

WILDLIFE PROTECTION, MITIGATION, AND ENHANCEMENT PLANS
ANDERSON RANCH AND BLACK CANYON FACILITIES

Final Report

Prepared By

G. Allyn Meuleman, Project Leader
H. Jerome Hansen, Wildlife Biologist
Robert C. Martin, Wildlife Biologist

Idaho Department of Fish and Game
600 S. Walnut
P.O. Box 25
Boise, Idaho 83707

Funded By

U.S. Department of Energy
Bonneville Power Administration
Division of Fish and Wildlife
P.O. Box 3621
Portland, Oregon 97208
Project 86-73
Contract No. DE-A179-86BP62775

June 1987

Table of Contents

	<u>Page</u>
Acknowledgments	1
Abstract	2
Introduction	3
Anderson Ranch	4
Facility Description	4
Impacts on Wildlife	4
Black Canyon	10
Facility Description	10
Impacts on Wildlife	10
Responsibility of Hydropower to Mitigate Wildlife Losses	15
Methods	22
Selection of Target Species	22
Anderson Ranch Target Species	22
Black Canyon Target Species	22
Mitigation Goals	23
Assessment of Benefits of Mitigation Projects	25
Habitat Evaluation Procedure	25
Mitigation Credit	25
Assessment of Costs of Mitigation Projects	27
Advance Design	27
Implementation	27
Operation and Maintenance	27
Monitoring	27
Results and Discussion	29
Target Species	29
Mallard	29
Canada Goose	29
Mink	30
Yellow Warbler (Scrub-shrub Wetlands)	30
Black-capped Chickadee (Forested Wetlands)	31
Ruffed Grouse	31
Mule Deer	32
Blue Grouse	33
Sharp-tailed Grouse	33
Ring-necked Pheasant	34
Peregrine Falcon	34
Anderson Ranch Mitigation Plan	36
Anderson Ranch Mitigation Goals	36
Anderson Ranch Preferred Mitigation Projects	36
Hill City Marsh Protection/Enhancement	37
Bennett Hills Big Game Winter Range Enhancement	39
Nelson Ranch Area Protection/Enhancement	40
Boise River Riparian Protection/Enhancement	41
Peregrine Falcon Reintroduction	42
Anderson Ranch Borrow Site Rehabilitation	43
Anderson Ranch Preferred Mitigation Plan Summary	44
Anderson Ranch Alternative Mitigation Projects	50
Black Canyon Mitigation Plan	59
Black Canyon Mitigation Goals	59
Black Canyon Preferred Mitigation Projects	59

Table of Contents

	<u>Page</u>
Bruneau River Valley Protection/Enhancement	60
Nelson Ranch Area Protection/Enhancement	61
Boise River WMA Big Game Winter Range Protection/Enhancement	62
Black Canyon Preferred Mitigation Plan Summary	63
Black Canyon Alternative Mitigation Projects	69
Literature Cited	75

List of Tables

<u>Table</u>		<u>Page</u>
1.	Cover type acreages in the Anderson Ranch study area for pre- and post-construction conditions.	6
2.	Summary of wildlife habitat impacts associated with construction and operation of the Anderson Ranch Facility, South Fork Boise River, Idaho.	7
3.	Cover type acreages in the Black Canyon Facility area for pre- and post-construction conditions.	13
4.	Summary of wildlife habitat impacts associated with construction and operation of the Black Canyon Facility, Payette River, Idaho.	14
5.	Anderson Ranch Facility wildlife protection, mitigation, and enhancement plan summary.	45
6.	Estimated benefits (Habitat Units) of the Anderson Ranch preferred mitigation plan.	47
7.	Estimated initial 10-year costs of the Anderson Ranch preferred mitigation plan.	48
8.	Initial 5-year action plan for Anderson Ranch Facility wildlife protection, mitigation, and enhancement plan.	49
9.	Anderson Ranch alternative mitigation projects.	50
10.	Black Canyon Facility wildlife protection, mitigation, and enhancement plan summary.	64
11.	Estimated benefits (Habitat Units) of the Black Canyon preferred mitigation plan.	66
12.	Estimated initial 10-year costs of the Black Canyon preferred mitigation plan.	67
13.	Initial 5-year action plan for Black Canyon Facility wildlife protection, mitigation, and enhancement plan.	68
14.	Black Canyon alternative mitigation projects.	69

List of Figures

<u>Figure</u>		<u>Page</u>
1.	Anderson Ranch Reservoir and vicinity.	5
2.	Black Canyon Reservoir and vicinity.	12
3.	Boise Project, Idaho.	16

List of Appendices

Appendix

- A. Acronyms Used.
- B. Formal Comments.

Page
80
81

ACKNOWLEDGMENTS

We would like to thank the following individuals who participated in work sessions held during this mitigation planning effort: Bob Adair, Bureau of Reclamation; Chuck Arendts, Jenny Carson, Kathy Lucich, and Larry Tripp, Forest Service; Jim Clark, Ervin Cowley, Jon Idso, Steve Langenstein, Larry Mangan, Jeff Marks, Vicki Saab Marks, Sam Mattise, and Alan Sands, Bureau of Land Management; Dave Irving and Signe Sather-Blair, U.S. Fish and Wildlife Service; Mary Mahaffy and Jim Meyer, Bonneville Power Administration; and Ted Chu, Craig Kvale, Andy Ogden, Dick Orcutt, Jerry Sholten, Dale Turnipseed, and Dale VonSteen, Idaho Fish and Game. Thanks also to Bureau of Reclamation personnel for help in collecting background materials on the entire Boise Project, and to Marty Montgomery of the Northwest Power Planning Council for providing guidance throughout this planning process. We would also like to thank all other agency personnel that contributed to this planning effort. A special thanks goes to Sue Alvarez, Idaho Fish and Game, for another remarkable performance on the word processor!

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, projects have been developed in Idaho to mitigate the impacts to wildlife habitat and production due to the development and operation of the Anderson Ranch and Black Canyon Facilities (i.e. dam, power plant, and reservoir areas). The Anderson Ranch Facility covered about 4,812 acres of wildlife habitat while the Black Canyon Facility covered about 1,115 acres. These acreages include dam and power plant staging areas. A separate mitigation plan has been developed for each facility. A modified Habitat Evaluation Procedure (HEP) was used to assess the benefits of the mitigation plans to wildlife. The interagency work group used the target species Habitat Units (HU's) lost at each facility as a guideline during the mitigation planning process, while considering the needs of wildlife in the areas. Totals of 9,619 and 2,238 target species HU's were estimated to be lost in the Anderson Ranch and Black Canyon Facility areas, respectively. Through a series of projects, the mitigation plans will provide benefits of 9,620 target species HU's to replace Anderson Ranch wildlife impacts and benefits of 2,195 target species HU's to replace Black Canyon wildlife impacts. Target species to be benefited by the Anderson Ranch and/or Black Canyon mitigation plans include the mallard, Canada goose, mink, yellow warbler, black-capped chickadee, ruffed grouse, mule deer, blue grouse, sharp-tailed grouse, ring-necked pheasant, and peregrine falcon.

INTRODUCTION

The Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Public Law 96-501) directed that measures be implemented to protect, mitigate, and enhance fish and wildlife to the extent affected by development and operation of hydropower projects on the Columbia River System. This Act created the Northwest Power Planning Council, which in turn developed the Columbia River Basin Fish and Wildlife Program. This Program established a 4-part process:

- 1) Wildlife Mitigation Status Reports -- to identify mitigation proposed, mitigation required, mitigation implemented, and current studies and planning;
- 2) Wildlife Impact Assessments -- to quantify wildlife and habitat impacts using the best scientific information available;
- 3) Wildlife Protection, Mitigation, and Enhancement Plans -- to provide a plan to mitigate wildlife and habitat losses pursuant to Sections 4(h)(5) and (6) of the Pacific Northwest Electric Power Planning and Conservation Act of 1980;
- 4) Implementation of protection, mitigation, and enhancement projects -- to mitigate wildlife and habitat losses.

These mitigation plans for the Anderson Ranch and Black Canyon Facilities were developed to fulfill the requirements of Section 1004(b)(3) of the Columbia River Basin Fish and Wildlife Program. Agencies that actively participated in the planning sessions included the U.S. Bureau of Reclamation (USBR), Bureau of Land Management (BLM), U.S. Fish and Wildlife Service (USFWS), U.S. Forest Service (USFS), and the Idaho Department of Fish and Game (IDFG). Personnel from these agencies, plus the Shoshone-Bannock Tribes, formed the interagency work group. Throughout preparation of this plan, we consulted and coordinated with the above agencies and tribes, the Bonneville Power Administration (BPA), Northwest Power Planning Council (NPPC), and Pacific Northwest Utilities Conference Committee. This study was funded by the Bonneville Power Administration.

ANDERSON RANCH

Facility Description

Anderson Ranch Dam is located at approximately mile 37 of the South Fork of the Boise River, about 20 air miles north of Mountain Home, Idaho (Figure 1). The earth-filled structure is 456 feet high and has a total storage capacity of 493,200 acre-feet of water. Two generators operate at a maximum capacity of 40 megawatts (USBR 1981a). At full pool, the reservoir has a surface area of 4,740 acres, is 14.6 miles long, and is 0.25 - 1 mile wide. The reservoir inundated 4,740 acres of habitat, 18.3 miles of river channel, and 6.7 miles of tributaries. In addition, the dam and power plant staging areas covered about 72 acres, and the borrow site covered about 80 acres. The Wildlife Mitigation Status Report (Chaney and Sather-Blair 1985a) for this project stated "...there was no mitigation for losses of wildlife habitats..." resulting from the project.

The Anderson Ranch Facility is part of a federal water storage system in the Boise River drainage. It is authorized for irrigation, flood control, power production, fish and wildlife, and recreation (USBR 1981a). Construction of the project was authorized by the Department of the Interior Secretary's Findings of Feasibility, June 25, 1940, under Section 9 of the Reclamation Project Act of 1939 (USBR 1957). The dam was completed in 1950 (USBR 1980).

Prior to 1980, irrigation releases from the reservoir from July through September averaged 4,500 cubic feet per second (cfs). In September, releases from the reservoir were generally reduced to 200 cfs. Winter releases varied with power peaking operations and ranged from 200 cfs to 1,600 cfs. Spring flood control releases have reached 5,000 cfs (USBR 1981a). Over the past 5 years, the USBR has maintained fall and winter minimum flows of 300 cfs, and a minimum of 600 cfs during the rest of the year. Between 1976 and 1985, the average annual reservoir drawdown was 62 feet, and the largest drawdown was 116 feet.

Impacts on Wildlife

Martin and Ablin-Stone (1986) summarized the Anderson Ranch Facility's impacts on wildlife:

"The Anderson Ranch Project covered 4,812 acres of wildlife habitats. The study area of concern included the reservoir, the dam site, the staging area by the dam, and the area within 100 meters of the reservoir shoreline. The study area totaled 6,516 acres.

"Eight cover types were identified in the study area. All were reduced in the area after project construction except lacustrine open water. The project resulted in a loss of 18.3 miles of river and 6.7 miles of tributaries. Losses included 966 acres of deciduous forested wetlands, 256 acres of deciduous scrub-shrub wetlands, and 275 acres of free-flowing river. Upland areas reduced by the project included 2,200 acres of shrub-steppe, 280 acres of evergreen forest, 270 acres of deciduous shrubland, and 565 acres of agriculture/pasture [Table 1].

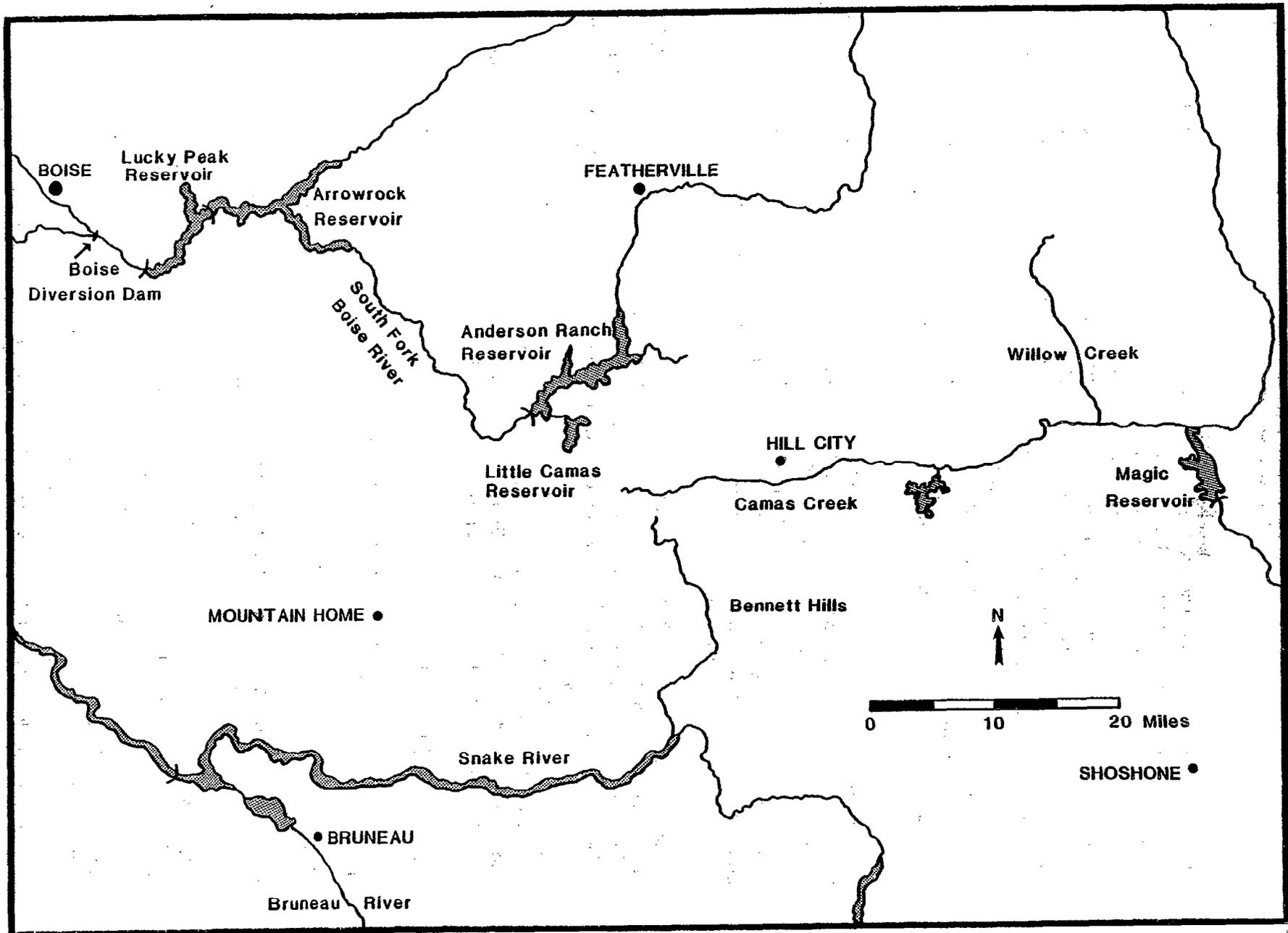


Fig. 1. Anderson Ranch Reservoir and vicinity.

Table 1. Cover type acreages in the Anderson Ranch Facility area¹ for pre- and post-construction conditions (Martin and Ablin-Stone 1986).

	Deciduous Forested Wetland	Deciduous Scrub-shrub Wetland	Shrub-steppe	Evergreen Forest	Deciduous Shrubland	Agriculture/ Pasture	Riverine Rock Bottom	Lacustrine Open Water	Other ²	Total
Pre-construction	1,006	258	3,379	675	358	565	275	0	0	6,516
Post-construction	40	2	1,179	395	88	0	0	4,740	72	6,516
Net gain or loss	-966	-256	-2,200	-280	-270	-565	-275	+4,740	+72	

¹ Study area extended 100 meters from the edge of the reservoir [and did not include the 80 acre borrow site].

² Includes dam and power plant staging areas.

Table 2. Summary of wildlife habitat impacts associated with construction and operation of the Anderson Ranch Facility, South Fork of the Boise River, Idaho (Martin and Ablin-Stone 1986).

Group [evaluation species]	Pre-construction			Post-construction			Impacts	
	Habitat acres	HSI	HU's	Habitat acres	HSI	HU's	Habitat acres	HU's
Big game								
Mule deer	5,676	0.69	3,916	1,704	0.72	1,227	-3,972	-2,689
Aquatic furbearers								
Mink	2,382	0.80	1,905	1,727	0.10 ¹	173	-755	-1,732
Waterfowl								
Mallard	2,283	0.48	1,096	56	0.85	48	-2,227	-1,048
Upland game								
Ruffed grouse	1,006	0.95	956	40	0.93	37	-966	-919
Blue grouse	4,412	0.72	3,177	1,662	0.72	1,197	-2,750	-1,980
Nongame species								
Black-capped chickadee	1,006	0.92	926	40	0.89	36	-966	-890
Yellow warbler	616	0.65	400	90	0.43	39	-526	-361

¹ During mitigation planning, the interagency work group agreed that 0.10 was a more accurate estimate of post-construction habitat conditions than the HSI estimated during the impact assessment.

"The HEP was used to evaluate pre- and post-construction wildlife habitat conditions. Evaluation species were selected to represent important species groups and habitats. Impacts for evaluation species were measured in terms of the difference between pre- and post-construction Habitat Units (HU's), a measure of habitat quantity (habitat area) and quality (Habitat Suitability Index or HSI). For a given species, one HU is equivalent to one acre of prime habitat (HSI = 1.0).

"The study area contained an estimated 5,676 acres of big game habitat prior to construction, while it presently contains 1,704 acres. The project resulted in a loss of 2,689 HU's for mule deer [Table 2]. This loss is considered representative for Rocky Mountain elk in the study area. The black bear and the mountain lion were also affected by the project, but habitat losses were not quantified. Other project-related impacts include the annual winter loss of big game dying as a result of ice conditions on the reservoir. Annual ice-related losses of mule deer are estimated to range from 1 or 2 to over 30; the average annual loss is estimated to be 6 deer.

"The study area contained an estimated 2,382 acres of aquatic furbearer habitat prior to construction, while the reservoir currently has 1,727 acres along its shoreline. Using the mink model, the pre-construction habitat quality along the river and its tributaries was high, while the reservoir currently provides lower-quality habitat. A loss of 1,197 HU's was estimated for the mink. Due to an average annual drawdown of 62 feet and complete loss of 25 miles of river and tributary habitat, this loss is considered an underestimate for beaver, muskrat, and river otter. [Later, the mitigation planning work group agreed that the mink model did not adequately estimate the post-construction conditions for mink; the work group agreed that 0.1 is a more accurate estimate of post-construction conditions, and therefore there were an estimated 1,732 mink HU's lost.]

"Prior to project construction, the study area had an estimated 2,283 acres of waterfowl breeding habitat along the river and its tributaries, while the reservoir currently has an estimated 56 acres suitable for nesting. Using a mallard model, the project resulted in an estimated loss of 1,048 HU's of waterfowl habitat.

"The forested wetlands within the study area provided an estimated 1,006 acres of ruffed grouse habitat, while the study area presently provides only 40 acres. Upland habitats provided an estimated 4,412 acres of blue grouse habitat, and presently provide 1,662 acres. The project resulted in the loss of 919 HU's for game bird species associated with forested wetland habitats [ruffed grouse], and 1,980 HU's for game bird species associated with upland habitats [blue grouse].

"Although over 4,800 acres of nongame habitats were inundated by the project, impacts to nongame species were estimated only for wetland cover types and the upland deciduous shrubland cover type. The black-capped chickadee model was used to evaluate the quality of the overstory in forested wetlands, and the yellow warbler model was used to evaluate scrub-shrub wetlands and deciduous shrublands. The project

resulted in estimated losses of 890 HU's for nongame species dependent on forested wetlands, and 361 HU's for nongame species dependent on scrub-shrub wetlands and deciduous shrublands.

"The project adversely affected wintering bald eagles. The reservoir currently provides little open water habitat during most winters, while the river prior to the project remained open. Whitefish were also eliminated from the study area as a result of the project. Ospreys are the one raptor species that probably have benefited from the project."

The level of impacts that construction of Anderson Ranch Dam and Reservoir had on peregrine falcons is hard to quantify. It has been suggested that a significant cause of the falcon's historic decline can be attributed to loss of wetlands and associated prey items, which could have been a combined effect resulting from change in precipitation levels and hydroelectric development (M. Nelson, pers. commun., in Burnham and Howard 1986). At Anderson Ranch Reservoir, 1,221 acres of riparian habitats were inundated and lost (Martin and Ablin-Stone 1986). Further, M. Nelson (1986 letter to NPPC) stated:

"There were many observations of peregrines on the South Fork of the Boise River before the completion of Anderson Ranch Dam. I made authentic observations of these birds during the nesting season in the area above and below the existing dam site. Anderson Ranch backwaters covered a significant prey base area for the nesting birds. The human activity of building the reservoir, and the loss of riparian prey base that followed, had a significantly negative effect on the nesting peregrines. They have not been observed in the area during the nesting season since."

An 80 acre borrow site was used as fill for the Anderson Ranch Dam. The borrow site was not identified during the wildlife impact assessment. The area historically was sagebrush-grassland, and presently is in a severely degraded condition.

BLACK CANYON

Facility Description

Black Canyon Dam is located on the Payette River near Emmett, Idaho (Figure 2). The concrete dam is 183 feet high and has an ogee overflow spillway. Crest length is 1,039 feet. The facility has the capacity to divert water from the Payette River at a rate of 1,360 cfs. The dam contains 2 electrical generating units with a total installed capacity of 8,000 kilowatts. The reservoir, at full pool, extends about 9 miles upstream from the dam and covers about 1,100 acres (Chaney and Sather-Blair 1985b). From 1983 to 1985, the reservoir drawdown averaged 42 feet and ranged from 20 to 72 feet. There were no wildlife mitigation measures identified in the mitigation status report for this project (Chaney and Sather-Blair 1985b).

Black Canyon Reservoir initially had the capacity for about 44,000 acre-feet of water. By the early 1970's, sedimentation, mainly at the upper end of the reservoir, had reduced the capacity by about one-third. Deposition of sediments has continued to reduce the reservoir's capacity.

Sedimentation in the upper end of the reservoir contributed to chronic spring flooding of adjacent low-lying agricultural lands (Chaney and Sather-Blair 1985b). The USBR acquired 1,095 acres within the extended 100-year flood plain, and in cooperation with IDFG, prepared the Montour Wildlife/Recreation Plan for the area (USBR 1984). A memorandum of understanding outlining management responsibilities was previously signed by the respective parties in August, 1983. Pursuant to Section 4(h)(10)(A) of the Northwest Power Act, BPA funding of proposed wildlife projects at Montour would appear to be in lieu of other expenditures authorized or required from other entities under other agreements or provisions of law, and therefore would be against the intentions of the Act. Because of the previous agreement, no mitigation projects are planned at Montour.

The Black Canyon Facility's authorized purposes are irrigation and power production. The facility is part of the USBR's Boise Project, authorized March 27, 1905. The dam was authorized June 26, 1922 by the Secretary of the Interior. Construction was completed in 1924 (Chaney and Sather-Blair 1985b). The Black Canyon Facility and upstream storage reservoirs provide a system that allows the USBR to optimize irrigation releases and power production. Deadwood and Cascade Reservoirs were both authorized with expectations of contributing to federal power production at Black Canyon (USBR 1949:57-61).

Impacts on Wildlife

Black Canyon Reservoir inundated at least 1,057 acres, and the dam and reclamation areas covered 58 acres (Martin and Ablin-Stone 1986). The impacts of the project were evaluated in a study area that included the dam, reservoir, power plant staging area, and 100 meters adjacent to the reservoir. The riverine environment was most likely characterized by a cottonwood-willow complex with an understory of various shrubs and

grasses (Martin and Ablin-Stone 1986). Table 3 summarizes pre- and post-construction cover type acreages associated with Black Canyon Reservoir.

The Habitat Evaluation Procedure was used to evaluate the effects, in terms of habitat values, that the reservoir had on the target species chosen. Impacts to target species are listed in Table 4. Martin and Ablin-Stone (1986) provided further detail and information on the impact of the Black Canyon Facility on wildlife.

Based on historic distribution information and residual habitat characteristics of the Sweet and Montour Valleys, it is highly likely that the Black Canyon Facility area once provided habitat for sharp-tailed grouse. "Inundation removed riparian vegetation, rendering critical wintering habitat unsuitable" (BLM and Nature Conservancy proposal to BPA, 1986).

Because management of the sharp-tailed grouse is of high priority to state and federal wildlife and land management agencies in Idaho, it was selected as another target species during mitigation planning for Black Canyon. Impacts of the Black Canyon Facility on sharptails were evaluated and are also listed on Table 4.

Impacts of Deadwood Reservoir on wildlife were evaluated and presented in the Black Canyon Wildlife Impact Assessment (Martin and Ablin-Stone 1986). However, this mitigation plan only examines mitigation projects for Black Canyon Reservoir impacts. Further analysis of wildlife impacts and/or mitigation actions at Deadwood and Cascade Reservoirs is planned in the future.

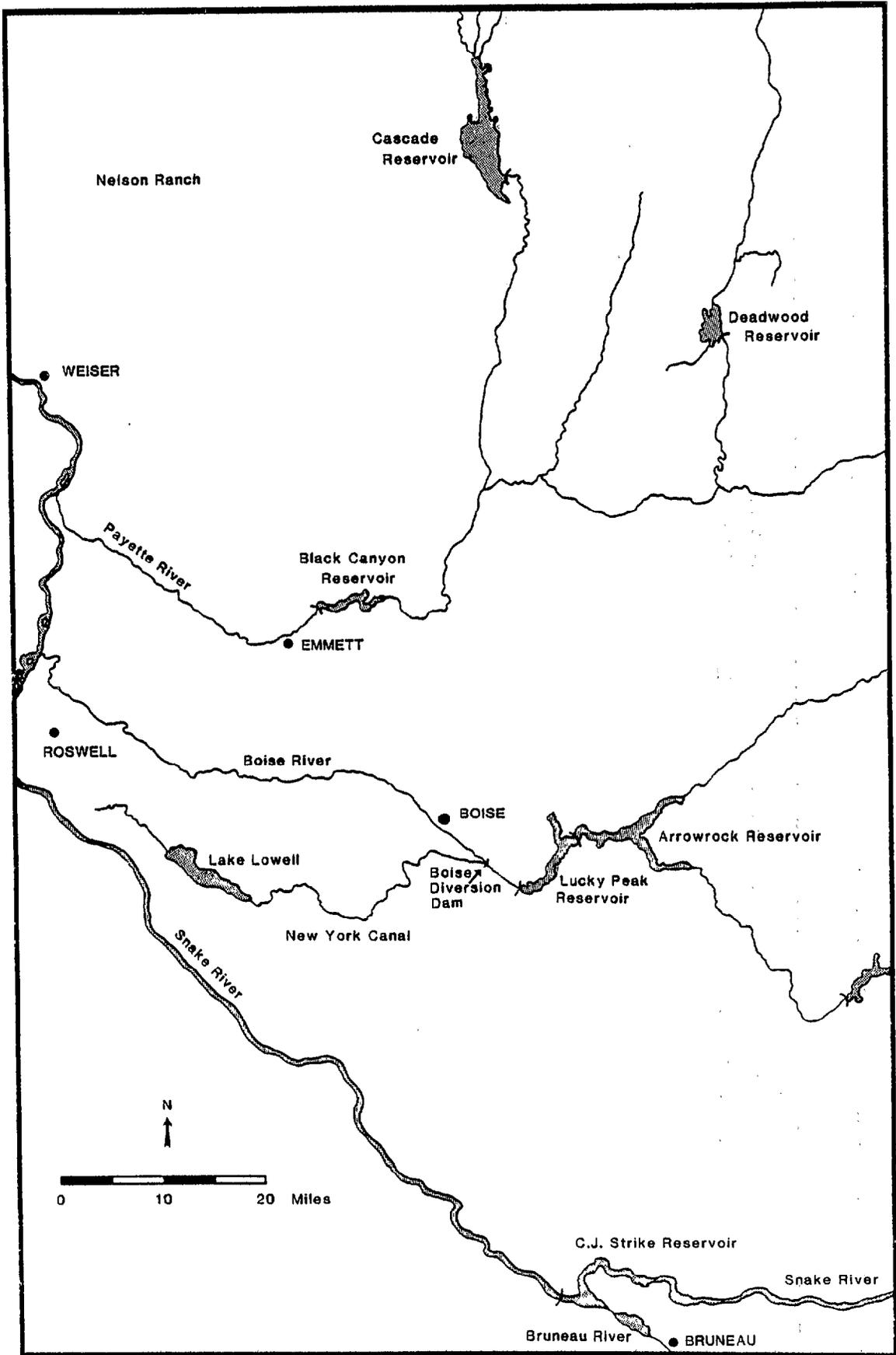


Fig. 2. Black Canyon Reservoir and vicinity

Table 3. Cover type acreages in the Black Canyon Facility area¹ for pre- and post-construction conditions (Martin and Ablin-Stone 1986).

	Deciduous Forested Wetland	Deciduous Scrub-shrub Wetland	Emergent Wetland	Shrub- steppe	Agriculture/ Pasture	Riverine	Lacustrine	Other ²	Total
Pre-construction	196	24	0	1,158	406	246	0	0	2,030
Post-construction	118	34	7	628	128	0	1,057	58	2,030
Net gain or loss	-78	+10	+7	-530	-278	-246	+1,057	+58	

¹ Study area extended 100 meters from the edge of the reservoir.

² Includes dam and power plant staging areas.

Table 4. Summary of wildlife habitat impacts associated with construction and operation of the Black Canyon Facility, Payette River, Idaho (Martin and Ablin-Stone 1986).

Group [evaluation species]	Pre-construction			Post-construction			Impacts	
	Habitat acres	HSI	HU's	Habitat acres	HSI	HU's	Habitat acres	HU's
Big game								
Mule deer	1,378	0.45	620	787	0.48	378	-591	-242
Aquatic furbearers								
Mink	1,084	0.77	835	915	0.20 ¹	183	-169	-652
Waterfowl								
Mallard	1,084	0.55	596	466	0.70	326	-618	-270
Canada goose	1,084	0.55	596	466	0.82	382	-618	-214
Upland game								
Ring-necked pheasant	1,784	0.33	589	915	0.36	329	-868	-260
Sharp-tailed grouse ²	1,387	0.50	689	787	0.20	157	-591	-532
Nongame species								
Black-capped chickadee	196	0.88	172	118	0.88	104	-78	-68
Yellow warbler	24	0.78	19	34	0.78	27	+10	+8

¹ During mitigation planning, the interagency work group agreed that 0.20 was a more accurate estimate of post-construction habitat conditions than the HSI estimated during the impact assessment.

² Added as an evaluation and target species after the initial impact assessment (Martin and Ablin-Stone 1986) was completed.

RESPONSIBILITY OF HYDROPOWER TO MITIGATE WILDLIFE LOSSES

The Pacific Northwest Electric Power Planning and Conservation Act of 1980 states, "...the Administrator shall use the Bonneville Power Administration fund and the authorities available to the Administrator to enhance fish and wildlife to the extent affected by the development and operation of any hydroelectric project of the Columbia River and its tributaries..." [Public Law 96-501, section 4(h)(10A)]. This section, in effect, requires answers to two questions:

- 1) Which water projects in the Columbia Basin were developed or are operated, in whole or in part, as a result of the need for hydroelectric power production?
- 2) For those water projects developed or operated for hydroelectric power production, what is the extent of the impacts, to wildlife, that are specifically a result of that development or operation?

Because the Anderson Ranch and Black Canyon Facilities and the entire Boise Project are multipurpose projects, these questions have been examined.

Background

Boise Project. The Boise Project (Fig. 3) is a multipurpose water resource development operated as a system for irrigation, power, flood control, recreation, and fish and wildlife. Since its first authorization in 1905, the Boise Project has expanded in an orderly program of development that has included construction of five major reservoirs (Arrowrock, Lake Lowell, Deadwood, Cascade, and Anderson Ranch), two principal diversion dams (Boise Diversion Dam and Black Canyon Dam), three power plants (Boise Diversion, Black Canyon, and Anderson Ranch), three sizable pumping plants, and related facilities (USBR 1981:46-47).

Presently, the Boise Project furnishes irrigation water to about 225,000 acres of project lands, and provides supplemental water for an additional 165,000 acres. The three USBR power plants have a combined capacity of 49,500 kilowatts [Anderson Ranch: 40,000; Black Canyon: 8,000; Boise Diversion: 1,500 (presently not operating, but could be restarted under short notice)] (USBR 1981:43-46). The power plants are operated as a system to maximize the Boise Project's power revenues (USBR 1953:6). The Black Canyon Power Plant (and until 1982, the Boise Diversion Power Plant) provides power for pumping to Payette Division lands and the Emmett Irrigation District. Anderson Ranch power serves pumping loads in the Minidoka and Owyhee Projects. Surplus power from all plants is turned over to the BPA for marketing (USBR 1981:48).

For administrative and operating purposes, Boise Project lands are divided into the Arrowrock and Payette Divisions. Some of the features serve only one division; other features serve both divisions as well as other nearby projects (USBR 1981:43).

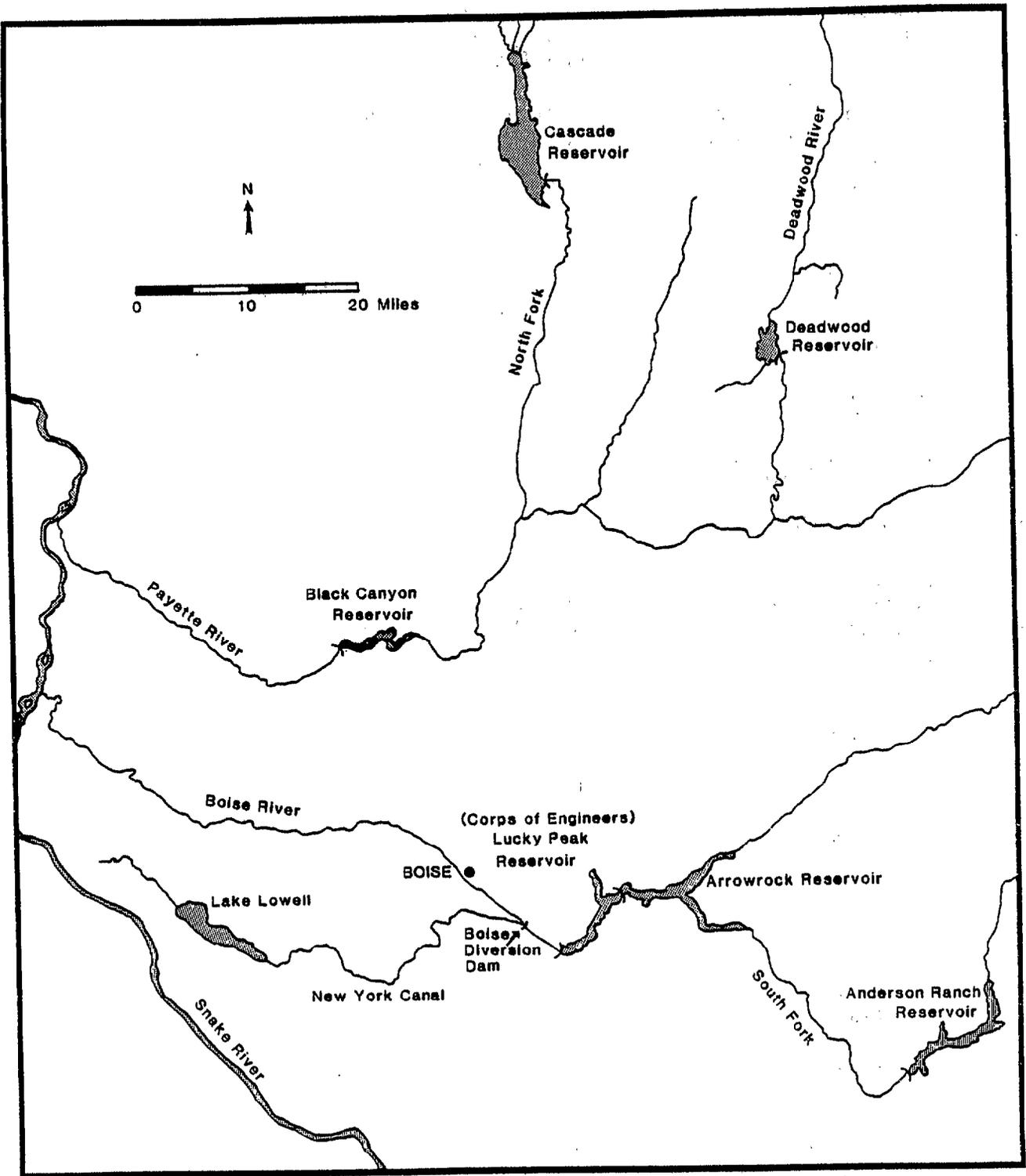


Fig. 3. Boise Project, Idaho

Arrowrock Division. Water for the Arrowrock Division is stored in Anderson Ranch Reservoir (493,200 acre-feet), Arrowrock Reservoir (286,600 acre-feet), and in Lake Lowell (190,000 acre-feet). Lucky Peak Dam, built by the Corps of Engineers, has an active capacity of 278,200 acre-feet. By agreement among the Corps of Engineers, Boise Project Board of Control, and USBR, the Anderson Ranch, Arrowrock, and Lucky Peak Reservoirs on the Boise River are operated jointly for the benefit of irrigation, power, and flood control (USBR 1981:43). Until 1982, power was produced at the Boise Diversion Power Plant, which is located near the bottom of the Boise River storage system. It produced power from 1912 until 1982, when it was shut down for economic reasons. It could be restarted under short notice (pers. commun., USBR). Presently, the Anderson Ranch Power Plant provides the only federal power production on the Boise River. Anderson Ranch Dam and Reservoir are ideally located for power production because winter releases for power can be recaptured in Arrowrock Reservoir, thus assuring the production of a block of firm power without the loss of water for irrigation (USBR 1953:3-4).

Payette Division. Water storage facilities for this division include Deadwood Reservoir (162,000 acre-feet) and Cascade Reservoir (703,200 acre-feet). The Black Canyon Dam and Power Plant facility serves to divert water to the Payette Division lands and to produce power.

The Black Canyon Facility and upstream storage reservoirs provide a system that allows the USBR to optimize irrigation releases and power production. The Deadwood Facility was authorized for the purpose of storing water for power production at Black Canyon Power Plant, with the entire cost of the Deadwood Facility to be repaid from power revenues (USBR 1949:57-59). The Cascade Dam and Reservoir facility was authorized for storage of water for irrigation and power production in the Payette Division (USBR 1949:59-61). The United States' purpose for constructing Cascade Dam and Reservoir was to provide water for the anticipated 21,000 acre pumping division of the Payette Division, supplement the supply of the gravity division, and furnish water for power (USBR 1938, 1940, 1941).

Review of the history of the Payette Division makes several points clear:

- 1) Construction of storage reservoirs upstream from the Black Canyon Dam and Power Plant site was planned as early as 1905; expectation of development of upstream storage reservoirs was used to justify authorization of the Boise Project (USBR 1949:53-56).
- 2) Irrigation of an anticipated 21,000 acres in the Payette Division required a firm and cheap power supply for pumping, and the Black Canyon Diversion Dam could not provide the water necessary for power (USBR 1949:59-61).
- 3) Congressional authorizations of the Deadwood and Cascade federal facilities (USBR 1949:57-61) were based on the need for storage of water for power production and pump irrigation (which is not

possible without power for pumping). Without Cascade and Deadwood storage, federal power production at Black Canyon would be severely limited.

Financial Feasibility (Congressional Repayment Allocation)

For a federal water project to be financially feasible, federal law requires that the monetary allocations to reimbursable project purposes (e.g. power, irrigation) plus the allocations to nonreimbursable project purposes (e.g. flood control) must equal the total estimated cost of construction. Thus, financial feasibility of water projects is indicated by the prospect of full recovery of all reimbursable costs from water users and power users.

Reimbursable costs of the facilities that comprise the Boise Project have been combined, and are being repaid from combined power and irrigation revenues. Hence, it is not readily possible to determine the percent that power and irrigation contribute to the repayment of any specific facility of the Boise Project (pers. commun., USBR).

Total costs for the Boise Project are \$105,194,306 (USBR 1986a). The cost allocations are \$73,743,259 to irrigation, \$11,635,268 to power, \$19,804,955 to flood control, and \$10,824 to cultural resources. Because project costs chargeable to irrigation are limited by Public Law 87-728, and excess charges reallocated to hydropower, power subsidizes \$35,054,650 of the costs allocated to irrigation. As a result, hydropower is responsible for repaying \$46,689,918, which is 44% of the total cost of the Boise Project and 55% of the reimbursable costs of the Project. Thus, it is felt that hydropower beneficiaries should take full (100%) responsibility for wildlife losses, because hydropower repayment has made the Boise Project, and hence the Anderson Ranch and Black Canyon Facilities, financially feasible.

Operations

Revenues from the Anderson Ranch and Black Canyon power plants (and until 1982, the Boise Diversion power plant) are optimized by system-wide operation, and depend on other storage reservoirs to achieve maximum power production. The Anderson Ranch power plant contribution to power revenues, in part, is due to the existence of downstream storage reservoirs, which allow for optimum power releases during winter without the loss of irrigation water (USBR 1953:3-4). Based on an analysis of Anderson Ranch discharges by month, about 87% of annual Anderson Ranch discharges pass through the turbines and are used for power. Black Canyon power plant's contribution to power revenues is based largely on the existence of upstream storage reservoirs (Deadwood and Cascade), which were both authorized with expectations of contributing to federal power production at Black Canyon (USBR 1949:57-61). Based on Black Canyon discharges by month, about 47% of annual Black Canyon discharges pass through the turbines and are used for power.

Habitat

From a habitat standpoint, the minimum acreage inundated at Anderson Ranch by water that is specifically for power could be considered as the minimum power pool (70,000 acre-feet) plus the active storage space allocated to power (5,000 acre-feet). Taking into account the physical characteristics of Anderson Ranch Reservoir, 75,000 acre-feet would cover 1,160 acres. This is 24% of the total 4,740 surface acres of Anderson Ranch Reservoir. Black Canyon Reservoir is essentially maintained at maximum levels year-round to provide maximum power production year-round, and to provide irrigation diversion from April to the middle of October.

Power and Irrigation Ties

The Snake River Country pamphlet published by the Pacific Northwest River Basins Commission and Washington Sea Grant Program stated: "Irrigated agriculture would not be the cornerstone of the Basin's economy without the early development of electricity. In fact, energy development and agriculture grew up together in the Snake River Basin. In the early 1900's, it became evident that pumps were needed to lift water to irrigate much of the basin's lands."

Some of the power produced at the Anderson Ranch and Black Canyon Facilities is used to run electric irrigation pumps on the Boise, Owyhee, and Minidoka Projects. The conversion of large acreages from native vegetation to agriculture was directly the result of the availability of Boise Project power.

The conversion of native range to agriculture affects many wildlife species. While a few agricultural dependent species such as pheasants may initially respond positively to this conversion, valuable habitat for native wildlife species such as sage grouse, sharp-tailed grouse, pronghorn, and mule deer is lost. Native range supports a diverse plant community and wealth of wildlife species. Land converted to agriculture is normally cultivated toward monoculture with little plant diversity, which in turn supports little wildlife diversity.

The impacts of land conversion from native vegetation to agriculture were not examined in the Anderson Ranch and Black Canyon wildlife impact assessments (Martin and Ablin-Stone 1986), although many impacts resulted directly from the development and operation of the Boise Project. When the Interagency work group agreed to limit the wildlife impact assessment study area to the reservoir area, and not quantify the impacts of conversion of native habitat to irrigated agriculture, they expected all (100%) of the reservoir impacts to be mitigated under the Columbia Basin Fish and Wildlife Program. The wildlife impact assessment team was lenient in their final assessment of wildlife losses attributable to the Anderson Ranch and Black Canyon Facilities by only examining the inundated areas. As the USFWS points out in their formal comments regarding this Plan (Appendix B), if the hydroelectric projects were being planned today, under the authority of the Fish and Wildlife Coordination Act, the investigation of impacts would assess impacts associated with the entire project area, including irrigation lands,

which also constitute the project. Had the tie between irrigation and hydropower been examined in more detail, many more losses to wildlife and their habitats would have been attributed to the development and operation of these facilities.

Allocation of Construction Costs

The allocation of joint facilities construction costs to various project functions was examined as a possible procedure to determine hydropower responsibility. We concluded that this is not a suitable procedure for determining hydropower responsibility at the Boise Project. Unlike repayment, cost allocations do not directly prove a water project's financial feasibility. Also, allocations to project functions can vary considerably based on the particular method used.

The USBR (1961) stated that prior to the adoption of more recent methods of cost allocation, "several other procedures had been employed by the various agencies engaged in the water resource development programs. It was found through experience that these procedures were unsuitable for one reason or another and consequently they were abandoned."

The USBR (1961) goes on to state, "The methods of cost allocation initially employed by the Bureau of Reclamation were based upon physical criteria such as 'use of space' or 'water released.' However, it was found that such methods of allocation did not properly measure the extent of use by the various functions involved ... The physical approach to cost allocation was also unsatisfactory in that it did not provide a common denominator for all functions involved.

"The alternative justifiable expenditure method limits the allocation to any function to the justifiable expenditure which is the lesser of the benefits or the cost of securing the same benefit through the most likely alternative means ... While this method of cost allocation met with the objections inherent in those procedures based solely on benefit or physical criteria, it involved other aspects which were objectionable.

"This procedure depends on the arbitrary segregation of facilities into joint (those which serve more than one function) and into specific (those which serve only a single function). In this procedure, the entire cost of the dam and reservoir is considered as a joint facility even though there may be dead storage which provided only power head, or exclusive storage space which serves only a single function such as flood control or irrigation. Also, in the application, it is assumed that imbedded penstocks in the dam or a powerhouse constructed in the dam are specific power facilities even though the elimination of such facilities would not result in a saving equal to the cost of the facilities removed. For example, if such facilities were removed, the voids left would have to be filled.

"Thus, the joint costs used under the alternative justifiable expenditure method may include, for example, that part of the storage capacity used exclusively for a single function. Also, the true costs

of the specific facilities may be less than the cost normally regarded as the cost of specific facilities" (USBR 1961).

Summary

The agencies and tribes (BLM, USFWS, USFS, IDFG, Shoshone-Bannock Tribes) involved in the work group, except for the USBR, feel that hydropower beneficiaries should take full (100%) responsibility for mitigation of wildlife losses due to development and operation of the Anderson Ranch and Black Canyon Facilities. The Boise Project, and hence the Anderson Ranch and Black Canyon Facilities, would not be financially feasible without hydropower repayment, which is responsible for 44% of total Project costs and 55% of reimbursable Project costs. Hydropower development and operation at the Anderson Ranch and Black Canyon Facilities are closely tied to the development and operation of the entire Boise Project system. About 87% of annual Anderson Ranch discharges pass through the turbines, and about 47% of Black Canyon discharges pass through the turbines. Quantified wildlife losses occurred with the inundations of Anderson Ranch Reservoir 37 years ago, and Black Canyon Reservoir 63 years ago. Other impacts to wildlife, including irrigation development, also occurred but were not quantified. Ratepayers have benefited from power production during this time span, while wildlife losses have gone unmitigated. It seems reasonable that hydropower beneficiaries should take full responsibility for mitigation of wildlife losses due to the Anderson Ranch and Black Canyon Facilities' impacts. Further analysis of wildlife impacts from additional Boise Project facilities and system-wide impacts may be required in the future.

METHODS

SELECTION OF TARGET SPECIES

For each hydropower facility, the interagency work group chose target species to represent wildlife and habitats affected by the hydropower facility and/or potentially affected by mitigation projects. The species were chosen because they are of high priority according to state or federal programs, and/or because they are indicator species used to best describe habitat conditions for groups of species with similar habitat needs.

Anderson Ranch Target Species

The mallard and mink were chosen primarily to represent dabbling ducks and aquatic furbearers, respectively, and to represent a set of ecological components present in aquatic/riparian habitats. The yellow warbler was chosen primarily to represent scrub-shrub wetlands. The black-capped chickadee and ruffed grouse were chosen primarily to represent a set of ecological components present in forested wetlands. The mule deer was chosen to represent big game over a diversity of cover types. The blue grouse was chosen as a game bird species to represent the ecological characteristics of uplands in the Anderson Ranch area. The sharp-tailed grouse and peregrine falcon were chosen because they are of high priority according to state and federal programs.

Black Canyon Target Species

The mallard and mink were chosen primarily to represent dabbling ducks and aquatic furbearers, respectively, and to represent a set of ecological components present in aquatic/riparian habitats. The yellow warbler was chosen primarily to represent scrub-shrub wetlands. The black-capped chickadee was chosen to represent forested wetlands. The mule deer was chosen to represent big game over a diversity of cover types. The sharp-tailed grouse, Canada goose, and ring-necked pheasant were chosen because they are of high priority according to state and/or federal programs.

MITIGATION GOALS

For each hydropower facility, the Interagency work group agreed that a reasonable mitigation goal for wildlife impacts from the facility would be to protect and/or enhance enough wildlife habitat to replace the value of habitat inundated by each reservoir. The Interagency group further agreed to use the target species Habitat Units lost (Martin and Ablin-Stone 1986) as a guideline during the mitigation planning process, while considering existing management plans and the needs of wildlife in the areas. These decisions were based on the following:

- 1) Wildlife need habitat to exist.
- 2) Wildlife provide many social, economic, and aesthetic benefits to people through a diversity of consumptive and nonconsumptive uses.
- 3) Habitat inundation attributable to hydroelectric development and operation at the facilities reduced, and continues to reduce, the wildlife that could be supported by habitat in the reservoir areas had the facilities not been built.
- 4) The United States government, by passing the Northwest Power Act in 1980, acknowledged that benefits of power production from hydroelectric projects were occurring at the expense of wildlife, and the benefits wildlife can provide have been, and continue to be, reduced. Acknowledging that tradeoffs have occurred between benefits of wildlife and benefits of hydropower, the Northwest Power Act directed the BPA administrator to use the BPA fund and available authorities "...to protect, mitigate, and enhance...wildlife to the extent affected by the development and operation of any hydroelectric project of the Columbia River and its tributaries..." (PL 96-501).

In early times, the wildlife resource seemed unlimited and negative impacts went unnoticed. However, needs of wildlife have become more and more apparent through time, with man's continued encroachment on declining amounts of wildlife habitat. As a result, the needs that wildlife have for habitat, and the needs that people have for wildlife, seem to far outweigh the wildlife losses attributable to the Anderson Ranch and Black Canyon Facilities. However, the authorization to protect, mitigate, and enhance wildlife under this program appears to be limited to the amount wildlife was affected by hydroelectric development and operation at the projects. Accordingly, the work group agreed to use the target species Habitat Units lost as a guideline during the mitigation planning process, while keeping in mind the needs of wildlife and the demand for wildlife resources in the areas. Because the habitat degradation at the Anderson Ranch borrow site was not identified during the wildlife impact assessment, it was further agreed that the site should be rehabilitated. Also, because peregrine falcons were adversely affected by construction of the Anderson Ranch Facility, and it takes more than just improved habitat to recover this species in the northern

Rocky Mountain states, it was agreed that a reasonable level of enhancement would be establishing and maintaining 1 reintroduction site and releasing 3 to 5 birds per year for at least 10 years.

ASSESSMENT OF BENEFITS OF MITIGATION PROJECTS

Habitat Evaluation Procedure

A modification of the Habitat Evaluation Procedure (HEP) developed by the USFWS (1980) was used to estimate the benefits of mitigation projects in terms of Habitat Units (HU's). For a given species, one HU is equivalent to one acre of prime habitat. For each target species benefited by a project, the interagency team of biologists estimated the effect the project would have on the species Habitat Suitability Index (HSI). An HSI is a number between 0 and 1.0, and is a measure of an area's ability to provide the habitat requirements of a species. For a given species, prime habitat has an HSI of 1.0. Species models, comprised of measurable habitat variables, were used for guidance during HSI estimation. As much as possible, techniques to estimate HSI's and HU's were performed consistent with techniques used during the Wildlife Impact Assessments (Martin and Ablin-Stone 1986).

Mitigation Credit

Estimated benefits of protection actions and enhancement actions were credited differently for mitigation. Credit for protection of private land was the total estimated HU's that would be provided by the parcel after management rights are acquired through acquisition of fee-title or easement (willing sellers only), and after the area is enhanced through management actions. Credit for enhancement projects on lands administered by federal or state land management agencies was the estimate of HU's that would be increased on the project area as a result of the management action.

These methods and the accounting methods in the wildlife impact assessment were used in an effort to make mitigation accounting easier to understand than if the more appropriate technique of annualizing (USFWS 1980a) had been used. These simplified methods have resulted in liberal estimates of mitigation project benefits and conservative estimates of losses attributable to hydropower.

Losses attributable to the Anderson Ranch and Black Canyon Facilities were estimated as if they had occurred at one point in time, although losses of available wildlife habitats have been occurring for about 37 years and 63 years, respectively. Likewise, mitigation credits for protection/enhancement projects have been estimated as if they will occur as soon as projects are implemented. However, benefits may not occur for several years until habitats improve and wildlife increase their use of the enhanced areas.

If the projects in this plan are completed by 1990 and take only 4 years to produce the benefits estimated, by the year 2000 there will be only 6 years of benefits to mitigate 50 years of wildlife production losses at Anderson Ranch and 76 years of production losses at Black Canyon. We make this point to acknowledge the results of using simplified methods for mitigation accounting. The decision to use the simpler methods was based, in part, on good faith that annual operation and maintenance efforts would be funded for the life of the Anderson Ranch and Black

Canyon Facilities. As long as the dams are in place, inundation of wildlife habitat will continue, and hands-on management at enhancement projects will be necessary if the continuing hydropower impacts are to be mitigated to the extent wildlife is being affected.

ASSESSMENT OF COSTS OF MITIGATION PROJECTS

Advance Design

This includes the estimated costs of preparing management plans for enhancement work, conducting surveys, soliciting bids and quotes, negotiating management agreements, and associated labor and travel. For protection actions, willing sellers will be identified during advance design work. All options of acquisition of fee-titles versus conservation easements will be examined. Costs are based on estimates provided by biologists and/or engineers.

Implementation

This includes estimated costs of protection and costs of enhancement measures necessary to initially develop mitigation project areas. Protection costs include the easement or purchase price of land (based on appraised value of similar parcels), appraisals, and legal work and negotiations necessary for acquisition of easements or fee-titles from willing sellers.

The costs of acquiring conservation easements from willing sellers of private parcels is expected to be similar to actual fee-title acquisition of the same parcels. Current Idaho law regarding conservation easements requires that in most cases, in order to purchase a conservation easement, the purchasing agency must own land appurtenant to the parcel to be purchased. There are plans to submit a conservation easement bill to the Idaho Legislature in the future. A purpose of the bill would be to provide more flexibility in acquiring conservation easements.

Enhancement costs include actions to initially improve wildlife habitat, such as building dikes and islands, planting vegetation, and fencing. Implementation costs are based on estimates provided by biologists and/or engineers.

Operation and Maintenance (O&M)

These are recurring annual costs necessary to achieve and sustain a project's estimated benefits to wildlife. Operation and maintenance includes work such as fence maintenance, weed control, water level control, nesting and perching structure maintenance, grazing management to maintain desired habitat conditions through management of livestock and operators, island rehabilitation, and associated labor and travel. Costs are based on estimates provided by biologists.

Monitoring

This includes the cost of collecting baseline biological data as well as periodic monitoring of all mitigation lands. Baseline data and monitoring are necessary to assess the effectiveness of proposed protection/enhancement measures. Using adaptive management, mitigation

techniques will be changed if monitoring indicates that the desired mitigation results are not being obtained. Costs are based on estimates by biologists.

RESULTS AND DISCUSSION

TARGET SPECIES

Mallard

Biological needs. The mallard is a dabbling duck that depends on wetlands for successful nesting and brood production. Their diet consists primarily of aquatic plants; the presence of shallow-water feeding areas is critical (Johnsgard 1975). Nests are generally located on the ground in dense herbaceous vegetation, usually within 100 meters of water (Bellrose 1976). An important habitat-related factor that affects mallard populations is predator-caused nest failure (Bellrose 1976). In summary, mallard production is best in areas that have dense herbaceous vegetation close to water, and that are relatively safe from predators.

Management goals. IDFG management goals for mallards in particular and waterfowl in general include: 1) increase Idaho's resident duck populations, 2) protect and improve wetlands, 3) increase Idaho's duck production by improving nesting habitat statewide, and 4) make a concerted effort to acquire food for ducks for use in summer, fall, and winter (Will et al. 1986).

USFWS goals for the Snake River area of southwestern Idaho include maintaining wintering waterfowl habitats to support a mid-winter population of 500,000 mallards. Strategies for this goal include maintaining current amounts and quality of seasonal and permanent wetlands, and selectively acquiring critically needed habitat. The USFWS identifies continued loss of wetlands and riparian habitat as a current problem (USFWS 1980b). Presently, mallard populations in southwestern Idaho are far below the USFWS goal. The 1986 mid-winter mallard count in all of southern Idaho was only 93,495.

Canada Goose

Biological Needs. Geese tend to nest very close to water on sites with good visibility. They prefer to nest on small islands, but they also nest on narrow peninsulas and along the water's edge. They readily use artificial nest structures, but these structures require annual maintenance. The primary causes of nest failure are desertion, predation, and flooding. Brood habitat includes open water, gentle bank slopes, and short succulent grasses and forbs for food. If adequate brooding habitat is close to nests, the birds will stay in the vicinity of the nest site throughout spring, summer, and fall. If brooding habitat is not available, adults will take the young elsewhere, sometimes several miles from the nest site. Such movements may result in increased mortality of the young (Will et al. 1986).

Management goals. IDFG management goals for Canada geese include: 1) increase local goose populations, 2) protect and improve habitat for

resident Canada geese, and 3) develop and/or enhance goose nesting and brood-rearing habitat (Will et al. 1986). The 1987 breeding pair goose counts in southwestern Idaho were below the minimum objectives for the area.

Presently, there are no published Pacific Flyway Council goals specific to the southwestern Idaho area. There is a draft management plan in progress at this time. USFWS goals for the Snake River area of southwestern Idaho include: 1) maintain wintering waterfowl habitats to support a mid-winter population of 35,000 western Canada geese (Branta canadensis moffitti), and 2) maintain 1,500 nesting pairs of western Canada geese (USFWS 1980b:MB 35-36). Strategies include preserving/enhancing nesting sites and preserving and enhancing brooding habitat. The USFWS has identified decreased production of Canada geese along the Snake River as a current problem because of loss and degradation of nesting and brooding habitats, with construction of dams being the cause of such habitat loss (USFWS 1980b). The 1986 mid-winter Canada goose count for all of southern Idaho was only 11,521. The 1987 Canada goose breeding pair count in southwestern Idaho was only 866.

Mink

Biological needs. Mink are predaceous mammals that use aquatic habitats and riparian and upland habitats within 100 to 200 meters of the water's edge (Melquist et al. 1981). Habitats associated with small streams are preferred to those with large, broad rivers. Also, wetlands with irregular and diverse shorelines provide more suitable habitat than those with straight open and exposed shorelines (Allen 1984). Mink feed on a variety of prey including fish, small mammals, and waterfowl. The presence of muskrats can be very important to mink populations.

Management goals. IDFG management goals for aquatic furbearers in general and mink in particular include: 1) cooperating with land managers to implement habitat management programs, and 2) maintaining an annual harvest of mink.

Yellow Warbler (Indicator Species for Scrub-shrub Wetlands)

Biological needs. The yellow warbler breeds throughout most of the United States and is a common breeder in scrub-shrub habitat in Idaho. Preferred nesting habitats for this insectivorous warbler are generally wet areas with abundant shrubs or small trees (Schroeder 1982). Areas of extensive forest with closed canopies are generally avoided (Hebard 1961), while areas of low deciduous growth are preferred (Morse 1973). A breeding bird census across the United States (VanVelzen 1981) was summarized to determine nesting habitat needs of the yellow warbler (Schroeder 1982). Approximately 67% of all censused areas dominated by shrubs were used, while 100% of all shrub wetlands received use. Wetland shrub habitats also had the highest average breeding densities of yellow warblers. In Idaho, yellow warblers also occupy areas dominated by deciduous shrubs or narrow stream-side thickets (Larrison et al. 1967).

Management goals. 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).

Black-capped Chickadee (Indicator Species for Forested Wetlands)

Biological needs. Black-capped chickadees generally prefer deciduous or riparian woodlands (Larrison and Sonnenberg 1968, Sturman 1968). Cadwallader (1980) found that black-capped chickadees were associated with riparian zones on the South Fork of the Boise River in southern Idaho. Chickadees are "insect gleaners" and serve as important insect predators in forested areas (Sturman 1968).

Black-capped chickadees are cavity nesters (Stauffer and Best 1980). Nesting habitat is often limited by the number of available snags (Schroeder 1983). Preferred nesting tree species include willows (Salix spp.) and cottonwoods and poplars (Populus spp.).

Management goals. Similar to the yellow warbler, the future distribution of the black-capped chickadee is closely tied to riparian area management goals in Idaho. IDFG riparian goals for nongame species are listed under "Management goals" for the yellow warbler.

Ruffed Grouse

Biological needs. Ruffed grouse inhabit early successional deciduous communities and prefer sites dominated by quaking aspen (Populus tremuloides) (Berner and Gysel 1969). Gullian (1970) considered the presence of aspen to be critical in maintaining viable ruffed grouse populations in Minnesota. In the Pacific Northwest, ruffed grouse are typically found in lowlands and river bottoms, in ecotones between forests and clearings, and in brush tangles in burned or logged areas (Jackman and Scott 1975). In Idaho, they also use aspen stands year-round (Stauffer and Peterson 1985).

The ruffed grouse diet consists primarily of plant matter. Aspen and cottonwoods were listed as the principal foods in 17 different studies (Korschgen 1966). Winter foods consist largely of buds and twigs of trees. Aspen was the most important winter food source in Minnesota (Gullian 1967).

Management goals. Idaho Fish and Game goals for forest grouse are to protect and enhance habitat whenever possible, and to increase populations and distribution (Rybarczyk et al. 1985).

Mule Deer

Biological needs. Mule deer are herbivores that use a variety of habitats and usually migrate between seasonal ranges. Winter range is a critical component of mule deer habitat, and spring and summer-fall ranges are also very important (Trent et al. 1985).

Mule deer winter habitat in most of southern Idaho is low elevation sagebrush-grassland range. Cover, aspect, and elevation are recognized as crucial components of winter range, where availability of thermal sites and forage is important. Loveless (1967, cited by Mackie et al. 1982) reported that snow depths of 20 inches or more precluded the use of an area by mule deer. Gilbert et al. (1970) found snow depths in excess of 18 inches to preclude deer use of an area. Winter diet is principally browse (leaves and twigs of shrubs and trees). The availability of adequate browse is often the limiting factor for mule deer populations over much of their range (Schneegas and Bumstead 1977).

Early spring is an important time of year for mule deer, and spring range is a key component of year-round habitat. Quality and quantity of nutritious forage in the spring has a major effect on mule deer production and survival (Wallmo et al. 1977). Spring diet contains a high percentage of grasses (Hill 1956) as well as forbs and browse (Kufeld et al. 1973).

Summer-fall ranges are important because this is where deer produce fat reserves that allow survival through winter (Trent et al. 1985). Forbs and new shrub growth comprise most of the diet during this period (Schneegas and Bumstead 1977).

Management goals. IDFG statewide habitat-related goals for mule deer include the following:

- 1) Acquire and/or improve winter range.
- 2) Through purchase of fee-titles or easements, work toward maintaining access to habitat.
- 3) Purchase parcels within or adjacent to the boundaries of established wildlife management areas.

IDFG habitat-related goals for mule deer in the mitigation areas include the following:

- 1) Attempt to purchase important winter range, adjacent to the Boise River WMA, that is in private ownership and thus subject to subdivision.

- 2) Prepare and pursue recommendations to improve sagebrush winter ranges dominated by cheatgrass and medusahead.
- 3) Urge BLM to monitor the condition and trend of bitterbrush on key winter ranges and, if necessary, adjust livestock grazing and/or initiate other rehabilitation projects to protect this browse species.
- 4) Support and recommend management actions by the BLM to improve riparian habitats.

Blue Grouse

Biological needs. Martin and Ablin-Stone (1986) and Rybarczyk et al. (1985) summarized the ecology and biological needs of the blue grouse, which is present throughout most of the forested portions of Idaho where Douglas fir (Psuedotsuga menziesii) is present.

Blue grouse follow a seasonal, elevational migration through a variety of habitat types. They winter at high elevations in open Douglas fir stands and feed on fir needles and buds. Both sexes migrate to lower elevations in the spring, where they occupy mixed brush, shrub, and deciduous tree sites. After breeding, the females nest in brushy cover, selecting tall sagebrush if available, and other brushy and herbaceous areas where tall sagebrush is not available. After breeding, males return to higher elevations where they summer.

Females and broods remain at lower elevations throughout the summer and early fall. Brood-rearing habitat appears to be that which provides ample opportunity for young to feed on insects and other invertebrates (Johnsgard 1983). The most important characteristics of brooding areas are proximity to cover, and an extensive herbaceous layer (Donaldson and Bergerud 1974). Low elevation areas used for breeding by blue grouse often are used extensively by livestock. Grazing that dramatically reduces the extent and height of herbaceous vegetation also reduces the quality of brood-rearing habitat (Zwickel 1972).

Management goals. Idaho Fish and Game goals for forest grouse are to protect and enhance habitat whenever possible, and to increase populations and distribution (Rybarczyk et al. 1985).

Sharp-tailed Grouse

Biological needs. Columbian sharp-tailed grouse historically were abundant and widespread throughout the Pacific Northwest, including Idaho. The range of the species is now severely limited because of livestock overgrazing and agricultural development (Rybarczyk et al. 1985). Sharptails are now confined to scattered grassland/brush habitats in the southeastern and western portions of Idaho.

Habitat for the sharptail has generally been described as flat to rolling sagebrush/grassland with inclusions of deciduous brush and trees

(Marshall and Jensen 1937, Parker 1970). The sagebrush/grass areas provide for breeding, nesting, and brood-rearing. The deciduous shrub component (chokecherry, hawthorn, serviceberry, etc.) provides year-long escape cover as well as a critical source of food during the fall and winter.

Management goals. The Columbian sharp-tailed grouse has been designated as a "Species of Special Concern" by the IDFG, and as a "Sensitive Species" by both the USFWS and the BLM. BLM policy is to maintain or increase current levels of sensitive animals through early habitat protection or enhancement (BLM Manual 6840). A goal of the IDFG is to protect and enhance sharptail habitat, and a strategy of the Department is to urge land managers to implement special measures to protect critical sharptail habitats from overuse by livestock (Rybarczyk et al. 1985).

Ring-necked Pheasant

Biological needs. Ring-necked pheasants are closely associated with agricultural areas and occur in varying abundance on or near farmland throughout Idaho (Rybarczyk et al. 1985). Nesting and winter cover are probably the two most limiting factors for pheasants in the Northwest (Galbreath 1973). Riparian and wetland habitats near agricultural areas are of critical importance to pheasants in Idaho, especially in providing winter cover. Sagebrush habitats adjacent to agricultural land also provide important winter cover (Rybarczyk et al. 1985).

Rybarczyk et al. (1985) summarized the present condition of the pheasant population in Idaho:

"Lack of winter food and cover are the major factors currently limiting pheasant populations in Idaho, and this problem will probably become more acute in the future. ... Most pheasant habitat is on private property, and changes in farming practices have seriously affected pheasant populations throughout Idaho. Since the 1960's, intensive farming has resulted in larger farms, removal of riparian and wetland habitats, fewer hedgerows and fencelines, less ditch bank cover, greater pesticide and herbicide use, more spring burning, and a declining pheasant population. ... Available habitat will probably continue to decline in Idaho unless the economic climate dictates changes in agriculture and human population distribution."

Management goals. A goal of Idaho Fish and Game is to enhance winter habitat whenever and wherever possible. A strategy of the IDFG is to work more closely with government agencies to promote development and management of winter habitat for pheasants (Rybarczyk et al. 1985).

Peregrine Falcon

Biological needs. The peregrine falcon is presently listed as endangered in the United States under the Endangered Species Act of 1973 (as amended). Severe population declines were identified in the early

1960's, with peregrines essentially extirpated from the northern Rocky Mountain states by 1975 (Heinrich et al. 1986). It has been suggested that the demise of the peregrine could be traced to a loss of habitat (wetlands and associated prey base), and the widespread use of DDT and its metabolites, which prevented reproduction from occurring (USFWS 1984b).

Peregrines in the Rocky Mountains nest mainly on mountain cliffs and river gorges. Nest sites are often adjacent to water courses and impoundments because of the abundance of avian prey that frequent such areas.

Peregrines may travel up to 17 miles from nesting cliffs to hunting areas (Porter and White 1973). Habitats such as river bottoms, marshes, meadows, and lakes attract numerous small birds and provide preferred hunting areas for peregrines.

Management goals. Under the American peregrine falcon recovery plan (USFWS 1984), the statewide recovery objective for Idaho is 17 nesting pairs. One nesting pair now exists in Idaho, in the eastern part of the state. An objective of a recently submitted cooperative proposal (Heinrich et al. 1986) is to establish and maintain 30 nesting pairs of peregrine falcons in the tri-state recovery area (includes eastern Idaho) by 1990. The objective for Idaho under this proposal is the establishment of 10 nesting pairs in the eastern part of the state. Potential release sites in the rest of Idaho are widely scattered (Heinrich et al. 1986). As much as possible, sites will be grouped to enhance establishment of local populations of peregrines (Burnham 1986). Three peregrine hack sites are currently maintained in western Idaho (R. Howard, pers. commun.).

The IDFG will attempt to re-establish extirpated native species to portions of their former range (Morache et al. 1985). The Department will continue to cooperate with USFWS, BLM, USFS, private industry, and the Peregrine Fund in hacking programs to reintroduce breeding peregrines into suitable locations in Idaho.

ANDERSON RANCH MITIGATION PLAN

Anderson Ranch Mitigation Goals

The goal of this mitigation plan is to at least replace the target species' Habitat Units (HU's) lost due to the development and operation of the Anderson Ranch Facility, through a combination of protection/enhancement projects. As per agreement between the Idaho Department of Fish and Game and the Bonneville Power Administration (Project No. 86-73), the interagency work group has made a strong effort to develop mitigation actions (projects) that will address the needs of wildlife and benefit the greatest number of target species. However, as large multi-species projects are developed, it becomes apparent that some target species will gain more HU's than were originally lost, and some target species will gain fewer HU's than were lost. With this knowledge, the interagency work group agreed that some tradeoffs between extra benefits to some target species and fewer benefits to other target species would have to occur within the overall mitigation plan, in order to meet contractual agreements, and to provide for the needs of wildlife in the area. Furthermore, this methodology provides for the most cost-effective and reasonable means of mitigation.

Anderson Ranch Preferred Mitigation Projects

The following preferred mitigation projects were developed and prioritized by the interagency work group. Projects were developed using the Anderson Ranch wildlife impact assessment (Martin and Ablin-Stone 1986) as a guideline, while considering the needs of wildlife in the area.

Section 4(h)(8)(A) of the Northwest Power Act provides the opportunity to use enhancement measures as a means of achieving offsite protection and mitigation with respect to compensation for losses arising from the development and operation of the Columbia River hydroelectric facilities. This section allows flexibility in the location of proposed mitigation projects. However, all mitigation projects developed in this plan are located in the general vicinity of Anderson Ranch Reservoir, with final selection and prioritization based more on target species benefits and needs than on distance from the reservoir.

It is the interagency work group's understanding that should future circumstances dictate that a preferred mitigation project is not feasible, then alternative projects would be added to the preferred plan until the loss of the preferred project (in terms of target species' HU's) would be compensated for.

Hill City Marsh protection/enhancement. Protect and enhance 6,100 acres of wetlands and uplands in the Camas Creek area. Protection will be through acquisition of fee-titles or easements from willing sellers. Currently, these private parcels are heavily grazed, and the marsh area is threatened with being drained.

Constructing low dikes (about 2 miles of dikes 4 feet high), modifying existing roadway fills, and installing water control structures will stabilize water levels and provide for permanent shallow water and marsh on about 40% of the acreage that can be protected. The acquisition of water rights from downstream users may be necessary to achieve the full habitat potential of this project.

Additional enhancement proposals include planting about 400 acres of aspens and cottonwoods, planting some willows and serviceberry, revegetating about 600 agricultural acres into permanent cover, building about 15 miles of fence, and planting waterfowl food crops in some upland areas.

Annual operation and maintenance efforts will include maintaining fences, regulating water control structures, maintaining dikes, enhancing riparian vegetation, controlling weeds, managing grazing to benefit wildlife, and planting waterfowl food crops.

Benefits: Acquiring full management rights, and subsequently managing this area for wildlife, will protect and enhance this unique marsh/creek/upland complex. In addition to the target species listed below, protection and improvement will benefit a broad variety of wetland and upland associated species including the sandhill crane, long-billed curlew, Swainson's hawk, muskrat, Canada goose, sage grouse, and numerous other shorebirds, waterbirds, raptors, and upland species. It is possible the project would benefit bald eagles and peregrine falcons in the future.

<u>Species</u>	<u>HU's</u>
Mallard	2,600
Mink	970
Blue grouse	1,210
Ruffed grouse	200
Yellow warbler	280
Black-capped chickadee	360
Total	5,620

Costs: Advance design will include conducting aerial contour surveys, identifying willing sellers, preparing a management plan, negotiating management agreements, and soliciting bids and quotes. Estimated implementation costs include costs for acquiring easements or fee-titles from willing sellers, and costs of enhancements necessary to initially develop the project area. Annual operation, maintenance, and monitoring will be necessary to achieve and sustain the project's estimated benefits.

Advance Design	220,000
Implementation	<u>1,960,000</u>
Total	\$2,180,000
Operation and Maintenance	70,000
Monitoring	<u>6,000</u>
Total Annual Costs for Life of Anderson Ranch Project	\$76,000

Bennett Hills big game winter range enhancement. Enhance about 15,500 acres of BLM-administered land, on crucial mule deer winter range, through rehabilitation and grazing control. The goal of rehabilitation is to establish and perpetuate shrubs, perennial grasses, and forbs on medusahead (Elymus caput-medusae) and/or cheat grass (Bromus tectorum) dominated areas. These areas occur on about 15% (2,300 acres) of the area proposed for enhancement. Perpetuation of rehabilitation efforts will require purchase of grazing preferences from willing sellers over the 15,500 acres. About 11 miles of fencing are estimated to be needed. Greenstripping and some annual bulldozer grading will be necessary to reduce the chances of fire ignition in the enhancement area. To maintain the estimated benefits of this project over time, it is estimated that the rehabilitation efforts will have to be re-done about every 20 years. Other annual operation and maintenance needs include maintenance of fences, greenstrips, and bulldozer scrapes.

Benefits: Areas to be rehabilitated presently provide almost no wildlife habitat values. Establishing shrubs, perennial grasses, and forbs will benefit a variety of wildlife in addition to enhancing crucial mule deer winter range. Control of grazing over the entire enhancement area will help protect the rehabilitated areas, enhance riparian vegetation, and enhance existing sagebrush-grasslands that have been perennially heavily grazed.

<u>Species</u>	<u>HU's</u>
Mule deer	2,670
Yellow warbler	100
Total	2,770

Costs: Advance design will include identifying willing sellers of grazing preferences, preparing a management plan, negotiating management agreements, and soliciting bids and quotes.

Implementation cost estimates include the costs of initially enhancing the crucial winter range, and costs necessary to protect the investment (greenstripping, bulldozer grading). Annual operation, maintenance, and monitoring will be necessary to achieve and sustain the project's estimated benefits.

Advance Design	80,000
Implementation	680,000
Total	\$760,000

Operation and Maintenance	40,000
Monitoring	8,000
Total Annual Costs for Life of Anderson Ranch Project	\$48,000

Nelson Ranch area protection/enhancement. Protect, through acquisition of fee-titles, grazing permits, or easements from willing sellers, 960 acres of key Columbian sharp-tailed grouse habitat in western Idaho on or adjacent to the 4,200 acre, privately owned Nelson Ranch. The Nelson Ranch contains the largest known population of Columbian sharptails in western Idaho. The ranch contains 4 of the 5 known dancing grounds in western Idaho. The population has fluctuated between 50 - 200 birds during the last 6 years. The availability of good winter range, consisting of mountain shrub patches and riparian zones, is believed to be a limiting factor to sharptails. Proposed enhancement measures on the protected 960 acres include fencing for grazing control and patch planting 2,000 two year old stock of serviceberry, chokecherry, and hawthorn in existing poor condition mountain shrub patches and riparian zones.

Benefits: Protection and enhancement of this parcel will help ensure the continued existence of the Columbian sharp-tailed grouse in western Idaho. This project will also benefit blue grouse. However, because the project will benefit sharp-tailed grouse more, the interagency work group agreed to use sharp-tailed grouse as the target species for this project, instead of blue grouse. This project will also benefit yellow warblers, because of the existing riparian shrub and mountain shrub component in the area. Nontarget species benefited by this project include sage grouse, California quail, chukars, and gray (Hungarian) partridge. This area also provides important spring/fall deer and elk range.

<u>Species</u>	<u>HU's</u>
Sharp-tailed grouse	<u>770</u>
Yellow warbler	<u>10</u>
Total	780

Costs: Advance design includes costs associated with the identification of willing sellers, boundary surveys, preparation of management plans, soliciting bids and quotes, negotiating management agreements and is expected to cost about \$10,000. Implementation costs to protect and enhance 960 acres are estimated at about \$93,000. This includes costs of acquisition of fee-titles, grazing permits, or easements, appraisals, legal fees, shrub plantings, and fencing. Annual operation and maintenance (replanting, fence repair, etc.), and monitoring will be necessary to sustain annual wildlife benefits.

Advance Design	10,000
Implementation	<u>93,000</u>
Total	\$103,000
Operation and Maintenance	3,000
Monitoring	<u>1,000</u>
Total Annual Costs for Life of Anderson Ranch Project	\$4,000

Boise River riparian protection/enhancement. Protect and enhance about 160 acres of privately owned land, and enhance 40 acres of county land adjacent to the Boise River. The area is predominantly forested wetland habitat. Protection will be through acquisition of easements or fee-titles from willing sellers. Currently, these areas are seriously degraded due to livestock grazing. There is no regeneration of trees occurring, and most of the cottonwoods are old, with short remaining life spans. These areas are classified as Class A lands under the Boise River Plan. They were identified as extremely important to preserve in the Boise River Plan because of their value to bald eagles and other wildlife species. Enhancement proposals include fencing and planting of native trees and shrubs. Annual fence maintenance and planting maintenance will be necessary.

Benefits: Protection and enhancement would preserve and improve a forested wetland community that is presently very degraded. Large numbers of wintering bald eagles use this area. This project would enhance their habitat and help ensure their continued presence along this section of the Boise River. The wildlife impact assessment identified that the Anderson Ranch Facility adversely affected wintering bald eagles and forested wetlands. Protection and enhancement of this specific area would help mitigate for forested wetland losses, as well as benefiting wintering bald eagles more than protection and enhancement of any other riparian area on the Boise River. In addition to the target species below, many other nongame, furbearer, and waterfowl species would also benefit by protection and enhancement of these areas.

<u>Species</u>	<u>HU's</u>
Black-capped chickadee	180
Mink	140
Mallard	<u>130</u>
Total	450

Costs: Advance design will include identifying willing sellers, preparing a management plan, negotiating management agreements, and soliciting bids and quotes. Implementation costs include estimated costs for acquisition of easements or fee-titles from willing sellers, and estimated costs of enhancement actions. Annual operation, maintenance, and monitoring will be necessary to achieve and sustain the project's estimated benefits.

Advance Design	15,000
Implementation	<u>210,000</u>
Total	\$225,000
Operation and Maintenance	6,000
Monitoring	<u>2,000</u>
Total Annual Costs for Life of Anderson Ranch Project	\$8,000

Peregrine falcon reintroduction. The goal of this project is to annually release 3 to 5 peregrines from a hack (reintroduction) site for at least 10 years. After 10 years of releases, success of the project will be evaluated to assess whether further releases are needed. The location of the hack site will be determined in the future, based on habitat suitability, proximity to other release sites, and other biological factors. The site will likely be in western Idaho. The exact location of the site may vary annually, based on returning falcons, predators, success of previous releases, etc.

Costs: Advance design will include selecting a hack site, preparing a management plan, negotiating management agreements, and soliciting bids and quotes. Implementation costs for 10 years of releases are estimated to be \$17,000 per year, and include the propagation and release of birds. Operation and maintenance will be necessary as long as releases are made. Monitoring costs include annual surveys to locate active nests and signs of productivity, and an evaluation of the release site and methods.

Advance Design	2,000
Implementation	<u>170,000</u>
Total	\$172,000

Operation and Maintenance	1,000
Monitoring	<u>4,000</u>
Total Annual Costs for 10 Years	\$5,000

Anderson Ranch borrow site rehabilitation. The borrow site by Anderson Ranch Dam provided fill for the dam site, and presently is in a severely degraded condition. The site is on USFS-administered lands. Historically, the area provided sagebrush-grassland habitat. Wildlife losses at the 80 acre site were not addressed during the Anderson Ranch wildlife impact assessment. Rehabilitation actions at the site would be specifically for impacts at the site, and would take advantage of opportunities to enhance the site for waterfowl and improve water quality.

The project includes bulldozer leveling and planting a shrub/forb/grass mixture on about 60 acres, constructing 4 or 5 short dikes to create 3 or 4 small ponds and increase the size of one small pond, planting willows around the ponds, and protecting the area with 2 miles of fencing. About 12 acres of ponds may be possible.

Benefits: Establishing shrubs, forbs, and grasses on the site will benefit a variety of wildlife, including blue grouse and mule deer. Pond development will benefit many species, including mallard. Water quality will also be improved. Benefits to blue grouse, mallard, and mule deer are estimated to be less than the losses that occurred for these target species at the borrow site.

Costs: Advance design will include preparing a management plan, and soliciting bids and quotes. Implementation costs include the estimated costs to initially rehabilitate and enhance the site. Operation, maintenance, and monitoring costs include annual inspection and repairs of the dikes, and evaluation of the project's success.

Advance Design	5,000
Implementation	<u>50,000</u>
Total	\$55,000
Operation and Maintenance	2,000
Monitoring	<u>1,000</u>
Total Annual Costs for Life of Anderson Ranch Project	\$3,000

Anderson Ranch Preferred Mitigation Plan Summary

The Interagency work group has developed a preferred mitigation plan (Table 5) that follows the mitigation goals outlined at the beginning of this planning process. A number of alternative mitigation projects were examined, before formulation of the preferred plan. Estimated benefits from the preferred projects are presented in Table 6, estimated initial 10-year costs are outlined in Table 7, and a 5-year action plan is in Table 8. Projects were prioritized by the Interagency work group based on mitigation goals and needs of wildlife in the area.

To our knowledge, all proposed acquisitions of easements or fee-titles in the mitigation plan meet the land acquisition criteria outlined in the Columbia River Basin Fish and Wildlife Program and the Northwest Power Act. Projects complement management policies and goals of federal and state wildlife agencies and the Shoshone-Bannock Tribes. Acquisition projects were developed by professional wildlife biologists who took into consideration the needs of wildlife in the area, the cost-effectiveness of acquisition projects compared to available alternatives, and the biological objectives of the mitigation plan. To our knowledge, funding of these mitigation projects with the BPA fund is not in lieu of any other expenditures presently authorized or required from other entities under other agreements or provisions of law.

Annual operation, maintenance, and monitoring of mitigation projects will be necessary for the life of the Anderson Ranch Facility for this Plan to protect, mitigate, and enhance wildlife to the extent affected by hydroelectric development and operation of the facility. Continued annual funding is justified by the fact that as long as the facility is in place, the identified wildlife habitat impacts will continue to occur. The Anderson Ranch Facility inundated naturally self-perpetuating ecosystems. A large part of this Plan is to mitigate those losses through man-made enhancements, which are not naturally self-perpetuating. Under the methods in this Plan, mitigation credit for enhancement is the difference between the habitat values presently provided and the increased habitat values provided with hands-on management (habitat treatments followed by operation, maintenance, and monitoring). If annual operation, maintenance, and monitoring of enhancement actions cease being funded, management actions will cease, and the mitigation projects will no longer provide the full benefits estimated in this Plan. As a result, the benefits of mitigation projects would have to be re-evaluated, and more acquisitions of fee-titles or easements would be needed to mitigate the Anderson Ranch Facility wildlife losses. Because annual wildlife losses will continue for the life of the Anderson Ranch Facility, annual benefits of enhancement actions must be sustained by hydropower beneficiaries for this Plan to mitigate wildlife impacts to the extent affected by hydropower. The Interagency work group looks forward to continued coordination with the Northwest Power Planning Council and the Bonneville Power Administration.

Table 5. Anderson Ranch Facility wildlife protection, mitigation, and enhancement plan summary. These projects are not in order of priority.

Target Species	Habitat Losses Attributable to Hydropower	Mitigation Goals
Mallard	1,048 HU's	<p>Provide benefits of 2,730 mallard HU's, 1,110 mink HU's, 290 yellow warbler (scrub-shrub wetland) HU's, 540 black-capped chickadee (forested wetland) HU's, 200 ruffed grouse HU's, 1,210 blue grouse HU's, and 770 sharp-tailed grouse HU's (tradeoff for blue grouse losses) preferably through the following 3 mitigation projects:</p> <p>1) Protect and enhance 6,100 acres of wetlands/uplands, preferably in the Camas Creek (Hill City Marsh) area. This project will result in estimated gains of 2,600 mallard HU's, 970 mink HU's, 280 yellow warbler (scrub-shrub wetland) HU's, 360 black-capped chickadee (forested wetland) HU's, 200 ruffed grouse HU's, and 1,210 blue grouse HU's. Multi-species benefits from this project result in necessary, but cost-effective, tradeoffs between extra benefits to some target species and fewer benefits to other target species.</p> <p>2) Protect and enhance 960 acres of key sharp-tailed grouse habitat preferably on or near the Nelson Ranch as a tradeoff for blue grouse habitat losses. This project will result in estimated gains of 770 sharp-tailed grouse HU's and 10 yellow warbler HU's.</p> <p>3) Protect and enhance 200 acres of predominantly forested wetland habitat preferably on the Boise River. This project will result in estimated gains of 130 mallard HU's, 140 mink HU's, 180 black-capped chickadee (forested wetland) HU's, in addition to</p>
Mink	1,732 HU's	
Yellow warbler (scrub-shrub wetland)	361 HU's	
Black-capped chickadee (forested wetland)	890 HU's	
Ruffed grouse	919 HU's	
Blue grouse	1,980 HU's	

Table 5. Continued.

Target Species	Habitat Losses Attributable to Hydropower	Mitigation Goals
		protecting key winter habitat for a large number of bald eagles.
		All 3 projects: Years 1-3, advance design. Years 2-6, implementation. Year 3 through life of Anderson Ranch Facility, annual operation, maintenance, and monitoring.
		An additional 100 yellow warbler (scrub-shrub wetland) HU's will be provided, preferably by the following mule deer project.
Mule deer	2,689 HU's	Provide benefits of 2,670 mule deer HU's, preferably through enhancement of 15,500 acres of crucial mule deer winter range in the Bennett Hills area. This project will also provide 100 yellow warbler (scrub-shrub wetland) HU's. Years 1-3, advance design. Years 2-6, implementation. Year 3 through life of Anderson Ranch Facility, annual operation, maintenance, and monitoring.
Peregrine falcon	1,222 acres of riparian habitat, and loss of nesting pair(s)	Establish and maintain 1 hacking (reintroduction) site for at least 10 years. Peregrines will be released at the rate of 3 to 5 birds per year. Year 1, advance design. Years 2 to at least 11, annual implementation, operation, maintenance, and monitoring.
Blue grouse, Mallard	80 acres at borrow site	Rehabilitate and enhance the Anderson Ranch borrow site, which was not addressed in the wildlife impact assessment. Year 1, advance design. Years 2-3, implementation. Year 3 through life of Anderson Ranch Facility, annual operation, maintenance, and monitoring.

Table 6. Estimated benefits (Habitat Units) of the Anderson Ranch preferred mitigation plan. Projects are listed in order of priorities chosen by the Interagency work group.

Project	Target Species								Total
	Mallard	Mink	Yellow Warbler	Black-capped Chickadee	Ruffed Grouse	Mule Deer	Blue Grouse	Sharp-tailed Grouse	
Hill City Marsh protection/enhancement (6,100 ac)	2,600	970	280	360	200		1,210		5,620
Bennett Hills big game winter range enhancement			100			2,670			2,770
Nelson Ranch area protection/enhancement (960 ac)			10					770	780
Boise River riparian protection/enhancement (200 ac)	130	140		180					450
Peregrine reIntroduction									
Anderson Ranch borrow site rehabilitation ¹									
Total	2,730	1,110	390	540	200	2,670	1,210	770	9,620

¹ Project is specifically to rehabilitate and enhance this site, which was not addressed in the wildlife impact assessment.

Table 7. Estimated initial 10 year costs of the Anderson Ranch preferred mitigation plan. After the initial 10 years, annual operation, maintenance, and monitoring will continue to be necessary to sustain project benefits. Projects are listed in order of priorities chosen by the interagency work group.

Project	Advance Design	Implementation	Operation and Maintenance	Monitoring	Total Initial 10 Year Costs ¹
Hill City Marsh protection/ enhancement (6,100 ac)	220,000	1,960,000	70,000	6,000	2,712,000
Bennett Hills big game winter range enhancement	80,000	680,000	40,000	8,000	1,096,000
Nelson Ranch area protection/ enhancement (960 ac)	10,000	93,000	3,000	1,000	131,000
Boise River riparian protection/ enhancement (200 ac)	15,000	210,000	6,000	2,000	281,000
Peregrine reintroduction	2,000	170,000	1,000	4,000	207,000
Anderson Ranch borrow site rehabilitation	5,000	50,000	2,000	1,000	76,000
Total	332,000	3,163,000	122,000	22,000	4,503,000

¹ Operation, maintenance, and monitoring costs are multiplied by 7 in the initial 10 year cost estimate. The assumption is that the first 3 years will primarily be advance design and implementation, with the knowledge that the schedule of projects will vary.

Table 3. Initial 5-year action plan for Anderson Ranch Facility wildlife protection, mitigation, and enhancement plan.

Year	Action
1	Advance design for all mitigation projects.
2	Continue advance design on all mitigation projects; begin implementation on all mitigation projects.
3	Continue implementation on all projects; begin operation, maintenance, and monitoring of projects where implementation has begun.
4, 5	Continue implementation on all projects not fully completed; continue annual operation, maintenance, and monitoring on all projects.

Anderson Ranch Alternative Mitigation Projects

The following alternative mitigation projects were developed by the Interagency work group. It is the work group's understanding that should future circumstances dictate that a preferred mitigation project is not feasible, then alternative projects would be added to the preferred plan until the loss of the preferred project (in terms of target species' HU's) would be compensated for. Projects are listed in order of priority under each general project classification (Table 9).

Table 9. Anderson Ranch alternative mitigation projects. Projects are listed in order of priority under each of the general project classifications.

<u>Target Species</u>	<u>Page No. in Text</u>
<u>Big Game</u>	
Bennett Hills big game winter range protection/enhancement	51
<u>Waterfowl/Aquatic Furbearer</u>	
Magic Reservoir protection/enhancement	52
Little Camas Reservoir protection/enhancement	53
Anderson Ranch subimpoundment	54
<u>Deciduous Forested Wetland/Nongame</u>	
South Fork Boise River riparian protection/enhancement (Featherville segment)	55
South Fork Boise River riparian protection/enhancement (Smoky Bar segment)	56
<u>Upland Game</u>	
Willow Creek protection/enhancement	57
Ruffed grouse (aspen) enhancement	58

Bennett Hills big game winter range protection/enhancement. Protect and enhance 6,400 acres in the Bennett Hills crucial mule deer winter range. Protection would be through acquisition of fee-titles or easements from willing sellers. Presently, the parcels are heavily grazed and in need of range improvements. Some are surrounded by public land. The goal of rehabilitation on these parcels would be to establish and perpetuate shrubs, perennial grasses, and forbs on areas currently dominated by medusahead and/or cheatgrass. These areas occur on an estimated 20% (1,280 acres) or more of the acreage proposed for acquisition. Perpetuation of rehabilitation efforts will require greenstripping and some annual bulldozer grading to reduce the chances of fire ignition. An estimated 20 miles of fencing would be needed to exclude livestock. To maintain the estimated benefits of this project over time, it is estimated that the rehabilitation efforts would have to be re-done about every 20 years. Other annual operation and maintenance needs would include maintenance of fences, greenstrips, and bulldozer scrapes.

Benefits: Areas to be rehabilitated presently provide almost no wildlife habitat values. Establishing shrubs, perennial grasses, and forbs would benefit a variety of wildlife in addition to enhancing crucial mule deer winter range. Successful exclusion of livestock grazing would help protect the rehabilitated areas, enhance riparian vegetation, and enhance existing sagebrush-grasslands that have been perennially heavily grazed.

<u>Species</u>	<u>HU's</u>
Mule deer	2,690
Yellow warbler	220
Total	2,910

Costs: Advance design would include identifying willing sellers, preparing a management plan, negotiating management agreements, and soliciting bids and quotes. Implementation cost estimates include the costs to acquire fee-titles or easements from willing sellers, costs to initially enhance the crucial winter range, and costs necessary to protect the investment (greenstripping, bulldozer grading). Annual operation, maintenance, and monitoring would be necessary to achieve and sustain the project's estimated benefits.

Advance Design	50,000
Implementation	1,220,000
Total	\$1,270,000

Operation and Maintenance	28,000
Monitoring	5,000
Total Annual Costs for Life of Anderson Ranch Project	\$33,000

Magic Reservoir protection/enhancement. Enhance waterfowl production on the southwestern corner of Magic Reservoir by constructing a 0.25 mile long dike and a 0.5 mile long dike across two adjacent bays. Construction of the two dikes would allow water levels in the bays to be held stable longer into the irrigation season, and promote the establishment of emergent vegetation. Coordination with water users will be necessary throughout project implementation. Sixty acres of private land in the 460 acre project area would need to be protected through acquisition of fee-title or easement from a willing seller. The remaining 400 acre project area includes about 300 submerged acres and 100 acres of upland habitat managed by BLM. The entire project area would be fenced to exclude cattle grazing and promote waterfowl nesting cover.

Benefits: A more stable water system and increased wetland and upland vegetation will benefit nesting mallards. In addition, several nontarget wildlife species, such as Canada geese, muskrats, northern harriers, and sage grouse will benefit from this project.

<u>Species</u>	<u>HU's</u>
Mallard	184

Costs: Advance design will include costs associated with identification of willing sellers, environmental assessment preparation, preparing a management plan, surveying for dike location, soliciting bids and quotes, and negotiating management agreements. Implementation costs will include dike construction, water control structures, protection of 60 acres (including appraisal, legal fees, and actual cost of land), and fencing of the perimeter of the project boundary. Due to erosion, sedimentation, and marsh plant encroachment, annual operation, maintenance, and monitoring of the dikes and open water conditions will be necessary to sustain the benefits of this project.

Advance Design	20,000
Implementation	<u>470,000</u>
Total	\$490,000
Operation and Maintenance	5,000
Monitoring	<u>1,000</u>
Total Annual Costs for Life of Anderson Ranch Project	\$6,000

Little Camas Reservoir protection/enhancement. Protect 520 acres near the upper, southeastern end of Little Camas Reservoir through acquisition of fee-title or easement from willing seller. A portion of this acreage would be uplands bordering the reservoir, while the rest would be seasonally flooded wetlands, within the high water mark of the reservoir. Approximately 200 acres of wetlands on the upper end of the reservoir, within the high water line, will be dredged and diked to sustain pools of open water further into the summer, and create nesting islands. Currently, the project area dries up too soon in the summer for successful duck production to occur, as the reservoir is drained down for downstream irrigation needs. Upland areas will be fenced to provide nesting and brooding cover. Coordination with water users will be necessary throughout project implementation.

Benefits: More stable water conditions and increased vegetative cover from this project will benefit many target wildlife species, including mallards, mink, yellow warblers, and blue grouse, and nontarget species such as bald eagles and Canada geese.

<u>Species</u>	<u>HU's</u>
Mallard	150
Mink	125
Yellow warbler	10
Blue grouse	150
Total	435

Costs: Advance design will include costs associated with identification of willing sellers, environmental assessment preparation, preparing a management plan, surveying for dike location, soliciting bids and quotes, and negotiating management agreements. Implementation costs include the protection of 520 acres of land (including appraisal fees and fee-title acquisition or easement costs), ditch and island construction, and fencing. Construction will be accomplished with an excavator which will excavate ditch segments and side-cast the excavated material to form berms (islands) adjacent to the ditches. Approximately 10,000 linear feet of ditches will be excavated in the project area. Due to erosion, sedimentation, and marsh plant encroachment; annual operation, maintenance, and monitoring of ditches, islands, and open water conditions will be necessary to sustain the benefits of this project.

Advance Design	20,000
Implementation	<u>225,000</u>
Total	\$245,000
Operation and Maintenance	8,000
Monitoring	<u>1,000</u>
Total Annual Costs for Life of Anderson Ranch Project	\$9,000

Anderson Ranch subimpoundment. This project would create about a 40 acre subimpoundment on the upper end of Anderson Ranch Reservoir with the construction of a riprapped dike 10 feet high and 0.5 mile long. Three islands would be constructed in the subimpoundment area. Material for dike and island construction would have to be transported to the site. The upper end of Anderson Ranch Reservoir has silted in, through the years, to create a large exposed mud-flat as irrigation drawdown occurs in the summer. The purpose of this project is to hold water levels stable for the future establishment of riparian and emergent wetland vegetation. The dike would not cross the main river channel, and would not affect kokanee fall spawning runs. Another feature of the project would be an estimated 500-foot long screened diversion ditch from the main channel of the river to the impoundment, to maintain a constant flow of water through the impoundment.

Benefits: The formation of stable water levels, wetland vegetation, and islands would benefit mallards and mink. In addition to these target species, the project would benefit other nesting waterfowl, shorebirds, and muskrats.

<u>Species</u>	<u>HU's</u>
Mallard	50
Mink	<u>40</u>
Total	90

Costs: Advance design includes costs associated with environmental assessment preparation, surveying for the impoundment dike, contour survey, and layout/design for the diversion ditch, survey for island location and design, time for permit applications, and preparation of a management plan. Costs for implementation include those for a 0.5-mile-long riprapped dike which is 10 feet high, two water control structures, a 500-foot-long concrete diversion ditch, a fish screen, three 50-foot by 100-foot islands, and vegetation establishment on the dike and islands. Due to erosion, sedimentation, and marsh plant encroachment, annual operation, maintenance, and monitoring of islands, dike, screen, diversion ditch, and open water conditions would be necessary to sustain the benefits of this project.

Advance Design	60,000
Implementation	<u>240,000</u>
Total	\$300,000

Operation and Maintenance	20,000
Monitoring	<u>1,000</u>
Total Annual Costs for Life of Anderson Ranch Project	\$21,000

South Fork Boise River riparian protection/enhancement (Featherville segment). Protect, through acquisition of fee-titles or easements from willing sellers, 780 acres of riparian habitat on the South Fork Boise River, upstream from Anderson Ranch Reservoir, between Pine and Featherville. This area is threatened by future subdivision and home development. Most of the area is currently grazed with livestock. With this project and subsequent grazing removal, many of the meadow areas are expected to change toward deciduous forested wetland (cottonwoods) and scrub-shrub (willow) communities.

Benefits: This project would benefit a host of target wildlife species that utilize riparian habitats. In addition, this project should benefit a small number of elk which inhabit this area in the winter. The existence of these elk is threatened by future development in the area.

<u>Species</u>	<u>HU's</u>
Black-capped chickadee	440
Yellow warbler	140
Ruffed grouse	380
Mallard	130
Mink	200
Blue grouse	90
Total	<u>1,380</u>

Costs: Advance design will include costs associated with identification of willing sellers, surveys, and management plan preparation. Implementation costs are estimated at \$1,180,000 to protect and enhance 780 acres. Annual operation, maintenance (i.e. fence repair), and monitoring will be needed to sustain annual wildlife benefits.

Advance Design	10,000
Implementation	<u>1,180,000</u>
Total	\$1,190,000

Operation and Maintenance	10,000
Monitoring	<u>5,000</u>
Total Annual Costs for Life of Anderson Ranch Project	\$15,000

South Fork Boise River riparian protection/enhancement (Smoky Bar segment). Protect, through acquisition of fee-titles or easements from willing sellers, 900 acres of riparian habitat near Smoky Bar, on the South Fork of the Boise River. Most of the acreage is currently overgrazed, and threatened by future summer home development. Many scrub-shrub (willow) acres have been cleared in the past, and converted to open meadows. This project would include livestock removal, fencing, and some planting of riparian vegetation for stream stabilization and wildlife cover.

Benefits: This project will benefit a variety of target species that utilize riparian habitats, in addition to upland target species benefits on portions of the acreage.

<u>Species</u>	<u>HU's</u>
Black-capped chickadee	80
Mink	170
Ruffed grouse	50
Blue grouse	210
Yellow warbler	<u>150</u>
Total	660

Costs: Advance design will include costs associated with identification of willing sellers, surveys, and management plan preparation. Implementation costs to protect and enhance 900 acres are estimated at \$1,700,000. This includes costs associated with acquisition of fee-titles or easements, fencing, and willow and aspen plantings. Annual operation and maintenance (i.e. fence repair, additional plantings, etc.) will be needed, as will annual monitoring to sustain annual wildlife benefits.

Advance Design	15,000
Implementation	<u>1,700,000</u>
Total	\$1,715,000
Operation and Maintenance	10,000
Monitoring	<u>5,000</u>
Total Annual Costs for Life of Anderson Ranch Project	\$15,000

Willow Creek protection/enhancement. Protect, through acquisition of fee-titles or easements from willing sellers, 1,000 acres of an upland/wetland complex on Willow Creek, northeast of Fairfield. A large part of the acreage is being proposed for subdivision. This acreage contains a mix of meadow areas along the stream, and rolling uplands with mountain shrubs. A large portion of the area is currently overgrazed. Much of the meadow area is expected to move vegetatively toward scrub-shrub (willow) and some deciduous forested wetland (cottonwood), as grazing is excluded and riparian plantings are established.

Benefits: This project will primarily benefit blue grouse, but will also benefit a variety of wetland/riparian associated target species.

<u>Species</u>	<u>HU's</u>
Blue grouse	860
Ruffed grouse	35
Mallard	30
Mink	130
Yellow warbler	160
Black-capped chickadee	35
Total	<u>1,250</u>

Costs: Advance design will include costs associated with identification of willing sellers, surveys, and management plan preparation. Implementation costs to protect and enhance 1,000 acres are estimated at \$570,000, which includes costs associated with acquisition of fee-titles or easements, fencing, and riparian plantings. Annual operation and maintenance (i.e. fence repair, additional plantings, etc.) will be needed, as will annual monitoring, to sustain annual wildlife benefits.

Advance Design	10,000
Implementation	<u>570,000</u>
Total	\$580,000

Operation and Maintenance	15,000
Monitoring	<u>3,000</u>
Total Annual Costs for Life of Anderson Ranch Project	\$18,000

Ruffed grouse (aspen) enhancement. Enhance 500 acres of old-age aspen stands on national forest land in the vicinity of Anderson Ranch Reservoir. Either mechanical treatments or prescribed burning will be used to create early successional stages of aspen and stop conifer encroachment. Early successional stages of aspen are important components of ruffed grouse habitat. Temporary fencing of treated stands will be required if the stand is located in an area of livestock use.

Benefits: This project will benefit ruffed grouse because they are closely associated with early successional stages of aspen. Various nongame species will also benefit from the increased diversity of cover types.

<u>Species</u>	<u>HU's</u>
Ruffed grouse	150

Costs: Advance design will include costs associated with surveying existing aspen stands, preparing management plans, soliciting bids and quotes, and negotiating management agreements. Implementation costs are calculated based on an estimate that one half of the treatment will be done by hand-cutting, and one half will be accomplished with prescribed burning. It is estimated that approximately 0.5 acres can be cut by hand per day (\$80/day). Prescribed burning costs are estimated at \$20/acre. Temporary fencing costs are estimated at \$6,000. Annual operation, maintenance, and monitoring will be necessary in order to ensure that stands remain in early successional stages, and that wildlife benefit goals are being met.

Advance Design	10,000
Implementation	<u>31,000</u>
Total	\$41,000
Operation and Maintenance	2,000
Monitoring	<u>1,000</u>
Total Annual Costs for Life of Anderson Ranch Project	\$3,000

BLACK CANYON MITIGATION PLAN

Black Canyon Mitigation Goals

The goal of this mitigation plan is to at least replace the target species' habitat units (HU's) lost due to the development and operation of Black Canyon, through a combination of protection/enhancement projects. As per agreement between the Idaho Fish and Game and the Bonneville Power Administration (Project No. 86-73), the interagency work group has made a strong effort to develop mitigation actions (projects) that address the needs of wildlife and benefit the greatest number of target species. However, as large multi-species projects are developed, it becomes apparent that some target species will gain more HU's than were originally lost, and some target species will gain fewer HU's or possibly none. With this knowledge, the interagency work group agreed that some tradeoffs between extra benefits to some target species and fewer benefits to other target species would have to occur within the overall mitigation plan, in order to meet contractual agreements, and to provide for the needs of wildlife in the area. Furthermore, this methodology provides for the most cost effective and reasonable means of mitigation.

Black Canyon Preferred Mitigation Projects

The following preferred mitigation projects were developed and prioritized by the interagency work group. Projects were developed using the Black Canyon wildlife impact assessment (Martin and Ablin-Stone 1986) as a guideline, while considering the needs of wildlife in the area.

Section 4(h)(8)(A) of the Northwest Power Act provides the opportunity to use enhancement measures as a means of achieving off-site protection and mitigation with respect to compensation for losses arising from the development and operation of the Columbia River hydroelectric facilities. This section allows flexibility in the location of proposed mitigation projects. However, all mitigation projects developed in this plan are located in the general vicinity of Black Canyon Reservoir, with final selection and prioritization based more on target species benefits and needs than on distance from the reservoir.

It is the interagency work group's understanding that should future circumstances dictate that a preferred mitigation project is not feasible, then alternative projects would be added to the preferred plan until the loss of the preferred project (in terms of target species HU's) would be compensated for.

Bruneau River Valley protection/enhancement. Protect through fee-title acquisition or easements from willing sellers, 800 acres of wetlands and associated habitats in the Bruneau River Valley, much of which is currently under private ownership with heavy livestock use. Current habitat conditions include large acreages of emergent wetlands, some scrub-shrub (willow) along riparian zones, and uplands with hayfields and shrub-steppe (sagebrush). Good wildlife cover is currently limited due to constant livestock grazing pressure. Once protected, enhancement measures on the 800 acres will include the diking of small sloughs, pothole blasting, shallow pond development, nesting platforms, water control structures, riparian shrub plantings, and initial grazing removal followed by periodic grazing to benefit wildlife. The C. J. Strike WMA, managed by IDFG, is located at the mouth of the Bruneau River. This project will augment the existing WMA, and follow the IDFG goal of protecting land around the WMA to facilitate increasing public demands on the resource (IDFG 1986).

Benefits: Implementation of this project will greatly increase herbaceous and woody cover in the area. This increase, along with additional shallow ponds and marshes from diking, will benefit several target species in the area, including mallard, Canada goose, mink, yellow warbler, and pheasant. This project will also provide expanded habitat for Rio Grande turkey and whitetail deer.

<u>Species</u>	<u>HU's</u>
Mallard	510
Canada goose	160
Mink	190
Yellow warbler	120
Pheasant	<u>320</u>
Total	1,300

Costs: Advance design includes costs associated with the identification of willing sellers, developmental surveys, preparation of management plans, and soliciting bids and quotes. Implementation costs to protect and enhance 800 acres of land in the Bruneau River Valley are estimated at \$370,000. This includes costs of acquisition of fee-titles or easements, appraisals, legal fees, dike and levee construction, water control structures, pothole blasting, riparian shrub planting, island construction, nest platforms, fence building, and the acquisition of water rights. Annual operation and maintenance will include fence maintenance, dike repair, water level management, grazing management, shrub replanting, and annual payment for water rights. Annual operation, maintenance, and monitoring will be necessary to sustain wildlife benefits of the project.

Advance Design	30,000
Implementation	<u>370,000</u>
Total	\$400,000
Operation and Maintenance	15,000
Monitoring	<u>3,000</u>
Total Annual Costs for Life of Black Canyon Project	\$18,000

Nelson Ranch area protection/enhancement. Protect through fee-title acquisition, grazing permit acquisition, or easements from willing sellers, 600 acres of key Columbian sharp-tailed grouse habitat on or adjacent to the 4,200 acre, privately owned Nelson Ranch. The Nelson Ranch contains the largest known population of Columbian sharptails in western Idaho. The ranch contains four of the five known dancing grounds in western Idaho. The population has fluctuated between 50 - 200 birds during the last six years. The availability of good winter range, consisting of mountain shrub patches and riparian zones, is believed to be a limiting factor to sharptails. Proposed enhancement measures on the protected 600 acres include fencing for grazing control, planting hawthorns along 0.25 mile sections of Deer Creek and Brood Creek, and patch planting 2,000 two year old stock of serviceberry, chokecherry, and hawthorn in existing poor condition mountain shrub patches and riparian zones.

Benefits: Protection and enhancement of this parcel will help ensure the continued existence of the Columbian sharp-tailed grouse in the Nelson Ranch area, and ultimately in western Idaho. Because of the riparian shrub and mountain shrub component existing in the area, yellow warblers will also benefit. Nontarget species benefited by this project include California quail and Hungarian partridge. This area also provides important spring/fall deer and elk range.

<u>Species</u>	<u>HU's</u>
Sharp-tailed grouse	510
Yellow warbler	10
Total	520

Costs: Advance design includes costs associated with the identification of willing sellers, boundary surveys, preparation of management plans, soliciting bids and quotes, and negotiating management agreements. Implementation costs to protect and enhance 600 acres are estimated at \$80,000. This includes costs of acquisition of fee-titles, grazing permits, or easements, appraisals, legal fees, shrub plantings, and fencing. Annual operation and maintenance (replanting, fence repair, etc.), and monitoring will be necessary to sustain annual wildlife benefits.

Advance Design	10,000
Implementation	80,000
Total	\$90,000
Operation and Maintenance	4,000
Monitoring	1,000
Total Annual Costs for Life of Black Canyon Project	\$5,000

Boise River WMA big game winter range protection/enhancement. Protect through fee-title acquisition or easements from willing sellers, 500 acres of key big game winter range adjacent to the IDFG Boise River Wildlife Management Area (WMA). The acreage will be enhanced through livestock use control and management for the benefit of wildlife. The 32,000 acre Boise River WMA contains the most critical portions of the entire winter range for deer in Game Management Unit 39 (IDFG 1986). This important winter range, adjacent to the Boise River WMA, is in private ownership with a strong possibility of subdivision for homes in the future.

Benefits: In addition to the benefits to the target species, mule deer, this project is expected to benefit chukar, gray (Hungarian) partridge, turkeys, quail, and to some extent, 30 elk which occur in the area seasonally. Golden eagles and an occasional bald eagle use the area during winter and spring. Long range plans are to reintroduce sage grouse into the area, if feasible.

<u>Species</u>	<u>HU's</u>
Mule deer	375

Costs: Advance design includes costs associated with the identification of willing sellers, surveys, preparation of management plans, and soliciting bids and quotes. Implementation costs to protect and enhance 500 acres are estimated at \$65,000. This includes costs of acquisition of fee-titles or easements, appraisals, legal fees, and the construction of about 2 miles of fence. Annual operation and maintenance and monitoring will be necessary to sustain annual wildlife benefits.

Advance Design	15,000
Implementation	<u>65,000</u>
Total	\$80,000
Operation and Maintenance	5,000
Monitoring	<u>2,000</u>
Total Annual Costs for Life of Black Canyon Project	\$7,000

Black Canyon Preferred Mitigation Plan Summary

The interagency work group has developed a preferred mitigation plan (Table 10) that follows the mitigation goals outlined at the beginning of this planning process. A number of alternative mitigation projects were examined, before formulation of the preferred plan. Estimated benefits from the preferred projects are presented in Table 11, and estimated initial 10-year costs are outlined in Table 12. Projects were prioritized by the interagency work group based on mitigation goals and needs of wildlife in the area. An initial 5-year action plan for the mitigation plan appears in Table 13.

To our knowledge, all proposed acquisitions of easements or fee-titles in the mitigation plan meet the land acquisition criteria outlined in the Columbia River Basin Fish and Wildlife Program and the Northwest Power Act. Projects complement management policies and goals of federal and state wildlife agencies and the Shoshone-Bannock Tribes. Acquisition projects were developed by professional wildlife biologists who took into consideration the needs of wildlife in the area, the cost-effectiveness of acquisition projects compared to available alternatives, and the biological objectives of the mitigation plan. To our knowledge, funding of these mitigation projects with the BPA fund is not in lieu of any other expenditures presently authorized or required from other entities under other agreements or provisions of law.

Annual operation, maintenance, and monitoring of mitigation projects will be necessary for the life of Black Canyon Facility for this Plan to protect, mitigate, and enhance wildlife to the extent affected by hydroelectric development and operation. Continued annual funding is justified by the fact that as long as the project is in place, the identified wildlife habitat impacts will continue to occur. The Black Canyon Facility inundated naturally self-perpetuating ecosystems. A large part of this Plan is to mitigate those losses through man-made enhancements, which are not naturally self-perpetuating. Under the methods in this Plan, mitigation credit for enhancement is the difference between the habitat values presently provided and the increased habitat values provided with hands-on management (habitat treatments followed by operation, maintenance, and monitoring). If annual operation, maintenance, and monitoring of enhancement actions cease being funded, management actions will cease, and the projects will no longer provide the full benefits estimated in this Plan. As a result, the benefits of mitigation projects would have to be re-evaluated, and more acquisitions of fee-titles or easements would be needed to mitigate Black Canyon Facility's wildlife losses. Because annual wildlife losses will continue for the life of Black Canyon Facility, annual benefits of enhancement projects must be sustained by hydropower beneficiaries for this Plan to mitigate wildlife impacts to the extent affected by hydropower. The interagency work group looks forward to continued coordination with the Northwest Power Planning Council and the Bonneville Power Administration.

Table 10. Black Canyon Facility wildlife protection, mitigation, and enhancement plan summary.

Target Species	Habitat Losses Attributable to Hydropower	Mitigation Goals
Mallard	270 HU's	<p>Provide benefits of 510 mallard HU's, 190 mink HU's, 160 Canada goose HU's, 120 yellow warbler HU's, and 320 ring-necked pheasant HU's, preferably through the protection and enhancement of 800 acres of wetlands/uplands in the Bruneau River Valley. Multi-species benefits from this project result in necessary, but cost-effective tradeoffs between extra benefits to some target species and fewer benefits to other target species. Years 1-3, advance design. Years 2-6, implementation. Year 3 through life of Black Canyon Facility, annual operation, maintenance, and monitoring.</p> <p>An additional 10 yellow warbler (scrub-shrub wetland) HU's will be provided preferably by the following sharp-tailed grouse project.</p>
Mink	652 HU's	
Canada goose	214 HU's	
Black-capped chickadee	68 HU's	
Ring-necked pheasant	260 HU's	
Yellow warbler	Gained 8 HU's	
Sharp-tailed grouse	532 HU's	<p>Provide estimated benefits of 510 sharp-tailed grouse HU's, preferably through the protection and enhancement of 600 acres of key sharp-tailed grouse habitat in the Nelson Ranch area of western Idaho. Years 1-3, advance design. Years 2-6, implementation. Year 3 through life of Black Canyon Facility, annual operation, maintenance, and monitoring.</p>
Mule deer	242 HU's	<p>Provide estimated benefits of 375 mule deer HU's, preferably through the protection and enhancement of 500 acres of key mule deer winter range, adjacent to the Boise River WMA. Years 1-3, advance design. Years 2-6, implementation, Year 3 through</p>

Table 10. Continued.

Target Species	Habitat Losses Attributable to Hydropower	Mitigation Goals
		life of Black Canyon Facility, annual operation, maintenance, and monitoring.

Table 11. Estimated benefits (Habitat Units) of the Black Canyon Facility preferred mitigation plan. Projects are listed in order of priorities chosen by the Interagency work group.

Project	Target Species								Total
	Mallard	Canada Goose	Mink	Yellow Warbler	Black-capped Chickadee	Mule Deer	Sharp-tailed Grouse	Ring-necked Pheasant	
Bruneau River Valley protection/enhancement (800 ac)	510	160	190	120				320	1,300
Nelson Ranch area protection/enhancement (600 ac)				10			510		520
Boise River WMA big game winter range protection/enhancement (500 ac)						375			375
Total	510	160	190	130		375	510	320	2,195

Table 12. Estimated Initial 10 year costs of the Black Canyon Facility preferred mitigation plan. After the initial 10 years, annual operation, maintenance, and monitoring will continue to be necessary to sustain project benefits. Projects are listed in order of priorities chosen by the Interagency work group.

Project	Advance Design	Implementation	Operation and Maintenance	Monitoring	Total Initial 10 Year Costs ¹
Bruneau River Valley protection/enhancement (800 ac)	30,000	370,000	15,000	3,000	526,000
Nelson Ranch area protection/enhancement (600 ac)	10,000	80,000	4,000	1,000	125,000
Boise River WMA big game winter range protection/enhancement (500 ac)	15,000	65,000	5,000	2,000	129,000
Total	55,000	515,000	24,000	6,000	780,000

¹ Operation, maintenance, and monitoring costs are multiplied by 7 in this initial 10 year cost estimate. The assumption is that the first 3 years will primarily be advance design and implementation, with the knowledge that the schedule of projects will vary.

Table 13. Initial 5-year action plan for Black Canyon Facility wildlife protection, mitigation, and enhancement plan.

Year	Action
1	Advance design for all target species mitigation projects.
2	Continue advance design on all mitigation projects; begin implementation on all mitigation projects.
3	Continue implementation on all projects; begin operation, maintenance, and monitoring of projects where implementation has begun.
4, 5	Continue implementation on all projects not fully completed; continue annual operation, maintenance, and monitoring on all projects.

Black Canyon Alternative Mitigation Projects

The following alternative mitigation projects were developed by the Interagency work group. It is the work group's understanding that should future circumstances dictate that a preferred mitigation project is not feasible, then alternative projects would be added to the preferred plan until the loss of the preferred project (in terms of target species HU's) would be compensated for. Projects are listed in order of priority under each general project classification (Table 14).

Table 14. Black Canyon alternative mitigation projects. Projects are listed in order of priority under each of the general project classifications.

<u>Target Species</u>	<u>Page No. In Text</u>
<u>Big Game</u>	
Boise River WMA big game winter range enhancement	70
<u>Waterfowl/Aquatic Furbearers</u>	
Wildlife Management Area enhancement	71
Hubbard Reservoir protection/enhancement	72
Payette River acquisition/enhancement	74

Boise River WMA big game winter range enhancement. Enhance 1,000 acres of big game winter range on the Boise River WMA. Approximately 250 acres will be cultivated and planted to a grass/forb/shrub mixture, 250 acres will be hand planted to bitterbrush, and 500 acres pre-treated with a combination of fire and herbicides, and then seeded aerially to a grass/forb/shrub mix. The topography of much of the area is steep. The infestation of medusahead over some of the area has become a problem, resulting in almost no habitat value to wintering big game.

Benefits: This project will benefit primarily wintering mule deer, with some additional benefits to upland game, such as chukar, Hungarian partridge, and quail.

<u>Species</u>	<u>HU's</u>
Mule deer	250

Costs: Advance design will include costs associated with surveys, preparation of management plans, and soliciting bids and quotes. Implementation costs will vary over the 1,000 acres, based on topography, current range condition, and planting methods used. Costs are based upon grass/forb seeding mixtures at \$5.00/lb., bitterbrush seedlings at \$0.15/plant, and bitterbrush seeding mixtures at \$8.00/lb. Annual operation, maintenance, and monitoring will be necessary to ensure that annual benefits to wildlife continue.

Advance Design	20,000
Implementation	<u>135,000</u>
Total	\$155,000
Operation and Maintenance	15,000
Monitoring	<u>1,000</u>
Total Annual Costs for Life of Black Canyon Project	\$16,000

Wildlife Management Area enhancement. The preferred proposal for this alternative is to enhance about 600 acres of IDFG lands at Roswell Marsh. Enhancement possibilities may include more or less acreage and, if necessary, could be implemented at the IDFG's Fort Boise, C. J. Strike, or Payette River WMA's. Enhancement proposals include channels, dikes, water control facilities, islands, annual food crop plantings, riparian cover plantings, nesting platforms, fencing, prescribed burning, and grazing management. Flood easements or special land use agreements may need to be obtained.

Benefits: Marsh and upland enhancement would benefit a variety of waterfowl, aquatic furbearers, upland game, and nongame. Target species benefits below are estimated for enhancement on 600 acres of open water, cattails, and sedge-wetmeadow in the Roswell Marsh area.

<u>Species</u>	<u>HU's</u>
Mallard	180
Canada goose	180
Mink	240
Pheasant	120
Yellow warbler	30
Total	750

Costs: Advance design would include conducting surveys, preparing a management plan, negotiating management agreements, and soliciting bids and quotes. Implementation costs include estimates for initial enhancements on 600 acres in Roswell Marsh. Annual operation, maintenance, and monitoring would be necessary to achieve and sustain the project's estimated benefits.

Advance Design	60,000
Implementation	<u>530,000</u>
Total	\$590,000
Operation and Maintenance	25,000
Monitoring	<u>2,000</u>
Total Annual Costs for Life of Black Canyon Project	\$27,000

Hubbard Reservoir protection/enhancement. Protect through fee-title acquisition, easement, or long-term lease, 385 acres of land owned by the State of Idaho and administered by the Idaho Department of Lands. Both land above and below the high water line of Hubbard Reservoir would be protected under this project. A Bureau of Reclamation flood easement covers most of the adjacent private land.

The main function of Hubbard Reservoir is to provide emergency short-term storage for irrigation should a failure occur in the New York Canal Irrigation system. The reservoir also serves a flood control function. The main source of water is overflow from the New York Irrigation canal.

Currently, the 385 acres are heavily grazed by livestock, with little cover remaining for wildlife. Also, water is lost every year through sinkholes in the reservoir floor.

The purpose of this project is to improve wildlife habitat by maintaining higher and more constant water levels. Enhancement measures will include sealing sinkholes with bentonite, grazing removal, dike repair, riparian area plantings, island construction, and nest platforms.

Benefits: Implementation of this project will increase herbaceous and woody cover in the Hubbard Reservoir area, both in uplands and wetlands, and provide benefits to a number of target species, including mallard, Canada goose, yellow warbler, black-capped chickadee, and pheasant. In addition, a variety of shorebirds, songbirds, and other waterfowl will be benefited by this project. Because of its location close to Boise, the Hubbard Reservoir area could provide a future wildlife educational tool for the public.

<u>Species</u>	<u>HU's</u>
Mallard	80
Canada goose	50
Yellow warbler	25
Black-capped chickadee	25
Pheasant	<u>150</u>
Total	330

Costs: Advance design includes costs associated with negotiating management agreements, preparation of management plan, surveys, and soliciting bids and quotes. Implementation costs to protect and enhance 385 acres of land at Hubbard Reservoir are estimated at about \$340,000. This includes costs of acquisition of fee-title, easement, or lease, appraisals, legal fees, dike and sinkhole repair, riparian shrub seeding, nest platform construction, and the construction of fifteen rip-rapped islands, each 50 feet by 100 feet. Annual operation and maintenance (water level management, dike and fence maintenance, shrub replanting, etc.), and annual monitoring will be necessary to sustain wildlife benefits of the project.

Advance Design	20,000
Implementation	<u>340,000</u>
Total	\$360,000
Operation and Maintenance	10,000
Monitoring	<u>1,000</u>
Total Annual Costs for Life of Black Canyon Project	\$11,000

Payette River acquisition/enhancement. The preferred proposal for this alternative is to protect and enhance 300 acres adjacent to Regan Bend on Black Canyon Reservoir. Protection would be through acquisition of easement or fee-title if the seller is willing. Only about 200 acres would be completely protected, because the USBR has a flood easement on about 100 acres of the property. Enhancement proposals include nesting platforms and boxes, annual food crop plantings and irrigation, revegetating agricultural land into permanent cover, managing grazing for goose pasture, and fencing to protect riparian zones and islands.

Other riparian protection and enhancement possibilities exist in the Payette River area. Acreages and enhancements would vary depending on the available parcels.

Benefits: Marsh and upland enhancement would benefit a variety of species. Target species benefits below are estimated for protection and enhancement on 300 acres of forested wetland, scrub-shrub wetland, and upland habitat on Regan Bend.

<u>Species</u>	<u>HU's</u>
Mallard	160
Canada goose	160
Mink	40
Pheasant	170
Black-capped chickadee	60
Yellow warbler	<u>20</u>
Total	610

Costs: Advance design would include identifying willing sellers, preparing a management plan, negotiating management agreements, and soliciting bids and quotes. Implementation costs include estimates for acquiring an easement or fee-title, if the seller is willing, and for the enhancements necessary to initially develop 300 acres on Regan Bend. Annual operation, maintenance, and monitoring would be necessary to achieve and sustain the project's estimated benefits.

Advance Design	20,000
Implementation	<u>290,000</u>
Total	\$310,000
Operation and Maintenance	13,000
Monitoring	<u>2,000</u>
Total Annual Costs for Life of Black Canyon Project	\$15,000

LITERATURE CITED

- Allen, A.W. 1984. Habitat suitability index models: mink. FWS/OBS-82/10.61. Western Energy Land Use Team, U.S. Fish and Wildlife Service. Fort Collins, CO. 19pp.
- Bellrose, F.C. 1976. Ducks, Geese, and Swans of North America. Stackpole Books, Harrisburg, Pennsylvania. 543pp.
- Berner, A., and L. Gysel. 1969. Habitat analysis and management considerations for ruffed grouse for a multiple use area in Michigan. J. Wildl. Manage. 33:769-778.
- Burnham, W., and R.P. Howard. 1986. Northwest Power Planning Council, Columbia River Basin Fish and Wildlife Program, application for amendment. 17pp.
- Cadwallader, D. 1980. South Fork Boise River fish and wildlife investigations progress report. Young Adult Conservation Corps, U.S. Fish and Wildlife Ser. 69pp.
- Chaney, J.E., and S. Sather-Blair. 1985a. Wildlife mitigation status report: Anderson Ranch Dam and Reservoir. Pages C1 - 14 in Martin, R.C., L.A. Mehrhoff, J.E. Chaney, and S. Sather-Blair. 1985. Status review of wildlife mitigation at 14 of 27 major hydroelectric projects in Idaho. Idaho Dep. Fish and Game, and U.S. Fish and Wildlife Service. Bonneville Power Administration. Division of Fish and Wildlife. Proj. 83-478.
- _____. 1985b. Wildlife mitigation status report: Black Canyon Dam and Reservoir. Pages D1-13 in Martin, R.C., L.A. Mehrhoff, J.E. Chaney, and S. Sather-Blair. 1985. Status review of wildlife mitigation at 14 of 27 major hydroelectric projects in Idaho. Idaho Dep. Fish and Game, and U.S. Fish and Wildlife Service. Bonneville Power Administration. Division of Fish and Wildlife.
- Donaldson, J., and A. Bergerud. 1974. Behavior and habitat selection of insular population of blue grouse. Syesis. 7:115-127.
- Galbreath, D.S. 1973. Pheasant population studies and pheasant losses from alfalfa mowing operations in the Columbia Basin of central Washington. Proc. Ann. Conf. W. Assn. State Fish and Game Comm. 53:326-335.
- Gilbert, P.F., O.C. Wallmo, and R.B. Gill. 1970. Effects of snow depth on mule deer in Middle Park, Colorado. J. Wildl. Manage. 34:15-23.
- Gullion, G. 1967. Selection and use of drumming sites by male ruffed grouse. Auk 84:87-112.

- _____. 1970. Factors influencing ruffed grouse populations. *Trans. N. Am. Wildl. Conf.* 34:93-105.
- Hebard, F.V. 1961. Yellow warblers in conifers. *Wilson Bull.* 73(4) 394-395.
- Heinrich, B., B. Oakleaf, D. Flath, and W. Melquist. 1986. A cooperative proposal for reintroduction of peregrine falcons in adjacent areas of Idaho, Montana, and Wyoming, rough draft. 15pp.
- Hill, R. 1956. Forage, food habits, and range management of the mule deer. Pages 393-414 in W.P. Taylor, ed., *The Deer of North America*. Stackpole Co., Harrisburg, PA.
- Howerton, J., D. Hwang, M. Jordan, E. Rybak, O. Sill, R. Starkey, G. VanLom, and P. Wright. 1984. Status review of wildlife mitigation at Columbia Basin Hydroelectric Projects - Columbia Mainstem and Lower Snake facilities. Washington Dep. of Game, and U.S. Fish and Wildlife Service. Bonneville Power Admin. Division of Fish and Wildlife. Proj. 83-478. (DOE/BP-369).
- Idaho Fish and Game Department. 1986. Region 3, wildlife management areas, five-year management plans, 1986-1990. 109pp.
- Jackman, S., and J. Scott. 1975. Pages 153-170 in Literature review of twenty-three selected forest birds of the Pacific Northwest. USDA For. Serv., Region 6.
- Johnsgard, P.A. 1973. Grouse and quails of North America. Univ. of Nebraska, Lincoln, and London. 553pp.
- _____, P.A. 1975. Pages 221-233 in Waterfowl of North America. Indiana Univ. Press. Bloomington and London.
- Korschgen, L. 1966. Foods and nutrition of ruffed grouse in Missouri. *J. Wildl. Manage.* 30:86-100.
- Kufeld, R.C., O.C. Wallmo, and C. Feddema. 1973. Foods of the Rocky Mountain mule deer. USDA For. Serv. Res. Pap. RM-111.
- Larrison, E.J., and K.G. Sonnenberg. 1968. Washington birds. Seattle Audubon Society. 258pp.
- _____, J.L. Tucker, and M.T. Jollie. 1967. Guide to Idaho birds. J. Idaho Academy of Science, Univ. of Idaho, Moscow. 220pp.
- Loveless, C.M. 1967. Ecological characteristics of a mule deer winter range. Tech. Bull. 20. Colorado Game, Fish, and Parks Dep., Denver. 124pp.
- Marshall, W.H., and M.S. Jensen. 1937. Winter and spring studies of the sharp-tailed grouse in Utah. *J. Wildl. Manage.* 1:87-98.

- Martin, R.C., L.A. Mehrhoff, J.E. Chaney, and S. Sather-Blair. 1985. Status review of wildlife mitigation at 14 of 27 major hydroelectric projects in Idaho. Idaho Dep. Fish and Game, and U.S. Fish and Wildlife Service. Bonneville Power Admin. Division of Fish and Wildlife. Proj. 83-478.
- _____, and K. Ablin-Stone. 1986. Wildlife impact assessment, Anderson Ranch, Black Canyon, and Boise Diversion Projects, Idaho. Idaho Dep. Fish and Game. Bonneville Power Admin. Division of Fish and Wildlife. Proj. 85-1.
- Melquist, W., J. Whitman, and M. Hornocker. 1981. Resource partitioning and coexistence of sympatric mink and river otter populations. Pages 187-220 in J. Chapman and D. Pursley, eds., Proc. Worldwide Furbearer Conf. Vol. 1., Frostburg, Maryland.
- Morache, M., C. Chaffin, J. Naderman, and W. Melquist. 1985. Nongame management plan 1986-1990. Idaho Dep. Fish and Game, Boise. 82pp.
- Morse, D.H. 1973. The foraging of small populations of yellow warblers and American redstarts. Ecology 54(2):346-355.
- Parker, T.L. 1970. On the ecology of sharp-tailed grouse in southeastern Idaho. M.S. Thesis, Idaho State Univ., Pocatello. 144pp.
- Porter, R.D., and C.M. White. 1973. The peregrine falcon in Utah. Brigham Young Univ. Sci. Bull., Biol. Ser. 18(1):1-74.
- Rybarczyk, W.B., J. Connelly, et al. 1985. Upland game management plan 1986-1990. Idaho Dep. Fish and Game, Boise. 37pp.
- Schneegas, E.R., and R.S. Bumstead. 1977. Decline of western mule deer populations: probable cause, tentative solution. Proc. Annu. Conf. West Assoc. State Game and Fish Comm. 57:218-237.
- Schroeder, R.L. 1982. Habitat suitability index models: yellow warbler. FWS/OBS-82/10.27. Western Energy Land Use Team, U.S. Fish and Wildlife Service, Fort Collins, Colorado. 8pp.
- _____. 1983. Habitat suitability index models: black-capped chickadee. FWS/OBS-82/10.37. Western Energy Land Use Team, U.S. Fish and Wildlife Service, Fort Collins, Colorado. 12pp.
- Stauffer, D.F., and L.B. Best. 1980. Habitat selection by birds of riparian communities: evaluating effects of habitat alterations. J. Wildl. Manage. 44:1-15.
- _____, and S. Peterson. 1985. Seasonal micro-habitat relationships of ruffed grouse in southeastern Idaho. J. Wildl. Manage. 49:605-610.

- Sturman, W.A. 1968. Description and analysis of breeding habits of the chickadees, Parus atricapillus and P. rufescens. Ecology 49(3):418-431.
- Towell, D.E., N.F. Johnson, G. McNeil, and K. Kiler. 1985. Furbearer management plan 1986-1990. Idaho Dep. Fish and Game, Boise. 26pp.
- Trent, T., W. Bodie, and C. Brown. 1985. Mule deer management plan 1986-1990. Idaho Dep. Fish and Game, Boise. 43pp.
- U.S. Bureau of Reclamation. 1938. History of the Boise Project, Idaho.
- _____. 1940. History of the Boise Project, Idaho.
- _____. 1941. History of the Boise Project, Idaho.
- _____. 1949. Bureau of Reclamation project feasibilities and authorizations.
- _____. 1953. Revised allocation and repayment report, Boise Project, Idaho Regional office, Boise. 20pp.
- _____. 1961. Separable costs - remaining benefits method of cost allocation. Internal document. Boise, ID. 18pp.
- _____. 1981. Project Data.
- _____. 1984. Montour wildlife/recreation area plan. Boise, Idaho. 42pp.
- _____. 1986a. Statement of project construction cost and repayment, Boise Project as of September 30, 1986. Regional office, Boise, ID.
- _____. 1986b. Plant, property, and equipment, Boise Project, Idaho. Regional office, Boise.
- U.S. Fish and Wildlife Service. 1980a. Habitat evaluation procedures. Ecological Services Manual 102. Division of Ecological Services, Washington, D.C.
- _____. 1980b. Regional Resource Plan: Region 1. Portland, OR.
- _____. 1984. American peregrine falcon recovery plan, Rocky Mountain/Southwest populations. Rocky mountain/southwest peregrine falcon recovery team. USFWS. Denver, CO. 105pp.
- _____. 1985. Fish and Wildlife coordination act report on the Boise Project power and modification study, Payette River Basin. 25pp.
- VanVelzen, W.T. 1981. Forty-fourth breeding bird census. Am. Bird 35(1):46-114.

- Wallmo, O.C., L.H. Carpenter, W.L. Regelin, R.B. Gill, and D.L. Baker. 1977. Evaluation of deer habitat on a nutritional basis. *J. Range Manage.* 30:122-127.
- Will, G.C., C.T. Kvale, and J.A. Hayden. 1986. Waterfowl, sandhill crane, and snipe management plan 1986-1990. Idaho Dep. Fish and Game. 37pp.
- Zwicker, F.C., and J.F. Bendell. 1972. Blue grouse, habitat, and populations. *Proc. Int. Ornithol. Congr.* 15:150-169.

APPENDIX A

Acronyms Used

- BLM - Bureau of Land Management
- BPA - Bonneville Power Administration
- cfs - cubic feet per second
- HEP - Habitat Evaluation Procedure
- HSI - Habitat Suitability Index
- HU - Habitat Unit
- IDFG - Idaho Department of Fish and Game
- MOU - Memorandum of Understanding
- NPPC - Northwest Power Planning Council
- O&M - Operation and Maintenance
- SFBR - South Fork Boise River
- USBR - U.S. Bureau of Reclamation
- USFS - U.S. Forest Service
- USFWS - U.S. Fish and Wildlife Service
- WMA - Wildlife Management Area (Idaho Department of Fish and Game)

APPENDIX B

Formal Comments



600 South Walnut • Box 25
Boise, Idaho 83707

July 1, 1987

Mr. John Palensky, Director
Division of Fish and Wildlife, PJS
Bonneville Power Administration
P.O. Box 3621
Portland, OR 97208

Dear Mr. Palensky:

Enclosed are the Anderson Ranch and Black Canyon Facilities (i.e. dam, power plant, and reservoir areas) Wildlife Protection, Mitigation, and Enhancement Plans. These planning efforts were funded by the Bonneville Power Administration pursuant to section 1004(b)(3) of the Northwest Power Planning Council's Columbia Basin Fish and Wildlife Program. These Plans were prepared by the Idaho Department of Fish and Game in consultation and coordination with the U.S. Bureau of Reclamation, U.S. Forest Service, U.S. Fish and Wildlife Service, U.S. Bureau of Land Management, Shoshone-Bannock Tribes, Bonneville Power Administration, Northwest Power Planning Council, and Pacific Northwest Utilities Conference Committee.

The Department supports the content of these Plans. We agree with the interagency work group's position that 100% of the wildlife losses identified in the Anderson Ranch and Black Canyon Facilities Wildlife Impact Assessments should be attributed to the hydroelectric project purpose. We encourage the Northwest Power Planning Council and Bonneville Power Administration to consider and implement these Plans in a timely manner.

Sincerely,

A handwritten signature in black ink, appearing to read "Jerry M. Conley".

Jerry M. Conley
Director

JMC/GAM/sa

Enc.



United States Department of the Interior

FISH AND WILDLIFE SERVICE

BOISE FIELD OFFICE
4696 Overland Road, Room 576
Boise, Idaho 83705

May 18, 1987

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

MAY 21 1987

Dear Mr. Conley:

The Fish and Wildlife Service (Service) has reviewed the draft report for the Anderson Ranch and Black Canyon Wildlife Protection, Mitigation, and Enhancement Plan. This plan is the product of an interagency study team, and the listed recommendations and priorities reflect the consensus of team members.

The hydropower allocation discussion in the report was indepth and informative. The Service would like to add some additional insights with regard to the Fish and Wildlife Coordination Act (Act). These projects were built prior to 1958 when the amended Act was passed by Congress that mandated that fish and wildlife receive "equal consideration" with other project purposes. The 1958 Act also provided for enhancement of fish and wildlife values where possible and required that compensatory actions be taken when unavoidable adverse impacts to fish and wildlife occur. Prior to 1958, federal water projects were built with little, if any, mitigation for fish and wildlife habitat losses.

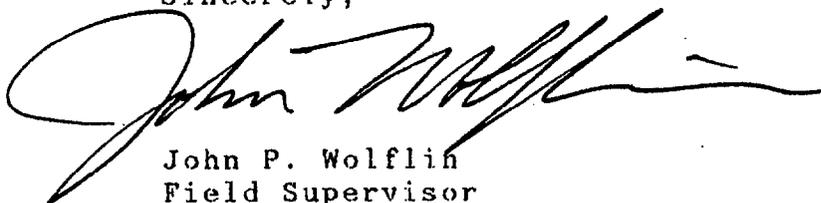
If the projects were being planned today, the Service, under the authority of the Act, would investigate impacts associated with the entire project area, including irrigation lands which also constitute the project. The impacts to fish and wildlife associated with the entire project area are much greater than those reported for the reservoir area alone in an earlier loss assessment report. If the Power Council desires to allocate mitigation funding between the various project purposes, then the entire project area should be included in this analysis. This action would be consistent with the intent of the Act.

The study team discussed the allocation topic in detail at the beginning of the earlier loss assessment. At that time, the irrigation project features were reviewed. For the most part, these are non-hydroelectric power project features (even though the relationship between power need and irrigation development

was recognized) and the group decided to investigate the reservoir area alone. It was agreed, at that time, that impact to wildlife habitat associated with reservoir inundation should be allocated to the hydroelectric power purpose and there would be no need to evaluate the irrigation project features. If proper mitigation were provided for the reservoir area, then compensation for losses associated with hydroelectric development would be considered complete.

If mitigation goals described in this document are achieved, the future outlook for many important wildlife species (e.g. waterfowl, mule deer, Columbian sharp-tailed grouse, peregrine falcon, nongame birds) will be much improved.

Sincerely,

A handwritten signature in black ink, appearing to read "John P. Wolflin". The signature is fluid and cursive, with a long horizontal stroke at the end.

John P. Wolflin
Field Supervisor

cc: John Palensky, BPA, Portland
BLM, Shoshone Dist., Shoshone
BLM, Burley Dist., Burley
BLM, State Office, Boise
IDFG, Region 4, Jerome
IDFG, Region 3, Boise
Marte Montgomery, NWPPA, Boise
FWS, PFO, Portland (Attn: Giger)
FWS, RO, Portland
FWS, SE, Boise (1-4-87-I-248)
FS, Boise National Forest, Boise (Attn: Lucich)

MAY 15 1987



United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Boise District
3948 Development Avenue
Boise, Idaho 83705

IN REPLY
REFER TO:

6520

MAY 12 1987

Jerry M. Conley, Director
Idaho Dep't. of Fish & Game
P.O. Box 25
Boise, ID 83707

Dear Mr. Conley:

This letter is in response to your request for comments on the draft report for Anderson Ranch and Black Canyon Wildlife Protection, Mitigation and Enhancement Plan.

Our previous involvement and close coordination in the identification of wildlife losses, scoping potential mitigation projects, and prioritizing these proposals has resulted in a document which we fully support. In addition, we concur with the plans rationale regarding hydropower responsibilities to mitigate for wildlife losses. Although these reservoirs meet irrigation, flood control, and recreation purposes as well as power production, the manner in which these facilities are operated to provide power production results in water levels being maintained at high levels (i.e., inundating wildlife habitat). Thus, in our view, it is logical to assign the entire reservoir area to habitat losses attributable to hydropower.

Thank you for the opportunity to comment on the plan.

Sincerely yours,

J. David Brunner
District Manager



United States
Department of
Agriculture

Forest
Service

Boise
National
Forest

1750 Front Street
Boise, ID 83702

Reply to 2610

Date: May 26, 1987

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

Dear Jerry:

Your final draft report on "Wildlife Protection, Mitigation, and Enhancement Plan: Anderson Ranch and Black Canyon Facilities" resolves all Boise National Forest concerns. We have been pleased with the interagency process used to identify and prioritize projects. We fully agree with your request for annual operation and maintenance funds for the life of the reservoir facilities, and support your desire for mitigation of all losses associated with the reservoirs.

We are eager to begin treatment of the Anderson Ranch borrow pit and would be pleased to participate in the reintroduction of peregrine falcons on National Forest lands. Several of the "alternative mitigation projects" also affect the Boise National Forest. We support proposals for protection of riparian habitat on Little Camas Reservoir and along the South Fork Boise River near Featherville. We would work to coordinate our management of adjacent lands. We are also strongly interested in rejuvenating aspen stands on National Forest lands near Anderson Ranch Reservoir. Preliminary investigation of a subimpoundment on Anderson Ranch Reservoir would be appropriate to evaluate feasibility and cost-effectiveness.

Sincerely,

for 
JOHN J. LAVITT
Forest Supervisor

JUN 1 1987



The SHOSHONE-BANNOCK TRIBES

FORT HALL INDIAN RESERVATION
PHONE (208) 238-3700
(208) 785-2080



FORT HALL BUSINESS CENTER
P.O. BOX 200
FORT HALL, IDAHO 83702

June 2, 1987

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

RE: Anderson Ranch and Black Canyon Wildlife Protection,
Mitigation, and Enhancement Plan

Dear Mr. Conley:

The Shoshone-Bannock Tribes have reviewed the Anderson Ranch and Black Canyon Wildlife Protection, Mitigation and Enhancement Plan. We are pleased with the plan and believe it represents a reasonable approach to achieving wildlife mitigation goals for losses sustained by the two facilities.

The Tribes support the Interagency Work Group's use of the modified Habitat Evaluation Procedure (HEP) to estimate the benefits of mitigation projects in terms of habitat units. While this method is not perfect, it represents a workable approach to quantifying habitat values. It has the advantage of providing a uniform method that all states and agencies can use; it is consistent with techniques used during the Wildlife Impact Assessments; and it is the most widely accepted method available to date. The Tribes also support the Group's finding that a total of 9,619 and 2,238 target species habitat units were lost as a result of the development and operation of the Anderson Ranch and Black Canyon facilities, respectively.

As pointed out in the mitigation plan, the use of simplified mitigation accounting results in a severe underestimate of the

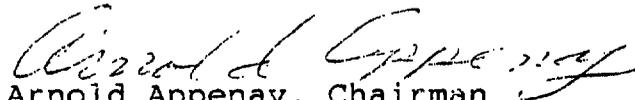
Mr. Jerry Conley
June 2, 1987
Page 2

losses that have been occurring since the installation of facilities at Anderson Ranch and Black Canyon. Every effort must be made to assure that annual operation and maintenance efforts are funded for the life of the Anderson Ranch and Black Canyon facilities. These efforts must go beyond "good faith" to an active, vigorous pursuit of the required annual mitigation and enhancement activities and necessary funding.

The Shoshone-Bannock Tribes support the Idaho Fish and Game's position that hydropower beneficiaries should take 100% responsibility for mitigation of wildlife losses due to development and operation of the Anderson Ranch and Black Canyon facilities. The entire Boise Project would have been infeasible without the benefits provided by hydropower. These hydropower benefits allow the Project to conform to federal financial feasibility criterion. In addition, irrigation which is one of the other major uses of the Project, would not have been feasible without power development for pump irrigation.

The Tribes appreciate the opportunity to work closely with the Idaho Fish and Game to support mutual wildlife goals.

Sincerely,


Arnold Appenay, Chairman
Fort Hall Business Council

MAY 11 1987



United States Department of the Interior

BUREAU OF RECLAMATION
PACIFIC NORTHWEST REGION
FEDERAL BUILDING & U.S. COURTHOUSE
BOX 043 - 550 WEST FORT STREET
BOISE, IDAHO 83724

IN REPLY
REFER TO PN 150

MAY 11 1987

Ms. Allyn Meuleman
Idaho Department of Fish and Game
600 South Walnut
P.O. Box 25
Boise, Idaho 83707

Dear Ms. Meuleman:

We have reviewed the Draft Wildlife Mitigation Plan for Anderson Ranch and Black Canyon Projects (Northwest Power Act) which you sent on April 2, 1987. We have the following comments for your use.

General Comment

We believe some credit should be given for the wildlife enhancement work accomplished over the last few years in the Montour valley. In addition, this area is adjacent to the upper end of Black Canyon Reservoir and provides an ideal situation for at least partial mitigation for wildlife habitat losses in the Black Canyon Reservoir area.

Specific Comments

Page 25, paragraph 3: Reference is made to a power "subsidy" of \$35 million financial assistance to irrigation repayment from hydropower, and the statement is made that "hydropower is responsible for repaying \$46,689,918 (44 percent) of the total cost of the Boise Project." The discussion in the subsequent paragraph would lead the reader to assume that the Anderson Ranch and Black Canyon Powerplants alone are responsible for that 44 percent repayment. That is not the case. The \$35 million of financial assistance is from the Federal Columbia River Power System (Public Law 89-561)(33 percent of the total project repayment), while Anderson Ranch and Black Canyon are repaying the commercial power investment of \$11,635,268 referred to (11 percent of total project repayment). Perhaps the hydropower-based repayment associated with the \$35 million should be analyzed in terms of wildlife mitigation associated with each facility generating the revenue, not the Boise Project.

Page 26, last paragraph: The first 70,000 acre-feet in Anderson Ranch Reservoir is dead and inactive space originally intended for sedimentation, a conservation pool, and power head, rather than simply a "minimum power pool." On top of that space, 5,000 acre-feet was allocated specifically to power. That 5,000 acre-feet of space is being subscribed to by the Boise Water Corporation for municipal and industrial (M&I) water supply. Even if this 75,000 acre-feet of storage space is assumed to be allocated specifically to power, this amount of storage would cover 1,160 acres, or about 25 percent of the total reservoir surface area of 4,740 acres, rather than the 1,971 acres (42 percent) shown in the report.

The Black Canyon Mitigation Status Report (Chaney and Sather-Blair 1985) concluded that no mitigation agreements or requirements are documented nor has any mitigation been implemented at Black Canyon. In a July 20, 1984 letter attached to the mitigation status report, the USBR stated, "[t]he report appears to be an accurate description of the project and its history." Because of the August 1983 Memorandum of Understanding between the USBR and the IDFG, any wildlife projects planned for the future, which are outlined in the MOU, would be considered "in lieu of" under the 1980 Northwest Power Planning Act (Sec. 4(h)(10)(A)).

Anderson Ranch and Black Canyon power plants were originally responsible for repaying the Boise Project "power investment" of \$11,635,268. It is our understanding that the Columbia Basin federal power pool (which includes the Anderson Ranch and Black Canyon power plants) is responsible for repaying the \$35,054,650 balance of total power responsibility, plus any of the \$11,635,268 Boise Project "power investment" that was not repaid by 1966, when all Columbia Basin federal power repayment obligations became the responsibility of the pooled power system administered by the BPA.

The USBR (1953:11) allocated 75,000 acre-feet (ac-ft) of Anderson Ranch storage to power. Based on physical characteristics of the reservoir, this would correctly cover 1,160 acres, or about 25% of the total reservoir surface area.

Page 27, Power and Irrigation Ties: While the concept in this section no doubt applies in many areas, perhaps including the Payette River portion of the Boise Project, it is misleading on the Boise Project as a whole. The Boise Project acreages are as follows:

	<u>Full Supply</u> (acres)	<u>Supplemental Supply</u> (acres)	<u>Total</u> (acres)
Arrowrock Division (Boise River)	165,000	112,000	277,000
Payette Division (mostly Payette River)	<u>60,000</u>	<u>54,000</u>	<u>114,000</u>
Total	225,000	166,000	391,000

Page 27, paragraph 2: The second sentence states: "The conversion of large acreages from native vegetation to agriculture was directly the result of the availability of Boise Project power." In fact, none of the Arrowrock Division irrigation depends on project power, and only a portion of the smaller Payette Division depends on project power (parts of the Payette Division depend on gravity diversion, and some of the areas on the north side of the Payette River are served by direct connected pumps rather than electric pumps).

Page 28, first paragraph: This paragraph states that the interagency work group agreed that mitigation of the wildlife losses at Black Canyon and Anderson Ranch Reservoirs would provide adequate compensation. The last sentence in this paragraph then states that many more wildlife losses would have been found if the tie between irrigation and hydropower had been examined in detail. As pointed out above, the Boise Project is not a good example of irrigation development via hydropower. Since this section of the report does not cite a single acreage figure, the reader might assume from the text that a sizable share of the 390,000-acre total is involved, when in fact only some fraction of the 114,000-acre Payette Division (Black Canyon Dam) would be involved. The Boise Project was essentially fully developed by the time Anderson Ranch was placed in operation. Anderson Ranch, developed primarily for supplemental irrigation and flood control, was equipped with a powerplant to utilize the releases made for its primary purposes. Its power output was made to serve pre-existing Reclamation loads on the Owyhee Project and on existing southern Idaho projects. Bonneville Power Administration (BPA) has marketed surplus Reclamation power in this area since the 1960's.

Page 30, second paragraph: As noted earlier, the 5,000 acre-feet of power space in Anderson Ranch Reservoir is being subscribed to for M&I use by the Boise water Corporation. Even assuming the 5,000 acre-feet is power space, the 75,000 acre-foot total space covers only 25 percent of the total reservoir surface acreage rather than the 42 percent presented in the report.

Page 30-31, summary: Based on the analysis in this report, it is difficult to understand the logic for the conclusion that hydropower should be assigned 100 percent responsibility for mitigation of wildlife losses due to the development and operation of Anderson Ranch and Black Canyon Dams and Reservoirs. The analysis does not appear to support that conclusion.

The total acreage of pump irrigation served by Boise Project power was not available when this report was completed. Boise Project power is used for irrigation pumping on at least 26,000 acres in the Payette Division of the Boise Project, and on undetermined acreages in the USBR's Owyhee and Minidoka Projects. Regarding pump irrigation on the Owyhee Project, the USBR (1981:733) stated that power supplied from Boise Project power plants is used for the operation of existing pumping plants to irrigate 30,000 to 35,000 acres.

During the period 1983-1986, only 20% of the Boise Project net power generation was used for "federal reserve irrigation pumping," while 77% was used for "generation to BPA (for sales, etc.)."

The USBR (1953:11) allocated 75,000 ac-ft of Anderson Ranch storage to power. Based on physical characteristics of the reservoir, this would correctly cover 1,160 acres, or about 25% of the total reservoir surface area.

Hydropower is responsible for repaying 44% of the total Boise Project costs, and 55% of the reimbursable costs. Because irrigators have a limited "ability to pay," the Boise Project, and hence the Anderson Ranch and Black Canyon Facilities, would not have been financially feasible without inclusion of hydropower repayment. Furthermore, when the interagency work group agreed to limit the wildlife impact assessment study area to the reservoir area, and not quantify the impacts of conversion of native habitat to irrigated agriculture, they expected all (100%) of the reservoir impacts to be mitigated under the Columbia Basin Fish and Wildlife Program.

In regard to the appropriate wildlife mitigation, the following conceptual approach is suggested. If Anderson Ranch and Black Canyon Dams and Reservoirs were built under Federal programs today, any mitigation cost because of the dam and reservoir would be considered a joint project cost along with the actual dam and reservoir cost. Accordingly, the mitigation cost would be assigned to all functions involved, based on the percentage of remaining joint costs. The percentage of remaining joint costs is determined through the cost allocation process.

The basis for the allocation of costs for both Anderson Ranch and Black Canyon is a report titled "Boise Project, Idaho: Revised Allocation and Repayment Report, USBR, September 21, 1953." This is the source document that Reclamation currently uses to allocate costs and assign repayment of current costs each fiscal year.

The 1953 report considered both Anderson Ranch and Black Canyon Dams and Reservoirs as joint use project facilities, and costs were assigned to irrigation, flood control, and power for Anderson Ranch (based on reservoir space), and to irrigation and power for Black Canyon. Accordingly, the 1953 report allocated the joint use project costs (dam and reservoir costs) as follows:

<u>Item</u>	<u>Percent</u>
Anderson Ranch	
Irrigation	47.5
Flood Control	47.5
Power	5.0
Total	100.0
Black Canyon	
Irrigation	50.0
Power	50.0
Total	100.0

This is consistent with the original allocation and the way the costs are currently accounted for by Reclamation. This is also consistent with our recommendation for the Palisades Project wildlife mitigation study.

We recognize the allocations would be made under a different method if they were made today, although we are not sure what the results would be. However, data are not available to prepare new cost allocations for study purposes, including the necessary single-purpose project estimates, etc.

The last sentence on page 30 should be revised to reflect the fact that the Boise Project Powerplants are repaying 11 percent of the total cost of the Boise Project, while Federal powerplants elsewhere in the Columbia River Basin are repaying 33 percent of the total cost (see comment on page 25, paragraph 3).

The 5% joint use allocation to power presented here for Anderson Ranch is actually the combined joint use allocation of storage in Anderson Ranch and Arrowrock reservoirs. Arrowrock has a surface area of 3,100 acres and was not included in the Anderson Ranch Wildlife Impact Assessment.

The USBR (1953:11) allocated 75,000 ac-ft of Anderson Ranch storage to power (15% of the total storage capacity of 493,000 ac-ft). The remaining 418,000 ac-ft, it was said, would be used jointly for flood control and irrigation. By joint use allocation methodology, 75,000 ac-ft were allocated to power, 418,000 ac-ft were allocated to flood control, and the same 418,000 ac-ft were allocated to irrigation. This amounts to an "equivalent" of 911,000 ac-ft for a reservoir that holds 493,000 ac-ft. As a result, the joint use allocation for power is 75,000 / 911,000, or about 8%, and does not account for the fact that most of the 418,000 ac-ft of storage is also used for power generation. In fact, about 87% of annual Anderson Ranch discharges pass through the turbines.

Regardless of the percentages assigned to various project functions under joint cost allocation, irrigators are limited by an "ability to pay" their cost allocations. As a result, irrigation cost allocations in excess of the irrigators' "ability to pay" must necessarily be re-allocated to hydropower for repayment. Therefore, it is hydropower that makes the Boise Project financially feasible.

See our reply to the page 25, paragraph 3 comment on the first page of this letter. Also, "Federal power plants elsewhere" includes the Anderson Ranch and Black Canyon power plants.

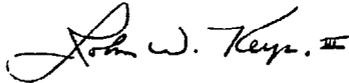
Page 35, first paragraph; page 66, page 77 (table 6): Recommending peregrine falcon enhancement and asking for endorsement based on the existing writeup appears premature. The writeup should be developed to the same level as the other recommended mitigation proposals. At a minimum, a preliminary evaluation of the habitat should be conducted to locate a hacking site, the needed improvements/developments identified, and the benefits of the program listed.

Page 67-68: The Bureau and the Forest Service have completed some preliminary work on improving the esthetics of this borrow site. Improvements for waterfowl were not included. Fish and Game should contact the Bureau and the Forest Service to determine the status of this project.

The Nelson Ranch area protection/enhancement project is proposed under both the Anderson Ranch (pages 62-63) and Black Canyon (pages 100-101) mitigation plans. It is not clear if the intent is to credit mitigation from this proposed project to both plans or to only one. If it is to apply to only one plan, it would be helpful to assign a priority to that plan.

We suggest a meeting to discuss these comments with you. Please contact Bob Adair (334-1209) if you believe a meeting would be beneficial.

Sincerely yours,



Regional Director

Morian Nelson's (1986 letter to Northwest Power Planning Council) discussion of peregrine impacts from losses of wetlands is summarized on page 9. The specific location of the hack site will be developed during advance design, once the project is approved.

The Anderson Ranch Borrow Site Rehabilitation project was proposed to the Anderson Ranch mitigation planning work group by the Forest Service. Both Forest Service and Bureau of Reclamation personnel are active members of the Interagency work group and have been coordinated with throughout the development of this project.

A separate Nelson Ranch project is proposed in both the Anderson Ranch and Black Canyon mitigation plans, with a combined protection goal of 1,560 acres.



Department of Energy
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208-3621

MAY 08 1987

PJSD

Ms. Allyn Meuleman
Idaho Department of Fish and Game
600 South Walnut
Box 25
Boise, ID 83707

Dear Ms. Meuleman:

This letter is in response to your request for comments on the Draft Wildlife Protection, Mitigation, and Enhancement Plan for Black Canyon and Anderson Ranch. The following is a list of recommended changes or comments concerning the report:

1. Abstract, page 2:

- ° In the first sentence you state that "projects have been developed in Idaho to mitigate the impacts to wildlife habitat and annual wildlife production." The wording "annual wildlife production" implies you are assessing cumulative wildlife losses. Since you are not addressing cumulative wildlife losses this wording should be omitted or changed.
- ° Use of a modified Habitat Evaluation Program (HEP) is mentioned, however, the methodology of the HEP procedure you used is never discussed in the report text.
- ° Total acres inundated at each facility should be included in the Abstract for quick reference.

Addressed in text.

The methodology of the modified HEP used is discussed on pages 25-26.

Addressed in text.

2. Introduction, page 3:

- ° References to the Columbia River Basin Fish and Wildlife Program (Program) should be quoted instead of paraphrased. The Program does not call for the "redress" of wildlife and wildlife habitat losses.

Addressed in text.

3. Responsibility of Hydropower to Mitigate Wildlife Losses, page 20:

- ° Bonneville Power Administration's (BPA) position has been that the facilities are multipurpose projects and wildlife losses and wildlife mitigation responsibilities have to be allocated among the other project purposes (i.e., irrigation and flood control).

Addressed on next page.



- The information presented, particularly in the Summary on page 30, is Idaho Department of Fish and Game's (IDFG) position. It would be more appropriate if this information was presented in an appendix that clearly identifies it as IDFG's position.
4. Implementation, page 38:
- How does current law affect the feasibility of proposed conservation easements? It appears that in most cases easements would not be feasible if the purchasing agency must own land appurtenant to the parcel being purchased. Have any actions been taken to submit a conservation easement bill to the Idaho Legislature?
5. Results and Discussion, pages 40 - 54.
- Numerical management goals are given for some species. It would be useful if the current status for those species was also given and related to the goals.
6. Peregrine Falcon, page 54:
- How do selected sites fit into the recovery plan for peregrines?
7. Hills City Marsh Protection/Enhancement, page 57:
- It is indicated that purchase of water rights may be necessary. If they can't be obtained, what does this do to the feasibility of the project?
8. Nelson Ranch, pages 62 and 100:
- What is the current status of the Nelson Ranch? If the ranch is not protected, does this affect the biological importance of the areas surrounding it? It seems that preservation of grouse habitat on the ranch should be the first priority for grouse.
9. Mitigation Plan Summaries, pages 69 and 104:
- The Scope of Work calls for land acquisition criteria to be addressed under Objective 2, Task 5. The report does not appear to sufficiently address these criteria. It is important that the plan show "how the proposed mitigation project would be the most cost-effective alternative, while accomplishing the biological objectives of the mitigation plan" [1004(d)(1)(B)].
10. Mitigation Plans, pages 70 and 105:
- Discussion on the establishment of a trust fund should be deleted. As presented in the plan, a trust fund would not be in conformance with U.S. Treasury regulations. Also the use of a trust is a BPA funding decision.

Idaho Fish and Game has developed the Hydropower Responsibility section, but it reflects the views of the entire interagency work group except for USBR. Until this particular question is resolved, this type of information should be readily available to the reviewer, in the main body of the text.

At the present time, Idaho law does not provide an easy way of purchasing conservation easements, due to the "appurtenant" stipulation. Actions have been taken to submit a conservation easement bill to the Idaho Legislature, and attempts to get a bill passed will continue in the future.

Addressed in text.

Addressed in text.

The project would still be feasible, although maximum habitat potential might not be achieved.

Protection of Nelson Ranch is a high priority, and is still being pursued at this time. However, even if the ranch were not protected, protection of key areas adjacent to it are still of extreme biological importance to the preservation of the sharp-tailed grouse in western Idaho.

Land acquisition criteria are addressed throughout these plans. Acquisition projects developed in the mitigation plans for both Anderson Ranch and Black Canyon are cost-effective because of relatively low land values in Idaho and because of the large number of wildlife benefits that will be gained through acquisition of identified parcels.

Addressed in text.

11. Action Plan, page 79:

- The Action Plan should not include fiscal years since the exact timing of actions is still unknown. It would be more appropriate to refer to time according to year (i.e., year 1, 2, etc.).

12. Hubbard Reservoir protection/enhancement, page 117:

- BPA questions the appropriateness of proposing acquisition of state lands. Other alternatives such as agreements should be considered.

If you have any questions regarding these comments, please call me at (503) 230-7579.

Sincerely,



Mary S. Mahaffy
Wildlife Biologist

Addressed in text.

Any acquisition of fee-title or long-term lease would be through competitive bid and would not take place without the consent and cooperation of the Idaho State Dept. of Lands. State law requires that the Idaho Dept. of Lands manage all of their property for the highest economic return. Therefore, land use agreements pertaining to the management of these lands are generally not possible.