and day use. Two fee campgrounds have been developed. The CoE operates Dent Acres and Idaho Department of Parks and Recreation (IDPR) operates Dworshak State Park and Big Eddy Marina. There are seven improved boat launch facilities. Four facilities allow boats to be launched with up to a 90-foot pool reduction, and three allow boats to be launched with up to a 110-foot pool reduction. CoE visitor surveys at Dworshak Reservoir indicate that the overwhelming reason people come to the reservoir is to fish.

Mid-summer water level reductions have negatively impacted visitor use at Dworshak Reservoir. Visitor days at CoE docks and camps averaged 131,425 from 1984-91 (Jaymi Osborne, CoE, personal communication, data provided). Visitor days at the same locations averaged 98,399 from 1992-94, a 25 percent reduction. Visitor days at Dworshak State Park averaged 36,960 during 1990 and 91. Use was at or above this average in 1992 and 93, but fell to 65 percent of average in 1994 (Mike McElhatton, Idaho Department of Parks and Recreation, personal communication, data provided). Regression analysis of visitor use and water level indicates that, except for June, from May to August the majority of the variation in user visits can be explained by reservoir elevation. Further analysis of use and water level indicates that minicamp use is virtually abandoned when drawdown exceeds 30 feet. Operation plan committee members also observed that boater use was substantially reduced when drawdown exceeded 30 feet.

Economics

Using the direct cost method, the fishery in Dworshak reservoir in the late 80's is valued at approximately $620,000 annually (1985 dollars, Sorg et. al.). Multiplied by three for an estimated economic ripple effect, the reservoir fishery generates approximately $1.8 million annually (1985 dollars). Applying visitation trends to the fishery indicates a 20-25 percent reduction in

participation due to reduced pool elevations in the summer months. However, the economic value of the steelhead sport fishery in the Clearwater River has been estimated at 10-14 million dollars annually. A four- percent increase in the economic value of the steelhead fishery may compensate for a 20 percent decline in the value of the reservoir fishery.

Commercial Navigation

Between 1988 and 1991, 81 million board feet of timber were transported from four dump sites on the Dworshak pool to takeout facilities located near Dworshak Dam (Fig. 1; BPA *et al.*, 1995a). Approximately 90 percent of this activity occurred in the months of June, July, and August. Logs have not been transported via the reservoir since 1991 due to early drafting for flow augmentation and resulting declines in reservoir elevations. The log dumpsites cannot be used when the reservoir elevation drops below 1570 ft. The added annual cost of truck transportation when the reservoir

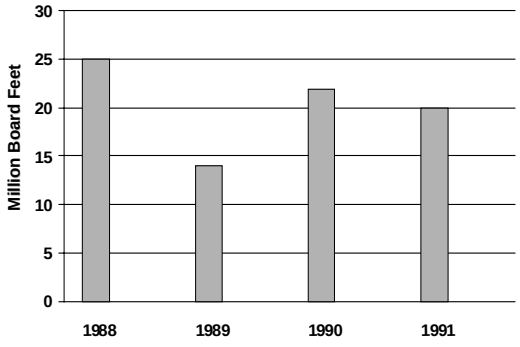

Figure 1. Log Transportation on the Dworshak Pool.

cannot be used has been estimated as high as $470,000 when harvest is near the more distant dump sites.

Power Production

The average annual power production for the Dworshak Project between 1974 and 1991 was 1,769,000 megawatt hours (Fig. 2, CoE Power Production Records). At the Bonneville Power Administration preferred customer rate of 24 mils/kilowatt hour, the average annual power value was $42.5 million. The average annual production between 1992 and 1998 was 1,418,000 megawatt hours, resulting in an average annual value of $34.0 million. This represents a 20 percent reduction in power revenues under flow augmentation During the pre flow augmentation period (1974-1991) one of the peak power production periods was November through January, which helped offset regional winter demands (Fig. 3). During the flow augmentation period, 1992-1998, peak production coincided with spring and summer augmentation releases. Power production during the winter months has been reduced substantially.

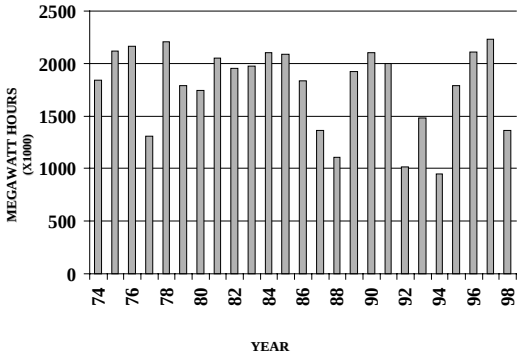

Figure 2. Annual Power Production for the Dworshak Project, 1974-1998.

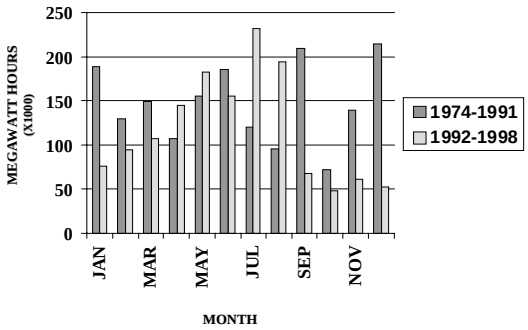

Figure 3. Average Monthly Power Production for the Dworshak Project, 1974-1998.

Flood Control

The primary objective of Columbia River system flood control operations is to reduce peak flows on the lower Columbia River (BPA *et al.*, 1995b). This area includes parts of Portland, Oregon and an additional 120 river miles protected by 42 diking districts. Under traditional operations, the Dworshak pool was maintained at or near full until after September 1. Between September 1 and January 1, the pool was gradually drafted to pool elevations of 1550 to 1560 feet (this provided approximately 700,000 acre-feet of space). Drafting continued into early April resulting in low pool elevations approaching 1450 feet (1,970,000 acre-feet available storage). Spring runoff resulted in reservoir refill, and full pool, elevation 1600 feet, was typically attained around June 10th. The reservoir pool elevation was usually maintained at 1600 feet through September 1.

With the advent of flow augmentation in 1992, some of the flood control space could be transferred from Dworshak to the Grand Coulee project. In theory, this would leave more water in the Dworshak pool to support spring flow augmentation while increasing the likelihood of full pool in late spring or early summer.

Water Quality

In 1998, the Idaho Division of Environmental Quality (IDEQ) issued a draft list of 19 stream segments in the Upper North Fork Clearwater (Hydrologic Unit Code 17060307), which are purportedly water quality limited due to excess sediment pollution. In addition, Osier Creek is also listed as water quality limited due to water temperature exceedances and flow/habitat alterations. A total daily maximum load (TMDL) analyses for the Upper North Fork Clearwater is scheduled for completion by December 31, 2000.

Water quality issues in the lower North Fork Clearwater River (Hydrologic Unit Code 17060308) and the mainstem Clearwater River (Hydrologic Unit Code 17060306) include both water temperature and total dissolved gas supersaturation. Specifically, IDEQ and IDFG are concerned about thermal shock and gas saturation created when 20,000 cfs of 8 deg C water is released from the dam during the summer low flow period. Releasing cold water from Dworshak Reservoir for the purpose of flow augmentation and water temperature control in Lower Granite Reservoir during the summer can have an adverse effect on the growth and the productivity of both resident and anadromous fish in the lower Clearwater River. A TMDL for the lower North Fork Clearwater River is due in the year 2002 and a TMDL for the mainstem Clearwater River is due in the year 2003.

Short Term Activity Exemption

Since April 1995, the National Marine Fisheries Service (NMFS) has sent annual requests to both the IDEQ and to the Nez Perce Tribe seeking approval for a short-term activity exemption to exceed the total dissolved gas standard of 110 percent supersaturation in the North Fork Clearwater and the mainstem Clearwater Rivers below Dworshak Dam. The basis for this request is to provide water from Dworshak Reservoir to augment flows in the lower Snake River for the purpose of improving migration conditions for juvenile chinook, steelhead, and sockeye salmon originating from Idaho, Oregon, and Washington tributaries as well as the mainstem Snake River. Dissolved gas monitoring information from the CoE indicates that the 110 percent standard is exceeded in the river below Dworshak Dam at approximately 4,000 to 5,000 cfs spillway flow, or 14,000 to 15,000 cfs total flow.

The Idaho Administrative Procedures Act (IDAPA 16, Title 01, Chapter 02, Section 080.02) provides that the Idaho Department of Health and Welfare or the Board of Health and Welfare may conditionally authorize short-term activities that may result in a violation of state water quality standards (rules). The Idaho Water Quality Standards provide state that no activity can be authorized unless:

- The activity is essential to the protection or promotion of public interest;
- No permanent or long-term injury of beneficial uses is likely as a result of the activity. The designated beneficial uses listed for the North Fork Clearwater and the Clearwater Rivers in the Idaho Water Quality Standards are:

- Cold Water Biota
- Salmonid Spawning
- Primary Contact Recreation
- Secondary Contact Recreation
- Special Resource Water

Gas Bubble Trauma Monitoring

Beginning in 1995, NMFS requested a variance from the total dissolved gas standard to allow flow augmentation spills that could result in total dissolved gas levels up to 120 percent saturation. A requirement imposed by IDEQ with the activity exemption was a monitoring program for fish populations in the affected waters to determine extent of gas bubble trauma (GBT) associated with elevated dissolved gas saturation levels. Over the course of the past five years (1995 through 1999), over 30,000 individual fish were examined for gas bubble trauma (Table 1; Cochnauer, 1999). The incidence of GBT was never greater than 1.0 percent of all fish examined in a given year. Over 95 percent of all GBT incidences were observed in the two monitoring areas closest to Dworshak Dam. Wild rainbow trout showed the highest incidence of GBT in 1996 and 1997. The highest incidence of GBT for both an individual species and all species collectively occurred in 1997 when the greatest number of days exceeding the 110 percent and 120 percent total dissolved gas saturation occurred. Seventy-three percent of the fish exhibiting GBT were at the lowest trauma level. Fifty-three percent of GBT was observed during the summer flow augmentation interval.

Table 1. Summarization of days by year with total dissolved gas exceeding Idaho state water quality standard and the percentage of gas bubble trauma observed for selected fish species (Cochnauer, 1999).

	1995	1996	1997	1998	1999
Days TDG exceeding 110%	33	41	55	47	41
Days TDG exceeding 120%	10	17	20	0	0
Number of individual fish examined	4,752	5,773	8,557	5,474	5,935
Number of fish species with GBT	5	2	7	1	2
% GBT for all species	0.2	0.2	0.8	<0.1	<0.1
%GBT for wild rainbow trout	0.0	2.0	7.5	0.0	0.4
%GBT for mountain whitefish	1.0	0.1	0.7	0.0	0.0
%GBT for largescale sucker	0.1*	0.2*	1.3	0.0	<0.1

*May include some bridgelip suckers

ONGOING ACTIVITIES

Total Dissolved Gas Activity Exemption

In March 2000, the IDEQ and the Nez Perce Tribe worked together in a collaborative manner to prepare a joint response to the NMFS annual request for a short-term activity exemption (Appendix A). This approach provides for the State of Idaho and the Nez Perce Tribe to have a collective regional voice with the Federal Caucus.

The 2000 Activity Exemption also varies from past exemptions in that conditions are attached that pertain to summer water storage and release from the Dworshak Project. These conditions specify that the Dworshak Project will be at full pool by June 30th, that full pool will be maintained through July 31 and that 200,000 acre-feet of the flow augmentation water will be preserved for augmentation needs after August 31. The purpose of these conditions is to shape releases from Dworshak to better meet anadromous and resident fish needs, as well the other traditional beneficial uses of the Project.

Following issuance of the waiver on March 31, 2000, NMFS notified the Tribe and the State that the conditions of exemption were unacceptable. Spring releases from Dworshak were made at levels that were not supposed to exceed the 110 percent standard. Subsequent review of hourly recordings indicated that the CoE may have been in violation of the standard. Summer releases from Dworshak are also being shaped to not exceed the 110-percent saturation standard.
If flow augmentation is successful in 2000 without exceeding the total dissolved gas standard, annual activity exemptions may no longer be required on a regular basis. It is anticipated that any future requests for exemptions will be linked to the integrated rule curve currently being developed for the Dworshak Project (see page 18), and supported by flow, temperature, total dissolved gas, and fish passage monitoring and modeling.

Technical Basis for Flow Augmentation (temperature modeling)

Prior to formulation of the Dworshak Operation Plan, efforts to model water temperature have focussed on the Snake River from Lower Granite Reservoir to its confluence with the Columbia River. Water quality and flow parameters for the Snake and Clearwater Rivers above Lower Granite Reservoir are input as boundary conditions. Mixing processes at the confluence of the two rivers and the effect of cold water releases from Dworshak had not been modeled.

Dr. Steven Wright of the University of Michigan, working through the University of Idaho, provided hydrologic analysis and preliminary temperature modeling in support of the Dworshak Operation Plan. Dr. Wright's hydrologic analysis focused on the mixing processes at the confluence of the Snake and Clearwater Rivers. Subsequent modeling simulated the impact of cold water releases from Dworshak on Snake River

temperatures below the Clearwater confluence.

The hydrologic analysis of mixing processes at the confluence of the Snake and Clearwater Rivers relied heavily on thermal imagery developed for the Idaho Department of Environmental Quality (Wright, 2000a). In a thermal scan of the Snake and Clearwater confluence during 1999 summer flow augmentation, the colder Clearwater River water is shown diving under the warmer Snake River water. Warm surface water temperatures indicate that very little mixing occurs below the confluence. Water released from the bottom of pool at Lower Granite Dam is substantially cooler than water surface in the forebay. The cooler Clearwater River water flows along the bottom of the reservoir and out the intakes at Lower Granite. The warmer water occupies the upper portions of the water column and remains relatively stagnant. The degree of vertical stratification is reduced as water moves through the remaining lower Snake reservoirs. The difference between forebay surface and the bottom-of-pool temperature is about one degree at Ice Harbor Dam.

A numerical model developed by Dr. Wright used historical data for mainstem Clearwater and Snake River discharges and temperature along with two different scenarios for Dworshak releases (Wright, 2000b). Simulations were performed for the summer release seasons (6/1 to 8/31) for four years; 1994 (dry), 1995 (average), 1996 (wet), and 1997 (very wet). The numerical model was one-dimensional and predicted Snake River temperatures are based on an assumption of complete mixing with Clearwater River water.

Under the NMFS Scenario (Scenario A), release begins on July 1 with a reservoir discharge of 14,500 cfs. This is the maximum discharge from Dworshak that remains at or below the state total dissolved gas saturation standard of 110 percent. Discharge then remains at 14,500 cfs until the full 1.2 million acre-feet of flow augmentation water are released (Fig. 4-7). The end of release date varies from August 16 (dry) to August 25 (very wet). The general effect of Dworshak augmentation under Scenario A is a reduction of temperature following the July 1 flow increase. Water temperature down-reservoir of the Snake confluence remains below 20 deg C (considered to be the upper limit of tolerance for migrating salmonids) until the 1.2 million acre-feet have been released (usually between 8/15 and 8/25). After augmentation, reservoir outflow is generally reduced to equal inflow. Mid to late August reductions are followed by Lower Granite temperatures exceeding 20 deg C. often into mid-September.

Under the Idaho Scenario (Scenario B), Dworshak remains at full pool from July 1 through July 31, then 1 million acre-feet are released from storage, along with natural inflow by August 31 (Fig. 8-11). This leaves 200,000 acre-feet of storage for late summer or early fall augmentation. In Scenario B the temperature reduction occurs later in summer, and remains in effect through August 31. The temperature reduction may be somewhat more pronounced due to a higher flow release from Dworshak, and the temperature reduction effect may be greater during dry years, such as 1994. Lower Granite water temperature may exceed 20 deg C in September, but this can be controlled through the use of the 200,000 acre-feet held in reserve, and by slight reductions in August release discharges from Dworshak.

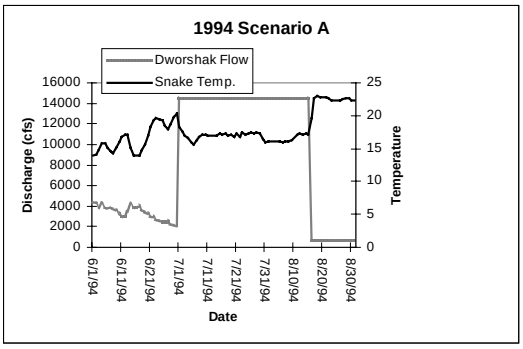

Figure 4. Scenario A, 1994.

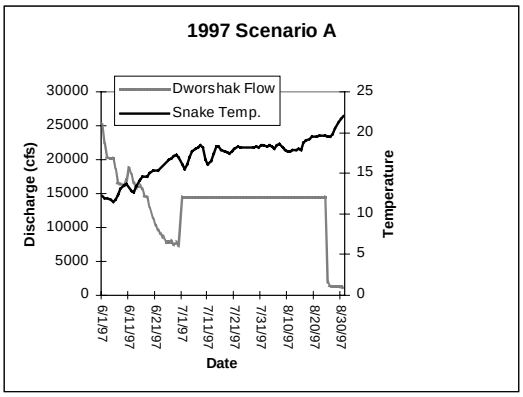

Figure 7. Scenario A, 1997.

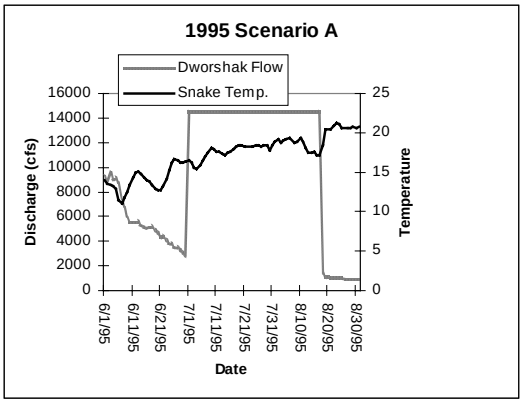

Figure 5. Scenario A, 1995

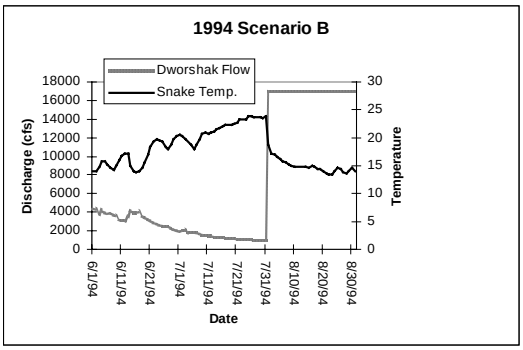

Figure 8. Scenario B, 1994.

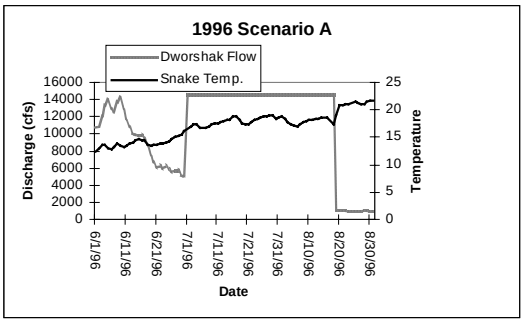

Figure 6. Scenario A, 1996.

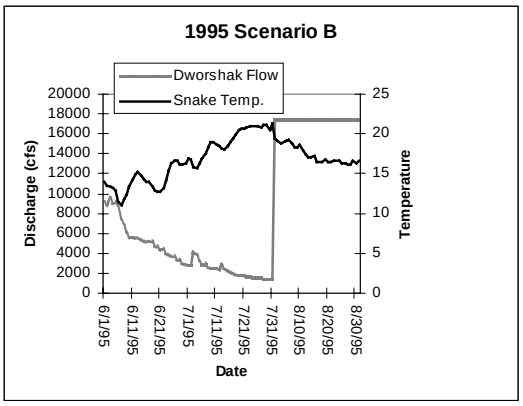

Figure 9. Scenario B, 1995

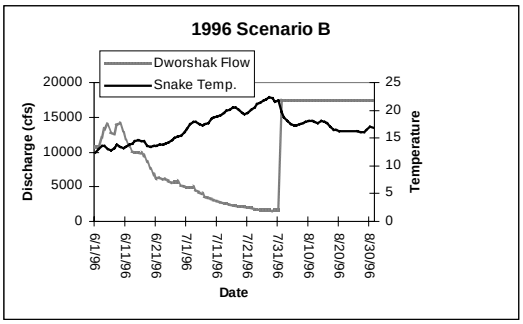

Figure 10. Scenario B, 1996

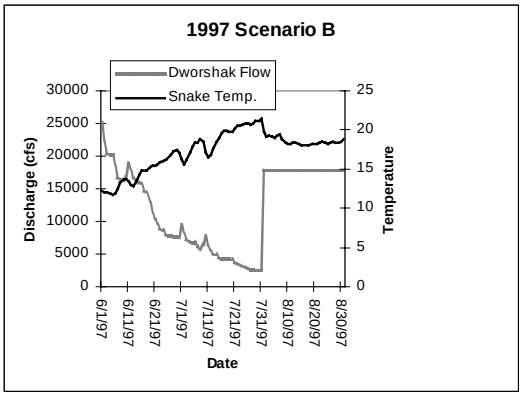

Figure 11. Scenario B, 1997.

Dr. Wright also provided an analysis of conditions that would be expected to result in thermal stratification in Lower Granite. Based on the depth and water velocity for a 14,500 cfs Clearwater flow at the confluence, Dr. Wright estimated that with a temperature difference of 6 deg C or greater between the Snake River and Clearwater temperatures, thermal stratification would develop in the Lower Granite pool.

The modeling support provided by Dr. Wright illustrates the importance of obtaining expertise in this area, and utilizing modeling capabilities to optimize the beneficial uses of Idaho's water. To this end, the Department of Water Resources, in partnership with the IDEQ and the University of Idaho, is obtaining the capability to model water quality. Initially this effort will focus on TMDL development and flow augmentation in the Snake River below Hells Canyon Dam and the Clearwater below the Dworshak Project.

Integrated Rule Curve

The Dworshak Operation Plan Committee learned of the Nez Perce Tribe's integrated rule curve (IRC) development through a presentation at the Committee's June 16, 1999 meeting. The beneficial uses of significance to the Tribe are similar to the authorizations specified by the Dworshak Management Policies in the North Fork Clearwater Plan. This led to discussions of the benefits of state and tribal collaboration in the IRC modeling process. A verbal commitment to work together in developing a model that considered beneficial uses of importance to both Idaho and the Tribe was reached in October 1999. The Idaho Department of Fish and Game is currently cooperating with the Nez Perce Department of Fisheries in this effort.

The Tribe's Department of Fisheries is currently in the process of developing an IRC model for the Dworshak Project that optimizes project storage and outflows to meet multiple beneficial uses. The tribal fisheries agency received funding through the Northwest Power Planning Council to initiate the development of an IRC model for the Dworshak project in 1995. Extensive efforts to collect dissolved oxygen, temperature, photometry, and productivity data for the Dworshak pool were recently completed. Additional information regarding recreation, power production,

commercial navigation, flood control, resident and anadromous fish, and wildlife has also been pulled together.

The Nez Perce Tribe recently entered into a subcontract with Washington State University to apply the Montana Biological Rule Curve modeling template (Marotz *et al., 1996)* to the Dworshak Project. Model development is scheduled for completion in early 2001.

Multi-Species Framework

The Columbia Multi-Species Framework Project is an ongoing effort by state, federal, and tribal resource managers to address fish and wildlife planning in the Columbia River Basin. The Framework provides a structure for regional planning, stressing ecological objectives, and strategies supported by a long-term science-based vision. The Multi-Species aspect reflects the emphasis on breaking down the usual demarcations between terrestrial and aquatic management and between management of anadromous versus resident fish.

The main application of the Framework Project will be the development of the fish and wildlife program for the Northwest Power Planning Council. The Council plans to structure the goals and actions of their next program, which directs the expenditure of $127 million annually around the Framework. The Framework analysis will also be the basis for future watershed-level planning. This will be aimed at development of specific sub-basin plans to provide sub-basin objectives and guide annual prioritization and selection of actions. In the Clearwater River Basin, watershed level planning is being accomplished and co-coordinated by the Idaho Soil Conservation Commission and the Nez Perce Tribe through a Clearwater Focus Program.

The Clearwater Focus Program

The Northwest Power Planning Council (NPPC), under the Northwest Power Act of 1980, developed a program to protect and enhance Columbia River Basin fish and wildlife, including threatened or endangered species. This program promotes protecting and improving anadromous and resident fish habitat and water quality. To facilitate this concept, the NPPC proposed in 1995 that Idaho, Montana, Oregon, and Washington each identify at least one basin in which to apply and implement the approach used in the Pacific Northwest Model Watershed Project. This process emphasizes local involvement in developing strategies to manage fish and wildlife. In June 1995, the NPPC recommended that a focus project be implemented in the Clearwater River subbasin.

The Clearwater Focus Program is co-coordinated by the Idaho Soil Conservation Commission and the Nez Perce Tribe. Input and assistance are provided by a policy advisory committee with representation from the Idaho Association of Soil Conservation Districts, the Idaho Department of Environmental Quality, the Idaho Department of Fish and Game, the Idaho Department of Lands, the Clearwater National Forest, the Potlatch Corporation, the Idaho County Commission, and the Nez Perce Tribe. To date, the Clearwater Focus Program has provided leadership, continuity, and a framework for water quality and fisheries habitat improvements in the Clearwater River subbasin. The project has been instrumental in developing an inventory of watershed projects and technical data sources, and in implementing

a comprehensive watershed assessment process. The ultimate goal of the Clearwater Focus Program is to develop a plan that identifies critical habitat protection and improvement needs, sets basin-wide priorities, and establishes funding strategies for plan implementation. The Dworshak Operation Plan is expected to be a key component of the integrated Clearwater Focus Project Plan.

National Recreation Lakes Pilot Program

In September 2000, the CoE, Walla Walla District nominated Dworshak Dam and Reservoir for inclusion in the National Recreation Lakes Pilot Program. Through this program, a commission appointed by the President will prepare reports for selected federally managed manmade lakes and reservoirs that:

1. Review the extent to which components identified in specific authorizations have been accomplished.

2. Evaluate the feasibility of enhancing recreation opportunities at federally managed lakes and reservoirs.

3. Consider legislative changes that would enhance recreation opportunities.

4. Make recommendations on alternatives for enhanced recreation opportunities.

Dworshak Dam and Reservoir were not selected for inclusion in the program during the current federal fiscal year.

RECOMMENDATIONS

Consistent with the Dworshak management policies and the objective of this plan, the Board makes the following recommendations:

1. The Board recommends that the CoE incorporate the integrated rule curve developed for the for Dworshak Project by Nez Perce Tribe in collaboration with the Water Resource Board and the State of Idaho into the Dworshak Master Plan.

2. The Board recommends continued collaborative issuance of annual short-term activity exemptions for total dissolved gas that contain operating conditions consistent with the integrated rule curve for the Dworshak Project.

3. The Board recommends and supports continued water quality modeling, including temperature, by the State of Idaho to determine the quantity and timing of discharges from Dworshak to optimize anadromous fish migration through the lower Snake River, while providing favorable conditions for resident species of concern. Resident species of concern include bull trout and cutthroat trout. Future modeling efforts must include biological parameters to directly link fish migration data with water quality parameters.

4. The Board recommends continued support by the Northwest Power Planning Council of the Clearwater Focus Program to perform an ecological assessment and to formulate a plan for the Clearwater River subbasin. The assessment process will identify critical habitat, and the planning process will define implementation actions and strategies.

5. The Board recommends that the CoE review the Dworshak mitigation-stocking program with the Idaho Department of Fish and Game on an annual basis. The Board further recommends that this program be utilized to optimize the resident sport fishery in Dworshak Reservoir.

6. The Board recommends that the CoE study the following enhancements to the Dworshak Project through their master plan process:

    - A strobe light or equivalent system at the Dworshak outlet works to eliminate or reduce resident fish escapement from the reservoir.
    - Improved swimming and boating facilities that provide continued use of the reservoir under less than full conditions.
    - Processes, such as tributary fertilization, to enhance the resident sport fishery.
    - Funding mechanisms for the maintenance of Dent Bridge.
    - Enhancements to log transportation facilities that would provide for dumping and transport under drawdown conditions.
    - Processes that may improve reservoir shoreline vegetation.
    - Project landscaping enhancements.

    Feasibility analysis of these enhancements must focus on the overall

benefit to the region and the nearby community of Orofino. The Board recommends that enhancements determined to have substantial positive benefits be implemented on a timely basis.

7. The Board recommends that the CoE resubmit the nomination of Dworshak Dam and Reservoir for inclusion in the National Recreation Lakes Pilot Program prior to 2002 federal fiscal year.

8. The Board recommends that the Dworshak Project be operated in a manner that is consistent with Idaho Code and the Comprehensive State Water Plan.

ACTION

Pursuant to Policy 4B of the Comprehensive State Water Plan, Part A (the statewide water policy plan), the Board will meet annually with the CoE to discuss spring and summer flow release strategies for the Dworshak Project.

IMPLEMENTATION

The Board requests the support of the Idaho congressional delegation in ensuring that the Dworshak Operation Plan is incorporated into the Dworshak Master Plan currently being prepared by the CoE. The Board will then seek full implementation of the Master Plan.

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Wright, Steven J. 2000a. Written communication to Mr. William S. Whelan, dated March 20, 2000.

Wright, Steven J. 2000b. Written communication to Mr. Bill Graham, dated June 2, 2000.

APPENDIX A: LETTER AND ATTACHMENT REGARDING SHORT TERM ACTIVITY EXEMPTION OF TOTAL DISSOLVED GAS SUPERSATURATION STANDARD

March 31, 2000

William Stelle, Jr., Regional Director
United States Department of Commerce
National Marine Fisheries Service
525 NE Oregon Street
Portland, Oregon 97232-2737

Brigadier General Carl A. Strock
Commander, North Pacific Division
United States Army Corps of Engineers
P.O. Box 2870
Portland, Oregon 97208-2870

Re: Short Term Activity Exemption of Total Dissolved Gas Supersaturation Standard

Dear Gentlemen:

This letter is a joint response from the Nez Perce Tribe and the State of Idaho to a request on February 17, 2000 by the National Marine Fisheries Service (NMFS) for a short term activity exemption to allow exceedance of the water quality standard of 110% total dissolved gas (TDG) supersaturation in the North Fork of the Clearwater River below Dworshak Dam and the Clearwater River below the North Fork between April 3 and August 31, 2000. The stated reason for the NMFS request for exceedance of the TDG standard is to supplement flows in the lower Snake River to achieve flow objectives as set forth in the 1995 Federal Columbia River Power System Biological Opinion and the 1998 supplement to that document.

The Nez Perce Tribe and the State of Idaho, in consultation with various state and federal agencies, have reviewed the information provided by the referenced request for a short term activity exemption. The Nez Perce Tribe and the State of Idaho grant a short term activity exemption to allow exceedance of the TDG standard up to 120% for 12 of the highest hourly measurements during 24 hour spill, as measured at the U.S. Army Corps of Engineers Dworshak fish hatchery monitoring station, for the lower North Fork Clearwater and the mainstem Clearwater Rivers during the period April 3 through August 31, 2000. This short term activity exemption is granted by the Nez Perce Tribe and the State of Idaho under the conditions set forth in Attachment A.
This joint response to your request for a short term activity exemption represents a collaborative

effort between the Nez Perce Tribe and the State of Idaho and is designed to address the needs of migrating and resident fish and to optimize water management in the Snake and Clearwater River Basins. We look forward to working with you and other federal, tribal and state agencies to successfully implement this short term activity exemption process.

Sincerely,

Samuel N. Penney
Chairman
Nez Perce Tribe

C. Stephen Allred
Administrator
Idaho Division of Environmental Quality

cc: James Yost
Karl Dreher
Rod Sando
Chuck Clarke
Mike Field

CONDITIONS OF THE SHORT TERM ACTIVITY EXEMPTION TO THE STATE AND TRIBAL
TOTAL DISSOLVED GAS STANDARD
31 March 2000

The Nez Perce Tribe (Tribe) and the State of Idaho (State) are jointly issuing a short term activity exemption, through their authorities, to the total dissolved gas standard of 110 percent of saturation. The short term activity exemption allows the standard to be exceeded up to 120 percent within the North Fork Clearwater River, Dworshak Project to mouth, and the main Clearwater River, North Fork confluence to mouth. The conditions of the short term activity exemption are set forth in this document.

Conditions of Short term activity exemption

1. The Dworshak Project will be at full pool (elevation 1600 ft) by June 30th.

2. The Dworshak Pool will be maintained at elevation 1600 ft through July 31st.

3. On August 31st, the Dworshak pool will be at or above elevation 1537 ft. This will provide 200,000 AF to meet late summer/fall augmentation needs.

4. All releases from Dworshak for the purposes of anadromous fish migration and water temperature control must first be approved by the State and the Tribe upon a finding that the release is supported by scientifically defensible water quality and fish migration studies and data.

- Supporting studies and/or data must show that Dworshak releases will achieve their stated purpose(s).
  - Releases from Dworshak will not interfere with the rearing and migration of Clearwater River fall chinook smolts.
  - Specific flow augmentation releases will be authorized jointly in writing by the designated representatives of the Tribe and the State within this framework, after demonstration that there is scientifically defensible support for the release.

Releases will be approved only with the written concurrence of both parties.

5. The US Army Corps of Engineers will maintain the dissolved gas and temperature monitoring network, including monitoring stations at Dworshak, Peck and Lewiston. These stations will be operated and maintained on a continuous basis during the period of the short term activity exemption, except that the Dworshak station will be operated and maintained year-around.

Exceptions

Exceptions to these conditions may be granted under unusual circumstances (e.g. drought, specific fish passage needs, flood management requirements, etc.) if supported by scientifically defensible data and/or studies.

- The request for an exception will be made in writing to the Tribe and the State, and may result in a meeting with designated state and tribal representatives in Lewiston.
- Scientific data supporting the need for an exception will be attached to the request.
- A joint decision regarding the request for exception will be issued in writing by the designated state and tribal representatives.
- System operations requests for use of Dworshak water for flow augmentation and temperature control will not be presented to the NMFS Adaptive Management Process (TMT, IT) until after the request for exception is approved and issued by the designated state and tribal representatives.

Exceptions will be approved only with written concurrence of both parties.

APPENDIX B: COMMENT LETTER FROM SENATOR MARGUERITE MCLAUGHLIN

MARGUERITE McLAUGHLIN
DISTRICT 7
BENEWAH, CLEARWATER,
IDAHO, LATAH, LEWIS
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COMMITTEES

FINANCE (JFAC)

COMMERCE & HUMAN RESOURCES

JLOC

Idaho State Senate

State Capitol
P.O. Box 83720
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Idaho Department of Water Resources
Idaho Water Resource Board
1301 North Orchard St.
P.O. Box 83720
Boise, Idaho 83720-0098

Dear Board Members:

I have reviewed your draft on management of the Dworshak Reservoir as recommended by the State of Idaho. I want to thank each of you and your staff for the support you have given the Clearwater Basin constituents on this critical issue. I only have one negative comment on the management of Dworshak and I do realize that you are not advocating the 80' proposed drawdown each summer.

At no time should the state agree to the 80' drawdown except in exceptional dry water and weather conditions. This mode of operation was called upon in extreme low water years and now after five years of ups and downs is being used as a goal instead of a last resort to reach flow targets for enough water to save fish.

During average or high water years Dworshak should have the same recreational potential as all other Snake and Columbia reservoirs have. To arbitrarily send water downstream in excess of true fish needs is detrimental to this beautiful area and does not help the fish. It then becomes a matter of greed on someone's part to allow or advocate such management. I hope that you will continue to do all you can to see that Dworshak drawdowns and management is in the best interest of the downriver endangered fisheries and this Clearwater Valley and not for downriver expansion and use.

I sincerely hope that we will once again, under ideal weather conditions, have the use of the reservoir as we enjoyed in the 1970s to the late 1980s.

Sincerely,

Senator Marguerite McLaughlin

Cc/ Governor Kempthorne, U.S. Corp of Engineers, Northwest Power Planning Council, Idaho Department of Environmental Quality.