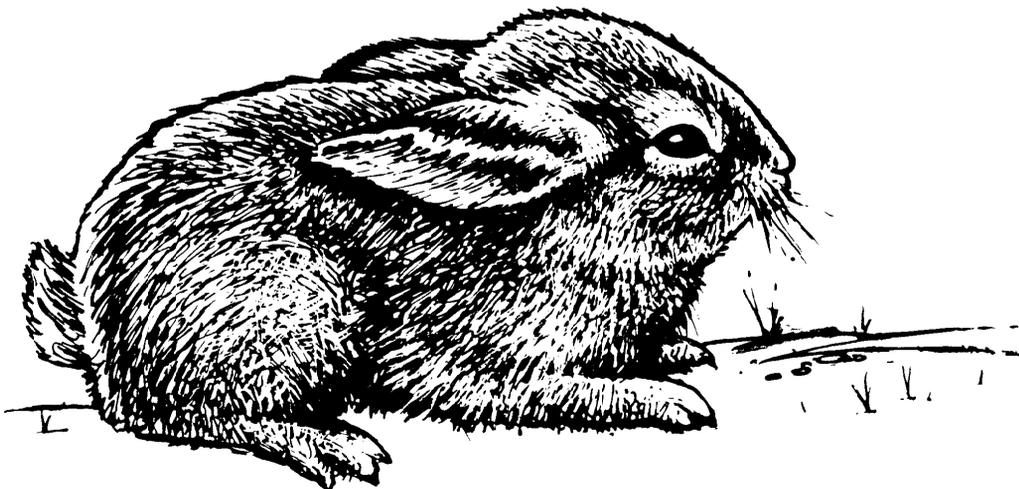


# Pygmy Rabbit Management Plan Columbia River Wildlife Mitigation Grand Coulee Dam Project

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Washington Department of Wildlife



This report was funded by the Bonneville Power Administration (BPA), U.S. Department of Energy, as part of BPA's program to protect, mitigate, and enhance fish and wildlife affected by the development and operation of hydroelectric facilities on the Columbia River and its tributaries. The views in this report are the author's and do not necessarily represent the views of BPA.

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GRAND COULEE DAM WILDLIFE MITIGATION PROGRAM  
PYGMY RABBIT PROGRAMMATIC MANAGEMENT PLAN  
DOUGLAS COUNTY, WASHINGTON

Prepared for  
Bonneville Power Administration  
Division of Fish and Wildlife  
Under Agreement No. CE-B179-91BP18504  
Phase One Project No. 91-061

By  
Paul Ashley  
Washington Department of Wildlife

## ABSTRACT

This programmatic management plan describes mitigation strategies and objectives for managing pygmy rabbits within the proposed Douglas County pygmy rabbit mitigation project area.

The plan focuses on the management of pygmy rabbits and shrub-steppe habitat relative to livestock grazing and perpetual conservation easements. In addition, the plan describes habitat types and wildlife species that occur on the project site as well as addresses how issues such as crop depredation, predator control, taxation, noxious weeds, fire control, recreation and access will be managed on project lands.

The pygmy rabbit management section contains life history data, Washington Department of Wildlife management standards and guidelines; and generic management objectives for the species. Management objectives are identical under perpetual conservation easements and fee title land purchases; however, grazing regimens may vary because most perpetual conservation easements will include some level of livestock grazing, whereas grazing may be excluded from fee title acquisitions.

The range management section describes various grazing systems that could be used to manipulate habitat to accomplish wildlife management objectives. Habitat development/manipulation techniques are also outlined within the plan.

The Habitat Evaluation Procedure (HEP) was used to determine base line habitat conditions and to estimate existing Habitat Units (HUs) at the Douglas County sites (one HU is equivalent to one acre of optimum habitat).

All technical information for this plan was provided by intra-agency technical groups, scientific literature, personal communications, and other federal and state agencies.

## ACKNOWLEDGEMENTS

I would like to express my appreciation to the following organizations and individuals for their assistance in the development of this plan:

The Chief Joseph/Grand Coulee Steering Committee.

The Davenport Soil Conservation Service office/field staff.

The Davenport Conservation District.

The Bonneville Power Administration.

U.S. Fish and Wildlife Service.

Peter Paquet - Northwest Power Planning Council.

Joel Bisch - Yakima Indian Nation.

The following local landowners allowed us on their property and/or assisted with the HEP evaluation: Charles Olin, Don Roberts, and David Dormaier.

Special thanks to my Department of Wildlife colleagues for their technical expertise and suggestions regarding this plan and to Sara LaBorde, Debbie Nelson, and Judy Wrzesinski for typing and editing the numerous drafts.

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## INTRODUCTION

This project was proposed by the Washington Department of Wildlife (WDW) as partial mitigation for the hydropower share of wildlife habitat losses from construction of Grand Coulee Dam. The project is funded by Bonneville Power Administration (BPA) and carried out in cooperation with the WDW, the Bureau of Land Management (BLM), U. S. Fish and Wildlife Service (USFWS), Grand Coulee/Chief Joseph Wildlife Mitigation Steering Committee, Columbia Basin Fish and Wildlife Authority (CBFWA), Northwest Power Planning Council (NPPC), Bureau of Reclamation (BOR), and others. The project will be consistent with Section 1003(b)(7) of the Council's Wildlife Rule, which addresses mitigation for wildlife losses due to the Federal Columbia River Power System.

The NPPC and BPA approved the pygmy rabbit project as partial mitigation for impacts caused by the construction of Grand Coulee Dam. The focus of this project is the protection and enhancement of shrub-steppe/pygmy rabbit habitat in northeastern Washington.

In conformance with the NPPC Wildlife Rule, the BPA will explore the use of perpetual conservation easements (Alternative 1) before considering the outright purchase of land (Alternative 2). Under both alternatives the biological requirements of the pygmy rabbit will take precedence over all other considerations including recreational opportunities and livestock grazing.

Perpetual conservation easements must achieve biological objectives in a cost-effective manner when compared with the fee title acquisition option.

Land or easements will be purchased only from willing sellers. Land condemnation will not occur for this project.

## BACKGROUND

### Mitigation Process Under the Northwest Power Act

Grand Coulee Dam was built on the Columbia River in the 1930s. Its reservoir, Lake Roosevelt, flooded 151 miles of river including nearly 83,000 acres of wildlife habitat. Even though Grand Coulee Dam contributed significantly to the prosperity of the region, some native wildlife populations suffered as critical habitats were flooded or converted to agricultural uses. Until recently, nothing was done to make up for or "mitigate" wildlife losses.

In 1980, Congress passed the Pacific Northwest Electric Power Planning and Conservation Act (Northwest Power Act) requiring the region, with BPA's support, to "protect, mitigate, and enhance" wildlife to the extent it was affected by hydroelectric development and operation. This legislation also created the NPPC.

Through the 1980s, the NPPC worked with federal and state agencies and Indian Tribes to develop reservoir mitigation plans. The NPPC considered wildlife loss estimates, methods of restoration, private versus public land use, leasing versus willing seller only acquisition, impacts to local economies, the role of local government in the planning process, and other concerns.

In 1989 the NPPC amended the Columbia Basin Fish and Wildlife Program and created the current Wildlife Rule. The resultant Wildlife Rule included a series of criteria to be used to ensure that public concerns are addressed in each mitigation project proposal made by wildlife management agencies (Appendix A).

Both in 1990 and in 1991, the Washington State Legislature, together with the WDW, provided funding to develop mitigation strategies on private lands in the Lake Roosevelt area to address the needs of sharp-tailed grouse and pygmy rabbits.

In March 1990, the Grand Coulee Wildlife Mitigation Advisory Group was formed by the WDW to help advise in the mitigation process. The advisory group is comprised of about 50 individuals primarily from the counties bordering Lake Roosevelt (FDR). A six member Steering Committee, representing local government, utilities, landowners, conservation groups, environmentalists, and Indian tribes, was selected by the advisory group to work closely with WDW, NPPC, and BPA officials. In 1991, additional representatives from the Cattlemen's Association, the Wheatgrowers Association, the Upper Columbia River Counties (UCRC), and a local sportsman's organization were added bringing the steering committee up to 13 members (Appendix B).

In 1990 the WDW, in concert with the steering committee, developed several shrub-steppe mitigation project proposals to begin addressing impacts caused by Grand Coulee Dam. These proposals were approved by BPA and NPPC and determined to be consistent with the Council's Wildlife Rule.

A Pre-design Contract, between the WDW and the BPA, was implemented in May 1991. The agreement called for development of programmatic management plans

for sharp-tailed grouse and pygmy rabbits, perpetual conservation easement language terms and conditions, and a Memorandum of Agreement (MOA) between the WDW and the BPA. The WDW was responsible for accomplishing the agreement objectives while funding for the Pre-design Contract was provided by the BPA.

#### General Project Environment

The two proposed Douglas County project sites encompass approximately 960 acres in eastern Douglas County. Figure 1 depicts the general project area and the immediate vicinity. The northern site is referred to as the Dcrmaier property, while the southern project area is known as Coyote Canyon.

The area is sparsely populated. Primary land uses include livestock grazing and the production of small grains such as wheat and barley. In addition, grass fields have been established in Coyote Canyon in conjunction with the United States Department of Agriculture's (USDA) Conservation Reserve Program (CRP).

The proposed project lands are comprised of three private ownerships: David Dcrmaier in the Jamiscn Lake area, and Don Roberts and Charles Olin at Coyote Canyon (Figure 2).

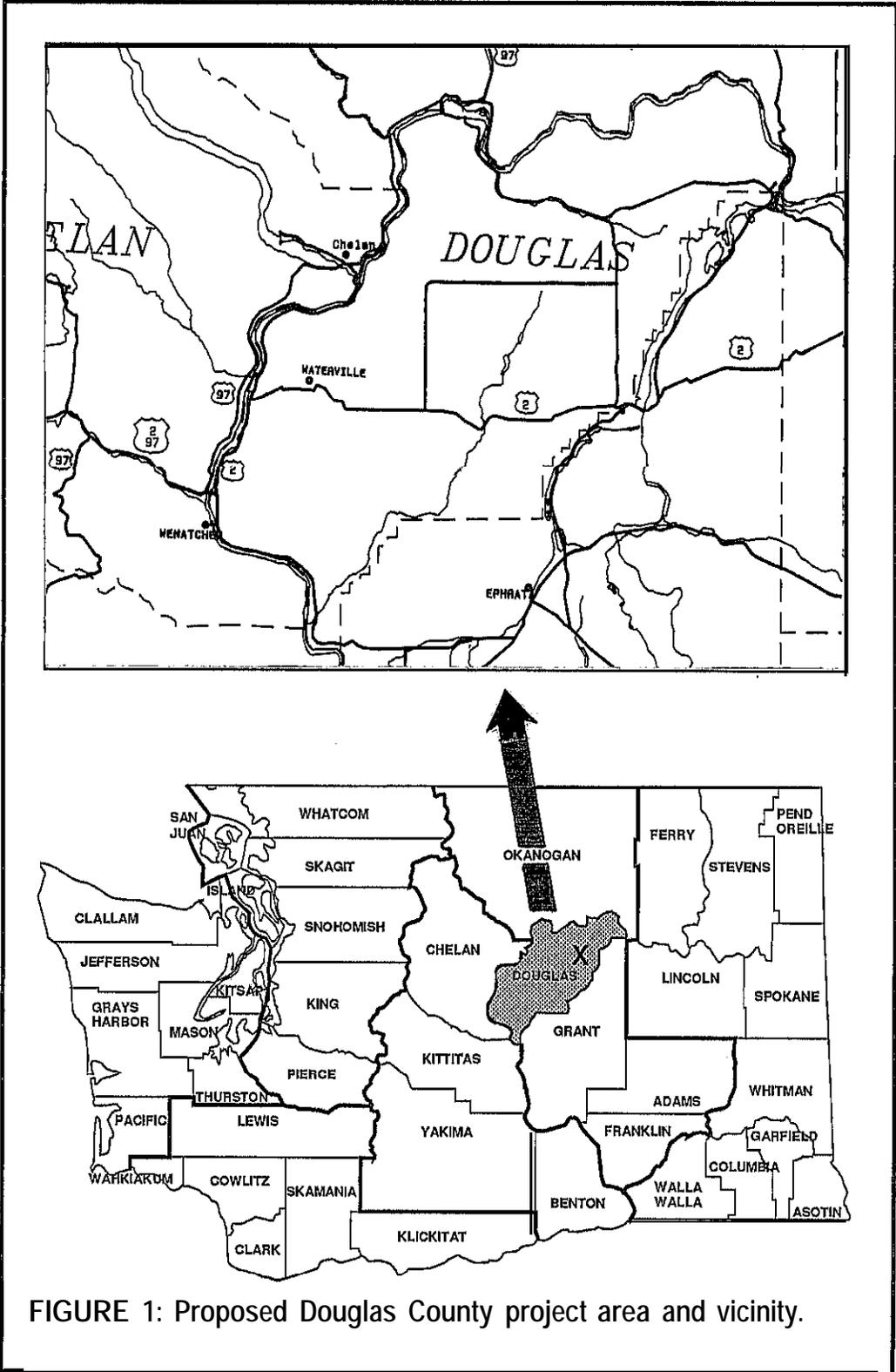
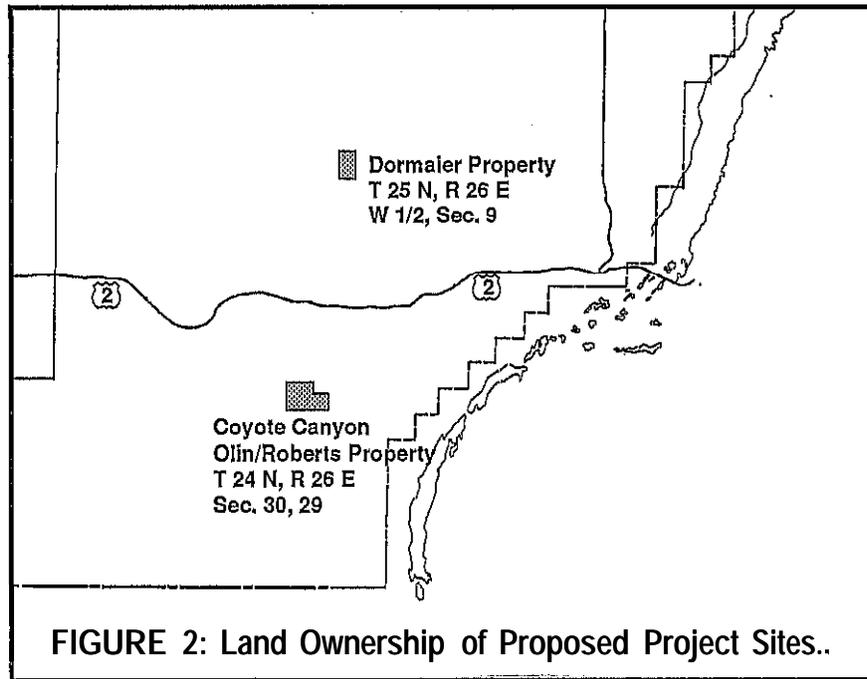


FIGURE 1: Proposed Douglas County project area and vicinity.



### Physicgraphy and Relief

Douglas County is located in the central part of Washington in the great bend area of the Columbia River.

During the Pleistocene Epcc, glacial ice moved south mixing pre-existing soils with material that was carried along and ground up by the ice sheets. This glacial till material was left on the surface as the glacier receded. In some areas it was modified by water; however, in most places the till is an unconsolidated mixture of silt, clay, gravel, sand, cobbles, and a few large boulders or "haystack rocks." Where no till was deposited, there are occasional basalt or granite bedrock outcrops.

A layer of till, up to 50 feet thick, covers the northern half of the county. This till is covered by lcess to a depth of one to three feet in most places. Drumlins (1), kames (2), kettles (3), and eskers (4) are found in this part of the county. In the southern portion of the county, lcess is the predominant soil material.

Up to 20 feet of lcess was deposited as a result of volcanic eruptions; the average depth was four to five feet. In the central part of the county, in the

1. Drummlins are long ridges or oval-shaped hills formed of glacial drift.
2. Kames include hills or short, steep ridges of stratified sand or gravel deposited in contact with glacial ice.
3. Kettles are the depressions in glacial drift remaining after the melting of an isolated mass of buried ice.
4. Eskers are winding, narrow ridges of sand or gravel, probably deposited by a stream flowing in or under glacial ice.

vicinity of the proposed project sites, loess was deposited over hardpan to a depth of 20 to 40 inches (USDA, 1980).

As its name implies, the topography of the Coyote Canyon project area is a typical canyon site and is comprised of a drainage extending from the northeast to the southwest. Slopes range from nearly level to 45% (Kehne, 1992). Topography on the Dormaier site ranges from 0 to 20% (White, 1992).

## Soils

Soils in Douglas County were formed in material weathered from glacial till and outwash, loess, volcanic ash and pumice, basalt, granite, sedimentary and metamorphic rocks, alluvium, eolian sand, and lake sediment.

In 1991, soils within the proposed project areas were classified and mapped by the USDA. They were formed from either glaciated material, as is the Dormaier property, or like in Coyote Canyon, loess and material weathered from basalt.

The Dormaier site is comprised of the following seven soil types: DelRio, Heytou, Strat, Stubblefield, Tagear, Touhey, and Tubspring. Bare rock outcrop is also present.

In addition to rock outcrop, the following soil types are found at Coyote Canyon: Alstown, Argabak, Benwy, Cheviot, Grinrod, Horseflat, Rails, Renslow, Selah, and Zen.

## Climate

Douglas County lies in the rain shadow of the Cascade Mountains. In addition, the Rocky Mountains partly shield the county from harsh Arctic winds during the winter (Beieler, 1981). The semi-arid climate includes winters that are generally cold but not too severe, and summers that are hot during the day and cool at night.

In winter the average daily minimum temperatures at Waterville and Wenatchee are 17 and 25 degrees F, respectively. The average daily maximum temperature in summer is 83 degrees F.

Precipitation ranges from 6 to 15 inches with 65 percent composed of snow. Prevailing winds are from the west-northwest.

## General Wildlife/Habitat Type Descriptions

Wildlife resources within the project area consist of two major categories: mammals and birds. Major mammal groups include deer, furbearers, and rodents. Major bird groups include native and introduced upland species, song birds, and raptors. Reptiles and amphibians, such as snakes and lizards, are also present.

Wildlife distribution depends on the presence or absence of suitable habitat. Wildlife habitat is defined by cover type, that is, the variety and relative

abundance of plants found within a defined area and the type of cover the plants provide for wildlife. Two general cover types exist within the project area: shrub-steppe and agriculture.

### Shrub-steppe

Both project areas consist primarily of the shrub-steppe cover type (Figure 3). Wyoming Big Sagebrush is the primary shrub species. Other shrub species that may be present include three-tipped sagebrush, stiff sagebrush, rabbitbrush, chokecherry, serviceberry, and currant. The primary grass species are Idaho fescue, blue-bunch wheatgrass, needle and thread, cheat grass, basin wild rye, Cusick bluegrass, and Sandberg bluegrass. Forbs found in this cover type are represented by buckwheat, yarrow, balsamroot, and tumbling mustard.

Typical wildlife species found within the shrub-steppe cover type include black-tailed jackrabbit, white-tailed jackrabbit, Nuttall's cottontail rabbit, mule deer, badger, coyote, and northern pocket gopher. Other species, such as sage grouse, pygmy rabbit, Swainson's hawk, Merriam's shrew, and sagebrush vole may also occur. In areas that have rock outcrops the bobcat, bushy-tailed woodrat, rattlesnake, rock wren, and yellow bellied marmot may be present.

Where shrub-steppe is found adjacent to croplands ringneck pheasant, Hungarian partridge, and California quail can be observed.



FIGURE 3: Shrub-Steppe Cover Type Example.

## Riparian

Riparian habitat consists of a single spring in the Coyote Canyon area. No riparian habitat occurs on the Dcrmaier project site. As a result, this habitat type was not considered separately from the shrub-steppe cover type.

## Agriculture

The agriculture cover type consists primarily of dryland wheat and barley crops. Recently, implementation of the USDA's CRP has resulted in additional perennial grass fields within the proposed project area. The reinvasicn of sagebrush into CRP fields may enhance opportunities for pygmy rabbits and other sage-dependent wildlife species to inhabit new areas.

Wildlife species that occur in the dryland farmed areas include Great Basin pocket mice, deer mice, northern pocket gopher, badger, Nuttall's cottontail rabbit, meadowlarks, horned lark, barn swallow, ringneck pheasant, and Hungarian partridge. Where there is suitable adjacent shrub-steppe habitat, mule deer and white-tailed deer may also be present.

## HABITAT EVALUATION

A HEP analysis was performed to determine baseline habitat conditions and to estimate the number of potential habitat units (HUs) gained by purchasing perpetual conservation easements or buying lands in fee.

Sharp-tailed grouse, sage grouse, pygmy rabbit, and mule deer were selected as indicator species to represent shrub-steppe dependent wildlife. Unpublished HEP models (Appendix C) were developed to reflect local habitat conditions. Project sites were evaluated primarily for pygmy rabbit habitat.

An inter-diciplinary HEP team (Appendix D) evaluated habitat conditions based on the habitat variables within species models. The field team estimated habitat variables using ocular measurement techniques. Results of the HEP evaluation can be found in Appendix E.

Even though the HEP process was used to determine the initial loss assessments and subsequent base-line habitat estimates for the Douglas County project sites, future mitigation crediting, monitoring, and evaluations may be accomplished on an acre-for-acre basis, or other suitable measure, instead of a habitat unit basis.

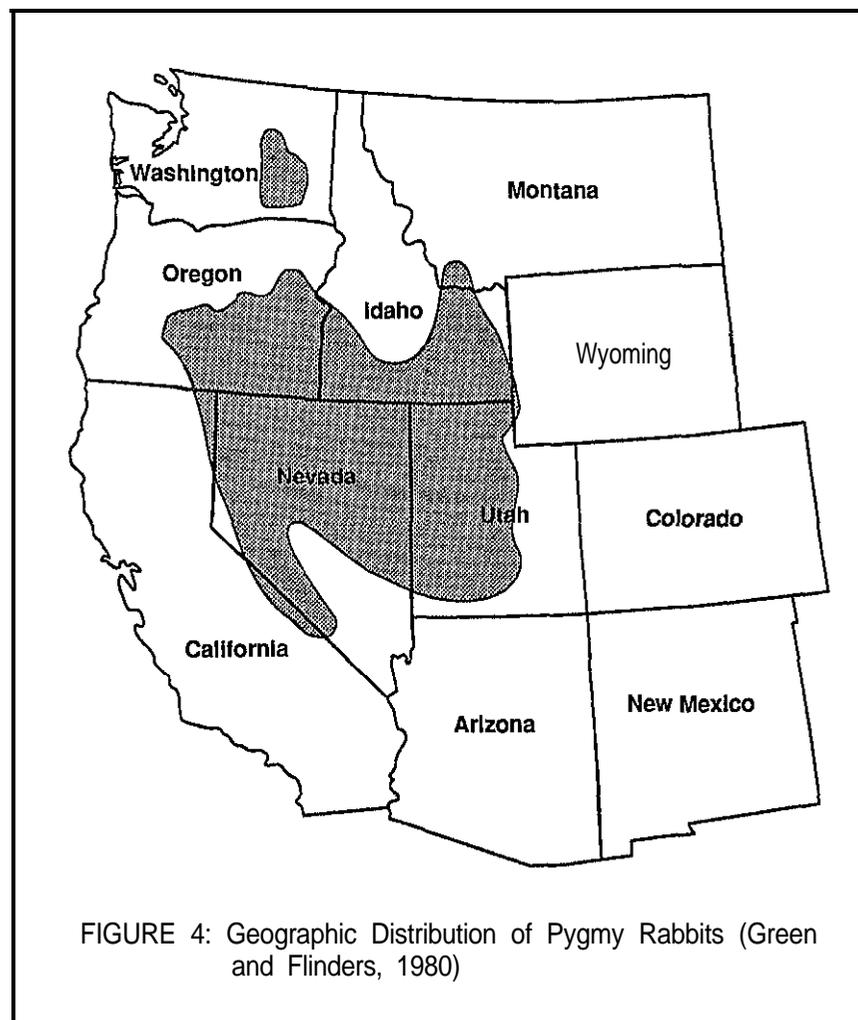
## PYGMY RABBIT BIOLOGY AND MANAGEMENT OBJECTIVES

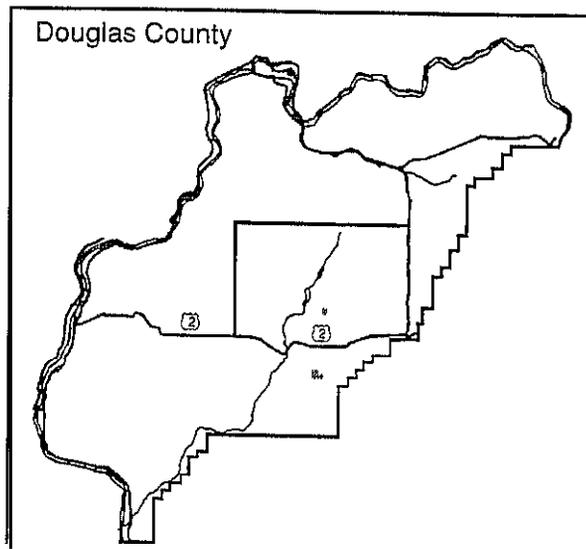
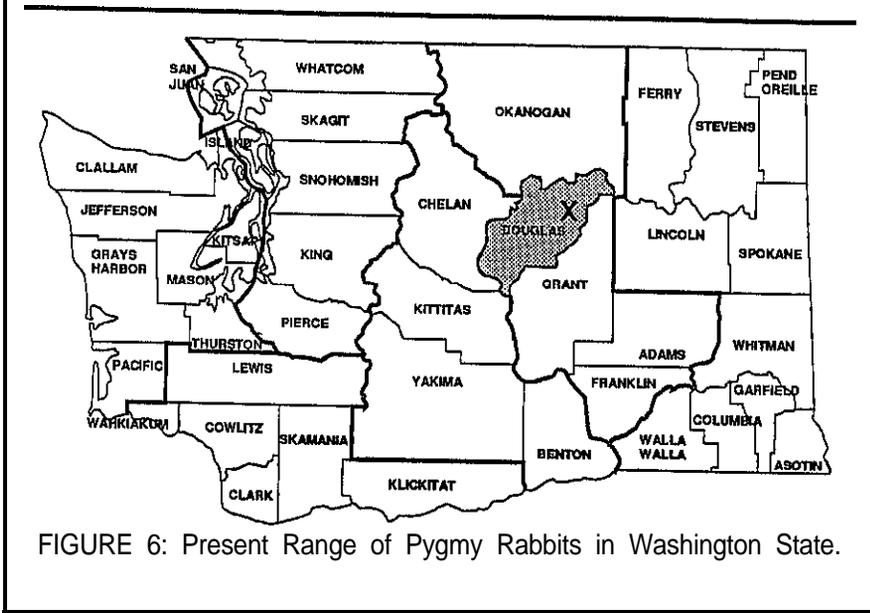
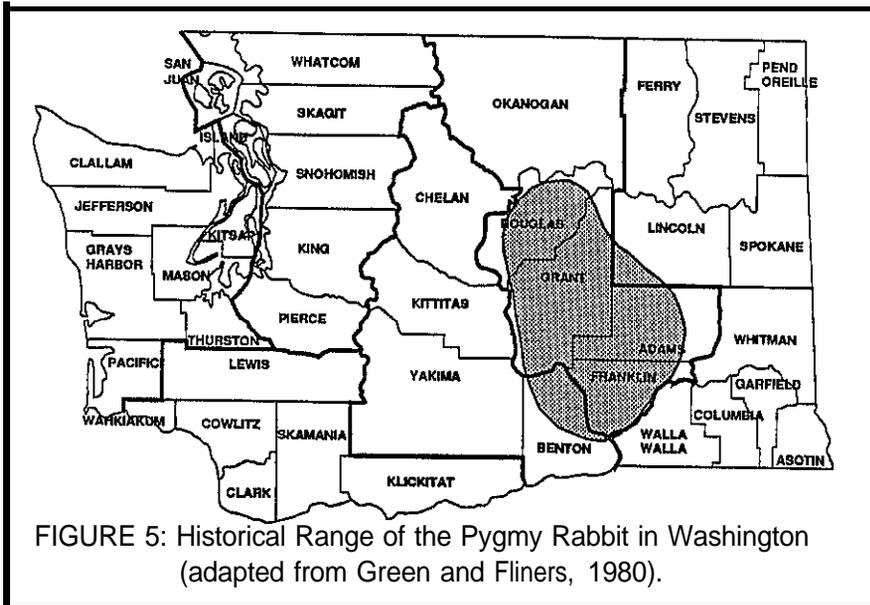
### Distribution/Current Status/Limiting Factors

Pygmy rabbits are found in western Montana, southern Idaho, northern Utah, northern Nevada, southeastern Oregon, northeastern California, and eastern Washington. The population in Washington is disjunct from those in other states (Figure 4).

Historically, the pygmy rabbit occupied shrub-steppe habitats throughout all of the southern arid regions of Washington (Booth, 1947). Pygmy rabbits were fairly common in the coulees and slopes of Adams County (Taylor and Shaw, 1929) and also occurred in Grant and Lincoln counties in limited numbers (Figure 5).

The present range of the pygmy rabbit consists of small isolated pockets of habitat in Douglas County (Figure 6). Surveys conducted by the WDW indicate that only five active sites exist. Even though there are no confirmed recent observations, scattered populations may also still occur in Lincoln and Grant Counties as well as other areas of Douglas County.





Pygmy rabbit populations have declined considerably since the turn of the century. The primary factor responsible for the decline of the species was the conversion of its habitats to agriculture (Buechner, 1953). Overgrazing and the use of herbicides to alter pristine shrub-steppe vegetation (Daubenmire, 1970) also contributed to the decline of pygmy rabbit numbers. Due to the highly specialized habitat requirements of this species, the pygmy rabbit is not adaptable to habitat changes caused by man.

In areas of limited habitat, food competition between the pygmy rabbit, the white-tailed jackrabbit, and the black-tailed jackrabbit could be a limiting factor for the less aggressive pygmy rabbit (Ingles, 1973). Friesz (1991) believes that the Nuttall's cottontail rabbit presents the most severe species competition.

According to Green (1979) weasels, coyotes, marsh hawks, and owls prey upon pygmy rabbits. He also reports that starvation and environmental stress accounts for some loss; however, the primary cause of mortality is due to predation. Likewise, Friesz suggests that badgers may be the most significant predators affecting Washington pygmy rabbit populations.

Unlike predation, most researchers agree that disease is probably not a significant mortality factor (Green, 1979).

Another potential limiting factor may be hunter identification problems. Discussions with hunters in the Columbia Basin indicate that most hunters are not able to distinguish pygmy from cottontail rabbits (Lloyd, 1979). As a result, some pygmy rabbits are probably being harvested by hunters. Considering hunter identification problems with this species and its nature not to immediately flush, this species may not be very resistant to hunting pressure. Dobler and Friesz, however, suggest that mortality from hunters is very slight and probably not a limiting factor to Washington populations.

The direct ramification of the loss of the few remaining pockets of habitat is extirpation of the species from Washington States. The population decline is so severe now that immediate action must be taken to preserve active pygmy rabbit sites and to investigate potential new site locations.

### Life History

Pygmy rabbits are, as their name implies, very small rabbits. They are the smallest in North America. Adults weigh from 1/2 to one pound. The pelage is primarily slate-gray on top, buff colored on the belly, with cinnamon coloring on the legs, chest, and nape of the neck. Tail and legs are notably small.

The pygmy rabbit is distinguished from the cottontail rabbit by its smaller size, pale gray pelage, short rounded ears, small legs and lack of a large white **surface** on the tail when running.

Unlike other species of rabbits, pygmy rabbits usually dig their own burrows. Not much is known about the breeding habits of pygmy rabbits, but studies in Idaho suggest that pygmy rabbits are sexually active in the month of January (Green, 1979).

Larrison (1970) indicated that the breeding season is probably similar to other rabbit species, extending from early spring into the hotter part of the summer.

Pygmy rabbits have 5 to 8 young per litter, with 6 young being the average. The gestation period is similar to the cottontail rabbit lasting from 26 to 28 days (Bradfield, 1974). Green (1979) reported that under favorable conditions multiple litters are possible, with 3 litters per year the maximum number of litters for this species.

### Habitat Requirements

Pygmy rabbits are found primarily in areas where dense clumps of sagebrush and rabbitbrush grow in soft soils, deep enough to excavate burrows, and where micro-relief is greatly varied (Dobler, 1991). Within the proposed project area, most active burrows are located in dense stands of Wyoming big sagebrush with soft soils deeper than 2 feet (Dobler, 1990).

Pygmy rabbits are seldom found in sparsely vegetated areas (Bradfield, 1974). Green (1979) indicated that the pygmy rabbit in Idaho selects habitat where the sagebrush approaches 50 percent canopy closure. Other research suggests, contrary to previous literature, that tall sagebrush is not a habitat requirement, but that soft earth for digging was. The general concensus of the various authorities, however, is that the most critical habitat requirement of this species is areas of dense sagebrush vegetation.

Burrows are another important habitat requirement. They provide protection during periods of severe weather conditions, safety from predators and a secure place for raising young (Bradfield, 1974). In addition to digging their own burrows, pygmy rabbits have also been observed utilizing abandoned badger and yellow-belly marmot excavations, as well as natural cavities (Green, 1979).

Burrow systems usually consist of 2 to 7 openings with the main entrance being somewhat concealed at the base of a sagebrush plant (Olterman, 1972). Davis (1939) indicated burrow entrances to be 5 inches in diameter with well defined runways and "scrapes" outside the burrow entrance in which the rabbits lay.

During the winter months pygmy rabbits excavate extensive snow burrows which are heavily utilized for foraging (Bradfield, 1974).

Sagebrush is a major food item for the pygmy rabbit, comprising 99 percent of its winter food supply. During the spring and summer months, its diet consists of 39 percent grasses and 10 percent forbs, with the majority of the diet still comprised of sagebrush (Green, 1979). In Washington, forbs may make up a greater proportion of the pygmy rabbit's spring and summer diet.

The pygmy rabbit feeds on sagebrush, rabbit brush, Sandberg blue grass, squirrel tail, lupine, phlox, aster, balsom root, galium and other forbs within its home range, usually within 30 yards of its burrow. During the winter months snow tunnels are excavated, for foraging purposes, to lead from one sagebrush plant to another.

## Habitat Management

Conversion of shrub-steppe habitat to agricultural crops, coupled with intensive livestock grazing, have resulted in pygmy rabbit population declines in recent years. Land management practices aimed at enhancing conditions for pygmy rabbits must address these two factors.

### Management of Agricultural Areas

The conversion of land from native habitats to agriculture should be curtailed in areas specifically managed for pygmy rabbits. This could be done by purchasing perpetual conservation easements from private landowners, enrolling land into or extending CRP contracts, and fee title acquisitions. In addition, native vegetation should be reestablished on croplands included within mitigation efforts.

The revegetation of croplands should include seeding forbs and perennial grasses and planting big sagebrush. A combination of grasses, forbs, and shrubs are needed by pygmy rabbits to satisfy habitat needs throughout the year. Annual grasses and noxious weeds such as cheatgrass and knapweed may be detrimental to pygmy rabbits because they compete with more important vegetation. Weed control measures and vegetation management should focus on reducing the dominance of these weeds in the landscape.

### Management of Grazing Areas

Several authors have documented the degradation of habitat that accompanies livestock grazing. Light grazing can be used to manage vegetation, but must often be combined with other techniques.

Most of the shrub-steppe habitat in Washington has been intensively grazed since the late 1800s. Habitat that is managed for pygmy rabbits may initially require a no-grazing regimen in order to allow the vegetation to recover sufficiently for pygmy rabbit use. In some areas range seedings may also be needed to improve the ecological condition of rangelands that have been severely overgrazed by livestock.

Grazing could be resumed once the vegetation has recovered enough to meet the needs of the rabbit. Grazing will only be used when found to be consistent with the biological needs of the rabbit.

### General Management

The first management priority should be the preservation of all active pygmy rabbit sites through fee title acquisition or perpetual conservation easements, followed by an intensive search throughout eastern Washington for additional pockets of rabbits.

Soil data/parameters from known pygmy rabbit sites should be digitized and used in conjunction with Geographical Information Systems (GIS) mapping to identify potential reintroduction sites and isolate areas where unknown

populations may exist. This technique could also be used to document the amount of suitable habitat still remaining throughout eastern Washington.

The ownership of habitat presently used by the rabbit should be documented. Private property owners and public land management agencies that own/manage pygmy rabbit habitat should be advised as to the unique habitat requirements of this species.

WDW wildlife managers should consult with SCS range conservationists, public land stewards and private landowners to develop land management recommendations and/or implement range manipulation practices that will benefit pygmy rabbits.

Public education regarding this species should be emphasized in order to promote its aesthetic value as part of Washington's natural wildlife heritage and to prevent further harvest of the pygmy rabbit by hunters due to misidentification.

The following table lists habitat standards and guidelines for pygmy rabbits.

Table 1. PYGMY RABBIT MANAGEMENT ZONE STANDARDS

	HABITAT COMPONENTS FOR PYGMY RABBITS	OPTIMUM CONDITIONS OF PYGMY RABBIT HABITAT COMPONENTS
Soils	Coarse silty, ash, coarse loamy, cobble free soil. Clay content less than 18%. Twenty inches deep or more. Usually mound/intermound or heavily dissected topography, or alluvial (Kehne, 1991).	Cobble free soils 20 to 40 inches deep. Mound/intermound or dissected topography.
<u>Vegetation</u>	Big sagebrush with fair or better condition grass and forb understory. Mature sagebrush in dense (>15% cover) in stands or patches. Grasses include blue-bunch wheatgrass, Needle-and thread, Thurber's needlegrass, Sandberg blue grass. Forbs include lupine, Phlox, Aster, Achilles, Lomatium, Erigeron, Galium, Balsamorhiza, Hieracium, and Astragalus.	Dense patches of mature sagebrush consisting of 20 to 30% canopy cover. Grasses include blue-bunch wheatgrass, Needle-and thread, Thurber's needlegrass, Sandberg blue grass. Forbs include lupine, Phlox, Aster, Achilles, Lomatium, Erigeron, Galium, Balsamorhiza, Hieracium, and Astragalus.

Source : Dobler, 1991.

## Habitat and Population Monitoring

The WDW's current strategic plan calls for increasing pygmy rabbit population levels as the primary objective for that species. Strategies include:

1. Habitat inventory and monitoring.
2. Developing enhancement techniques.
3. Coordination of mitigation projects; actions of land management agencies, and land use planning to enhance and protect habitat.
4. Working with private landowners to encourage pygmy rabbit habitat improvement and protection.
5. The acquisition and protection of critical habitat through fee purchase or perpetual conservation easements.
6. Improving basic knowledge of pygmy rabbit habitat needs, population status, and monitoring techniques and data management.

A system to monitor whether habitat management objectives are being achieved is important to the development and implementation of a successful and cost-effective mitigation program. Initially, the vegetation of the area should be mapped and measurements taken in each vegetation type. A subsample can be collected if the management area is large (refer to range monitoring for habitat measurement techniques). Permanent vegetative transects should be established and monitored to identify and quantify habitat changes.

Flushing surveys and documentation of active burrowing sites could be used to estimate pygmy rabbit densities, as well as monitor population trends.

## Mitigation Objectives

The following mitigation objectives provide a framework from which implementation plans will be developed. The objectives focus on the biological/habitat requirements of pygmy rabbits and are consistent under both conservation easement and fee title strategies. An attempt was made to display a full range of actions that could be considered under different easement options.

### Alternative 1 - Conservation Easements

- Objective 1: Preserve Existing Pygmy Rabbit Sites
- Objective 2: Enhance Pygmy Rabbit Habitat
- Objective 3: Ensure Genetic Flow Between Populations
- Objective 4: Increase Public Education

The actions associated with each objective follow.

## Alternative 1 - Conservation Easements

### Objective 1: Preserve Existing Pygmy Rabbit Sites.

- Actions:
1. Limit livestock grazing.
    - Develop a site specific grazing management plan that will ensure that critical habitat structure is maintained.
    - Fence project boundaries and provide additional fencing as required to accomplish management objectives.
    - Control noxious weeds.
  2. Control wildfires.
    - Reduce ground litter with livestock grazing.
    - Remove wind blown weeds from draws.
    - Maintain water pump trucks at project sites during fire season.
    - Construct road and perimeter fire breaks through mechanical and/or chemical means.
    - Plant fire break "green belts" around project boundaries and adjacent to roads.

### Objective 2: Enhance Pygmy Rabbit Habitat.

- Actions:
1. Establish grass/forb communities with sagebrush overstory.
    - Plant grasses and forbs.
    - Plant and/or encourage the regeneration of sagebrush.
  2. Manipulate existing habitat to encourage optimum grass/forb production and obtain suitable sagebrush canopy densities.
    - Manipulate with grazing.

### Objective 3: Ensure Genetic Flow Between Populations.

- Actions:
1. Establish corridors to adjacent populations.
    - Conservation easements.
    - Land purchases.
  2. Exchange rabbits between geographically separated Washington populations.

### Objective 4: Increase Public Education.

- Actions:
1. Educate the agricultural community and general public regarding the uniqueness of the species and WDW management objectives.
    - Draft articles for the news media and agricultural publications.
    - Conduct public involvement meetings.
    - Present lectures to local schools and other organizations.

2. Erect interpretive boards at project sites as appropriate.
3. Develop brochures, posters, slide presentations, and video programs on pygmy rabbits and shrub-steppe ecosystems.
4. Meet with local fire districts and DNR fire protection crews. Discuss the need for prompt fire response on project lands to protect sensitive and unique pygmy rabbit habitats.

#### Alternative 2 - Fee Title Acquisitions

Objective 1: Preserve Existing Pygmy Rabbit Sites

Objective 2: Enhance Pygmy Rabbit Habitat

Objective 3: Ensure Genetic Flow Between Populations

Objective 4: Increase Public Education

The actions associated with each objective follow.

#### Objective 1: Preserve Existing Pygmy Rabbit Sites.

##### Actions:

1. Suspend livestock grazing except as needed to maintain vegetative structure.
  - Fence project boundaries and provide additional fencing as required to accomplish management objectives.
  - Control noxious weeds.
2. Control wildfires.
  - Reduce ground litter with livestock grazing.
  - Remove wind blown weeds from draws.
  - Maintain water pump trucks at project sites during fire season.
  - Construct road and perimeter fire breaks through mechanical and/or chemical means.
  - Plant fire break "green belts" around project boundaries and adjacent to roads.

#### Objective 2: Enhance Pygmy Rabbit Habitat.

##### Actions:

1. Establish grass/forb communities with sagebrush overstory.
  - Plant grasses and forbs.
  - Plant and/or encourage the regeneration of sagebrush.
2. Manipulate existing habitat to encourage optimum grass/forb production and obtain suitable sagebrush canopy densities.
  - Manipulate with grazing.
  - Alter vegetative structure with chemical or mechanical means.

Objective 3: Ensure Genetic Flow Between Populations.

- Actions:
1. Establish corridors to adjacent populations.
    - Land purchases.
  2. Exchange rabbits between geographically separated Washington populations.

Objective 4: Increase Public Education.

- Actions:
1. Educate the agricultural community and general public regarding the uniqueness of the species and WDW management objectives.
    - Draft articles for the news media and agricultural publications.
    - Conduct public involvement meetings.
    - Present lectures to local schools and other organizations.
  2. Erect interpretive boards at project sites as appropriate.
  3. Develop brochures, posters, slide presentations, and video programs on pygmy rabbits and shrub-steppe ecosystems.
  4. Meet with local fire districts and DNR fire protection crews. Discuss the need for prompt fire response on project lands to protect sensitive and unique pygmy rabbit habitats.

Mitigation Emphasis

Substantial control/protection of pygmy rabbit habitat is essential to maintaining existing populations. Vegetation management for pygmy rabbits typically eliminates or greatly restricts common income-producing practices like grain production and livestock grazing. Land purchase and restrictive conservation easements are two techniques that can provide the level of control needed for habitat protection and enhancements. The use of perpetual conservation easements will be explored before pursuing fee title acquisition in order to provide protection and enhancement of key shrub-steppe habitats. Easement language to address the vegetative management needed by pygmy rabbits will need to be sufficiently restrictive, but flexible.

Habitat enhancement would also be promoted through extension programs, land resource agencies, land use planning, and agriculture set-aside and conservation programs. Such efforts could affect large acreages.

## RANGE MANAGEMENT

### Introduction

Managing habitat for pygmy rabbits in Douglas County may include using livestock grazing as one tool for achieving desired habitat enhancement objectives. If this management option is selected as the appropriate enhancement tool, livestock management plans will be developed within the context of site specific wildlife management objectives and to ensure/improve the ecological integrity of each site. In some cases, livestock grazing may be inconsistent with wildlife needs and precluded from consideration.

If grazing is seen as the best management option to create the desired habitat conditions, all ecological impacts must be considered prior to selecting a management plan that will produce the desired conditions on a site. This includes the effects of a program on non-target wildlife species and potential impacts to adjacent landowners, current grazing lease holders, and recreational users.

Leased public lands (federal or state owned) located within the project area may be included in site specific management plans. The WDW/BPA will coordinate with both the current lessee and the public agency responsible for management of the land before initiating any management agreement which could impact the current lessee's lease or land use options.

Federal and state owned rangelands currently within a "good" or "excellent" ecological condition may be sub-leased from the present lessee and managed to reflect wildlife habitat objectives. Other publicly-owned lands may undergo treatments to improve the ecological condition of the range and then leased back to private landowners for livestock grazing or other agricultural practices as required to meet wildlife management goals. The BPA will assist in relocation of lessees as stipulated by provisions within the Relocation Assistance Act.

Grazing may occur on lands protected by perpetual conservation easements or through fee title purchases; however, in either case the biological requirements/habitat needs of the pygmy rabbits will supersede all other uses. The remainder of this section will focus on defining range conditions, identifying grazing regimens, and adjusting animal-use-monfth levels.

### Range Ecology

In general, a site in a "poor" ecological condition may have a plant community with no more than 25 percent of the plant cover characteristic of undisturbed, natural plant communities. A "fair" condition indicates that 26-50 percent of the present vegetation is characteristic of the potential natural plant community. "Good" condition represents 51-75 percent potential native vegetation while "excellent" means that 76-100 percent of the natural plant community is present.

Rangeland plant communities should be managed to reflect "good" or "excellent" ecological conditions.

## Grazing Systems

Selective range management is a continuous process whereby annual livestock grazing allotments are based on:

1. Present range conditions
2. Site potential and the current plant community's potential for change
3. Wildlife habitat objectives
4. Resource use conflicts
5. Landowner desires
6. Grazing systems

A grazing treatment/system is the application of livestock grazing to a pasture at a specific intensity with specific timing in relation to the annual growth cycle of key range plant species. Specific elements of a grazing system include the season of use, livestock stocking rates, and range improvements and treatments needed to meet resource management objectives.

The type of grazing system to be implemented will be based upon the following considerations:

1. Wildlife habitat objectives
2. Vegetation potential and water availability
3. Season of use
4. Landowner needs
5. Implementation costs
6. Topography

There are six general treatments/systems. These include:

1. Early grazing - Grazing occurs prior to the beginning of the critical growth period. Livestock utilize primarily the previous year's growth. Some use of the new early green growth occurs.
2. Growing season grazing - Grazing occurs during the critical growing period, usually from April 1 until seed ripe for key grass species.
3. Deferred grazing - Grazing occurs after seed ripe and may include any period until growth begins next spring.
4. Winter grazing - Grazing occurs during late fall months while plants are dormant.
5. Rest rotation - Occurs on an area with multiple pastures where at least one pasture is left ungrazed for one year.
6. Rest grazing alternative - No grazing.

A grazing system may include one or more planned livestock grazing treatments to bring about change or maintain the composition of key plant species. Key species are those plants which serve as indicators of community stability and/or change and can be used to monitor objective accomplishments. Implementing grazing systems which allow key species to complete their growth cycles generally result in increases in or maintenance of those species. In the target area, the critical part of the growing season usually occurs from late March through June (Madsen, 1991).

### Early Spring Grazing System

Grazing occurs early in late winter and/or early spring before the critical growing period for major perennial grass species. Early spring grazing maximizes the use of early maturing grasses that are not as palatable later in the season, such as cheatgrass and Sandberg bluegrass. The previous year's growth of perennial plants is also utilized. Under this regimen, grazing ceases while adequate soil moisture is available for continued plant growth. Therefore, most perennial plants are able to produce seed and replenish carbohydrate reserves. Early spring grazing would permit seeding establishment (Stoddart et.al., 1975) and may increase key herbaceous species composition.

Only very light utilization of upland woody species is expected under early spring grazing. Consequently, a long-term increase in composition of these species would likely occur in areas where a potential for increase exists as plant vigor and reproduction would be maintained. Key woody upland and herbaceous riparian vegetation should increase under this system as better distribution of livestock caused by cool weather, green upland forage, and maximum water sources promote dispersed grazing. Regrowth after grazing should occur with soil moisture remaining in both riparian areas and uplands.

### Spring/Summer Grazing System

Grazing occurs each year during the critical part of the growing season. Stocking rates are designed to achieve levels of utilization on most areas. Rough terrain, location of fences and water, and the type of forage often prevents or limits uniform grazing patterns. Heavy grazing occurs on some portion of the range while light use often occurs in other areas.

A decrease in native upland herbaceous and woody species occurs within areas experiencing heavy grazing, primarily adjacent to water, riparian areas, and flat valley bottoms. Also, heavy grazing under a spring/summer system usually results in lowered plant vigor and a decrease in most key herbaceous and woody upland plants. If only the herbaceous understory is heavily grazed, lowering the competition and allowing woody seedlings to become established, shrubs often increase.

Moderate grazing levels may also reduce plant vigor, but the composition of most key species would be maintained. If grazing during critical growth periods reduces plant vigor, annuals or woody species will invade the stand.

### Deferred Grazing System

The deferred system allows grazing after most of the key upland herbaceous species have reached the seed ripe stage and replenished carbohydrate reserves.

Moderate utilization of upland woody species encourages growth of additional twigs, if not grazed at the same time each year, resulting in increased forage production. Plant reproductive capacity is slightly decreased over time because increased twig growth discourages the development of flowers and fruits; however, long-term composition is not expected to change unless

heavy grazing occurs (1985 - BLM Resource Management Plan). Under the deferred grazing option, livestock will concentrate on accessible riparian areas in late spring and summer when the weather warms and plants begin to mature and go dormant, as green forage, shade, and water are available here. This concentration results in heavy utilization of riparian herbaceous and woody species alike. Woody riparian species will decrease because grazing occurs during the critical growth period for these species.

#### Winter Grazing System

Grazing occurs during late fall and winter months while range plants are dormant. Winter grazing encourages the use of shrubs which are more available and have a higher value in the winter than herbaceous species. (This may vary depending upon area, precipitation, snow depth, and amount of forage remaining after growth.)

This results in a decrease of the shrub component under moderate or heavy grazing pressure. Under light to moderate grazing, shrubs may actually increase as competition to seedling establishment may be reduced.

Since livestock grazing would cease prior to the initiation of herbaceous species growth, an increase in the composition of perennial forbs and grasses would result under all levels of livestock use unless heavy hoof action physically removes or dislodges perennial plant root crowns.

#### Deferred Rotation Grazing System

Under this system one or more years of grazing use during the critical growing period are alternated with a year or more of grazing after the seeds of the key herbaceous species ripen and carbohydrate reserves have been restored. At moderate grazing levels, an increase in key herbaceous species should occur. Under heavy utilization levels, root storage during the year of deferment may not be adequate to offset depletion that would occur during the year of use. If plant vigor is reduced significantly, it may take several years to recover when growth conditions are favorable. Herbaceous species composition would not be expected to change. Woody species composition in upland areas would not change significantly under moderate utilization but would decrease at heavy utilization levels unless at least two years pass between deferred treatments.

Impacts to woody and herbaceous vegetation in riparian areas are similar to those under a deferred grazing system.

#### Rest Rotation Grazing System

Rest rotation grazing alternates one or more years of complete rest with other treatments. The length of the rotation cycle and number of grazing treatments depend on site specific wildlife habitat management objectives and the number and size of pastures in the grazing system. A discussion regarding the three primary rest rotation grazing systems follows.

The first type of rest rotation alternates spring/summer grazing with rest. Herbaceous and woody upland plant communities will probably change in composition with any intensive grazing use, even with rest, because plants usually require several years to recover from heavy use. At light or moderate grazing levels, these species may increase in abundance. On the other hand, key species in riparian areas would remain at existing levels because the heavy utilization made on these plants would be offset by the year of rest.

The second type of rest rotation alternates early spring grazing one year with rest the next. This system has the advantages of an early spring grazing treatment every other year with the area rested on alternate years. No grazing occurs during the critical growing period.

The third rest rotation system alternates deferred grazing use one year after seed ripe with complete rest the next. Under this system, upland herbaceous species would not be grazed during the growing period. This should result in improved vigor, increased seed production, and possibly seeding establishment. However, livestock will tend to concentrate in wet areas and riparian zones during the grazing treatment year. Depending on the condition of the plant community and degree of grazing use of both herbaceous and woody plants, grazing impacts may not be overcome with one year **of** rest.

#### No Grazing Alternative

A permanent or temporary no-grazing policy may be adopted to protect critical wildlife habitat such as pygmy rabbit sites, sage sparrow habitat, and prairie grouse leks. The no-grazing policy does not preclude the application of alternative habitat/manipulation techniques.

Alternative habitat management/manipulation treatments will be applied in accordance with the objectives outlined within site specific management plans.

#### Adjustments to AUMs

Determining animal-use months (AUMs) requires the consideration of wildlife habitat objectives, forage production, and livestock management goals. Annual vegetative production will vary by range site and environmental conditions. Regardless of the amount of forage produced in any given year, sufficient reserves must **remain** after livestock grazing to provide for plant vigor, vegetative structure, and wildlife needs under the most severe environmental conditions.

Range conditions will be monitored to measure changes resulting from livestock grazing. AUMs will be adjusted accordingly to ensure that wildlife management objectives are met.

In order to ensure that grazing systems are compatible with current SCS technical guidelines and practices, WDW wildlife managers will consult with SCS range conservationists and landowners prior to implementing a grazing regimen.

## Summary

If consistent with wildlife management objectives, livestock grazing could be used as a tool to meet wildlife habitat objectives.

A limited, closely controlled and monitored grazing program might be used to enhance habitat; however, grazing moratoriums may be needed in some areas for several years to offset the impacts of drought and continuous livestock use.

Years of livestock grazing at various intensities may have caused permanent changes to plant communities throughout the project area. Likewise, fire and herbicides have also altered plant communities.

Invader plant species such as cheatgrass have replaced native grasses and forbs in many areas. As a result, grazing regimens and grazing moratoriums alone may not improve the ecological condition of rangelands.

Encouraging the reestablishment of big sagebrush along with reseeding grasses and forbs may be necessary to improve habitat conditions for pygmy rabbits.

## WILDLIFE HABITAT AND POTENTIAL SITE DEVELOPMENTS

The following discussion focuses on the potential design of habitat manipulation practices, range improvements, and site development proposed in this plan. Additional design features, not specifically discussed in this section, will be included in site specific management plans.

Habitat development and range improvements will focus on maximizing benefits for wildlife and, whenever possible, will be consistent with applicable SCS technical standards, local conservation district mandates, and state/county land use designations. WDW wildlife managers will coordinate with SCS and conservation district technicians and landowners, if required, prior to implementing management activities.

SCS and conservation district technical assistance should be requested during the planning phase of all projects. Likewise, projects managed by other resource agencies should include WDW representation when such projects impact adjacent WDW efforts.

The following items will be discussed in this report:

1. Fences
2. Water development
3. Dug-outs and water holes
4. Springs
5. Existing water resources
6. Vegetation manipulation practices
7. Existing agricultural fields
8. Brush control and enhancement measure
  - Burning
  - Chaining

- Seeding
- Shrub and tree plantings

9. Information and regulatory signs

1. Fences will be constructed/maintained to delineate project boundaries, control livestock, protect wildlife habitat developments and riparian zones, establish parking and viewing areas, control access, and provide privacy and physical security for landowners residing within the project area.

Fences may be built with smooth wire or barbed-wire. Smooth wire is preferred because it is less detrimental to wildlife and can be electrified. Solar powered charging units may be used to electrify fences.

If used, barbed-wire fences will be constructed using steel posts and four strands of barbed-wire with intermediate wire stays. Gates and/or cattle-guards will be installed as needed. Gates will be chained and locked in cooperation with landowners and/or livestock ranchers. Removable fences, snow fences, and temporary modifications to pasture fences will be constructed as needed to accomplish habitat management objectives. Fence stiles may also be built to facilitate access where appropriate.

Bids for new boundary and pasture fence construction should be solicited through area newspapers, conservation district offices, and other public locations. This should encourage local community involvement as well as reduce initial construction time schedules. Bids must be obtained in accordance with WDW/BPA bidding procedures.

WDW personnel/landowners will delineate pasture fence locations and ensure that all fences are built in accordance with technical specifications and management plan objectives. The locations of boundary fences may require the use of certified surveyors, either currently employed by the WDW, BPA, or obtained on a contract basis. Boundary fence posts may be painted a specific color in order to make identification of project lands easily distinguishable from adjacent privately-owned property, or signs may be posted to identify project lands.

Annual fence maintenance will be the responsibility of WDW wildlife managers and/or landowners. Fence maintenance materials will be purchased by WDW personnel with Operations and Maintenance (O&M) funds supplied by the BPA.

2. Water developments such as dug-outs, water holes, catchments, springs, and wells will be constructed as required to accomplish management objectives.
3. Dug-outs and water holes will be fenced and water piped to a trough for livestock consumption. Wildlife water guzzlers may also be installed and fenced.
4. Springs will be developed or redeveloped using a buried collection system consisting of drain tile or perforated pipe and a collection box. The spring area and overflow will be fenced to exclude livestock. Water will be piped to a trough as required for wildlife and/or livestock use. In

addition, ramps, rocks, or floatboards will be provided in all troughs for small birds and mammals to gain access to and escape from water. Additional fencing will be used to encourage and protect new riparian vegetation resulting from spring overflows.

Wherever possible, water pipelines and new power lines will be buried. Well locations will be selected based on geologic reports and local experts. All applicable federal, state, and county laws and regulations will be observed.

5. Existing water resources and associated riparian areas will be fenced and otherwise protected in concert with site specific management plans. Consideration will be given to livestock water and shade requirements.
6. Vegetation manipulation practices such as brush control or enhancement, range seedings, and shrub and tree plantings will be conducted to achieve site specific wildlife habitat mitigation objectives.
7. Existing agricultural fields included in perpetual conservation easements or purchased under Alternative 2 will be converted to and maintained as shrub-steppe grasslands for perpetuity unless WDW wildlife managers determine that other cover types are more conducive to meeting wildlife management objectives.

Cost-sharing opportunities, such as the CRP, will be used whenever possible to offset the cost of converting agricultural fields to shrub-steppe grasslands.

Landowners and/or WDW wildlife managers will establish and maintain shrub-steppe grasslands. Habitat development and maintenance responsibilities will be specified within individual perpetual conservation easements or purchase agreements.

Fields that are currently enrolled in the CRP will be maintained as grasslands for perpetuity unless wildlife management objectives can be better served by replacing the established vegetation with other suitable habitat. Landowners/WDW wildlife managers will follow all CRP regulations, restrictions, and guidelines.

8. Brush control and enhancement measures designed to improve wildlife habitat conditions may be employed to accomplish habitat management objectives. Brush control methods include burning, chaining, plowing, grazing, and chemical treatments. Brush enhancements may include scarification, planting, and fertilization.

Burning will temporarily reduce big sagebrush abundance because it does not resprout following fire (Pellant, 1989). The impacts of burning on perennial bunchgrass varies with the intensity of the fire, season of the burn, and the effected grass species. The amount of cheatgrass will increase on burned areas. Other perennial grass species may increase in productivity because of the fertilizer effect of fire and reduced shrub competition, but may not increase in abundance (number of plants) because of competition from cheatgrass relative to slow establishing perennial seedlings (Perry, 1991). Studies in Idaho indicate that fall

burning does not harm most perennial herbaceous species depending on fire intensity and the amount of litter accumulated on the ground and under individual plants.

Chaining consists of dragging a large chain (ship anchor chain), each end of which is attached to a track-type tractor, through the brush. This inexpensive method is effective only on large brush and small trees with rigid trunks. Chaining will reduce the density of sagebrush and will encourage the growth of bitterbrush seedlings on disturbed bitterbrush sites. New bitterbrush plants may also develop from lower branches that remain attached to root crowns after the tops are removed. The disturbance of the soil and removal of some competition favors the establishment of a new stand of brush from seed as well as encourages the growth of grass, forbs, and legumes (Box, Smith, Stoddart, 1975). Range seedings should follow chaining to minimize the invasion of noxious weeds such as knapweed, skeleton wood, spurge, toadflax, cheatgrass, and others.

As with other treatment methods, proper timing is important. Sprouting shrubs are more affected by mechanical control at low stages in their food storage cycles and when conditions for regrowth are least favorable. Smaller shrubs are more susceptible to mechanical control methods that crush and pulverize the stems when they are most brittle in late fall or early winter. Reinvasion may be increased if treatment is accomplished after seed formation.

Seedings, if required, will be accomplished with a rangeland drill through broadcast seeding, aerial seeding, or by hand-planting individual plants.

Preparations for seedings will vary and range from brush and cheatgrass control through controlled burns, herbicide applications, or mechanical treatments to no preparation. Seeding establishment and composition, following any treatment, will depend on the success of pre-seeding preparations, seed mix composition, post germination survival, reinvasion of native and introduced plant species, and the amount of precipitation in the year following seeding.

Seed mixes will consist of native and other acceptable grasses, forbs, and legumes as described in site specific management plans. scs planting date recommendations and technical guidelines should be followed.

Seedings may be accomplished by WDW wildlife managers or through sharecrop agreements/contracts with local farmers. Project managers will coordinate with SCS/ASCS representatives to determine if federal cost-sharing programs such as the CRP are available to help defray part of the seeding and maintenance costs.

Shrub and tree plantings will be established to provide forage, browse, and permanent cover for wildlife. They will be planted with mechanical planters and/or by hand. Vegetative competition will be controlled prior to planting and, if required, for a minimum of three years thereafter. Competitive vegetation and noxious weeds will be controlled

by mechanical/chemical means. All federal, state, and county regulations and laws will be followed during the application of herbicides.

Shrub and tree plantings will be fenced to exclude livestock. Seedlings will be irrigated with drip irrigation systems or hand watered to increase plant survival, vigor, and growth. Irrigation will continue for a minimum of two years or until shrubs and trees are able to survive without supplemental water.

Native shrubs such as big sagebrush may be planted to enhance pygmy rabbit habitat.

WDW wildlife managers will be responsible for planning, coordinating, and conducting planting activities.

The survival of shrubs will vary depending on planting methodology, species adaptability, soil parameters, control of vegetative competition, precipitation, and wildlife/livestock depredation.

9. Information and regulatory signs will be posted to control public access, delineate project boundaries, and provide additional information/guidance as required.

#### WEED CONTROL

Weed control will be accomplished as required by state and county regulations through biological, mechanical, and/or chemical control measures. Federal, state, and county regulations governing the use of pesticides will be observed.

WDW wildlife managers will annually conduct surveys and coordinate with landowners to detect and control new invasions of noxious weeds.

WDW managers and/or landowners will identify, inventory, and map existing noxious weeds on project lands and develop a control plan for each weed species. The plan will include the following:

1. Status of the weed as defined by State/County Noxious Weed Control Boards/Laws.
2. A map showing current weed locations as a reference to planning control work and to monitor its spread or reduction in coverage with treatment.
3. Identification of preferred/alternative control methodologies.
4. Selection of primary control measure(s) that will provide the necessary level of weed control and still meet wildlife/habitat management objectives.
5. Time table for initial and follow-up treatments.
6. Identification of management practices/treatments required to minimize establishment, reinvasion, and dispersion of noxious weeds.
7. Implementation of control strategy.
8. Plan to monitor the effects of the treatment(s) on targeted weed species, habitat, and wildlife.
9. Strategy to coordinate noxious weed control measures with adjacent landowners.

Constant plant community monitoring should be emphasized and, whenever possible, weed control measures should be initiated while the infestation is small. If a noxious weed is established over a wide area, control measures will be done to meet community standards. More extensive control practices may be applied under the following conditions:

1. Control measures will not negatively impact wildlife/habitat
2. Control measures will significantly enhance wildlife habitat/populations.

Alternative weed control practices will be evaluated and selected based upon the following considerations:

1. Costs/benefits
2. Location of weed concentration
3. Difficulty of control
4. Treatment effectiveness/level of control required
5. Labor and equipment constraints
6. Availability of biological control options
7. Timing of treatments.

WDW Management Standards and Guidelines include the following prioritized weed control measures:

1. Biological control
  - Insects/diseases
  - Acceptable/desirable competing vegetation
2. Mechanical control
  - Hand pulling
  - Mowing or cultivation
  - Grazing
3. Herbicide Control - Herbicide selection will be based upon the following criteria:
  - Herbicide use limitations (registered uses)
  - Selection of chemical(s) of lowest toxicity that is effective on target weed species and minimizes the need for reapplications
  - Application/chemical costs

Herbicides will be applied in such a manner as to avoid spray drift and contact with non-target plant species. Whenever possible, annual herbicide applications will be limited to sites with high seed dispersal potential such as road sides, access areas, parking areas, etc. This does not preclude the application of herbicides to rangelands and cultivated fields on an as-needed basis.

All herbicide label directions and safety precautions will be followed. The **lowest** chemical concentration feasible to accomplish weed control objectives will be used. Furthermore, WDW wildlife managers, in conjunction with landowners, should review and modify management to minimize reinvasion of noxious weeds.

Once weed infestations have been controlled, WDW wildlife managers and landowners should consider planting competing vegetation. Habitat/range

management manipulation practices should be applied during the control phase to discourage the reinvasion of weed species (maximize desirable plant competition, minimize the condition that allowed weed establishment).

Weed control measures will be monitored and adjusted as required to accomplish wildlife management objectives.

Weed control measures will be monitored and adjusted as required to obtain specific management objectives.

#### FIRE CONTROL

Wildfires on lands managed by the WDW will be suppressed. Responsibility for wildfire protection and suppression rests primarily with local fire protection districts and/or the DNR.

Fire protection on project lands will be included as part of annual O&M costs. WDW currently uses the following system for land it manages:

1. Lands within the boundaries of a fire protection district: An assessment or the cost of suppression efforts is paid.
2. Lands outside of, but adjacent to, the boundaries of a fire protection district: The costs of fire suppression is paid to adjacent fire district.
3. Unprotected lands: Contract with the DNR and/or county fire districts, or use WDW personnel to control the fire (Beckstead, 1991).

WDW wildlife managers will eliminate fire hazards on project lands whenever possible. In the event of a wildfire, WDW personnel will notify the appropriate fire control agency, advise adjoining landowners and recreational users, and if directed, assist with suppression efforts as needed.

The WDW may eliminate all public access to project lands during periods of high fire danger. Lands will be posted and patrolled whenever a closure is implemented.

The control of wildfires does not preclude the use of prescribed burns for habitat manipulation purposes; however, WDW personnel must have the appropriate training and proper equipment to use fire as a management tool. In addition, prescribed burns should be planned and completed with the assistance of WDW and SCS range/forestry specialists. All applicable permits will be obtained and state/local regulations complied with.

## MANAGEMENT OF SENSITIVE WILDLIFE

Department owned/managed lands will be managed for pygmy rabbits, threatened and endangered wildlife, and other species of concern. Opportunities to enhance potential habitat to aid in the recovery of sensitive wildlife species will be a high priority. Where conflicts between the habitat needs of species of concern and any species not so designated occur, habitat will be maintained to support the sensitive species.

WDW nongame biologists will develop monitoring/management plans for sensitive wildlife species occurring on project lands. Management plans will be implemented by project wildlife managers. WDW revenues, if available, as well as other funding sources will be used to complement mitigation habitat enhancement efforts for threatened and endangered wildlife species and other sensitive wildlife species.

WDW wildlife managers will report observations of threatened and endangered and other species of concern occurring on project lands to the WDW nongame data system. Monitoring plans should be developed to ensure that the habitat occupied by a species of concern is regularly examined for occupancy and that habitat maintenance or enhancement activities are effective.

The following table lists the sensitive wildlife species that may occur on proposed project lands.

TABLE 2. SENSITIVE WILDLIFE SPECIES THAT MAY OCCUR NEAR OR FREQUENT THE PROPOSED PROJECT AREA

<u>Common Name</u>	<u>Scientific Name</u>
Birds	
Sharp-tailed grouse	<u>Tympanuchus phasianellus</u>
Sage grouse	<u>Centrocercus urophasianus</u>
Sage sparrow	<u>Amphispiza belli</u>
Sage thrasher	<u>Oreoscoptes montanus</u>
Ash-throated fly catcher	<u>Myiarchus cinerascens</u>
Grasshopper sparrow	<u>Ammodramus savannarum</u>
Brewer's sparrow	<u>Spizella breweri</u>
Lark sparrow	<u>Chondestes grammacus</u>
Burrowing owl	<u>Athene cunicularia</u>
Snowy owl	<u>Nyctea scandiaca</u>
Ferruginous hawk	<u>Buteo regalis</u>
Swainson's hawk	<u>Buteo swainsoni</u>
Prairie falcon	<u>Falco mexicanus</u>
Gyrfalcon	<u>Falco rusticolus</u>
Golden eagle	<u>Aquila chrysaetos</u>
Bald eagle	<u>Haliaeetus leucocephalus</u>

Table 2 (Cont.)

Mammals

Pygmy rabbit	<u>Brachylagus idahoensis</u>
White-tailed jackrabbit	<u>Lepus townsendi</u>
Sagebrush vole	<u>Lagurus curtatus</u>

Amphibians

Long-toed salamander	<u>Ambystoma macrodactylum</u>
Tiger salamander	<u>Ambystoma tigrinum</u>
Horned lizard	<u>Phrynosoma douglassi</u>
Sagebrush lizard	<u>Sceloporus graciosus</u>
Spotted frog	<u>Rana pretiosa</u>

source: Hickman, WDW, 1991

A complete list of federal and state species of concern can be found in Appendix F.

#### RECREATION MANAGEMENT

Public recreation opportunities are important, but subordinate to wildlife/habitat management goals and objectives. The biological and habitat requirements of the pygmy rabbit, threatened and endangered species, and other species of concern must take precedence over recreation programs on project lands.

Recreation management programs will be developed and monitored by the WDW on all mitigation lands whether purchased through fee title or managed with perpetual conservation easements.

WDW wildlife managers will determine the type and scope of access programs and recreational opportunities that will be allowed on specific sites. Activities must not conflict with wildlife goals and objectives and be consistent with WDW mandates.

All public access and recreational opportunities will be regulated throughout the year by WDW wildlife managers to protect sensitive habitats and minimize disturbance to wildlife species.

Landowner/WDW liability will be in accordance with RCWs 4.24.200 and 4.24.210 (Appendix G) which "encourage owners of land to make land and water available to the public by limiting their liability for persons who enter that land and may be injured or otherwise damaged by acts of omissions of others."

## MANAGEMENT OF CULTURAL, GEOLOGICAL, AND BOTANICAL FEATURES

Cultural sites on WDW owned or controlled lands will be protected. It is unlawful to alter any historic or prehistoric site or to remove artifacts from state owned/controlled property. The BPA will identify paleontological, archeological, and historical resources and Native American sites through the National Environmental Protection Assessment (NEPA) process.

The location(s) of all sites will be reported to the Department of Community Development (DCD). The DCD will be consulted prior to initiation of activities that may impact a known site. If a site is inadvertently disturbed, all activity shall stop and the DCD shall refer to the appropriate authority responsible for supervising site restoration.

Geological and sensitive botanical sites will also be protected. Management activities occurring near these sites will not be done so they threaten the integrity of the feature. WDW managers/specialists shall coordinate with DNR Natural Heritage Program staff before implementing activities near or on a sensitive botanical site.

All special features of interest should be periodically monitored to ensure that the resource is maintained in its present condition. Likewise, a plan should be developed to restore damaged or destroyed features of special interest.

## MONITORING

### Habitat

A resource monitoring plan should provide wildlife managers with enough information to make sound decisions regarding the implementation and adjustment of management activities.

The effects of implementing habitat management strategies will be evaluated and monitored for the life of the project. WDW wildlife managers will develop a monitoring and evaluation program to accomplish the following:

1. To determine if an activity is fulfilling the purpose and need for which it was designed, or if there is a need for modification or termination of current management.
2. To identify unanticipated and/or unpredicted impacts, positive or negative.
3. To ensure that decisions are being implemented as scheduled.
4. To provide consistency with federal, state, and local plans, programs, and regulations.
5. To monitor mitigation program benefits (environmental, social, biological, economic), as well as cost.
6. To evaluate the impacts of grazing on plant communities in order to form a basis for modifying pasture rotations, seasons of use, grazing intensities, or possible elimination of this management practice.
7. To ensure that terms and conditions of conservation easements are implemented and complied with by all parties.

Base line information concerning range conditions and wildlife populations may be available through SCS/landowner farm plans, WDW personnel, and the USFWS; however, additional sampling may be required to document present conditions. WDW range specialists, SCS range conservationists, and landowners should be consulted to facilitate the collection of base line data.

Monitoring techniques should be consistent with methodologies used in studies conducted in Idaho and other states/provinces.

Information obtained through monitoring will be used to evaluate wildlife habitat conditions, AUM allotments, pasture grazing rotations, forage use patterns, and to detect changes in plant communities. Table 3 lists examples of methodologies that may be used to monitor vegetative trends, forage utilization, plant parameters, and other environmental variables.

TABLE 3. HABITAT VARIABLE MEASURING TECHNIQUES

<u>Habitat Variable</u>	<u>Measuring Technique</u>
1. Canopy Cover (grass/forbs)	Micro Plot
2. Canopy Cover (shrubs/small trees)	Line Intercept
3. Canopy Cover (trees/brush piles)	Spherical Densiometer
4. Canopy Diameter	Diameter Tape
5. Horizontal Foliar Density	Vegetation Profile Board
6. Vertical Vegetation Cover	Cover Pole
7. Height of Plants	Graduated Rod Optical Range Finder
8. Plant Density	Calculated Cover
9. Frequency of Herbs/Shrubs/Trees	Quadrat
10. Plant Diversity	Calculated Community Dominance
11. Slope and Aspect	Clinometer and Compass Topo Maps
12. Water Depth	Graduated Rod
13. Water Velocity	Averaging

Source : Hays, 1991.

The methodology and monitoring intensity that is chosen for a site will be determined by the nature and severity of the resource conflicts that are present at that site. The Geographical Information System (GIS) can also be used to determine habitat variables/measurements.

### Wildlife

Wildlife monitoring efforts within the project area will focus on indicator species; threatened, endangered, and sensitive wildlife species; and related biotic resources using both temporary and permanent study techniques.

Lek surveys, brood routes, and flushing counts are a few of the techniques that can be used, in conjunction with habitat variable measuring methodologies, to monitor wildlife responses to habitat conditions and trends; browse/forage

availability, utilization, composition, and vigor; changes in cover and habitat effectiveness; and general habitat conditions.

A "presence/absence" survey will be utilized to document nongame response to habitat management.

An effective monitoring process should detect qualitative and quantitative changes in habitat and/or wildlife populations. Information obtained through the monitoring and evaluation process should be analyzed and fed back into the management plan review process in order to evaluate the impacts of land use decisions as well as the adequacy of mitigation measures.

## ADDITIONAL ISSUES

### Property Taxes

The use of perpetual conservation easements will be exercised prior to pursuing fee title acquisitions. Landowners will be responsible for property taxes under Alternative 1, Perpetual Conservation Easements. Conversely, property taxes under Alternative 2, Fee Title Acquisitions, may be paid by the WDW with annual O&M funds. In addition, BPA may explore with, effected counties, alternative forms of compensation other than property taxes.

### Exotic Wildlife

Exotic wildlife introductions will not be allowed on mitigation lands. This is necessary to protect as well as encourage the recovery and maintenance of native wildlife species.

Exotic wildlife includes pheasants, gray partridge, quail, turkey, game farm reared upland birds along with any other non-native wildlife species.

### Off-Road Vehicles

Off-road vehicles (ORVs) will not be operated on project lands except by WDW personnel/landowners as required to complete habitat management/monitoring activities. Privately-owned vehicles will be restricted to county roads and designated parking areas in order reduce the spread of noxious weeds, protect fragile habitats and agricultural fields, and to reduce disturbance to wildlife populations.

### Tribal Needs

Tribal subsistence and ceremonial needs will be addressed in accordance with current federal treaty provisions and state/county regulations.

### Crop Depredation

Landowners adjacent to the project area may suffer crop damage due to increased wildlife populations. Hunting will be used to eliminate crop depredation whenever possible; however, if crop damage still occurs, landowner damage claims and specific problem situations will be dealt with in the following manner.

Response to Damage Complaints: Following a report of damage, a WDW representative will contact the landowner and/or respond to the complaint within 48 hours.

Disbursing/Elimination: The WDW will provide landowners with propane guns, firecrackers, cracker shells, and shotgun shells for disbursing and redistributing depredating wildlife.

When no other practical means of damage control is feasible, selected big game animals may be killed out of season. An assessment will be made by WDW field personnel to determine the effectiveness of remedial methods. Consideration will be given to such factors as time of year, extent of damage, potential for future damage, and whether season adjustments are necessary.

The number of big game animals eliminated will be the minimum necessary to help landowners disperse them from a crop that is being damaged.

The preferred method of out-of-season elimination is to permit licensed hunters the opportunity to harvest the animals. The presence of hunters associated with the killing of a minimum number of animals has proven to be an effective means of disbursement.

Hot spot damage control hunts may be considered when the value of the potential claim exceeds \$1,000. Authority for the hot spot hunt rests with the WDW regional manager. Hunters will be randomly selected by computer.

If hot spot damage control is not effective or cannot be used, WDW regional managers may authorize kill permits.

Trapping and/or relocating nuisance wildlife may be considered if other control methods are ineffective or inappropriate.

Compensation: Landowners suffering crop damage may choose to receive hay as replacement for lost crops. The advantages to the landowner are: almost immediate settlement, no requirement to file a formal damage claim, and quality (alfalfa) hay available at their convenience. This method of compensation would apply in the following situation and manner:

- Landowner and local WDW representative agree on a dollar value of damage.
- Cost of replacement hay will not exceed \$2,000 based on average local price at time of agreement. Both parties agree that the exchange, hay for damages, is full and final payment.

Formal Damage Claims: Where damage does not exceed \$500, and the landowner and the WDW representative agree on the amount of loss, settlement will be at the local level.

Claims in excess of \$500 and less than \$2,000 will be processed and the claimant notified of the disposition within 60 days of receipt of the claim in Olympia. However, if a crop value cannot be established within 60 days, the claimant will be advised and the claim will be processed as soon as possible. Nothing will prohibit the claimant and the WDW from agreeing on a reasonable extension.

Claims that are denied by the WDW director, or payment amount refused by the claimant, must go to the legislature for consideration.

Landowner Cooperation: Landowners will allow/encourage hunting on their property. Whenever practical landowners will assist in preventing damage by allowing public hunting during scheduled hunting seasons.

### Predator Control

Predatory birds and mammals may be controlled on project lands and adjacent areas. Predator control may also be warranted in conjunction with wildlife reintroductions and instances of livestock depredation.

Control measures will be accomplished by WDW wildlife managers in accordance with federal, state, and county regulations. At the discretion of the WDW, other individuals may be authorized to conduct predator control activities on project lands.

Control measures will not exceed that which is necessary to obtain a minimum level of control over offending predators.

WDW wildlife managers should advise landowners and consult with the USFWS, local county extension agents, and the Department of Agriculture prior to initiating predator control activities.

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## APPENDIX A

### NORTHWEST POWER PLANNING COUNCIL WILDLIFE MITIGATION STANDARDS

All mitigation projects will be evaluated on how well they:

1. Complement the activities of the region's state and federal wildlife agencies and Indian tribes;
2. Be the least costly way to achieve the biological objective;
3. Protect or enhance special habitat or species that would not be available unless prompt action is taken: such proposals should only be implemented with the consent of the Council;
4. Encourage the formation of partnerships with other persons or entities, which would reduce project costs, increase benefits and/or eliminate duplicative activities;
5. Have measurable objectives such as the restoration of a given number of habitat units;
6. Not impose on the BPA the funding responsibilities of others, as prohibited by section 4(h)(10)(A) of the Northwest Power Act;
7. Address special wildlife losses in area that formerly had salmon and steelhead runs that were eliminated by hydroelectric projects (for example, societal and tribal wildlife losses);
8. Protect high quality, native, or other habitat or species of special concern, whether at the project site or not, including endangered, threatened, or sensitive species;
9. Provide riparian or other habitat that may benefit both fish and wildlife;
10. Address concerns over additions to public land ownership and impacts on local communities, such as reduction or loss of local government tax base, special district tax base; or the local economic base, or consistency with local governments' comprehensive plans;
11. Use publicly-owned land for mitigation, or management agreements on private land, in preference to acquisition of private land, while providing permanent protection or enhancement of wildlife habitat in the most cost-effective manner;

12. Mitigate losses in-place, in-kind, where practical. When a wildlife measure is not directly related to hydroelectric caused loss, the habitat units protected, mitigated, or enhanced by that measure will be credited against mitigation due for one or more hydroelectric projects, including power-related storage or regulatory dams;
13. Help protect or enhance natural ecosystems and species diversity over the long term; and
14. Use the best available scientific knowledge.

APPENDIX B

GRAND COULEE/CHIEF JOSEPH WILDLIFE  
MITIGATION STEERING COMMITTEE

The Steering Committee was established to represent local input and concerns with the planning and implementation process.

Local Utilities .....	Ralph Byre
Wheat Growers (Lincoln County).....	Hal Johnson
(Douglas County).....	Lee Hammer
Cattlemen (Lincoln County).....	Keith Nelson
(Douglas County).....	Allan Miller
Colville Confederated Tribes.....	Steve Judd
Upper Columbia United Tribes.....	Chris Merker
Conservation Groups (Ephrata Sportsmen's Club)...	Don Galbreath
Sportsman/Landowner.....	David Stevens
Environmental Groups (WA Environmental Council)..	Larry Hampson
Local Government (Stevens County).....	Allan Mack
(Stevens County).....	Tom McKern
(Douglas County) .....	Jay Weber

## APPENDIX C

### UNPUBLISHED HABITAT EVALUATION PROCEDURE (HEP) MODELS

The following materials are unpublished habitat evaluation models used to determine the habitat suitability indices for the Grand Coulee Dam Wildlife Mitigation study.

1. Sharp-Tailed Grouse (Tympanuchus phasianellus) from Ashley, et al., 1990.
2. Sage Grouse (Centrocercus urophasianus) from Ashley, et al., 1990.
3. Mule Deer (Odocoileus hemionus) from Ashley, et al., 1990.
4. Pygmy Rabbit (Brachylagus idahoensis) from Ashley, et al., 1990.

Sharp-tailed GROUSE  
(*Tympanuchus phasianellus*)

**CHARACTERISTICS**

The sharp-tailed grouse are of moderate size (17 inches) and color, with scaled and spotted underparts, a tail that is mostly white and pointed, and yellowish eye combs.

**FOOD AND HABITAT REQUIREMENTS**

Sharp-tailed grouse feed primarily on plant materials, although insects are also consumed in spring and summer. Grasses and flowers are important foods in spring and summer. Optimum habitat is 10-25% herbaceous cover. Winter foods consist of buds, twigs and catkins from shrubs and trees. Optimum winter habitat includes greater than 25% bud producing shrubs and trees.

Permanent native habitats containing a mixture of native grasses and brush are most likely to support sharp-tailed grouse. Optimum habitats are composed of a combination of grass, shrub and shrub/grass communities rather than pure stands of any of these community types. Edges between shrubby and grassy cover types are especially important to this species.

Bunchgrass clumps and woody vegetation are used by sharp-tails for cover from weather and predators and for visual isolation of individuals during feeding, resting and nesting activities. Winter roosts are established in snow burrows when snow is deep; however, woody vegetation is used when snow is shallow or crusts. Riparian areas, conifer forest edges and woody ravines also provide important cover for grouse throughout the year.

**BREEDING**

The breeding season begins in early April with young dispersed by mid-July. Male birds gather at display grounds, or "leks" following receding snow cover when fall-grown forbs and grass foods become available. The male's purple neck sacs are inflated during courtship display as he rattles his wing quills to attract females while performing a ritualized courtship dance. Individual birds return to traditional leks and defend the same territories used in previous years. Territory sizes may range from 46-558 square feet with typically 8-12 males present at a lek site.

Sharp-tailed grouse leks are likely to occur in areas of low or sparsely distributed, mixed vegetation. Washington leks are established on barren areas with little or no vegetation within native bunch grass prairies. Nests are built on the ground and may be located beneath a clump of bunchgrass and within 10 feet of brushy cover.

**STATUS IN WASHINGTON**

In Washington, sharp-tailed grouse live along the edges of native bunchgrass prairies of eastern Washington. The bird was extirpated from portions of its former range, which included California, Oregon and Nevada. The major limiting factor for sharp-tailed grouse is the availability of undisturbed native grass and shrub communities.

Sharp-Tailed Grouse  
(*Tympanuchus phasianellus columbianus*)  
Shrub-Steppe (SS)

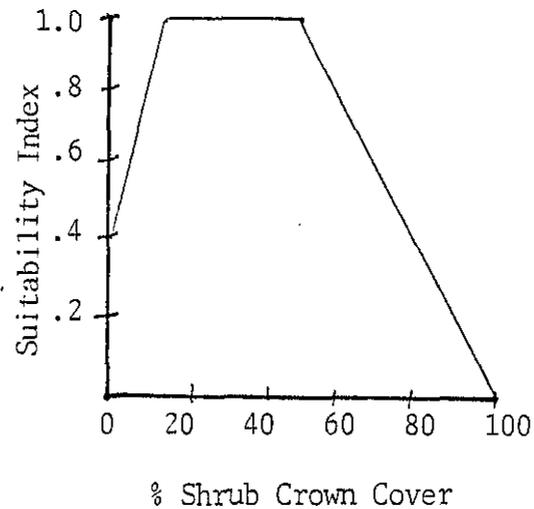
Draft 10/90

Summer Range

Variable 1: % Shrub Crown Cover

V1 Field values:

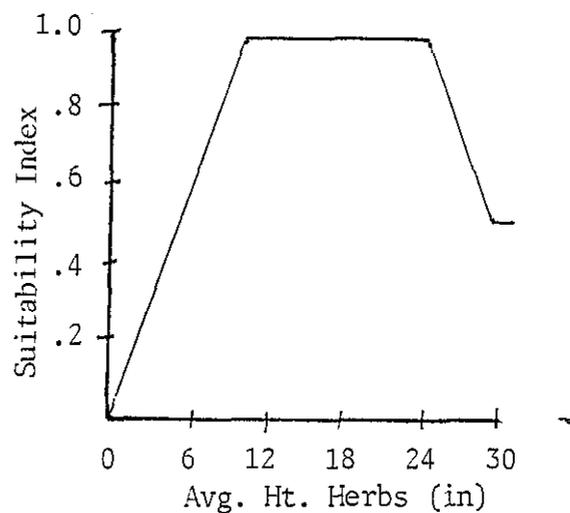
0 - 10 = 0.7  
11 - 50 = 1.0  
51 - 75 = 0.5  
76 - 100 = 0.2



Variable 2: Average Height of Herbaceous Vegetation (in)

V2 Field values:

0 - 10.9 = 0.5  
11 - 24.9 = 1.0  
25 - 40 = 0.7



Sharp-Tailed Grouse  
(*Tympanuchus phasianellus columbianus*)  
Shrub-Steppe (SS)

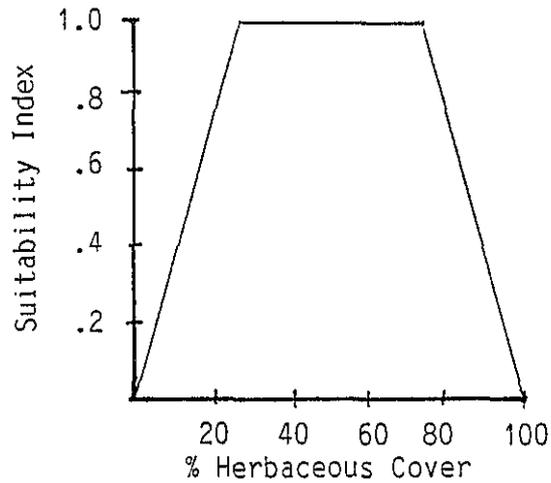
Draft 10/90

Summer Range

Variable 3: % Herbaceous Cover

V3 Field values:

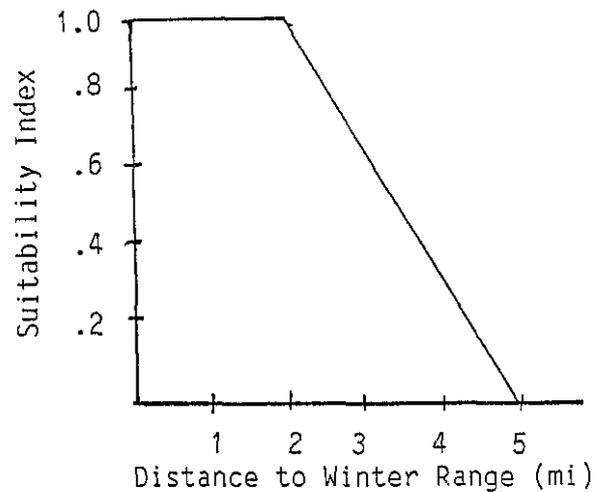
0 - 25 = 0.5  
26 - 75 = 1.0  
76 - 100 = 0.5



Variable 4: Distance to Winter Range (mi)

V4 Field values:

0 - 2 = 1.0  
2.1 - 3 = 0.8  
3.1 - 4 = 0.5  
4.1 - 5 = 0.2



$$HSI = (V1+V2+V3+V4) / 4$$

Sharp-Tailed Grouse  
(*Tympanuchus phasianellus columbianus*)  
Shrub-Steppe (SS)

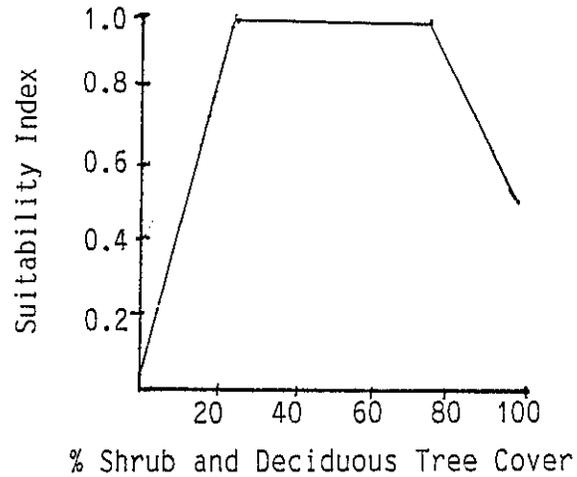
Draft 10/90

Winter Range

Variable 1: % Shrub and Deciduous Tree Crown Cover

V1 Field values:

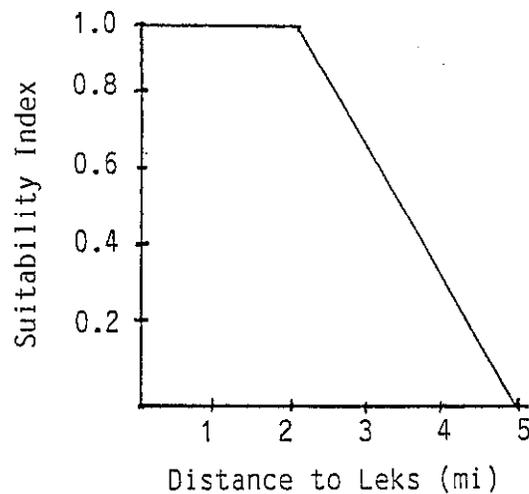
1 - 25% = 0.5  
25 - 75% = 1.0  
75 - 100% = 0.7  
0% = 0



Variable 2: Distance to Leks (mi)

V2 Field values:

0 - 2mi = 1.0  
2.1 - 3mi = 0.8  
3.1 - 4mi = 0.5  
4.1 - 5mi = 0.2  
> 5mi = 0



Sharp-Tailed Grouse  
 (Tympnanuchus phasianellus columbianus)  
 Shrub-Steppe (SS)

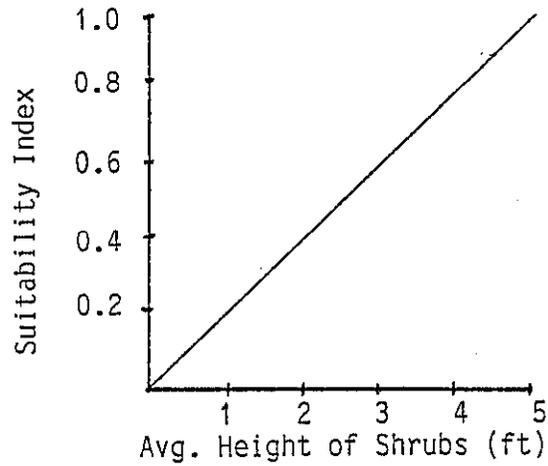
Draft 10/90

Winter Range

Variable 3: Avg Height of Shrubs (ft)

V3 Field values:

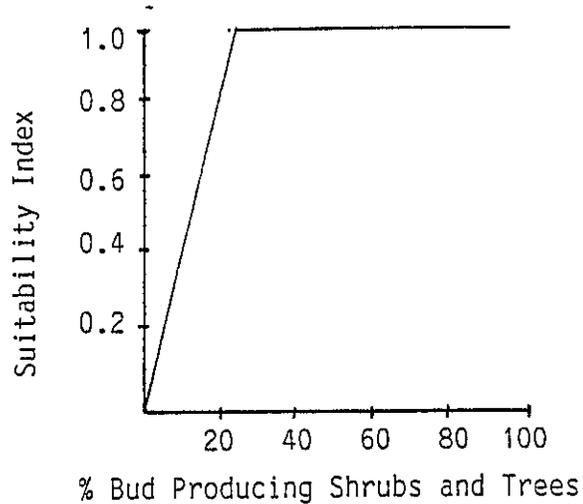
0 - 1 = 0  
 1.1 - 2 = 0.3  
 2.1 - 3 = 0.5  
 3.1 - 4 = 0.7  
 4.1 - 5 = 0.9  
 > 5 = 1.0



Variable 4: % Bud Producing Shrubs and Trees

V4 Field values:

0 - 5 = 0  
 6 - 15 = 0.2  
 16 - 25 = 0.7  
 > 25 = 1.0



$$HSI = \frac{(V1 \times V2 \times V3)^{1/2} + V4}{2}$$

## MULE DEER

### CHARACTERISTICS

Mule deer are best distinguished by the small black tipped tail, evenly forked antlers, and large (4 inch) scent gland inside the back leg.

### FOOD AND HABITAT REQUIREMENTS

The availability of adequate browse is often the limiting factor for mule deer populations over much of their range (Schneegas and Bumstead 1977). Browse often furnishes 75% or more of the mule deer's winter diet. Forbs and grasses are supplemental winter foods and their availability will result in an increased food value for mule deer. Quantity and quality of nutritious forage in the spring has a major effect on mule deer production and survival (Wallmo et al. 1977).

Thermal cover is provided by woody vegetation over 5 feet tall with a crown cover exceeding 50%. Hiding cover is defined as vegetation greater than 24 inches tall that can hide 90% of a bedded deer at 150 feet or less (Hall 1985). Topographic relief also provides hiding cover value as well as thermal protection from winds (Zender, Ashley, pers comm 1990).

### STATUS IN WASHINGTON

Overall deer populations in southeast Washington are not low now. However, if an extended series of droughts or severe winters significantly reduced current numbers, many herds could not rebuild very easily with the existing low buck/doe ratios. A ratio of about 15 bucks for every 100 does is needed for adequate reproduction. However, most southeast Washington mule deer herds have declined to less than 5 bucks per 100 does.

MULE DEER  
 [*Odocoileus hemionus*] .  
 Shrub-Steppe (SS)

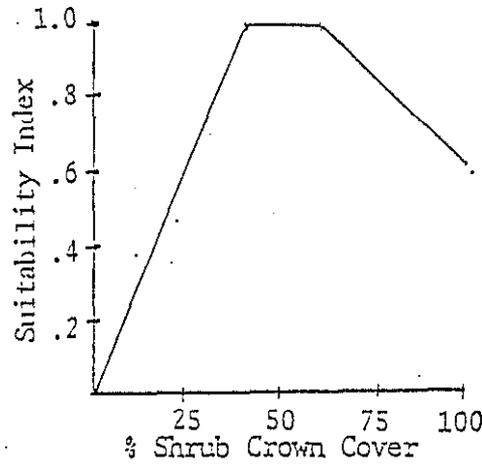
Draft 10/90  
 Corrected 10/90

Winter Habitat

Variable 1: Percent Shrub Crown Cover  $\leq$  5 ft in height  
 (do not consider small conifers as shrubs)

V1 Field values:

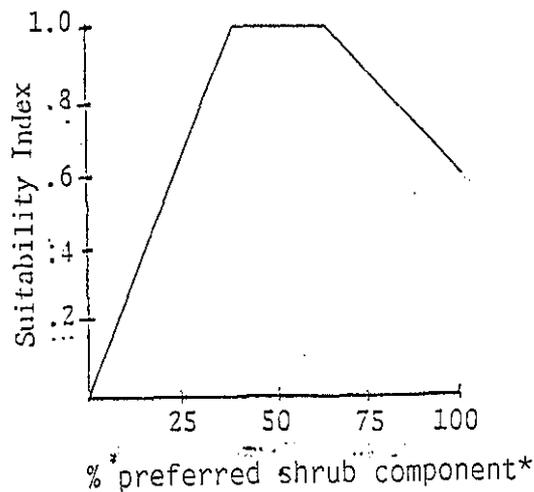
	0%	=	.0
	< 25%	=	.2
25	-	40%	= .7
41	-	60%	= 1.0
61	-	100%	= .8



Variable 2: Percent of shrub component consisting of preferred forage species  $\leq$  5 ft in height.

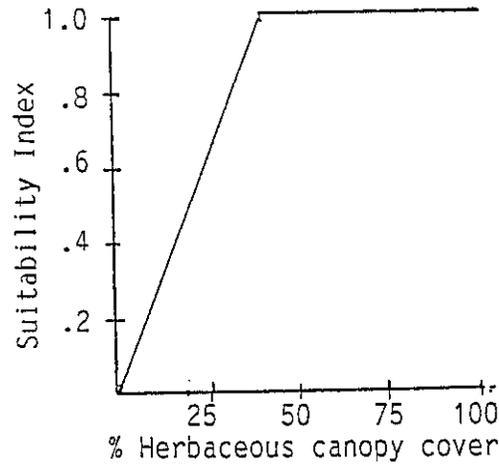
V2 Field values:

	0%	=	0
	< 25%	=	.2
25	-	40%	= .7
41	-	60%	= 1.0
61	-	100%	= .8



\* Preferred shrubs include, but are not limited to:  
 bitterbrush, serviceberry, nine bark, chokecherry, rose spp.,  
 squaw current, willow, water birch, aspen.

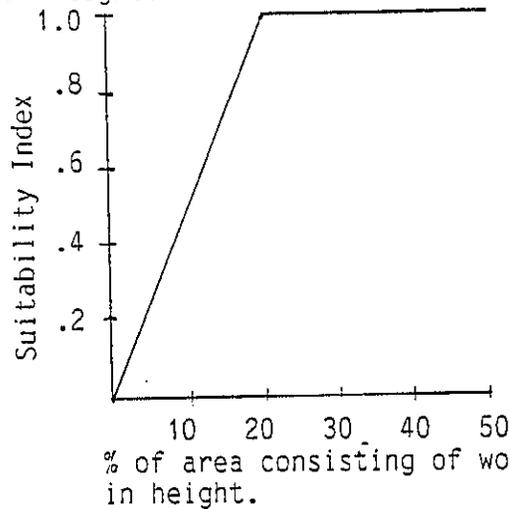
Variable 3: Percent herbaceous canopy cover.



V3 Field values:

- 0% = 0
- <25% = .2
- 25 - 40% = .7
- >40% = 1.0

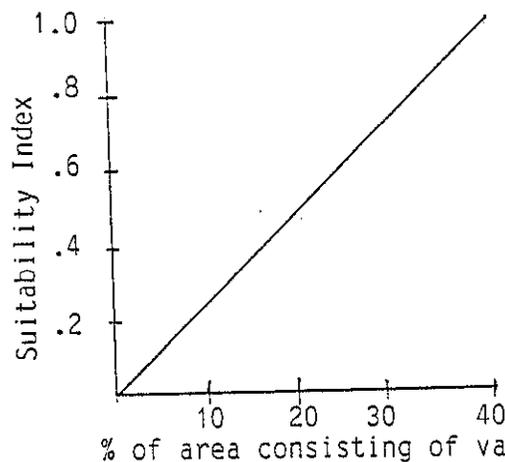
Variable 4: Percent of area consisting of woody evergreen vegetation  $\geq$  6 feet in height.



V4 Field values:

- 0% = 0
- 1 - 10% = .2
- 11 - 20% = .7
- >20% = 1.0

Variable 5: Percent of area consisting of variable topography.



V5 Field values:

- <10% = 0
- 10 - 20% = .3
- 21 - 30% = .6
- 31 - 40% = .8
- >40% = 1.0

$$HSI = \left[ \left( \frac{V1+V2+V3}{3} \right) \times \left( \frac{V4+V5}{2} \right) \right]^{1/2}$$

SAGE GROUSE  
(*Centrocercus urophasianus*)

CHARACTERISTICS

Sage grouse are very distinctive with a black belly, long pointed tail feathers and large size (28 inches in length). Excluding the recently introduced turkey, it is Washington's largest upland game bird, the males attaining a weight of over six pounds. The male is larger and more colorful than the female, with yellow eye combs, black throat and bib, and a large white ruff on its breast. In flight, the dark belly, absence of white outer tail feathers and its much larger size distinguish this bird from the sharp-tailed grouse.

FOOD AND HABITAT REQUIREMENTS

The sage grouse has a specialized digestive system. It possesses a thin-walled stomach adapted to a soft vegetable diet. All other gallinaceous game birds have thick-walled gizzards designed for grinding hard seeds. For this reason the sage grouse is inseparably linked with the sage brush plant for food. About 75% of the diet consists of sagebrush leaves. A minimum of 20% sagebrush cover is optimum. Forbs and insects are also important to the bird's nutritional requirements. Animal foods comprise up to 10% of the diet.

Typical sage grouse habitat consists of lightly-grazed areas of big sagebrush interspersed with grasses and forbs. Wet meadows and wheat fields adjoining such areas are extensively used.

Water is used daily when it is available, although sage grouse can go for long periods without drinking. The best populations are usually found near water.

BREEDING

The sage grouse is promiscuous in its mating habits. Beginning in early spring the males travel up to several miles to a central, open "strutting ground," where each day at dawn and dusk they strut and display before the hens. Courting males fan their tails and rapidly inflate and deflate their air sacs, emitting a loud popping sound. Mating occurs at the strutting ground. These areas, sometimes termed leks, are characterized by bare ground ranging from 0.1 to 100 acres. Leks are usually adjacent to nesting and rearing habitats. The nest is located on the ground, under a sagebrush or in a clump of ryegrass, and usually contains from 7 to 13 eggs. optimum nesting habitat has a minimum of 20% cover of sagebrush ranging from 7-30 inches in height. Sage grouse use the same leks and nesting sites year after year.

STATUS IN WASHINGTON

The sage grouse was formerly abundant wherever big sagebrush was present in eastern Washington. The large bird and its eggs were an important item in the diet of the early settlers of the area. Destruction of its habitat by plowing and sagebrush control, cattle grazing, over-shooting and perhaps unknown factors have drastically reduced its numbers, and it is now absent from most of its former range.

Sage Grouse  
( Centrocercus urophasianus )

Draft 10/90

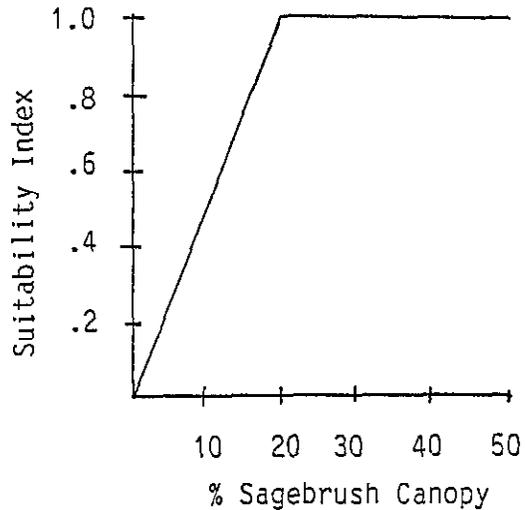
Shrub-Steppe ( SS )

Winter Habitat

Variable 1: Percent sagebrush canopy.

V1 Field Values:

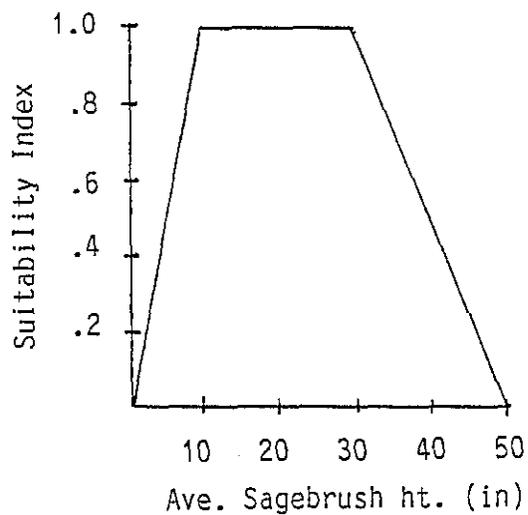
0% = 0  
1 - 10% = .2  
10 - 19% = .7  
20 - 50% = 1.0



Variable 2: Average sagebrush height (in)

V2 Field values:

0in = 0  
1 - 10in = .5  
10 - 30in = 1.0  
31 - 40in = .7  
41 - 50in = .3  
> 50in = 0



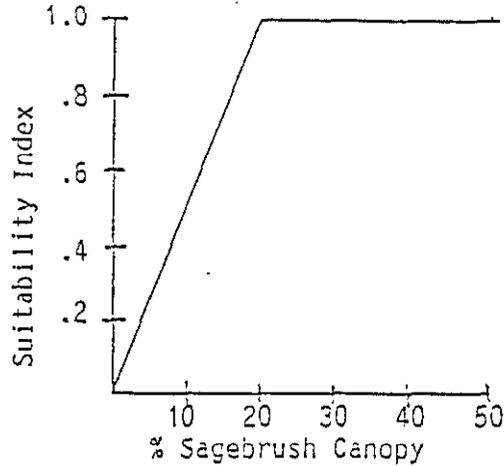
$$HSI = (V1 \times V2)^{1/2}$$

SAGE GROUSE  
 (Centrocercus urophasianus)  
 Shrub-steppe (SS)

DRAFT 10/90

Summer Habitat

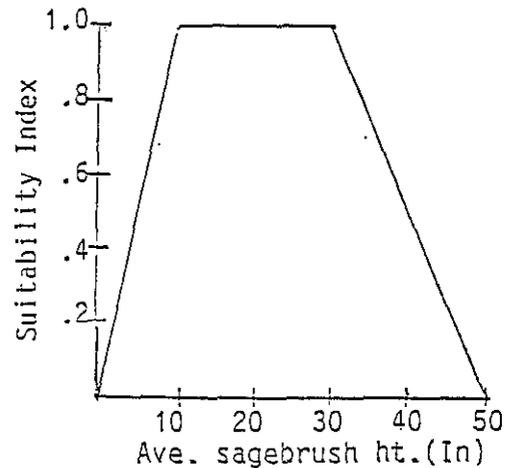
Variable 1: Percent sagebrush canopy.



V1 Field values:

<10% = .2  
 10 - 19% = .7  
 20 - 50% = 1.0

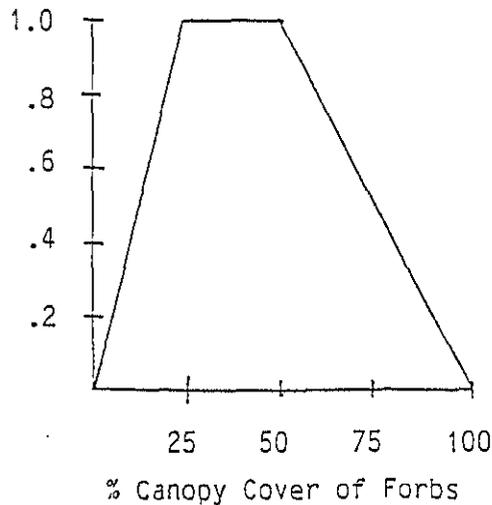
Variable 2: Average sagebrush height (In)



V2 Field values:

<10in. = .5  
 10 - 30in. = 1.0  
 31 - 40in. = .7  
 41 - 50in. = .3  
 >50in. = 0

Variable 3: Percent Canopy Cover of Forbs.

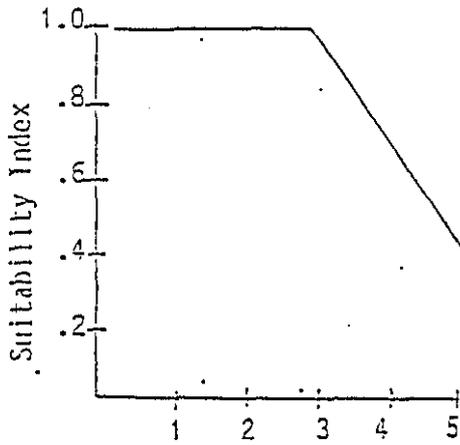


V3 Field Values:

0% = 0  
 1 - 25% = .5  
 25% - 50% = 1  
 51% - 75% = .7  
 75% - 100 = .3

Summer Habitat

Variable 4: Distance to Lek or area suitable for strutting (Mi)



V4 Field values: Miles

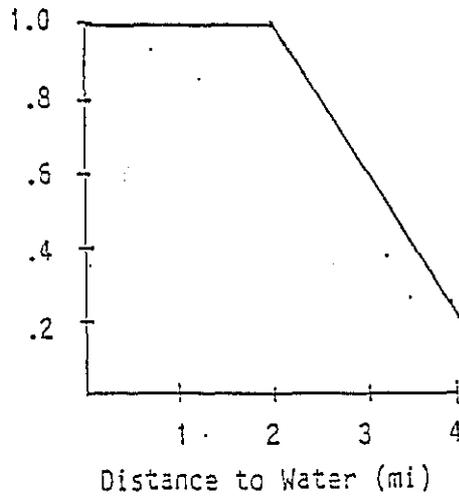
- 1 - 3mi. = 1.0
- 3.1 - 4mi. = .8
- 4.1 - 5mi. = .4

$$HSI = [(V1+V2+V4+V5)/4 \times V3]^{1/2}$$

Variable 5: Distance to Water (mi)

V5 Field Values:

- 0 - 2mi = 1.0
- 2.1 - 3mi = .8
- 3.1 - 4mi = .4
- 4.1 - 5mi = .1
- > 5mi = 0



PIGMY RABBIT  
(*Sylvilagus idahcensis*)

**CHARACTERISTICS**

Pygmy rabbits are, as their name implies, very small rabbits, the smallest in North America. They weigh only 1/2 to one pound. These diminutive rabbits are slate-gray on top, buff-colored on the belly, with cinchamon coloring on the legs, chest and nape of neck. Tail and legs are notably small. These rabbits are nocturnal to crepuscular (dawn and dusk) in their activity patterns and unlike cottontails, they do not display a white tail when running.

**FOOD AND HABITAT REQUIREMENTS**

Pygmy rabbits are found primarily in areas of sage and where the soil is rock-free and soft enough to dig burrows. A three foot depth is optimum. Undisturbed areas of big sage (*Artemisia tridentata wyomingensis*) are most important with optimum habitat at a minimum sage density of 20% cover. The rabbits dig their own burrows but will occasionally use abandoned badger burrows. Burrows usually have more than one opening, well-defined runways, and "scrapes" outside the burrow entrance in which the rabbits lay. Because they are a relatively slow moving rabbit, they do not range very far from their burrow entrances. The bulk of their diet year-round is sagebrush, although in the spring and summer they eat grasses and forbs as well.

**BREEDING**

Not much is known about the breeding habits of pygmy rabbits, but it is believed that the breeding season extends from early spring to mid-summer. Females can produce more than one litter per year. Between May and August females give birth to an average of six young. Young rabbits are independent at two months.

**STATUS IN WASHINGTON**

Pygmy rabbits are found in western Montana, southern Idaho, northern Utah, northern Nevada, southeastern Oregon, northeastern California, and eastern Washington. The population in Washington is disjunct from those in the other states.

In the early part of this century, pygmy rabbits were reported from several eastern Washington counties. Reports vary from common to "rare and of local occurrence." Their population has declined rapidly and their range has been drastically reduced in recent times. Mortality rate is estimated at 70%. Their number may be so low as to make detection very difficult. Being most active dusk to dawn makes their detection difficult as well.

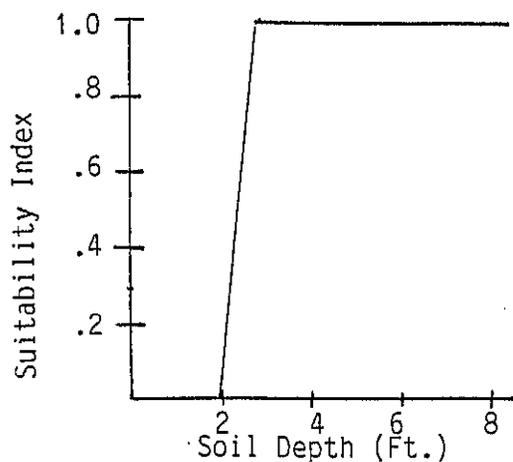
PYGMY RABBIT  
 (Sylvilagus idahoensis)  
 Shrub-steppe (SS)

Pygmy Rabbit Habitat Thresholds: \*

1. Soils must be soft and rock free versus hardpan and stony ( $\geq 2$  Ft. deep).
2. Wyoming Big Sage (Artemisia tridentata wyomingensis) is the sage brush sub-species preferred by Pygmy Rabbits.

\* Each site should be evaluated to determine the presence or absence of the threshold requisites. If one or both requisites are absent, do not evaluate further. Conversely, if both requisites are present continue through this draft model to determine baseline SI.

Variable 1: Soil depth parameters.



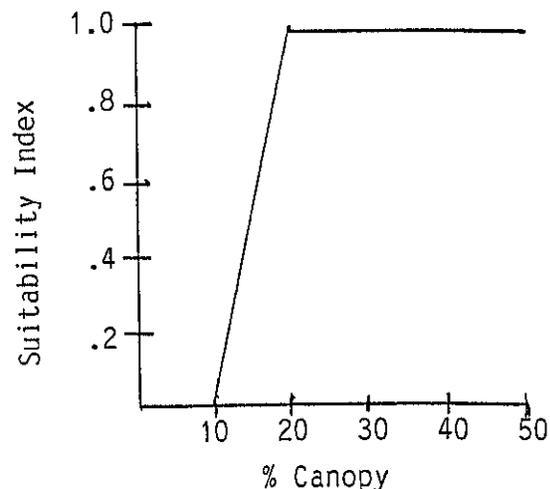
V1 Field Values:

<2' = 0  
 2' - 2'11" = .5  
>3' = 1.0

V2 Field Values:

<10% = 0  
 10 - 19% = .5  
>20% = 1.0

Variable 2: % Sagebrush Canopy



Variable 3: Food/Range Conditions.

SV1: Presence of immature Big Sage brush.

Present = 1.0

Absent = 0

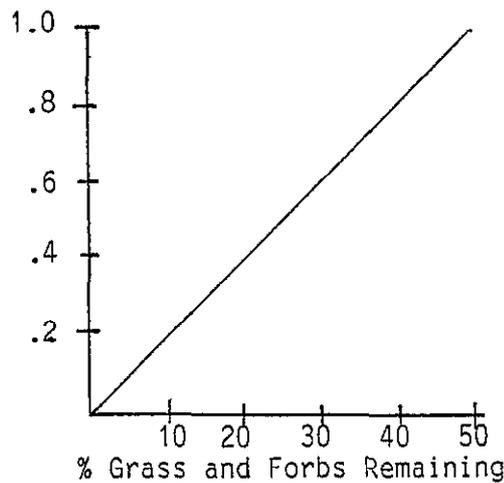
SV2: Current Range Conditions.

Good = 1.0

Fair = .5

Poor = 0

SV3: Percent of current year's grass and forb crop remaining.



SV3 Field Values:

> 50% = 1.0

41 - 50% = .9

31 - 40% = .7

21 - 30% = .5

11 - 20% = .3

0 - 10% = .1

$$SIV3 = \frac{SV1 + SV2 + SV3}{3}$$

$$HSI = \frac{V1 + (V2 \times V3)^{1/2}}{2}$$

Pygmy Rabbit Habitat Thresholds - Cont.\*\*

3. The minimum size of potential pygmy rabbit re-introduction sites should consist of a minimum of 640 acres of shrub-steppe which would include 320 acres of soft deep soils.

\*\* Threshold 3 should only be applied to potential re-introduction sites.

APPENDIX D

GRAND COULEE HABITAT EVALUATION  
PROCEDURE FIELD TEAM

The HEP Team measured wildlife habitat variables for each of the indicator species in the study area.

<u>HEP Member</u>	<u>Affiliation</u>
David Stevens	Sportsman/Landowner
Chris Merker	UCUT
Maureen Murphy	Colville Tribe
Todd Thompson	BLM
Craig Madsen	scs
Mike Finch	Landowner
Bill Rustemeyer	Landowner
Andy Rustemeyer	Landowner
Mike P. Kuttel	WDW
GINNA CORREA	WDW
Steve Judd	CCT
Chuck Perry	WDW
Paul Ashley	WDW
Tom Stralser	EWU
Craig Madsen	scs
Karen Taylor-Woodrich	NPS
Jim Romero	USBR
Don Schmander	Farmer
Ron Friesz	WDW
Jerry Hickman	WDW
Peter Paquet	NPPC
Joel Bich	YIN

WDW - Department of Wildlife  
 UCUT - Upper Columbia United Tribes  
 BLM - Bureau of Land Management  
 CCT - Colville Confederated Tribes  
 scs - Soil Conservation Service  
 NPPC - Northwest Power Planning Council  
 YIN - Yakima Indian Nation  
 USBR - United States Bureau of Reclamation  
 NPS - National Park Service  
 SC - Steering Committee  
 EWU - Eastern Washington University  
 NPS - National Park Service  
 USBR - United States Bureau of Reclamation

APPENDIX E

BASE LINE HABITAT EVALUATION PROCEDURE RESULTS OF PROPOSED PROJECT AREA

SITE	COUNTY	NUMBER OF ACRES	TOTAL HABITAT UNITS (HUs)	SHARP-TAILED GROUSE HUs	SAGE GROUSE HUs	MULE DEER HUs	PIGMY RABBIT HUs
1	Douglas	220	552	154	132	79	187
2	Douglas	180	343	126	108	1	108
3	Douglas	320	616	160	224	172	160

## APPENDIX F

### WASHINGTON DEPARTMENT OF WILDLIFE

#### List of State areas of recognized Species of Special Concern

The following code explanations pertain to the following species list:

#### STATE STATUS

CODE	<u>EXPLANATION</u>
SE	<u>STATE ENDANGERED</u> - Wildlife species native to the state of Washington that are seriously threatened with extinction throughout all or a significant proportion of their ranges within the state. Endangered species are legally designated in WAC 232-12-014.
ST	<u>STATE THREATENED</u> - Wildlife species native to the state of Washington that are likely to become endangered within the foreseeable future throughout significant portions of their ranges within the state without cooperative management or the removal of threats. Threatened species are legally designated in WAC 232-12-011.
ss	<u>STATE SENSITIVE</u> - Wildlife species native to the state of Washington that are vulnerable or declining and are likely to become endangered or threatened in a significant portion of their ranges within the state without cooperative management or the removal of threats. Sensitive species are legally designated in WAC 232-12-011.
SC	<u>STATE CANDIDATE</u> - Wildlife species that are under review by the Department for possible listing as endangered, threatened, or sensitive. A species will be considered for State Candidate designation if sufficient scientific evidence suggests that its status may meet criteria defined for endangered, threatened, or sensitive in WAC 232-12-297. Currently listed State Threatened or State Sensitive Species may also be designated as a State Candidate Species if their status is in question. State Candidate Species will be managed by the Department, as needed, to ensure the long-term survival of populations in Washington. They are listed in WDW Policy 4802.
SM	<u>STATE MONITOR</u> - Wildlife species native to the State of Washington that: <ol style="list-style-type: none"><li>1) were at one time classified as endangered, threatened, or sensitive;</li><li>2) require habitat that has limited availability during some portion of its life cycle;</li><li>3) are indicators of environmental quality;</li><li>4) require further field investigations to determine population status;</li><li>5) have unresolved taxonomy which may bear upon their status classification;</li><li>6) may be competing with and impacting other species of concern; or</li><li>7) have significant popular appeal.</li></ol> State monitor species will be managed by the department, as needed, to prevent them from becoming endangered, threatened, or sensitive.

Species already classified in a category that provides adequate management emphasis, survey work, and data maintenance (e.g., game animals, game birds, furbearers, etc.) will not be designated as State Monitor Species. Monitor species are designated in Wildlife Policy 4803.

FEDERAL STATUS

CODE	<u>EXPLANATION</u>
FE	<u>FEDERAL ENDANGERED</u> - A species in danger of extinction throughout all or a significant portion of its range.
FT	<u>FEDERAL THREATENED</u> - A species which is likely to become endangered within the foreseeable future.
FP	<u>FEDERAL PROPOSED</u> - A species that is the subject of a proposed or final rule indicating the appropriateness of listing as threatened or endangered.
FC1	<u>FEDERAL CANDIDATE CATEGORY 1</u> - A species that is a candidate for listing under the Endangered Species Act. U.S. Fish and Wildlife Service has substantial evidence to support listing es threatened and endangered species.
FC2	<u>FEDERAL CANDIDATE CATEGORY 2</u> - A species that is a candidate for listing under the Endangered Species Act. Listing is possibly appropriate but conclusive information is lacking.
FC3	<u>FEDERAL CANDIDATE CATEGORY 3</u> - A species that was once considered for listing under the Endangered Species Act which is no longer being considered.

Washington Department of Wildlife  
 Species of Special Concern  
 Jan. 22, 1992

Common name/Scientific name	State Status	Federal Status
-----		
Invertebrates		
Newcomb's littorine snail <i>Algamorda newcombiana</i>	SM	FC2
Giant Columbia River limpet <i>Fisherola nuttalli</i>	SC	FC2
Great Columbia River spire snail <i>Fluminicola columbiana</i>	SC	FC2
Beller's ground beetle <i>Agonum belleri</i>	SC	FC2
Long-horned leaf beetle <i>Donacia idola</i>	SC	FC3
Columbia River tiger beetle <i>Cicindela columbica</i>	SC	FC3
Hatch's click beetle <i>Eanus hatchii</i>	SC	FC2
Fender's soliperlan stonefly <i>Soliperla fenderi</i>		FC2
Silver-spotted skipper <i>Epargyreus clarui californicus</i>	SM	
Northern cloudy wing <i>Thorybes pylades</i>	SM	
Dreamy duskywing <i>Erynnis icelus</i>	SM	
Propertus duskywing <i>Erynnis propertius</i>	SM	
Pacuvius duskywing <i>Erynnis pacuvius lilius</i>	SM	
Afranius duskywing <i>Erynnis afranius</i>	SM	
Persios duskywing <i>Erynnis persius</i>	SM	
Alpine checkered skipper <i>Pyrgus centaureas loki</i>	SM	
Arctic skipper <i>Carterocephalus palaemon mandan</i>	SM	
Garita skipperling <i>Oarisma garita</i>	SM	
Juba skipper <i>Hesperia juba</i>	SM	
Oregon branded skipper <i>Hesperia comma oregonia</i>	SM	
Nevada skipper <i>Hesperia nevada</i>	SM	
Yellowpatch skipper <i>polites coras</i>	SM	
Mardon skipper <i>Polites mardon</i>	SC	

Washington Department of Wildlife  
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Common name/Scientific name	state status	Federal Status
-----		
Invertebrates (continued)		
Tawny-edged skipper	SM	
<i>Polites themistocles</i>		
Long-dash skipper	SM	
<i>Polites mystic</i> ssp.		
Sonora skipper	SM	
<i>Polites Sonora sonora</i>		
Sonora skipper	SM	
<i>Polites sonora siris</i>		
Coastal woodland skipper	SM	
<i>Ochlodes sylvanoides orecoasta</i>		
Bonneville skipper	SM	
<i>Ochlodes sylvanoides bonnevilla</i>		
Yuma skipper	SC	
<i>Ochlodes yuma</i>		
Dun skipper	SM	
<i>Euphyes vestris vestris</i>		
Kiowa skipper	SM	
<i>Euphyes vestris kiowa</i>		
Roadside skipper	SM	
<i>Amblyscirtes vialis</i>		
Shepard's parnassian	SC	
<i>Parnassius clodius shepardi</i>		
Eastern tiger swallowtail	SM	
<i>Papilio (Pterourus) glaucus canadensis</i>		
Checkered white	SM	
<i>Pieris (Pontia) protodice</i>		
Western sulphur	SM	
<i>Colias occidentalis occidentalis</i>		
Labrador sulphur	SM	
<i>Colias nastes streckeri</i>		
Lustrous copper	SM	
<i>Lycaena cuprea henryae</i>		
Edith's copper	SM	
<i>Lycaena editha editha</i>		
Ruddy copper	SM	
<i>Lycaena rubida perkinsorum</i>		
Purplish copper	SM	
<i>Lycaena helloides</i>		
Makah copper (Queen Charlotte copper)	SC	
<i>Lycaena mariposa charlottensis</i>		
Golden hairstreak	SC	
<i>Habrodais grunus herri</i>		
Coral hairstreak	SM	
<i>Harkenclenus titus immaculosus</i>		
Sylvan hairstreak	SM	
<i>Satyrium sylvinum sylvinum</i>		

Washington Department of Wildlife  
 Species of Special Concern  
 Jan. 22, 1992

Common name/Scientific name	State Status	Federal Status
-----		
Invertebrates (continued)		
Sylvan hairstreak <i>Satyrium sylvinum putnami</i>	SM	
Bramble green hairstreak <i>Callophrys dumetorum dumetorum</i>	SM	
Oregon green hairstreak <i>Callophrys dumetorum oregonensis</i>	SM	
Immaculate green hairstreak <i>Callophrys affinis affinis</i>	SM	
Canyon green hairstreak <i>Callophrys sheridanii neoperplexa</i>	SM	
Thicket hairstreak <i>Mitoura spinetorum spinetorum</i>	SM	
Johnson's (mistletoe) hairstreak <i>Mitoura johnsoni</i>	SC	
Arborvitae hairstreak <i>Mitoura rosneri rosneri</i>	SM	
Basin hairstreak <i>Mitoura barryi</i>	SC	
Juniper hairstreak <i>Mitoura siva ssp.</i>	SC	
Moss elfin <i>Incisalia mossii mossii</i>	SM.	
Hoary elfin <i>Incisalia polia obscura</i>	SM	
Shelton pine elfin <i>Incisalia eryphon sheltonensis</i>	SM	
Eastern tailed blue <i>Everes comyntas comyntas</i>	SM	
Branded azures <i>Celastrina argiolus echo</i>	SM	
Puget blue <i>Plebejus icarioides erymus</i>	SC	
High mountain blue <i>Agriades glandon megalo</i>	SM	
Puget sound silverspot <i>Speyeria cybele pugetensis</i>	SM	
Oregon silverspot <i>Speyeria serene hippolyta</i>	ST, SC	FT
Valley silverspot <i>Speyeria serene bremnerii</i>	SC	
Egleis fritillary <i>Speyeria egleis oweni</i>	SM	
Egleis fritillary <i>Speyeria egleis mcdunnoughi</i>	SM	
Hydaspe fritillary <i>Speyeria hydaspe rhodope</i>	SM	

Washington Department of Wildlife  
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Common name/Scientific name	State Status	Federal Status
-----		
Invertebrates (continued)		
Silver-bordered bog fritillary <i>Boloria selene atrocotalis</i>	SC	
Meadow fritillary <i>Boloria bellona</i> ssp.	SM	
Freya's fritillary <i>Boloria freiija freiija</i>	SM	
Astarte fritillary <i>Boloria astarte</i>	SM	
Northern checkerspot <i>Chlosyne palla palla</i>	SM	
Pasco pearl crescent. <i>Phyciodes "tharos" pascoensis</i>	SM	
Pale crescent <i>Phyciodes pallidus barnesi</i>	SM	
Perdiccas checkerspot <i>Euphydryas chalcedona perdiccas</i>	SM	
Snowberry checkerspot <i>Euphydryas chalcedona wallacensis</i>	SM	
Whulge checkerspot <i>Euphydryas editha taylori</i>	SC	
Oreas anglewing <i>Polygonia oreas</i>	SM	
Compton tortoiseshell <i>Nymphalis vau-album watsoni</i>	SM	
American painted lady <i>Vanessa virginiensis</i>	SM	
Viceroy <i>Limenitis archippus lahontani</i>	SM	
California sister <i>Adelpha bredowii californica</i>	SM	
Island ochre ringlet <i>Coenonympha "tullia" insulana</i>	S M	
Great grayling <i>Oeneis nevadensis gigas</i>	SC	
Chryxus arctic <i>Oeneis chryxus chryxus</i>	SM	
Valerata arctic <i>Oeneis chryxus valerata</i>	SM	FC3
Melissa arctic <i>Oeneis melissa beanii</i>	SM	
Fish		
Pygmy whitefish <i>Prosopium coulteri</i>	SM	

Washington Department of Wildlife  
 Species of Special Concern  
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Common name/Scientific name	State Status	Federal Status
-----		
Fish (continued)		
Redband trout		FC2
<i>Salmo</i> sp.		
Bull trout		FC2
<i>Salvelinus confluentis</i>		
Olympic mudminnow	SC	FC2
<i>Novumbra hubbsi</i>		
Lake chub	SM	
<i>Couesius plumbeus</i>		
Nooky dace	SM	
<i>Rhinichthys cataractae</i> ssp.		
Salish sucker	SM	
<i>Catostomus</i> sp.		
Mountain sucker	SM	
<i>Catostomus platyrhynchus</i>		
Sand roller	SM	
<i>Percopsis transmontana</i>		
Piute sculpin	SM	
<i>Cottus beldingi</i>		
Slimy sculpin	SM	
<i>Cottus cognatus</i>		
Riffle sculpin	SM	
<i>Cottus gulosus</i>		
Margined sculpin	SM	
<i>Cottus marginatus</i>		
Reticulate sculpin	SM	
<i>Cottus perplexus</i>		
Amphibians		
Tiger salamander	SM	
<i>Ambystoma tigrinum</i>		
Cope's giant salamander	SM	
<i>Dicamptodon copei</i>		
Olympic salamander	SM	
<i>Rhyacotriton olympicus</i>		
Dunn's salamander	SC	
<i>Plethodon dunni</i>		
Larch mountain salamander	SC	FC2
<i>Plethodon larselli</i>		
Van dyke's salamander	SC	
<i>Plethodon vandykei</i>		
Woodhouse's toad	SM	
<i>Bufo woodhousei</i>		
Tailed frog	SM	
<i>Ascaphus truei</i>		

Washington Department of Wildlife  
 Species of Special Concern  
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Common name/Scientific name	State Status	Federal Status
Amphibians (continued)		
Red-legged frog <i>Rana aurora</i>		FC2
Cascades frog <i>Rana cascadae</i>		FC2
Spotted frog <i>Rana pretiosa</i>	SC	FC2
Reptiles		
Western pond turtle <i>Clemmys marmorata</i>	ST, SC	FC2
Olive Ridley sea turtle <i>Lepidochelys olivacea</i>	SC	FT
Leatherback sea turtle <i>Dermochelys coriacea</i>	SE	FE
Green sea turtle <i>Chelonia mydas</i> -	ST	FT
Loggerhead sea turtle <i>Caretta caretta</i>	ST	FT
Southern alligator lizard <i>Elgaria multicarinata</i>	SM	
Sharp-tailed snake <i>Contia tenuis</i>	SM	
Ring-necked snake <i>Diadophis punctatus</i>	SM	
Night snake <i>Hypsiglena torquata</i>	SM	
California mountain kingsnake <i>Lampropeltis zonata</i>	SC	
Striped whipsnake <i>Masticophis taeniatus</i>	SC	
Pacific gopher snake <i>Pituophis melanoleucus catenifer</i>	SM	
Birds		
common loon <i>Gavia immer</i>	SC	
Horned grebe <i>Podiceps auritus</i>	SM	
Red-necked grebe <i>Podiceps grisegena</i>	SM	
Western grebe <i>Aechmophorus occidentalis</i>	SM	
Clark's grebe <i>Aechmophorus clarkii</i>	SM	

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Common name/Scientific name	state status	Federal Status
Birds (continued)		
American white pelican <i>Pelecanus erythrorhynchos</i>	SE	
Brown pelican <i>Pelecanus occidentalis</i>	SE	FE
Brandt's cormorant <i>Phalacrocorax penicillatus</i>	SC	
Great blue heron <i>Ardea herodias</i>	SM	
Great egret <i>Casmerodius albus</i>	SM	
Green-backed heron <i>Butorides striatus</i>	SM	
Black-crowned night-heron <i>Nycticorax nycticorax</i>	SM	
Aleutian Canada goose <i>Branta canadensis leucopareia</i>	SE	FE
Harlequin duck <i>Histrionicus histrionicus</i>		FC2
Turkey vulture <i>Cathartes aura</i>	SM	
osprey <i>Pandion haliaetus</i>	SM	
Bald eagle <i>Haliaeetus leucocephalus</i>	ST	FT
Northern goshawk <i>Accipiter gentilis</i>	SC	FC2
Swainson's hawk <i>Buteo swainsoni</i>	SC	
Ferruginous hawk <i>Buteo regalis</i>	ST	<b>FC2</b>
Golden eagle <i>Aquila chrysaetos</i>	SC	
Merlin <i>Falco columbarius</i>	SM	
Peregrine falcon <i>Falco peregrinus</i>	SE	FE
Gyrfalcon <i>Falco rusticolus</i>	SM	
Prairie falcon <i>Falco mexicanus</i>	SM	
Sage grouse <i>Centrocercus urophasianus</i>	SC	FC2
Sharp-tailed grouse <i>Tympanuchus phasianellus</i>	SC	FC2
Mountain quail <i>Oreortyx pictus</i>		FC2

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Common name/Scientific name	state status	Federal Status
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Birds (continued)

Sandhill crane <i>Grus canadensis</i>	SE	
Snowy plover <i>Charadrius alexandrinus</i>	SE	FC2
Black-necked stilt <i>Himantopus mexicanus</i>	SM	
Upland sandpiper <i>Bartramia longicauda</i>	SE	
Long-billed curlew <i>Numenius americanus</i>	SM	FC2
Caspian tern <i>Sterna caspia</i>	SM	
Arctic tern <i>Sterna paradisaea</i>	SM	
Forster's tern <i>Sterna forsteri</i>	SM	
Black tern <i>Chlidonias niger</i>	SM	FC2
Marbled murrelet <i>Brachyramphus marmoratus</i>	SC	FP
Yellow-billed cuckoo <i>Coccyzus americanus</i>	SC	
Flemmulated owl <i>otus flammeolus</i>	SC	
Snowy owl <i>Nyctea scandiaca</i>	SM	
Burrowing owl <i>Athene cunicularia</i>	SC	
Spotted owl <i>Strix occidentalis</i>	SE	FT
Barred owl <i>Strix varia</i>	SM	
Great gray owl <i>Strix nebulosa</i>	SM	
Boreal owl <i>Aegolius funereus</i>	SM	
Black swift <i>Cypseloides niger</i>	SM	
Vaux's swift <i>Chaetura vauxi</i>	SC	
Lewis' woodpecker <i>Melanerpes lewis</i>	SC	
White-headed Woodpecker <i>Picoides albolarvatus</i>	SC	
Three-toed woodpecker <i>Picoides tridactylus</i>	SM	

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<u>Common name/Scientific name</u>	<u>State Status</u>	<u>Federal Status</u>
Birds (continued)		
Black-backed woodpecker Picoides arcticus	SM	
Pileated woodpecker Dryocopus pileatus	SC	
Gray flycatcher Empidonax wrightii	SM	
Ash-throated flycatcher Myiarchus cinerascens	SM	
Streaked horned lark Eremophila alpestris strigata	SM	
Purple martin Progne subis	SC	
Boreal chickadee Parus hudsonicus	SM	
Western bluebird Sialia mexicana	SC	
Sage thrasher Oreoscoptes montanus	SC	
Loggerhead shrike Lanius ludovicianus	SC	FC2
Green-tailed towhee Pipilo chlorurus	SC	
Oregon vesper sparrow Poocetes gramineus affinis	SM	
Sage sparrow Amphispiza belli	SC	
Grasshopper sparrow Annodramus savannarum	SM	
Lesser goldfinch Carduelis psaltria	SM	
Mammals		
Prebles shrew Sorex preblei	SM	FC2
Pacific water shrew Sorex bendirii	SM	
Destruction Island shrew Sorex trowbridgii destructioni		FC2
Merriam's shrew Sorex merriami	SC	
Pygmy shrew Sorex hoyi	SC	
Keen's myotis Myotis keenii	SM	

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Common name/Scientific name	State Status	Federal Status
Mammals (continued)		
Long-eared myotis Myotis evotis	SM	
Fringed myotis Myotis thysanodes	SM	
Long-legged myotis Myotis volans	SM	
Small-footed myotis Myotis leibii	SM	
Western pipistrelle Pipistrellus hesperus	SM	
Red bat Lasiurus borealis	SM	
Townsend's big-eared bat Plecotus townsendii	SC	FC2
Pallid bat Antrozous pallidus	SM	
Pygmy rabbit Brachylagus idahoensis	ST, SC	FC2
Red-tailed chipmunk Tamias ruficaudus	SM	
Washington ground squirrel Spermophilus washingtoni	SM	
Western gray squirrel Sciurus griseus	SC	
Brush prairie pocket gopher Thomomys talpoides douglasi	SC	
White salmon pocket gopher Thomomys talpoides limosus	SM	
Tacoma pocket gopher Thomomys mazama tacomensis		FC2
Shelton pocket gopher Thomomys mazama couchi	SC	
Roy prairie pocket gopher Thomomys mazama glacialis	SC	FC2
Cathlamet pocket gopher Thomomys mazama louiei	SC	FC2
Olympic pocket gopher Thomomys mazama melanops	SM	
Tenino pocket gopher Thomomys mazama tumuli	SC	
Ord's kangaroo rat Dipodomys ordii	SM	
Northern grasshopper mouse Onychomys leucogaster	SM	
Kincaid's meadow vole Microtus pennsylvanicus kindaidi	SM	FC2

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Common name/Scientific name	State Status	Federal Status
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Mammals (continued)

Gray-tailed vole	SM	
Microtus canicaudus		
Shaw Island vole		FC2
Microtus townsendii pugeti		
Sagebrush vole	SM	
Lagurus cutatus		
Northern bog lemming	SM	
Synaptomys borealis		
Gray wolf	SE	FE
Canis lupus		
Grizzly bear	SE	FT
Ursus arctos		
Northern sea lion	SC	FT
Eumetopias jubatus		
California sea lion	SM	
Zalophus californianus		
Fisher	SC	FC2
martes pennanti		
Wolverine	SM	FC2
Gulo gulo		
Sea otter	SE	
Enhydra lutris		
Harbor seal	SM	
Phoca vitulina		
Lynx	SC	FC2
Lynx canadensis		
Gray whale	SE	FE
Eschrichtius robustus		
Sei whale	SE	FE
Balaenoptera borealis		
Fin whale	SE	FE
Baleonoptera physalus		
Blue whale	SE	FE
Balaenoptera musculus		
Hump-backed whale	SE	FE
Megaptera novaeangliae		
Black right whale	SE	FE
Balaena glacialis		
Killer whale	SM	
Orcinus orca		
Pacific harbor porpoise	SC	
Phocoena phocoena		
Dali's porpoise	SM	
Phocoenoides dalli		
Sperm whale	SE	FE
Physeter macrocephalus		

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Common name/Scientific name	state status	Federal Status
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Mammals (continued)		
Columbia white-tailed deer Odocoileus virginianus leucurus	SE	FE
Mountain caribou Rangifer tarandus	SE	FE
California bighorn sheep Ovis canadensis californiana		FC2

## APPENDIX G

### INFORMATION ON LIMITED LIABILITY

**4.24.200 Liability of owners or others in possession of land and water areas for injuries to recreation users-Purpose.** The purpose of RCW 4.23.200 and 4.242 10 is to encourage owners or others in lawful possession and control of land and water areas or channels to make them available to the public for recreational purposes by limiting their liability toward persons entering thereon and toward persons who may be injured or otherwise damaged by the acts or omissions of persons entering thereon. [ 1969 ex.s. c 24 § 1; 1967 c 216 § 1.]

**4.24.210 Liability of owners or others in possession of land and water areas for injuries to recreation users-Limitation.** Any public or private landowners or others in lawful possession and control of any lands whether rural or urban, or water areas or channels and lands adjacent to such areas or channels, who allow members of the public to use them for the purposes of outdoor recreation, which term includes, but is not limited to, the cutting, gathering, and removing of firewood by private persons for their personal use without purchasing the firewood from the landowner, hunting, fishing, camping, picnicking, swimming, hiking, bicycling, the riding of horses or other animals, clamdigging, pleasure driving of off-road vehicles, snowmobiles, and other vehicles, boating, nature study, winter or water sports, viewing or enjoying historical, archaeological, scenic, or scientific sites, without charging a fee of any kind therefore. shall not be liable for unintentional injuries to such users: *Provided*, That any public or private landowner. or others in lawful possession and control of the land, may charge an administrative fee of up to ten dollars for the cutting, gathering, and removing of firewood from the land: *Provided further*, That nothing in this section shall prevent the liability of such a landowner or others in lawful possession and control for injuries sustained to users by reason of a known dangerous artificial latent condition for which warning signs have not been conspicuously posted: *Provided further*, That nothing in RCW 4.24.200 and 4.X.210 limits or expands in any way the doctrine of attractive nuisance: *And provided further*, That the usage by members of the public is permissive and does not support any claim of adverse possession. [ 190 c 111 § 1; 1979 c 53 § 1; 1972 ex.s. c 153 § 17; 1969 ex.s. c 24 § 2; 1967 c 216 § 2.]

APPENDIX H

LISTS OF WILDLIFE AND PLANT SPECIES CITED IN THIS PLAN

<u>Common Name</u>	<u>Scientific Name</u>
Birds	
Sharp-tailed grouse	<u>Tympanuchus phasianellus</u>
Sage grouse	<u>Centrocercus urophasianus</u>
Sage sparrow	<u>Amphispiza belli</u>
Sage thrasher	<u>Oreoscoptes montanus</u>
Ash-throated fly catcher	<u>Myiarchus cinerascens</u>
Grasshopper sparrow	<u>Ammodramus savannarum</u>
Brewer's sparrow	<u>Spizella breweri</u>
Lark sparrow	<u>Chondestes grammacus</u>
Burrowing owl	<u>Athene cunicularia</u>
Snowy owl	<u>Nyctea scandiaca</u>
Ferruginous hawk	<u>Buteo regalis</u>
Swainson's hawk	<u>Buteo swainsoni</u>
Prairie falcon	<u>Falco mexicanus</u>
Gyr Falcon	<u>Falco rusticolus</u>
Golden eagle	<u>Aquila chrysaetos</u>
Bald eagle	<u>Haliaeetus leucocephalus</u>
Rock wren	<u>Salpinctes obsoletus</u>
Hungarian partridge	<u>Perdix perdix</u>
California quail	<u>Callipepla californica</u>
Ringneck pheasant	<u>Phasianus colchicus</u>
Meadow lark	<u>Sturnella neglecta</u>
Horned lark	<u>Eremophila alpestris</u>
Barn swallow	<u>Hirundo rustica</u>
Mammals	
Pygmy rabbit	<u>Brachylagus idahoensis</u>
White-tailed jackrabbit	<u>Lepus townsendi</u>
Sagebrush vole	<u>Lagurus curtatus</u>
Black-tailed jackrabbit	<u>Lepus californicus</u>
Nuttall's cottontail	<u>Sylvilagus nuttallii</u>
Mule deer	<u>Odocoileus hemionus</u>
White-tailed deer	<u>Odocoileus virginianus</u>
Coyote	<u>Canis latrans</u>
Badger	<u>Taxidea taxus</u>
Northern pocket gopher	<u>Thomomys talpoides</u>
Merriam shrew	<u>Sorex merriami</u>
Bobcat	<u>rufus</u>
Wood rat	<u>Neotoma cinerea</u>
Yellow-bellied marmot	<u>Marmota flaviventris</u>
Deer mouse	<u>Peromyscus maniculatus</u>
Pocket mice	<u>Perognathus parvus</u>

Amphibians/Reptiles

Long-toed salamander	<u>Ambystomamacrodactylum</u>
Tiger salamander	<u>Ambystoma tigrinum</u>
Horned lizard	<u>Phrynosoma douglassi</u>
Sagebrush lizard	<u>Sceloporus graciosus</u>
Spotted frog	<u>Rana pretiosa</u>
Rattlesnake	<u>Crotalus viridis oreganus</u>

Shrubs/Trees

Wyoming big sagebrush	<u>Artemisia tridentata wyomingensis</u>
Big sagebrush	<u>Artemisia tridentata</u>
Three-tipped sagebrush	<u>Artemisia tripartita</u>
Stiff sagebrush	<u>Artemisia rigida</u>
Rabbitbrush	<u>Chrysothamnus nauseosus</u>
Chokecherry	<u>Prunus virginiana</u>
Serviceberry	<u>Amelanchier alnifolia</u>
currant	<u>Ribes cereum</u>

Grass/Forbs/Hydrophytes

Idaho fescue	<u>Festuca idahoensis</u>
Blue-bunch wheatgrass	<u>Agropyron spicatum</u>
Needle and thread	<u>Stipa comata</u>
Cheat grass	<u>Bromus tectorum</u>
Sandberg bluegrass	<u>Poa sandbergii</u>
Wild rye	<u>junceus</u>
Buckwheat	<u>Eriogonum spp.</u>
Yarrow	<u>Achilles millefolium</u>
Balsamroot	<u>Balsamorhiza sagittata</u>
Tumbling mustard	<u>Sisymbrium altissimum</u>
Lupine	<u>Lupinus spp.</u>
Phlox	<u>Phlox longifolia</u>
Wheat	<u>Triticum aestivum</u>
Barley	<u>Hordeum spp.</u>
Cusick bluegrass	<u>Poa cusickii</u>
Aster	<u>Aster spp.</u>
Lomatium (desert parsley)	<u>Lomatium grayi</u>
Astragalus (locoweed)	<u>Astragalus spp.</u>
Erigeron (daisy)	<u>Erigeron spp.</u>
Hieracium (hawkweed)	<u>Hieracium spp.</u>

## APPENDIX I

### PUBLIC OUTREACH SUMMARY, GRAND COULEE/CHIEF JOSEPH DAM WILDLIFE MITIGATION

The following list includes presentations, meetings, and consultations with individuals, agencies, and state/local elected officials. News releases, newspaper editorials, brochures, and television coverage were used whenever possible to enhance the effectiveness of the Public Outreach Program.

- o       **2-89**        Briefing to membership of Lake Roosevelt Forum.
- o       **4-05-89**      Briefing to representatives of Washington Department of Community Development.
- o       **4-11-89**      Briefing to representatives of Washington Quail Unlimited organization.
- o       **4-21-89**      Briefing to membership of Lake Roosevelt Forum.
- o       **4-24-89**      Consultation with Montana NPPC member John Brenda.
- o       **5-05-89**      Consultation with Washington NPPC member Ted Bottiger.
- o       **5-25-69**      Briefing to representatives of Ephrata Sportsmen Club.
- o       **6-05-89**      Briefing to Washington Department of Wildlife's Wildlife Advisory Council.
- o       **6-07-89**      Briefing to Washington Wildlife Commission, telephone conference.
- o       **8-12-69**      Briefing before Washington Wildlife Commission.
- o       **8-30-89**      Consultation with Washington NPPC member Tom Trulove and Lake Roosevelt Forum.
- o       **9-05-09**      Spokane Columbia River Wildlife Mitigation Public Outreach meeting.
- o       **9-06-09**      Wenatchee Columbia River Wildlife Mitigation Public Outreach meeting.
- o       **Q-07-89**      Yakima Columbia River Wildlife Mitigation Public Outreach meeting.
- o       **Q-11-69**      Vancouver Columbia River Wildlife Mitigation Public Outreach meeting.
- o       **Q-13-69**      Seattle Columbia River Wildlife Mitigation Public Outreach meeting.

- 0 9-15-09 Briefing of House Natural Resources and Perks Committee of Washington Legislature.
- 0 10-24-89 Briefing of Washington State Senator Scott Barr, local residents, end elected officials in the vicinity of Davenport.
- 0 11-03-89 Briefing of Senate Environmental end Natural Resources Committee of Washington Legislature.
- 0 11-22-89 Briefing to Washington State Representative Steve Fuhrman, local residents, end elected officials in the vicinity of Kettle Falls.
- 0 11-30-89 Consultation with major agencies end tribes on draft Grand Coulee Dam wildlife mitigation goals end the Power Planning process (National Perk Service, Bureau of Reclamation, U.S. Fish end Wildlife Service, Colville Tribe, Spokane Tribe, end NPPC staff).
- 0 12-15-89 Public review document regarding Grand Coulee Wildlife Mitigation Plan end prioritized goals made available to local government using DCD Intergovernmental Review Process.
- 0 1-08-90 Consultation with The Nature Conservancy on Columbia River wildlife mitigation.
- 0 1-15-90 Public review document regarding Grand Coulee Wildlife Mitigation Plan and prioritized goals. Mailed to over 700 individuals end organizations statewide with a 30-day written input period.
- 0 I-20-90 Consultation with local public and government end conservation/environmental groups in Chewelah. In cooperation with local end state elected officials, the Grand Coulee Wildlife Mitigation Advisory Group was established, consisting of approximately 50 members.
- 0 Z-07-90 Local government/Grand Coulee Advisory Group consultation to collect formal input on Grand Coulee mitigation goals and to provide background information on the loss statement and Columbia River mitigation planning process.
- 0 Z-12-90 Davenport public hearing to obtain formal input on Grand Coulee mitigation goals end to provide background information on the loss statement and Columbia River mitigation planning process.
- 0 Z-13-90 Kettle Falls public hearing to obtain formal input on Grand Coulee mitigation goals end to provide background information on the loss statement end Columbia River mitigation planning process.

- 0 3-22-90 Grand Coulee Wildlife Mitigation Advisory Group meeting. Grand Coulee Wildlife Mitigation Steering Committee created as a five-member subset of the Advisory Group.
- 0 4-16-90 Grand Coulee Wildlife Mitigation Steering Committee meeting.
- 0 4-18-90 Consultation with Ephrata Sportsmen Association on Columbia River wildlife mitigation end Banks Lake.
- 0 5-14-90 Grand Coulee Wildlife Mitigation Steering Committee meeting.
- 0 5-29-90 Consultation with BPA on preliminary Grand Coulee wildlife mitigation strategies.
- 0 6-04-90 Lincoln County Wheat Growers meeting in Herrington.
- 0 6-06-90 Consultation with BPA on Chief Joseph Dam mitigation planning study "Statement of Work."
- 0 6-07-90 Meeting with BLM concerning wildlife management strategies on BLM property in Lincoln County.
- o 6-11-90 Grand Coulee Wildlife Mitigation Steering Committee meeting.
- o 6-13-90 Briefing to Davenport Conservation District Board.
- o 6-19-90 Demonstration project briefing with Lee Smith, WDW legislative representative.
- 0 6-21-90 Consultation with Lincoln County Commissioner Andy Rustemeyer concerning the demonstration project.
- 0 6-25-90 Consultation with BLM area office staff concerning a tour of potential public-owned mitigation sites.
- 0 6-28-90 Briefing to Ed Menning, National Park Service, Seattle, concerning National Park participation in Grand Coulee wildlife mitigation.
- o 7-02-90 Briefing to Lincoln County Commissioners in Davenport.
- o 7-12-90 Toured BLM lands in Lincoln County.
- o 7-16-90 Conducted a tour of Lincoln County shrub-steppe habitat with BPA representatives.
- 0 7-26-90 Briefed the Davenport Chamber of Commerce on project history, project objectives and goals, and estimated program costs.
- 0 7-27-90 Consultation with BPA representatives concerning project advance design requirements.

- 0 7-31-90 Briefed the NPPC Wildlife Advisory Committee on WDW mitigation efforts, shrub-steppe habitat, end the WDW Public Outreach Program.
- 0 **8-02-90** Grand Coulee Wildlife Mitigation Steering Committee meeting.
- 0 **8-03-90** Consultation with BLM representatives end toured BLM properties for potential inclusion into current mitigation strategies.
- o **B-07-90** Consultation with Wildlife Scoping Group concerning project prioritization.
- o Q-06-90 Briefing to Stevens County Commissioner Allen Mack.
- o Q-10-90 Grand Coulee Wildlife Mitigation Committee meeting.
- o Q-14-90 Consultation with NPPC members Bottiger end Trulove on Columbia River wildlife mitigation, the implementation process, end WDW Grand Coulee mitigation project proposals.
- o Q-27-90 Consultation with PNUCC end WDW representatives to develop a HEP model for pygmy rabbits.
- o 10-11-90 Consultation with NPS representative Karen Taylor Goodrich.
- o 10-15-90 Consultation with EWU Research Unit Biologists Chris Merker end Tom Stralser.
- o 10-22-90/  
**10-25-90** Tracy Rock field measurements for HEP. Individuals representing UCUT, CCT, WDW, BLM, SCS, NPPC, YIN, USBR, NPS, EWU, Lincoln County Commissioners, and private landowners participated in the HEP analysis.
- o 11-13-90 Briefing with Grand Coulee Steering Committee concerning HEP evaluation results.
- o 12-04-90 Consultation with NPS, peregrine fund, BOR regarding Lake Roosevelt mitigation proposal to reestablish peregrine falcon.
- o 12-07-90 Briefing with Tracy Rock area landowners regarding results of the HEP process.
- o 12-10-90 Submitted outline of Chief Joseph Wildlife Mitigation Planning Study to the Department of Community Development for inclusion in the Washington intergovernmental review process (Federal Clearing House Process).
- o 12-13-90 Discussed status of project with Lincoln County Commissioner Andy Rustemeyer.
- o 1-03-91 Grand Coulee/Chief Joseph Wildlife Mitigation Steering Committee meeting.

- 0 1-10-91 Meeting with Harold Roloff (landowner) and John Martin (TWC).
- o 1-15-91 Consultation with NPPC member Bottiger on Public Outreach Program for Columbia River wildlife mitigation.
- o 2-01-91 Beginning of Chief Joseph Dam Wildlife Mitigation Planning Study. WDW as lead agency for BPA-funded study.
- o 2-07-91 Consultation with BPA on predesign contract elements for Lincoln County sharp-tailed grouse and Douglas County Pygmy Rabbit Project proposals (Grand Coulee mitigation).
- o 2-21-91 First meeting of Chief Joseph Wildlife Mitigation Planning Study Interagency Technical Working Group. Members include WDW, CCT, NPPC, BPA, PNUCC, COE, USFWS, BLM, and UCRC.
- 0 3-01-91 Began interviews with local landowners in the Chief Joseph study area: Lee and Joan Hanford, Paul Benson, Tex Troutman, Charles and Sharon Hammon.
- o 3-05-91 Meeting with Douglas County Wheat Growers Association. Reviewed the status of Columbia River wildlife mitigation.
- o 3-06-91 Grand Coulee/Chief Joseph Wildlife Mitigation Steering Committee meeting.
- o 3-08-91 Interviews about study area with Melvin and Shine Thoren, and Lee Hemmer, landowners, Douglas County.
- o 3-12-91 Consultation with BPA concerning components of WDW statement of work for Tracy Rock sharp-tailed grouse proposal and Douglas County Pygmy Rabbit Project.
- 0 3-18-91 Briefing with Dave Dormaier (Douglas County landowner) and Douglas County SCS representatives regarding pygmy rabbit management plans and conservation easement terms.
- o 3-21-91 Briefing with Douglas County Steering Committee members regarding the status of the Columbia River Mitigation Program.
- o 4-04-91 Meeting with COE, reviewed Rufus Woods Lake and mitigation sites for ten-foot pool rise.
- o 4-08-91 Chief Joseph Wildlife Mitigation Planning Study Interagency Technical Working Group meeting.
- o 4-10-91 Chief Joseph Project Biologists join COE for trip to Bailey Basin and Buckley Bar on Rufus Woods Lake.
- o 4-10-91 Chief Joseph Project Biologists gave an update to the Ephrata Sportsmen Club about the project.
- o 4-17-91 Chief Joseph Wildlife Mitigation Planning Study public meeting in Bridgeport.

- 4-25-91 Meeting with Melba Cannon and Shine Thoren; discussed "Bridgeport: A Collection of Memories."
- 4-30-91 Project Biologists' meeting in Olympia with USFWS to go over HEP models and target species.
- 5-01-91 Project Biologists reviewed original land survey notes of Chief Joseph Study area at Department of Natural Resources, Olympia.
- 5-06-91 Grand Coulee pre-design contract begins; funded by BPA.
- 5-08-91 Chief Joseph Wildlife Mitigation Planning Study Interagency Technical Working Group meeting, and tour of Rufus Woods Lake.
- 5-09-91 Project Biologists, USFWS, and COE looked at staging areas, spoil piles, and started planning HEP in field.
- 5-15-91 Project Biologists went to Waterville Soil Conservation Service, Douglas County Courthouse, and Waterville Museum.
- 5-30-91 Grand Coulee/Chief Joseph Wildlife Mitigation Steering Committee meeting, Spokane.
- 6-03-91 through 6-06-91 Contacted 30 local landowners for permission to enter their land for HEP study.
- 6-06-91 Project Biologists met with COE and USFWS; did preliminary HEP field work.
- 6-10-91 through 6-18-91 Chief Joseph Wildlife Mitigation Habitat Evaluation Procedure field study.
- 7-10-91 Grand Coulee/Chief Joseph Wildlife Mitigation Advisory Group meeting.
- 7-16-91 Project Biologists met with COE to discuss aerial photographs of non-inundated (impacted) areas.
- 7-30-91 through 7-31-91 Chief Joseph Wildlife Mitigation HEP grab samples on Rufus Woods Lake.
- E-09-91 Talked to Dick Thompson, retired Game Protector, Department of Game, Electric City.
- 8-21-91 Chief Joseph Wildlife Mitigation Technical Working Group meeting, Ephrata.
- Q-03-91 Talked to Jack Wells, landowner, about study area.

- 9-06-91 Project Biologists met with Jay Weber (Douglas County Commissioner) and later interviewed Harold Weber (longtime area resident landowner).
- 9-11-91 Project Biologists gave an update of the study to Ephrata Sportsmen Club, Ephrata.
- 9-13-91 Interviewed George Thalheimer, landowner, Okanogan County.
- 9-24-91 Second Chief Joseph Wildlife Mitigation Study public meeting, Wright Elementary School, Coulee Dam.
- 9-25-91 Project Biologists met with COE personnel, Bridgeport, to address comments received at public meeting.
- 9-25-91 Douglas County Steering Committee meeting, Mansfield.
- 10-07-91 Project Biologists interviewed Cecil and Eleanor Trefry, Manson longtime residents of Trefry Canyon in the study area.
- 10-07-91 through 10-08-91 Chief Joseph Wildlife Mitigation HEP study for impacted areas around Chief Joseph Dam.
- 10-08-91 Briefing Lee Hemmer, landowner, and Wheat Growers Association, Douglas County.
- 10-08-91 Consultation with COE regarding potential future mitigation lands surrounding Chief Joseph Dam.
- 10-23-91 Mailed draft report for Chief Joseph Wildlife Mitigation Study to Technical Working Group members.
- 10-30-91 Chief Joseph Interagency Technical Work Group meeting, Ephrata.
- 11-01-91 Grand Coulee/Chief Joseph Wildlife Mitigation Steering Committee meeting.
- 11-20-91 Wildlife mitigation presentation in Sand Point, Idaho at annual BPA contract coordination meeting.
- 11-25-91 Consultation with Douglas County Commission on Chief Joseph Study and Columbia River mitigation under the Power Act.
- 12-03-91 Grand Coulee/Chief Joseph Wildlife Mitigation Steering Committee meeting.
- 12-11-91 Last public hearing conducted to gather formal input on Chief Joseph Dam wildlife habitat losses, estimates, and mitigation objectives.

- 0 1-15-92 Briefing to Bob Nichols (Governor's Office, Office of Financial Management) concerning Columbia River Wildlife Mitigation Public Outreach Program, ongoing mitigation projects, and public involvement.
- 0 1-21-92 Consultation with Fish and Wildlife Committee of Power Planning Council on the results of the Chief Joseph Dam Wildlife Habitat Loss Assessment and related public outreach efforts.
- 0 1-29-92 Briefing to Lincoln County Cattlemen's Association in Creston, Washington on Columbia River Wildlife Mitigation and Grand Coulee Dam Mitigation Program.
- 0 2-13-92 Consultation with County Commissioners from Grant and Douglas counties in Ephrata, Washington on Columbia River Wildlife Mitigation and Grand Coulee/Chief Joseph Mitigation Program.
- o 3-05-92 Grand Coulee/Chief Joseph Wildlife Mitigation Steering Committee meeting in Spokane, Washington.
- o 3-05-92 Tour and consultation with Harza Inc. regarding Grand Coulee NEPA.
- o 3-06-92 Consultation with BLM, Clearwater Realty, and Harold Roloff regarding shrub-steppe habitat protection options.
- o 3-12-92 Consultation with BLM in Spokane, Washington on Columbia River Wildlife Mitigation and Grand Coulee/Chief Joseph Mitigation Program. Emphasis was to pursue cooperative efforts between agencies regarding shrub-steppe and riparian habitat projects.

DOVBP-1889  
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