

PHASE I
WILDLIFE PROTECTION, MITIGATION, AND
ENHANCEMENT PLANNING
DWORSHAK RESERVOIR

Final Report

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ABSTRACT

Under direction of the Pacific Northwest Electric Power Planning and Conservation Act of 1980, and the subsequent Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program, impacts to wildlife due to the development and operation of the U.S. Army Corps of Engineers Dworshak Project have been examined. Using existing information, it has been determined that the project has resulted in the loss of 15.316 acres of elk habitat, 15,286 acres of white-tailed deer habitat, 16.986 acres of black bear habitat, 14.776 acres of ruffed grouse habitat, 13.616 acres of pileated woodpecker habitat, and 66 acres of yellow warbler habitat (scrub-shrub/red alder). Acreages of mallard, Canada goose, river otter, and beaver habitat could not be determined from existing information. The interagency work group has recommended that a HEP (Habitat Evaluation Procedure) be used to determine changes in the quantity and quality of target species habitat in the study area, due to the development and operation of Dworshak Reservoir.

INTRODUCTION

This report presents an analysis of impacts on wildlife and their habitats as a result of the development and operation of the Dworshak Project. The study was funded by the Bonneville Power Administration under the authority of Section 1000 of the Columbia River Basin Fish and Wildlife Program adopted by the Northwest Power Planning Council pursuant to Section 4(h) of the Northwest Electric Power Planning and Conservation Act of 1980. The objectives of this study were to:

1. Summarize the net effects to wildlife (excluding bald eagles and osprey) resulting from hydroelectric development and operation of Dworshak Dam.
2. Identify the current status, management goals, and plans of target wildlife species (excluding bald eagles and osprey) and important wildlife habitats in the Dworshak Reservoir area.
3. Recommend wildlife/wildlife habitat protection, mitigation, and enhancement goals for the Dworshak Reservoir area.

The summary of net effects to wildlife is based on existing information (Task 2, Objective 1. Project Nv. 87-111). Existing information did not adequately cover the effect of Dworshak Reservoir on most target species. Areas where information is insufficient to accurately assess net effects to target species have been identified.

This study (87-111) was conducted concurrently with a Nez Perce Tribe study (87-406). which examined Dworshak Project impacts on bald eagles, osprey, and downstream wildlife species. Both studies were designed to include interested agencies and other entities. Meetings and field tours were held concurrently. Agencies and other entities which participated in all or part of the meetings and field tours included the Nez Perce Tribe, U.S. Army Corps of Engineers (USACE), U.S. Forest Service (USFS), U.S. Fish and Wildlife Service (USFWS), Idaho Department of Lands (IDL), Bonneville Power Administration (BPA), and Northwest Power Planning Council (NWPPC). The Pacific Northwest Utilities Conference Committee (PNUCC) was coordinated with throughout this study. but did not attend meetings or the field tour. This study (project 87-111) was funded by the Bonneville Power Administration.

PROJECT DESCRIPTION

Dworshak Dam, located 1.9 miles upstream from the mouth of the North Fork Clearwater River (Figure 1). is a concrete-gravity structure which rises 717 feet above the riverbed. The hydraulic height of the dam (depth of lake at dam) is 632 feet at full pool. Initial generator installation includes two 90 megawatt generating units and one 220 megawatt generating unit. Space is provided for the possible future installation of three additional generator units (USACE 1975).

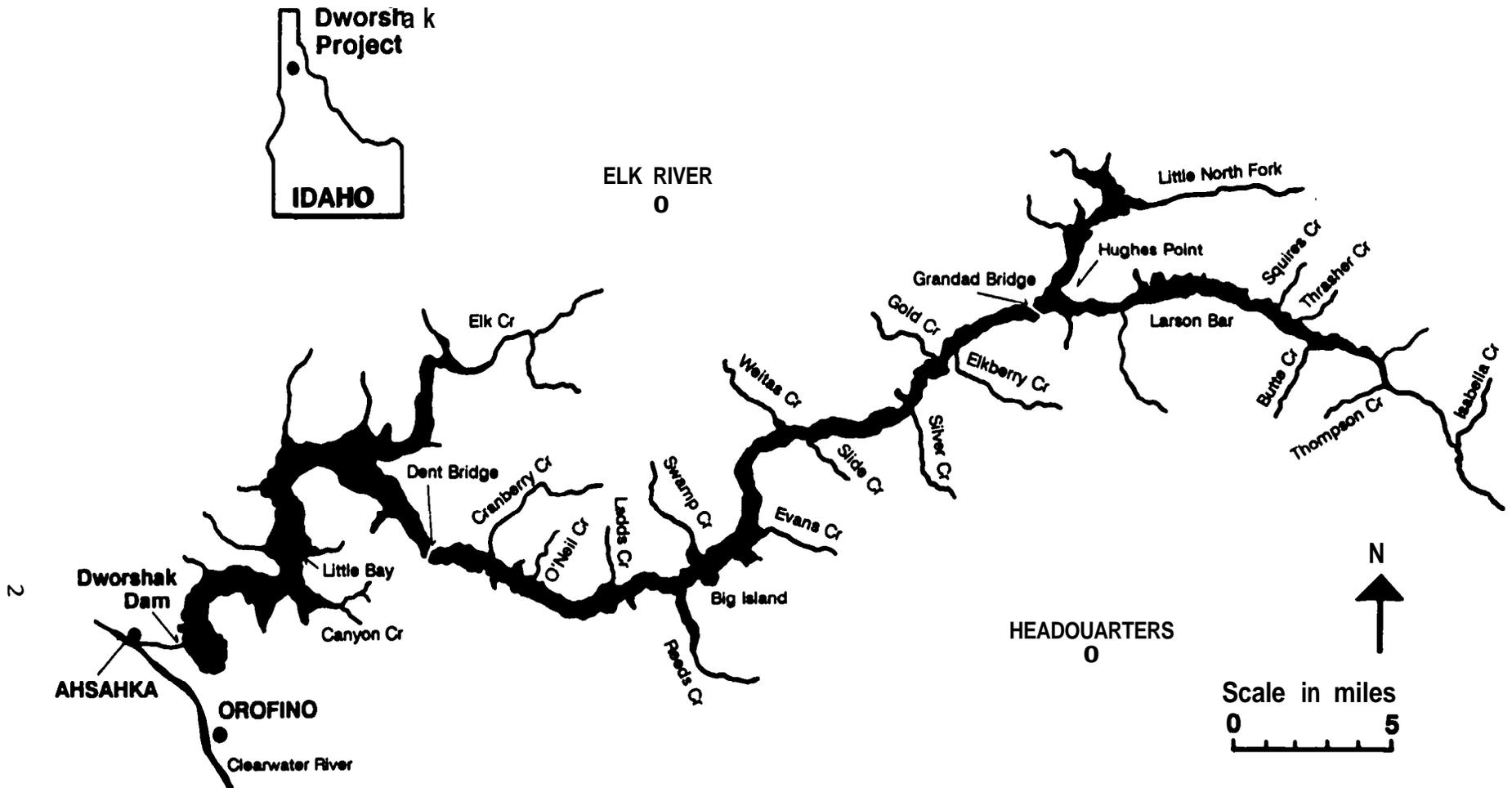


Figure 1. Dworshak Reservoir and vicinity.

The Reservoir created by Dworshak Dam extends 53.6 miles up the North Fork of the Clearwater River. The surface area of the reservoir at full pool (1,600 feet msl) is 16,970 acres (USACE 1974) and the shoreline length is 175 miles (USACE 1975). Major tributary arms of the reservoir include Elk Creek (7 miles long) and the Little North Fork (6 miles long). The dam and lower portions of the reservoir are within the Nez Perce Indian Reservation.

The Dworshak pool elevation varies from a high of 1,600 msl at full pool to 1,445 msl at minimum pool. The pool is drawn down in the fall and winter, and held down during the early spring to provide storage for spring flood waters. Refilling occurs during the spring and summer with full pool obtained in early July for the recreational season. Water released from the reservoir is passed through turbines for electrical power generation. Water is released on a seasonal basis to meet flood control criteria. Hydropower needs and constraints dictate daily operations (USACE 1985b). Recently, water budget requirements have altered Dworshak releases. Less water is released in the winter so that additional releases into the Columbia Basin System are possible in the spring (USACE. pers. commun.).

Dworshak Project lands above the normal pool include 30,935 acres (USACE 1985b) (Figure 2). These lands are classified towards various project purposes including project operations, recreation, mitigation, environmental sensitive, and multiple resource management (USACE pers. commun. 1987). Exact acreages allocated to each classification are not yet available as the final Dworshak Master Plan has not been published, and land classification titles and acreages have changed somewhat since the 1985 Draft Master Plan. Because it was the only document available, acreage figures from the 1985 Draft Master Plan have been used in this analysis of Dworshak Wildlife Impacts.

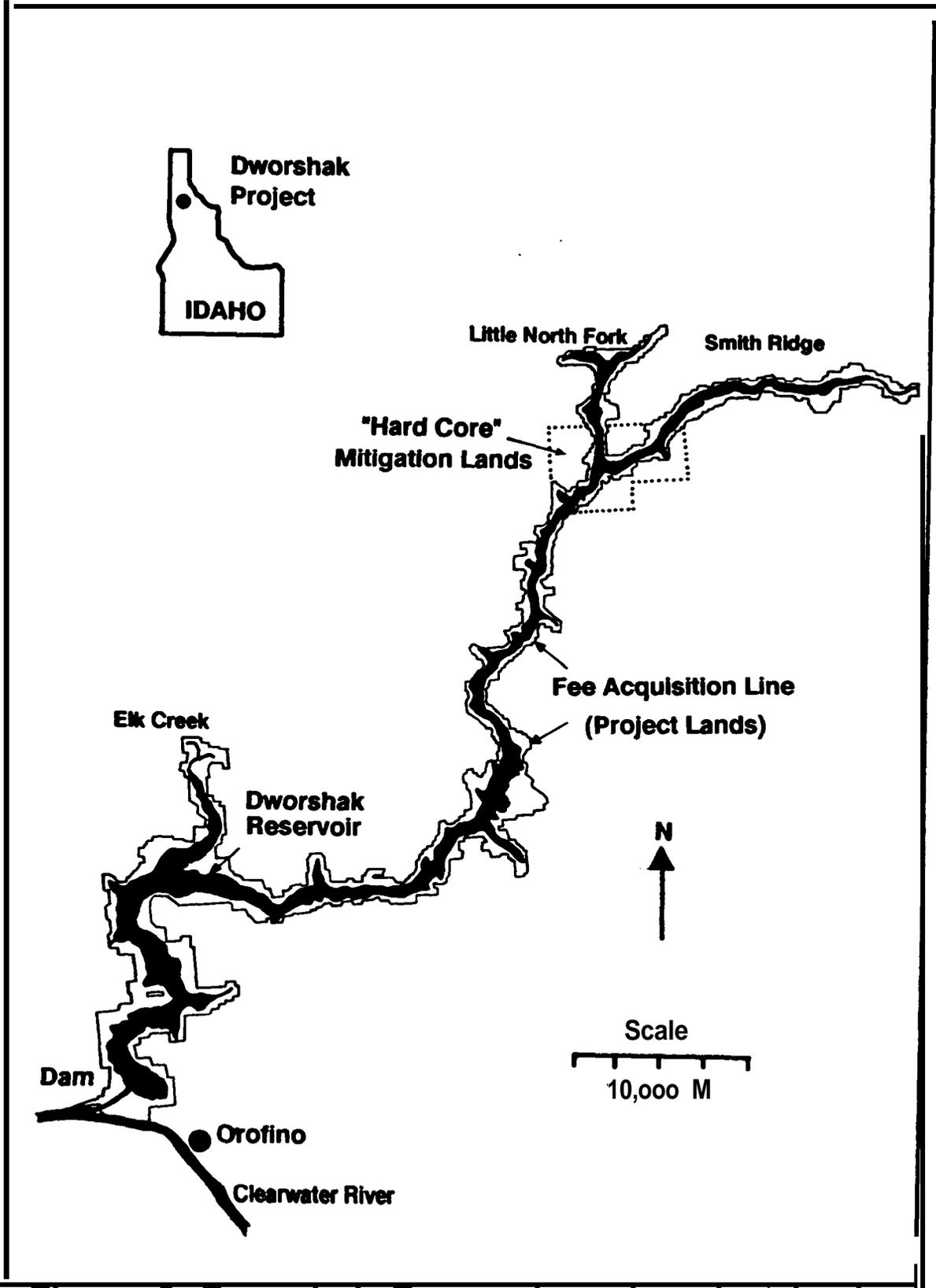


Figure 2. Dworshak Reservoir and project lands.

WILDLIFE MITIGATION HISTORY

During the early planning stages for Dworshak Dam and Reservoir, the project was known as the Bruce's Eddy Project. The name was changed in 1963 to honor the late Senator Henry C. Dworshak of Idaho. The Bruce's Eddy at-ea was first listed as a potential dam and reservoir site in the early 1950's. Authority for construction was contained in Public Law 87-874, Section 201 of the Flood Control Act of 1962, in accordance with House Document 403. 87th Congress, 2nd Session (USACE 1975). On September 27, 1971. the river diversion tunnel was sealed and Dworshak Reservoir was formed.

The history of the Dworshak Project has been filled with studies and negotiations. From the time the Dworshak Project was first proposed, there have been many concerns about the impact of the Dworshak Project on wildlife, with loss of big game winter range the primary focus (Norberg and Trout 1958). Although little data were available, substantial impacts to other wildlife species were expected (USFWS 1960. 1962).

Mehrhoff and Sather-Blair (1985) chronicled the history and status of wildlife mitigation at the Dworshak Project up to 1985:

"In 1960 the USFWS published the first Coordination Act Report (CAR) for the Dworshak Project. At that time they recommended 24,000 acres for mitigation in three areas: (1) 4,000 acres between Elk Creek and Cranberry Creek: (2) 16,000 acres in Big Island - Swamp Creek area: and (3) 4,000 acres at Smith Ridge. However, later that year the Corps released Design Memorandum No. 2 (USACE 1961) increasing the size of the pool area by 52%. This, in essence, invalidated the mitigation recommendations in the CAR.

"In 1962 the USFWS updated the CAR based on the increase in project size. The project would now flood approximately 15,000 acres of terrestrial habitat. This time they recommended 16,000 acres in Big Island-Swamp Creek area, 10,000 acres on Smith Ridge and clearing of 50-100 acre tracts along the project downstream from the Little North Fork Clearwater River. The latter areas were intended to mitigate for white-tailed deer and ruffed grouse losses.

"In March of 1963, the IDFG proposed establishing a 50,800 acre management area at the junction of the Little North Fork and the North Fork of the Clear-water Rivers (Heezen 1963). This area encompassed the headwaters of the Dworshak pool and was referred to as the "Heezen Block." It included 34,700 acres of state land administered by the Idaho State Land Board (ISLE). 13,400 acres of private lands (45% of which was owned by Potlatch Forest, Inc. (PFI). and 2,700 acres of federal lands. The area was contiguous with Forest Service land and considered desirable for vegetation manipulation to improve its value for big game (Heezen 1963).

"In March of 1964 the USFWS recommended that the Corps purchase 2.616 acres of private lands and sign management agreements for remaining 9,600 acres of private land and 34.700 acres of state land. The proposal for private lands, however, met with opposition from the Corps and PFI (Sport Fishing Institute 1981). An agreement between IDFG and ISLB was signed on August 12, 1965 concerning management of state lands for big game.

"After studies by the USFWS and IDFG within the 'Heezen Block' in 1966, the USFWS recommended that the management area be reduced to 46,000 acres (USFWS 1966). No management agreements on private lands were requested. The USFWS recommended that 7.045 acres of private lands be purchased in fee. About 4,850 acres of this private land was located in the "Heezen Block" and was commonly referred to as the "hard core" area. A little over 2,000 acres of private land was added in this proposal located at the extreme upper end of the reservoir on the Little North Fork Clearwater River. This area was commonly referred to as the Gobbler's Knob area. The Corps refused to consider this area as part of the mitigation acquisition package (USACE 1967). Later in 1967 the IDFG reluctantly signed a management agreement with PFI for the Gobbler Knob area.

"In response to a request from the Corps in 1967 the USFWS again submitted a justification report for the mitigation proposed (USFWS 1968a). They submitted that the 46,000 acre Heezen Block was necessary to develop and manage winter range for elk and mule deer. They recommended that the "hard core" area be purchased in fee title while the rest of the private and state lands be managed under agreements with their respective owners. The greatest vegetation manipulation for browse production was to occur on the "hard core" lands. In this report the USFWS estimated that there would be a net increase of 915 elk if the proposed plan was adopted (this figure becomes important in later negotiations). During 1968 IDFG and the USFWS repeatedly insisted that the "hard core" lands should be purchased by the Corps rather than managed under agreement (USFWS 1968b).

"In 1970 the Corps released its Public Use Plan for the Dworshak Project (USACE 1970). Besides developing the "hard core" area exclusively for wildlife, they proposed three other levels of wildlife management on project lands: (1) fish and wildlife project lands (3,017 acres) - development freedom except no interference with project operation; (2) general access lands (10,687 acres) - available for wildlife use with management designed for wildlife given consideration; (3) public recreation areas (6,806 acres) - incidental wildlife use when not a detriment to recreational goals. However, the USFWS estimated that only 2,000 acres of these lands could be managed for big game (USFWS 1970).

"In 1971 the IDFG and the USFWS reopened negotiations [with USACE and other agencies] on the additional acquisition of Smith Ridge lands. This proposal was based on the fact that the management agreements in the Heezen Block had not succeeded in providing additional benefits to

big game (Meske 1971). Smith Ridge lands are administered by ISLB, and they and IDFG could not reach agreement on a management scheme given their divergent views on timber and browse. [Idaho Department of Lands (IDL) is required by law to manage state endowment lands for their highest economic return. Burning and the subsequent increased browse production usually did not fit into the IDL timber management goals.]

"In 1972 the USFWS once again was asked to prepare a report justifying the mitigation proposal. In their report the USFWS stated: 'It is our judgment that full control of 4,500 acres on Smith Ridge is required, in addition to the 3,217 acres within project takeline, plus the 5,120 acres of hard core land under intensive management, to adequately compensate for big game losses caused by construction and operation of Dworshak Dam and Reservoir.' (USFWS 1972).

"After 1972 the IDFG and USFWS continued to stress the need for acquisition of the hard core area and Smith Ridge to complete mitigation. The hard core area was acquired through land transfer with the Bureau of Land Management in 1978. However, Smith Ridge land negotiations were deadlocked. [The ISLB suggested that a land exchange be carried out between the IDL and the USFS that would place the Smith Ridge lands into USFS ownership. For various reasons, this exchange and it has not been conducted (IDL. pers. commun.).] In two letters dated March 14 and November 17, 1981 the Corps suggested to IDFG that 24,000 acres of project lands be used to mitigate for big game losses. This new proposal was in response to the stalled situation in acquiring the Smith Ridge area. The Corps proposed to use project lands for browse production.

'The IDFG responded on February 11, 1983 that '...if sufficient browse can be developed, mitigation will be considered complete.' The amount of browse necessary was defined as that '.. required to feed 915 elk for a 100-day winter period.' If this goal [1.8 million annual pounds of browse] can not be achieved on project land, IDFG suggested that other off-project lands be obtained, specifically Smith Ridge. The Corps responded on April 7, 1983, accepting the IDFG's revised goal and plans are being made to modify project documents" (Mehrhoff and Sather-Blair 1985).

MITIGATION TO DATE

In 1978, 4.028 acres of public land was withdrawn from Bureau of Land Management administration to Corps of Engineers administration for mitigation purposes. This land was included in the 5.120 acre hard core wildlife mitigation area, purchased by the Corps and located at the confluence of the Little North Fork and the North Fork of the Clearwater River (Figure 2). The hard core (5.120 acre) area is located within the original "Heezen Block" (50.800 acres). It is managed for wildlife under a Memorandum of Understanding signed by the IDFG and the Corps (Mehrhoff and Sather-Blair 1985).

Presently, 75 subunits, totaling 2,905 acres, have been clear cut and burned to create brushfields on the hard core mitigation area (USACE 1985a). In addition to these planned clearcuts, another 79 acres have been cut after the blow down of 1983, bringing the total of created brushfields to 2.984 acres. Roads, fire lanes, and landings have been grass seeded and fertilized after burning, for both soil stabilization and big game spring forage (USACE pers. commun.).

Although not specifically designed for mitigation, 811 acres downstream of the hard core area have been developed for browse or grass production during the 1970's. In addition, seven management units downstream from the hard core area are designated for future habitat manipulations, including logging, hand slashing, roller crushing, burning, herbicide treatments, and selective thinning (USACE 1985a).

Original management agreements between the IDFG and the Idaho State Land Board and Potlatch Forest, Inc., signed in the mid-1960's, are still acknowledged. However, these agreements, which cover lands in the original "Heezen Block," are not effective in mitigating wildlife impacts (IDFG pers. commun. in Mehrhoff and Sather-Blair 1985). Based on preliminary browse production estimates projected to the year 1994, a total of 563,028 pounds of browse is expected to be produced annually on Dworshak project lands (USACE pers. commun.). This figure includes 400,150 pounds on the hard core area, 106,598 pounds on naturally occurring brushfields, and 56,280 pounds on lower reservoir developments plus the Gold Creek burn area.

STUDY AREA

The North Fork of the Clearwater River watershed covers 2,440 square miles with a mean annual run off of 4,100.000 acre-feet (USACE 1985b). The climate is characterized by mild summers and long, cold winters. Precipitation averages 51 inches annually, ranging from 24 inches near Dworshak Dam to 80 inches near the headwaters of the North Fork (USACE 1985b).

Dworshak Reservoir is located in the Idaho white pine belt. White pine stands are mixed with grand fir, Douglas fir, Englemann spruce and red cedar. Much of the drainage bottoms are characterized by climax stands of cedar and grand fir (USACE 1975). Pure Ponderosa pine stands on south-facing slopes have become mixed with Douglas fir. Fire and logging have impacted portions of the study area as seral brushfields have replaced conifer forests in some areas.

For purposes of this wildlife impact assessment, the study area includes the 16,970 acre reservoir site and the 30,935 acres of Corps project lands adjacent to the reservoir (Figure 2). Hence, this assessment will take into account impacts to wildlife from activities and habitat manipulations on all project lands, in addition to impacts from the inundation of 16,970 acres of habitat. The total study area is 47,905 acres. Impacts to wildlife downstream of Dworshak Dam will be examined during the concurrent NPZ Perce Tribe study (BPA Project NO. 87-406).

METHODS

At the outset of this study, the interagency work group selected ten target species and agreed to evaluate the impacts from the operation and development of the Dworshak Project on each species. These target species were primarily chosen because of their regional importance to the area, and/or because it was felt that they could be used as an indicator species to represent impacts to other wildlife species with similar habitat needs (Table 1).

As per contract 87-111, impacts to target species have been assessed using information existing from past studies and negotiations. In an effort to augment existing information, long time residents of the North Fork Clear-water River Basin have been interviewed. Pre-project aerial photos obtained from the IDL (1968) and USACE (1966) have been examined to compare pre-construction and post-construction habitat conditions in the Dworshak pool area.

Table 1. Target species selected for the Dworshak Wildlife Impact Assessment.

Species	Reason for Selection
Rocky Mountain elk (<u>Cervus elaphus</u>)	Important big game species.
White-tailed deer (<u>Odocoileus virginianus</u>)	Important big game species.
Ruffed grouse (<u>Bonasa umbellus</u>)	Important upland game species.
Pileated woodpecker (<u>Oryocopus pileatus</u>)	Indicator species for old-growth dependent species.
Beaver (<u>Castor canadensis</u>)	Important aquatic furbearer.
River otter (<u>Lutra canadensis</u>)	Indicator species for aquatic furbearers.
Yellow warbler (<u>Dendroica petechia</u>)	Indicator species for wildlife associated with scrub-shrub wetlands.
Mallard (<u>Anas platyrhynchos</u>)	Indicator waterfowl species.
Canada goose (<u>Branta canadensis</u>)	Important waterfowl species.
Black bear (<u>Ursus americanus</u>)	Important big game species.

RESULTS AND DISCUSSION

HABITAT AND LAND USE

Pre-construction Conditions

Prior to inundation, the lower 55.5 miles of the North Fork of the Clearwater River flowed through a mostly remote area characterized by extensive timber stands, steep canyon walls, and some scattered bench and open areas. Major tributaries included the Little North Fork and Elk Creek.

Most of the land use in the Dworshak Project area was devoted to forestry uses, by both private corporations and public agencies (Table 2). Over 60% of the total land acquired by the Corps for the Dworshak Project was in private ownership (USACE 1985b). Agricultural activities were limited in the area.

Both logging activities and forest fires greatly influenced the vegetation structure and composition in the North Fork Clearwater drainage.

During 1910 and 1919, forest fires burned extensive areas in the Upper North Fork Clearwater drainage, creating large shrubfields (USFWS 1962). Most of the major burns occurred above the confluence of the North Fork Clearwater and Little North Fork (Norberg and Trout 1958). Logging activities, with the subsequent removal of overstory, led to the creation of shrubfields in the lower part of the North Fork drainage (Norberg and Trout 1958). Although supporting marketable stands of timber, many of the lower slopes of the North Fork drainage were not harvested due to rough topography and inaccessible sites (USACE 1970). The drainage bottoms were dominated by climax stand of cedar and grand fir (USACE 1975).

Norberg and Trout (1958) sampled vegetation in the Dworshak Project area, using quantitative ocular estimations to determine composition and density of various plant species in the area. They found that six vegetation zones (Daubenmire 1946) were represented in the Project area, reported in ascending order: the wheatgrass-bluegrass zone, the fescue-wheatgrass zone, the ponderosa pine zone, the Douglas fir zone, the arborvitae-hemlock zone, and the spruce-fir zone. The first two zones, in which coniferous vegetation was absent, were only represented in the lower portions of the North Fork drainage.

In climax stands of Douglas fir, arborvitae-hemlock, and spruce-fir, dense canopies restricted sunlight from reaching the forest floor. In the ponderosa pine zone, found more in the lower portion of the proposed Project area, the more open forest canopy allowed large quantities of sunlight to reach mid-story browse species (Norberg and Trout 1958). Norberg and Trout (1958) concluded that there was no great difference in the abundance or composition of plant species above and below the proposed high pool elevations.

Table 2. Approximate land use acreages of USACE project lands prior to development of the Dworshak Project (USACE 1975).

Land Use ¹	Acreage
Cropland or improved grazing	670
Unimproved grazing	900
Cut over timber	2,800
Marketable timber	20,000
Reproduction timber	17,000
River bed	2,200²
Other	100

Total	43,670³

1 In general terms, cut over timber refers to areas where timber has recently been harvested; marketable timber refers to stands over 40" tall and over 9" diameter; and reproduction timber refers to timber less than 40' tall and less than 9" diameter.

2 The reason for the difference between this number and the water and streambed acreage of 1.700 quoted in Table 3, is unknown.

3 This acreage figure does not include the hard core mitigation area.

Heezen (1962) inventoried streamside vegetation along the North Fork Clearwater River. Information obtained included species composition, density, and crown coverage. Thirty species of woody plants were encountered in the Project area, with seven being coniferous. Grand fir, western red cedar, and Douglas fir were the most frequently encountered coniferous species while willow, mountain maple, serviceberry, redstem ceanothus, hawthorn, dogwood, bittercherry, chokecherry, cascara, and elderberry were most important browse species encountered. The ten major browse species made up 21% of all plants encountered and 38% of the total crown cover per acre. Coniferous timber provided 15% of the plants encountered and 30% of the crown cover. Snowberry and spirea were the most numerous plants in the area, comprising almost one half of all plants encountered. However, combined, they only totaled 5% of the crown cover per acre.

The proposed pool area (below elevation 1,600 feet msl) had an average woody plant density of 19,949 plants per acre, as compared to 24,396 plants per acre for the entire study area (Heezen 1962). All ten browse species were encountered in the pool area, making up 22% of the total plants counted and 27% of the crown cover. Conifers made up 17% of the plants encountered and 33% of the crown cover.

The USFWS (1962) listed the principal cover types that would be inundated by the proposed Dworshak Reservoir (Table 3). The dense coniferous type (largely Douglas fir and cedar-hemlock associations) was generally more prevalent along the south side of the drainage, while the open coniferous type (Douglas fir and pine associations) was more typical on the sunny slopes of the north side of the river.

Agricultural land included many small irregular fields used for hay production and gardening. Thirty-eight sets of improvements other than roads and bridges were inundated, including logging facilities and home sites along with various subsistence-type homesteads (USACE 1961).

Steele (1971) studied red alder and other habitat types along the North Fork of the Clearwater River just prior to inundation. He found that as a result of fire and logging, only small patches of climax forest dominated by western red cedar remained in the study area.

Banks and terraces lying within a few meters of the high water line of the river contained a flora quite different from the red alder habitat found on higher terraces and along tributaries (Steele 1971). In general, willow and a small species of sagebrush adapted to gravel bars comprised the major shrub portion of the vegetation. The species appeared to be confined to what is probably a layer of cool air flowing along the river channel. The same conditions which permitted these species to persist along the river channel also apparently prevented the invasion of red alder on newly formed alluvium next to the river. Steele (1971) concluded that the North Fork of the Clearwater River displayed an unusual combination of temperature and precipitation and hence contained numerous species uncommon to Idaho.

Table 3. Principal cover types within Dworshak Reservoir site (USFWS 1962).

Cover Type	Acreage	Percent
Open coniferous timber	7,300	43
Dense coniferous timber	6,100	36
Brush	1,190	7
Grass	510	3
Agricultural crops	170	1
Water and streambed	<u>1,700</u>	10
Total	16,970	100

Post-construction Conditions

The Dworshak Project created a 16.970 surface acre reservoir, inundating 54 miles of the free-flowing North Fork Clear-water River and many cumulative miles of tributaries. About 15,270 acres of low elevation vegetation were lost along with the river and streambed (1,700 acres). Steele (1971) stated that the loss of red alder habitat to the Dworshak Reservoir threatens certain disjunct and endemic populations along the North Fork. When Dworshak Reservoir filled, only a third of this unusual habitat remained (Steele 1971).

Because of flood control and power needs, the reservoir is drawn down every fall and winter from the high pool elevation of 1,600 feet msl. In the years that the low pool elevation of approximately 1,445 feet msl is reached, 7,367 acres of shoreline and mudflats are exposed, preventing the establishment of normal riparian species (Asherin and Orme 1978). Annual forbs and grasses invade the exposed banks every year on the lower half of the reservoir (Asherin and Orme 1978).

In most winters, solid ice forms on upper Dworshak Reservoir and extends down as far as Magnus Bay. with open water below that point (Meske 1977). In exceptionally cold winters, the entire reservoir freezes over. Reservoir operations (lowering water levels) in the winter often expose and weaken ice along the reservoir edges. The huge blocks of ice left on steep hillsides can make a formidable barrier to big game movements (Meske 1975).

The creation of Dworshak Reservoir increased human access to areas surrounding the North Fork Clearwater drainage. In 1984, 348,320 people used recreational sites along Dworshak Reservoir (USACE 1985b). Also, the reservoir may have helped access some timber stands, (by means of reservoir transport), which in the past were considered impractical to harvest because of terrain, extreme cost of removal, and high costs of access roads.

Creation of Dworshak Reservoir has also led to changes on part of the 30.935 acres of project lands that the Corps purchased adjacent to Dworshak Reservoir. These lands are classified and managed for various project purposes and functions. Specific habitat alterations have occurred on project lands because of dam and powerhouse construction, log handling facilities, road construction, recreation facilities, wildlife management, and wildlife mitigation.

A total of 247 acres of project land near Ahsahka is classified as project operations land (USACE 1985b). The dam, powerhouse, rock quarry, and related structural facilities occupy about 124 acres of the project operations land. In the mid-1970's, the USACE contracted and planted approximately 200,000 trees and shrubs in the canyon below the dam. Although the planting effort has reclaimed part of the area for a

few species of wildlife, human disturbance and the actual presence of structures have combined to make the area of limited value for most target wildlife species. Project operations land covers an additional 22.4 acres of land at Evans Creek (future overnight camp) and 29.3 acres of land in the Little North Fork (old quarry). Thus, of the 299 acres of project operations land, approximately 153 acres have been lost to target wildlife species due to construction of the dam, powerhouse, rock quarries, and related facilities. The additional 146 acres of project operations land have undergone changes in wildlife habitat quality.

Land use classifications for present and future log handling facilities cover 184 acres of project lands. These areas, located close to the shoreline, are characterized by log piles, dirt roads, machinery, and noise. The areas are used seasonally.

A total of 1.245 acres have been allocated to recreation high density (Figure 3). 1,120 acres have been allocated to recreation high density future, and 4,083 acres have been allocated to recreation low density (USACE 1985b). Of the total acreage allocated to recreation around Dworshak Reservoir, 300 acres have actually been developed with parking lots, buildings, plantings, etc. (USACE, pers. commun.). Additional development is expected in the future.

An estimated 3.200 acres of project timberland (USACE 1961) was originally needed to build approximately 27 miles of new roads on project lands (USACE 1970). Most of these roads are used seasonally. Asherin and Orme (1978) delineated 63.2 acres of roads on Dworshak Project lands.

A total of 811 acres of project lands have been developed for wildlife browse or grass production during the 1970's. In addition, seven management units are designated for future habitat manipulations (USACE 1985). A total of 2,905 acres have been clearcut and burned on the hard c-core mitigation area (USACE 1985). Another 79 acres have been cut since the blow down of 1983. Most habitat manipulations for wildlife have changed cover types from dense coniferous timber to brush.

Asherin and Orme (1978) inventoried vegetation on 24,376.5 acres of Dworshak project lands (Table 4). This inventory did not include the 5.120 acre hard core wildlife mitigation area. Eighty-nine percent of the land along the reservoir was in coniferous overstory. 5.5% in brushfield. 4.12 in grassland or brackenfern, and 1.0% in red alder vegetation types. Asherin and Orme (1978) considered the red alder/maidenhair fern vegetation type to be rare along the reservoir, as was the western hemlock type, which was found in only one location along the Little North Fork arm of the reservoir.

A majority of the land adjacent to the project lands is owned by Potlatch Corporation, or the State Department of Lands (USACE 1985). Much of the land has been clearcut in the past, with the remaining stands expected to be cut in the future (USACE pers. commun. 1987).

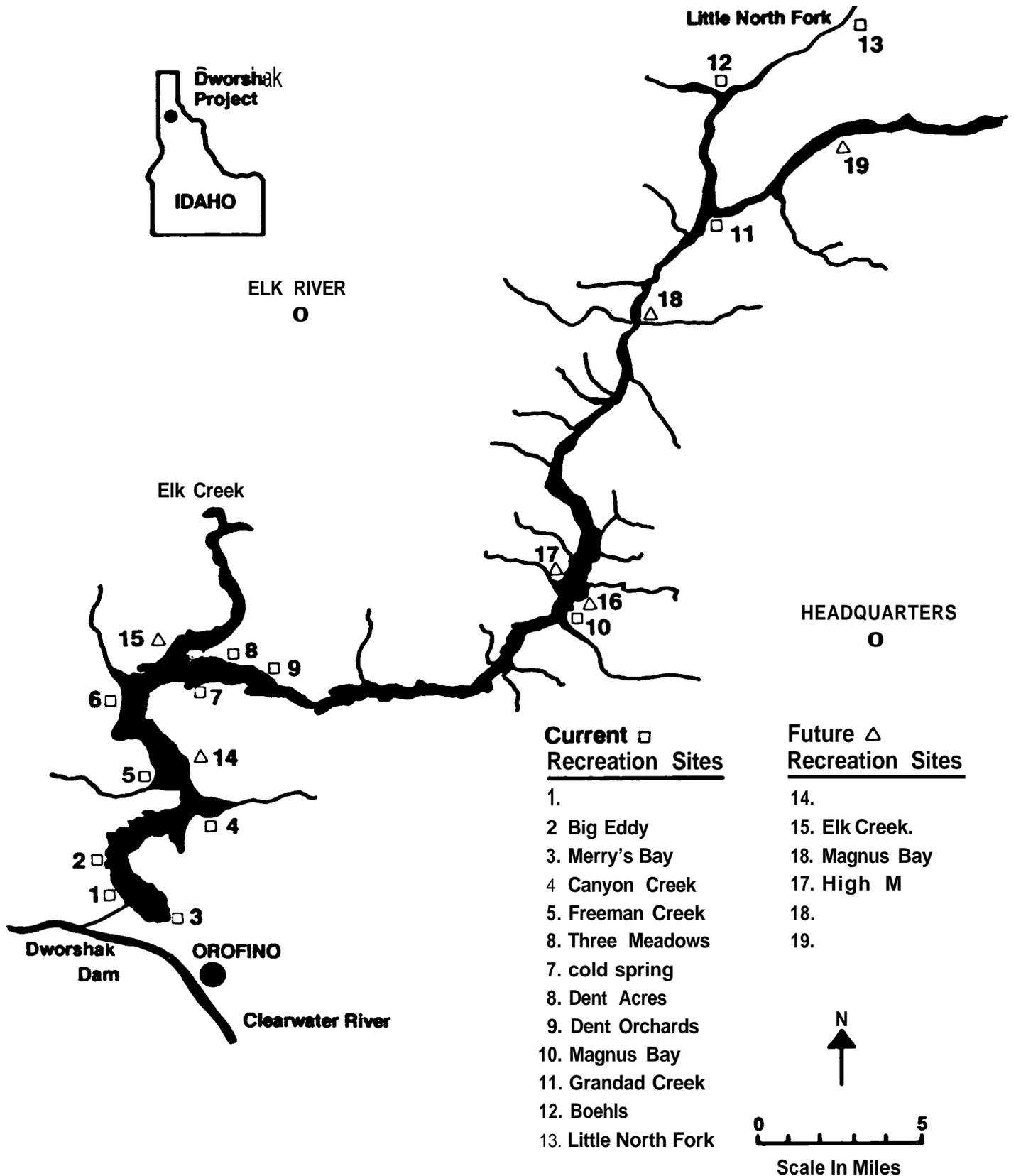


Figure 3. Dworshak Reservoir and recreation sites.

Table 4. Hectares and acres of vegetation and landform types encompassing Corps take lands along Dworshak Reservoir (Asherin and Orme 1978).

type	Hectares	Acres	% of Total Area
Brackenfernlorchardgrass-timothy	145.7	360.1	1.5
Cheatgrass brome/buckhorn plantain	107.7	266.1	1.1
Kentucky bluegrass-cheatgrass brome-orchardgrass	154.1	380.7	1.6
Mallow ninebark-creambush oceanspray	431.9	1067.3	4.3
Mockorange/cheatgrass brome	118.3	292.3	1.2
Western hemlock	54.3	134.1	0.6
Western redcedarlmaidenhair fern	671.1	1658.4	6.8
Douglas fir/serviceberry-common snowberry	2230.3	5510.9	22.6
Grand fir/maidenhair fern	517.3	1278.3	5.2
Mixed conifer (grand fir)/thimbleberry	1420.8	3510.7	14.4
Mixed conifer (Western redcedar)/thimbleberry	1330.9	3288.7	13.5
Mixed conifer (Douglas fir)/serviceberry-thimbleberry	2099.5	5187.9	21.3
Red alder/maidenhair fern	93.3	230.4	1.0
Ponderosa pine/common snowberry	35.9	88.8	0.4
Ponderosa pine/cheatgrass brome	424.7	1049.4	4.3
Roads	25.6	63.2	0.3
Marinas and public access areas	3.7	9.2	0.04
Total	9865.1	24,376.5	100.0

TARGET SPECIES

ELK

Pre-construction Conditions

The Clearwater River drainage is one of the most important big game areas in Idaho and the nation (USACE 1975). Elk and deer herds are nationally known, and draw hunters from all over the United States. The North Fork Clearwater drainage supports the second largest elk herd in the Clearwater Basin (USACE 1975).

In 1910 and again in 1919, large forest fires swept through the upper part of the drainage, creating vast brushfields on 180 square miles of potential elk winter range (USFWS 1962). Approximately 57 square miles of elk winter range in the Dworshak area was also burned. This, coupled with an increase in logging operations at lower elevations, contributed to an increase of elk numbers in the lower North Fork (Dworshak area) (USFWS 1962).

Norberg and Trout (1958) counted 5,329 elk in the North Fork Clearwater drainage during winter census work. Approximately 11% (720 animals) of the elk were counted in the proposed Dworshak pool area. It was felt that elk numbers were still increasing in the area, based on additional forage becoming available after logging activities. Norberg and Trout (1958) summarized that "... the value of this range (Dworshak) cannot be measured in terms of square miles or even in terms of total amount of available food. Its greatest value is its ability to keep animals alive during short emergency periods. Loss of this range would mean a beginning of excessive big game population fluctuations."

The elk population in the North Fork Clearwater drainage was estimated at 12,000 animals in 1956 (USFWS 1962). The average annual harvest of elk from 1956 to 1960 was about 2,400 animals. The annual elk population of the North Fork during a 50 year period of analysis was expected to average about 18,000 animals (USFWS 1962).

Later studies (USFWS 1973), using elk harvest statistics collected by the IDFG for the period 1954-1971, indicated that the North Fork elk population peaked between 1959 and 1963. A peak elk population of 13,773 animals and an average late winter population of 11,431 animals were calculated for the North Fork drainage (USFWS 1973). After this time, elk numbers were believed to begin a slow decline, as deciduous shrubfields became decadent and conifer invasion occurred (USACE 1975).

Post-construction Conditions

Development and operation of the Dworshak project inundated about 15,100 acres of elk and deer winter range (USFWS 1962). The stream bed and agricultural lands were not included as elk habitat (Table 3). At least 216 acres of habitat have been lost on Dworshak project lands due to project operations (dam, powerhouse, and related facilities), and

road construction. An additional 630 acres of wildlife habitat have been changed due to project operations (146 acres), log handling (184 acres). and developed recreation (300 acres). A total of 3,795 acres (Table 6) of habitat have been manipulated on Project lands to create big game browse. New road construction and boating access have increased the number of people entering the lower North Fork drainage.

Immediately following inundation by Dworshak Reservoir, major elk wintering areas downstream from Thompson's Creek included Smith Ridge and Magnus Bay. In addition, a few elk wintered throughout the length of the river downstream to the confluence with the Clearwater River. A small concentration of elk occurred in Elk Creek, a few miles upstream from the mouth (USACE 1975).

Meske (1977) compared 1956 and 1972 elk census data with three year average harvest data for 1958 to 1960 and 1970 to 1972. The data pertained to elk population and harvest numbers from Grandad Bridge on Dworshak Reservoir to the headwaters of the North Fork. The decline in the elk population was 24%, while the decline in the harvest rate was 44%. However, statewide elk harvest, based on 1956 and 1972 estimates, had declined 59%.

Asherin and Orme (1978) conducted an aerial count of elk along the lower 33 miles of Dworshak Reservoir in April, 1976. A total of 134 elk were counted.

Elk counts in the Smith ridge area have increased from 100 animals in 1976 to 439 animals in 1985. Bulls only hunting was implemented in the area, starting in 1977 (IDFG pers. commun.).

IDFG and USACE personnel surveyed nearly the entire reservoir by helicopter on winter flights in 1984 and 1985. A total of 513 elk were counted in 1984, and 937 were counted in 1985 (IDFG 1985). The largest concentrations were found between Reeds Creek and Slide Creek on the south side of the reservoir, and Squires Creek to Thrasher Creek in the Smith Ridge area.

In the past ten years, timber harvest has increased dramatically on adjacent lands to the point where potential thermal and hiding cover is rapidly disappearing (USACE pers. commun.).

Impact Assessment

The study area provided 46,035 acres of elk habitat prior to the Dworshak Project. Following inundation and Project land development, 30,719 acres of habitat remained.

Pre-construction habitat (15,100 + 30,935)		46.035 acres
Habitat Lost		
Inundation	15,100 acres	
Roads	63 acres	
Project Operations	153 acres	
Total Habitat Lost		15,316 acres
Post-construction habitat		30,719 acres
Estimated Elk Lost		720t animals
Habitat Changed		
Project Operations	146 acres	
Log Handling	184 acres	
Recreation Developments	300 acres	
Browse Developments	3,795 acres	
Total Habitat Changed		4,425 acres

The Sport Fishing Institute (1981) chronicles over 20 years of studies and negotiations concerning Dworshak Reservoir impacts on elk. Early in 1983. the IDFG and USAGE agreed on a mitigation goal of producing sufficient browse on hard core and other Dworshak Project lands to feed 915 elk for a 100 day winter period. To achieve this goal, 1.830.000 pounds would need to be available annually from December 15 through March 25. Based on preliminary browse production estimates, projected to the year 1994, a total of 563.028 pounds of browse is expected to be produced annually on Dworshak Project lands (USACE pers. commun.). This includes 400.150 pounds on the hard core area. 106.598 pounds on naturally occurring brushfields. and 56.280 pounds on lower reservoir developments plus the Gold Creek burn area.

One of the reasons most of the early work keyed on the impacts to elk was because of the economic importance of this species to the region and state. A cooperative study of the economic impact of elk hunting in Idaho recently completed by IDFG and the USFS estimated the value of a WFUD (Wildlife and Fish User Day) in 1982 at \$100. In 1985. an estimated 68.450 hunter days were spent in IDFG big game Units 8A. 9A, 10. and 10A. which is where the Dworshak Project is located. This represents a net economic value of elk of over 6.8 million dollars in the four management units in which the Dworshak Project is a part of.

Additional Information Needed

A projected total of 563.028 pounds of browse will be produced on Dworshak project lands in 1994. Since this is only about one third of the agreed upon browse production goal of 1.8 million pounds, the work group needs to explore additional alternatives for elk mitigation. The magnitude of timber harvesting activities on adjacent lands and loss of thermal and security cover should also be examined and included where applicable to future mitigation planning. The interagency work group needs to decide if a Habitat Evaluation Procedure (HEP) should be conducted on elk on the Dworshak Project.

Management Goals, Plans, and Programs

A statewide goal of the IDFG (Toweill et al. 1985a) is to increase elk populations in areas or units, or portions thereof, where natural forage is available. Four statewide issues pertaining to the Dworshak Project include:

- (1) Adequacy of food and cover on winter range is a major factor limiting numbers of elk in many areas.
- (2) Quality of some winter ranges is deteriorating because of plant succession or vegetative changes caused by land management practices.
- (3) Roading and logging in elk habitat increases vulnerability of elk to harvest, displaces elk, eliminates habitat, and reduces cover. Thus the ability of the habitat to produce and support elk can be reduced and game management options restricted.
- (4) Elk habitat is lost to residential and recreational development.

Some strategies the IDFG (Toweill et al. 1985a) have developed to deal with these issues include:

- (1) The IDFG will work with federal, state, and private land managers to implement programs of controlled burning and other range rehabilitation measures on elk winter range.
- (2) The IDFG will update and advocate implementation of elk/ logging guidelines.
- (3) The IDFG will encourage decision makers to consider habitat needs of elk in their land use plans, and to provide mitigation for critical habitats lost through development whenever possible.

Dworshak Reservoir and project lands are located within small **portions** of IDFG big game management Units 8A, 9A, 10, and 10A. The IDFG goal (Toweill et al. 1985a) is to increase elk populations to 1,000 animals in Unit 8A, 1,500 animals in Unit 9A, 15,000 animals in Unit 10, and 1,200 animals in Unit 10A.

Two issues in Management Area 3, which includes these units, are:

- (1) Full mitigation for elk habitat losses due to Dworshak Reservoir has not been achieved.
- (2) Plant succession is reducing winter range size [over much of Area 3], and the amount of available forage per acre has dramatically declined.

Some strategies the IDFG (Toweill et al. 1985a) have developed to deal with these issues include:

- (1) The IDFG will continue to work with the Corps of Engineers to meet mitigation goals and objectives and intensify efforts with the State Land Board, USFS, Corps of Engineers, and USFWS to complete acquisition of needed elk winter range on project lands.
- (2) The IDFG will provide the USFS and other land management agencies with our elk management goals.

WHITE-TAILED DEER

Pre-construction Conditions

White-tailed deer were abundant in northern Idaho in the early 1800's. By the early 1900's, whitetail populations were low, due to over-exploitation by trappers, miners, and settlers. After several decades of protection, whitetail numbers probably peaked in the late 1940's and early 1950's (Hanna and Meske 1985).

Whitetail habitat in Idaho is dominated by dense coniferous forests interspersed with natural brushfields, logged areas, river bottoms, and farm lands. Jageman (1984) summarized white-tailed deer habitat use patterns in northern Idaho. White-tailed deer subsist primarily on browse throughout most of the year in northern Idaho, often switching to grass and forbs in the spring and fall. In winter, deer are usually located at lower elevations in association with river bottoms or lake shores (Pengelly 1961). Deer generally use more open sidehills during milder weather, and dense coniferous stands when temperatures decrease or snow depth increases. In the best habitats, severity of winter appears to be the major limiting factor on population growth (Hanna and Meske 1985).

Norberg and Trout (1958) conducted an aerial search for white-tailed deer in the North Fork Clearwater drainage during the winter of 1955-56. A total of 411 white-tailed deer was observed in the drainage, with 95% located from Ahsahka to the mouth of the Little North Fork. A total of 98.15 (403 animals) of the entire wintering population was counted in the area that would be inundated by the proposed Dworshak pool. It was believed that only a small portion of the whitetail population was counted, due to heavy cover conditions in the area. All animals were wintering below 3,500 feet in elevation, with the majority well below 3,000 feet.

Based partly on Norberg and Trout's (1958) work, the USFWS (1962) estimated that 3,000 white-tailed deer wintered in the Dworshak big game range, most below 2,000 feet in elevation and most in the proposed reservoir site during severe winters.

The white-tailed deer winter range, determined to be about 206 square miles, extended from the mouth of the North Fork upstream to Skull Creek (above Canyon Ranger Station). However, 183 square miles (89%) of the delineated winter range was located in an area that would be directly influenced by the proposed Bruce's Eddy Dam (Norberg and Trout 1958).

The percentage distribution of white-tailed deer was not correlated with the percentage distribution of burned winter range, as most of the large burns occurred above whitetail winter range. In the lower area, where most of the whitetails were located, small, scattered burns combined with logging activities created excellent white-tailed deer habitat (Norberg and Trout 1958).

The USFWS (1960) stated that most of the winter food for deer occurs in the brushland or open coniferous types. These cover types accounted for 8,490 acres of habitat inundated by Dworshak Reservoir (USFWS 1962).

Post-construction Conditions

Development and operation of the Dworshak Project inundated about 15,000 acres of elk and deer winter range (USFWS 1962). Although the entire reservoir still fell within delineated white-tailed deer winter range (Norberg and Trout 1958), most of the actual use occurred in the lower two-thirds of the proposed reservoir site, from Silver Creek downstream. Because most white-tailed deer spend critical winter periods below elevation 2,000 feet, and because the water level in the North Fork drainage was changed from 940 msl to 1,600 msl with the completion of Dworshak Reservoir, the deer lost 660 vertical feet of their former winter range (USACE 1975). The reservoir inundated land required as emergency winter range for white-tailed deer (Norberg and Trout 1958).

Ice formation on Dworshak Reservoir has caused problems for deer. During the winter of 1971, a minimum of 110 deer fell through the ice and drowned. In addition, 95 deer on ice were eaten by coyotes (Meske 1972). The deer were browsing on the foliage of felled trees that had floated on, then frozen into, the lake surface. Meske (1976) reported that observed losses on the ice alone amounted to over 200 deer that one year, but the actual loss was probably several times that number.

Meske (1977) studied white-tailed deer browse utilization and movements after Dworshak Reservoir was filled. He found the majority of the winter range to be dominated by conifers, with redstem ceanothus the primary browse species. The majority of other preferred species such as mountain maple, serviceberry, and willow had already grown too tall to be of much benefit to deer. Average browse utilization from 1973 to 1976 progressed from 33% to 58% to 85% to 89%. It was hypothesized that the deer population had crashed in the 1971-72 winter (when the reservoir was first being filled) to a point below the carrying capacity of the remaining winter range, but had rapidly expanded again to the capacity of the range.

During January 1975, Meske (1977) observed 323 white-tailed deer (by boat) between Dworshak Dam and Magnus Bay. It appeared that Magnus Bay was a major reservoir crossing point, and that a chronic problem with ice and coyotes was possible. Fourteen white-tailed deer were radio-collared during the winters of 1975 and 1976, and followed from winter range along Dworshak Reservoir to summer range (Meske 1977). Average distance from winter to summer range was nine airline miles, ranging from one-half mile to 21 miles.

Meske (1977) concluded that the thin ribbon of land around lower Dworshak Reservoir was of high value to wintering white-tailed deer, and that it was the key to whitetail populations from far surrounding areas.

Asherin and Orme (1978) counted white-tailed deer along the lower 33 mile:; of Dworshak Reservoir by helicopter in April 1976. This area included nearly all of the whitetail winter range (Asherin and Orme 1978).

A total of 584 whitetails were counted with 44.2% on the east side and 55.8% on the west side. Major concentration areas included the north side of Canyon Creek, Little Bay area, Magnus Bay/Evans Creek, Elk Creek Recreation Area, mouth of Elk Creek to Cranberry Creek, Oneil Creek, and Ladds Creek. Asherin and Orme (1978) attempted to evaluate relative use of major vegetation types by big game species, particularly white-tailed deer (Table 5). Extensive deer use of green-up on exposed mud banks at the Dent Acres area and at the mouth of the Elk Creek arm was observed. Use of green-up on mud flats along other areas was much lighter.

IDFG and USACE personnel conducted winter aerial counts of whitetails along Dworshak during 1984 and 1985. A total of 985 were counted between the dam and the Little North Fork confluence area in 1984, and 1,088 were counted in 1985.

About 19,200 acres of Corps Project lands below Gold Creek and Elkberry Creek are included in the major whitetail winter range. Land use activities on this land have altered whitetail habitat to some degree.

The dam, power plant, rock quarry and related facilities occupy 124 acres of project operations land that was formerly white-tailed deer winter range. Habitat quality of an additional 123 acres of project operations land has been changed in the lower reservoir area.

Fourteen recreation sites (Figure 3) are located on the lower portion of the reservoir, within whitetail winter range. A total of 270 acres has been developed with parking lots, buildings, plantings, etc. on these areas (USACE pers. commun.). Most recreational sites along the reservoir are characterized by more gentle terrain than is typical for the rest of the area. A total of 1,870 acres of project lands located in whitetail winter range have been classified as Recreation High Density, and 4,083 acres have been classified as Recreation Low Density (USACE 1985b). Because most recreation activities do not take place during the winter, human disturbance probably has a minimal effect on whitetail winter range.

Table 5. Comparison of relative winter use by big game on major vegetation types at four wintering areas along Dworshak Reservoir, 1977 (Asherin and Orme 1978).

Area	Major Vegetation Types	Date	No. Of Pellet Groups	
			Plots	Per Hec (Ac)
Little Bay	Kentucky bluegrass/cheatgrass brome-orchardgrass	28 April	10	197.6(80.0)
	Cheatgrass brome/plantain	28 April	30	271.7(110.0)
	Mixed conifer (Douglas fir)/ serviceberry-thimbleberry	28 April	70	264.5(107.1)
	Recent prescribed burn (burned fall 1976)	29 April	40	358.2(145.0)
Freeman Acres	Cheatgrass bromelplantain	29 April	40	210.0(85.0)
	Mallow ninebark/creambush oceanspray	29 April	10	321.1(130.0)
	Douglas fir/serviceberry- snowberry	29 April	40	253.2(102.5)
	Mixed conifer (grand fir)/ thimbleberry	29 April	40	302.6(122.5)
Mouth of Elk Cr. Arm	Kentucky bluegrass/cheatgrass- orchardgrass	1 May	40	1259.7(510.0)
	Douglas fir/serviceberry- snowberry	1 May	40	605.2(245.0)
	Grand fir/maidenhair fern	1 May	20	1037.4(420.0)
Oneil Creek	Kentucky bluegrass/cheatgrass- orchardgrass	30 April	20	3371.6(1365.0)
	Mallow ninebark/creambush oceanspray	30 April	20	395.2(160.0)
	Douglas fir/serviceberry- snowberry	30 April	40	642.2(260.0)

Most roads constructed on project lands are used to access recreational sites, hence the majority of roads are in the lower reservoir area, through whitetail winter range. Asherin and Orme (1978) delineated a total of 63 acres of roaded areas on Dworshak Project lands (Table 4). Log handling areas cover an additional 100 acres of project lands within white-tailed deer winter range.

A total of 811 acres of project lands below Grandad Bridge have been brush rolled burned, bare root stock planted, hand slashed, logged. and/or grass seeded during the 1970's. Meske (1977) examined browse production and deer use in some of the areas following treatments, and reported mixed results. In some areas, the number of deer pellet groups increased following treatment, even though the browse supply was not substantially changed. In some areas. cattle grazing hurt shrub seedling survival and browse production.

Impact Assessment

Prior to the Dworshak Project, the study area provided 34,300 acres of whitetail habitat. Following inundation and Project land development, 19,013 acres of habitat remain.

Meske (1975) agreed with former estimates that white-tailed deer lost approximately 40% of their winter range with the inundation of Dworshak Reservoir. and with the 40% reduction in winter range, there was approximately a 40% reduction in the whitetail population. Based on an estimated pre-project population of 2,500 whitetails (Meske 1975). this would mean an estimated loss of 1,000 deer. This was the most recent attempt to quantify whitetail losses in terms of animal numbers.

Dwornshak Reservoir inundated 15,100 acres of white-tailed deer winter range habitat. Major winter range lost due to inundation totaled approximately 12,000 acres of habitat downstream from Gold Creek and Elkberry Creek. Most of this was considered in excellent condition because of the presence of small scattered burns and logging activities (Norberg and Trout 1958). In addition, at least 187 acres have been lost due to the construction of the dam, power plant, rock quarries, access roads, and related facilities. The habitat quality on an additional 493 acres of project lands due to recreational developments, log handling facilities. and project operations has been changed.

since the inundation of Dworshak Reservoir, quality has probably delined overall on whitetail winter range remaining on project lands, due to vegetative successional trends away from prime brush fields and more toward conifers. The 811 acres of shrub and grassland treatments have probably increased the habitat quality and hence the carrying capacity of wintering whitetails on project lands for a period of time after treatment. However, unless habitat quality of these sites in maintained over time with long term operation and maintenance (O&M), beneficial impacts on deer will diminish.

Pre-construction habitat (15,100 + 19,200)		34,300 acres
Habitat Lost		
Inundation	15,100 acres	
Roads	63 acres	
Project Operations	124 acres	
Total Habitat Lost		15.287 acres
Post-construction habitat		19,013 acres
Estimated Deer Lost		1.000 animals
Habitat Changed		
Project Operations	123 acres	
Log Handling	100 acres	
Recreation Developments	270 acres	
Browse Developments	811 acres	
Total Habitat Changed		1.304 acres

There is an economic impact to the region from the loss of white-tailed deer. White-tailed deer hunters contributed over four million dollars to Idaho's economy in 1984 (Donnelly and Nelson 1986). Dworshak Reservoir is located in IDFG's whitetail management Area 1. Area 1 contained 76% of the estimated white-tailed deer population and supported 79% of the statewide harvest in 1984.

Additional Information Needed

Existing whitetail impact information needs to be augmented using a Habitat Evaluation Procedure (HEP) (USFWS 1980) along lower Dworshak Reservoir. The HEP should be used because (1) data are collected in a standardized way which can be compared between different points in time to determine changes in conditions; (2) it is a habitat based approach, which is less affected by natural variability than population based approaches; and (3) it was developed by USFWS specifically for assessing wildlife impacts from water-related projects. The HEP represents a significant improvement over past practices and, with further refinement, should expedite more appropriate habitat evaluation procedures (Sport Fishing Institute 1983). Using a white-tailed deer Habitat Suitability Index (HSI) model, the quality of winter habitat inundated and altered on Project lands will be determined. Habitat quality is expressed at a Habitat Suitability Index (HSI), which ranges from zero to 1.0, with 1.0 representing optimum conditions. The total impact of the Dworshak Project on whitetails will be reported in Habitat Units [quality of habitat (0 to 1.0) multiplied times quantity (acreage)]. Pre-project aerial photos will be used along with habitat data collected from representative sites along Dworshak Reservoir.

Management Goals, Plans, and Program?

IDFG statewide white-tailed deer goals include:

- 1) Maintain the white-tailed deer population that occurs in northern Idaho at current levels, and

- 2) Increase harvest and recreational hunting opportunity in the major white-tailed deer management units (Hanna and Meske 1985).

Dworshak Reservoir and Project lands are located in IDFG white-tailed deer management Area 1. This area contained 79% of the statewide harvest in 1984. The goal in Area 1 is to maintain white-tailed deer populations, increase harvest, and provide more recreational opportunity.

The following issues and strategies in management Area 1 pertain to white-tailed deer and the development and operation of the Dworshak Project (Hanna and Meske 1985):

ISSUE - Several counties in Area 1 are experiencing rapid human population growth. Individual dwellings, rural subdivisions, and recreational developments built on private land are reducing the quality and quantity of white-tailed deer habitat, especially wintering areas. The loss of winter range plus increased deer harassment and mortality primarily from free-ranging dogs has reduced the environment's ability to support whitetails in several units. This trend is expected to continue and accelerate in the future.

STRATEGY - The IDFG will (1) cooperate with the appropriate county planning and zoning commissions to inform them of this problem and work to minimize impacts on deer; and (2) continue to conduct information and education programs through the media in an attempt to convince dog owners to control their pets.

ISSUE - Dworshak Reservoir flooded approximately 80% of the historic white-tailed deer winter range in the North Fork of the Clearwater River drainage. Recreational developments by the Corps of Engineers along the reservoir shoreline will further reduce carrying capacity of remaining winter ranges. Fluctuations and lowering of pool elevation during winter increase the loss of deer on and through the ice.

STRATEGY - The IDFG will monitor and evaluate habitat development on USACE land surrounding Dworshak Reservoir. If mitigation for whitetails cannot be accomplished on existing lands, the IDFG will seek additional off-site mitigation through the Bonneville Power Administration.

BLACK BEAR

Pre-construction Conditions

Little pre-construction data are available on historical black bear populations in the North Fork Clearwater drainage. The U.S. Forest Service estimated that there were 260 bears in the Clear-water National Forest in 1924, and 245 bears in 1936 (USFWS 1956). The USFWS (1962) reported that black bears were especially numerous around Big Island and that a few were taken each year, mainly for trophies. An estimated 1,300 man-days of hunting for black bears occurred in the North Fork drainage annually (USFWS 1962).

The North Fork of the Clearwater contained an important portion of the spawning and rearing habitat for anadromous fish in the Columbia Basin (USFWS 1962). From 1957 to 1962, the number of adult fish spawning in the North Fork drainage averaged about 9,000 annually (USFWS 1962). Most were steelhead, with a few chinook. Because bears are opportunistic feeders, this food source was probably utilized at times. However, even though salmon are an important food item for black bears in some areas, their mere presence in an area is not all that is important (Shea 1980).

Black bears are multi-cover type users (Shea 1980). Black bears avoid extensive open areas and extensive areas of dense timber, preferring "open" forest habitats that provide cover in the forests, and lush green vegetation and succulent herbs on forest edges and in clearings.

Much of the North Fork Clearwater drainage probably supported excellent black bear habitat prior to the development of the Dworshak Project. Numbers likely peaked in the mid-1950's and early 1960's, concurrent with optimum habitat conditions due to the fires of 1910 and 1919, and logging activities in the lower reservoir. High quality black bear habitat includes the presence of an abundance of berry producing shrubs. Serviceberry, hawthorn, bittercherry, chokecherry, elderberry, currant, and huckleberry were all found in the proposed Dworshak pool area (Heezen 1961), with serviceberry being the most common.

The primary importance of the lower North Fork Clearwater drainage to black bears was probably as early spring range. Grassy, open slopes and bench lands along the lower drainage received the least snow in the area, and greened up the earliest. The black bears diet is primarily composed of grasses and forbs during the spring and early summer (Beecham et al. 1986).

Post-construction Conditions

Asherin and Orme (1978) observed 22 black bears within the lower 33 miles of Dworshak Reservoir during an aerial count April 15-16, 1976. Observations included seven single bears, two sows with twin cubs, and three sows with twin yearlings. Observations of bears were made as early as March 26, 1976. Including random bear observations,

22 out of 25 total bear observations (88%) on Dworshak Project lands were made during the months of April, May, and June. Bear observations were made along the entire length of the reservoir and in all cover types except red alder, western red cedar, and grand fir. Based on cover type delineations made by Asherin and Orme (1978). these combined vegetation types covered 13% of Dworshak project lands.

The present population of black bears on the Clear-water National Forest is estimated at 1,200 animals (USFS 1987).

Dworshak Reservoir inundated 16.800 acres of black bear habitat. This includes all cover types delineated by USFWS (1962) (Table 3) except agricultural crops. The water and stream bed types are included because of the post-construction presence of salmon. The open coniferous, brush, and grass cover types (totaling 9,000 acres) probably were of prime importance as spring green-up sites.

Land use activities on the 30.935 acres of Dworshak Project lands, adjacent to the reservoir, have altered black bear habitat. At least 216 acres of habitat have been lost due to project operations facilities and new road construction. An additional 630 acres of habitat has been changed due to additional project operations, log handling facilities, and developed recreation.

The creation of 2,984 acres of browse fields on the hard core mitigation area, and the manipulation of an additional 811 acres for browse and grass production. has also changed the habitat quality of Dworshak Project lands for black bears. Browse fields composed primarily of red-stem ceanothus are of little food value for black bears. Browse field containing substantial amounts of serviceberry, chokecherry, bittercherry. etc. increase the habitat quality.

Impact Assessment

The study area provided 47.735 acres of black bear habitat prior to the Dworshak project. Following inundation and project land development, 30.719 acres remained.

Pre-construction Habitat (16.800 + 30,935)	47,735	acres
Habitat Lost		
Inundation	16.800	acres
Roads	63	acres
Project Operations	153	acres
Total Habitat Lost	17,016	acres
Post-construction Habitat	30.719	acres
Habitat Changed		
Project Operations	146	acres
Log Handling	184	acres
Recreation Developments	300	acres
Browse Developments	3,795	acres
Total Habitat Changed	4.425	acres

In an early report. USFWS (1962) indicated that it was unlikely that black bears would suffer any great reduction in numbers due to the Dworshak Project. Because the Project inundated 16,800 acres (26.2 square miles) of black bear habitat, that early conclusion seems somewhat inaccurate. Black bears have a social system which limits density (number of black bear per square mile) at 1.5 to 2 bears per square mile of habitat in highest quality habitats (Beecham et al. 1986). In terms of animal numbers, up to 52 bears may have been lost annually because of the loss of the inundated area.

Land management practices that decrease the diversity of vegetation within a local area will generally decrease the value of that area as bear habitat (Pacific Working Group 1977 in Shea 1980). Dam projects often decrease local bear habitat due to the elimination or reduction of riparian habitat. which provides a variety of food during all seasons in addition to cover for travel (Shea 1980).

Black bears have lost 16,800 acres of habitat due to inundation, and 216 acres of habitat due to land use activities on adjacent Project lands. The loss of this low elevation, spring green-up area may retard the earliest feeding activities of local bears back somewhat, as the earliest snow free area is no longer available. Asherin and Orme (1978) noted that exposed mud banks along the reservoir seeded naturally with forbs and annual grasses in the spring. This food source probably provides a source of spring green-up for bears in the lower part of the reservoir.

Accessibility of an area to hunters influences the vulnerability of black bears to hunters. Black bear populations in highly roaded areas usually have low numbers of adult bears (<60%). especially males, and these areas may have reduced numbers of bears (Beecham et al. 1986). Creation of Dworshak Reservoir and related recreation sites and road access has allowed more people into the formerly inaccessible area. The long term impact of human disturbance to black bears on Dworshak Project lands is unknown at this time.

The popularity of the black bear as a game animal has grown considerably over the last 15 years (Beecham et al. 1986). It ranks third in Idaho, behind deer and elk, in terms of days of hunting recreation. Data collected by the IDFG indicated that black bear hunters contributed over 2.5 million dollars to Idaho's economy in 1982 (Beecham et al. 1986).

Additional Information Needed

A Habitat Evaluation Procedure needs to be conducted on Dworshak Project lands to determine the change in the quantity and quality of black bear habitat in the study area due to the development and operation of Dworshak Reservoir. Pre-project aerial photos and vegetation sampling on Dworshak Project lands will augment existing information.

Management Goals, Plans, and Programs

Dworshak Project lands are located in parts of black bear management Areas 1 and 2 (Beecham et al. 1986). The IDFG management goal in Area 1, which is highly roaded, is to reduce harvest and increase the age structure of harvest of black bear. The IDFG management goal in Area 2, which is less accessible by road, is to maintain current harvest levels and distribution of black bear.

RUFFED GROUSE

Pre-construction Conditions

Ruffed grouse were the principal upland game bird in the North Fork drainage. They nested, reared their young, and wintered throughout the Dworshak reservoir site. The Big Island - Swamp Creek section of the river probably contained the largest populations of grouse in the project area (USFWS 1962).

Ruffed grouse are the most common grouse species in northern Idaho. The species is generally associated with riparian zones and moist sites throughout the year. Preferred habitats in Idaho consist of a mixture of deciduous shrubs and trees and forb-producing areas (Rybarczyk et al. 1985).

During spring, summer, and early fall, ruffed grouse feed on a variety of insects and forbs. In late fall and winter, they switch to and depend on berries and buds of deciduous shrubs and trees for sustenance (Rybarczyk et al. 1985).

Prior to impoundment, most of the Dworshak pool area probably provided good ruffed grouse habitat, due to earlier fires and logging activities. In particular, open coniferous timber, brush, and grass cover types (9,000 acres) (USFWS 1962) probably provided optimum habitat. Heezen (1961) documented the presence of several berry and bud producing shrubs in the pool area, including willow, mountain maple, serviceberry, hawthorn, bittercherry, chokecherry, elderberry, alder, currant, and huckleberry.

Post-construction Conditions

Asherin and Orme (1978) found estimated fall densities of ruffed grouse on Dworshak Project land ranging from zero to 1.8 birds per hectare. In general, average density ranges found were similar to the 0.27 to 0.5 birds per hectare found on the University of Idaho experimental forest from 1946 to 1950 (Hungerford 1951).

Spring drumming counts were conducted by Asherin and Orme (1978) in 1976 and 1977. The Douglas fir/serviceberry-common snowberry vegetation type had the highest drumming activity in both 1976 and 1977. The western red cedar/maidenhair fern and western hemlock types were lowest in drumming activity in 1976. and the grand fir/maidenhair fern and western hemlock types were lowest in 1977. A general trend of decreasing drumming activity toward the upper end of the reservoir was noted.

Ruffed grouse flushing counts were conducted during the falls of 1976 and 1977 (Asherin and Orme 1978). Ruffed grouse were flushed in all major vegetation types (Table 4) except mixed conifer (grand fir/thimbleberry and western hemlock) in 1976. and all vegetation types except western red cedar/maidenhair fern and western hemlock in 1977.

Asherin and Orme (1978) concluded that ruffed grouse had no particular preference during the fall for particular vegetation types except for an apparent avoidance of the western hemlock and western red cedar/maidenhair fern vegetation types.

Land use activities on the 30.935 acres of Dworshak Project lands have altered ruffed grouse habitat. At least 216 acres of habitat have been lost due to project operations facilities and new road construction. Habitat quality on an additional 630 acres of project lands has been changed due to project operations, log handling facilities, and developed recreation.

A total of 2,984 acres of browse fields have been created on the hard core mitigation area, and 811 acres of Project land have been manipulated for browse and grass production. These changes in habitat quality have probably benefited ruffed grouse.

Impact Assessment

Dworshak Reservoir inundated approximately 14,590 acres of ruffed grouse habitat. The loss of 9,000 acres of open coniferous timber, grass, and brush cover types (Table 4) was probably the most critical to ruffed grouse.

The USFWS (1962) predicted that populations of ruffed grouse in the vicinity of the reservoir would be greatly reduced. Using the Asherin and Orme (1978) study as a reference, the Sport Fishing Institute (1981) hypothesized that as many as 1,500 to 2,700 ruffed grouse may have been displaced and lost as a result of Dworshak Project construction. Their estimate did not include the brush cover types as ruffed grouse habitat. If it were included, estimated losses in terms of animal numbers would be approximately 1,600 to 2,950 ruffed grouse annually.

The loss of approximately 216 acres of habitat and the alteration of an additional 630 acres from log handling, recreation development, and project operations on Project lands have probably negatively impacted ruffed grouse. Most project operations land, recreation sites, and new roads occur in the lower Dworshak area, where Asherin and Orme (1978) found some of the highest post-construction ruffed grouse densities.

The Bureau of Sport Fisheries and Wildlife (1970) predicted that ruffed grouse habitat could be improved on the management area, but that the greatest improvement would be achieved on lands under agreement with Potlatch and the Department of Lands. The more intensive development of browse species anticipated on the hard core mitigation area was not anticipated to be as beneficial as the mixed conifer-shrub types which would prevail on the agreement lands.

Ruffed grouse are a bird that is associated with disturbed forest habitats (Gullion 1977). However, Gullion (1970) points out that elimination of forest cover over an area greater than four hectares (>10 acres) results in reduced breeding densities. Most of the browse fields on the hard core area are considerably larger than 10 acres, as are some of the clearcuts on lower project lands.

The major management objective on the hard core mitigation area is the production of redstem ceanothus, following clearcutting and burning. Redstem is not a preferred food of ruffed grouse. Hence, creating large expanses of redstem would not benefit ruffed grouse. Smaller brush fields supporting some berry or catkin producing shrubs such as serviceberry, chokecherry, hawthorn, or alder would benefit ruffed grouse. Larger brush fields receive some ruffed grouse use on edges.

Pre-construction habitat	(14,590 + 30,935)	45.525 acres
Habitat Lost		
Inundation	14.590 acres	
Roads	63 acres	
Project Operations	123 acres	
Total Habitat Lost		14.776 acres
Post-construction Habitat		30,749 acres
Estimated Ruffed Grouse Lost		2.700 animals
Habitat Changed		
Project Operations	146 acres	
Log Handling	184 acres	
Recreation Developments	300 acres	
Browse developments	3,795 acres	
Total Habitat Changed		4,425 acres

In the northern half of Idaho, forest grouse are by far the most sought after and harvested upland game species. Ruffed grouse is the most frequently harvested species (Rybarczyk et al. 1985). The IDFG and USFS recently reported that the average net value for upland game hunting in Idaho was \$28.50 per day. It was determined that in 1983 the net value of upland game hunting in Idaho was almost 24 million dollars, and in 1984 it was approximately 18 million dollars (Rybarczyk et al. 1985).

Additional Information Needed

A Habitat Evaluation Procedure needs to be conducted on Dworshak Project lands to determine the change in the quantity and quality of ruffed grouse habitat in the study area due to the development and operation of Dworshak Reservoir. Pre-project aerial photos and vegetation sampling on Dworshak Project area will augment existing information.

Management Goals, Plans, and Programs

Ruffed grouse are the most frequently harvested grouse species in the northern half of Idaho. The area provides 702 of the total state forest grouse harvest. IDFG statewide goals for forest grouse include 1) protect and enhance habitat whenever possible, 2) increase Idaho's forest grouse populations and their distribution, and 3) increase harvest and recreational activity (Rybarczyk et al. 1985).

MALLARD AND CANADA GOOSE

Pre-construction Conditions

Based on existing information, it appears that the North Fork Clear-water River supported minimal numbers of mallards and Canada geese. USFWS (1956) reported that the North Fork and the Middle Fork of the Clearwater were not considered good waterfowl streams. The lower main stem of the Clearwater received good waterfowl use, but the birds did not range far into the forks of the river in any numbers. Because of the relative inaccessibility of the North Fork, the bulk of waterfowl observations were made in the Middle Fork. Mallards, common and Barrow's goldeneyes, canvasbacks, American wigeons, Canada geese, and mergansers were noted in small numbers. The largest number as well as the greatest variety was seen in November. Mallards and common mergansers constituted the bulk of waterfowl seen.

The USFWS (1962) reported that the North Fork Clearwater was not located on a major waterfowl flyway, and that the area contributed relatively little to this wildlife group. Limited waterfowl use was noted to occur along some stream sections, however, and several species of waterfowl, including common mergansers, mallards, common and Barrow's goldeneyes, canvasbacks, American wigeons, wood ducks, gadwalls, green-winged teals, and Canada geese were observed.

Most of the North Fork Clearwater River was characterized by steep canyon lands, few wetlands, and high spring flows. A review of pre-project aerial photos of the proposed pool area showed the existence of some islands in localized areas, and some wide river bars. A few Canada geese nested on the North Fork of the Clearwater, above the Little North Fork confluence, prior to inundation.

Post-construction Conditions

Asherin and Orme (1978) conducted monthly waterfowl surveys on Dworshak Reservoir from March 1976 through October 1977. Highest numbers and diversity of waterfowl occurred during the spring migration months of March, April, and May. Forty-six percent of waterfowl counted occurred during those three spring months. Only 15% of the total waterfowl were counted during June, July, August, and September. Most of the waterfowl were associated with bays and inlets, and were usually found near the shoreline. Mallards were one of four species consistently observed in all monthly surveys. Numerous Canada geese were observed grazing on green-up areas on exposed banks below high pool in the spring.

The highest numbers and diversity of waterfowl on the reservoir were generally between Dworshak Dam and Dent Bridge, including the Elk Creek arm. Large groups of waterfowl were noticeably absent on the reservoir, except during spring migration when large flocks of American wigeon, northern shovelers, northern pintails, and tundra swans were occasionally observed.

Supplemental observations of nesting waterfowl on Dworshak Reservoir were recorded (Asherin and Orme 1978). Minimum production totaled five mallards in 1976, and 13 mallards in 1977.

The annual drawdown at Dworshak Reservoir exposes mud banks and provides a source of forage for Canada geese and dabbling ducks (Asherin and Orme 1978). Early nests were expected to be inundated each spring as the reservoir filled (Asherin and Orme 1978).

Impact Assessment

Construction of Dworshak Reservoir inundated 54 miles of the free flowing North Fork Clear-water River, and 13 miles of major tributaries (Elk Creek and the Little North Fork).

The USFWS (1962) predicted that waterfowl as a group would be relatively unaffected by the development and operation of Dworshak Reservoir. This opinion was based on the fact that the North Fork Clear-water was not located on a major flyway and that following inundation, extensive reservoir fluctuations would prevent establishment of necessary waterfowl food plants.

Implementation of the water budget plan and future demands on the reservoir for downstream fisheries may have added impacts on waterfowl around the reservoir, if water levels are held lower for longer periods of time.

Additional Information Needed

A Habitat Evaluation Procedure needs to be conducted on Dworshak Project land to determine the change in the quantity and quality of mallard and Canada goose habitat in the study area due to the development and operation of Dworshak Reservoir. Pre-project aerial photos and vegetation sampling on Dworshak project lands will augment existing information. Pre- and post-construction habitat acreages should be determined for both mallard and Canada goose in an interagency work group session environment.

Management Goals, Plans, and Programs

IDFG statewide management goals for ducks include 1) increase Idaho's resident and wintering duck populations, and 2) increase waterfowl habitat in Idaho (Will et al. 1986).

IDFG statewide management goals for Canada geese include 1) increase Idaho's local and wintering Canada goose population. and 2) increase habitat in Idaho (Will et al. 1986).

RIVER OTTER AND BEAVER

Pre-construction Conditions

Little pre-Dworshak data are available on the presence of river otter and beaver in the North Fork Clear-water drainage. Otters were present on the North Fork but numbers were unknown. Four were reported caught in Clearwater County in 1953 (USFWS 1956). It was noted (USFWS 1956) that no estimate of present or past beaver populations in the Dworshak area was available. It was known, however, that in some places they were still plentiful, even though the overall population had dwindled. Lester Trout (unpubl. rept.) mentioned seeing a few beaver in the proposed pool in 1955. during river reconnaissance work. Several otters were noted around Butte Creek prior to inundation (IDFG pers. commun.). The USFWS (1962) noted that fur harvest in the area was small. due to low fur prices and difficult access during the trapping season.

The presence of beaver and otter in an area are often interrelated. River otter often den in abandoned bank burrows of beaver. Melquist and Hornocker (1983) found that beaver bank dens and lodges accounted for 38.% of the resting sites used by instrumented otters in west central Idaho.

Suitable habitat for beaver must contain all of the following: (1) stable aquatic habitat providing adequate water: (2) channel gradient of less than 15%: and (3) quality food species present in sufficient quantity (Allen 1982).

River otters prefer secluded portions of lakes, ponds, and rivers with heavily timbered shorelines (Liers 1951). Ice free areas along streams or lakes are needed in the winter. Shallow, clear waters are preferred for foraging. Melquist and Hornocker (1983) found that otters preferred valley to mountain habitats, and stream-associated habitats to lakes, reservoirs, and ponds.

The North Fork Clear-water River and tributaries provided habitat for both beavers and river otters before inundation. Although much of the gradient on the main channel would have been too steep for beaver dam establishment, backwater areas, tributary mouths, and areas of wider stream valleys should have provided some good beaver habitat. Heezen (1961) documented the presence of willow and red osier dogwood in the proposed pool area, which are preferred foods of beaver.

The North Fork Clear-water River supported abundant fish populations, otters most common prey, prior to inundation. It is expected that otters would have been located throughout the drainage.

Post-construction Conditions

Asherin and Orme (1978) recorded 14 beaver observations along Dworshak Reservoir during 1976 and 1977. Nine of the 14 observations (64%) were made between the months of October and April. Beaver were noted climbing mud banks to obtain food from shrubs above the high water mark, and then returning to the water to strip the twigs. The only food source available to beaver was the shrubs above the high water mark. No bank dens or lodges were ever found along the reservoir. Observations indicated the movement of a few individuals from tributaries into the pool area during winter months. Trappers were known to have taken 53 beavers, from the headwaters of tributaries to the reservoir, between 1972 and 1976.

A total of 17 river otter observations were made along Dworshak Reservoir during 1976 and 1977, involving actual sightings of 32 otter (Asherin and Orme 1978). Twelve of the 17 observations were made in the upper end of the pool, and four were in the Elk Creek arm of the reservoir. Observations included four groups of four, three groups of three, one group of two, and five single otters. During the winter, otter and/or sign were observed regularly at the edge of the ice sheet.

Impact Assessment

Development and operation of the Dworshak Project inundated river otter and beaver habitat along 54 miles of the free flowing North Fork Clearwater River, and along 13 miles of major tributaries (Elk Creek and the Little North Fork). The USFWS (1962) predicted that fur animals, including river otter and beaver, would be adversely affected by the impoundment. Asherin and Orme (1978) concluded that the large annual drawdown on the reservoir had eliminated all beaver production from the entire pool area. Beaver having to climb mud banks to obtain food from shrubs above the high water line were believed to be at an extreme disadvantage for survival due to increased exposure to predators and increased energy expenditure to obtain food (Asherin and Orme 1978).

Asherin and Orme (1978) concluded that unlike beaver, river otter did not appear to be adversely affected by the annual drawdowns because the observations of family groups indicated successful reproduction was taking place. Impacts to river otter were expected to occur if den sites were flooded as the reservoir was filled each spring. Based on river otters' affinity for using old beaver bank lodges and dens, the annual lack of these sites would probably also adversely affect river otters.

Habitat must provide adequate shelter in addition to sufficient food if it is to be extensively used by otters (Melquist and Hornocker 1983). Even though Cascade Reservoir in west central Idaho had ample food and was easily accessible to otters, it was virtually unused by most otters because there was insufficient escape cover and resting sites along the flat shoreline (Melquist and Hornocker 1983).

Implementation of the water budget plan and future demands on the reservoir for downstream fisheries may have added impacts on beaver and river otter around the reservoir, if water levels are held lower for longer periods of time.

The trapping season for river otters is currently closed in Idaho. Beaver were the fourth most important furbearer in Idaho during the 1983 to 1984 trapping season, with nearly 6,000 animals harvested. These animals contributed over \$76,000 to Idaho's economy that year (Toweill et al. 1985b).

Additional Information Needed

A Habitat Evaluation Procedure needs to be conducted on land adjacent to the Dworshak Project to determine the change in the quantity and quality of river otter and beaver habitat in the study area due to the development and operation of Dworshak Reservoir. Pre- and post-construction habitat acreages should be determined for both mallard and Canada goose in an interagency work group session environment. Pre-project aerial photos and vegetation sampling in the Dworshak Project area will augment existing information. Asherin and Orme (1978) pointed out that denning requirements of river otter along the reservoir were unknown. They recommended a follow up intensive study on both river otter and beaver along Dworshak Reservoir.

Management Goals, Plans, and Programs

IDFG statewide goals for river otter (Toweill et al. 1985b) include 1) maintain river otter populations and distribution, 2) encourage nonconsumptive enjoyment of river otters, and 3) improve the data base on river otter populations.

IDFG statewide goals for beaver (Toweill et al. 1985b) include 1) maintain or increase annual beaver harvest seasons, and 2) encourage nonconsumptive use and enjoyment of beaver and their habitats.

The following issues and strategies apply to beaver management in Idaho (Toweill et al. 1985b).

ISSUE - Beaver activities may create problems for private landowners and highway departments, including flooding, blocking of irrigation canals and culverts, and loss of streamside trees.

STRATEGY - The Department will (1) direct trappers into chronic beaver damage areas; (2) continue to handle beaver damage complaints on private lands on a complaint basis; (3) continue a program of landowner education stressing means of preventing beaver damage and correcting problem situations; (4) encourage landowners to use beaver to control erosion, raise local groundwater levels, and create ponds whenever appropriate; and (5) authorize beaver kill permits to landowners when necessary.

ISSUE - Beaver activities can create valuable fish and wildlife habitat, although in some areas these benefits may be outweighed by blockage of upstream fish passage.

STRATEGY - The Department will consider positive and negative impacts of beaver dams on fish and wildlife habitat on public lands when establishing goals, objectives, and regulations for beaver management.

YELLOW WARBLER

Pre-construction Conditions

Yellow warblers represent birds that reproduce in shrubs and make extensive use of wet areas. Optimal habitat is wet areas with abundant shrubs or small trees such as thickets, marshes, and willow swamps (Bent 1953). Preferred nesting and foraging habitats are wet areas dominated by alder and willow (Morse 1966). The yellow warbler is used as a target species in this study to represent impacts to willow and red alder habitats.

The yellow warbler was said to be abundant in the Clearwater National Forest (USACE 1975). No other pre-construction information on this species population was found.

Steele (1971) examined red alder habitats in the North Fork Clearwater drainage prior to inundation. He found red alder stands along stream side drainages. These red alder stands outlined many warblers in the spring time (B. Steele pers. commun.).

Banks and terraces lying within a few meters of high water line contained flora distinctly different from red alder habitat found along tributaries (Steele 1971). In general, willow and a small species of sagebrush adapted to gravel bars comprised the major vegetation.

Along most of the North Fork drainage, coniferous timber occupied steep slopes immediately to the edge of the river (Steele pers. commun.). High water scoured stream sides and gravel bars in the spring. Willow was generally limited to a thin band of vegetation between the coniferous forest and the river bed. A total of 66 acres of scrub/shrub and red alder habitats was delineated in the pool area from pre-project aerial photos.

Post-construction Conditions

Asherin and Orme (1978) delineated 230 acres of the red alder/maidenhair fern vegetation type on Corps project lands adjacent to Dworshak Reservoir. This accounted for 1% of all vegetation types delineated (Table 4). This vegetation type was considered unique and rare along the reservoir. The majority of red alder stands delineated by Asherin and Orme (1978) occurred at the mouths of tributaries emptying into the reservoir. No willow stands associated with aquatic conditions were delineated.

Impact Assessment

The study area provided 296 acres of scrub shrub/red alder habitats prior to the Dworshak Project. Following inundation, a total of 230 acres of red alder habitat remained. The scrub shrub (willow) habitat which existed along portions of the North Fork drainage prior to inundation has been lost.

Pre-construction Habitat (60 = 230)	296 acres
Habitat Lost to Inundation	66 acres
Post-construction Habitat	230 acres

Additional Information Needed

A Habitat Evaluation Procedure needs to be conducted on land adjacent to the Dworshak Project to determine the change in the quantity and quality of yellow warbler habitat in the study area due to the development and operation of Dworshak Reservoir. Pre-project aerial photos and vegetation sampling in the Dworshak Project area will augment existing information.

Management Goals, Plans, and Programs

The yellow warbler is closely associated with riparian habitat. Therefore, most management goals that pertain to riparian areas in Idaho affect yellow warblers. The IDFG will place special emphasis on the preservation and protection of riparian habitats. This will include: (1) fencing to exclude livestock, (2) support of legislation to compensate private landowners who preserve riparian habitats, and (3) purchasing or acquiring easement to key riparian habitats. The Department will promote any reasonable efforts to rehabilitate damaged riparian habitats. It will further identify riparian zones used by any nongame species classified as Threatened or Endangered, a Sensitive Species, or a Species of Special Concern and make every reasonable effort to preserve and enhance areas, whether through purchase, rehabilitation fencing, or other means (Morache et al. 1985).

PILEATED WOODPECKER

Pre-construction Conditions

Optimal habitat for pileated woodpeckers is mature, dense, productive forest, either coniferous or deciduous (Bock and Lethiene 1975). The critical components of pileated woodpecker habitat are large snags, large trees, diseased trees, dense forest stands, and high snag densities (Bull 1975).

Pileated woodpeckers have been used in this study to represent species which are dependent on old growth for life requisites. Old growth is a key element in a diverse forest environment. Drastic reduction in quantity of old growth not only reduces diversity, but also makes old growth dependent wildlife species vulnerable to significantly reduced populations, extirpation, or even extinction (Jerry 1983).

Steele (1971) mentioned that as a result of fire and logging, only small patches of climax forest dominated by western red cedar remain in the study area. Long time resident Koppang (pers. commun.) mentioned the existence of old growth white pine in the Little Silver Creek area. Driver (pers. commun.) remembered big old growth cedar around Boel Creek cabin and some on upstream. The USACE (1975) pointed out that because of protection from fire, the drainage bottoms of the North Fork Clearwater had developed to an apparent climax stand of cedar and grand fir. Approximately 20,000 acres of Dworshak Project lands were classified as supporting marketable stands of timber, prior to project construction and inundation (Table 2). The USFS cruised the timber in the reservoir area prior to inundation. An estimated 107.3 million board feet of saw timber ($\geq 11'$ dhh) and 77.9 million board feet of pole-size timber (5.0 to 10.9 dbh) existed on about 13,000 forested acres (USACE 1961).

Using pre-project aerial photos and past vegetation information, it was estimated that a total of 617 acres of old growth timber had existed in the Dworshak pool area. Stands included as old growth were characterized by mature, coniferous trees in somewhat open stands.

Pileated woodpeckers do use forest stands other than old growth for foraging (Mellen 1987). Pileated woodpeckers preferred forest habitat classes older than 40 years of age and deciduous riparian habitats for foraging and other diurnal activities in western Oregon (Mellen 1987). Nesting and roosting occurred in stands greater than 70 years of age (Mellen 1987). Pileated woodpeckers probably occurred in both open coniferous (7,300 acres) and dense coniferous (6,100 acres) (Table 3) forest stands prior to inundation, with the occurrence of old growth (617 acres) providing the key habitat component.

Post-construction Conditions

Asherin and Orme (1978) reported that 892 (21,707 acres) of the Project lands along the reservoir were in coniferous overstory (Table 4). This figure did not include the hard core area. No old growth stands were specifically delineated. Pileated woodpeckers were noted to occur on Dworshak Project lands during the study.

Land use activities on the 30,935 acres of Dworshak Project lands have altered pileated woodpecker habitat. At least 216 acres of habitat have been lost due to Project operations facilities and road construction. An additional 630 acres of habitat have been altered due to project operations, log handling, and developed recreation.

A total of 2,984 acres of browse fields have been created on the hard core mitigation area, and 811 acres of Project lands have been manipulated for browse and grass production.

Impact Assessment

The construction of Dworshak Reservoir inundated approximately 13,400 acres of pileated woodpecker habitat. An estimated 617 acres of old growth forest was included in this loss. In addition, 216 acres of pileated woodpecker habitat on project lands was lost due to project operations and road construction.

The alteration of approximately 630 acres of habitat on Project lands has probably negatively impacted the pileated woodpecker.

Pileated woodpeckers were impacted when 2,984 acres of coniferous forest habitat were changed to browsefields were created on the hard core mitigation area. Of the 811 acres manipulated for browse and grass production on the lower reservoir, only 239 acres involved the removal of coniferous timber overstory and subsequent impact on pileated woodpecker habitat. USACE (1985b) points out that species that prefer timbered areas with little understory structure may be adversely affected by big game management activities.

Additional Information Needed

A Habitat Evaluation Procedure needs to be conducted on Dworshak Project lands to determine the change in the quantity and quality of pileated woodpecker habitat in the study area due to the development and operation of Dworshak Reservoir. Pre-project aerial photos and vegetation sampling on Dworshak Project lands will augment existing information. The acreage of old growth habitat existing in the North Fork Clearwater drainage prior to impoundment will be delineated.

Pre-construction habitat (13,400 + 28.435)	41.835 acres
Habitat Lost	
Inundation	13.400 acres
Roads	63 acres
Project Operations	153 acres
Total Habitat Lost	13,616 acres
Post-construction Habitat	28.219 acres
Habitat Changed	
Project Operations	146 acres
Log Handling	184 acres
Recreation Developments	300 acres
Browse Developments	3,223 acres
Total Habitat Changed	3,853 acres

Management Goals, Plans, and Programs

IDFG issues and strategies which apply to the pileated woodpecker include the following (Morache et al. 1985):

ISSUE - The effects of certain forest management practices upon many species of nongame wildlife are not completely understood. This is particularly true relative to species dependent on old growth, mixed timber stands.

STRATEGY - The Department will cooperate with the USFS, USFWS, BLM, and other entities in studying this problem. In the interim, the Department will urge USFS to preserve sufficient old growth stands on each forest to meet the life support requirements of old growth dependent nongame species based on current information.

Clearwater National Forest Standards (USFS 1987) include to:

- 1) Provide habitat for snag dependent indicator species (pileated woodpecker and goshawk).
- 2) Maintain at least 10% of the forest (including Selway-Bitterroot Wilderness) in old growth habitat.
- 3) Provide for old growth dependent wildlife species by selecting at least 5% of each approximate 10,000 acre watershed (timber compartment) or combination of smaller watersheds (subcompartments) within forested nonwilderness areas to manage as old growth habitat.

WILDLIFE PROTECTION, MITIGATION, AND ENHANCEMENT GOALS

Low elevation lands and riverine systems provide optimum habitat for many wildlife species. In the winter, animals are sometimes confined to these areas, which are characterized by more moderate temperatures and less snow cover.

The interagency work group recognizes that Dworshak Reservoir inundated 16.970 acres of low elevation terrestrial and aquatic habitats, critical to many wildlife species. With the loss of this habitat in mind, and its relationship to selected target wildlife species, individual members of the interagency work group have outlined some broad, preliminary mitigation goals for the Dworshak area. These are listed here in no specific order.

1. Mitigate for lost values of the area to wildlife to the extent affected.
2. Pursue in-kind mitigation for the loss of all wetland and/or riparian areas.
3. Protect remaining red alder and old growth stands on Dworshak Project lands.
4. Continue to pursue acquisition of Smith Ridge.
5. Enhance USFS lands in the upper reservoir area for elk.
6. Streamline browsefield development for elk in the upper reservoir, and for white-tailed deer in the lower reservoir.
7. Enhance lower Dworshak Project lands for whitetails and ruffed grouse (small patch developments).
8. Protect private land in the lower reservoir area for whitetails, through acquisition of easements or fee titles from willing sellers.
9. Consider off-site acquisition of easements or fee titles of private land from willing sellers to mitigate for the loss of low elevation lands at Dworshak.
10. Manage Dworshak Project lands to benefit several wildlife species, using a variety of management techniques.
11. Consider enhancing low elevation whitetail winter range along the lower clearwater or other tributaries.
12. Consider enhancing spring or fall range for whitetails which winter in the Dworshak area.

These goals are preliminary in nature, and this list should not be considered complete. Specific wildlife mitigation projects will be developed during Phase II mitigation planning, after wildlife impacts are qualified and quantified.

SUMMARY

Development and operation of the Dworshak Project inundated 54 miles of the free flowing North Fork Clearwater River, 13 miles of major tributaries, and a total of 16,970 acres of wildlife habitat. A total of 30,950 acres (USACE 1985b) of habitat remains on the Corps Project lands adjacent to this reservoir.

Using existing information, Project impacts on ten selected target wildlife species were discussed. In terms of acres of habitat lost due to development and operation of the Dworshak Project, elk lost about 15,316 acres, white-tailed deer lost about 15,287 acres, black bear lost about 17,016 acres, ruffed grouse lost about 14,776 acres, pileated woodpecker lost about 13,616 acres, and yellow warbler lost about 66 acres of scrub shrub/red alder habitat (Table 6). Land use activities have altered habitat quality on additional acreage on Dworshak project lands. Specific acreages of mallard, Canada goose, river otter, and beaver habitat impacted could not be determined from existing information.

This impact assessment reflects only loss of habitat acreage (quantity), not quality of the habitat lost. The interagency work group has developed some broad, preliminary mitigation goals for the Dworshak area.

A HEP (Habitat Evaluation Procedure) needs to be conducted on each target species with the possible exception of elk, to determine the specific change in the quantity and quality of habitat in the study area due to the development and operation of Dworshak Reservoir. The need to conduct a HEP on elk will be determined by the interagency work group. The HEP should be used because 1) data are collected in a standardized way which can be compared between points in time to determine changes in conditions; 2) it is a habitat based approach which is less affected by natural variability than population based approaches; and 3) it was developed by USFWS specifically for assessing wildlife impacts from hydroelectric projects. Because HEP is a useful tool to monitor changes in habitat, it will work well for future mitigation planning for Dworshak.

Table 6. Summary of estimated wildlife habitat impacts associated with the development and operation of the Dworshak Project, based on existing information. These figures only reflect habitat acreage, and do not reflect habitat quality.

Target Species	Pre-project Habitat Acres ¹	Post-project Habitat Acres ²	Impacts Habitat Acres
Elk	46,035	30.719	-15,316
White-tailed deer	34,300	19.013	-15,287
Black bear	47,735	30.719	-17,016
Ruffed grouse	45,525	30.749	-14,776
Mallard ³		-	-
Canada goose ³		-	-
River otter ³			
Beaver ³			
Pileated woodpecker	41,835	28.219	-13,616
Yellow warbler	296	230	66

¹ Entire study area is 47,905 acres [inundated acreage (16.970) **plus** project lands (30.935)].

² After inundation and Project land development.

³ Acreages of pre-project and post-project habitat could not be determined from existing information.

HYDROPOWER RESPONSIBILITY

Adoption of the Bruce's Eddy (Dworshak) Project was recommended in Senate Document 51, 84th Congress, 1st Session, dated June 14, 1955. Detailed planning for the Dworshak Project was approved July 3, 1958, under Public Law 85-500, 85th Congress, 2nd Session. Authority for construction was contained in Public Law 87-874, approved October 23, 1962, Section 201 of the Flood Control Act of 1962. in accordance with House Document 403. 87th Congress, 2nd Session. Construction funds were authorized by Public Law 87-880. approved October 24. 1962 (USACE 1975).

Dworshak Dam and Reservoir is a multi-purpose water resource project, and is an integral part of the comprehensive water resource development plan for the Columbia River and its tributaries. It is designed for flood control and hydroelectric power production with consideration for recreation (USACE 1975).

The powerhouse has two 90,000 kw and one 220,000 kw generating units in the initial installation, with space provided for three additional 220,000 kw units. Daily operation of Dworshak Reservoir reflects hydropower needs (USACE 1985b). Water released from the reservoir is passed through turbines for generation of electrical power. Power operations are scheduled through the North Pacific Division Reservoir **Control** Center, and the schedule can call for peaking operation, block loading, or base loading (USACE 1985b). An average of 4,100,000 acre-feet of water passes through the Dworshak Project annually (USACE 1985). Most of this water passes through turbines and produces power. The average annual energy produced because of the Dworshak Project is 2.470.3 million kilowatt hours (USACE 1961). The initial annual benefit from power production at Dworshak was estimated to be \$10,232,000 (USACE 1961).

The estimated cost of the Dworshak Project in 1980 was \$322,600,000. Based on Bonneville Power's financial summary (1986). the cost is now \$359,834,000. Commercial power revenues repay the U.S. Treasury 84.12% of the total cost of the Dworshak Project. Costs allocated to flood control, navigation, and recreation are non-reimbursable, and hence will not be returned to the U.S. Treasury.

Under the Corps Separable Cnsts-Remaining Benefits Method of assigning a portion of joint costs for specific project features to various project purposes, 88% of the costs of Dworshak Project joint costs are assigned to power (PNUCC's pers. commun. 1987).

Section 4(h)(10)(A) of the 1980 Northwest Power Act states that "...the Administrator shall use the Bonneville Power Administration fund and the authorities available to the Administrator under this Act and other laws administered by the Administrator to protect, mitigate, and enhance fish and wildlife to the extent affected by the development and operation of any hydroelectric project of the Columbia River and its tributaries." This section goes on to explain that "Expenditures of

the Administrator pursuant to this paragraph shall be in addition to, not in lieu of, other expenditures authorized or required from other entities under other agreements or provisions of law."

Based on previous studies, negotiations, and agreements, the U.S. Army Corps of Engineers assumed responsibility for elk mitigation at Dworshak Reservoir, with a goal of producing enough browse (1.830.000 pounds) on the hard core mitigation area and other project lands to feed 915 elk for a 100 day winter period. This goal is now being worked toward cooperatively between the Corps and the IDFG. Based on preliminary browse production estimates projected to the year 1994. a total of 563.028 pounds of browse is expected to be produced annually on Dworshak Project lands (USACE pers. commun.).

Many other species of wildlife lost habitat when Dworshak Reservoir inundated nearly 17.000 acres of habitat. Other than a few benefits to some species because of elk mitigation activities, nothing has been done to mitigate their losses.

Ratepayers in the Northwest have benefited from low cost hydropower produced at Dworshak for the last 15 years. Power is the major revenue producing purpose of the Project. Under the 1980 Northwest Power Act, ... the Administrator shall use the Bonneville Power Administration fund and the authorities available to the Administrator under this Act and other laws administered by the Administrator to protect, mitigate, and enhance fish and wildlife to the extent affected by the development and operation of any hydroelectric project of the Columbia River and its tributaries."

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Appendix A:

Minutes of Meetings: Mailing List



December 14, 1987

Enclosed for your formal comments is the draft report for Phase I of the Dworshak Wildlife Projecton, Mitigation, and Enhancement Plan. This draft report was funded by Bonneville Power Administration under the authority of Sectlons 1004(b)(5) of the Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program.

Please have your comments to us by January 11, 1988. If you have any questions, please feel free to call Allyn Meuleman or Jerome Hansen at (208)334-5057.

Sincerely,


Jerry M. Conley
Director


JMC/HJH/sa

EQUAL OPPORTUNITY EMPLOYER

Nez Perce



RESOURCE & FORESTRY



(208) 843-2253

September 16, 1987

Jerome Hansen
Wildlife Biologist
Idaho Fish and Game
P.O. Box 25
600 S. Walnut
Boise, Idaho 83707

Dear Jerome:

This is a brief summary of the interagency field trip to Dworshak Reservoir and the Lower Clearwater River. Please let me know if you have any additions or subtraction to this summary.

Sincerely,

Loren A. Kronemann
Wildlife Biologist

See attached mailing list

Mailing List

Jim Meyer BPA
Allyn Meulemann **IDF&G**
Jerome Hansen IDF&G
Bob Martin IDF&G
Dick Giger USFWS
Marty Montgomery PNWPPC
Dick Moore COE
Dean Johnson IBL
Vicki Saab Marks USFWS

Carl Christianson COE
John McKern COE
Al Sutlick COE
Sam McNeill IDF&G
Ted Meske IDF&G
Dan Davis USFS
Jim Kosciuk COE
Pam Barrow PNUCC

What: Summary of the field trip by the Interagency Work Group to Dworshak Reservoir and the Lower Clearwater River.

When: September 1 and 2.

Where: Dworshak Reservoir - Administered by Army Corps of Engineers and Lower Clearwater River from the project to the confluence of Clearwater and Snake River.

Those in attendance:

Carl Christianson	COE
Vicki Saab Marks	USFWS
Al Sutlick	COE
Lcren A. Kronemann	Nez Perce Tribe
Ted Meske	IDFG
Dean Johnson	IDL
Jack Bell	Nez Perce Tribe
Marty Montgomery	NPPC
Keith Lawrence	Nez Perce Tribe
Jerome Hansen	IFG
Bob Martin	IFG
Dick Moore	COE

The interagency work group met at the Big Eddy Marina on Dworshak Reservoir at 9:00 a.m. Tuesday, September 1, 1987. A launch provided by the Corps of Engineers was used to carry the group on an inspection tour of Corps lands. Dick Moore and Ted Meske provided background information and history of the reservoir and conducted a field tour of management units on the lower pool and hard core areas.

First we stopped at an Elk Creek management unit that had been planted with bare root stock of Red Stem Ceanothus in 1974. The survival rate of the plantings was low and evidence of heavy use was seen.

We hiked to a management unit on Magnus Bay that was roller chopped and burned. A tremendous cover of Red Stem following the preparation was only a remnant at this time, with willow the dominant shrub species there now. Apparently, a resident deer and elk population utilized the area extensively. A hydraulic brush chopper was used experimentally in this unit which shows some promise for habitat regeneration.

At noon, we inspected the Gold Creek burn (burned in 1374 and again in 1985) which was recovering from its most recent wild fire. A short trip up the Little North Fork revealed the layout of the management program on the hard core areas along Huches Point and on the Grandad Creek side of the reservoir. Several log handling sites were also pointed out.

Longbar A and B, back out on the North Fork, were treated with Asulox, for control of bracken fern. A small amount bracken fern was left after the treatment, in areas protected from aerial application.

Following the boat tour we landed at Grandad Bridge and continued by pickup, furnished by Ted Bleske (IFG). We looked at management unit Long Creek C, first. This area was logged and burned in 1977 and 1978. The result was a good stand of red stem. Mortality on the shrub was seen from a hard freeze. Heavy use of the shrub field was also seen. Most shrubs were from 4 to 7 feet tall.

The last management unit toured was Grandad I. This unit was logged and burned in 1984. There was a shrub cover but was heavily used by a resident deer herd. A deer and elk enclosure was constructed on the site to get a better handle on production. From Grandad I the group could look over much of the hard core area and many of the management units.

Throughout the upper end of the reservoir we saw evidence of blow down which was still being logged and cleaned up. The land adjacent to Corp property was being logged heavily with large clearcuts running up to Corp boundary.

Much of the discussion throughout the tour centered around the difficulty of shrub regeneration and questions whether bruce was the limiting factor. A discussion on the local populations of the other target species designated during our first interagency group meeting was brought up by Jerome Hansen.

The group got back to Big Eddy Marina between 5:30 - 6:00 p.m. and agreed to meet at Konkolville Motel in Orofino at 9:00 a.m. on Wednesday for the second half of the field trip covering the Lower Clearwater.

The interagency group started the second leg of the field trip at RM 1 of the North Fork just below the power house. A discussion was held on the differences between the effects of power generation above the dam versus the effects seen below the dam on the lower Clearwater. Effects such as water temperature, water chemistry, vegetation changes and physical changes like, fluctuations and erosion were discussed. Specific information for this area, at this time, seemed to be spotty. Generic and specific information will have to be tied together to give a complete picture. Bald Eagle management was discussed because of the wintering eagle roost/feeding area below the dam.

From this point, the group traveled down river and stopped at several strategic points along the river that showed evidence of stabilization of the riparian habitat because of reduced inundation and scouring by flooding and ice flows, respectively. Evidence showed increasing amounts of vegetation

along the banks and islands. This continuous stabilization of the main Clearwater could change the complexion of the riparian zone which would have strong implications over the long term. It was also pointed out that there were no osprey nests along the lower Clearwater. Possible reasons for this were discussed. Much of the problem in loss assessment along the lower Clearwater was the lack of specific pre-impoundment information for the area. Other than goose nesting platforms, specific wildlife habitat management for the lower Clearwater **seems** to be incidental to the management of the region due to land ownership patterns and lack of funding for research and management.

As we ended our tour of the lower Clearwater near the slack water of Lower Granite Dam we saw evidence of silting on the river bed due to the reduced velocity of the river. This would change the species composition of the fishery that can take advantage of a more lucustrine habitat. The goose pastures, which were mitigation for lower Granite, were visited toward the end of the trip.

At the end of the trip everyone seemed to be better informed about what was there and what wasn't. It was agreed at this time to plan for a 2 day meeting in Lapwai, at the Nez Perce Tribal Offices on October 15 and 16. We should have a good productive meeting at this time. It's important that we have a good head count on who will be attending this meeting so we can make detailed plans. So, if you could, please drop me or Jerome a note or call to let us know of your plans to attend.

Thank you,



Loren Kronemann
Wildlife Biologist
Nez Perce Tribe
(208) 843-2253 Ext. 339



600 South Walnut • Box 25
Boise, Idaho 83707

November 16, 1987

Enclosed are the minutes from the October 15, 1987 Dworshak Reservoir Wildlife Protection, Mitigation, and Enhancement Planning Consultation/Coordination meeting in Lapwal, Idaho. Minutes of the morning and afternoon sessions were prepared by the Idaho Department of Fish and Game and the Nez Perce Tribe biologists, respectively.

Sincerely,

G. Allyn Meuleman
Regional Wildlife **Biologist**

GAM/ sa

Enc.

EQUAL OPPORTUNITY EMPLOYER

Minutes
of
**Dworshak Reservoir Wildlife Protection,
Mitigation and Enhancement Planning
Consultation/Coordination Meeting**

October 15, 1987
Lapwai, Idaho

The following people attended:

Dan Davis	U.S. Forest Service	208-476-4541
Jerome Hansen	Idaho Department of Fish and Game	208-334-5057
Loren Kroneman	Nez Perce Tribe	208-843-2253
Keith Lawrence	Nez Perce Tribe	208-843-2253
Vicki Saab Marks	U.S. Fish and Wildlife Service	208-334-1931
Ted Meske	Idaho Department of Fish and Game	208-743-6502
Allyn Meuleman	Idaho Department of Fish and Game	208-334-5057
Dick Moore	U.S. Army Corps of Engineers	208-476-7570

The major objective of the meeting was to review existing information pertaining to the impacts of Dworshak Dam and Reservoir on target species, and decide if additional information was needed to accurately assess impacts. After information for each target species was reviewed and exchanged by the interagency work group, methods for obtaining any necessary additional information were discussed.

The morning session dealt primarily with Dworshak Reservoir impacts to target species above the dam (excluding bald eagles and osprey) while the afternoon session centered on Dworshak impacts on bald eagles and osprey both above and below the dam and also impacts on other downstream target species. A review of the results of the meeting follows.

Above dam impacts - IDFG Project No. 87-111.

1. Habitat data. Some pre-project habitat and vegetation data is available from Heezen's (1961) work in the pool area. thirty species of woody plants were encountered in the study. A total of 6,720 woody plants on 154 transects were measured. Information gathered included species composition, density, and big game utilization. The USFWS Coordination Act Report (1962) recorded principal cover types inundated by Dworshak Reservoir. Asherin and Orme (1978) sampled *vegetation* on 30 sites around Dworshak Reservoir. Vegetation attributes measured in the field included (1) species presence, (2) plant and ground coverage, (3) density, (4) frequency of occurrence, and (5) **shrub and tree crown heights.**
2. Elk. The work group agreed that because Dworshak impacts on elk have been intensively studied in the past, and because agreements have been reached on acceptable browse production goals to support 915 elk for 100 days in the winter, there would be no attempt to re-evaluate the impacts to elk. Rather, the amount of browse

currently produced on mitigation lands will be compared to mitigation goals. Based on preliminary information available at the meeting it appears current browse production is far short of mitigation goals. Elk mitigation goals, alternatives, **and** solutions will be addressed during the mitigation planning phase of this contract. The work group agreed that impacts of past elk mitigation activities to other target species should be recorded.

3. White-tailed deer. Available information on the impacts of Dworshak Reservoir on white-tailed deer was presented and discussed. Pre-Dworshak data includes an aerial count of deer observed in the pool area during the 1954-1957 Clearwater Game and Range Study (IDFG 1957). Ninety-eight percent of the observed wintering population was counted in the area that would be inundated. The 1957 report concluded that numbers counted represented only a small proportion of the deer populations in the area. It was pointed out in the meeting that white-tailed deer are hard to accurately count in dense cover conditions. In 1975 it was estimated that white-tailed deer losses were approximately 40% of the pre-project population. The work group agreed that Dworshak Reservoir had inundated key white-tailed deer winter range and that no mitigation had been accomplished yet for white-tailed deer losses.
4. Black bear. The USFWS (1962) report stated that it was unlikely that black bears would suffer any great reduction in numbers due to the project. The Asherln and Orme (1978) study indicated that bears were still common around the reservoir. With the inundation of over 15,000 acres of habitat, the work group agreed that Dworshak has impacted the black bear. It was pointed out during the meeting that some of the lower, south facing slopes had probably provided important spring green-up foraging areas for bears. The work group agreed that in a lot of instances, elk and/or deer mitigation activities would probably benefit black bear.
5. Ruffed grouse. The USFWS (1962) report pointed out that populations of ruffed grouse in the vicinity of the reservoir would be greatly reduced. The Sport Fishing Institute (1981) concluded that significant losses of ruffed grouse were expected, but the losses in terms of habitat or populations were never identified. Asherln and Orme (1978) surveyed ruffed grouse in

coniferous vegetation types around Dworshak Reservoir, finding densities generally from 0.27 to 0.5 birds per hectare. The work group discussed possible benefits of past elk mitigation activities to ruffed grouse. It was felt that where abundant fruit-producing shrubfields (i. e. serviceberry, hawthorn, etc.) were created, then benefits may have occurred. Large shrubfields producing a minimum of preferred grouse foods were expected to only receive use around the edges.

6. River otter and beaver (aquatic furbearers). The USFWS (1962) concluded that fur animals, including river otter and beaver, would be adversely affected by the Impoundment. Asherin and Orme (1978) observed both beaver and river otter using the exposed mud banks. No beaver production on the reservoir was noted during the study, while sighting of young river otter indicated that some reproduction is occurring. Asherin and Orme (1978) recommended separate studies on the impact of the reservoir on both river otter and mink.

7. Mallard and Canada goose (waterfowl). The USFWS (1962) report concluded that the North Fork of the Clearwater River is not located on a major waterfowl flyway, and that past project conditions in the area contributed little to this group. It also stated that limited waterfowl use occurs along some stream sections and both mallards and Canada geese have been observed in the area. The USFWS also concluded that if the project were built, extensive reservoir fluctuations would prevent establishment of waterfowl food plants and that waterfowl use of the reservoir would be chiefly for resting. Asherin and Orme (1978) agreed that waterfowl generally use the reservoir as a resting stop during spring and fall migrations, foraging on exposed mud banks. They also concluded that waterfowl nesting along the reservoir is minor. Inundation of nests on mud banks was expected to occur each spring as the pool was filled. The work group generally agreed with the conclusions in these reports. It was noted that a few Canada geese were known to nest on the North Fork of the Clearwater above the confluence with the Little North Fork, in the pre-Dworshak times. It was also noted that at least three mallard broods were observed on Dworshak Reservoir last spring, primarily associated with tributaries.

8. Pileated woodpecker (old growth). No information was presented on pileated woodpeckers, as none was found. It was felt that the pileated woodpecker had probably occurred in most forested areas of the pool area before inundation. It was mentioned that Panhandle National Forest personnel had worked extensively on old growth management practices and habitat requirements of old growth dependent wildlife species.
9. Yellow warbler. No information on this species was presented as none was found. It is used as a target species to represent the scrub-shrub wetland component which existed in riparian zones along the North Fork Clearwater River, prior to impoundment. The work group discussed pre-Dworshak riparian conditions. It was noted that a scrub-shrub wetland component did exist in a non-continuous manner in riparian areas all along the North Fork Clearwater River.
10. Data needed to supplement existing information. The work group agreed that although a large amount of wildlife information exists pertaining to Dworshak Reservoir, it does not adequately cover impacts to target species other than the elk. It was agreed that existing information would have to be supplemented with field data collected during a modified Habitat Evaluation Procedure (HEP) for each target species other than elk. The existing habitat information is more quantitative than qualitative. It was felt that collection of some qualitative field data was imperative in order to accurately assess the wildlife impacts from Dworshak Reservoir. The work group decided that we would gather the additional information needed under Phase II of the Dworshak Wildlife Protection, Mitigation and Enhancement Plan. Phase I of the Dworshak Plan will consist of existing information available as outlined in the objectives and will be completed February, 1988.



FOREST RESOURCE DEPARTMENT

Box 365
LAPWAI, IDAHO
83540

(208) 843-2253

Summary of Meeting

Interagency Work Group Meeting

October 15, 1987

Lapwai Idaho

Afternoon Session

The afternoon session of the meeting concentrated on Bald Eagle and Osprey mitigation over the entire study area, Dworshak Reservoir and along the Lower Clearwater from Dworshak Dam to Lewiston.

A discussion of Osprey started the afternoon session. It was acknowledged that there was a significant amount of work done on Osprey in general, but little was known about this specific population. The COE informally keeps track of nest locations but has no on-going program concerning Osprey. It was agreed to that the formation of the Reservoir was generally beneficial to Osprey nesting and that Osprey populations were expanding overall, but the question of why there were no nests down stream from the dam site was still unanswerable. Several theories were presented. The exposure of the nestlings to summer heat along the Clearwater (Don

Johnson, personal Com.) was mentioned a possible reason however , it was pointed out that Osprey are known to nest in areas of greater heat intensity than what is seen in the Clearwater valley The number of suitable nesting sites and the amount of river fluctuations during the nesting season may be the critical elements in nest site selection along the lower Clearwater. This question has never been addressed for this population. The resource status at this time is not known. The relative stability of the Osprey populations in the region and funding cutbacks of land managers in the region has lead to a reduction in population monitoring by all government agencies at this time.

Discussion on the Bald Eagle population in this area was concerned with the wintering population. Here again the lack of specific information on the wintering populations was noted. A discussion on the ecology of wintering Bald Eagles in this location was covered with possible ramifications due to hydro-power generation on the wintering population. Is the population of wintering Bald Eagles an indication of an expanding population or is it a concentration of Eagles due to an added winter feeding site provided by flushing fish through the turbines at Dworshcak? What are the management policies concerning this population of wintering Bald Eagles. At this time COE keeps access to the, east side of the river from the dam to the confluence closed while Eagles are using the area.

The session that was scheduled for the morning of October 16, 1987 was combined with the afternoon session of October 15, 1987. The areas of concern covered in the late after session was the mitigation for habitat loss along the lower clearwater from Dworshak to Lewiston. Targets species of concern were White Tail and Mule Deer, River Otter, Beaver, Quail, Chukcr, Great Blue Heron, Canada Goose, Mallard and Yellow Warbler. These target species were chosen because the work group felt they are highly visible and they represent the habitats that would be most impacted by down stream effect of Dworshak Dam. Documentation on these target species is scarce for the lower Clearwater river.

The riparian zone and adjacent lands along the lower Clearwater provided habitat for a resident population of white tails and muledeer (Asherin and Orme, 1978), but would be recognized as critical only under the most severe winter conditions. To date, there is little or no information for the deer populations along the lower Clearwater other than the inventory work by Asherin and Orme (1978). Their inventory showed very little use of the riparian zone along the river.

Geese, mallards, and Great Blue Herons were recognized as persistent residents along the lower Clearwater tied closely to the islands and narrow shrub-brush riparian zone along the river. Their populations are not considered significant but

persistent. No pre-Dworshak documentation has been found concerning these target species.

Aquatic- furbearers like the Beaver and river Otter are both tied directly to the quality of the riparian habitat. Beaver, though present along the lower Clearwater in moderate numbers have the dubious honor of being in conflict with human activities so they are trapped under a State of Idaho general permit and removed if there are any conflicts. Trapping records and personal communication with area trappers provide most of the historical information available.

The River Otter is present along the lower clearwater but little is known of this population. They are protected but with their population being highly mobile and elusive the extent of the information on River Otter is limited to the inventory work of Asherine and Orme (1978).

Upland game birds were also located within the study area but once again information is lacking. Direct effects on the upland game populations by power generation on the lower clearwater was considered marginal. Effects may be limited to vegetation changes due to stabilizing the maximum flows of the lower Clearwater.

It was pointed out that the effects along the lower Clearwater are not due to habitat lost to inundation but due to

changes in water chemistry water temperature and changes in the cover type of the riparian zone and the islands Subtle changes such as these may be more far reaching when considering the entire Columbia River, Snake River, Clearwater River ecosystem.

Methods of quantifying the loss were discuss&d. With little or no estimates of historical populations along the lower Clearwater, the difficulty in measuring loss, centers around measuring change in habitat vs. measuring a total loss of habitat due to inundation. Ii there is a reduction in the quality of habitat for one species but a gain for another how do we weigh the importance of one species against the other? Do we focus on a change in yellow marbler habitat vs. Canada Goose habitat or do we focus on the changes overall within a reparation zone along approximately 40 miles of the lower Clearwater River. HEP was brought up as a method to consider. The question also came up,do we need to follow the same approach above and below the dam and if so, do we follow the same approach for all species orjust the target species that are found in both areas? COE felt that if HEP is used it. should be done at a minimum on all target species common to above and below the reservoir.

The meeting closed at 6:15 p.m. October 15. No further workgroup meetings were scheduled at this time.



600 South Walnut- Box 25
Boise Idaho 83707

July 24, 1987

Enclosed are the minutes from the July 9, 1987 Dworshak coordination meeting in Lewiston, Idaho.

As per our discussion during the meeting, a work group field trip to the Dworshak area is planned for the future. However, the field trip is now scheduled for September 1 and 2, instead of the last week of July. Please let us know by August 17 if you plan to attend.

Thank you for your time.

Sincerely,

G. Allyn Meuleman
Regional Wildlife Biologist

GAM/sa

Enc.

Minutes
of
**Dworshak Wildlife Impact Assessment
Consultation/Coordination Meeting**

**July 9, 1987
Lewiston Idaho**

The following people attended:

Dick Giger	USFWS	503-231-6 179
Jerome Hansen	IDPG	208-334-5057
Dean Johnson	IDL	208-245-4551
Jim Kosciuk	COE	208-476-7631
Loren A. Kroneman	Nez Perce Tribe	208-843-2253
Keith Lawrence	Nez Perce Tribe	208-843-2253
Vicki Saab Marks	USFWS	208-334-1 931
John McKern	COE	509-522-6499
Sam McNeill	IDFG	208-743-6502
Ted Meske	IDFG	208-743-6502
Allyn Meuleman	IDFG	208-334-5057
Jim Meyer	BPA	503-234-5239
Dick Moore	COE	208-476-7570

The interagency work group discussed a number of topics related to wildlife mitigation planning at Dworshak Reservoir. Work statements for both the Nez Perce tribe (impacts below the dam) and Idaho Fish and Game (impacts from dam and above) were reviewed. Consultation/ coordination requirements of the work group were discussed. Target species were selected for both the Nez Perce and Idaho Fish and Game projects.

Specific activities and discussions at the meeting included:

- 1. The goal of the work group is to reach a consensus on all issues. However, if a consensus cannot be reached, the work group agreed that a majority vote would be used. Each agency will have an opportunity to formally comment on the draft impact assessment.**
- 2. Target species selected for the Idaho Fish and Game project (Impacts from dam and above) included elk, white-tailed deer, ruffed grouse, pileated woodpecker beaver, otter, yellow warbler, Mallard, Canada goose, and black bear.**
- 3. Target species selected for the Nez Perce project (impacts below the dam) included bald eagle, osprey, white-tailed deer, mallard, Canada goose, chukar, pheasant, California quail, beaver, otter, great blue heron, yellow warbler, and sucker.**
- 4. The work group agreed that a two day field trip to the Dworshak area will be beneficial. The list of previously selected target**

species will be re-examined while in the field. Changes to the list can be made by the work group during this field trip.

- 5. There will be close coordination between the Nez Perce Tribe and the Idaho Fish and Game projects. As much as possible, project activities and meeting will be scheduled concurrently. Future interagency coordination meeting were scheduled for October 15, 1987 and January 25, 1988.**

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Pacific Northwest utilities Conference Committee
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Portland, OR 97204

Carl Christianson
U.S. Army Corps of Engineers
City-County Airport, Bldg. 602
Walla Walla, WA 99362-9265

Dan Davis
Clearwater National Forest
Hwy. 12
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Walla Walla WA 99362-9265

Appendix B:
Interagency Formal Comments



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
NORTH PACIFIC DIVISION, CORPS OF ENGINEERS
P. O. BOX 2870
PORTLAND, OREGON 97208 2870

January 25, 1988

Environmental Resources Branch

Mr. Jerry M. Conley, Director
Idaho Department of Fish and Game
600 S. Walnut
Box 25
Boise, Idaho 83707

Dear Mr. Conley:

Enclosed for your consideration are the formal comments of the U.S. Army Corps of Engineers on the draft report for Phase I of the Dworshak Wildlife Protection, Mitigation, and Enhancement Plan. The enclosure represents the consolidated comments of the respective staffs of the Walla Walla District office, the Dworshak project, and the North Pacific Division office.

If you have any questions, please feel free to call Mr. Owen Mason of this office at (503) 221-3829.

Sincerely,

James R. Fry
Colonel, Corps of Engineers
Deputy Division Engineer

Enclosure

86

22 January 1988

U.S. ARMY CORPS OF ENGINEERS COMMENTS
ON THE DRAFT REPORT FOR PHASE I OF THE
DWORSHAK WILDLIFE PROTECTION, MITIGATION,
AND ENHANCEMENT PLAN

1. Because Dworshak is an existing project without benefit of previous HEP data, application of HEP as the evaluation tool has inherent weaknesses. The Corps of Engineers has consistently expressed reservations regarding the use and validity of HEP when applied to older, existing projects because of the inability to accurately evaluate the quality of lost habitats via photographic interpretation. Accordingly, use of HEP as the evaluation tool at Dworshak will require the establishment of, and agreement upon, clearly articulated assumptions by the study team to deal with the quality aspects of lost habitats. Study team participants must be willing to negotiate and compromise when assumptions prove invalid and/or result in unreasonable and unsupported loss statements. We also believe that ultimate recommendations regarding wildlife protection, mitigation, and enhancement must be accompanied by a valid assessment of the relative health and vigor of existing animal populations within the Dworshak area. The present draft does not substantiate animal losses or determine the existence of any unhealthy populations.

2. The report recommends applying the Habitat Evaluation Procedures (HEP) to all of the target species chosen, except for elk. We understand that this is proposed because there is already an agreement on mitigation for elk, and that they have been thoroughly studied. However, if the HEP procedure is considered to be the most accurate indicator of habitat unit losses and gains, we should apply it to elk habitat also. As the report says, HEP should be used because data are collected in a standardized way which can be compared between points in time, it is less affected by natural variability than population based approaches, and it was developed specifically for assessing wildlife impacts from hydroelectric projects.

3. During the field trip on September 1-2, 1987, discussions turned several times to the activities occurring on lands adjacent to Dworshak Project and whether browse or cover was now becoming the limiting factor for elk in the winter range surrounding Dworshak. The only mention of any of these discussions or even the question of limiting factors is in one sentence in paragraph 5 of the field trip summary in Appendix A. This office believes that this question is legitimate, and that it can best be addressed through a HEP study of a much larger area than just the Dworshak Project lands. In the past 10 years, timber harvest on these adjacent lands has increased to the point where browse (although not always of the highest quality) is in greater abundance in many parts of the area than is thermal and hiding cover. While browse can be developed in a period of 3-5 years, cover takes 20-50 years and sometimes more. Mistakes made with regards to cover will affect the elk herd for a substantial amount of time.

4. We have some concern about the presentation of certain facts. Throughout the draft, reference is made to evaluation, surveys, or observations supporting

1. The 1980 Northwest Power Act directs that all plans be based on and supported by the best available scientific knowledge. The HEP seems to be the best tool we have available to us to examine hydroelectric impacts on wildlife, even at older, existing projects. Agencies currently using the HEP on older projects include the USACE, USFWS, IDFG, Washington Dept. of Game, Oregon Fish and Wildlife, and EnviroSphere. This report substantiates the loss of 16,970 acres of terrestrial and aquatic wildlife habitat, due to the inundation from Dworshak Reservoir. This habitat and associated potential annual wildlife production is lost forever. This report also substantiates land use activities on 30,935 acres of USACE Dworshak Project lands, some of which have resulted in the permanent loss of wildlife habitat and all associated potential annual wildlife production.

2. Noted. We will discuss this with the work group.

3. Noted. We will discuss this with the work group.

4. A total of 985 and 1,088 white-tailed deer were counted in 1984 and 1985, during IDFG and USACE aerial counts. As correctly

a statement. For example, numbers of elk through Fish and Game aerial counts for the years 1984 and 1985 were 985 and 1,088. This should have stated aerial counts have been conducted since 1976 and a table should have been presented showing respective counts for each year as well as cow/bull, and cow/calif ratios. Without an accurate account of facts, a person may be misled or misunderstand the current status. It is recommended that the draft be rewritten to clarify and make a better presentation of facts. The second draft should be reviewed prior to finalization.

5. One purpose of this document is to outline and present the current status of Dworshak Project. Reference is made to 2,900 acres of browse fields established in the mitigation area and 800+ acres below the mitigation area manipulated in the 1970's. The State was given information on all vegetation plantings and browse manipulation. No mention was made of the work performed on Corps lands outside of elk mitigation. In the mid 1970's, the Corps contracted and planted approximately 200,000 trees and shrubs in the canyon below the dam, this and other practices should have been mentioned. Practices not mentioned have had a positive impact in maintaining vegetative conditions suitable to particular wildlife species.

6. Page vi. Is the 7,030 acres of habitat for mallards, Canada geese, and river otter a combined total or is the acreage figure identical for each?

7. Abstract. The second sentence is misleading. To clarify, it should be rewritten to state, "Using existing information, it has been determined that the project has resulted in the inundation of 16,970 acres of land and river channel and development of 30,935 acres of land for various project purposes. This has resulted in the loss of 15,630 acres of elk habitat, 15,500 acres of white-tailed deer habitat, 17,330 acres of black bear habitat, 15,120 acres of ruffed grouse habitat and 17,150 acres of pileated woodpecker habitat." (Underlined section to be added.)

8. Page 1: Reference is made to a study; the abstract identifies the document as a report.

9. Page 3: Recreation site developments should be identified as they indicate developments and some improvement to the habitat.

10. Page 3: An inset showing the location of the project area within the state like the one on Page 6 would be helpful.

11. Page 5: In the paragraph discussing operation of the pool, a new, but important consideration is the effect of drawdown for the Water Budget. Perhaps a sentence of two should be added describing that impact on pool operation and resultant impacts on wildlife.

11. Page 7: Reference to Dworshak Project history being filled with frustrations is not appropriate. We understand that various deadlines were not met, Federal lands were excessed, and personnel from various agencies did not always agree. Reference to frustration is opinionated and should not be used in a document of this type.

stated in the report, IDFG and USACE personnel counted 513 elk in 1984 and 937 elk in 1985.

5. It is our understanding that the planting of 200,000 trees and shrubs was an effort to rehabilitate severely degraded lands that presently provide minimal wildlife value.

6. This was a potential habitat acreage figure computed for each species. The 7,030 acres included a 100 meter band of habitat on either side of the 67 miles of river and major tributaries, and the acreage of the riverbed (1,700 acres). Because this acreage figure did not come from existing information, it was decided to delete it until the Interagency work group can delineate potential waterfowl and aquatic furbearer habitat acreages in a work session environment.

7. Noted.

8. A study has been conducted to produce this report.

9. A figure showing recreation developments has been included in the report.

10. Incorporated into text.

11. a. Incorporated into text.

b. Noted.

12. Pages 7 thru 11: In quoting Mehrhoff and Sather-Blair, quotations are placed at the beginnings of the paragraphs, but not at the ends.

13. Page 8: It is our understanding that PFI stands for Potlatch Forest Industries, Inc.

14. Page 9: The word "reluctantly" was used. The clear facts should be presented and not hearsay.

15. Page 10: The last paragraph on this page is vague. Realizing that it is a quotation from Mehrhoff and Sather-Blair, perhaps some explanation, in parentheses, is needed. As we understand, ISLB is required to maximize dollar returns from lands they administer, while IDFG would have preferred a shortened timber rotational cycle to maximize browse production.

16. Page 12: The first sentence is inaccurate. The lands were Public lands administered by the Bureau of Land Management. When another Federal agency uses Public Lands, they are "withdrawn" from Public Land status and BLM administration. The sentence should read, "In 1978, 4,028 acres of Public Land was withdrawn from Bureau of Land Management administration to Corps of Engineers administration for wildlife mitigation purposes." It would be helpful in the third sentence to identify the size of the Heezen Block. We understand it was 53,000 acres.

17. Page 15: Delete last sentence.

18. Page 17: The use of 54 miles in the first sentence is misleading. The dam is located at RM 1.9, the reservoir is 53.6 miles long, and the North Fork is 135 miles long.

19. Page 18: It should be helpful to define the meanings of the land uses in Table 2. For example, what do "cut over timber," "marketable timber," and "reproduction timber" mean?

20. Page 23: Line 22 and 23 - Low pool elevation of 1,445 feet msl is not reached every year.

21. Page 23: Line 23 - The 175 miles of shoreline is at full pool, not at draw down.

22. Page 24: Reference to 30,935 implies all acres were affected when in reality only some were.

23. Page 25: Reference to 247 acres is incorrect. Through extensive planting and reclamation effort most of the habitat has been replaced or modified to benefit other species.

24. Page 25: Reference to log handling facilities implies year round use. This should be rewritten to state the facility is used only seasonally. The paragraph referencing 27 miles of roads should also state a seasonal use in some areas.

17. In quoting long passages, quotations are placed at the first of each paragraph, and only placed at the end of the last paragraph of the quotation (Sherman and Johnson, 1983, Modern Technical Writing, p.44).

13. Based upon our information and conversations with Idaho Department of Lands personnel, PFI stood for Potlatch Forest, Incorporated.

14. As this was a direct quote out of the mitigation status report, it was not used in this report as hearsay.

15. Incorporated into text.

16. Based on Heezen (1963), the size of the original proposed "Heezen Block" was 50,800 acres. The rest of paragraph has been incorporated into text.

17. Incorporated into text.

18. Incorporated into text.

19. Incorporated into text.

20. Incorporated into text.

21. Incorporated into text.

22. Incorporated into text.

23. The draft Dworshak Master Plan (USACE 1985b) states that the 247 acres have too much human activity for high wildlife value. Habitat acreage where the dam, powerhouse, launch site, and related buildings are located is gone.

24. Incorporated into text.

25. Page 28: In the second paragraph, the phrase, "Dworahak area of influence," would be more clear stated as the area influenced by Dworahak project.
26. Page 29: Reference is made to 530 acres lost. This is not true; some species were impacted while others benefited.
27. Page 30: Line 21 - Should have read IDPG and USACE.
28. Page 30: Reference is made to major elk wintering areas. As determined by aerial big game counts conducted by IDPG and Corps, there are major wintering areas downstream. These sites may not have large numbers of animals, but nonetheless are important.
29. Page 32:
- a. Reference is made to units 10 and 10A. Credit should be given to units 8, 8A, and 9 which cover the other sites of the reservoir. The net value should double to near \$6 million dollars.
 - b. Under additional information needed, there should be some discussion of the impact of logging around the project lands. At the rate logging is occurring, cover sustained on project lands, not browse, may become the limiting factor for elk populations.
 - c. The \$100 dollar figure used near the top of the page appears low for the value of an elk-hunting day. Is it a combined big game figure?
30. Page 34:
- a. Reference is made to increase elk to 15,000 animals. Corps affected winter range is only a very small percentage of total unit acres.
 - b. Subparagraph 2 may be correct for Management Area 3 as a whole. However, mitigation measures to date have, by plant succession manipulation for that purpose, increased the amount of available forage on Dworahak project lands.
31. Page 39:
- a. Delete "No population...group counts."
 - b. Line 12 - Should have read "Idaho Fish and Game and Corps of Engineers personnel..."
32. Page 41: Line 5 and 15 - No reference (USACE 1985).
33. Page 43: Suggest that the third paragraph beginning, "In Summary..." be moved to the top of the page. Suggest the last paragraph be reworded to read, "There is an economic impact to the region from the loss of white-tailed deer. According to data compiled by Donnelly and Nelson (1986),..."

25. Incorporated into text.
26. At the time of this draft report, this was the best estimate of habitat occupied by recreational development, dam, powerhouse, related facilities, log handling facilities, and roads. Subsequent conversations with USACE personnel have indicated that exact numbers are hard to nail down.
27. Incorporated into text.
28. Noted.
- 29.
- a. Incorporated into text.
 - b. Incorporated into text.
 - c. In 1982, the net economic value of an Idaho Elk hunting trip to the hunter and to the nation was estimated to be \$99.82. This means the typical hunter would be willing to pay an additional \$100.00 per trip to hunt elk in Idaho. This value is on top of all other trip expenditures.
- 30.
- a. Noted.
 - b. Incorporated into text.
- 31.
- a. Incorporated into text.
 - b. Incorporated into text.
32. Incorporated into text.
33. Incorporated into text.

34. Page 45: The first issue and strategy do not apply to Corps lands along the reservoir.

35. Page 46, paragraph 3: The recreational developments along the shoreline do not necessarily reduce the carrying capacity of the winter range for whitetail deer. These areas are usually planted with small trees and shrubs which provide some browse, and are closed during the winter season which removes disturbance, and are often the first areas to green-up in early spring.

36. Page 46, paragraph 4: This report concluded that more information was needed through a HEP study. It is a little early to conclude that mitigation is required.

37. Page 52: Much of this page is a repeat of page 51. Should try to consolidate.

38. Page 60, paragraph 1: The study cited for determination of waterfowl habitat needs was done in an area of the state which is considerably different from the habitat at Dworshak. This office questions the basis for a 100 meter distance from water in the coniferous forest habitat. A more reasonable set of figures might be 50 meters in the lower reservoir, where open areas were often found, and 10 meters in the upper half of the reservoir, where the forest often existed right down to the streambank. This would result in a potential habitat acreage of 1400 acres, (27 miles of lower river with a 50 meter strip, and 27 miles of upper river and 13 miles of major tributaries with a 10 meter strip). This office believes that an error was made in computing the acreage of waterfowl habitat in the current report, since 67 miles of river X 5280 1/mile X 330 feet (100 meters) X 2 sides of the river; divided by 43,560 sq. ft./acre = 5,360 acres. If 2,200 acres of riverbed are added, the total is 7,560 acres. The text refers to terrestrial habitat, so it is assumed that riverbed would not be included, resulting in a difference of 1,670 acres. The author should be requested to either provide documentation of the applicability of the cited reference to the habitat at Dworshak or to consider modifying the habitat figures.

39. Page 61: Reference to net values of waterfowl hunting in Idaho is not relevant to this report.

40. Page 62: Second paragraph - This paragraph presents one persons's opinion without supporting facts. It should be deleted.

41. Page 63: This section does not relate to actual losses at Dworshak.

42. Page 65, paragraph 3: The figures of 100 meters from water for river otter and 200 meters for beaver are again difficult to accept given the topography and vegetation at Dworshak. The author should be asked to either provide documentation of the applicability of the cited reference to the habitat at Dworshak or to modify the habitat figures. Arithmetic should again be checked, since the acreage listed for river otter is in error (reference e. above) and a 200 meter strip should yield exactly twice the acreage of a 100 meter strip, yet in the text it does not (7,030 acres X 2 = 14,060 acres, not 12,360). If not all of the Clearwater and its tributaries were suitable for

34. This issue and strategy seems to apply to the Dworshak Project as it points out the importance and declining acreage of white-tailed deer wintering areas.

35. Parking lots, roads, buildings, etc. permanently remove the potential of some acres of habitat to support the annual production of wildlife. Also, while human disturbance is generally not a factor during the winter, the designation of these areas for recreation has constrained their development potential for on-site mitigation for wildlife. Most of the less steep and most productive areas around the reservoir have been designated for recreation.

36. See No. 1.

37. Incorporated into text.

38. Noted, see No. 6.

39. Noted.

40. Incorporated into text.

41. Our contract with BPA requires that management goals for target species be included in this report.

42. Noted. See No. 6.

beaver, this should be clarified. The text only states that portions had too steep a gradient for dam establishment.

43. Page 66: Reference should be made that trapping was actively pursued and reflected proportionally to counts.

44. Page 71: Reference to sagebrush implies a major plant species was present prior to inundation. This appears to be inaccurate.

45. Page 77, paragraph 4: The development of browse fields was coordinated with the U.S. Fish and Wildlife Service and the Idaho Department of Fish and Game, and elk was the species which all desired to manage for. Surely it was realized and accepted that the development would have a detrimental effect on some species. If we begin to assign losses based on management for other species, we will never reach the end, since management for one specie will always be to the detriment of another.

46. Acreages used for habitats, roads, and structures are estimates and may not be accurate. Clarification of acreages should be made and agreed to prior to the final report.

47. It was apparent after reviewing the document, a literature review in part was made. Where appropriate, references should be made rather than portions of a text.

43. Noted.

44. Noted.

45. The purpose of this report was to examine Dworshak Project impacts on all target species selected by the work group.

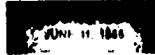
46. Because of ongoing land use changes on Dworshak project lands, acreages of roads, structures, etc. tend to change.

47. Noted.

JAN 25 1988

Nez Perce

TRIBAL EXECUTIVE COMMITTEE



(208) 843-2253

January 22, 1988

Jerry Conley
Idaho Department of Fish and Game
600 South Walnut
Boise, Idaho 83707

Dear Mr. Conley:

Attached is our comments on the draft of Phase I Dworshak Wildlife Protection, Mitigation, and Enhancement Plan (Project #87-111). We hope these comments are a useful assessment and initiate productive discussion. Our hope is to develop the best possible mitigation for the benefit of all wildlife impacted by Dworshak Dam.

We appreciate the cooperation we have had with IDFG's biologist's and look forward to continued cooperation in this matter. If you have any questions concerning our comments please contact Keith Lawrence at (208) 843-2253, Extension 334.

Sincerely,

for 

Larry Marek, Chairman
Fish & Wildlife Sub-Committee

NEE PERCE TRIBE COMMENTS REARDING DRAFT REPORT FOR
DWORSHAK BPA PROJECT #87-111

The comments that follow are broken down into the two subheadings of 1) editorial, which can be characterized as dealing with punctuation or organization and 2) content, which involves conclusions drawn from the material assembled for this report.

EDITORIAL

1. It is our understanding that it was originally intended for the final report from project #87-111 and 87-406 to be combined into one Loss Statement for the Dworshak project. We feel that this is a good idea and ultimately the report should talk about impacts rather than contain a lot of verbage delineating which agency was principal investigator for what area or which species. Between the draft and final documents we need to get the principal authors together and direct them to combine the two reports into a final document that has one study area description and deals with Wildlife losses.

2. Pages seven through eleven contains several open quotations. The reader can not tell if this is four pages of verbatim quotes or if other material is added. If the four pages are verbatim quotes then perhaps it could be set off with different size or style of print or summarized in a table.

Editorial

1. Our BPA contract does not call for, nor fund, a combination of the two reports.
2. In quoting long passages, quotations are placed at the first of each paragraph, and only placed at the end of the last paragraph of the quotation (Sherman and Johnson, 1983, Modern Technical Writing, p.44).

3. An example of a misconception caused by the problem cited in #2 above is found on page 10 paragraph 3. The quote states that the Idaho Department of Fish and Game and the U.S. Fish and Wildlife Service reopened negotiations. However, it is unclear as to who was involved in these negotiations, because the quote is not closed or attributed.

4. A more complete discussion of the whitetail habitat needs could be constructed from recent publications like the White-tailed Deer Habitat Management Guidelines by Jageman or Owens work in Northern Idaho. These citations may be more relevant than the reference in paragraph 2 on page 35 to the 1987 Clearwater Forest Management Plan EIS. Our concern here is that the value of old growth timber may be over emphasized to the detriment of forbs and grasses which regionally is an important fall and spring nutritional source and is obtained in brushland or open coniferous types as stated in the U.S. Fish and Wildlife Service Report from 1960, quoted on page 36.

5. The meeting minutes may be interesting in a draft report. However, since everyone in the work group as well as Bonneville Power Administration has the notes we feel they should be deleted from the final product.

6. The acknowledgement on page 13 is that original management agreements between the Idaho Department of Fish and Game and the Idaho State Land Board and Potlatch are ineffective, combined with the assertion from page 26 that "a majority of the land adjacent to

3. Noted. See No. 2.

4. Incorporated into text.

5. BPA requested that we include minutes of coordination meetings in our report.

6. Idaho Fish and Game will continue to work with federal, state, and private land managers. Management practices not possible in the past may be possible in the future.

the project lands is owned by Potlatch Corporation or the State Department of Lands" would appear to negate the effectiveness of any action embodied in the IDF & G plans quoted in ¶ 2, 3 and 4 on page 33. By the reports own admission all management strategies short of land acquisition have failed.

CONTENT

1. Our first concern is that the Impact Assessment for elk on page 31, when combined with Idaho Department of Fish and Wildlife Management Goals on page 32 and 34 and the Management Strategies on page 33 and 34 tend to indicate that although full mitigation of elk losses due to the Dworshak project have not been obtained, the Idaho Department of Fish and Game plans to continue to work with the Corps of Engineers to attempt to meet the goals they agreed upon in 1983. Barring that, "The department will consider for purchase elk winter ranges of critical importance." Questions arise as to what are the IDF & G yearly budget and regional priorities for winter range acquisition within the State and which range or ranges does the IDF & G intend to buy this year?

Without including a disclaimer in this section that the Department does not intend to acquire lands to mitigate for the effect of power generation at Dworshak it is not clear why the Northwest Power Planning Council or Bonneville Power Administration should pursue additional elk mitigation at Dworshak in lieu of the Department asserting it as a Corps and Department responsibility. Additionally

Content

1. Any big game winter range acquired with IDFG funds will not be considered mitigation for another agency's actions.

it is our recollection of the October 15, 1987 meeting that the work group, upon hearing the input of Dan Davis that the Clearwater National Forest has allocated significant acreage upstream from the Smith Ridge area as Elk Winter Range, concluded that this may be a suitable area for future off-site mitigation since the goal of 1.83 million pounds of browse had not been met in any of the four years since the agreement was made. The point is, the group recognized that off-site mitigation for elk is probably needed in the future and this section does not clearly state that.

2. There are a few concerns raised in the report that are not treated consistently throughout the text. U.S. Fish and Wildlife Service Reports are referenced as putting the loss of elk & mule deer at 915 animals and white-tailed deer at a 3000 animal herd with 40% losses. The assessments by the Fish and Wildlife Service of deer and elk losses were and continue to be very credible. The current work statements call for using all existing information where appropriate. What is the rationale in adopting the 915 figure while rejecting the 3000 deer figure, when an IDF & G Biologist working on-site for several years is quoted as agreeing with the 40% loss figure. It seems clear that we need more justification for utilizing a HEP for white-tailed deer. A HEP analysis was strongly recommended for White-Tailed deer at the October 15, 1987 consultation meeting by people familiar with the process. We were not familiar with HEP and the associated data collection procedures at that time but we endorsed any procedure that would be more accurate than the U.S. Fish and Wildlife Service estimates. Upon review of the white-tailed

2. Agreements on elk mitigation have been reached after more than 20 years of studies and negotiations between the USACE, IDFG, and USFWS. Other agencies such as the USFS, ISLB, and USBLM have also been involved. No specific mitigation has taken place for any other wildlife species. A HEP will incorporate knowledge gained from past and present studies on target wildlife species and their habitats and create standardized, manageable units of measure reflecting both quantity and quality of habitat impacted. It also is a useful tool to monitor benefits from mitigation activities. A HEP includes the opportunity for the work group to modify existing target species models (such as white-tailed deer) to fit habitat conditions in northern Idaho. As pointed out by Heezen (1961) and other pre-Dvorshak studies, white-tailed deer were difficult to count and the numbers seen depended upon the time of day the count was made.

deer HEP model we found it was constructed using research from the hardwood forests of the southeast U.S. We also assume that vegetation measurements would be made from habitats adjoining the lake. Measurements collected in 1988 from habitats above 1600 msl, 16 years after the land was first inundated may not be representative of the original land. Current research suggests that the biology of the white-tailed deer in Idaho is unlike that of eastern subspecies in reproductive capacity and habitat use. Acknowledging these difficulties we do not yet perceive how a HEP for white-tailed deer will provide a more accurate estimate of losses than those currently on record.

3. On page 46 the IDF & G management issues state that "Fluctuations and lowering of pool elevation during winter increases loss of deer on and through ice." The principal investigator, on page 37, cites losses from 1971 and frames the problem in a past tense. James M. Peek in chapter 28 of White-tailed Deer Ecology and Management cites similar "significant predation" occurred in 1975-76. The reader is left with an unclear picture of the continuing scope of this problem or how the proposed HEP will define it.

4. The U.S. Army Corps of Engineers (USACE) is quoted on page 31 stating the preliminary browse production estimates for Dworshak Project lands falls far short of the agreed upon goal of 1.83 million pounds. What percentage of the goal has been achieved? If the information exists to state the mitigation goal has not been

3. As we discussed at length in an earlier coordination meeting in Lapwai, it is difficult to use any method to get a true handle on the number of deer succumbing to drowning and predation annually at Dworshak. The inundation of the critical, low elevation winter range has led to this problem.

4. Incorporated into text after information received from USACE.

achieved, then it should be easy to convert that information to a percentage of what has been completed. It would also be useful to break down the forage production information into lbs/acre on intensively and non-intensively managed land.

5. IDF & G Management guidelines and strategies quoted for deer and elk on pages 33, 34, 44, 45, tend to indicate that IDF & G will continue to work with USACE, ISLB, USFS, and USFWS to complete acquisition of elk winter range but turn toward the Northwest Power Planning Council for deer mitigation. Thus, the IDF & G management plans indicate that it is not a NWPPC responsibility to participate in mitigation of elk losses but it is a council responsibility to participate in mitigation of deer losses. The rationale behind this direction was not put before the Technical work group nor was it endorsed by the group.

6. On page 77 the elk mitigation acres are counted as additional acres lost for pileated woodpeckers due to clear cutting. It may not be a viable stance to mitigate mitigation. The 2,984 acres of elk browse fields should be deleted from the total acreage counted as lost under pileated woodpeckers.

5. IDF 5-year species management plans are developed independently of the Dvorshak interagency work group. The contract for this report directs that existing management plans and goals for each target species will be incorporated into this report.

6. The purpose of this report was to examine Dvorshak Project impacts on all target species selected by the work group.

FEB 02 1988



United States
Department of
Agriculture

Forest
Service

Clearwater
National
Forest

12730 Highway 12
Orofino, ID 83544

Caring for the Land and Serving People

Reply to: 2600

Date: January 27, 1988

Jerry Conley, Director
600 S. Walnut
Box 25
Boise, ID 83707

Dear Jerry:

We have reviewed the Draft Report, Phase 1 of the Wildlife Protection, Mitigation, and Enhancement Planning of Dworshak Reservoir. We fully support the efforts of all agencies and interested parties to document the wildlife losses created by the inundation of Dworshak Reservoir. We also fully support the development of Comprehensive Mitigation and Enhancement Plan that would address these losses.

We found no major problems or concerns with the Phase 1 Draft Report. The authors did an excellent job of documenting the available information and preparing the report.

Sincerely,


J. DOUG GLEVANIK
Acting Forest Supervisor





United States Department of the Interior

FISH AND WILDLIFE SERVICE

BOISE FIELD OFFICE
4696 Overland Road, Room 578
Boise, Idaho 83705

U.S. FISH AND WILDLIFE SERVICE

January 29, 1988

Mr. Jerry M. Conley
Director
Idaho Department of Fish and Game
Box 25
Boise, Idaho 83707

Re: Review of Draft Dworshak Wildlife
Protection, Mitigation, and
Enhancement Plan, Phase I

Dear Mr. Conley:

The U. S. Fish and Wildlife Service (Service) has reviewed the referenced draft report, and we have the following general and specific comments.

General Comments

We agree that a Habitat Evaluation Procedure (HEP) is needed to further assess the net effects of the Dworshak Project on wildlife and their habitats. HEP was developed specifically for assessing wildlife impacts associated with water-related projects. The existing assessment reflects only changes in quantity of habitat. Using HEP, we can evaluate the change in quality and quantity of habitat within the project area.

Specific Comments

1. p. 12, P2, sentence 3. We question if seeding of roads, fire lines, and log landings should be credited as mitigation; rather, it should be considered reclamation (for soil stabilization).
2. p. 13. Quantify (Cervus elaphus) mitigation to date for elk losses.
3. p. 25. Summarize in a table the acreage losses by type of construction (e. g., losses due to inundation, roads, recreation, dam, and powerhouse).
4. p. 31, P3, sentence 4. The work group should consider reevaluating the loss assessment for elk. Based on discussions at work group meetings, the browse production goal apparently can not be met on Corps project lands and would be difficult on off-site lands. Currently, project lands provide a corridor of

1. Incorporated into text.
2. Incorporated into text.
3. Incorporated into text.
4. Noted.

timbered cover surrounded by primarily clearcuts. Is creation of more browse fields on project lands appropriate when timber on those lands probably provides critical wildlife cover?

5. p.31, P3, sentence 5. Based on a personal communication with the U. S. Army Corps of Engineers (Corps) in the Phase I Plan, the amount of browse produced to date is far short of the agreed upon goal for 915 elk. In a recent publication, the Corps (1987)¹ states that project lands "...are being developed for winter range and, with development about 80 percent complete, are supporting a significant portion of the identified requirement of 915 elk." These statements seem contradictory and an accurate assessment of the browse production must be determined to help define mitigation for elk losses.

6. p.41, P2, sentence 4. Although human disturbance is not a factor at most recreation sites during winter, the creation of those areas has precluded habitat development of on-site lands for compensation of wildlife losses.

7. p. 55, P3, sentence 2. Creation of browse fields, consisting mostly of redstem (Ceanothus sanguineus), has had little if any benefit to ruffed grouse (Bonasa umbellus). Redstem is not one of the fruit or bud producing shrubs that are regularly consumed by ruffed grouse.

8. p.59. The work group should reevaluate the selection of Canada goose (Branta canadensis) and mallard (Anas platyrhynchos) as target species. Based on the literature review in the Phase I plan, the North Fork of the Clearwater River has received limited historical and present use by waterfowl. Waterfowl habitat losses or gains due to reservoir construction would be difficult to document.

9. p. 81. Pre- and post-project habitat acreages should be estimated for all target species.

In conclusion, the Service supports the plan of action. Using HEP for the loss assessment would be consistent with habitat evaluation efforts being planned for the Lower Snake River Projects. This course of action is consistent with the intent of the Fish and Wildlife Coordination Act of 1958, as amended, and the Water Resources Act of 1986.

¹ U.S. Army Corps of Engineers 1987. Water resources development in Idaho 1987. Walla Walla District. 66 p.

5. Incorporated into text.

6. According to the draft Dworshak Master Plan (USACE 1985b), joint use of these lands for wildlife management will be permitted, provided such use will not adversely affect the basic recreation values.

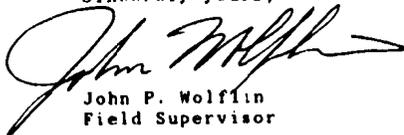
7. Noted.

8. Noted.

9. Habitat acreages have been estimated for all target species where enough existing information is available. Waterfowl and aquatic furbearer acreages should be determined in an interagency work group work session, using past and present studies.

Thank you for the opportunity to comment. We believe that our recommendations will be effective in developing a comprehensive impact assessment. Questions should be directed to Vicki Suab Marks of this office, (208) 334-1931.

Sincerely yours,



John P. Wolfen
Field Supervisor

cc: COE, Walla Walla (Attn: McKern)
COE, Walla Walla (Attn: Passmore)
IDFG, Dworshak Project Office (Attn: Moore)
IDFG, Region 2, Lewiston
FS, Nez Perce (Attn: Davis)
Nez Perce Indian Tribe (Attn: Kronemann)
Northwest Power Planning Council
BPA, Portland (Attn: Mahaffy)
Idaho Dept. of Lands (Attn: Johnson)



STATE OF IDAHO

IDAHO DEPARTMENT OF LANDS

DEPARTMENT OF LANDS

St. Joe Area Office (208) 245-4551
1806 Main Avenue, St. Maries, Idaho 83861

January 20, 1988

Idaho Department of Fish and Game
P.O. Box 25
Boise, ID 83707

ATTN: Allyn Neuleman

RE: Dworshak Wildlife Protection, Mitigation and Enhancement
Plan, Phase 1

Dear Allyn:

Per IDFG request, formal comments on the draft plan are as follows:

A. Details

1. The history section might be expanded somewhat on page 11 regarding efforts to place lands on Smith Ridge that were important for mitigation under IDFG management. After it had become apparent that joint management for both timber and big game was not viable, as an alternative it was suggested by the State Land Board that a land exchange be carried out between the IDL and the USFS that would place the Smith Ridge lands into USFS ownership. The USFS could then work with the COE and IDFG to achieve desired mitigation management. Attached are copies of records of that proposal. As you can see, the USFS was not receptive. It is further recollected that Senator Church introduced legislation to carry out this exchange, but it failed to pass.
2. Under Elk Impact Assessment on pages 31 and 32 an economic analysis appears questionable. Quoting from the text,

"A cooperative study of the economic impact of elk hunting in Idaho recently completed by IDFG and the USFS estimated the value of a WFUD (Wildlife and Fish User Day) in 1982 at \$100. In 1981, an estimated 36,400 hunter days were spent in IDFG Big Game Units 10 and 10A, which is where the Dworshak Project is located. This represents a net value of \$3,640,000 for the Dworshak Project Area."

1. Incorporated into text.

2. Incorporated into text.

EQUAL OPPORTUNITY EMPLOYER

Considering that the project area is but a relatively small part of Units 10 and 10A, it seems inappropriate to attribute the entire estimated economic value for the two units to the project area alone.

3. In the White-Tailed Deer section, on page 44 it is stated that "Area 1 ... supported 79% of the statewide harvest in 1984."; while on page 45 it says "This area contained 76% of the statewide harvest in 1984."

3. Noted.

B. Conclusions and Comments

1. Clearly, additional mitigation is in order and long overdue.
2. In order to define that mitigation, additional habitat information is needed. It appears the best approach is the Habitat Evaluation Procedure, as it is specific for assessing wildlife impacts from hydroelectric projects. This study is recommended for inclusion during Phase II.
3. The last paragraph, on page 85, implies that Northwest citizens are the heavy for the failure to provide mitigation in a timely manner. Not so, and this paragraph should be deleted.

1. Incorporated into text.

2. Incorporated into text.

3. Noted.

As is stated on page 84, in reference to the Federal 1980 Northwest Power Act,

"... the Administrator shall use the Bonneville Power Administration fund and the authorities available to the Administrator under this Act and other laws administered by the Administrator to protect, mitigate, and enhance fish and wildlife to the extent affected by the development and operation of any hydroelectric project of the Columbia River and its tributaries."

Dworshak is a federal project carried out under the authority of federal agencies. Indeed, mitigation should have been accomplished years ago. That it was not is attributable to the failure of the federal government and various federal agencies to work cooperatively together for the common good. Northwest citizens do not dictate to the federal government and its agencies; the reality is quite the reverse.

IDFG
ATTN: Allyn Meuleman
January 20, 1988
Page 3

Overall, a commendable job was done on your Phase 1 report. It is thorough, within the limits of available knowledge, and thus very informative. It provides a good foundation on which to build a case supporting mitigation measures in the future.

Sincerely,


Dean W. Johnson
Area Supervisor

DWJ:pa

Appendix C:

Elk Counts in the Smith Ridge Area

<u>Year</u>	<u>No. Elk Counted</u>
1976	100
1977	50
1981	101
1982	201
1983	347
1984	275
1985	439