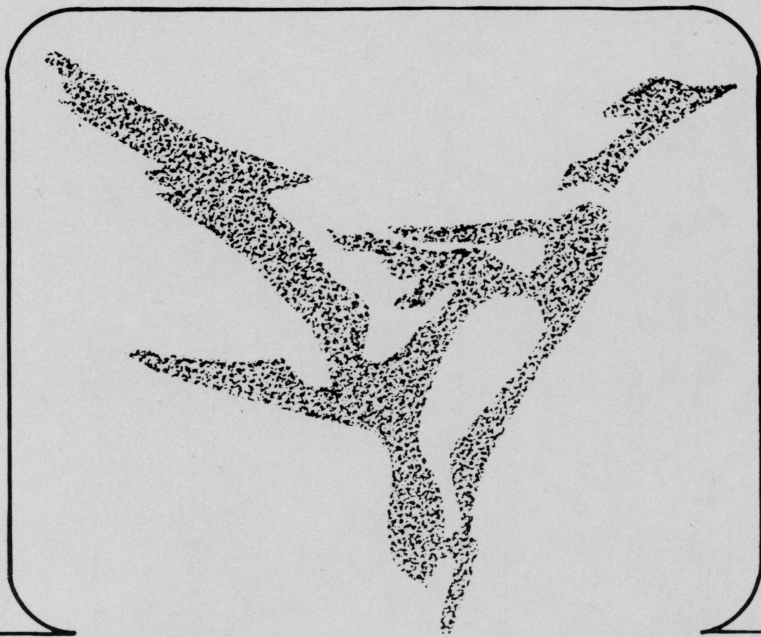




**US Army Corps
of Engineers**
Walla Walla District

Design Memorandum
Wildlife Habitat Development
Supplement No. 2
Hells Gate Habitat Management Unit



Lower Snake River Project



October 1987

Design Memorandum
WILDLIFE HABITAT DEVELOPMENT
Supplement No. 2
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Lower Snake River Project

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SECTION 1 - INTRODUCTION

1.01. PURPOSE.

The purpose of this memorandum is to serve as a supplement to the unnumbered design memorandum entitled "Design Memorandum for Wildlife Habitat Development on Project Lands: Lower Snake River Project," (U.S. Army Engineer District, Walla Walla, Washington, 1975) for the ongoing development of on-project wildlife habitat along the lower Snake River to compensate for wildlife losses caused by project development. This plan describes habitat management practices intended to improve the quality of vegetative communities beneficial to wildlife residing on Hells Gate lands and is based on the deletion of undeveloped lands from a lease agreement between Idaho Parks and Recreation Department (IPRD) and the U.S. Army Corps of Engineers (Corps). Management of the area as a Corps habitat management unit will provide increased hunting opportunities for the public of Idaho. Both IPRD and the Idaho Department of Fish and Game (IDFG) have signed a Memorandum of Agreement (MOA) with the Corps (Appendix A) agreeing to this change in management. By previous correspondence and by the MOA, IDFG and the Corps have reached agreement that management of Hells Gate Habitat Management Unit (HGHMU) along with management of other project lands on the Clearwater River arm of Lower Granite reservoir will compensate for losses to wildlife in Idaho caused by the construction of Lower Granite Lock and Dam.

1.02. AUTHORITY.

This supplement was prepared under the authority of the Lower Snake River Project, authorized by Public Law 14, 79th Congress, 1st Session, approved 2 March 1945. The "Lower Snake River Fish and Wildlife Compensation Plan, 1975" was prepared in fulfillment of the Fish and Wildlife Coordination Act, Public Law 85-624, 85th Congress, enacted 12 August 1958. The Compensation Plan was authorized by the Water Resource Development Act of 1976, Public Law 94-587, 94th Congress, 2nd Session, enacted 22 October 1976. Development of HGHMU is part of the on-project wildlife compensation program of which the following was stated in the 1975 Compensation Plan (page 75):

"...Development of habitat on Project lands is an important factor in providing partial compensation for wildlife losses caused by the Project. Authority already exists to conduct this development since these lands are under Federal ownership. Therefore, other than this discussion on the development and its relationship to the overall Project compensation plan, it will not be included in this recommendation for separate Congressional approval and funding...."

Congressional approval of this aspect and the remainder of the Compensation Plan was approved by the following language of the Water Resource Development Act of 1976:

"Sec. 102...The following works of improvement for the benefit of navigation and the control of destructive floodwaters and other purposes, are hereby adopted and authorized to be prosecuted by the Secretary of the Army, acting through the Chief of Engineers, substantially in accordance with the plans and subject to the conditions recommended by the Chief of Engineers in the respective reports herein designated.

Columbia River Basin

Fish and Wildlife Compensation Plan for the Lower Snake River, Washington and Idaho, substantially in accordance with a report on file with the Chief of Engineers...."

1.03. COMPENSATION HISTORY.

a. During the development of the Lower Snake River Fish and Wildlife Compensation Plan, in their response to the Bureau of Sport Fisheries and Wildlife (BSFW) concerning the Bureau's special report on mitigation of fish and wildlife losses caused by the four lower Snake River projects, IDFG felt that "...Project involved wildlife resources are minimal in Idaho, however, and we will defer detailed comment to the Washington Department of Game...." (17 January 1972 letter from IDFG to BSFW). That evaluation subsequently was reviewed by IDFG and was found to underestimate the wildlife losses in Idaho related to the Lower Granite Dam project. Hence, in a meeting with the Corps (Colonel Conover) on 24 November 1974 and in their letter of 4 December 1974 to the Corps, IDFG propounded the need for the Corps' acquisition, development, and maintenance of five land parcels to compensate for estimated wildlife losses on 114 acres of habitat inundated by Lower Granite.

b. In responding to the IDFG recommendations (12 February 1975 letter), Colonel Conover stated "...some 800 acres of the (Hells Gate) park area will be left in a wild state which should also benefit wildlife beyond its present intensively used status." Mitigation measures were again requested of the Corps by IDFG (7 April 1975 and 1 April 1977) and Fish and Wildlife Service (FWS) (18 April 1977).

c. In his 2 May 1977 letter to the FWS, Colonel Allaire explained that because Idaho's mitigation requests arrived as the Corps was in the final stages of preparing the Lower Snake River Fish and Wildlife Compensation Plan, the Corps opted to defer action on mitigation for Idaho's losses. Colonel Allaire promised to give this topic his "personal attention" when Lower Snake River Compensation Plan funds became available. Senator McClure of Idaho requested of the Corps (4 May 1977 letter) a clarification of the legislative authority to provide wildlife mitigation in Idaho since it was his understanding that the Compensation Plan provided for that mitigation. In his 16 May 1977 letter to Senator McClure, Colonel Allaire further assured Idaho that as the Compensation Plan does not specify where the compensation measures will be provided, the Corps would work with the three state agencies to determine exact locations of developments.

d. The Corps contracted with Dr. W. L. Pengelly of the University of Montana in December 1977 for his review of Idaho's mitigation requests. In his December 1978 report (Appendix B), Dr. Pengelly stated, "In summary, we believe that the lands purchased above PFI (Potlatch Forest Industries) can be and are being developed for wildlife and should be productive enough to compensate for the loss of riparian habitat in the lower 4 miles of the Clearwater....On the Snake River the dedication of the undeveloped acreage at Hells Gate State Park to wildlife should be adequate compensation."

e. In letters to the Corps in response to the Pengelly report, the FWS (26 March 1979) and IDFG (23 March and 23 May 1979) disputed some of the conclusions and continued their stance that the Corps should acquire 350 acres of off-project lands upstream from Hells Gate Park. Colonel Allaire replied to IDFG that "...excess park lands could be made available for wildlife habitat development. This would mitigate directly for claimed losses on this land due to our acquisition. If you feel these lands do not provide sufficient habitat to be of value for wildlife, we will have no recourse but to surplus them as excess to project needs. That would place us in an untenable position if we were then to propose acquisition of 350 acres of similar lands just upstream from this area for wildlife mitigation. It seems to be contradictory to claim wildlife losses which could not be mitigated on essentially the same land now in public ownership." Colonel Allaire also stated, "I believe the Pengelly

and McClelland report offers the best available evidence on wildlife impact caused by Lower Granite. It demonstrates that wildlife losses to Idaho can be compensated with existing lands and facilities which we can presently make available for wildlife. Unless there are additional data to the contrary which have not yet been brought to light, I see no reason to change our position concerning Lower Snake River wildlife mitigation to the State of Idaho."

f. IDFG (4 September 1979 letter) responded, "It is the Corps' position that the Pengelly report clearly shows that additional wildlife mitigation is not needed if excess Hells Gate lands can be used for habitat development. Conversely, it is our Department's position that the report just as clearly shows that if Hells Gate lands cannot be used, then acquisition of other, additional lands would be justified....If suitable Hells Gate lands are, in fact, surplus to recreation needs, our Department would consider them for wildlife mitigation. If suitable lands are not surplus then we will continue to press for other, additional land acquisition."

g. In a 25 February 1981 letter the Corps presented to IPRD the impact of the Pengelly report on Hells Gate Park and notified them that the Corps wished to prepare a wildlife management plan for the undeveloped portion of the park. On 12 March 1982 the Corps reiterated their interest in meeting with IPRD and IDFG to develop Hells Gate lands as a wildlife management unit of Lower Granite project.

h. Following the meeting of 26 April 1982 between the Corps, IDFG, and IPRD, IDFG wrote (5 May 1982) to the Corps, "We feel that, when finalized, the plan can provide essential habitat features that will satisfy our past requests for mitigation for wildlife habitat losses resulting from the Lower Granite project."

i. Based on IDFG letters of 4 September 1979 and 5 May 1982 and discussions during the meeting of 26 April 1982, it is assumed that IDFG will continue to request acquisition of off-project lands if Hells Gate lands are not developed and dedicated for wildlife mitigation. The cost to acquire 350 acres along the Snake River above Hells Gate Park as requested by IDFG would likely exceed \$1 million, nearly a ten-fold increase in the cost to satisfy wildlife mitigation relative to the proposed development of Hells Gate Park lands.

j. Comments from IPRD, IDFG, and Corps personnel on the Hells Gate wildlife management plan were incorporated in the final plan. In early 1983, an MOA was prepared by the Corps (Appendix A) and sent to IPRD and IDFG for their concurrence. The MOA indicated the lands (650 acres) to be developed for wildlife. In this MOA, IPRD agreed to request those

lands be deleted from the park lease so that wildlife habitat could be developed and hunting could occur. IDFG agreed that additional mitigation would not be requested if the subject lands were developed according to the management plan. The Corps agreed to accept responsibility for development, operation, and maintenance of the lands in a similar manner as on-project wildlife mitigation lands in Washington.

k. Following their August 1983 onsite inspection of the park lands to be developed for wildlife mitigation, the Idaho Parks and Recreation Board agreed to the turnover of those lands to the Corps based on the proposed use of the lands.

1. The subject lands were originally justified for acquisition in Design Memorandum No. 28a, Preliminary Master Plan Land Requirements Plan - Public Use, Supplement No. 1 (July 1971) for a buffer to park activities, an equestrian riding corridor, and day use. The riding corridor and day-use concepts were targeted mainly for the low-lying bench along the river which will remain in the park lease. As wildlife mitigation lands, the upper bench and knoll will continue to provide a buffer to the park, horseback trails, and day use (hiking, bird watching, etc.). Thus, the function of the subject lands will not change relative to recreation use.

1.04. SCOPE.

This plan concerns development of the vegetative community supporting terrestrial wildlife species occurring on those Hells Gate lands not currently under intensive park development nor reserved for future park expansion. Development activities and cost estimates are described.

1.05. COORDINATION.

Agencies consulted during preparation of this design memorandum supplement included:

USDA, Soil Conservation Service
Idaho Parks and Recreation Department
Idaho Department of Fish and Game
Fish and Wildlife Service
Nez Perce Tribe

1.06. AGREEMENTS AND RESPONSIBILITIES.

a. Nine hundred thirty-three acres comprising Hells Gate State Park are currently leased to IPRD under Park Lease Supplemental Agreement DACW68-1-75-25, dated 17 September 1979 and terminating on 3 May 2010.

Approximately 833 acres of Hells Gate State Park lying east and south of the campground area remain undeveloped by IPRD. The return of management responsibilities for 650 acres of these undeveloped lands from IPRD to the Corps will occur to facilitate management of these lands as a wildlife habitat management unit on the Lower Granite Dam project. IPRD requested deletion of 650 acres from the lease in their 12 January 1984 letter to Walla Walla District.

b. Following the return of management responsibility to the Corps, a cooperative agreement between IDFG and the Corps will be prepared to delineate specific management responsibilities. By state statute, IDFG has public responsibility for all wildlife within the State of Idaho, and such wildlife is the property of Idaho to be preserved, protected, and managed by the State.

SECTION 2 - DEVELOPMENT GOALS AND OBJECTIVES

2.01. DEVELOPMENT GOALS.

Development goals for the HGHMU are:

a. To designate and develop HGHMU lands in accordance with the Lower Snake River Fish and Wildlife Compensation Plan.

b. To conserve and improve natural resources of the area according to applicable Federal and state laws and regulations and accepted conservation practices.

2.02. DEVELOPMENT OBJECTIVES.

No specific mitigation requirements have been established for the HGHMU. However, the Corps has established development objectives for the unit and will make every effort to meet these objectives. The development objectives for the HGHMU are:

a. To provide access for public hunting recreation at an optimum level of use to be determined jointly between IDFG and the Corps, and which is expected to vary with changes in demand and habitat capabilities.

b. To develop a diversity of habitats such that will increase the habitat units (HUs) available on the HGHMU, using the following species to evaluate different habitat components:

- (1) Song sparrow (lower canopy, tree/shrub), increase by 8 HUs.
- (2) Yellow warbler (mid-upper canopy, tree/shrub), increase by 6 HUs.
- (3) Valley quail (brush/grasslands, tree/shrub), increase by 9 HUs.
- (4) Western meadowlark (brush/grasslands), increase by 40 HUs.
- (5) Montane vole (brush/grasslands), increase by 60 HUs.
- (6) Ring-necked pheasant (uplands), increase by 70 HUs.

A baseline study will be conducted to determine the number of HUs available on HGHMU prior to habitat development. HUs for the above species will then be developed to the extent possible.

c. To develop habitat to support a variety of game and nongame species of wildlife such as mourning dove, mountain cottontail, mule deer, red-tailed hawk, barn owl, western bluebird, common flicker, and violet-green swallow.

SECTION 3 - MANAGEMENT AREA DESCRIPTION

3.01. TOPOGRAPHY.

a. HGHMU is located in Nez Perce County, approximately 5 miles south of the city of Lewiston, Idaho, and directly across Lower Granite Lake from Asotin, Washington. The area is approximately 2 miles long and 3/4-mile wide at the widest point. It is bordered on the west and north by Hells Gate State Park and Tammany Creek Road, and to the south and east by private lands. Elevation in the area varies from 850 feet msl at the river's edge to 1,440 feet msl at the eastern boundary (Figure 3.1).

b. The HGHMU can be sectioned into two functional subunits (Figure 3.1) according to proposed management of the area:

(1) The Upper Bench subunit covers an area of approximately 125 acres and is located between elevations 850 and 950 feet msl. A more gently sloping portion comprises the northern third of the Upper Bench and previously was used for farming. The southern portion of the Upper Bench is broken by gullies running east-west. This portion of the Upper Bench was grazed by livestock prior to purchase by the Government.

(2) The Knoll subunit is a sharply rising hill ranging in elevation from about 951 to 1,440 feet msl. The Knoll subunit comprises approximately two-thirds of the HGHMU acreage. The northeast slopes of the Knoll are quite steep, rising about 400 feet in less than 1,200 feet horizontally.

3.02. SOILS.

a. Soils of the HGHMU are varied in origin. The deeper soils along the river are alluvium of the Snake River Plain; other soils in the area are of metamorphic and volcanic origins. Much of the material in the Upper Bench subunit is from lacustrine deposits which settled out of temporary lakes formed by glacial damming of the Snake River in various geological times. Materials weathered from the basaltic layers are overlain and mixed with wind-deposited material, mostly silts of western origin. Six soil types are found on HGHMU (Soil Conservation Service [SCS] unpublished data). Most of these are silt/loam combinations with some basalt outcroppings and gravel soils.

b. Of the six soil types, four are of the Chard series each of which is found on slopes of varying percentages or exhibits evidence of previous disturbance. Each soil type has been grouped into land-use capabilities by the SCS. This classification system identifies the potential of a particular soil type for cultivating plants and their resultant response to management. The capability classification of each soil type found on HGHMU will follow a description of that particular type. Symbols following each descriptive name refer to the location of that soil on the unit map (Figure 3.2). A soil survey for Nez Perce County has yet to be published by the SCS. Information presented here is based on that presently available from the SCS.

(1) Chard Loam (Cd1), 10-25 Percent Slopes.

This very deep and well-drained soil is found mainly on stream and alluvial terraces within the site. The native vegetation is mainly grasses and low shrubs. The potential natural plant community is Sandberg bluegrass, bluebunch wheatgrass, and rabbitbrush. Permeability of this soil is moderate on the surface and moderately rapid in the subsoil and substratum. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is rapid and the hazard of water erosion is high. Irrigation is needed for maximum production of moist crops. Sprinkler irrigation can be used but water needs to be applied slowly to minimize runoff. Continuous high residue crops with grass and legumes in rotation will improve soil fertility and tilth as well as help to control erosion. This map unit is suited to hay and pasture. Its capability classification is VIe, irrigated; and IVe, non-irrigated. Class VI soils have severe limitations that make them generally unsuitable for cultivation. Subclass "e" indicates that the main limitation is risk of erosion unless close-growing plant cover is maintained. Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

(2) Chard - Tammany Creek Variant (Cd2), 20-45 Percent Slopes.

This soil is located on terraces and canyon toe slopes. The primary vegetation consists of annual brome grasses and sweet clover, with rabbitbrush on undisturbed areas. Erosion hazard is moderate to severe. The capability classification is VIe.

(3) Chard Silt Loam (Cd4), 2-10 Percent Slopes.

This soil occurs on flat tops of high terraces and on low level terraces near Tammany Creek. The capability classification is IIe. Class II soils have severe limitations that reduce the choice of plants or that require moderate conservation practices.

(4) Chard Loam (Cd5), 30-50 Percent Slopes.

No information is available on this soil type at this time. This soil occurs along lower Tammany Creek.

(5) Endicott - Bryden Silt Loams Complex (En2), 4-12 Percent Slopes.

This complex is moderately deep, well-drained soil on loess-covered basalt plateaus. Bluebunch wheatgrass and Sandberg bluegrass are the dominant vegetation of the potential natural plant community. This soil has moderately slow permeability with rapid runoff resulting in a severe hazard of erosion by water. There is a restriction to rooting depth from a duripan at a depth of 25 to 40 inches. Sodium concentrations create special soil management problems such as poor nutrient availability, slower infiltration, and poor soil structure in the surface layer. The strongly alkaline soil material below a depth of about 30 inches is low in fertility. Nutrient availability can be improved by using a complete fertilizer program with nitrogen, phosphates, and sulfur as a minimum. The capability classification is IVe.

(6) Limekiln - Athena Variant Association (Lil), 35-70 Percent Slopes.

This shallow stony association occurs along canyon sides at elevations of 1,000 to 2,200 feet. The capability classification is IIe.

c. Table 3.1 lists ratings for each soil type according to its potential for providing habitat for various kinds of wildlife. The potential of the various soils is rated good, fair, poor, or very poor. A rating of "good" indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management and satisfactory results can be expected. A rating of "fair" indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of "poor" indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places but management is difficult and must be intensive. A rating of "very poor" indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

3.03. CLIMATE.

a. The climate of the HGHMU (based on data from the Lewiston weather station) is semiarid with winter lows averaging 23° F in January and an average maximum of 89° F in July. The highest temperature recorded was 117° F and the lowest was -23° F. The area is characterized by hot summers and moderate winters with a frost-free growing season of approximately 200 days during April through October.

b. The long-term average precipitation is 13.28 inches including an average snowfall of 13 inches, most of which falls during January and February.

c. Winds at Lewiston are predominantly from the east during all months with mean monthly windspeed ranging from 6 to 9 mph. However, wind direction on the HGHMU may vary somewhat from that recorded for Lewiston because the east-west junction of the Snake and Clearwater Rivers at Lewiston may induce different wind currents than occur along the north-flowing Snake River adjacent to the HGHMU.

3.04. VEGETATION.

a. Vegetation of the HGHMU is dictated by the local climate, soil depth and texture, slope aspect, precipitation, and external pressures (interspecific competition). The land use history of the area includes grazing and farming, both of which have affected the composition and density of the vegetation present in the area.

b. The Upper Bench is dominated by cheatgrass, sand dropseed, common mullein, Scotch thistle, rabbitbrush, and broom snakeweed. The western slopes of the Upper Bench also support scattered patches of prickly pear.

c. The south and west slopes of the Knoll are dominated by sand dropseed, bluebunch wheatgrass, prickly pear, buckwheat, western yarrow, and rabbitbrush. The north slope of the Knoll subunit supports a different vegetative community because of a more moist microclimate induced by the northerly aspect. Common plants on this slope include Idaho fescue, bluebunch wheatgrass, sand dropseed, Kentucky bluegrass, Canada bluegrass, arrowleaf balsamroot, old man's whiskers, snowberry, and Wood's rose.

d. A list of common and scientific names of plants mentioned in this text is found in Appendix C.

3.05. WILDLIFE.

a. Hells Gate was a popular hunting area for local residents prior to its designation as a state park. Hay growing activities on the Upper Bench and adjacent parklands provided a good quality habitat for upland game birds and many other wildlife species.

b. The HGHMU and adjacent parklands presently support dense stands of Scotch thistle, cheatgrass, sunflower, etc. Although these habitats are not popular with local agricultural interests (Scotch thistle is a noxious weed), these plants provide excellent habitat for cottontails, ring-necked pheasant, songbirds, snakes, and other species. This community is common on the northern portion of the Upper Bench and on parklands west of the HGHMU.

c. Most of the HGHMU is covered by a rabbitbrush/cheatgrass community which provides habitat for horned larks, meadowlarks, badgers, northern harriers, and chukar. Although this community comprises the largest area on the HGHMU, it supports the lowest diversity of wildlife because of its structural simplicity.

d. Mule deer, ring-necked pheasant, songbirds, etc., are present on the northeast side of the Knoll. The vegetative diversity is improved on that area because of slightly higher moisture retention of the northeast slope.

e. Ring-necked pheasant, valley quail, and mountain cottontails are the most common game species on the subunit. The Knoll subunit supports a variety of wildlife such as chukar, rock wrens, rattlesnakes, and horned larks. Mule deer and possibly feral goats on the Knoll subunit may provide additional recreational opportunities in the form of archery or shotgun hunting. Chukar and ring-necked pheasant are the most common small game species residing on this subunit.

f. Highest wildlife diversity is found in the tree (hawthorn)-shrub-forb (Scotch thistle) community on Hells Gate Park lands near the river west of the HGHMU. Valley quail, cottontails, sharp-shinned hawks, kingfishers, and many other wildlife species inhabit this ecologically diverse strip, mainly because of its proximity to water and good structural diversity.

g. A wildlife inventory list (Appendix D) was prepared for this supplement using inventories and observations on HGHMU and adjacent lands and waters (Snake River).

SECTION 4 - DEVELOPMENT CONCEPTS FOR HGHMU

4.01. PAST MANAGEMENT OF HGHMU.

a. The Corps developed camping, day use, and other facilities in the park adjacent to Lower Granite Lake prior to turning over operation and maintenance responsibilities to IPRD. Although IPRD has maintained the developed areas, approximately 833 undeveloped acres remain unchanged under their "open space management concept." Several management concepts have been considered for the area by IPRD, including grazing and farming.

b. A Resource Evaluation Report (unpublished) was prepared for Hells Gate State Park by the SCS during 1978. That report outlined several alternative activities which could be encouraged on the undeveloped lands of the park. Some of those activities (off-road vehicle use, rodeo activities, etc.) would be incompatible with wildlife habitat developments and camping. Six basic problems identified by the SCS in its report will be addressed herein. Those problems identified by SCS were:

(1) A need for high quality diversified recreational opportunities for the public of Lewiston and adjacent areas.

(2) A high potential for habitat destruction by off-road vehicles.

(3) A need for lands suitable for outdoor education and quality wildlife habitat.

(4) A need for interpretive development of archaeological, geological, and natural sites within the park.

(5) A potential of erosion on undeveloped areas caused by uncontrolled vehicular traffic.

(6) A lack of suitable vegetation on rangeland areas.

4.02. FUTURE DEVELOPMENT CONCEPTS FOR HGHMU.

a. To achieve the goal of increasing the value of HGHMU for wildlife and associated recreation, it is important to increase both the quantity and quality of vegetative communities in the area. Basic habitat requirements (food, cover, and water) of many wildlife species are found in varying amounts on the unit. Habitat improvements will be developed to establish additional grassland and tree/shrub communities. Features such as guzzlers, perches, nest boxes, brush piles, and food plots will be installed to provide specific needs.

b. Approximately 114 acres on the HGHMU are scheduled to receive vegetational improvements (Table 4.1). Species of vegetation to be planted in each of the subunits are listed in Tables 4.2 and 4.3. Approximately 4,000 trees and shrubs and 1,000 pounds of grasses will be planted in the development of the HGHMU.

c. Upper Bench Subunit.

(1) This area contains sparse herbaceous vegetation in many areas and supports a correspondingly low diversity and number of wildlife. Approximately 104 acres of the Upper Bench will be augmented with grass seedings as a field development to provide diversification of vegetation for nesting and a food source for wildlife. The field planting will contain four raptor perches (Figure 3.1) which are expected to provide hunting perches and/or "plucking posts" for raptors such as northern harriers, American kestrels, and barn owls.

(2) Tree/shrub plantings (Figure 3.1) will receive moisture from trickle lines radiating from three water developments. These plantings are designed to provide winter cover and travel lanes to and from parklands near the river.

(3) In addition to the enhancement from vegetational plantings, wildlife-carrying capacities on the xeric Upper Bench will be increased through the installation of four gallinaceous guzzlers located adjacent to water developments, thus receiving continuous water input throughout the summer.

(4) The northern portion of the Upper Bench was cultivated prior to purchase of the area by the Corps and since has become partially invaded by Scotch thistle. That area will receive treatment for noxious weeds (thistle) and will be developed as a nesting and brooding area for upland game and songbirds. Installation of a water development at the east edge of the field development and a raptor perch at the northern edge will increase the attractiveness of the development for several species of wildlife.

(5) Ring-necked pheasant, valley quail, and mountain cottontail are the most common game species on the Upper Bench subunit.

d. Knoll Subunit.

(1) The Knoll subunit supports a variety of wildlife such as chukar, rock wrens, rattlesnakes, and horned larks. Water sources for animals living in that area appear to be limited during most years, thus

two gallinaceous guzzlers will be installed to provide water during dry periods. Two guzzlers on the Upper Bench subunit abut the west and south slopes of the Knoll, providing additional sources of water to wildlife.

(2) Feral goats on the Knoll subunit may cause damage to the native vegetation and habitat plantings in the future. To restrict goat access to HGHMU, a fence will be constructed along the eastern project boundary.

(3) Mule deer on the Knoll subunit may provide additional recreational opportunities in the form of archery or shotgun hunting. Chukar and ring-necked pheasant are the most common small game species residing on this subunit.

SECTION 5 - HABITAT ELEMENT DESIGN CRITERIA

5.01. FIELD DEVELOPMENT.

a. The establishment of field developments by planting perennial grasses and forbs provides nesting cover and food for several wildlife species. Birds expected to nest in field plantings include: ring-necked pheasant; savannah, vesper, and lark sparrows; northern harrier; short-eared owl; and horned lark. Small mammal populations associated with field plantings provide food for several raptorial birds, skunks, weasels, coyotes, bobcats, and snakes.

b. Grasses and forbs will be seeded using a rangeland drill. Fertilizer will be applied to all seeded areas as dictated by soil analyses.

5.02. GALLINACEOUS GUZZLERS.

a. Gallinaceous guzzlers are watering devices that are placed in dryland sites to provide water for upland game, small mammals, and other wildlife whose range is limited by availability of water. Guzzlers are an effective means of increasing overall carrying capacity for wildlife by providing water near cover and food sources.

b. Wildlife species most benefited by guzzlers are those that require water daily or less frequently but cannot obtain it from their food or from other sources such as dew or succulent vegetation. Quail, chukar, doves, songbirds, and small mammals can be expected to benefit from the establishment of guzzlers. Quail and chukar populations, in particular, can be expected to increase in number as a result of guzzler establishment.

c. Development consists of embedding a tank or cistern in the ground, placing a protective top with access ramp, and installing a precipitation-gathering apron. The cistern should be installed with the long axis of the apron running east and west and the open end of the cistern top on the north side. The tank should be installed on a prepared base of compacted soil and shaped to provide maximum support and contact area for the floor and walls of the tank. In rocky substrate, the hole must be overexcavated and backfilled with sand or soil to avoid point contact by rocks that could puncture the tank. The rim of the tank should be level and not more than 2 inches above the surrounding ground. Excavated material should be spread evenly around the tank. The collector apron should be installed as shown in Figure 5.1.

d. Once installed, the guzzler should be filled with water. Annual maintenance will include inspection and cleaning of the tank and apron. Care should be taken to ensure maintenance of the ramp, as the cistern can become a deathtrap for small birds and mammals. In extremely dry years, it may be necessary to supplement water in the guzzlers to aid wildlife in surviving climatic extremes.

e. Installation should take approximately 2 man-days per guzzler. Annual maintenance should not take more than 2 man-hours per year unless extensive damage occurs.

f. Guzzlers may, if necessary, be enclosed with a barbed-wire fence to prevent contamination of water and structural damage by large mammals.

5.03. CLIFF-NESTING IMPROVEMENTS.

a. Avian use of cavities in basalt cliffs along the lower Snake River is well documented. However, many basalt outcroppings are of solid columnar basalt which do not provide the "honeycombed" cavities necessary for nesting and roosting sites.

b. Cliffs at the south portion of HGHMU are of solid columnar basalt and thus provide few cavities for avian use. To encourage the use of these cliffs by barn and great horned owls, wrens, and other cliff-nesting species, nest boxes attached to cables (Figure 5.2) may be installed.

c. Other options to provide cliff-nesting opportunities include blasting or hand excavation and cement ledges.

d. Three cliff-nesting structures are planned for the HGHMU, providing nesting opportunities adjacent to expansive feeding sites on the unit.

5.04. RAPTOR-NESTING/PERCHING STRUCTURES.

a. Raptor-nesting structures are provided where natural trees are lacking or not sufficiently developed to provide nesting sites for raptors. Perching structures are provided to allow for loafing and hunting activities of the raptors. Species which will utilize these structures include the red-tailed hawk, rough-legged hawk, American kestrel, barn owl, and great horned owl.

b. Nesting and perching structures should be prefabricated and placed on poles as indicated in Figure 5.3. Installation locations are indicated in Figure 3.1.

c. Materials required include treated lumber, doweling, hardware, and treated poles or metal pipes as indicated in Figures 5.2 and 5.3. Equipment required includes woodworking and hand tools for construction, a posthole digger and tamping tools for installation, and vehicles for access.

d. Prefabrication should take about 1 man-day per structure. Several structures can be installed in a day. Maintenance is expected to be minimal.

5.05. NEST BOXES.

a. The objective of installing nest boxes is to provide nesting habitat where it is limited. The carrying capacity of the land will thereby be increased for the particular species by providing nesting opportunities designed to meet their needs.

b. Major species expected to benefit from nest box installation include: common flicker (5 boxes), rock wren (6 boxes), western bluebird (4 boxes), barn swallow (5 boxes), violet-green swallow (5 boxes), and barn owl (5 boxes).

c. Nest boxes shall be constructed in accordance with specifications meeting the requirements of the species of bird for which they are being installed (Table 5.1). Designs are provided in Figures 5.4 and 5.5 as guidance in the construction of nest boxes for the various species. Each nest box shall be constructed for a specific species and it is important that design and dimensions be followed carefully. Each box should have either a hinged top or front for inspection and cleaning and should be equipped with slits under the roof for air circulation and small holes in the floor for drainage.

d. Nest boxes shall be installed as indicated in Table 5.1 and location of each nest box shall be recorded on a master map. All nest boxes should be installed under the supervision of the project biologist. Nest box openings normally should be facing away from the prevailing wind. Nest boxes should be installed first in areas with existing woody vegetation and later into newly developed areas. Nest boxes should be placed in areas not frequented by birds as well as those frequented by birds, for absence of nesting habitat may be the factor limiting bird distribution. Upon installation, boxes shall be filled with nesting materials as specified in Table 5.1.

e. Materials required will include rough-sawed lumber, lumber with bark on one side, galvanized nails, hinges, latches, hardware cloth, dowels for perches, lag bolts or spikes for installation, and poles for installation where trees are not available. Equipment needed includes a saw (table, radial arm, or circular) for cutting materials to shape and size, a drill with bits or hole saws for making the various sized and shaped openings, miscellaneous woodworking tools, and a ladder for installation.

f. It is estimated that each box will take 2 man-hours to construct and 1 man-hour to install. Costs can be reduced markedly by utilizing volunteer groups to construct and install the boxes. Such projects are ideal for local Scout troops, conservation clubs, or sportsman groups.

5.06. TREE/SHRUB DEVELOPMENTS.

Diversification of vegetation and cover types requires not only an increase in horizontal ground cover, as in the establishment of pastures, meadows, food plots, etc., but also necessitates an increase in the vertical habitat components as well. Tree and shrub developments provide escape, roosting, and nesting cover; hunting perches; food sources; and travel lanes to a variety of wildlife species. Although some tree and shrub species are expected to establish as dryland plantings, a much greater diversity of plantings will be nurtured through the use of trickle lines emanating from storage tanks on the Upper Bench. All woody species should be planted as 1-gallon nursery stock. A typical tree/shrub layout is shown in Figure 5.6.

5.07. ROADBED SEEDING FOR EROSION CONTROL.

Old roadbeds exist on some of the steep portions of the Upper Bench and greatly aggravate soil erosion problems in the area. While major roads will be maintained as fire control access, all other roadbeds will receive seeding (by drilling) of bluebunch wheatgrass, Idaho fescue, and mountain brome at a rate of 8 pounds pure live seed per acre during the fall (September/October). Water bars may be installed where necessary to reduce erosion of seeded areas. Specific attention will be given to reducing vehicular trespass on the HGHMU.

5.08. BRUSH PILES.

a. Brush piles will be created to provide protective cover for escape from predators, for nesting, and for roosting. They are often used to provide cover where natural cover is lacking. Species benefiting most from brush piles include valley quail, mourning doves, and other perching birds, and mountain cottontail.

b. Brush piles will consist of uprooted trees and shrubs, prunings, and miscellaneous woody materials. Such piles should be at least 10 to 12 feet in diameter and 6 feet high. Larger material should be placed near the bottom to provide 6 to 10 inches of elevation above the ground.

c. Brush pile construction will be accomplished as prunings and materials become available. Materials and labor can be provided by volunteer sources such as Scout groups or conservation clubs. Numerous orchards in the local areas should provide an abundant supply of material. Surplus Christmas trees also are a good source. Building of brush piles provides excellent wildlife habitat and should be continued as a long-term improvement.

5.09. FOOD PLOTS.

a. Food plots will be established to provide a supplemental food source to that provided by field plantings and tree and shrub communities. Food plots also provide a high level of nutrition to prepare wildlife for the stresses of winter. Standing crops provide food in all but the deepest snow accumulations for resident as well as late migrant wild birds. Major species benefited by food plots include pheasant, quail, gray partridge, chukar, songbirds, small mammals, raccoons, and mule deer.

b. Development will be accomplished in April using a no-till planter. Soil samples should be taken approximately 2 months prior to the time of planting and analyzed for determination of fertilizer requirements. Fertilizer would be applied just prior to seeding.

c. Once established, food plots should require no major maintenance. Spot infestations of broad-leafed weeds may be treated with localized applications of 2,4-D and Banvel-D or with Tordon 22-K if trees and shrubs are not located nearby.

d. Materials required include a seed mixture and fertilizer in amounts indicated by the size of the area treated and soil conditions. Equipment required includes a tractor, mower, rolling disc-plow, harrow, drill, and fertilizer spreader. Soil samples can be analyzed by local laboratories.

e. Chisel plowing, fertilizing, seeding, and discing should be accomplished at a rate of approximately 1 acre per 1/2 man-day of labor. Total time invested per year per acre should not exceed 10 man-hours.

5.10. WATER DEVELOPMENTS AND TRICKLE IRRIGATION.

To support the establishment of tree and shrub plantings, a source of water is necessary. Water will be pumped by electric pump from Lower Granite Lake near the southernmost campground development of Hells Gate State Park to three holding tanks on the northern portion of the Upper Bench (Figure 3.1). These 1,500-gallon holding tanks will have a single trip release which will allow all water in the tanks to be released into a trickle irrigation network providing water to trees and shrub plantings. The watering operation (running pump to fill tanks to water plants) should involve approximately 3 hours of labor per week during the growing season (March through September).

5.11. FENCING.

Fencing is used to restrict the access of animals that may cause damage to native vegetation and habitat developments. A fence will be installed along the eastern project boundary from the Snake River shoreline, up the rocky bluffs, to the top of the Knoll (Figure 3.1). It will be a standard four-strand barbed-wire fence. The fence will be inspected for breaks during the annual fence line survey.

5.12. FIREBREAK.

A 12- to 15-foot-wide chisel-plowed strip along the border between the park and the wildlife management habitat area will serve as a fire-break to protect the native and introduced vegetative communities on the HGHMU. Maintenance of the fire break will be described in the Operational Management Plan (OMP) for Lower Granite. Major roads will be maintained as fire control access and maintenance roads and also will serve as firebreaks.

5.13. SAFETY ZONE.

Boundary posts (carsonite-type) will be erected along the HGHMU/park boundary. The posts will be signed at frequent intervals to se the boundary of the hunting area upstream of the park.

5.14. RIDING TRAIL SIGNS.

Horseback riding has the potential to destroy wildlife habitat plantings by trampling them. To prevent habitat destruction, signs will be erected along the riding trails to designate the trails and identify nonriding areas. The signs will be erected at frequent intervals.

5.15. INFORMATION DISPLAYS.

Kiosks will be installed at the parking lot (PK-1) to provide information concerning vegetation, wildlife, recreational opportunities, management objectives for the unit, descriptions of habitat developments, and other relevant items.

5.16. RECREATIONIST PARKING AREA.

One 40- by 100-foot area will be developed on the HGHMU to provide public parking. The parking area (PK-1) will be located at the base of the gravel pit along Tammany Creek Road and will be surfaced with gravel. Steep banks surrounding PK-1 will serve as deterrents to vehicles entering the HGHMU from that location. Vehicular encroachment may necessitate construction of more effective barriers. Stiles will be installed along the barbed-wire fence near the parking area and near the south end of the park to permit foot access to the HGHMU.

5.17. NOXIOUS WEED CONTROL.

a. The Upper Bench has an infestation of Scotch thistle which must be treated to establish the vegetative developments.

b. Following establishment of preferred vegetative communities, treatment of thistle infestations should be limited to spot spraying during the spring/early summer.

c. Appropriate herbicides will be used in accordance with approval from the Nez Perce County weed control agent.

d. Herbicides will be applied in compliance with ER 1130-2-413, Pest Control Program for Civil Works Projects.

SECTION 6 - SPECIAL CONSIDERATIONS

6.01. CONTROL OF HUNTING.

Public hunting on HGHMU will be governed by IDFG. It is the desire of the Corps that any hunting activities associated with the HGHMU be controlled to minimize disturbance to park users. Enforcement of hunting activities on the HGHMU is the responsibility of IDFG and will be addressed under a cooperative agreement between IDFG and the Corps.

6.02. FERAL GOAT POPULATION.

Four domestic goats (sexes unknown) were released on the HGHMU near the upstream boundary during 1978 by residents of Asotin, Washington (D. Hines, SCS, personal communication). The feral goat herd has not been of concern to IPRD. Although damage to sensitive habitats near the release site has not been observed, a potential exists for erosion problems and damage to native vegetation caused by the goats. It is not known what the population size is at present, although a group of four was seen in December 1982, and there have been reports of as many as seven. A fence will be constructed along the eastern boundary of HGHMU to restrict access of goats from adjacent private lands. Project biologists will coordinate removal of the goats from HGHMU. It is recommended that the unit be included in the midwinter wildlife survey of the lower Snake River and that the presence of goats be noted.

6.03. OUTDOOR EDUCATION.

The HGHMU and adjacent parklands would provide an excellent location to establish a nature trail for use by local schools and other organizations in activities concerning outdoor education. The Lewiston School District has expressed interest in such a facility. The trail could include stations with discussions of wildlife, vegetation, habitat management, erosion, climate, archaeological aspects, fisheries, geology, etc.

6.04. FIRE PROTECTION.

Because of its remoteness from Lewiston, a fire protection agreement for the HGHMU with a local fire control group may be investigated.

6.05. FIRE AS A MANAGEMENT TOOL.

Prescribed burning can be a valuable management technique in controlling undesirable vegetation and stimulating growth of more beneficial species. Use of fire for management on the HGHMU will be addressed in the Lower Granite OMP.

SECTION 7 - EVALUATIONS OF WILDLIFE AND VEGETATIVE COMMUNITIES

7.01. VEGETATIVE EVALUATIONS.

a. Evaluation of vegetative developments will be of two types: ocular estimation and photographic. Success of plantings will be determined by the project biologist and replacement plantings or seeding scheduled. Replanting should occur only if a minimum of 50 percent of a particular species has failed to survive. If a substitute species is available which has shown better survival, it should be used as the replacement species. Replacement plantings and seeding should occur in the fall.

b. Permanent photographic stations will be installed throughout the area to monitor long-term changes in vegetational patterns in the area. Photos should be taken in late May and early September every 3 years.

7.02. WILDLIFE EVALUATIONS.

a. Deer, chukar, coyote, and raptor populations on the HGHMU will be censused during the winter concurrently with aerial counts of other lower Snake River habitat management units. This count in midwinter will provide Corps biologists with an index of wildlife use of the HGHMU.

b. An evaluation of wildlife HUs will be measured using Habitat Evaluation Procedures (1980) to establish a baseline from which to measure the success of habitat developments. HUs for evaluation species should be determined every 3 years after initial habitat developments.

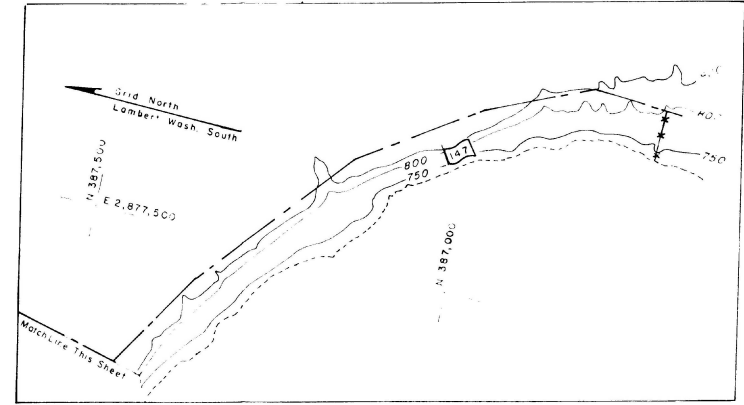
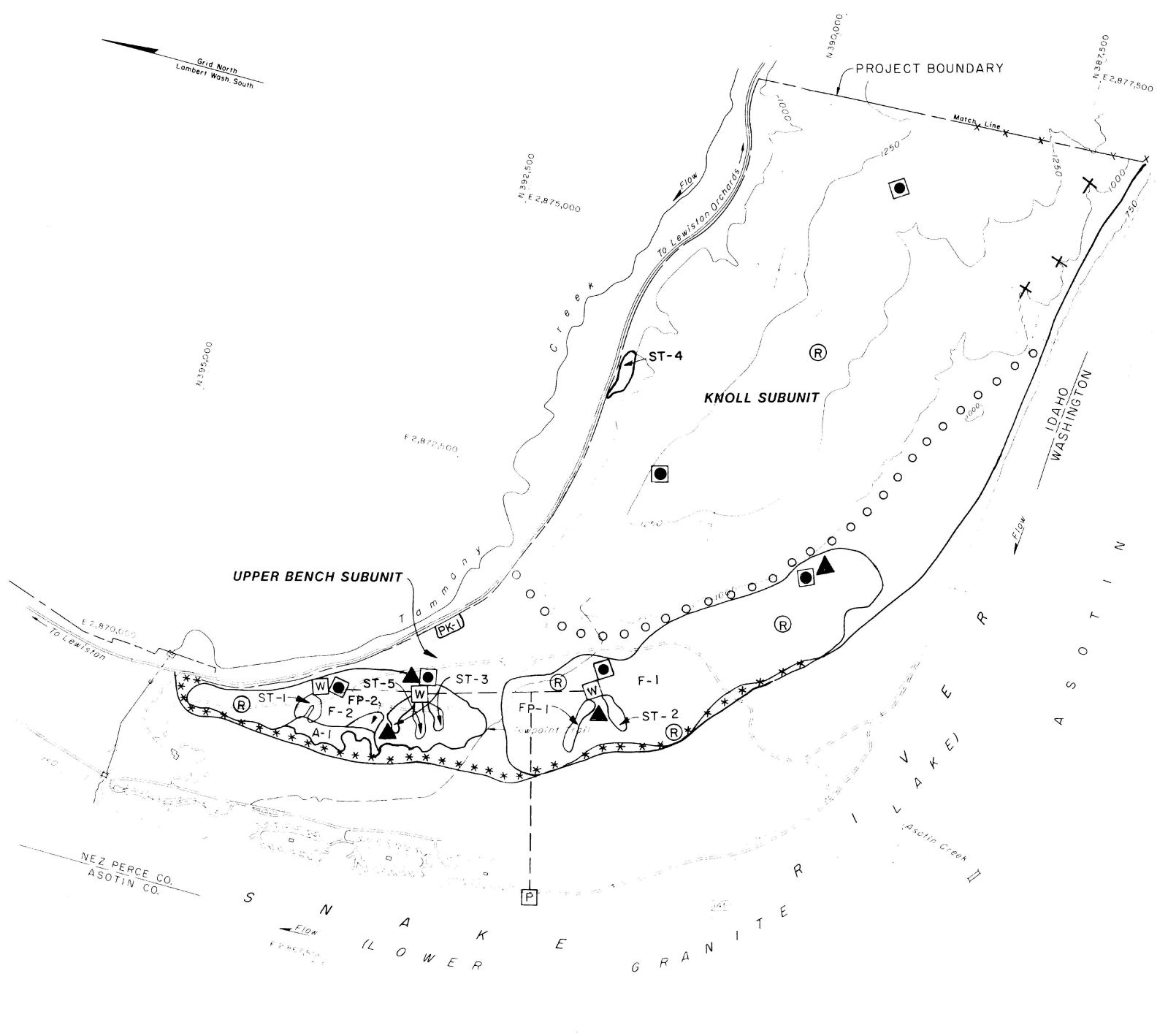
SECTION 8 - DEVELOPMENT SCHEDULE

Guidelines for development activities on the HGHMU are presented in Table 8.1. These are recommended time schedules and may be modified according to the needs of the project. Funding and manpower constraints will dictate the progression of habitat developments on the HGHMU. Development of the HGHMU will be subject to the availability of project Operation and Maintenance funding.

SECTION 9 - COST SUMMARY

a. Total estimated cost for the initial development of HGHMU is \$120,150 (Table 9.1). Several items are based on contracting cost, although it may be feasible to accomplish those activities through volunteer labor or by project personnel. Hence, overall costs may be reduced from the initial estimate.

b. Maintenance costs will be identified in the Lower Granite OMP.



LEGEND

- ST-1 SHRUB AND TREE PLANTING
- F-1 FIELD DEVELOPMENT
- FP-2 FOOD PLOT DEVELOPMENT
- PK-1 PARKING AREA
- A-1 ALFALFA PLANTING
- W WATER STORAGE TANK
- GUZZLER
- Ⓡ RAPTOR PERCH
- ▲ BRUSH PILES
- ** FIRE BREAK
- *** FENCE
- Ⓟ WATER SUPPLY PUMP
- WATER PIPELINE
- ○ ○ ○ SUBUNIT BOUNDARY
- × CLIFF NEST BOX

T. 35 N., R. 6 W.
 SCALE IN FEET
 0 500 1000

NOTE:
 Compiled from U.S.C.E. Stereo.
 Mapping dated 1961 & 1978.
 C.I. - 50'

REVISION	DATE	DESCRIPTION	BY
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DESIGNED:	Passmore		
DRAWN:	E. Johnson		
CHECKED:			
SUPERVISED:			
CHIEF, INV. RES. BR.			
SUBMITTED			
CHIEF, PLANNING DIVISION		SCALE AS SHOWN	INV. NO.
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		SHEET	

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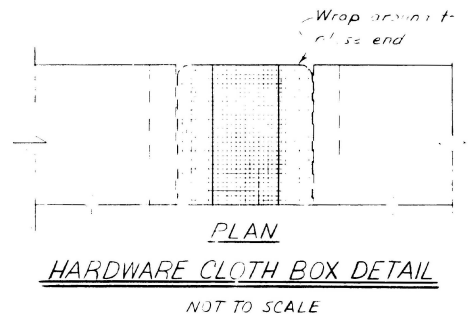
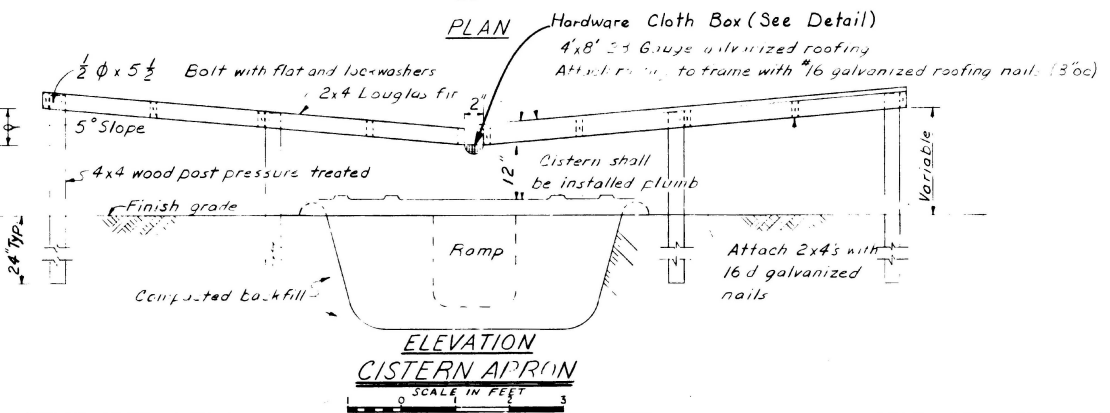
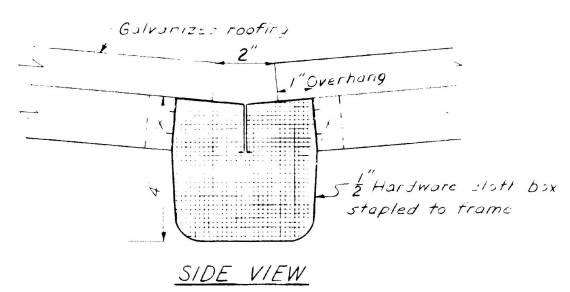
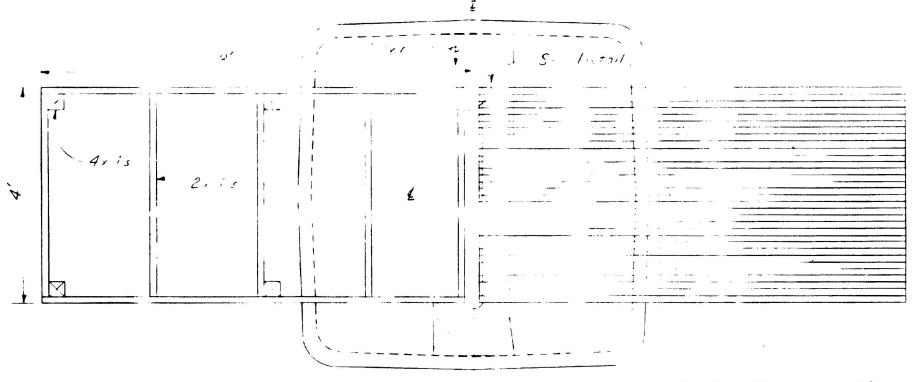
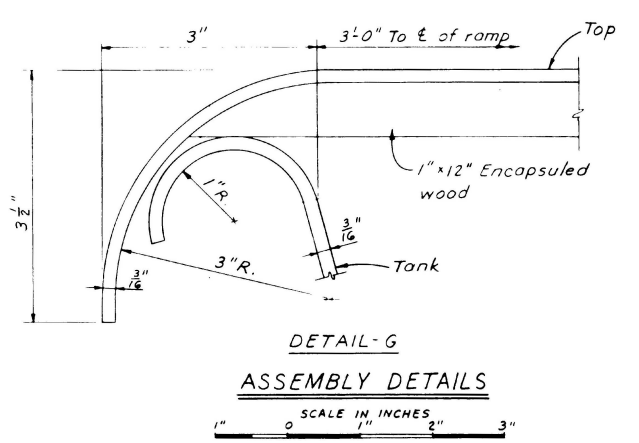
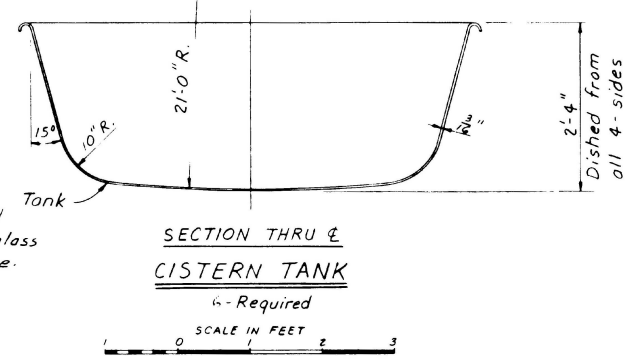
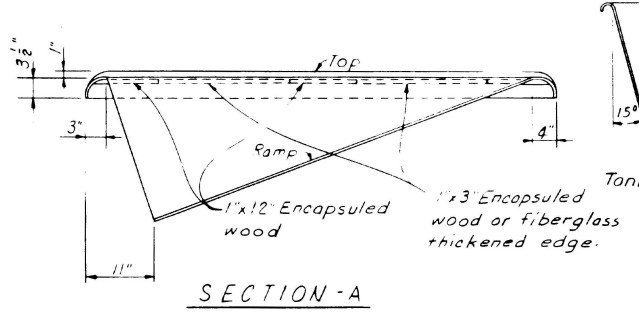
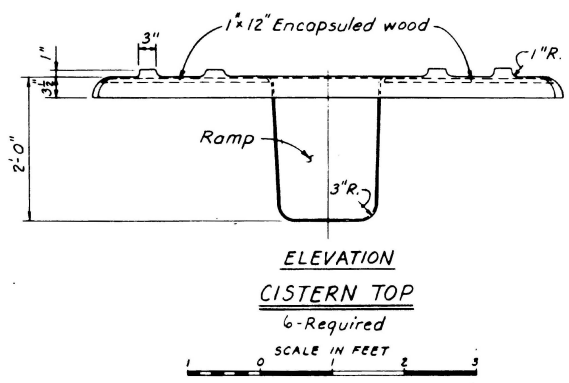
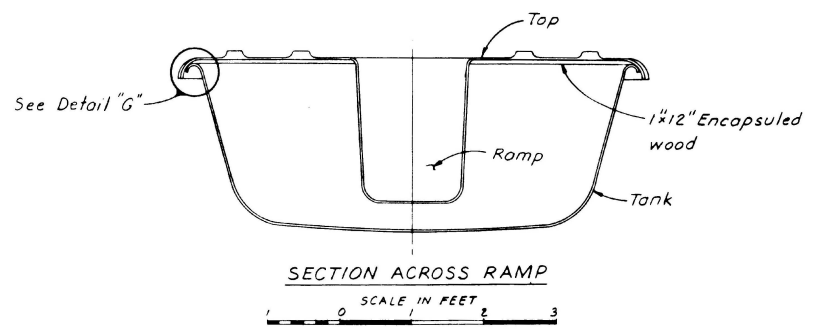
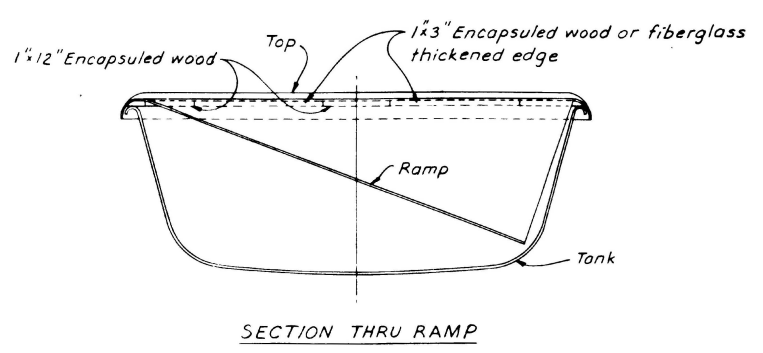
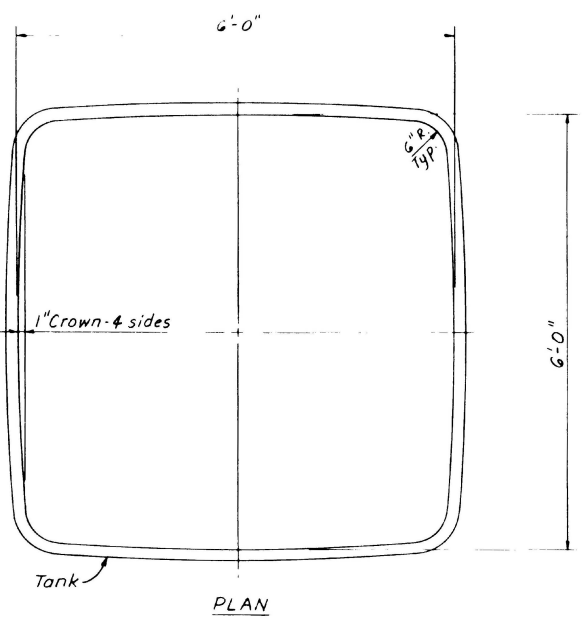
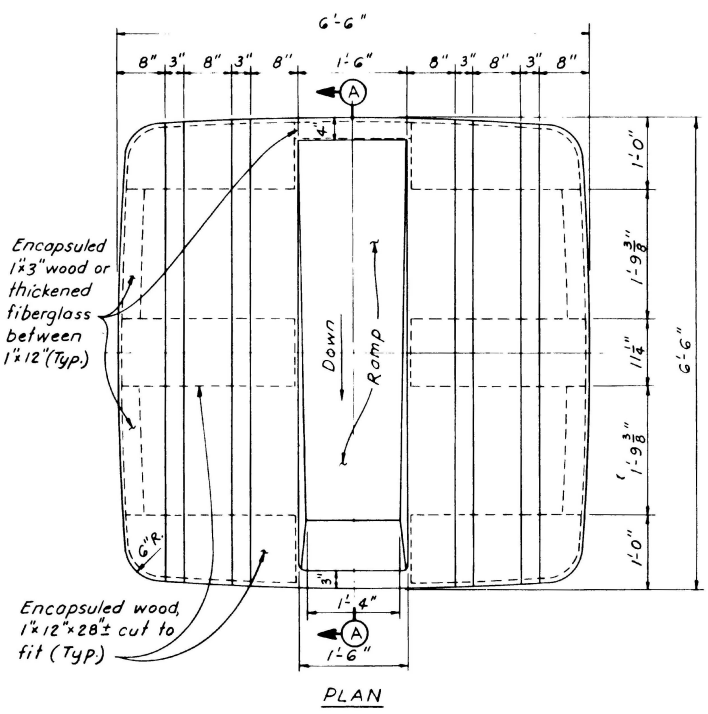
Hells Gate
H/MU

WASHINGTON

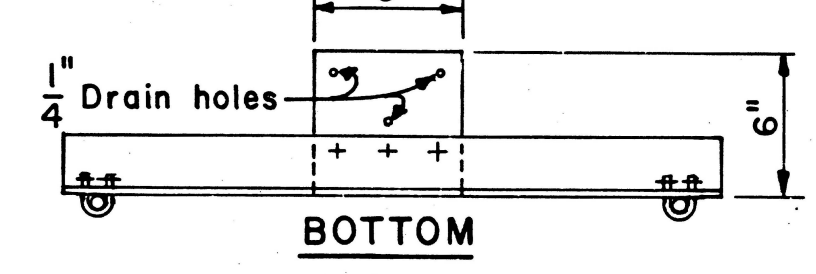
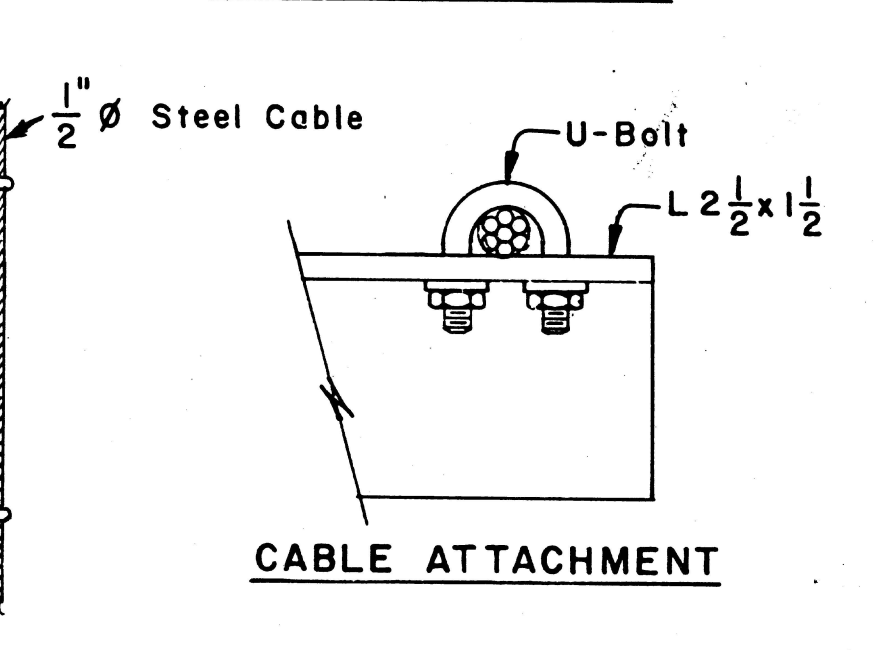
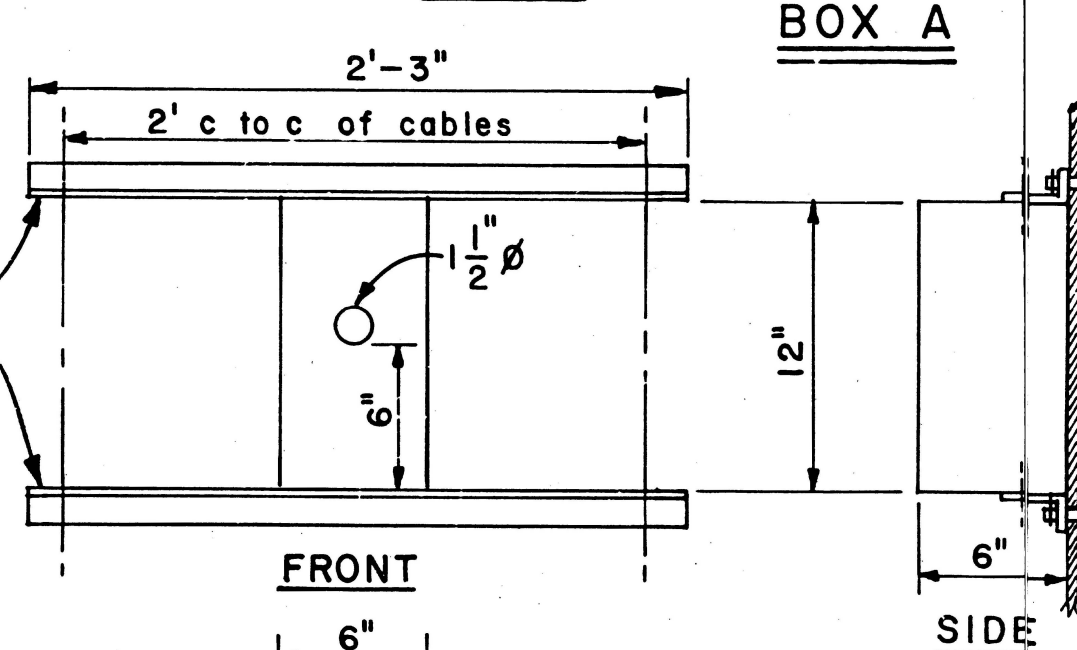
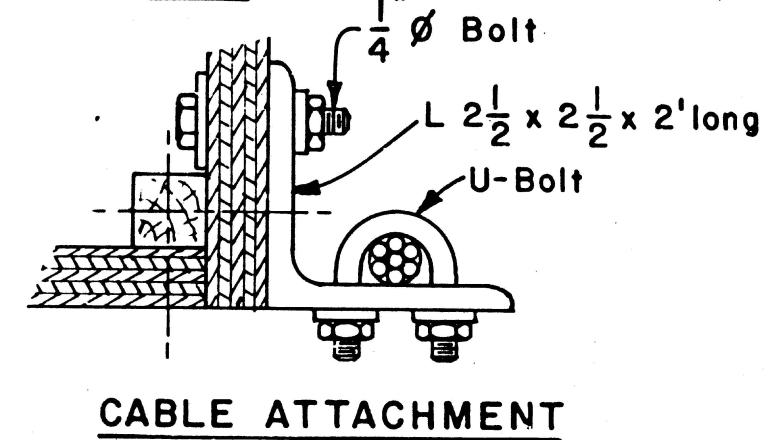
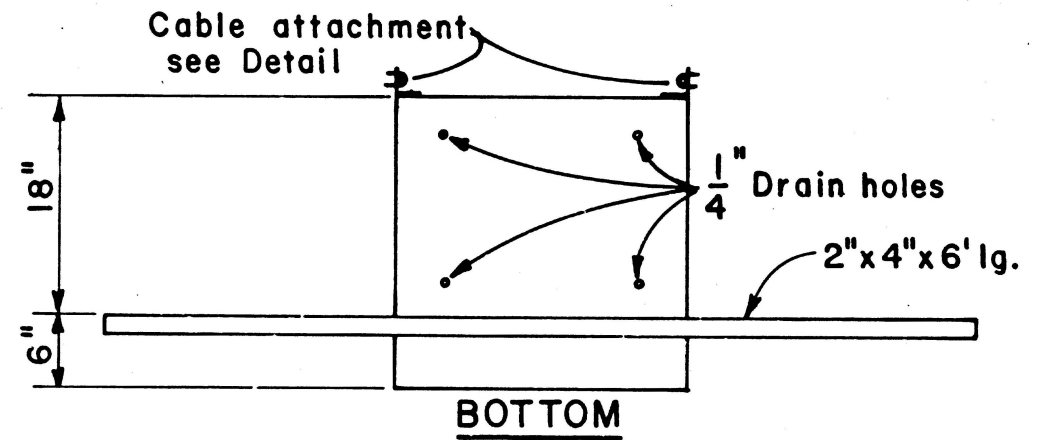
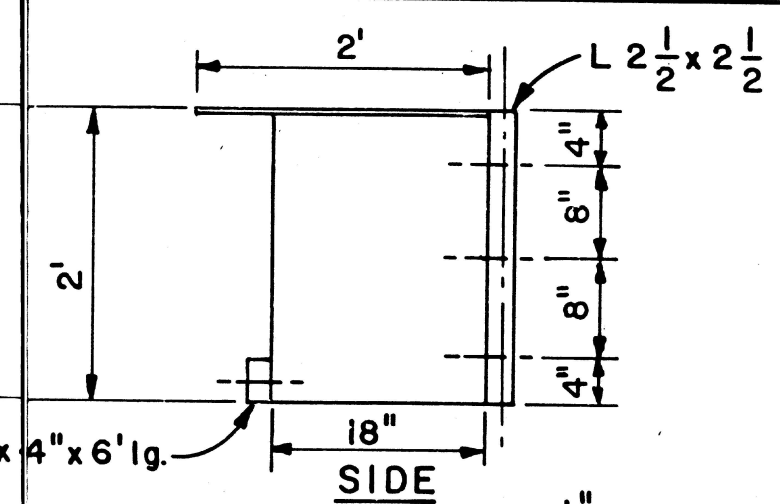
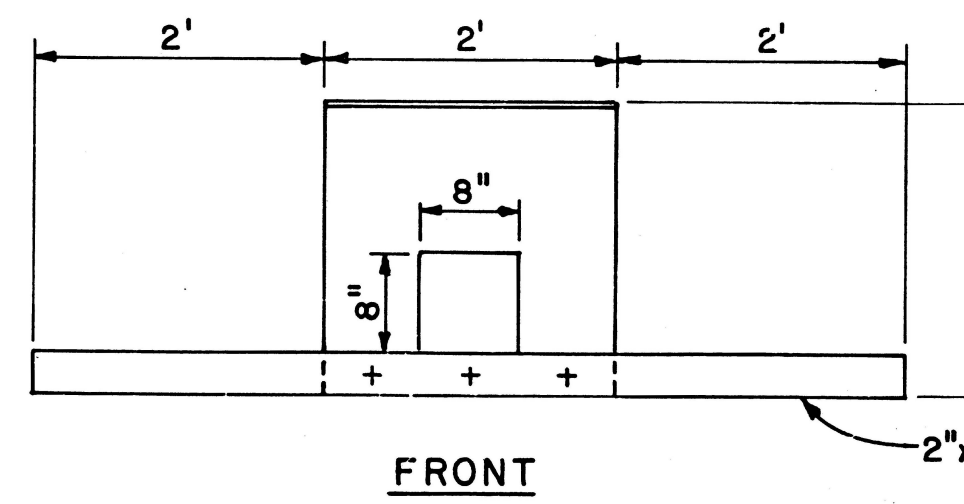
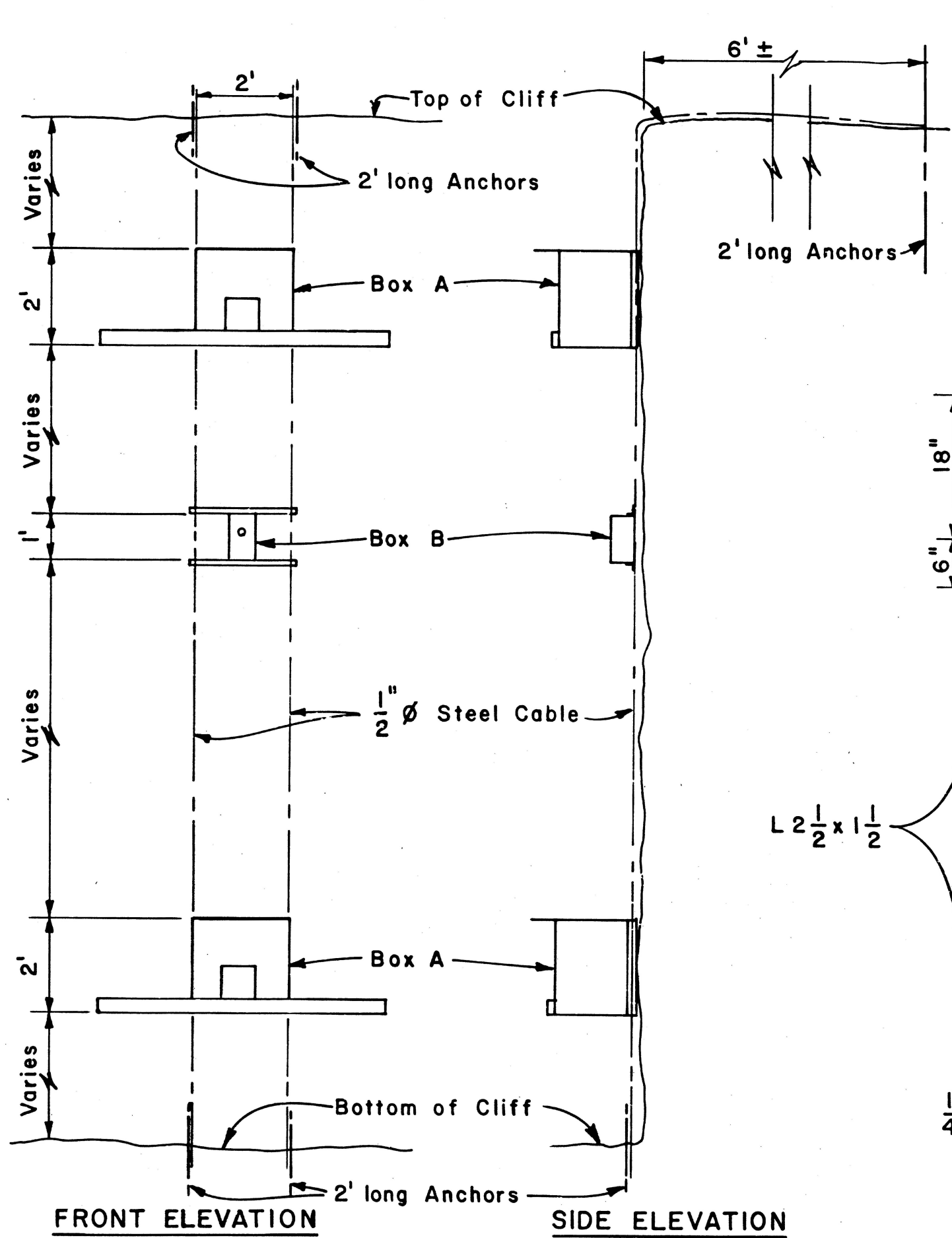
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FIGURE 3.2
HGHMU SOIL MAP





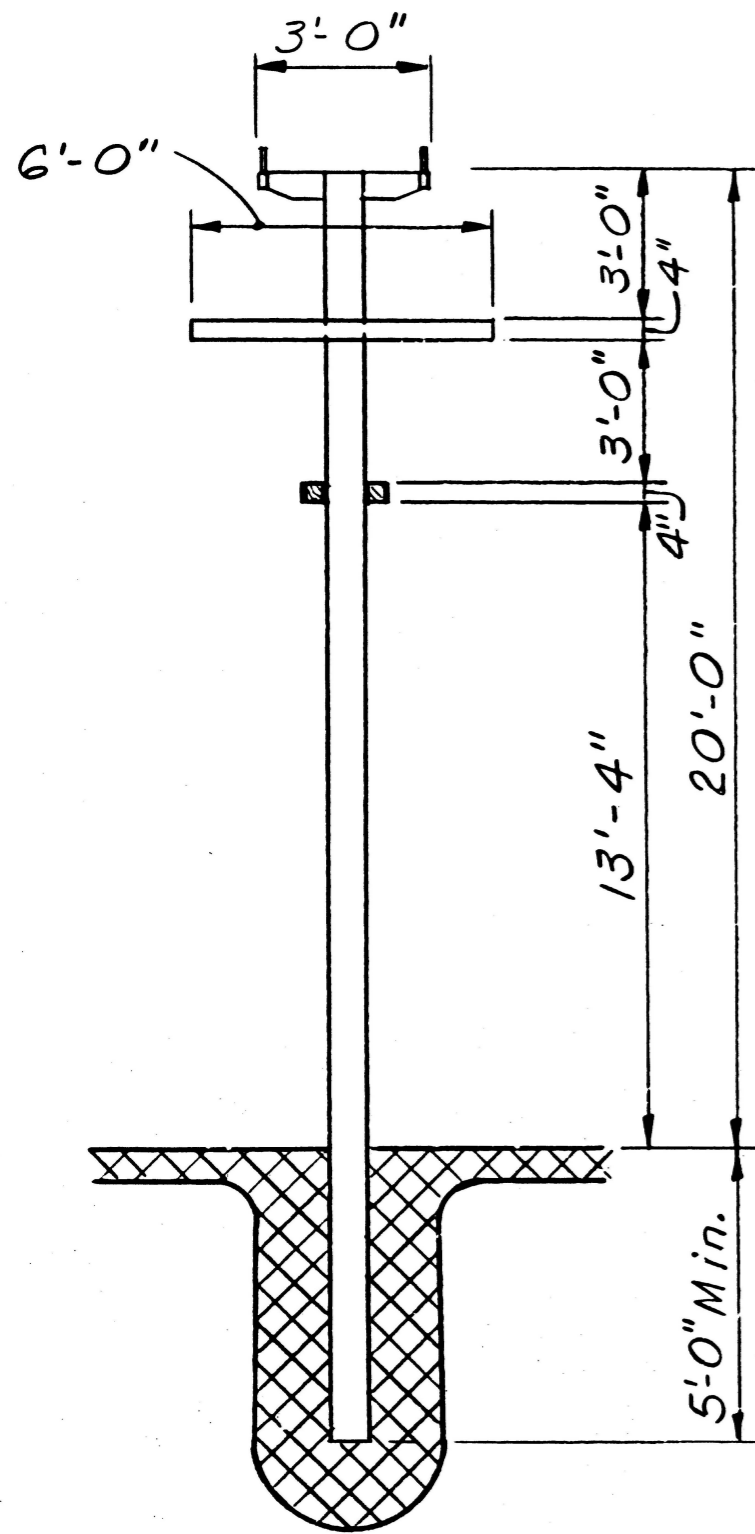
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DRAWN:			
CHECKED:	Passmore		
SUPERVISED:			
CHIEF, ENV. ANALYSIS			
SUBMITTED:		DATE: _____	
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NOTE:
Boxes shall be constructed of
 $\frac{5}{8}$ " thick marine plywood.

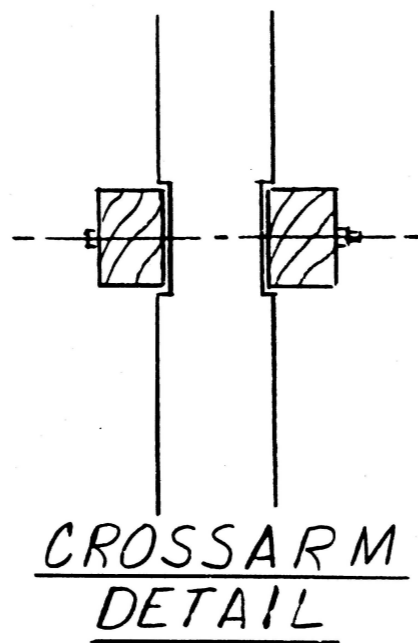
HELLS GATE HMU
LEWISTON, IDAHO
CLIFF NEST BOX DESIGN

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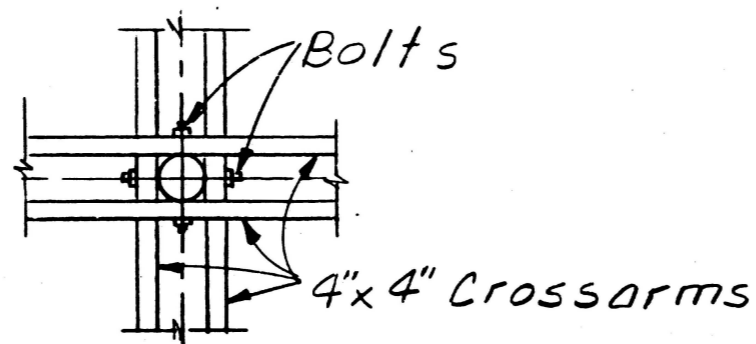


ELEVATION

SCALE IN FEET



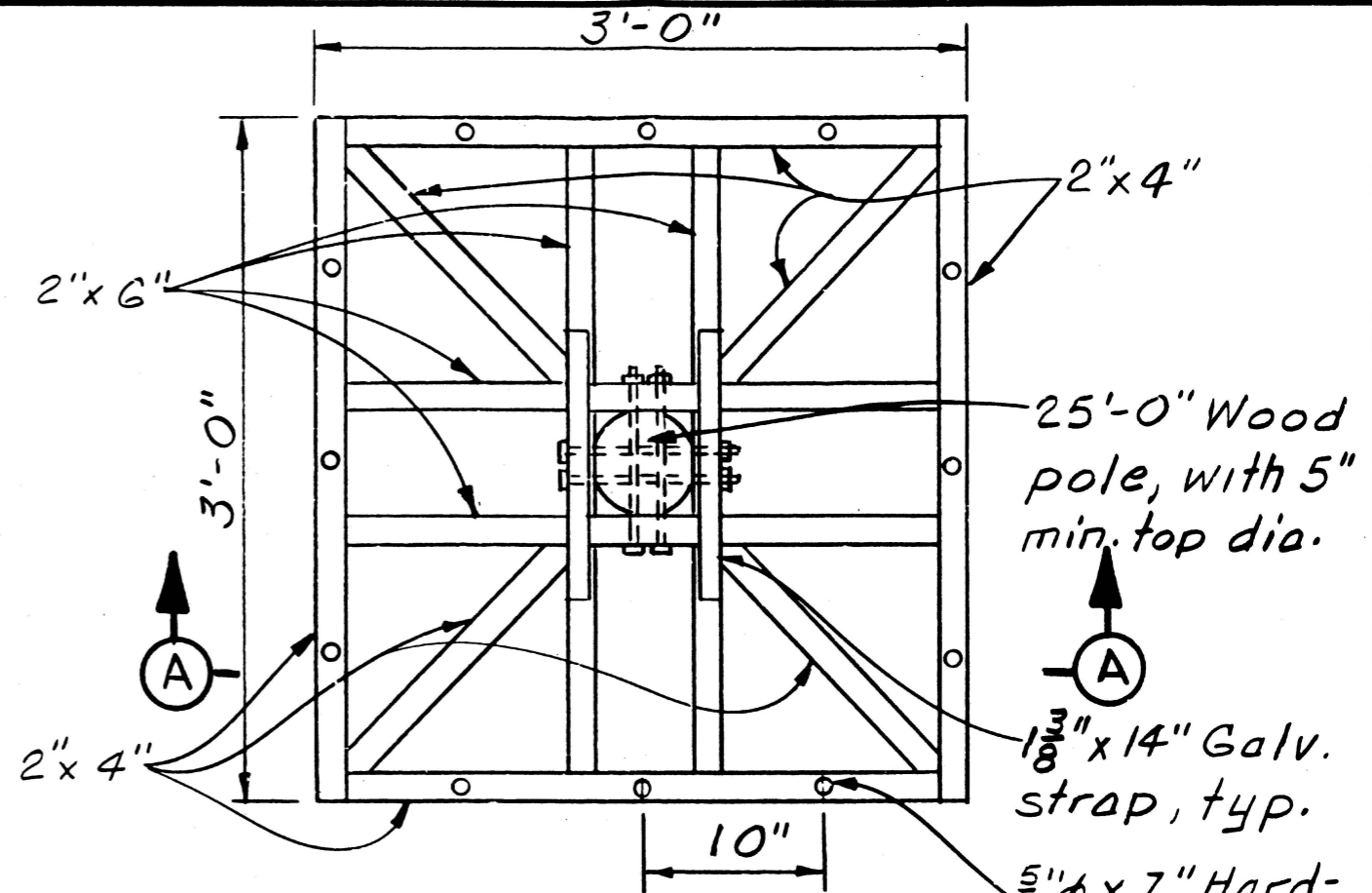
CROSSARM
DETAIL



PLAN

PERCH

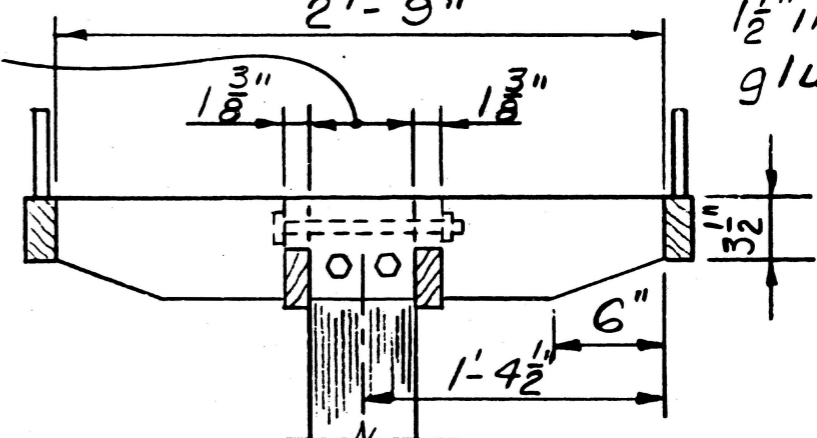
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PLAN

2'-9"

Same as dia.
of pole used



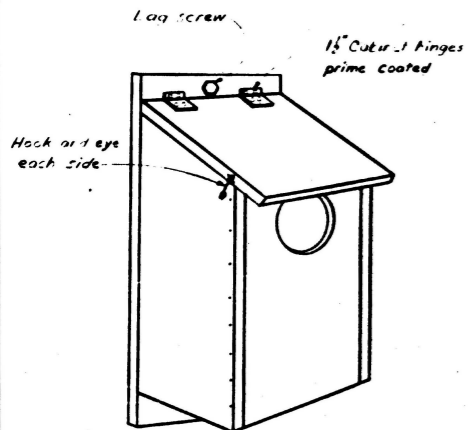
SECTION-A

NEST

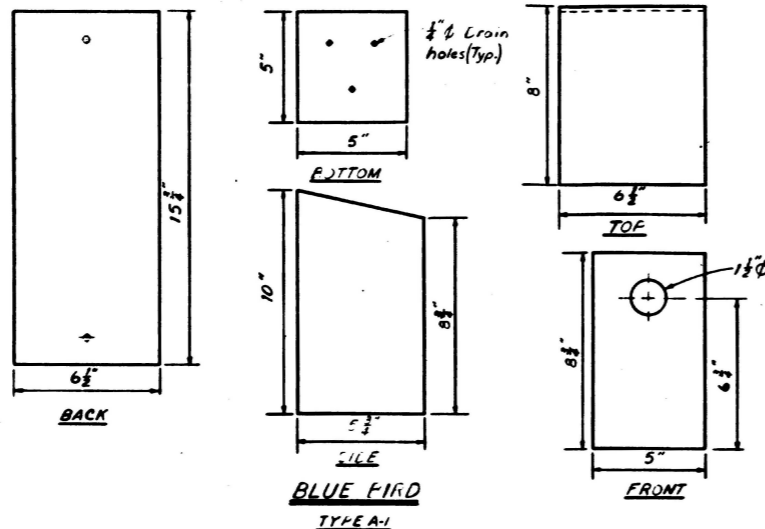
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**HELLS GATE HMU
LEWISTON, IDAHO
RAPTOR PERCH-NEST
STRUCTURE**

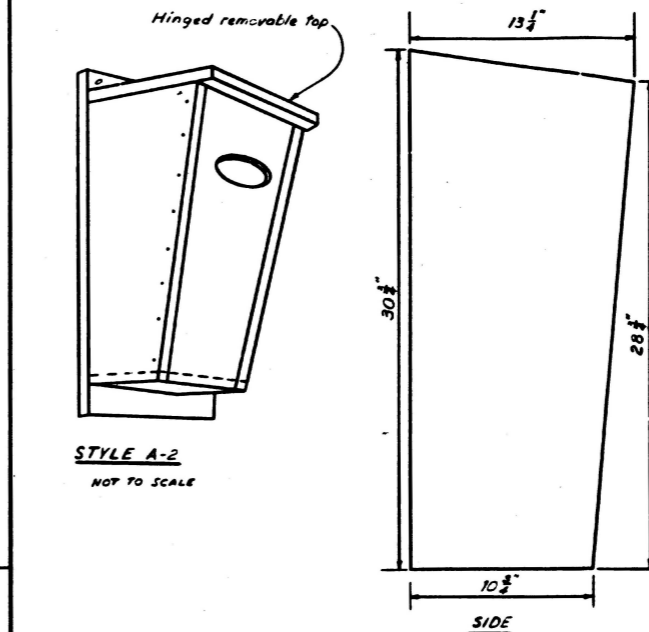
FIGURE 5.3



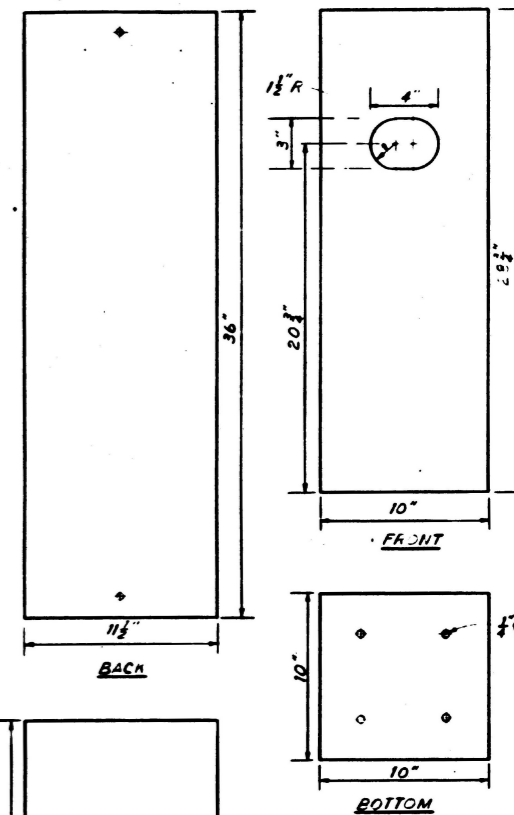
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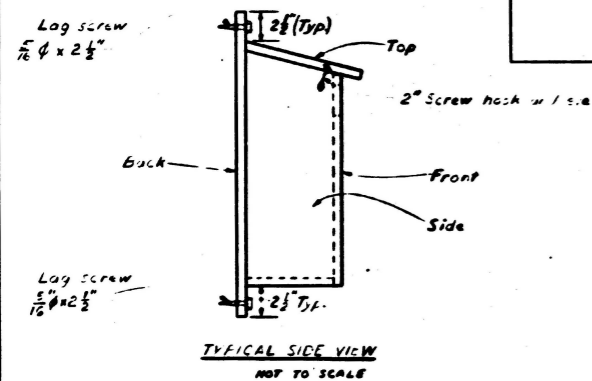
BLUE BIRD
TYPE A-1



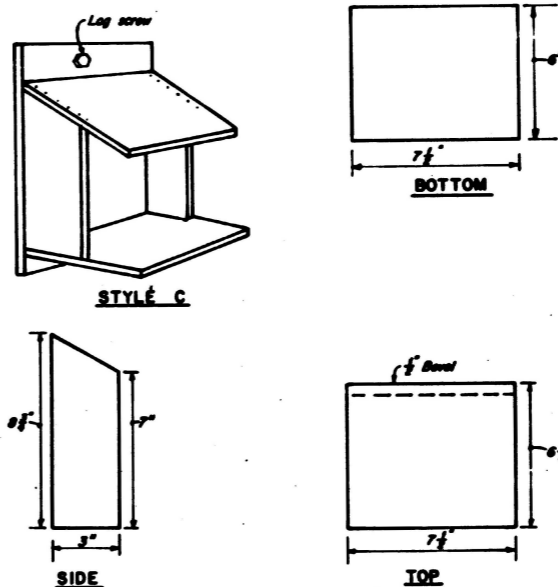
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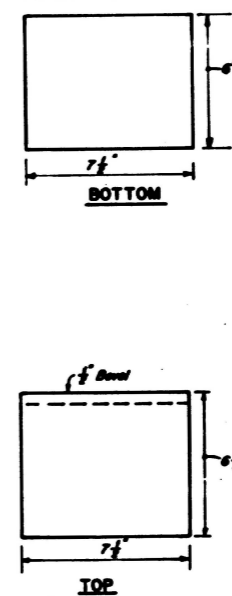
WOOD DUCK
STYLE A-2



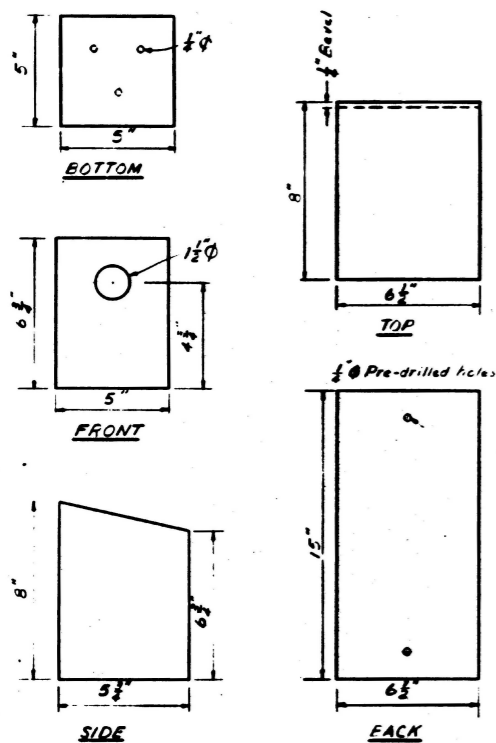
TYPICAL SIDE VIEW
NOT TO SCALE



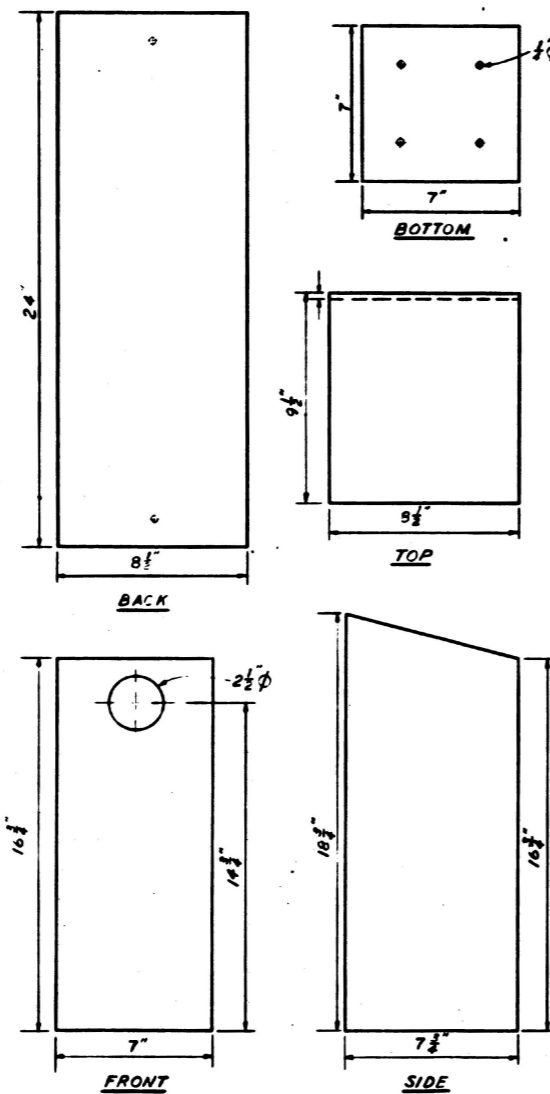
STYLE C



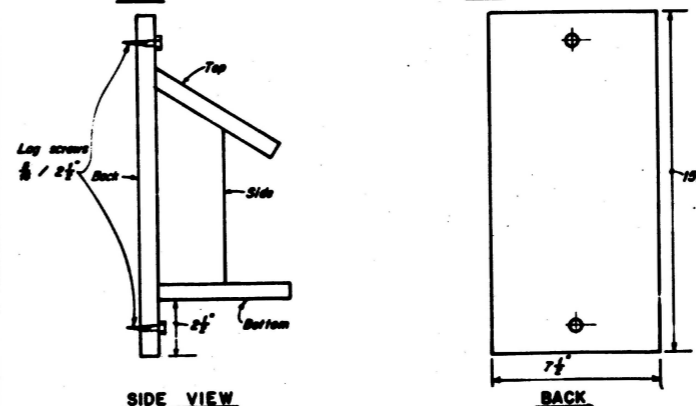
WOOD DUCK
STYLE A-2



TREE AND VIOLET GREEN SWALLOW
STYLE A-1



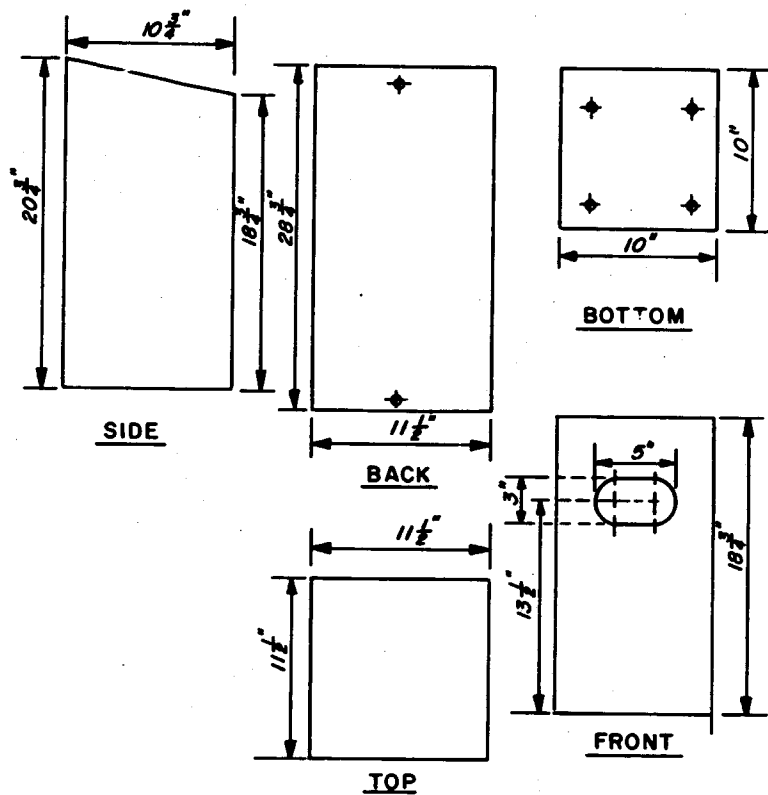
COMMON FLICKER
STYLE A-1



BARN SWALLOW

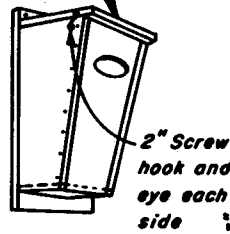
NOTE:
1. Each nest-box except barn swallow type shall have two hinges and two hooks attached to the top piece.

DATE	DESCRIPTION	BY
U. S. ARMY ENGINEER DISTRICT WALLA WALLA, WASHINGTON		
HELLS GATE HMU LEWISTON, IDAHO		
NEST BOX DETAIL		
DATE	SCALE AS SHOWN	REV. NO.
FILE NO.		

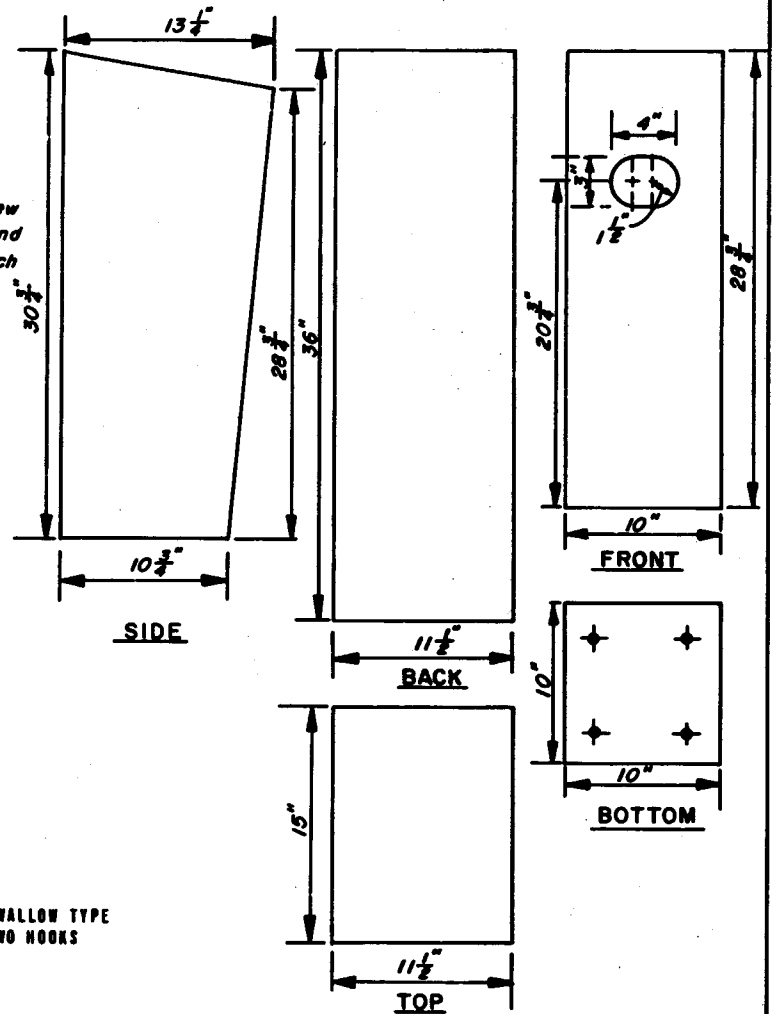


BARN OWL
STYLE D
 SCALE IN INCHES
 3 0 3 6

Hinged Removable Top



STYLE D
 NOT TO SCALE



WOOD DUCK
STYLE D
 SCALE IN INCHES
 3 0 3 6

NOTE:

1. EACH NEST-BOX EXCEPT BARN SWALLOW TYPE SHALL HAVE TWO HINGES AND TWO HOOKS ATTACHED TO THE TOP PIECE.

HELLS GATE HMU
LEWISTON, IDAHO
NEST BOXES - STYLE D

FIGURE 5.6

FIGURE 5.4

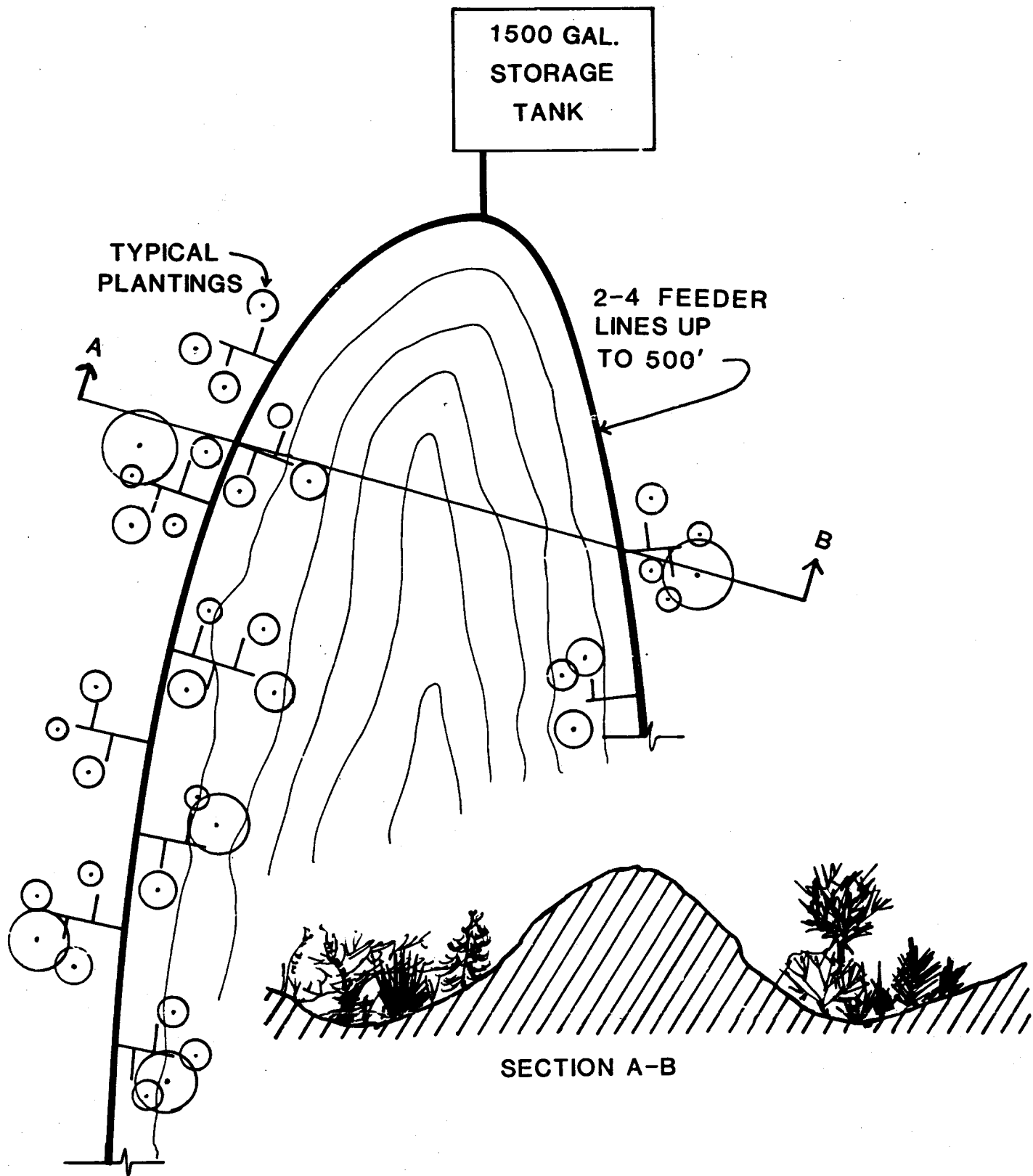


FIGURE 5.6
TYPICAL TREE/SHRUB LAYOUT
HELLSGATE HMU

N.T.S.

TABLE 3.1
WILDLIFE HABITAT POTENTIALS

	Potential for Habitat Elements								Potential as Habitat for:			
	Grain and Seed Crops	Grasses and Legumes	Wild Herbaceous Plants	Hardwood Trees	Coniferous Plants	Shrubs	Wetland Plants	Shallow Water Areas	Open-Land Wildlife	Woodland Wildlife	Wetland Wildlife	Rangeland Wildlife
Chard Loam (Cd1)	Fair	Good	Good	Fair	Fair	Good	Very Poor	Very Poor	Good	--	Very Poor	Good
Chard Variant (Cd2)	Fair	Good	Good	Fair	Fair	Good	Very Poor	Very Poor	Good	--	Very Poor	Good
Chard Fs1 (Cd4)	Good	Good	Good	Fair	Fair	Good	Poor	Very Poor	Good	--	Very Poor	Good
Chard Loam (Cd5)	Poor	Fair	Good	Fair	Fair	Good	Very Poor	Very Poor	Fair	--	Very Poor	Good
Endicott-Bryden Complex (En2)	Fair	Fair	Fair	Fair	Poor	Fair	Poor	Very Poor	Fair	--	Very Poor	Fair
Limekiln-Athena Variant (Li1)	Very Poor	Very Poor	Poor	Very Poor	Very Poor	Poor	Very Poor	Very Poor	Very Poor	--	Very Poor	Poor

TABLE 3.1

TABLE 4.1
HELLS GATE DEVELOPMENT ACREAGES

<u>Site</u>	<u>Acres</u>	<u>Type</u>
ST-1	0.9	Tree/Shrub
ST-2	0.9	Tree/Shrub
ST-3	1.4	Tree/Shrub
ST-4	1.2	Tree/Shrub
ST-5	0.7	Tree/Shrub
F-1	74.9	Field
F-2	27.9	Field
A-1	3.3	Alfalfa Plot
FP-1	1.7	Food Plot
FP-2	<u>0.7</u>	Food Plot
	113.6	

TABLE 4.2
TREE AND SHRUB SPECIES TO BE PLANTED
ON HELLS GATE HABITAT MANAGEMENT UNIT

<u>Site No.</u>	<u>Acres</u>	<u>Species To Be Planted</u>	<u>Number To Be Planted</u>
S/T-1	0.9	Black Locust	48
		English Hawthorn	48
		Douglas Hackberry	60
		Rocky Mountain Juniper	72
		Siberian Crab Apple	50
		Common Chokecherry	22
		Willow	128
		Autumn Olive	100
		Himalaya Blackberry	200
		Matrimony Vine	90
		Blueleaf Honeysuckle	150
		Woods Rose	150
		Common Elderberry	90
		Total Trees and Shrubs for S/T-1	1,208
S/T-2	0.9	Russian Olive	40
		Douglas Hawthorn	70
		Douglas Hackberry	65
		Rocky Mountain Juniper	50
		Willow	80
		Autumn Olive	60
		Himalaya Blackberry	100
		Matrimony Vine	60
		Woods Rose	90
		Golden Currant	80
		Smooth Sumac	40
		Western Virgins-Bower	30
		Blueleaf Honeysuckle	70
		Common Elderberry	65
Total Trees and Shrubs for S/T-2	675		
S/T-3	1.4	Tree of Heaven	50
		Rocky Mountain Juniper	50
		Douglas Hackberry	100
		Autumn Olive	75
		Staghorn Sumac	100
		Matrimony Vine	40
		Woods Rose	125
		Golden Currant	80
		Western Virgins-Bower	50
		Blueleaf Honeysuckle	75
		Lewis Mock Orange	25
Skunkbush Sumac	30		
Total Trees and Shrubs for S/T-3	800		

TABLE 4.2 (Continued)

<u>Site No.</u>	<u>Acres</u>	<u>Species To Be Planted</u>	<u>Number To Be Planted</u>
S/T-4	1.2	Bitterbrush	150
		Russian Olive	145
		Big Sagebrush	385
		Staghorn Sumac	140
		Douglas Hackberry	150
		Autumn Olive	145
		Total Trees and Shrubs for S/T-4	<u>1,115</u>
S/T-5	0.7	Douglas Hackberry	35
		Ponderosa Pine	10
		Douglas Hawthorn	35
		Common Chokecherry	20
		Common Elderberry	30
		Woods Rose	80
		Smooth Sumac	20
		Matrimony Vine	50
		Golden Currant	70
		Red Osier Dogwood	20
		Autumn Olive	<u>30</u>
		Total Trees and Shrubs for S/T-5	<u>300</u>
TOTAL TREES AND SHRUBS FOR HGHMU			4,098

TABLE 4.3
GRASS AND FORB SPECIES TO BE SEEDED ON
HELLS GATE HABITAT MANAGEMENT UNIT

<u>Site No.</u>	<u>Acres</u>	<u>Species To Be Planted</u>	<u>Lb./Ac.</u>	<u>Total Lbs.</u>
A-1	3.3	Dryland Alfalfa	5	17
		Delar Small Burnett	4	13
FP-1	1.7	Manta Foxtail Millet	11	19
		Sunflower	5	6
		White Proso Millet	15	23
FP-2	0.7	Manta Foxtail Millet	11	8
		Sunflower	5	4
		White Proso Millet	15	11
F-1	74.9	Siberian Wheatgrass	15	1,124
		Delar Small Burnett	5	375
F-2	27.9	Siberian Wheatgrass	15	419
		Delar Small Burnett	5	140
		Magnar Basin Wild Rye	8	8
TOTAL GRASSES/FORBS (pounds)				2,167

TABLE 5.1
SPECIFICATIONS FOR THE CONSTRUCTION AND PLACEMENT OF NEST BOXES
AT HELLS GATE HABITAT MANAGEMENT UNIT

<u>Nest Box Type</u>	<u>Floor Size (Inches)</u>	<u>House Height (Inches)</u>	<u>Hole Height Above Floor (Inches)</u>	<u>Hole Size (Inches)</u>	<u>House Height Above Ground (Feet)</u>	<u>Remarks</u>
Bluebird	5x5	8	6	1-1/2	5-10	Place in full sunshine, 1" dry grass on floor
Wren	4x4	8	6	3/4x2-1/2	5-10	Bark-covered box, 1" dry grass on floor
Tree or violet- green swallow	5x5	6	5	1-1/2	5-15	Place nest box in open or on post, 1" dry grass on floor
Common flicker	7x7	16-18	14	2-1/2	8-20	Place 2" of wood chips on floor
Barn owl	10x10	18	12-15	3x5	10-30	Place near cut- bank on tree or pole, 2" dry grass on floor

TABLE 8.1
DEVELOPMENT SCHEDULE FOR HELLS GATE HABITAT MANAGEMENT UNIT

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
*Install Water Pump, Tanks, and Trickle Lines					X	X	X																	
*Plant Trees and Shrubs							X	X				X	X	X				X	X					
*Spray Noxious Weeds							X	X											X	X				
*Soil Sample Analysis							X	X																
*Water Plants							X	X	X	X	X	X						X	X	X	X	X	X	X
Install Guzzlers							X	X	X															
Install Raptor Perches							X	X	X	X	X													
Install Boundary Markers and Trail Signs						X	X	X																
Install Fence								X																
Develop Brush Piles						X	X	X	X	X	X	X						X	X	X	X	X	X	X
Install Nest Boxes							X	X	X	X	X	X	X	X	X	X								
Install Cliff Nest Boxes							X	X	X															
Plow and Apply Herbicide/Fertilizer to Fields & Food Plot							X	X				X	X											
Plant Fields and Food Plots																	X	X	X					
Prepare Fire Break								X				X								X				X
Install Kiosk											X													
Evaluate Vegetative Developments																					X	X		
Conduct Winter Wildlife Counts (Aerial)					X												X							
Develop Parking Area									X	X	X													
Conduct HEP Baseline							X	X																

*Critical initial year activity.

TABLE 9.1
HELLS GATE HABITAT MANAGEMENT UNIT
DEVELOPMENT COST ESTIMATE
Price Level 1 Oct 86

<u>Item</u>	<u>Unit</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Amount</u>
Carsonite Boundary Markers	Ea.	75	\$ 9.00	\$ 700
Guzzlers (Installed)	Ea.	6	600.00	3,600
Level Parking Area	SF	4,000	0.25	1,000
1,500-Gallon H ₂ O Tanks (Installed)	Ea.	3	2,000	6,000
Water Pump (Installed)	Ea.	1	6,600	6,600
Feeder Lines from Pump (Installed)	LF	4,600	4.35	20,000
Trickle System Lines (Installed)	LF	4,000	1.00	4,000
Firebreak	LF	7,000	0.25	1,800
Nest Boxes (Installed)	Ea.	30	50.00	1,500
Cliff Nest Boxes (Installed)	Ea.	3	150.00	500
Trees & Shrubs (Installed)	Ea.	4,098	3.75	15,400
Grass Seed	Lb.	2,100	2.20	4,600
Plant F-1 and F-2	AC.	103	20.00	2,100
Prepare and Plant FP-1 and FP-2	AC.	2.4	450.00	1,100
Kiosk (Installed)	Ea.	1	500.00	500
Trail Signs (Installed)	Ea.	12	40.00	500
Raptor Structures (Installed)	Ea.	5	300.00	1,500
Brush Piles (Per Group)	Ea.	5	100.00	500
Barbed Wire Fencing	LF	2,250	2.50	5,600
Herbicides	Gal.	45	75.00	3,400
Fertilizer	Lb.	50	20.00	1,000
			Subtotal	\$ 81,900
			Contingencies + 25%	<u>20,475</u>
			Subtotal	<u>\$102,375</u>
			Design, Supervision, and Administration (20%)	<u>20,475</u>
			TOTAL	\$122,850

TABLE 9.1

APPENDIX A

MEMORANDUM OF AGREEMENT
FOR
ESTABLISHMENT OF HELLS GATE HABITAT MANAGEMENT UNIT

MEMORANDUM OF AGREEMENT
FOR
ESTABLISHMENT OF HELLS GATE
HABITAT MANAGEMENT UNIT

This Memorandum of Agreement is made and entered into this 30th day of September 1983 by and between the Corps of Engineers, Walla Walla District, hereinafter referred to as Corps and Idaho Department of Fish and Game, hereinafter IDFG, and Idaho Department of Parks and Recreation, hereinafter, IDPR.

Article 1. Purpose and Intent.

a. IDPR is the lessee of lands known as Hells Gate State Park acquired by the Corps for outdoor recreation near Lewiston, Nez Perce County, Idaho. Based on recommendations from IDFG and Pengelly and McClelland (unpublished report, 21 December 1978) the Corps has proposed the development of wildlife habitat on lands currently a part of Hells Gate State Park (Exhibit A).

b. It is the purpose of this agreement to make known the intent of the future use of those lands proposed to be returned to the Corps from the IDPR lease. Said lands will be developed and managed as a wildlife habitat management unit (known hereinafter as Hells Gate Habitat Management Unit; HGHMU) of the Lower Granite project and designated sections will be made available for hunting and fishing recreation purposes. Lands within the HGHMU shall be classed indefinitely as Wildlife - Intensive.

c. Developments planned for installation on the HGHMU include planting of trees, shrubs and grasses, development of water sources by construction of windmills and guzzlers, designation of public hunting and safety zones, construction of fences to control public access, construction of raptor perches, establishment of a parking area, and construction of brush piles.

Article 2. Obligations of the Parties.

a. IDPR will agree to request lands as indicated in Exhibit A be deleted from the lease agreement between IDPR and the Corps.

b. Responsibility for the development, operation, and maintenance of the HGHMU will be transferred to the Corps upon deletion of the undeveloped lands from the lease.

c. The Corps will develop habitats within five years following amendment of the lease, dependent on sufficient funding.

d. The Water Resources Development Act of 1976 (PL 94-587, 94th Congress, 22 October 1976) authorized the Corps to provide compensation and mitigation of wildlife losses resulting from the construction of four dams on the lower Snake River in Idaho and Washington. The Corps will utilize the Federal Grant and Cooperative Agreement Act of 1977 (PL 95-224) to enter into a Cooperative Agreement with IDFG with regard to the annual management of the HGHMU.

e. Public hunting areas and safety zones will be established by the Corps in agreement with IDPR and IDFG.

f. IDFG agrees that, because of the extent of proposed development of the Upper Bench, further wildlife development will not be requested of the Corps or IDPR by IDFG.

Article 3. Noninterference

Nothing contained in this Agreement shall be construed as granting IDPR or IDFG any rights to interfere or restrict the Corps' normal use, operating and maintenance procedures, or contract work for the Lower Granite Lock and Dam project.

Article 4. Relationship of the Parties


The parties to this Agreement act in their independent capacities in the performance of their respective functions under it, and no party is to be considered the officer, agent, or employee of the others.

Article 5. Hold and Save Harmless

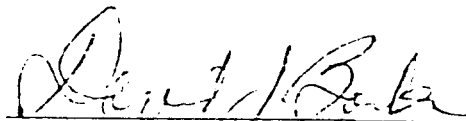
IDPR and IDFG shall hold and save harmless the United States of America free from any and all claims and damages resulting from construction, operation, and use of the HGHMU for wildlife purposes.

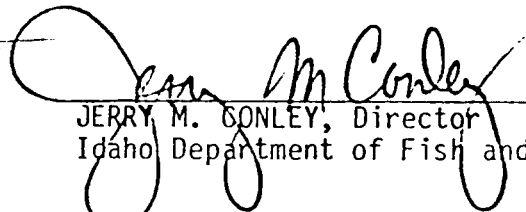
Article 6. Effective Term

This Agreement shall take effect upon signature by the three parties identified below, and shall remain in effect until and so long as the recreation lease between the Corps and IDPR and the Cooperative Agreement between the Corps and IDFG remain active.

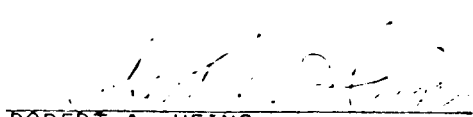

DALE R. CHRISTIANSEN, Director
Idaho Department of Parks and Recreation

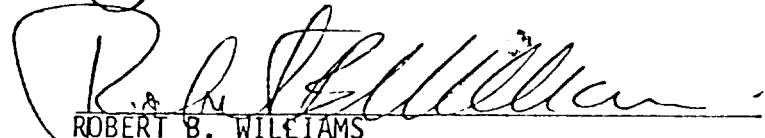
Approved as to content and form:


Deputy Attorney General
Idaho Dept. of Fish and Game


JERRY M. CONLEY, Director
Idaho Department of Fish and Game

APPROVED:


ROBERT A. HEINS
District Counsel


ROBERT B. WILLIAMS
Colonel, CE
District Engineer

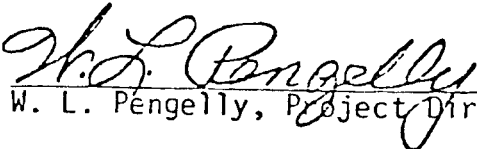
APPENDIX B

PENGELLY AND McCLELLAND REPORT
ON
WILDLIFE MITIGATION FOR IDAHO

Report of Impacts on Idaho
Wildlife Caused by Lower Granite
Project, Snake River, Washington

Submitted to the Corps of Engineers
Walla Walla District, Washington

by


W. L. Pengelly, Project Director


Riley McClelland

December 21, 1978

Report of Impacts on Idaho Wildlife
Caused by Lower Granite Project, Snake River, Washington

Introduction

A plan was developed by the Corps of Engineers, U.S. Army, Walla Walla district, following Congressional authorization (2 March 1945) for a series of 4 dams to be constructed on the lower Snake River in the State of Washington. Lower Granite, at River Mile 107.5, was completed in 1975. At full pool it creates slack water approximately 4.0 miles up the Clearwater River and 8 miles up the Snake River in Idaho.

Significant losses in wildlife and wildlife habitat were expected in the State of Washington and arrangements for mitigating these losses are underway. These efforts include research, land acquisition, easements, fencing, habitat development, game farms and fish hatcheries, and some changes in Corps of Engineers operations procedures.

Minor losses were expected in Idaho (Greenley to Findlay, 1/17/72) but it appears that until the levees were constructed and the pool filled, the extent of losses was underestimated by the Idaho Department of Fish and Game. They, accordingly, asked for post-authorization consideration to remedy these losses (12/4/74).

The Corps of Engineers contacted me in December, 1977 and asked me to evaluate the impacts on wildlife in Idaho caused by the Lower Granite Project.

The objectives of the study were to:

- (1) Ascertain the net impact (losses or gains) on wildlife habitat, on affected number of recreation- and hunter-days, and on acres of stream-type sport fishery lands in the State of Idaho due to the Lower Granite project.
- (2) Determine mitigation requirements (if any) for these impacts and compare them with the recommendations in the Special Report, Lower Snake River Fish and Wildlife Compensation Plan.

This was to be accomplished by careful study of maps and photos, examination of the area in question, and interviews with agency personnel. I engaged the services of Dr. Riley McClelland, non-game ecologist and recreation specialist, and Dr. David Brakke, limnologist. We visited Corps of Engineer Offices in Walla Walla, WN, in May for orientation and took a helicopter tour of the area with 3 Corps officials. We have also made 3 visits to the Clarkston Corps offices, and 3 visits to the Region #2 headquarters of the Idaho Department of Fish and Game in Lewiston where we had lengthy interviews with key personnel. On June 16, I flew to Boise and discussed the project with Idaho Department of Fish and Game Director Joe Greenley and his staff.

Personnel of the Idaho Department of Fish and Game have been very cooperative and the Corps has provided us with aerial photos, maps, and all the available reports pertinent to the project. As the project progressed, it became obvious that adequate data did not exist to meet all the objectives of the study.

History of the Project

The problem of determining the nature and extent of changes in wildlife habitat, numbers, and diversity is extremely complex, especially so in this area which involves two major communities totalling over 40,000 population, with networks of roads, highways, bridges, barge docks,

and railroads, all interspersed with quail, pheasants, songbirds, cottontails, and steelhead.

The expected increase in population growth in the Lewiston-Clarkston area will follow or accompany the growth of barge, rail, and truck traffic. Additional construction is expected as well along the industrial waterfront--rip rap, barge docks, railroad tracks, bridges and roads. Significant losses in wildlife and wildlife habitat probably occurred in the area for the century spanning the early gold rush in Idaho and Nez Perce County prior to the recent period of dam construction. These losses were gradual and prolonged but the recent losses are far more dramatic and sudden, and, thus, are contested more strongly. It does appear that much of the original shoreline area had already been degraded by urban pollution, dumps, and earlier flood control levees. The "quality" of the riparian habitat inundated by the rising pool certainly was lower (in terms of naturalness) than in presettlement times. The precise changes in quality cannot be evaluated from maps and descriptions available to us. This makes necessary professional judgment based on indirect evidence rather than evaluation based on detailed quantifications of physical and biological changes in the landscape.

An evaluation of wildlife losses that have been caused by the action of a federal agency is a fairly new concept. Despite the existence of the federal Wildlife Coordination Act (12 August 1958) little has been done in the way of protecting terrestrial wildlife. The Endangered Species Act of 1973 has brought this dilemma into sharper focus. As recently as 1972 most of the mitigation proposed for the Lower Snake River dams dealt with anadromous fish, according to a report prepared by Ted Wirth and associates (1974) for the Corps. Early Master Plans for Ice Harbor and Lower

Monumental Dams also made little mention of losses in terrestrial wildlife. The U.S. Fish and Wildlife Service made little comment either. From 1972 to 1975, however, mention of wildlife losses and requests for mitigation increased rapidly from 5 percent to 55 percent of total mitigation costs. In the current era of environmental impact statements and public hearings it is not likely that these shortcomings will be overlooked when future projects are discussed.

As often occurs with reservoir construction, existing islands or gravel bars may be submerged or removed for construction fill. Riparian vegetation is dozed out or killed by flooding, and subsequent pool fluctuations prevent the establishment of new vegetation. A comparison of aerial photograph mosaics from before and after impoundment impact clearly reveals that substantial riparian vegetation was lost. This project is further complicated by the removal of the Old Washington Water Power Company (WWPC) dam at Lewiston on the Clearwater River from December 1972-Spring 1973 which resulted in the emergence of approximately 64 acres of lands. At high pool level of Lower Granite Dam, 178 additional acres were reported to be submerged (by Idaho Fish and Game, 12/4/74 letter) for a net loss of 114 acres (estimated) on the Snake and Clearwater rivers.

The position taken by the Idaho Department of Fish and Game is clearly expressed in the letter by Director Greenley of December 4, 1974^{*} to Colonel Conover; it remains their basic position (Greenley to Allaire, 4/1/77). This has been supported as well by the Fish and Wildlife Service (see letters, Perry to Connell, 5/31/72; Aus to Allaire, 4/18/77).

* Referenced correspondence is in Appendix C, attached.

The Corps of Engineers response (Conover to Greenley, 2/12/75) expresses several areas of disagreement (see also Greenley to Conover, 4/7/75) and it is from this background that we will address our efforts. With that in mind, then, we can examine the available information and make suggested compromises and adjustments based on our best professional judgment.

Methods

In an attempt to evaluate and quantify changes in wildlife habitat "before" and "after" reservoir and levee construction, we examined photos (maxi-blowups)^{*} and real estate segment maps, read voluminous reports and correspondence, toured the area on the ground and by helicopter, and discussed changes with Corps and Idaho Fish and Game personnel familiar with the area. Levee construction impacted the area along a narrow strip, and, due to the value of the land and lack of necessity for acquiring large units, land purchases in the lower reaches of both rivers were minimal. Measuring miles of shoreline (linear) rather than total acreages seemed to be the most feasible way, with the data available to us, to measure the available habitat, "before" and "after." It was expected that with levee construction which removed small islands and shoreline indentations, the "after" condition would yield less total mileage and this was the case on the Snake River (see Tables 2 and 3). The removal of the power company dam and subsequent emergence of lands resulted in a slight increase in shoreline along the Clearwater River after the pool filled.

The measurements were taken with a Dietzgen map measuring instrument which records in inches. It proved to be a rapid and fairly accurate

* Maxi-blowups--scale 1" = 250'

way of measuring shoreline on the aerial blowups. The relative proportions of the 3 classes of habitat taken "before" and "after" the construction and filling of Lower Granite Dam are expressed in inches and should be accurate enough to detect gross changes.

Habitat evaluations were limited to three general classes due to the apparent lack of diversity in vegetation types which generally formed a narrow riparian belt. In addition to the limited number of plant species* the hundred year history of grazing, farming, urban encroachment, industrial activity, gravel mining, settling ponds, and car body dumps along the diked areas have probably produced adverse impacts on indigenous wildlife previous to dam construction.

Man has been the dominant factor in influencing the distribution and amount of vegetation on the lower Clearwater and adjacent Snake Rivers. Millions of logs were floated down the Clearwater until 1970, scouring the bottom and banks and contributing thousands of tons of bark debris to the river bottom. Also, according to Asherin and Orme:

"Riparian communities in the lower Clearwater River are now subject to 2 major changes in flow conditions due to the presence and operation of Dworshak Dam. One of the changes includes lower than normal spring flows due to the storage of water behind the dam.

The riparian habitats most likely to be directly affected by the altered flow regimes in the lower Clearwater River are the coyote willow, black cottonwood, and bunchgrass flood plain types."

The pool is scheduled to fluctuate no more than 5 feet and it will be several years before riparian invasion of the new shorelines takes place. (See the Summary--"Inventory of Riparian Habitats", Vol. 1.,

* Asherin and Orme. 1978. "Inventory of Riparian Habitats and Associated Wildlife Along the Lower Clearwater River and Dworshak Reservoir. College of Forestry, Wildlife and Range Science. University of Idaho.

U.S. Army Corps of Engineers, for more details about the impact of reservoir fluctuation on wildlife and vegetation.)

Wildlife Habitat Evaluation

The wildlife species composition of any given community is determined by a complex set of ecological factors. Food, cover, water, and special features are primary considerations. The availability of these needs may vary spatially and temporally (both seasonally and over longer times). Competition and predation also influence species presence.

Animals' needs vary by species, age, sex, season, and individual. Yellow Warblers prefer willow thickets, but Canada Geese avoid tall cover for nest sites. Killdeer often nest on open gravel bars, but the Great Horned Owl never does. Cavity-nesting birds are often limited by the availability of trees with cavities, e.g., small owls often nest in riparian sites with large trees. If the trees (and thus cavities) are absent, the owls will be absent.

Some species are generalists, i.e., adaptable to a variety of habitats (Robin); others are specialists, narrowly limited to specific sites (most raptors in the study area).

Waterfowl are more adaptable due to their mobility so their presence in an area cannot provide much proof as to the quality of the habitat they are temporarily occupying. Some species are very adaptable and it is unknown at present how much disturbance they will tolerate before leaving the area or dropping off in productivity.

The point is that natural communities are exceedingly complex and the assignment of the term "good" or "poor" habitat to a site is a subjective one. It is realistically possible only in a species-specific sense.

Because of the lack of site-specific census data (pre-impoundment) in the study area, we are forced to extrapolate from other apparently similar situations.

A recent study in South Dakota by John Emmerich showed that ". . . Riparian woodlands, which occur along rivers and streams, have the highest number of species of birds during all seasons." His study indicated that the larger number of bird species present in that type of habitat is due primarily to the size of the woodland. Any development that removes trees eventually will reduce the number of bird species present. He also demonstrated that single row-windbreaks supported fewer species than riparian woodlands.

The Fish and Wildlife Service report^{*} on the Lower Granite project stated that:

"Severe losses of . . . nongame wildlife have resulted from project effects . . ." ". . . A comparison of nongame wildlife 'before' and 'after' inundation of riparian woody vegetation shows that numerous valuable birds such as Yellow Warblers, Song Sparrows, Western Tanagers, House Wrens, Black-headed Grosbeaks . . . are replaced predominantly by a few Blackbirds and Meadowlarks, species that do not require extensive stands of shrubs and trees . . ."

Other nongame species reduced or eliminated by inundation include species of reptiles and amphibians. The Fish and Wildlife Service concluded:

"The extent of such losses cannot be readily measured in terms of human use because of their largely intangible nature. Yet these losses are important and must be given full consideration."

In general, sites with a diversity of foliage strata (grass and forb, shrub, and tree) support a greater diversity of bird species than sites with few strata (Balda 1975).

* Special Report on the Lower Snake River Dams Plan. Washington and Idaho. Sept. 1972, p. 24-25.

One way to attempt to evaluate the changes in habitat (before and after impoundment) is to base a quality estimate on the number of vegetative strata present (Balda 1975). Thus a "3" rating might indicate grass, shrub, and tree presence, and a combination of conditions leading to optimum usefulness for wildlife quality. A "1" rating would indicate only sparse ground cover, or even bare gravel, in this study area. This is a generalization fraught with difficulties for wildlife management, because some species require the presence of trees, some require the absence of trees. A "3" rating does not imply that all species are accommodated, only that more species are supported there than are supported in the areas classed as "1".

In rating habitat quality before and after impoundment, judgments were made as to number of vegetative strata present on the same site based on on-the-site visits and inspection of aerial photo blowups. Obviously, such estimates are imprecise, but this was the only way we could attempt an evaluation of habitat quality changes without accurate census data with which to work.

* Balda, R. P. 1975. Vegetation structure and breeding bird diversity. In Proceedings of the symposium on management of forest and range habitats for nongame birds. (May 6-9, 1975, Tucson, Arizona). USDA Forest Service Gen. Tech. Rep. WO-1. 343 p. Washington, DC.

Ownership

Segment Maps 12, 13, 17, 18, and 5 prepared by the Real Estate Division of the Corps were examined to determine total acreages purchased, previous ownerships and eventual use by the Corps. Of the total 1515 acres purchased, 1370 acres (90%) came from private owners, 121 (8%) from the State of Idaho and the remaining 23 acres (2%) from the city of Lewiston, Nez Perce County and the Port of Lewiston.

Not all the purchases were for levee construction, public access or for industrial-commercial development. The largest single designation was for the Hellsgate Park site (963 acres). Lands purchased specifically for wildlife habitat within the project boundaries are upstream from the old WWPC dam site (Goose Pasture, Pafille and McCann properties, lower Hog Island).

Table 1 provides a breakdown of acres purchased by category of previous ownership (calculated from the Segment Maps).

Table 1.

Segment Map No.	Private	City	State	County	Port of Lewiston	
13	1069.82	4.07	10.79	0.0	0.0	Snake
12	6.97	5.69	38.04	0.0	0.0	Snake
	52.47	3.12	26.23	0.0	0.0	Clearwater
18	16.42	1.07	16.91	0.0	0.0	Clearwater
17	95.95	0.00	16.18	0.0	0.0	Clearwater
5	128.14	0.07	13.25	1.26	8.26	Clearwater
Totals	1369.77	14.02	121.40	1.26	8.26	1514.71 (TOTAL)

On the Snake River, levee construction has occurred for about 1½ miles upstream on the Idaho shore. The major change in riparian vegetation in the upper pool area has been caused by the construction of marinas. The acreage purchased for Hellsgate Park included several miles of shoreline which provides some riparian habitat and guarantees public access. No purchases were made specifically for wildlife along the Snake but the undeveloped portion of Hellsgate State Park may serve that function.

Of the 51 acres (19 parcels) purchased by the Corps (Segment Map 12), 35 acres were owned by the State of Idaho in the vicinity of the Lewis and Clark bridge. This segment extended from the confluence of the Snake and the Clearwater south to 13th Street, near the Grain Growers, and consisted of many small private holdings (grain terminals, boat docks, pre-mix plant dump area) and one public beach.

In the Segment Map 13 area, 41 parcels totalling 1085 acres were purchased with the bulk of the units in the Hellsgate Park--963 acres including over 4 miles of shoreline. Most of these purchases were from private owners, changing the former limited access to unlimited public access. These purchases included gravel plants and settling ponds, dry and irrigated crop land, grazing land and a variety of other small commercial operations.

Land purchases along the Clearwater River upstream to the Hog Islands are covered in Segment Maps 12, 18, and 17 on the south shore and Map #5 on the north shore. On Segment Map 12 (Clearwater, south side), 82 acres were purchased, of which 53 acres were from private owners. The major owner (45a--Holbrook Island) was Potlatch Forests Incorporated (PFI) and the area was zoned port. The State of Idaho

owned an additional 26 acres in the Holbrook Island area. The balance of the 20 purchases were mostly very small private parcels. According to the Real Estate Division of the Corps, the entire area had been used previously as dumps, storage areas, industrial sites, and some undeveloped brushy areas. Levees, recreation walkways, ponds, and a truck route have now been constructed here and the area landscaped.

Proceeding upstream (south side--Segment Map 18) 52 parcels totalling only 34 acres were purchased and levees were constructed up to the Potlatch Forest plant. It was previously zoned industrial and included the Camas Prairie Railroad Yards.

"Segment Map 17 represents the lands acquired after the WWPC dam was removed and a small amount of shoreline acquired around the PFI plant. This acquisition extends along both sides of the Clearwater from RM 4.5 to about RM 9. It includes all lands between US 12 on the north and to Camas Prairie right-of-way on the south." (From Real Estate Division letter 26 July 1978)."

Total acreages purchased on Segment Map 17 equal approximately 112 acres and involves 23 parcels--20 private and 3 State. Thirty-one shoreline acres were purchased from private owners and 16 acres from the State, all of which were dedicated to wildlife habitat and access. An additional 12 acres (lower Hog Island) were purchased from PFI. Habitat development of these acres is underway and the areas are and have been used mostly by waterfowl and associated shorebirds. The area is part of the Lewiston Wildlife Preserve and with protection and habitat development, wildlife numbers and diversity should be enhanced.

Segment Map 5 covers the north shore of the Clearwater from the Idaho line to the old WWPC dam, approximately 4.7 miles. Based on Real Estate Division reports, the land was all privately owned and within the city limits of Lewiston. It was variously zoned as port, industrial, or commercial use. Approximately 151 acres were purchased in 46 parcels.

The islands had been used as borrow sources for Idaho Department of Highways and private contractors. This area is now built up with levees and port facilities.

Ownership alone does not tell much about the usefulness of a piece of ground for wildlife. The purchase of private property for the purpose of building a public levee or barge landing does not benefit wildlife. Since flood control in downtown Lewiston was a major project goal, levee construction was not a debatable point. At the upper end of the pool on both the Clearwater and the Snake where less construction disturbance occurred, and vegetation was already established, some possibilities for wildlife habitat enhancement are possible.

Riparian vegetation can be expected to invade some of the sites disturbed during construction but this will not be a major benefit except over a long time period. Plantings by the Corps, such as the 20,000 trees planted at recreation sites, will eventually improve the area for a variety of terrestrial wildlife species and much sooner than natural establishment.

A rating category for ownership was attempted using a rating of "3" for lands owned by the public and zoned for wildlife with no "interim use" restrictions. A "2" rating was given to publicly owned lands zoned for mass recreation. This would be comparable to undeveloped privately owned lands that do not have their future guaranteed. The lowest category of "1" would be public or privately owned lands zoned and used as commercial-industrial lands. Examples of Class "3" ownership would be the Goose Pasture, Pafille and McCann properties and lower Hog Island. Class "2" land would be the undeveloped acres of the Hellsgate Park site which could be easily developed into a better place for wildlife.

The marinas, levees and Potlatch Forest properties are examples of Class "1" lands.

Access

Access is not directly correlated with ownership and is totally unrelated to habitat quality. Some publicly owned properties are not open to the public by management decision, just as access is not always forbidden on private lands.

A reverse correlation exists with habitat quality and access, which we will assume is guaranteed under public ownership. For example, unlimited public access could very well nullify an otherwise high quality wildlife brood area. Totally restricted access would be the best management decision for wildlife benefits during many months of the year.

From a wildlife standpoint this poses several problems. Private lands of good wildlife potential with restricted access may be more beneficial to wildlife than lands owned by the public and subject to mass recreation pressures as at Hellsgate State Park.

Attempting to work out a numerical weighting scheme to evaluate habitat quality, ownership, access, and use in a single context is not feasible.

Results

Snake River. The "before" and "after" evaluations of changes affecting wildlife along the Idaho side of the Snake River were mainly a shift from average quality riparian habitat to poor quality wildlife habitat. Very little "good" habitat existed prior to the construction of Lower Granite Dam due to the encroachment by the city of Lewiston, industrial and commercial operations, and ranching operations.

Table 2 is a summary of how this shift seems to have occurred.

Table 2. Habitat changes along the lower Snake River, Idaho
(Measurements in inches of shoreline from aerial photos).

Habitat Quality*	Before	After
1 (poor)	22	90
2 (average)	92	14
3 (good)	10	4
Total	124	108

Discussion. Riparian vegetation was probably always marginal along this stretch of river but no less important to the wildlife species common to the area. Since production of numbers of selected species for consumptive use is not a primary goal of management for the area, the impact of inundation and construction will have to be evaluated from a different set of standards.

The shoreline of the Snake River has undergone many alterations, the most recent of which were the construction of levees and development of Hellsgate State Park.

From an inspection of aerial photos, 1967 (before) and 1973-74-75 (after), it appears that the construction of levees and marinas, boat docks, etc., has shifted the "average" quality riparian habitat to a poorer quality habitat for wildlife.

* Quality as used here implies diversity of species, i.e., "good" habitat will support more species than "poor" habitat.

It is also reasonable to predict that the increased pleasure boat traffic on the river will influence even good habitat adversely by continual disturbance. It is not known how various wildlife species will adapt to this condition.

Similarly, intensive human use of Hellsgate State Park may add stresses to which wild animals have not evolved a means of adapting. It is also possible that the removal of the livestock grazing on the vegetation of that area will not necessarily be immediately beneficial to wildlife, especially ground nesting birds. Vegetation not removed by grazing or fire may stagnate and smother with excessive mulch leading to range deteriorations according to recent research findings (see Cosby 1978)*.

Until the management plans for the undeveloped portions of the park are devised, we cannot comment on what benefits have accrued to wildlife as a result of this purchase. Public access has now been guaranteed, which is a plus for people but not necessarily for wildlife. Plantings, fencing and irrigation can be utilized to benefit wildlife according to the species present and management goals.

A wide range of figures was given for acres of losses and gains following removal of the WWPC dam on the Clearwater and the construction and subsequent filling of the pool of Lower Granite Dam.

Idaho Fish and Game Department Director Greenley (December 4, 1974 letter to Colonel Conover) stated that 93 acres of islands were inundated along with 85 acres of riparian shoreline habitat. He also listed a loss of 357 acres of habitat at Hellsgate Park and concluded that the total loss of 525 acres would not be replaced by the 145 acres purchased

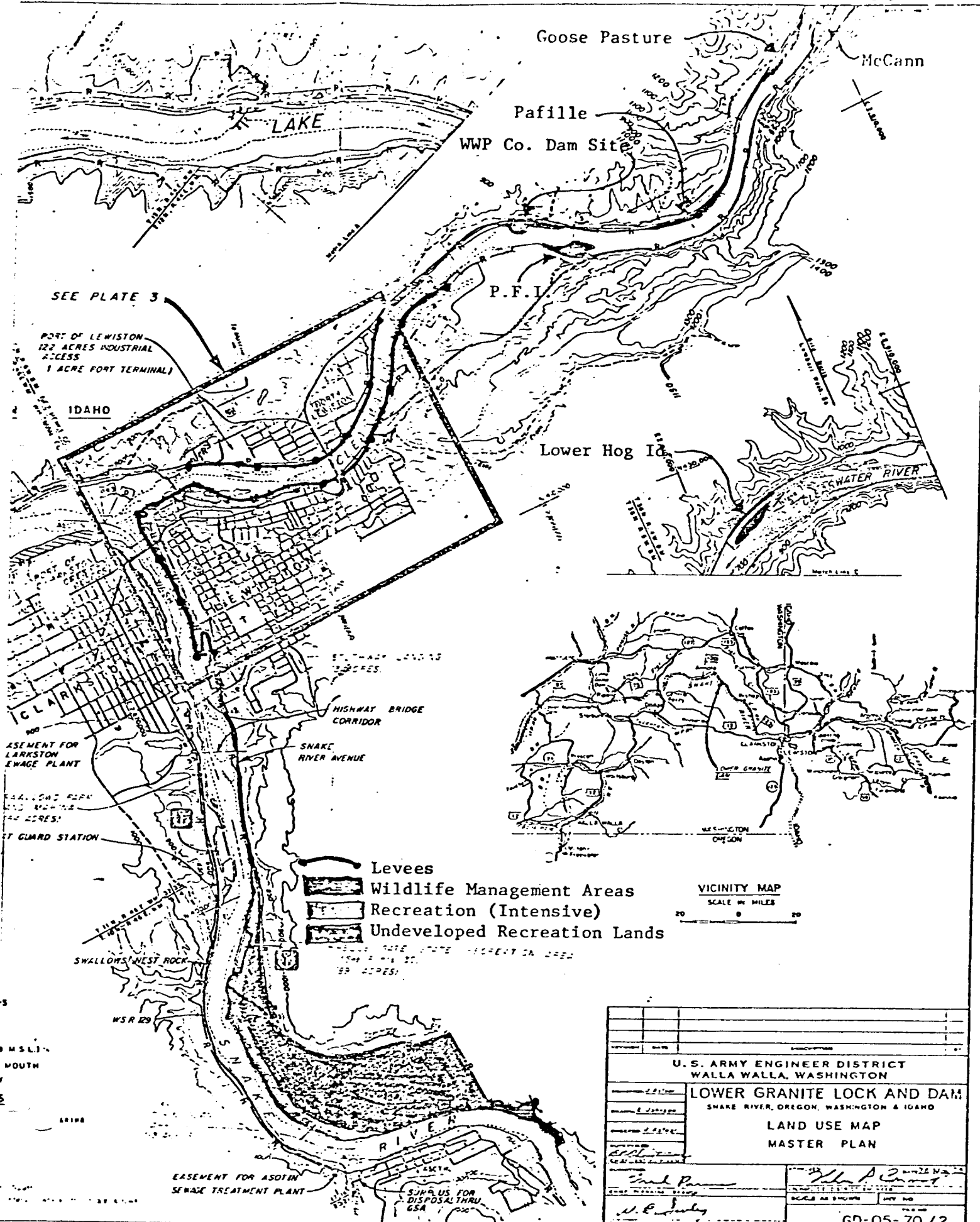
* Cosby, H. E. 1978. "Range Management Benefits Wildlife." Rangeman's Journal, 5(5) October. p. 159-161. Appendix C.

by the Corps for wildlife above the PFI property on the Clearwater.

Since the major point of contention centers around the Hellsgate Park acreage, we directed our attention to that area first. The total acreage purchased by the Corps is of great significance to wildlife. Adjacent acreages can be purchased and improved to offset losses but precise tradeoffs are a goal, not an actuality.

Figure 1, which is a photo copy of a Corps map (Master Plan DM28, Plate 2), has been marked to show the major areas of impact and purchase. What has been permanently altered by inundation cannot be replaced exactly. Technically, no two acres anywhere are identical, which makes it difficult to assess gains and losses. And, as we have previously stated, the usefulness to wildlife varies by species, season, sex, age, physiological needs, and behavioral patterns. Also, the disruptions of riparian vegetation and the maturation of new plantings will be altered over time. "The slack water ends above the confluence . . . nine miles on the Snake . . ."^{*} Before construction this was a free-flowing river between two cities and subjected to all the pressures of urbanization. The Idaho shore was in small private holdings--gravel plants, grain elevators, small businesses, railroad tracks and roads. A small amount of riparian vegetation above and below the Lewiston-Clarkston bridge was eliminated in the construction of the levees. The Corps, following the suggestions of fisheries biologists, altered their process of clearing the pool area and left some submerged vegetation in 10 feet of water for fish shelters. Some of the native vegetation lost in the clearing process is being replaced with plantings behind the levee, but generally the four miles of levee and marinas should be written off for wildlife.

^{*}Groff, E. O., Project Engineer. "Idaho's New Seaport City Keeps Dry with Levees Featuring an Impervious Cutoff." p. 2. (Buerstatte, H.--in Appendix B, Review of Draft Report, 26 July 1978--uses the figure of 3 miles on the Snake.)



SEE PLATE 3

PORT OF LEWISTON
122 ACRES INDUSTRIAL
ACCESS
1 ACRE FORT TERMINAL

IDAHO

EASEMENT FOR
LARKSTON
SEWAGE PLANT

WALLAND PARK
100 ACRES




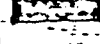
PORT GUARD STATION

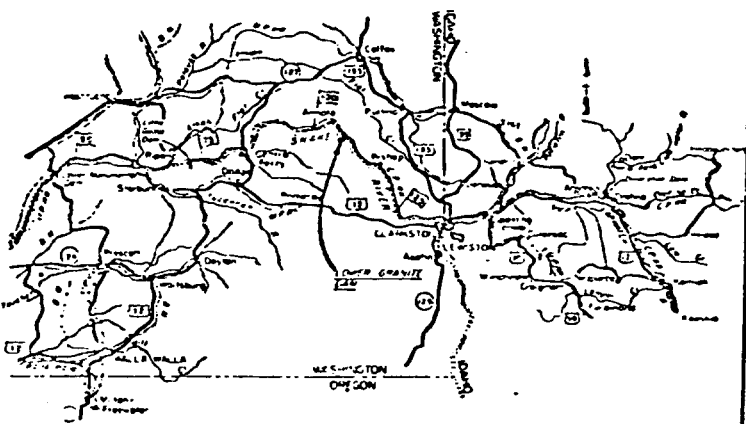
3 M.S.L. -
MOUTH

ARRIVE

EASEMENT FOR ASOTIN
SEWAGE TREATMENT PLANT

SUBS. US FOR
DISPOSAL THRU
GSA

-  Levees
-  Wildlife Management Areas
-  Recreation (Intensive)
-  Undeveloped Recreation Lands



VICINITY MAP
SCALE IN MILES
20 0 20

U. S. ARMY ENGINEER DISTRICT WALLA WALLA, WASHINGTON	
LOWER GRANITE LOCK AND DAM SNAKE RIVER, ORIGONE, WASHINGTON & IDAHO	
LAND USE MAP MASTER PLAN	
Prepared by <i>U. E. [Signature]</i> Checked by <i>[Signature]</i> Approved by <i>[Signature]</i>	Date Scale as shown Map No. 6D-05-70/2

The four miles of shoreline above the marina were purchased as part of the 963 acre Hellsgate Park acquisition and the area is open to the public. About 80-100 acres is planned for initial development with the balance to be left in an undeveloped state. This purchase and development has to be considered a gain for the State of Idaho and the people who use the park and seek access to the river. It is not necessarily a gain for wildlife unless the undeveloped portion is dedicated to their use. Some minor habitat development may be introduced after the agencies responsible for its management develop a plan to be implemented. The area has been changed from one of very restricted access to one of unlimited access and that also will not benefit wildlife.

Recommendations. Vegetation, nesting sites, and other natural features are subjected to trampling and other abuses in heavily used recreation sites. Thus, the Park area and adjacent lands will be transformed into areas that support only the more tolerant wildlife species. The undeveloped portions of the Park can provide cover and nesting sites for numerous bird species but only if intensive recreational use is avoided through conscious planning and management. Since this is the only area under consideration that was formerly inhabited by game birds (pheasants, quail, doves, Hungarian partridge, Chukars) and supported limited hunting, its continuation should be considered as a possible goal of future management.

Clearwater River. The major changes on the stretch of the Clearwater River impacted by Lower Granite Dam were the results of levee construction 4 miles upstream on the south bank and 2.4 miles on the north bank (to old WWPC dam site, approximately), and the removal of the

old WWPC dam which created 1½ miles of free flowing river and exposed some acreage (Table 3).

Table 3. Habitat changes along the lower Clearwater River (Measurements in inches of shoreline from aerial photos).

Habitat Quality	Before	After
3 (good)	47	57
2 (average)	114	79
1 (poor)	170	204
Total	331	340

The "good" habitat increase after Lower Granite Dam construction activities is related to the increased acreage resulting from the removal of the old WWPC dam. The decrease in "average" quality habitat is related to levee construction activities in the lower 4 miles and the removal of Holbrook Island. There was some change in the amount of "poor" quality habitat after impoundment but not as much as could have been expected due to previous levee construction and urban-industrial encroachment of the past.

Discussion. The levees constructed on the south shore near the junction with the Snake River changed Holbrook Island from an undeveloped area used by certain species of wildlife to a completely altered man-made recreation area. The loss of Holbrook Island to wildlife is a temporary one and since it was privately owned its loss cannot be charged against Corps activities. The artificial ponds are currently being used

by waterfowl. Later, when the plantings mature, these sites may become useful for other species of wildlife, mainly small birds.

The old levees maintained by the City of Lewiston have been replaced by Corps levees (Fig. 2). Some of the "average" quality habitat on the north shore west of Memorial Bridge was reduced to "poor" by levee construction. Since the area was being encroached upon by gravel removal, car dumps, and other blights of urbanization, its degradation was probably only a matter of time.

From the old WHPD dam site upstream the influence of the new impoundment is of little consequence. The gains from emerging lands and purchases of property from Pafille, McCann, and Goose Pasture and subsequent development and dedication for wildlife is an important plus. We rated these lands as "good" in public ownership since they have been dedicated to wildlife use and are being improved. The same lands in private ownership were also rated "good" despite the fact that the primary use is agricultural with wildlife merely trespassing. The new management goals will be to enhance wildlife quality and diversity by purchase to guarantee its future, and by subsequent development.

The south shore from PFI upstream to the "take line" is of limited value for wildlife except as a resting place for waterfowl and shorebirds. The recent changes at PFI resulting from the removal of the log ponds, and cessation of the log drives remain to be evaluated. Before the Lower Granite Dam was completed and the pool was filled (about 1975), conditions for wildlife along the Clearwater River were never constant. They varied with the spring floods and winter freezeups, also with the log drives, flood control levees, gravel removal, and spread of the industrial-commercial activities by private landowners who owned 90 percent of the total shoreline.

Wildlife had access to the sparse riparian sites and to some of the small parcels being farmed above PFI. These lands were managed for personal gain and use by wildlife was incidental and tolerated. The area lies within the boundaries of the Lewiston Wildlife Preserve so the only hazards animals faced are mechanical, accidents, weather, and some predation. Fishing is the only consumptive use of wildlife in the impact area.

Access to the river formerly was limited due to the predominance of private ownership and lack of parking space and boat landings. Before Lower Granite Lake was created 4½ miles of free-flowing river from the state line upstream to PFI property were available to fishermen. However, the WWPC dam at that location had already altered the ecology of the river, and, in fact, the construction of dams on the lower Snake and Columbia River had altered, forever, the natural fisheries.

When the privately owned WWPC dam was removed during the winter of 1972-73, approximately 1½ miles of former pool became free-flowing again but the river below the old dam to the state line became part of the pool. Thus, 4½ miles were impounded and 1½ miles were released for a net loss of 3 miles of partially altered but free-flowing stream.

The major changes above the WWPC dam resulting from the construction of Lower Granite Dam were mainly beneficial to wildlife and people. The transfer of the McCann, Pafille, Goose Pasture and Lower Hog Island properties to public ownership and their subsequent dedication and development for wildlife is beneficial. Parking areas, for persons viewing wildlife, fishing or using boat access are also in the public's favor but not directly beneficial to wildlife. Upper Hog Island supports vegetation classified by Asherin and Orme as mixed deciduous shrub/annual forb. It currently supports greater plant and wildlife diversity

than does Lower Hog Island. While not available for purchase, it can still contribute significantly to wildlife welfare. The Corps has requested the Idaho Department of Water Administration attempt to "preserve the intrinsic value associated with the natural character of the island."

The riparian edge on the north shore below Memorial Bridge to the state line has been lost due to levee construction. Also, the native vegetation on the 45 acre Holbrook Island has been temporarily lost. It was privately owned (PFI) and had been used as a log dump, gravel pit and illegal garbage disposal area by people in the area. The current developments behind the levee consist of ponds, bike and jogging paths, and tree shrub plantings. People will also have public access to the river for fishing and boating.

General Conclusions and Recommendations

Several possibilities exist in the operation and management of the Lower Granite Project for enhancement of certain species of wildlife and many of these have been discussed in the text of this report. Others, of a general nature are as follows:

The wildlife habitat development plans proposed by the Corps of Engineers (see letters from Cuckler^{*}, McKern^{**}) are well conceived and should be implemented. An agreement should be reached between the Idaho Department of Fish and Game and the Corps of Engineers re who will handle the development, operation, and maintenance of habitat areas, with the state agency taking the lead due to their legislative mandate, and the continuity of interest.

We recommend that plant species adapted to xeric sites be used whenever planting is done in those areas. The extensive use of species which must be provided with water creates the necessity of permanent and expensive irrigation projects.

Willows in and near the water's edge are of special importance to nongame birds and their propagation should be encouraged. Natural propagation may be sufficient on most sites if machinery is kept out.

Dead trees and shrubs and logs should not be removed. These features serve as food sources, cover, nest sites, perch sites, and display sites for many wildlife species. The temptation to "tidy up" all areas by removing these natural features is counter-productive.

* Cuckler letter to Chief Operations, 17 June 1977.

** Letter to Files, McKern, 13 June 1977.

We recommend that herbicide use be very limited or preferably eliminated as a means of vegetation manipulation in areas being managed for recreational or wildlife use (e.g., Hellsgate State Park). Although herbicides may be convenient tools for a manager, most of them simplify vegetational composition on affected sites with little selectivity (other than broad-leaved vs. narrow-leaved differences). Herbicides also have potential deleterious effects on humans using the area. Hoeing, plowing, burning, and other non-chemical methods of vegetation management may be more costly and require more manpower, but they will pay dividends in the resulting diversity of biota and opportunities for higher quality recreation.

Plant and wildlife (game and nongame) species were censused in the Lower Clearwater area by Asherin and Orme (1978). Their publication contains lists of species observed in intensive sampling sites (their sites 1 through 6 fall within our study area on the Lower Clearwater). The authors relate wildlife species to major vegetation types in the study area. Their publication can serve as an important reference in resource planning.

The requests for mitigation by the Idaho Fish and Game Department have been or are being met by the Corps as follows:

Requests by Idaho

1. Acquire 2 Hog Islands.

Action by Corps

1. Lower Hog Island has been purchased. Upper Hog Island cannot be purchased but the Corps has made strong recommendations for its continued maintenance for wildlife.

Requests by Idaho

Action by Corps

- | | |
|---|--|
| 2. Acquire portion of McCann property on south side of river. | 2. Done. |
| 3. Acquire Pafille property on north shore. | 3. Done. |
| 4. Acquire 350 acres upstream and adjacent to Hellsgate State Park. | 4. Not done. This would be very difficult to justify. We recommend designating the undeveloped portion of Hellsgate State Park for wildlife. |
| 5. Construction of island complexes in Clearwater. | 5. Small 5 acre island built at confluence of 2 rivers. May be useful as a bass spawning area and for waterfowl loafing area. Corps did not recommend nor do we agree with the proposal to create an island near old PFI log pond. |

In summary, we believe that the lands purchased above PFI can be and are being developed for wildlife and should be productive enough to compensate for the loss of riparian habitat in the lower 4 miles of the Clearwater. The loss of Holbrook Island should be compensated for by the development and habitat plantings of the area, even though its primary use will be for recreation and flood control. On the Snake River the dedication of the undeveloped acreage at Hellsgate State Park to wildlife should be adequate compensation. ✓

The steps that have been taken to compensate for fisheries losses seem acceptable to Idaho Fish and Game. The shift in recreation quality to developed mass recreation was inevitable and the recreation days generated post-project will almost certainly exceed the pre-project condition. This is attributable to the growing human population and increased mobility with an insatiable desire for water-based recreation in any form.

APPENDICES

- A. Recreation
- B. Fisheries
- C. Copies of letters and research papers

Appendix A

Recreation

A change from natural to artificial conditions is usually accompanied by a shift from low density human use to more concentrated forms of recreational pursuits. Formal swimming beaches, marinas, bike and jogging paths together with paved parking areas and other mass-recreation facilities become the norm. The recreational use survey by Holubetz and Simons (1972)* indicates that the use of such facilities may be primarily by local people where the area is not located on main tourist travel routes. Knight and Hornocker (1971)** concluded that the people of Idaho prefer dispersed, high quality recreation. The Corps believes that reservoir recreation opportunities will attract out-of-state users and it probably will as areas providing a higher quality of recreation are lost to urbanization and related development.

The 1977 Idaho State Comprehensive Outdoor Recreation Plan lists walking, bicycling, swimming, and similar activities as those receiving highest participation rates. There is, of course, a great difference between preferred activities and those in which recreationists participate most frequently. If a reservoir is the only nearby water recreation base, it seems quite obvious that recreation participation rates will be higher on flat water than on white water. Such participation may simply be a matter of activity availability unrelated to preference. As the Lower Snake River is now completely impounded, the stream fishermen will be forced to move upstream.

* "Recreation Use Survey-Asotin Dam Impact Area." 1972.

** A quality life in Idaho. Idaho Wildl. Rev., 1972. (2):7-9.

Recreational use data which clearly show changes or comparisons in similar types of recreational use pre- and post-impoundment were not available to us. As far as we could determine they do not exist. The recreation information provided by the Corps for 1974 is of little value since the area was already under construction and near completion and would not properly represent either pre- or post-impoundment conditions.

"Although there are no accurate data on recreational use of the river in the Lewiston-Clarkston area prior to impoundment, it surely has been increased many times with the recent recreation development." (Letter from E. O. Groff to Manager, LSRF & WCP, 8/8/78). Perhaps the major contribution to recreation was in providing access, marinas, and in general, cleaning a century's accumulation of debris from the waterfront.

Reservoir project visitation data from 1975-1977 show shifting patterns of use at the various sites and a general increase in total number of recreational visits in the project area in each of those years. With the exception of use data from Hellsgate Park, the data come from sites outside our study area. These increases in recreational visits are nearly impossible to evaluate in relation to pre-impoundment use, for which there are no meaningful data. Certainly the quality of the recreational experience available has changed as well as the total number of general recreationists. Holubetz and Simons (1972)* believed that construction of the proposed Asotin Dam might result in at least a 50 percent decrease in traditional types of recreational use of that portion of the Snake River (upstream from our study area). Thus, it cannot be assumed that impoundment and the provision of mass-use recreation facilities will result in an increase in recreational use in all areas. Results may vary

*"Recreation Use Survey-Asotin Dam Impact Area." 1972.

depending on distance to population centers and availability of alternate forms of recreation in the same area. Certainly the impoundment has resulted in a lowering of the quality of recreation opportunities if one bases such an evaluation on the availability (scarcity) of free-flowing river recreation.

Recreation activities along these stretches of the Snake and Clearwater rivers are bound to increase along with the ever-increasing human population and related demands for more recreational opportunity. It can be expected that more people will partake of water-based activities--canoeing, sailing, motor-boating, water-skiing, and fishing, none of which is beneficial to wildlife.

An excerpt from the Reach Inventory--Mid 1980's report (CRF-33/ April 1977, page G-1) states that:

"Freight hauling to the canyon residents and the transportation of recreation sightseers are the predominant uses. A large amount of recreation boating takes place on the lower part, and fishing, water skiing, rafting, and picnicking are complementary activities."

It becomes readily apparent that with this heavy and concentrated use of these rivers, it will take equally dedicated efforts to protect and maintain, if not to enhance, the wildlife resources of the area.

Appendix B

By letter of 9 April 1975 to Colonel N. P. Conover, Joseph Greenley, Director, Idaho Fish and Game Department, responded to the Draft Environmental Impact Statement and Special Report for the Compensation of Fish and Wildlife Losses at the Lower Snake River Project...

General comments

"We are in general agreement with the fishery compensation measures described and their related impacts. As near as we can determine, the Special Report and Draft Environmental Impact Statement lack any reference to wildlife losses and compensation in Idaho."

There seems to be general agreement among the participants regarding the proposed mitigation for anadromous fish losses. Something needs to be done, however, to get these good intentions off high center and to get the Lower Snake Plan implemented. To this date no dollars have been authorized for hatchery construction nor sites purchased. In view of the already lengthy delays and those to be expected in the future, the lost time must be calculated as a further loss to the citizens of Idaho, and appropriate reparations made to the State of Idaho.

Not
So.

It is highly desirable that native fish stocks be maintained. Careful genetic screening and monitoring of steelhead and salmon populations is essential. Data derived from such studies must be used to generate a management model that would mimic former anadromous fish runs by a careful stocking program of pre-smolt individuals. It is also suggested that the State of Idaho be given an adequate allotment allowing for comprehensive evaluation of stocking efforts.

Idaho Fish and Game biologists predict the loss of small mouth bass, catfish and bullhead spawning areas due to levee construction which removed small islands and shoreline indentations, and made subtle changes in water quality (water levels, temperature and substrate conditions). They are also concerned about the expected increase in fishing pressures. Approximately 12 miles of free-flowing river fishing for salmon and steelhead has been lost by inundation. Based on the data available to us it is impossible to estimate the magnitude of the loss. Locating and mapping the spawning areas after construction would not yield useful information since the "before" conditions were unknown. Creel census data and the experience of state and federal fisheries biologists in the area should be relied upon to make this assessment. Changes in the steelhead salmon population should also be monitored continuously.

Snags were left in the Snake River above the marinas to provide habitat for bass and this will partially compensate for the loss in spawning areas near the Grain Growers, Potlatch log pond, and pools associated with the WWPC dam.

"The temperature of water releases from the North Fork impoundment behind Dworshak dam is controlled to minimize the possible adverse effects of abnormal river water temperatures on resident and migrant fish and organisms comprising the natural food chains."*

The question of whether fisheries resources would benefit or lose following the removal of the WWPC dam is still debatable. Acting Regional Director of the U.S. Fish and Wildlife Service, Jack Hemphill in a letter to Colonel Connell (2/19/71--attached) estimated certain

* Reach Inventory--Mid 1980's System Description, CRF33, April 1977, p. F-2.

benefits to salmon and steelhead depending on the extent of structure removal but did not comment on warm water fisheries. He concluded, "At this time we are unable to assess the benefits of this change."

The change in timing and temperature of waters released from Dworshak Dam, the removal of the WWPC dam, the new pool level created by the filling of Lower Granite, the expected 5' annual fluctuation in pool levee and the removal of islands during levee construction are all variables influencing fisheries resources.

We can only assume that losses in warm-water fisheries will be compensated for by gains in salmon and steelhead and that this will be a satisfactory and inevitable trade-off. If the riverside ponds were managed for intensive fishing by youngsters, this would offset some of the losses claimed by Idaho.

By letter (2/12/75) to Idaho Fish and Game Director Greenley, Colonel Conover reiterated the Corps' willingness to acquire 50 acres of stream-bank lands "from willing landowners for access purpose." This is the equivalent of a 100' strip extending for approximately 4 miles. If this purchase could be an upstream continuation of the Hellsgate Park acquisition, it would guarantee public access and stream side protection. That purchase, combined with the dedication of the undeveloped (800 acres) of the Park to wildlife, should satisfy the claims of the Idaho Department of Fish and Game for mitigation.

APPENDIX C

LIST OF COMMON AND SCIENTIFIC NAMES OF PLANTS MENTIONED IN TEXT

APPENDIX C

LIST OF COMMON AND SCIENTIFIC NAMES OF PLANTS MENTIONED IN TEXT

Alfalfa (Medicago sativa)
Arrowleaf Balsamroot (Balsamorhiza sagittata)
Autumn Olive (Elaeagnus umbellata)
Big Sagebrush (Artemisia tridentata)
Bitterbrush (Purshia tridentata)
Black Locust (Robinia pseudoacacia)
Bluebunch Wheatgrass (Agropyron spicatum)
Broom Snakeweed (Gutierrezia sarothrae)
Browntop Millet (Panicum ramosum)
Buckwheat (Eriogonum sp.)
Bullrush (Scirpus sp.)
Canada Bluegrass (Poa compressa)
Cheatgrass (Bromus tectorum)
Common Mullein (Verbascum thapsus)
Common Sunflower (Helianthus annuus)
Douglas Hackberry (Celtis reticulata)
Douglas Hawthorn (Crataegus Douglasi)
Dwarf Milo (Sorghum vulgare)
English Hawthorn (Crataegus oxycantha)
Himalaya Blackberry (Rubus procerus)
Idaho Fescue (Festuca idahoensis)
Kentucky Bluegrass (Poa pratensis)
Manta Foxtail (Setaria italica)
Matrimony Vine (Lycium halimifolium)
Old Man's Whiskers (Geum triflorum)
Perennial Wheatgrass (Agrotricum W-21)
Prickly Pear (Opuntia fragilis)
Rabbitbrush (Chrysothamnus nauseosus)
Rocky Mountain Juniper (Juniperus scopulorum)
Russian Olive (Elaeagnus angustifolia)
Sand Dropseed (Sporobolus cryptandrus)
Scotch Thistle (Onopordum acanthium)
Snowberry (Symphoricarpos sp.)
Spikerush (Eleocharis sp.)
Staghorn Sumac (Rhus trilobata)
Trees of Heaven (Ailanthus altissima)
Western Yarrow (Achillea millefolium)
White Dutch Clover (Trifolium repens)
White Proso Millet (Panicum miliaceum)
Willow (Salix sp.)
Wood's Rose (Rosa woodsii)

APPENDIX D

WILDLIFE INVENTORY OF HELLS GATE STATE PARK
AND ADJACENT WATERS

APPENDIX D

WILDLIFE INVENTORY OF HELLS GATE STATE PARK AND ADJACENT WATERS

Class Amphibia

Order Salientia

- Bullfrog (Rana catesbeiana)
- Western Toad (Bufo boreas)
- Pacific Treefrog (Hyla regilla)

Class Reptilia

Order Squamata

- Western Fence Lizard (Sceloporus occidentalis)
- Western Skink (Eumeces skiltonianus)
- Western Yellow-Bellied Racer (Coluber constrictor)
- Great Basin Gopher Snake (Pituophis melanoleucus)
- Common Garter Snake (Thamnophis sirtalis)
- Wandering Garter Snake (Thamnophis elegans)
- Western Rattlesnake (Crotalus viridis)

Class Aves

Order Gaviiformes

- Common Loon (Gavia immer)

Order Podicipediformes

- Western Grebe (Aechmophorus occidentalis)
- Eared Grebe (Podiceps nigricollis)
- Pied-Billed Grebe (Podilymbus podiceps)

Order Anseriformes

- Whistling Swan (Cygnus columbianus)
- Canada Goose (Branta canadensis)
- Mallard (Anas platyrhynchos)
- Gadwall (Anas strepera)
- American Wigeon (Anas americana)
- Northern Shoveler (Anas clypeata)
- Cinnamon Teal (Anas cyanoptera)
- American Green-Winged Teal (Anas crecca)
- Blue-Winged Teal (Anas discors)
- Wood Duck (Aix sponsa)
- Redhead (Aythya americana)
- Canvasback (Aythya valisineria)
- Common Goldeneye (Bucephala clangula)
- Barrow's Goldeneye (Bucephala islandica)
- Bufflehead (Bucephala albeola)
- Ruddy Duck (Oxyura jamaicensis)
- Common Merganser (Mergus merganser)

- Order Falconiformes
- Cooper's Hawk (Accipiter cooperii)
 - Sharp-Shinned Hawk (Accipiter striatus)
 - Northern Harrier (Circus cyaneus)
 - Rough-Legged Hawk (Buteo lagopus)
 - Red-Tailed Hawk (Buteo jamaicensis)
 - Golden Eagle (Aquila chrysaetos)
 - Bald Eagle (Haliaeetus leucocephalus)
 - Osprey (Pandion haliaetus)
 - Prairie Falcon (Falco mexicanus)
 - American Kestrel (Falco sparverius)
- Order Galliformes
- California Quail (Lophortyx californicus)
 - Chukar (Alectoris chukar)
 - Ring-Necked Pheasant (Phasianus colchicus)
 - Gray Partridge (Perdix perdix)
 - Ruffed Grouse (Bonasa umbellus)
- Order Ciconiiformes
- Great Blue Heron (Ardea herodias)
- Order Gruiformes
- American Coot (Fulica americana)
- Order Charadriiformes
- American Avocet (Recurvirostra americana)
 - Killdeer (Charadrius vociferus)
 - Long-Billed Curlew (Numenius americanus)
 - Solitary Sandpiper (Tringa solitaria)
 - Spotted Sandpiper (Actitis macularia)
 - Long-Billed Dowitcher (Limnodromus scolopaceus)
 - Western Sandpiper (Calidris mauri)
 - California Gull (Larus californicus)
 - Forster's Tern (Sterna forsteri)
 - Ring-Billed Gull (Larus delawarensis)
- Order Columbiformes
- Rock Dove (Columba livia)
 - Mourning Dove (Zenaida macroura)
- Order Strigiformes
- Barn Owl (Tyto alba)
 - Screech Owl (Otus asio)
 - Great Horned Owl (Bubo virginianus)
 - Long-Eared Owl (Asio otus)
 - Short-Eared Owl (Asio flammeus)
- Order Caprimulgiformes
- Common Nighthawk (Chordeiles minor)
- Order Apodiformes
- Vaux's Swift (Chaetura vauxi)

Order Coraciiformes
 Belted Kingfisher (Megaceryle alcyon)

Order Piciformes
 Common Flicker (Colaptes auratus)

Order Passeriformes
 Eastern Kingbird (Tyrannus tyrannus)
 Western Kingbird (Tyrannus verticalis)
 Say's Phoebe (Sayornis saya)
 Willow Flycatcher (Empidonax traillii)
 Horned Lark (Eremophila alpestris)
 Barn Swallow (Hirundo rustica)
 Cliff Swallow (Petrochelidon pyrrhonota)
 Violet-Green Swallow (Tachycineta thalassina)
 Bank Swallow (Riparia riparia)
 Rough-Winged Swallow (Stelgidopteryx ruficollis)
 Black-Billed Magpie (Pica pica)
 Common Raven (Corvus corax)
 Common Crow (Corvus brachyrhynchos)
 Black-Capped Chickadee (Parus atricapillus)
 Rock Wren (Salpinctes obsoletus)
 Canyon Wren (Catherpes mexicanus)
 Robin (Turdus migratorius)
 Varied Thrush (Ixoreus naevius)
 Western Bluebird (Sialia mexicana)
 Golden-Crowned Kinglet (Regulus satrapa)
 Ruby-Crowned Kinglet (Regulus calendula)
 Water Pipit (Anthus spinoletta)
 Bohemian Waxwing (Bombycilla garrulus)
 Cedar Waxwing (Bombycilla cedrorum)
 Northern Shrike (Lanius excubitor)
 Starling (Sturnus vulgaris)
 Yellow Warbler (Dendroica petechia)
 Yellow-Rumped Warbler (Dendroica coronata)
 House Sparrow (Passer domesticus)
 Western Meadowlark (Sturnella neglecta)
 Yellow-Headed Blackbird (Xanthocephalus xanthocephalus)
 Red-Winged Blackbird (Agelaius phoeniceus)
 Brewer's Blackbird (Euphagus cyanocephalus)
 Brown-Headed Cowbird (Molothrus ater)
 Northern Oriole (Icterus galbula)
 Western Tanager (Piranga ludoviciana)
 Black-Headed Grosbeak (Pheucticus melanocephalus)
 Evening Grosbeak (Hesperiphona vespertina)
 Lazula Bunting (Passerina amoena)
 House Finch (Carpodacus mexicanus)
 Pine Grosbeak (Pinicola enucleator)

Common Redpoll (Carduelis flammea)
Pine Siskin (Carduelis pinus)
American Goldfinch (Carduelis tristis)
Savannah Sparrow (Passerculus sandwichensis)
Vesper Sparrow (Pooecetes gramineus)
Lark Sparrow (Chondestes grammacus)
Dark-Eyed Junco (Junco hyemalis)
Tree Sparrow (Spizella arborea)
Chipping Sparrow (Spizella passerina)
White-Crowned Sparrow (Zonotrichia leucophrys)
Lincoln's Sparrow (Melospiza lincolni)
Song Sparrow (Melospiza melodia)

Class Mammalia

Order Chiroptera

Yuma Myotis (Myotis yumanensis)
Western Pipistrelle (Pipistrellus hesperus)
Big Brown Bat (Eptesicus fuscus)

Order Lagomorpha

Mountain Cottontail (Sylvilagus nuttallii)

Order Rodentia

Yellow-Bellied Marmot (Marmota flaviventris)
Northern Pocket Gopher (Thomomys talpoides)
Beaver (Castor canadensis)
Western Harvest Mouse (Reithrodontomys megalotis)
Deer Mouse (Peromyscus maniculatus)
Bushy-Tailed Wood Rat (Neotoma cinerea)
House Mouse (Mus musculus)
Long-Tailed Vole (Microtus longicaudus)
Montane Vole (Microtus montanus)
Water Vole (Arvicola richardsoni)
Muskrat (Ondatra zibethicus)
Western Jumping Mouse (Zapus princeps)
Northern Grasshopper Mouse (Onychomys leucogaster)

Order Carnivora

Coyote (Canis latrans)
Raccoon (Procyon lotor)
Long-Tailed Weasel (Mustela frenata)
Striped Skunk (Mephitis mephitis)
Badger (Taxidea taxus)
Bobcat (Felis rufus)

Order Artiodactyla

Mule Deer (Odocoileus hemionus)