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In Reply Refer To:
1-7-97-F-273

Memorandum

To: Chief, Branch of Habitat Conservation, Oregon State Office, Portland, Oregon

From: Division Manager, Forest Resources/Endangered Species, Oregon State Office, Portland, Oregon

Subject: Biological Opinion for the Jobs-in-the-Woods Program

I. INTRODUCTION

A. General

In accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 et seq.) this biological opinion addresses effects of the U.S. Fish and Wildlife Service's (Service) Jobs in the Woods Program (JITW Program) to listed, proposed and candidate species, as well as to species of concern (collectively referred to as "rare" species). This opinion responds to your March 25, 1997, submittal of a programmatic Biological Assessment (BA) and request for formal consultation on the JITW program as a whole. This opinion addresses effects to terrestrial and non-anadromous aquatic species only; formal consultation has also been conducted with National Marine Fisheries Service (NMFS) for effects to anadromous fish.

This programmatic consultation addresses the effects to listed and other "rare" species of all existing and potential future actions funded wholly or partially through the Service's Jobs in the Woods program in western Oregon, which includes Benton, Clackamas, Clatsop, Columbia, Coos, Curry, Deschutes, Douglas, Hood River, Jackson, Jefferson, Josephine, Klamath, Lane, Lincoln, Linn, Marion,

Multnomah, Polk, Tillamook, Wasco, and Yamhill Counties. Endangered species addressed in this opinion include three fish: Lost River sucker (*Deltistes luxatus*), Oregon chub (*Oregonichthys crameri*), and shortnose sucker (*Chasmistes brevirostris*); two birds: American peregrine falcon (*Falco peregrinus anatum*) and brown pelican *(Pelecanus occidentalis);* one mammal: Columbian white-tailed deer (*Odocoileus virginianus leucurus)*; and three plants: Applegate's milk-vetch (*Astragalus applegatei*), Bradshaw's lomatium (*Lomatium bradshawii*), and western lily (*Lilium occidentale*). Threatened species covered in this opinion include five birds: the northern spotted owl (*Strix occidentalis caurina*), marbled murrelet (*Brachyramphus marmoratus*), northern bald eagle (*Haliaeetus leucocephalus*), Aleutian Canada goose (*Branta canadensis leucopareia*), western snowy plover (*Charadrius alexandrinus geron nivosus*) coastal population; one insect: Oregon silverspot butterfly (*Speyeria zerene hippolyta*); and one plant: Nelson's checkermallow (*Sidalcea nelsoniana*). The BA also addressed two additional plants, water howellia (*Howellia aquatalis*) and golden Indian-paintbrush (*Castilleja levisecta*). However, current information indicates that these plants are extirpated in Oregon; therefore, they are not addressed in this opinion.

In keeping with the mission of the Service, this intra-service consultation goes beyond legal mandates of the Act, by also considering non-jeopardizing effects to proposed species, as well as effects to candidate species and species of concern. Effects of the JITW Program to one recently proposed species, the bull trout (*Salvelinus confluentis*) are addressed in the BA and in this opinion. Thus, this document will serve as a conference report for bull trout. Candidate species addressed in the BA and in this opinion include two animals: Oregon spotted frog (*Rana pretiosa*), and Fender's blue butterfly (*Icaricia icarioides fenderi*), and five plants: Umpqua mariposa lily (*Calochortus umpquaensis*), Willamette daisy (*Erigeron decumbens* var. *decumbens*), Gentner's fritillary (*Fritillaria gentneri*), Cook's lomatium (*Lomatium cookii*) and rough popcornflower (*Plagiobothrys hirtus*). This opinion will also serve as a conference report for any of these species that are subsequently proposed.

This programmatic consultation covers JITW projects using FY 96 funds, as well as projects funded in future years, through FY 98. This opinion may be amended to include all additional fiscal years in which the JITW Program is funded, as long as the program objectives and goals remain unchanged.

The procedures developed in the BA and in this opinion are based on information exchanged during two inter-program [JITW and Endangered Species] staff meetings, held on November 19 and 21, 1996, to discuss the endangered species impacts of proposed FY 96 JITW projects and of the JITW Program as a whole. Other sources of information utilized in this opinion include the Oregon Natural Heritage Program database; the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (USDA and USDI 1994b) (ROD); all approved recovery plans for the species considered in this opinion, final rules designating endangered or threatened status for the species under consideration, other relevant information obtained through the Service's home page and internet connections, and continuing informal

consultation among our staff. A complete administrative record of this consultation is on file at the Oregon State Office.

B. JITW Program Description

Through the JITW Program, the Service allocates congressionally appropriated funds toward watershed restoration projects on non-federal lands within the range of the northern spotted owl that:

(1) employ dislocated timber and forest industry workers to the extent possible;
(2) address actions on *non-federal* lands identified during watershed analyses;
(3) support ongoing watershed restoration projects on *Federal* lands; and
(4) benefit federally significant plant and animal species that include listed and proposed species, sensitive and at-risk species, migratory birds, anadromous fish and their critical habitats (USFWS 1995).

The ecological goal of the program is to restore ecosystem functions and values to natural conditions, in concert with other governmental watershed restoration programs in the area covered by the Northwest Forest Plan. Additional program benefits and objectives include encouraging partnerships (e.g., government entities, private organizations and individuals), promoting environmental education experiences and fostering long-term stewardship of natural resources in the Pacific Northwest. The JITW Program's own requirement for benefitting endangered and threatened species, as well as the Program's goal of restoring ecosystems, go above and beyond what is required by the Endangered Species Act upon which this consultation is based.

C. PROTOCOL FOR JITW PROGRAM ENDANGERED SPECIES REVIEW

As a means of keeping this Biological Opinion current, the programs have agreed that the following protocol will be followed each year:

1. Lists of all rare species will be obtained for the location of each new project funded by the JITW Program in Oregon.
2. JITW Program staff will meet with endangered species biologists from the Service and NMFS, as appropriate, to discuss potential effects of new JITW projects to listed and other rare species, including species of concern, and management practices that could benefit these species, based on the best available information.
3. Based on information exchanged in these meetings, JITW Program staff will prepare effect determinations, and specific reasons for these determinations, for each species and project under consideration.

4. A final determination of effects will be prepared by Service endangered species staff, as appropriate, tiered to the terms and conditions addressed in this programmatic BO.
5. Formal consultation will be reinitiated for any individual projects that do not meet the conditions described in the BA and in this BO.

The procedure outlined above will ensure that JITW projects incorporate the latest information on location and management of rare species, and will provide a means for JITW biologists to update other biologists and staff annually on the status of JITW projects.

II. BIOLOGICAL OPINION

A. Description of The Proposed Actions

Jobs in the Woods restoration projects generally occur in habitats that have been previously degraded by human activities such as road building, logging, grazing, and agriculture. As indicated in the BA, JITW projects generally fall into four major project categories, as follows: (1) instream habitat restoration, (2) riparian/wetland restoration, (3) fish passage improvements, and (4) upland/forest restoration. Each of these categories is further described below:

1. Instream habitat restoration projects may include:
   - < Installation of wood and/or boulder instream structures
   - < Hydrologic modifications to stream side channels
   - < Development of off-channel refuge areas
   - < Installation of bioengineered streambank stabilization structures and the implementation of sedimentation and erosion reduction techniques
   - < Installation or development of wildlife foraging, breeding, nesting, roosting, and basking structures

2. Riparian/wetland habitat restoration projects may include:
   - < Installation of streambank and/or cross-pasture livestock exclusion fencing
   - < Installation of off-channel livestock watering facilities
   - < Installation of livestock stream crossings
   - < Installation of wood and/or boulder instream structures to establish natural hydrologic regimes in riparian/wetland habitats
   - < Closure, abandonment, or decommissioning of roads
   - < Drainage improvements on roads for sedimentation and erosion control
   - < Reestablishment of natural wetlands and their functions
   - < Creation of wetlands and their functions

- Installation of bioengineered streambank stabilization structures and the implementation of sedimentation and erosion reduction techniques
- Installation or development of wildlife foraging, breeding, nesting, roosting, and basking structures
- Planting of native riparian and wetland vegetation
- Silviculture treatments
- Control or removal of invasive plant species

3. Fish passage improvement projects may include:
    - Installation or modification of fishways
    - Reengineering of irrigation diversion structures
    - Removal or lowering of log jams and culverts
    - External and/or internal modifications to culverts
    - Realignment of culverts to stream flows
    - Replacement of undersized culverts with appropriately sized culverts
    - Replacement of culverts with bridges
    - Installation of bioengineered streambank stabilization structures and the implementation of sedimentation and erosion reduction techniques
    - Installation or development of wildlife foraging, breeding, nesting, roosting, and basking structures
    - Planting of native riparian and wetland vegetation

4. Upland/forest restoration projects may include:
    - Installation of livestock exclusion fencing
    - Installation of livestock watering facilities
    - Closure, abandonment, or decommissioning of roads
    - Drainage improvements on roads for sedimentation and erosion control
    - Installation of bioengineered soil and slope stabilization structures and the implementation of sedimentation and erosion reduction techniques
    - Installation or development of wildlife foraging, breeding, nesting, roosting, and basking structures
    - Planting of native upland and forest vegetation
    - Silviculture treatments
    - Control or removal of invasive plant species

Details on each of these project types are provided in Table 2 of the BA.

B. Environmental Baseline

Regulations implementing section 7 of the Act (50 CFR 402.02) define the environmental baseline as the past and present impacts of all Federal, state, or private actions and other human activities in the action area. The environmental baseline also includes the anticipated impacts of all proposed Federal projects in the action area that have undergone section 7 consultation, and the impacts of state and private actions that are contemporaneous with the consultation in progress.

The action area is defined at 50 CFR 402 to mean "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." For the purposes of this consultation, the action area includes all lands where JITW projects may occur in Benton, Clackamas, Clatsop, Columbia, Coos, Curry, Deschutes, Douglas, Hood River, Jackson, Jefferson, Josephine, Klamath, Lane, Lincoln, Linn, Marion, Multnomah, Polk, Tillamook, Wasco, and Yamhill Counties, Oregon.

As stated in the BA, JITW projects occur primarily or entirely in moderately to severely degraded areas, which may provide limited habitat for rare species in their present condition. JITW projects are designed to restore habitat, thereby benefitting rare and other native species. Over the long term JITW projects are expected to improve the environmental baseline. However, project installation may result in some immediate, temporary adverse impacts to listed, proposed, or other rare species.

C. Species' Status, Anticipated Impacts, and Design Criteria

This section addresses the biology and status of each species under consideration in this Biological Opinion. Potential impacts of JITW projects to each listed, proposed and candidate species are then discussed, and project design criteria, developed by the JITW Program to be incorporated into each approved project, as appropriate, are given. These criteria, designed to minimize or eliminate incidental take (or other impacts, for plants), provide the equivalent of “terms and conditions”, for the purposes of this Opinion .

BIRDS

1. <u>Spotted Owl</u>

a. Biology and Status

The northern spotted owl (*Strix occidentalis caurina*) is a bird that breeds in forest communities of the Pacific Northwest. It is distinguished by the round to elliptical white spots on its chocolate brown body

feathers, the white bars on the tail, and its dark eyes surrounded by tawny facial disks. This subspecies ranges from southern British Columbia, south to Marin County, California.

Like most of their relatives, spotted owls are primarily nocturnal predators, with exceptional eyesight and hearing and feathers modified to facilitate silent flight (Payne 1971, Konishi 1973, Martin 1986). Their most common vocalization is a four-note location call. Unlike most owls, which do not have the ability to learn calls, spotted owls can learn to recognize and imitate the calls of their neighbors (Fitton and Gutierrez in prep).

Most northern spotted owl nest sites observed on public land have been located in old-growth or mature forests (Forsman *et al*. 1984, LeHaye 1988). Spotted owls do not build their own nests; they depend upon suitable naturally occurring nest sites available in older-age forests, such as broken-top trees and cavities. Less frequently, they will also nest in abandoned squirrel or raptor nests, or on platforms formed by mistletoe brooms or debris accumulations. Spotted owls may forage and roost in younger age forest communities. A detailed account of the taxonomy, ecology and reproductive characteristics of the spotted owl is found in the 1987 and 1990 Fish and Wildlife Service Status Reviews (USFWS 1987, 1990a); the 1989 Status Review Supplement (USFWS 1989); the ISC Report (Thomas *et al*. 1990); and the final rule designating the spotted owl as a threatened species (USFWS 1990b).

There are approximately 5,600 pairs of spotted owls and resident singles (activity centers) and 8.1 million acres of "suitable" habitat (older age forest) currently estimated across the range of the species (Holzman, U.S. Fish and Wildlife Service, pers comm., 1996). Recent demographic studies suggest that the metapopulation is declining (Burnham *et al*. 1994, Lande 1988); however, the Service anticipates that implementation of the Forest Plan will provide for the conservation of the species in the long term.

b. Anticipated Impacts and Project Design Criteria

No silvicultural activities associated with the JITW program will occur in spotted owl suitable or critical habitat (Appendix D of the BA). Therefore, we anticipate no effect to spotted owls from habitat modification.

Disturbance to spotted owls could occur from project activities that produce noise above ambient levels. Such disturbance could be particularly harmful during the nesting season, if it caused incubating adults to flush from the nest, allowing the eggs to cool. To minimize disturbance to spotted owls, the following measures will apply, as appropriate, to all current and future projects funded or partially funded by the JITW Program in western Oregon:

1. For projects located in or within a ¼ mile of suitable surveyed or unsurveyed habitat or critical habitat, noise-producing work activities (i.e., above local ambient conditions) will be suspended at the project location from March 1 - June 30.
2. For projects located within a ¼ mile of a known owl occupied site or activity center, work at the project location will be suspended from March 1 - August 15. This restriction may be waived if coordination with the Endangered Species Division indicates that the pair is not nesting at that site during the year of the project activity.

2. <u>Marbled Murrelet</u>

a. Biology and Status

The marbled murrelet (*Brachyramphus marmoratus*) is a small diving seabird in the family Alcidae. Breeding adults have sooty brown upper plumage with dark bars and light, mottled brown underparts. In winter, adult plumage is brownish-gray above, with a white throat and nape, and white scapulars (shoulder patches). Male and female plumage is identical.

The following information has been extracted from the Draft Marbled Murrelet Recovery Plan (USFWS 1995). Marbled murrelets have a life history strategy unique among seabirds. Although they feed on fish and invertebrates primarily in nearshore marine waters, they nest inland as far as 52 miles in from the marine environment, on large limbs of mature conifers. While they are not colonial nesters, these birds are frequently observed in groups of three or more. Detailed accounts of the taxonomy, ecology, and reproductive characteristics of the murrelet are found in the Service's 1988 status review for the marbled murrelet (USFWS 1988), the final rule designating the species as threatened (USFWS 1992b), the final rule designating critical habitat for the species (USFWS 1996), and the Service's biological opinion for Alternative 9 of the Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (FSEIS) (USFWS 1994).

The Forest Service has published the *Ecology and Conservation of the Marbled Murrelet* (Ralph *et al*. 1995), a peer-reviewed, comprehensive summary of the status of the species. This document makes several key points regarding the status of the murrelet. Population trends are clearly downward. Ralph *et al*. (1995) and the Marbled Murrelet Recovery Team believe that possible reasons for the decline include the species' dependence for nesting on older forests that are now scarce and heavily fragmented, its low reproductive rate, and adult mortality due to predation, capture in gill nets, and encounters with oil spills. The amount and distribution of the remaining suitable [nesting] habitat is considered to be the most important determinant of the long-term population trend; further loss may severely hamper the stabilization and recovery of the species.

Most population estimates for murrelets have been conducted using at-sea surveys. Population estimates for the murrelet in Oregon vary substantially. Ralph *et al*. (1995) summarized some of the reasons for variability in population estimates among researchers, including differences in methodology, assumptions, spatial coverage, and survey and model errors. Nevertheless, both Ralph *et al*. (1995) and the Marbled Murrelet Recovery Team have concluded that the listed population appears to be in a long-term downward trend.

Murrelets have approximately 979 known occupied sites within Washington, Oregon, and California (Holzman, U.S. Fish and Wildlife Service, pers. comm. 1996). The total number of acres of suitable habitat in these three states is unknown. Currently, suitable habitat for the murrelet is estimated at 2,561,500 acres on Federal lands in the listed range of this species (Ralph *et al*.1995).

The entire Coast Range Province supports approximately 400,000 acres of suitable murrelet habitat (based on suitable spotted owl habitat). Approximately 591 known murrelet sites occur within this province, of which roughly 418 (71 percent) are on Federal land (Holzman, U.S. Fish and Wildlife Service, pers. comm. 1995).

The FEMAT (USDA *et al*. 1993) identified two zones of murrelet habitat based on observed use and expected occupancy. In Oregon, Zone 1 extends 0-35 miles inland from the marine environment. The majority of murrelet occupied sites and sightings occur in this zone. Zone 2 encompasses areas inland from the eastern boundary of Zone 1 and is typified by relatively low numbers of murrelet sightings, which is partially a function of fewer inventories (USDA *et al*. 1993). The U. S. Forest Service and the Bureau of Land Management have surveyed to protocol 4.2 percent of the suitable murrelet habitat throughout Zones 1 and 2.

b. Anticipated Impacts and Project Design Criteria

No silvicultural activities associated with the JITW program will occur in marbled murrelet suitable or critical habitat (Appendix D of the BA). Therefore, we anticipate no effect to marbled murrelets from habitat modification.

Disturbance to marbled murrelets could occur from project activities that produce noise above ambient levels. Such disturbance could be particularly harmful during the nesting season, if it caused incubating adults to flush from the nest, allowing the eggs to cool. For all current and future projects funded or partially funded by the JITW Program in western Oregon, the following measures will apply, as appropriate, to minimize disturbance to marbled murrelets:

1. For projects located in suitable surveyed or unsurveyed habitat, (a) no work will occur at the project location from April 1 - August 5, and (b) work activities between August 6 -

September 15 will be begun no earlier than two hours after sunrise and conclude no later than two hours before sunset.
2. For projects located in unsuitable habitat, but within a ¼ mile of suitable surveyed or unsurveyed habitat or critical habitat, work at the project location between April 1 - September 15 will be begun no earlier than two hours after sunrise and conclude no later than two hours before sunset.
3. For projects located in critical habitat or within a ¼ mile of a known murrelet occupied site, no work will occur at the project location from April 1 - September 15.

3. Bald Eagle

a. Biology and Status

The bald eagle population in Oregon has been listed as threatened. Its present status is a result of destruction of habitat, illegal harassment and disturbance, shooting, electrocution, poisoning, a declining food base, and environmental contaminants. Currently the primary threats to bald eagles are habitat degradation and environmental contaminants. Statewide goals set by the Pacific Bald Eagle Recovery Plan in 1986 have been met.

In Oregon and Washington, bald eagles typically nest in multi-layered, coniferous stands with old-growth trees located within one mile of lacustrine, large riparian or marine habitat. Availability of suitable trees for nesting and perching is necessary to maintain bald eagle site fidelity and populations. Perch trees are also needed by eagles for hunting and resting. These trees typically provide and unobstructed view of the surrounding area and are in proximity to feeding areas.

Oregon and Washington are key for wintering bald eagles, supporting approximately 25 percent of the wintering bald eagles in the conterminous United States. Wintering sites are typically in the vicinity of concentrated food sources such as anadromous fish runs, high concentrations of waterfowl or mammalian carrion. Winter roost sites provide protection from inclement weather conditions and are characterized by more favorable microclimate conditions.

b. Anticipated Impacts and Project Design Criteria

Silvicultural activities will not be allowed to occur within ½ mile of any known eagle nest site. Therefore, we anticipate no effect to nesting bald eagles from habitat modification.

Disturbance to eagles could occur from project activities that produce noise above ambient levels. Such disturbance could be particularly harmful during the nesting season, if it caused incubating adults to flush from the nest, allowing the eggs to cool. For all current and future projects funded or partially funded by

the JITW Program in western Oregon, the following measures will apply, as appropriate, to minimize disturbance to bald eagles:

1. For any project located within a ¼ mile non-line-of-site or ½ mile line-of-site of a known eagle nest, no noise-producing work activities (i.e., above local ambient conditions) will occur at the project site from January 1 - September 1.
2. Work activities producing noise above local ambient conditions will not be allowed to occur within ¼ mile of occupied roost sites or key foraging areas during periods of bald eagle use.

4. Peregrine Falcon

a. Biology and Status

The American peregrine falcon is listed as endangered in the United States. The recovery plan was developed by The Pacific Coast American Peregrine Falcon Recovery Team (USFWS 1982). The Service has published an "intent to propose delisting" (30 June 1995), although concerns have been expressed (Pagel, pers. comm.1996) that not all recovery goals have been met.

Peregrine falcons nest on cliffs situated near lacustrine, marine or riparian habitat. They often have a diverse avian prey base associated with riparian habitat (J.E. Pagel, Interagency Peregrine Falcon Program, USFS, pers. comm. 1996). Peregrine falcons are particularly sensitive to disturbance near the nest cliff during the breeding season. The breeding season extends from the winter solstice through the end of August (site specific nesting chronologies vary due to elevation, aspect of cliff, and individual behavioral variations).

Productivity at all peregrine nest sites in Oregon has been hampered by eggshell thinning induced by chronic levels of organochlorines. Due to eggshell thinning, protection of sites from disturbance is important to reduce potential for nest failure caused by human activities.

b. Anticipated Impacts and Project Design Criteria

Silvicultural activities will not be allowed to occur within ¼ mile of any known peregrine nest site; we anticipate no effect to nesting peregrines resulting from habitat modification.

Disturbance to peregrines could occur from project activities that produce noise above ambient levels. Such disturbance could be particularly harmful during the nesting season, if it caused incubating adults to flush from the nest, allowing the eggs to cool. For all current and future projects funded or partially funded by the JITW Program in western Oregon, the following measure will apply, as appropriate, to minimize disturbance to peregrine falcons:

For projects within a ¼ mile non-line-of-site or ½ mile line-of-site of a known peregrine nest, no noise-producing work activities (i.e., above local ambient conditions) will occur from January 1 - August 15.

5. <u>Aleutian Canada Goose</u>

a. Biology and Status

The Aleutian Canada goose (*Branta canadensis leucopareia*) is one of eleven generally recognized sub-species of Canada geese. It is the second smallest species in the Pacific Flyway. The adults are easily distinguished by a white ring around the neck. Other characteristics include: an abrupt forehead, cheek patches generally separated by black feathering on the ventral side of the head, and a narrow border of dark features along the bottom of the neck ring. In 1967, Aleutian Canada geese were listed as endangered. Fewer than 800 birds remained. Their decline was greatly attributed to the farming of Arctic foxes on all but one of the Aleutian Islands.

The loss of migration and wintering habitat to urban development also contributed to the decline of the Aleutian Canada goose. Chemical pollutants, human disturbance, disease, subsistence hunting by natives on the nesting area, and commercial and sport hunting on the winter grounds contributed further to the reduction of an already endangered bird.

Primarily due to successful control of Arctic fox predation, the status of the Aleutian Canada goose began to improve. The count in the winter of 1986/1987 showed a significant increase in population, from 790 geese in 1975 to 5,000 that winter. In 1990, an estimated 6,000 geese existed. The species was reclassified from endangered to threatened in 1991. The count in the spring of 1996 indicated that there are now more than 19,000 Aleutian Canada geese.

It is now known that the geese winter in and use pastures and grain fields along the coasts of Oregon and northern California and in California's Central Valley. Prior to the northward spring migration, almost the entire population stages near Lake Earl in Crescent City. They arrive in early February and head north in April. Thousands of birds heading north along the southern coast of Oregon stop to graze in the New River pastures on the Coos/Curry county line. At night, the geese roost on the coastal rocks near Bandon. It is presumed that the geese migrate between the Aleutian Islands and their wintering grounds by flying non-stop over the Pacific Ocean, a distance of nearly 2,000 miles.

A unique population of Aleutian Canada geese breed in the Semidi Islands, southwest of Kodiak Island, and winter only at Nestucca Bay, near Pacific City, Oregon. This population was slowly increasing and reached a peak of 144 birds. In the last few years, it has begun to decline with only 97 birds remaining.

Mr. Roy W. Lowe, a wildlife biologist with the Service in Oregon, is conducting research in the Semidi Islands to see if squirrels are preying on goslings and eggs.

b. Anticipated Impacts and Project Design Criteria

No adverse effects to habitat of wintering Aleutian Canada geese are anticipated as a result of JITW projects. Any marsh restoration projects conducted within the area shown on Map A-1 could be particularly beneficial to these geese.

Disturbance to Aleutian Canada geese could occur from project activities that produce noise above ambient levels. Such disturbance could interfere with resting and foraging behavior, if it caused the birds to flush frequently from their feeding and loafing areas. For all current and future projects funded or partially funded by the JITW Program in western Oregon, the following measure will apply, as appropriate, to minimize disturbance to Aleutian Canada geese:

> Where project sites are located within ¼ mile of active resting and foraging sites in the coastal areas of Tillamook, Coos and Curry Counties, work activities producing noise above ambient levels will not occur during the birds' normal wintering and migration period, from October 1 to April 30.

6. <u>Western snowy plover--Pacific Coast Population</u>

a. Biology and Status

The western snowy plover (*Charadrius alexandrinus nivosus*), one of twelve subspecies of the snowy plover, is a small, pale colored shorebird with dark patches on either side of the upper breast. The species was first described in 1758 by Linnaeus (American Ornithologists' Union 1957). For a complete discussion of the ecology and life history of this subspecies, see the Service's March 5, 1993, final rule listing the coastal population of the western snowy plover as a threatened species (58 FR 12864). The information below is extracted from that document.

Western snowy plovers in the Pacific Coast population breed in loose colonies primarily on coastal beaches from southern Washington to southern Baja California, Mexico. Preferred coastal habitats for nesting include sand spits, dune-backed beaches, unvegetated beach strands, open areas around estuaries, and beaches at river mouths are. Other less common nesting habitats include salt pans, coastal dredged spoil disposal sites, dry salt ponds, and salt pond levees and islands.

Based on the most recent surveys, a total of 28 snowy plover breeding sites or areas currently occur on the Pacific Coast of the United States. Six of these sites occur in Oregon, with 3 sites (Bayocean Spit,

North Spit Coos Bay and spoils, and Bandon State Park-Floras Lake) supporting 81 percent of the total coastal nesting population. From 43 to 81 plovers wintered on the Oregon coast between 1982-1990, primarily on 3 beach segments (Oregon Department of Fish and Wildlife 1994). The majority of birds, however, winter south of Bodega Bay, California.

Historic records indicate that nesting western snowy plovers were once more widely distributed in coastal California, Oregon, and Washington than they are currently. In Oregon, snowy plovers historically nested at 29 locations on the coast (Charles Bruce, Oregon Department of Fish and Wildlife, pers. comm., 1991). In 1990, only 6 nesting colonies remained, representing a 79 percent decline in active breeding sites.

In addition to loss of nesting sites, the coastal plover breeding population itself has declined significantly. Breeding season surveys along the Oregon coast from 1978 to 1993 show that the number of adult snowy plovers has declined at an average annual rate of about 7 percent (Oregon Department of Fish and Wildlife 1994). The number of adults declined from a high of 142 adults in 1981 to a low of 30 adults in 1992 (Oregon Department of Fish and Wildlife 1994; Randy Fisher, Oregon Department of Fish and Wildlife, in litt., 1992). Since then, however, this trend has reversed in Oregon. A number of habitat enhancement projects and conservation measures have been implemented to increase chick survival and minimize human disturbance . In 1996, plover numbers had increased to an estimated 132-137 adults in Oregon (Estelle *et al*. 1997).

The breeding season of the coastal population of the western snowy plover extends from mid- March through mid-September. Nest initiation and egg laying occurs from mid-March through mid-July (Wilson 1980, Warriner *et al*. 1986). The usual clutch size is three eggs. Incubation averages 27 days (Warriner *et al*. 1986). Both sexes incubate the eggs.

Plover chicks are precocial, leaving the nest within hours after hatching to search for food. Fledging (reaching flying age) requires an average of 31 days (Warriner *et al*. 1986). Broods rarely remain in the nesting territory until fledging (Warriner *et al*. 1986, Stern *et al*. 1990).

Page *et al*. (1977) estimated that snowy plovers must fledge 0.8 young per nest to maintain a stable population. Reproductive success falls far short of this threshold at many nesting sites (Page 1990). Fledging success was 34 percent in Oregon in 1996 (Estelle *et al*. 1997).

b. Anticipated Impacts and Project Design Criteria

As stated in Appendix D of the BA, potential adverse effects to suitable snowy plover coastal habitats resulting from any JITW restoration activities will be eliminated or minimized through implementation of the following measures: (1) Vegetation or stabilization projects will not occur within 100 feet of the

vegetation/sand interface on any beach, dune, blow-out, or other high energy-maintained habitats that are plover nesting areas. (2) Project locations will be restricted to the heavily vegetated portions near these areas and within the open water areas at river outlets and estuaries. (3) Only native, noninvasive plant species will be used to revegetate disturbed coastal project sites.

Disturbance to western snowy plovers could occur from any project activities or personnel movements that cause the birds to flush, thus interfering with foraging or nesting behavior. To minimize disturbance to western snowy plovers, the following measures will apply to all current and future projects funded or partially funded by the JITW Program in western Oregon, for projects located in or near suitable plover habitat:

1. Work will not occur on open coastal beaches, dunes, dry mud flats, sand spits at river outlets, or open sand bars along river estuaries during the nesting period (March 15-September 15).
2. Personnel and equipment access to the project site must not pass through any portion of the suitable habitat during the nesting period (March 15-September 15).
2. Appropriate efforts will be made not to attract potential avian or mammalian predators to the project location (e.g., the elimination of human-introduced food sources and the proper disposal of organic waste materials generated by restoration activities, avoidance of planting shrubs or other vegetation near nest sites that could serve as predator cover).

7. <u>Brown Pelican</u>

a. Biology and Status

A ponderous dark water bird, the brown pelican (*Pelecanus occidentalis)* can reach a bill-to-tail length of 50 inches and may have a wing span of 6 1/2 feet. Adults have much white about the head and neck. Immatures have dark heads and whitish underparts. The species ranges along the southern Atlantic, Pacific, and Gulf coasts of the United States, including the entire coast of Oregon, south to northern Brazil and Chile. Small numbers of immature brown pelicans regularly wander inland in summer, especially in the Southwest.

Brown pelicans occupy salt bays, beaches, and ocean, generally preferring shallow waters immediately along the coast, but sometimes seen well out to sea. The species nests on islands, which may be either bare and rocky or covered with mangroves or other trees. Strays may appear on freshwater lakes inland.

The diet consists almost entirely of fish. Types of fish known to be important in some areas include menhaden, smelt, anchovies. Some crustaceans may also be taken. The species' feeding behavior is

spectacular, diving from as high as 60 feet above water, plunging into water headfirst and coming to surface with fish in bill. Typically pelicans then tilt the bill down to drain water out of pouch, then toss head back to swallow. Brown pelicans will become tame, sometimes approaching fishermen for handouts.

Brown pelicans produce one brood per year. Breeding first occurs at age 3 years or older. Brown pelicans nest in colonies, on ground or cliffs, or on low trees such as mangroves. The nest, built by female, with material gathered by male. may be a simple scrape in the soil, a heap of debris with a depression at the top, or a large stick nest in a tree. Brown pelicans lay 2-4 eggs. Both sexes incubate; hatching occurs in 28-30 days. Both parents feed the young. Young may leave ground nests after about 5 weeks and gather in groups, where parents returning from foraging apparently can apparently recognize their own offspring. Young may remain in tree nests longer (perhaps up to 9 weeks) before clambering about in the branches. Age at first flight varies, reportedly 9-12 weeks or more. Adults continue to feed the young for some time after they leave the nesting colony.

Brown pelicans declined drastically in mid-20th century, as pesticides caused eggshell thinning and failure of breeding. After banning of DDT, the species made a strong recovery; it is now common and increasing on southeast and west coasts.

b. Anticipated Impacts and Project Design Criteria

As stated in Appendix D of the BA for snowy plover, coastal habitats will not be adversely impacted by restoration activities under any of the JITW project categories, and only native, non-invasive plant species will be used to revegetate disturbed coastal project sites. Therefore, no effect to brown pelicans from habitat modification is anticipated, in association with the JITW Program.

Disturbance to brown pelicans in their foraging or loafing areas could occur from project activities that produce noise above ambient levels, or otherwise flush the birds, thus interfering with loafing or foraging behavior. To minimize disturbance to brown pelicans, the following measures will apply to all current and future projects funded or partially funded by the JITW Program in western Oregon:

> Work activities producing noise above ambient levels will not be allowed to occur within ¼ mile of known pelican roosting/resting areas along the coast.

MAMMALS

1. Columbian White-Tailed Deer

a. Biology and Status

Accompanying the demise of the riverine woodland habitat along the Columbia River has been the decline of the Columbian white-tailed deer. This deer is medium-sized, with a coat that is tawny in the summer and bluish-gray in winter. Bucks weigh around 400 pounds, whereas does do not usually get over 250 pounds. The Columbian white-tailed has between one and two fawns every season. The young deer exhibit a reddish-tan coat with small white speckles.

Historically, the Columbian, one of 38 subspecies of white-tailed deer in the Americas, ranged from the southern end of Puget Sound to the Willamette Valley of Oregon, throughout the river valleys west of the Cascade Mountains Following European settlement, conversion of land to agriculture forced the deer into small vestiges of habitat where they are found today. Logging, traffic, poaching, and flooding also have contributed to the decline of these deer. Today, only two populations exist, one near Roseburg, Oregon, and another on a few small islands and in isolated areas of the lower Columbia River, near Cathlamet, Washington.

Efforts to save the Columbian white-tailed deer from extinction began in 1972, when the U.S. Fish and Wildlife Service (USFWS) established the 4,800-acre Julia Butler Hansen Refuge for the Columbian White-Tailed Deer near Cathlamet, Washington. Total numbers of the deer in the lower Columbia River population have increased in recent years. However, the flood of 1996 dealt these deer a setback, possibly eliminating up to half of this population (USFWS 1996). Based on aerial surveys, biologists estimated a post-flood population of 60 deer on the Refuge mainland unit and 100 deer on 2,000-acre Tenasillahe Island in the Columbia River. Before the onset of winter and the February ‘96 flooding, deer populations were estimated at 115 to 120 on the mainland and more than 200 on the Tenasillahe Island. Fortunately, flooding of the Julia Butler Hansen Refuge does not appear to have had a major effect on vegetation in the area. Bottomland pastures on the refuge regularly flood during winter, and the woody shrubs on which the deer browse were not killed by the flood.

A separate population of Columbian white-tailed deer, estimated at 5,000 animals, is found along the Umpqua River in Douglas County, Oregon, near Roseburg.

b. Anticipated Impacts and Project Design Criteria

No JITW projects will result in adverse habitat modification impacts to Columbian white-tailed deer. Therefore, no effects to this species from adverse habitat modification are anticipated in association with

the JITW Program. Any marsh restoration projects conducted within the area shown on Map A-2 could be particularly beneficial to this deer.

Disturbance or take of Columbian white-tailed deer could result in association with JITW projects. For all current and future projects funded or partially funded by the JITW Program in western Oregon, the following measures will apply, as appropriate, to minimize disturbance to Columbian white-tailed deer:

1. Project personnel will be instructed to reduce vehicle speeds to appropriate levels for projects located in or near occupied Columbian white-tailed deer habitat.
2. Project personnel will also be directed not to harass in any form adults or fawns in or near project locations.

FISH

1. <u>Oregon Chub</u>

a. Biology and Status

The Oregon chub (*Oregonichthys crameri*) is a small minnow (Family: Cyprinidae) endemic to the Willamette River Basin in western Oregon. The chub was listed by the U.S. Fish and Wildlife Service as endangered in 1993. Critical habitat has not been designated for Oregon chub. For a complete discussion of the ecology and life history of this species, see the Service's October 18, 1993, final rule listing the chub as endangered (58 FR 53804). The information below is extracted from that document. A recovery plan for the Oregon Chub is presently being developed.

Oregon chub and its sibling Umpqua chub have an olive colored back (dorsum) grading to silver on the sides and white on the belly. Scales are relatively large with fewer than 40 occurring along the lateral line; scales near the back are outlined with dark pigment. The main distinguishing characteristics between Oregon and Umpqua chub are: the greater length of the caudal peduncle in the Oregon chub; the mostly scaled breast on Oregon chub versus three fourths to fully naked breast of Umpqua chub; and the Oregon chub's more terminal mouth position, versus Umpqua chub's subterminal mouth. Several size classes of Oregon chub have been collected. Young of the year are approximately 7-32 mm, presumed 1+ chub are approximately 33-46 mm, presumed 2+ chub are approximately 47-64 mm, and presumed 3+ fish are >65 mm. The largest Oregon chub was collected from the North Santiam River and measured 89 mm (four in) in length.

Oregon chub are endemic to the Willamette River drainage of western Oregon. Typically they occupy off-channel habitats such as beaver ponds, oxbows, side channels, backwater sloughs, low gradient tributaries, and flooded marshes. This species was formerly distributed throughout the Willamette River

Valley as far downstream as Oregon City and as far upstream as Oakridge. Historical records report Oregon chub were collected from the Clackamas River, Molalla River, South Santiam River, North Santiam River, Luckiamute River, Long Tom River, McKenzie River, Mary's River, Coast Fork Willamette River, Middle Fork Willamette River, and the mainstem Willamette River from Portland to Eugene.

The current distribution of Oregon chub is limited to 19 naturally occurring populations and three recently reintroduced populations. The naturally occurring populations are found in the North Santiam River (4 populations), Mary's River (1 population), Muddy Creek in Linn County (1 population), Middle Fork Willamette River (11 populations), and Coast Fork Willamette River (1 population). Only four of these populations have more than 1000 fish, and 12 populations contain fewer than 50 individuals. The Oregon chub was petitioned for federal listing in 1990, and subsequently listed in 1993. Subsequent to listing, three populations of Oregon chub have been introduced into habitats in the Middle Fork Willamette River drainage at Wicopee Pond, East Ferrin Pond, and Fall Creek Spillway Pond.

Oregon chub habitats usually have little or no water flow, silty and organic substrate, and considerable aquatic vegetation as cover for hiding and spawning (Markle *et al*. 1991; Scheerer and Jones 1997). The average depth of Oregon chub habitats is typically less than 2 m and the summer temperatures typically exceed 16°C. Adult Oregon chub seek dense vegetation for cover and frequently travel in beaver channels or along the margins of macrophyte beds. In the early spring, fish are most active in the warmer, shallow areas of the ponds. Larval chub congregate in shallow areas near the shore (Pearsons 1989, Scheerer 1997). Juvenile Oregon chub venture farther from shore into deeper water (Pearsons 1989). In the winter months, Oregon chub are found buried in detritus or concealed in the limited aquatic vegetation (Pearsons 1989; P. Scheerer, Oregon Department of Fish and Wildlife, Corvallis, personal observation). Fish of similar size classes school and feed together.

Oregon chub spawn from April through September. Before and after spawning season, chub are social and non-aggressive. Spawning behavior, as described by Pearsons (1989), begins with the male establishing a territory in or near dense aquatic vegetation and aggressively excluding other males. When an adult female enters the territory the courting begins. The male rubs his head in the ventral region of the female between the pectoral and anal fins and directs her into the aquatic vegetation by slight changes in the angle and pressure of the head on the lateral undersides of the female. Twirling of both fish, arranged head to head, follows, and eggs and sperm are released. Spawning activity has only been observed at temperatures exceeding 16° C. Males >35 mm have been observed exhibiting spawning behavior. Female egg masses have been found to contain 147-671 eggs (Pearsons 1989).

Oregon chub feed throughout the day, mostly on water column fauna, and stop feeding after dusk (Pearsons 1989). The diet for Oregon chub adults collected in a May sample consisted primarily of copepods, cladocerans, and chironomid larvae (Markle *et al*. 1991). The diet of juvenile chub consisted of rotifers, copepods, and cladocerans. (Pearsons 1989).

In the last 80 years, backwater and off-channel habitats typically occupied by the Oregon chub have disappeared rapidly because of changes in seasonal flows resulting from the construction of dams throughout the basin, channelization of the Willamette River and its tributaries, removal of snags for river navigation, and agricultural practices. As a result, available Oregon chub habitat was reduced, existing Oregon chub populations were isolated, and recolonization of habitat and mixing between populations was reduced. In addition, a variety of non-native aquatic species were introduced to the Willamette Valley over the same period. The establishment and expansion of these non-native species, in particular, largemouth bass (*Micropterus salmoides*), smallmouth bass *(Micropterus dolomicu*), crappie (*Pomoxis* sp.), bluegill (*Lepomis macrochirus*), western mosquitofish (*Gambusia affinis*) and bullfrog (*Rana catesbiana*), has contributed to the decline of the Oregon chub and limits the species' ability to expand beyond its current range.

Many of the known extant populations of Oregon chub occur near rail, highway, and power transmission corridors and within public park and campground facilities. These populations are threatened by chemical spills from overturned truck or rail tankers; runoff or accidental spills of brush control chemicals; overflow from chemical toilets in campgrounds; siltation of shallow habitats from logging and construction activities; and changes in water level or flow conditions from construction, diversions, or natural desiccation.

b. Anticipated Impacts and Project Design Criteria

No permanent adverse effects to Oregon chub habitat are anticipated in association with JITW projects. Any river restoration projects conducted within the area shown on Map A-3 could have a beneficial effect to this species.

JITW projects that involve in-channel work could result in direct take of individual fish. Further, temporary increases in turbidity associated with JITW projects could interfere with the species' foraging or spawning behavior. In order to minimize disturbance to Oregon chub, the following measures will apply, as appropriate, to all current and future projects funded or partially funded by the JITW Program in western Oregon:

1. Projects will adhere to the established Oregon Department of Fish and Wildlife (ODFW) timing restrictions for instream construction activities (i.e., by stream reach).
2. The implementation of Best Management Practices (BMPs)listed in Appendix C of the BA will eliminate or reduce adverse impacts to the chub's migration/spawning cycles and will maintain appropriate water quality to promote the survival of all life stages.
3. A chub survey will be conducted at each project site where a known chub population is either upstream or downstream from the project site. Modifications to the project will be made, as necessary, to eliminate or reduce adverse impacts if survey results indicate the presence of the species at or near the project site. Alternate strategies will be developed to provide for fish

passage and/or water diversions to support known resident chubs during in-water construction periods.

.2. Lost River and Shortnose Suckers

a. Biology and Status

The Lost River sucker (*Deltistes luxatus*) is a large sucker that may reach over 3 ft. It is characterized by a long, slender head with a subterminal mouth and long, rounded snout. The coloring is dark on the back and sides, fading to white or yellow on the belly. The only species in the genus *Deltistes*, the Lost River sucker is native to Upper Klamath Lake and its tributaries. This sucker also historically inhabited the Lost River watershed, Tule Lake, Lower Klamath Lake, and Sheepy Lake (Moyle 1976), but is not considered native to the Klamath River, although it is now found there, at least downstream to Copco Reservoir (Beak 1987).

The shortnose sucker (*Chasmistes brevirostris*) historically occurred in Upper Klamath Lake and its tributaries (Miller and Smith 1981; Williams *et al*. 1985). Its historic range likely included Lake of the Woods, Oregon, and probably the Lost River system (Scoppettone and Vinyard 1991). The current distribution of the shortnose sucker includes Upper Klamath Lake and its tributaries, Klamath River downstream to Iron Gate Reservoir, Clear Lake Reservoir and its tributaries, Gerber Reservoir and its tributaries, the Lost River, and Tule Lake. Gerber Reservoir represents the only habitat with a shortnose sucker population that does not also have a Lost River sucker population.

Both species are primarily lake residents that spawn in associated rivers, streams, or springs. After hatching, larval suckers migrate out of spawning substrates, which are usually gravels or cobbles, and drift downstream into lakes. Vegetated river and lake shoreline habitats are known to be important during larval and juvenile rearing (Klamath Tribe 1991, Markle and Simon 1993). The Lost River and shortnose suckers are omnivorous bottom feeders whose diets include detritus, zooplankton, algae and aquatic insects (Buettner and Scoppettone 1990). Sexual maturity for Lost River suckers sampled in Upper Klamath Lake occurs between the ages of 6 to 14 years with most maturing at age 9. Most shortnose suckers reach sexual maturity at age 6 or 7 (Buettner and Scoppettone 1990).

The Upper Klamath River Basin above Iron Gate Dam (Basin) encompasses a drainage area of approximately 2,120,400 hectares (5,301,000 acres) in Oregon and California (USFWS 1992). The Basin once had over 350,000 acres of wetlands (USFWS 1989), extensive riparian corridors, and functional floodplains (Mitsch and Gosselink 1986). Early records from the Basin indicate that the Lost River and shortnose suckers were common and abundant. Gilbert (1898) noted that the Lost River sucker was "the most important food-fish of the Klamath Lake region." Several commercial operations processed "enormous amounts" of suckers into oil, dried fish, canned fish, and other products

(Andreasen 1975, Howe 1968). Currently, less than 75,000 acres of wetlands remain in the Basin (USFWS 1992).

The historical range of the Lost River and shortnose suckers has been fragmented by construction of dams, instream diversion structures, irrigation canals, and the general development of the U.S. Bureau of Reclamation's Klamath Project and related agricultural processes. Because habitat fragmentation limits or prevents genetic interchange among populations, extinction could result as genetic diversity decreases and populations become more susceptible to environmental change. The combined effects of damming of rivers, instream flow diversions, draining of marshes, dredging of Upper Klamath lake, and other water manipulations has threatened both species with extinction (53 FR 27130). Additionally, water quality degradation in the Upper Klamath Lake watershed has led to large-scale fish kills related to algal bloom cycles in the lake (Kann and Smith 1993). Introduced exotic fishes may reduce recruitment through competition with, or predation upon, suckers (USFWS 1993, Dunsmoor 1993).

b. Anticipated Impacts and Project Design Criteria

No permanent adverse effects to Lost River or shortnose sucker habitat are anticipated in association with JITW projects. Any river restoration projects conducted within the area shown on Map A-5 could result in beneficial effects to these species.

JITW projects that involve in-channel work could result in direct take of individual suckers. Further, temporary increases in turbidity associated with JITW projects could interfere with the species' foraging or spawning behavior. Any temporary water diversions associated with JITW projects, if made at an inappropriate time of year, could interfere with the species' migration patterns. In order to minimize disturbance to Lost River and shortnose suckers, the following measures will apply, as appropriate, to all current and future projects funded or partially funded by the JITW Program in western Oregon:

1. Projects will adhere to the established ODFW timing restrictions for instream construction activities (i.e., by stream reach).
2. The implementation of BMPs listed in Appendix C of the BA will eliminate or reduce adverse impacts to the suckers' migration/spawning cycles and will maintain appropriate water quality to promote the survival of all life stages.
3. A sucker survey will be conducted at each project site where a known sucker population is either upstream or downstream from the project site. Modifications to the project will be made, as necessary, to eliminate or reduce adverse impacts if survey results indicate the presence of the species at or near the project site. Alternate strategies will be developed to provide for fish passage and/or water diversions to support known resident suckers during in-water construction periods.

3. Bull Trout

a. Biology and Status

The bull trout (*Salvelinus confluentus*) was first described by Girard in 1856 from a specimen collected on the lower Columbia River. Cavender (1978) presented morphometric, meristic, osteological, and distributional evidence to document the separation between Dolly Varden (*Salvelinus malma*) and bull trout, and resurrected the species name *confluentus*, as first proposed by Suckley in 1858. Based on this work, taxonomists have recognized bull trout as a separate species from the coastal Dolly Varden since 1978 (Bond 1992).

Juvenile bull trout average approximately 50-70 mm (2-3 in) in length at age 1, 100-120 mm (4-5 in) at age 2, and 150-170 mm (6-7 in) at age 3 (Pratt 1992). Juveniles have a slender body form and exhibit the small scalation typical of charr. The back and upper sides are typically olive-green to brown with a white to dusky underside. The dorsal surface and sides are marked with faint pink spots. They lack the worm-like vermiculations and reddish fins commonly seen on brook trout (*Salvelinus fontinalis*). Spawning bull trout, especially males, turn bright red on the ventral surface with a dark olive-brown back and black markings on the head and jaw. The spots become a more vivid orange-red and the pectoral, pelvic, and anal fins are red-black with a white leading edge. The males develop a pronounced hook on the lower jaw. Bull trout have an obvious "notch" on the end of the nose above the tip of the lower jaw.

Bull trout populations are known to exhibit four distinct life history forms: resident, fluvial, adfluvial, and anadromous. Resident bull trout spend their entire life cycle in the same (or nearby) streams in which they were hatched. Fluvial and adfluvial populations spawn in tributary streams where the young rear from one to four years before migrating to either a lake (adfluvial) or a river (fluvial) where they grow to maturity (Fraley and Shepard 1989). Anadromous fish spawn in tributary streams, with major growth and maturation occurring in salt water.

The historic range of the bull trout spanned 7 states (Alaska, Montana, Idaho, Washington, Oregon, Nevada, and California) and 2 Canadian Provinces (British Columbia and Alberta) along the Rocky Mountain and Cascade Mountain ranges (Cavender 1978). In the United States, bull trout occur in rivers and tributaries throughout the Columbia Basin in Montana, Idaho, Washington, Oregon, and Nevada, as well as the Klamath Basin in Oregon, and several cross-boundary drainages in extreme southeast Alaska. In California, bull trout were historically found in only the McCloud River, which represented the southernmost extension of the species' range. Bull trout numbers steadily declined after completion of McCloud and Shasta Dams (Rode 1990). The last confirmed report of a bull trout in the McCloud River was in 1975, and the original population is now considered to be extirpated (Rode 1990).

Bull trout distribution has been reduced by an estimated 40 to 60 percent since pre-settlement times, due primarily to local extirpations, habitat degradation, and isolating factors. The remaining distribution of bull trout is highly fragmented. Resident bull trout presently exist as isolated remnant populations in the headwaters of rivers that once supported larger, more fecund migratory forms. These remnant populations have a low likelihood of persistence (Reiman and McIntyre 1993). Many populations and life history forms of bull trout have been extirpated entirely.

Highly migratory, fluvial populations have been eliminated from the largest, most productive river systems across the range. Stream habitat alterations restricting or eliminating bull trout include obstructions to migration, degradation of water quality, especially increasing temperatures and increased amounts of fines, alteration of natural stream flow patterns, and structural modification of stream habitat (such as channelization or removal of cover).

In Oregon, bull trout were historically found in the Willamette River and major tributaries on the west side of the Oregon Cascades, the Columbia and Snake rivers and major tributaries east of the Cascades, and in streams of the Klamath basin (Goetz 1989). Presently, most bull trout populations are confined to headwater areas of tributaries to the Columbia, Snake, and Klamath rivers (Ratliff and Howell 1992). Major tributary basins containing bull trout populations include the Willamette, Hood, Deschutes, John Day, and Umatilla (Columbia River tributaries), and the Owyhee/Malheur, Burnt/Powder, and Grande Ronde/Imnaha Basins (Snake River tributaries). Of these eight major basins, large fluvial migratory bull trout are potentially stable in only one, the Grande Ronde, and virtually eliminated from the remaining 7, including the majority of the mainstem Columbia River. The only known increasing population of bull trout is an adfluvial migrant population located in Lake Billy Chinook, and spawning and rearing in the Metolius river and tributaries. In recognition of the precarious status of Oregon bull trout populations, harvest of bull trout is prohibited in all state waters with the exception of Lake Billy Chinook and Lake Sintustus in the Deschutes River Basin.

Columbia and Klamath River basin bull trout have been isolated from one another for over 10,000 years. Leary *et al*. (1993) demonstrated substantial genetic separation between bull trout in the Klamath and Columbia River basins; these two basin populations would constitute "distinct population segments," potentially listable under the Endangered Species Act.

Bull trout spawn in the fall, primarily in September or October when water temperatures drop below 9°C (48°F). Typically, spawning occurs in gravel, in runs or tails of spring-fed pools. Adults hold in areas of deep pools and cover and migrate at night (Pratt 1992). After spawning, adfluvial adults return to the lower river and lake. In Flathead Lake, Montana, an average of 57 percent of the adult bull trout spawned in a given year (Fraley and Shepard 1989).

Bull trout eggs are known to require very cold incubation temperatures for normal embryonic development (McPhail and Murray 1979). In natural conditions, hatching usually takes 100-145 days and newly-hatched fry, known as alevins, require 65-90 days to absorb their yolk sacs (Pratt 1992). Consequently, fry do not emerge from the gravel and begin feeding for 200 or more days after eggs are deposited (Fraley and Shepard 1989), usually in about mid-April.

Fraley and Shepard (1989) reported that juvenile bull trout were rarely observed in streams with summer maximum temperatures exceeding 15°C (59°F). Fry, and perhaps juveniles, grow faster in cool water (Pratt 1992). Juvenile bull trout are closely associated with the substrate, frequently living on or within the streambed cobble (Pratt 1992). Along the stream bottom, juvenile bull trout use small pockets of slow water near high velocity, food-bearing water. Adult bull trout, like the young, are strongly associated with the bottom, preferring deep pools in cold water rivers, as well as lakes and reservoirs (Thomas 1992).

Juvenile adfluvial fish typically spend one to three years in natal streams before migrating in spring, summer, or fall to a large lake. After traveling downstream to a larger system from their natal streams, subadult bull trout (age 3-6) grow rapidly but do not reach sexual maturity for several years. Growth of resident fish is much slower, with smaller adult sizes and older age at maturity.

Juvenile bull trout feed primarily on aquatic insects (Pratt 1992). Subadult bull trout rapidly convert to eating fish and, as the evolution of the head and skull suggest, adults are opportunistic and largely nondiscriminating fish predators. Historically, native sculpins (*Cottus* spp.), suckers (*Catostomus* spp.), and mountain whitefish (*Prosopium williamsoni*) were probably the dominant prey across most of the bull trout range. In Hungry Horse Reservoir, Montana, where a native species assemblage is still present, northern squawfish (*Ptychocheilus oregonensis*) and largescale suckers (*Catostomus macrocheilus*) comprise over 99 percent of the bull trout diet (May 1988). Today, throughout most of the bull trout's remaining range, introduced species, particularly kokanee (*Oncorhynchus nerka*) and yellow perch (*Perca flavescens*), are often key food items (Pratt 1992).

Bull trout are habitat specialists, especially with regard to preferred conditions for reproduction. While a small fraction of available stream habitat within a drainage or subbasin may be used for spawning and rearing, a much more extensive area may be utilized as foraging habitat, or seasonally as migration corridors to other waters. Structural diversity is a prime component of good bull trout rearing streams (Pratt 1992). Several authors have observed highest juvenile densities in streams with diverse cobble substrate and low percentage of fine sediments (Shepard *et al*. 1984, Pratt 1992).

Persistence of migratory life history forms and maintenance or re-establishment of stream migration corridors is crucial to the viability of bull trout populations (Reiman and McIntyre 1993). Migratory bull trout facilitate the interchange of genetic material between populations, ensuring sufficient variability

within populations. Migratory forms also provide a mechanism for reestablishing local populations that have been extirpated. Migratory forms are more fecund and larger than smaller non-native brook trout, potentially reducing the risks associated with hybridization (Reiman and McIntyre 1993). The greater fecundity of these larger fish enhances the ability of a population to persist in the presence of introduced fishes.

On June 13, 1997, the Service proposed the Columbia Basin population of the bull trout as threatened and the Klamath population as endangered (USFWS 1997).

b. Anticipated Impacts and Project Design Criteria

No permanent adverse effects to bull trout habitat are anticipated in association with JITW projects. Any river restoration projects conducted within the area shown on Map A-4 could result in beneficial effects to this species.

JITW projects that involve in-channel work could result in direct take of individual bull trout. Further, temporary increases in turbidity associated with JITW projects could interfere with the species' foraging or spawning behavior. Any temporary water diversions associated with JITW projects, if made at an inappropriate time of year, could interfere with the bull trout's migration patterns. In order to minimize disturbance to bull trout, the following measures will apply, as appropriate, to all current and future projects funded or partially funded by the JITW Program in western Oregon:

1. Projects will adhere to the established ODFW timing restrictions for instream construction activities (by stream reach).
2. The implementation of BMPs listed in Appendix C of the BA will eliminate or reduce adverse impacts to the bull trout's migration/spawning cycles and will maintain appropriate water quality to promote the survival of all life stages.

AMPHIBIANS

1. <u>Oregon Spotted Frog</u>

a. Biology and Status

The Oregon spotted frog (*Rana pretiosa*, =West Coast population of the spotted frog) historically ranged from extreme southwestern British Columbia, Canada, south through the eastern side of the Puget/Willamette Valley trough and the Columbia River gorge, to the west-central Cascade mountains of Oregon, south into the Klamath Basin and northeastern California. The species is associated with nonwoody wetland plant communities, along the marshy edges of ponds, lakes, and slow-moving streams. Breeding occurs in February or March at lower elevations and late May or early June at higher

elevations. Males are not territorial and may gather in large groups of 25 or more individuals at specific locations. Females deposit their egg masses at the same locations in successive years. Tadpoles metamorphose during their first summer.

Recent genetic work shows that the taxon formally known as the West Coast population of the spotted frog is actually distinct to a point of being recognized as a full species (Green *et al*. 1996). Green *et al*. (in press) names the two species of spotted frogs that occur in the western States as the Oregon spotted frog (*Rana pretiosa*) and the Columbia spotted frog (*Rana luteiventris*). The Columbia spotted frog is found from extreme southwestern Yukon, through the Alaska panhandle and most of British Columbia, to Washington east of the Cascades, Idaho, western Montana, eastern Oregon, and northwestern Wyoming. Disjunct populations of the Columbia spotted frog occur in southeastern Oregon, southwestern Idaho, the Bighorn Mountains of Wyoming, the Mary's, Reese, and Owyhee River River systems in Nevada, the Wasatch Mountains, and the western desert of Utah (Green *et al*. in press). Based on this information, the West Coast population of the spotted frog should now be known as the Oregon spotted frog (*Rana pretiosa*) with a consequent change in listing priority number.

Historically, *Rana pretiosa* was recorded from 8 localities in western Washington, 44 localities in Oregon, 3 localities in California, and 1 site in British Columbia. Extensive surveys have recently been completed, and the species is currently documented from 3 sites in Washington, and 19 sites in Oregon. The species has not been found for 15 years at the British Columbia site, and no longer is extant in California. Based on historical sites, the Oregon spotted frog has disappeared from approximately 76 percent of its range (25 sites). This figure may be conservative due to the lack of historic collections at low elevation sites; the species has been estimated to be extirpated from 90 percent of its range based on geographic analysis. It is estimated that over 95 percent of the habitat that is suitable for the Oregon spotted frog has been surveyed across its range (Hayes 1997).

The Oregon spotted frog faces threats to its warmwater marsh habitat from development, changes in hydrology and water quality and overgrazing. Although moderate livestock grazing in some instances benefits the spotted frog by maintaining openings in the vegetation, overgrazing can adversely affect the habitat causing severe hydrologic modification. In addition, preliminary results from studies being conducted at two sites in Oregon show a significant improvement in the vegetation in areas where cattle are excluded.

Adverse affects from hydrologic changes are a significant threat to the spotted frog. Modification of river hydrology from the series of dams in the Willamette Valley and the Puget Trough has significantly reduced the amount of shallow overflow wetland habitat historically used by the spotted frog. In the Cascades, reservoirs have inundated large marsh complexes and fragmented remaining marshes, thereby reducing the survival of the Oregon spotted frog in these areas. Rangewide, over 50 percent of the extant Oregon spotted frog sites face threats from changes in hydrology.

Development threatens the spotted frog at several sites. For example, in Washington, the Dempsey Creek site near Olympia is privately owned by landowners who have recently expressed interest in subdividing or selling their land for development. The Nature Conservancy has purchased approximately 200 acres of the 1,200 acre Trout Lake site. The Department of Natural Resources has started the acquisition process to protect additional acres at this site, however, the remaining land at this site is vulnerable to subdivision. In Oregon, the landowner at the LaPine Creek site has expressed a desire to develop the property.

At Paulina Marsh, an historic site in Oregon, only 1 frog was found in 1991, and frogs have not been found there since. The loss of this site is probably due to a number of factors, including drought, habitat degradation from livestock, and the presence of brook trout.

Poor water quality conditions have affected the Oregon spotted frog, particularly in the Warner Basin. Habitat conditions there have deteriorated to a point where the species occurs in low numbers or may be extirpated.

Predation by exotic species such as warmwater fishes and bullfrogs (*Rana catesbeiana*) adversely affect the Oregon spotted frog. The spotted frog is unique among the native ranids of the Pacific Northwest in that it requires warmwater habitat, which is also habitat for a number of introduced fish. During recent surveys in Oregon, at least one exotic predator occupied 17 of 19 sites where spotted frogs were found (Hayes 1997). Brook trout (*Salvelinus fontinalis*) was the most frequently recorded exotic aquatic predator, occurring at 16 of the sites. These introduced fish prey on the tadpoles of native amphibians. The Oregon spotted frog did not evolve with these fish and do not have mechanisms to deter their predation. Evidence that exotic fish adversely affect the Oregon spotted frog comes from 1) demographics data that show sites that contain a disproportionate ratio of older spotted frogs to juvenile frogs (i.e., poor recruitment) also have significant numbers of brook trout; and 2) results of studies on other native amphibians that show lower densities of larvae or egg masses in areas containing high densities of fish (Tyler *et al*. 1996; Holomuzki 1995).

The invasion of such exotic plants as reed canary grass may eliminate areas of suitable breeding habitat for the Oregon spotted frog by creating such dense areas of vegetation that the frogs cannot gain access for breeding. A study currently underway in Washington is investigating this possibility.

Drought causes seasonal loss of habitat and degradation of essential shoreline vegetation and is considered a threat to the species. During extended droughts, spotted frogs are more vulnerable to predation as a result of reduced cover. Further, reduced water levels confine the frogs to smaller areas where they are more vulnerable to predators such as introduced fish.

The majority of the Oregon spotted frog populations are small, which makes them vulnerable to stochastic events such as drought and disease. Only 5 of 21 populations are considered large (greater than 1,000 individuals). Six populations contain fewer than 100 individuals. One site (Jack Creek) contains a relatively large number of larvae and juveniles, but very few adult frogs. There appears to be a lack of either adult survivorship or a lack of recruitment after the juvenile stage. Poor recruitment could lead to the loss of this site. Two of the five large sites face imminent threats from either brook trout predation or habitat degradation.

b. Anticipated Impacts and Project Design Criteria

No permanent adverse effects to spotted frog habitat are anticipated in association with JITW projects. Any aquatic restoration projects conducted within the area shown on Map A-6 could result in beneficial effects to this species.

JITW projects that involve in-water could result in direct take of individual spotted frogs, Temporary increases in turbidity associated with JITW projects could interfere with the species' foraging or spawning behavior. In order to minimize disturbance to spotted frogs, the following measures will apply, as appropriate, to all current and future projects funded or partially funded by the JITW Program in western Oregon:

1. Projects will adhere to the established ODFW timing restrictions for instream construction activities (i.e., by stream reach).
2. The implementation of BMPs listed in Appendix C of the BA will eliminate or reduce adverse impacts to the spotted frog and will maintain appropriate water quality to promote the survival of all life stages.
3. A spotted frog survey will be conducted at each project site where a known population is either upstream or downstream from the project site. Modifications to the project will be made, as necessary, to eliminate or reduce adverse impacts if survey results indicate the presence of the species at or near the project site.

INSECTS

1. <u>Oregon Silverspot Butterfly</u>

a. Biology and Status

The Oregon silverspot butterfly (*Speyeria zerene hippolyta*) is a darkly marked coastal subspecies of the Zerene fritillary, a widespread species in montane western North America. The historical range of the subspecies extends from the Long Beach Peninsula, Pacific County, Washington, south to Del Norte

County, California. Within its range, the butterfly is known to have been extirpated from at least 11 colonies (two in Washington, eight in Oregon, and one in California). The Oregon silverspot butterfly was listed as a threatened species with Critical Habitat by the Service in 1980. For a complete discussion of the ecology and life history of this subspecies, see that final rule (45 FR 44935). The information below is extracted from that document.

Historically, the Oregon silverspot butterfly was distributed along the Washington and Oregon coasts from Westport in Grays Harbor County south to about Heceta Head in Lane County. In addition, there is a disjunct cluster of populations north of Crescent City in Del Norte County, California. At least 20 separate localities were known for the butterfly in the past. The butterfly and its coastal grassland habitat were probably much more common in the past.

At present, the subspecies is currently well-established at only five sites. They include one in Del Norte County, two in Lane County (Rock Creek-Big Creek and Bray Point), and two in Tillamook County (Cascade Head and Mt. Hebo). A sixth site in Clatsop County (Clatsop Plains) is still extant. In addition, surveys in 1990 confirmed continued presence of a population on the Long Beach Peninsula. A new site was tentatively established on Fairview Mountain in Lane County, Oregon.

The current distribution of the Oregon silverspot butterfly includes three distinct (but in some cases co-occurring) types of grassland habitats -- montane grasslands, marine terrace and coastal headland "salt spray" meadows, and stabilized dunes. The latter two ecosystem types are strongly influenced by proximity to the ocean and are subject to mild temperatures, high rainfall, and persistent fog. In contrast, the montane sites have colder temperatures, significant snow accumulations, less coastal fog, and no salt spray.

Adult emergence starts in July and extends into September. Many males appear several weeks before most females emerge, as is typical of *Speyeria* butterflies. Mating usually takes place in relatively sheltered areas. Adults will often move long distances for nectar or to escape windy and foggy conditions. The Oregon silverspot butterfly differs from related taxa in physiology and slow larval development rates. These differences appear to be specific adaptations to a harsh, coastal environment characterized by fog and cold wind throughout much of the year. A slow caterpillar development rate synchronizes the adult flight season with best coastal weather conditions.

Caterpillars of the Oregon silverspot butterfly feed primarily on western blue violets (*Viola adunca*), but are known to feed on a few other species of the genus *Viola* as well. Nectar plants most frequently used by the Oregon silverspot adults are members of the aster (Composite) family, including goldenrod (*Solidago canadensis*), dune goldenrod (*Solidago spathulata*), California aster (*Aster chilensis*), pearly everlasting (*Anaphalis margaritacea*), and yarrow (*Achillea millefolium*).

Historically, fire is thought to be the dominant factor that maintained Oregon's coastal grassland communities and their endemic species. Other disturbances such as landslides, small mammal activities, windthrow, and herbivory by invertebrates, small mammals and large native ungulate grazers are thought to have played a secondary role in opening early successional habitat conditions. Severe fires in 1845 and 1910 converted substantial portions of Mt. Hebo from forest to grassland. Since that time fire frequencies on the Oregon coast have been greatly reduced and the extent of coastal grasslands has declined dramatically.

b. Anticipated Impacts and Project Design Criteria

Effects to Oregon silverspot butterflies associated with JITW projects would most likely result from adverse modification of the species' habitat. In order to minimize disturbance to these butterflies and their habitat, the following measures will apply, as appropriate, to all current and future projects funded or partially funded by the JITW Program in western Oregon:

1. Restoration projects will not occur in known occupied habitats (Clatsop, Tillamook and Lane Counties) if modifications cannot be made to eliminate adverse impacts to the butterflies' habitat.
2. A botanical survey, if required by the Service's endangered species biologist, will be conducted to determine the presence or absence of western blue violet at each project location. The optimal survey period is April to May.
3. Surveys for Oregon silverspot will be conducted during late July to early September on any proposed project site that supports western blue violet.
4. For all coastal project sites, only native, noninvasive plant species will be used to revegetate disturbed areas.

With the incorporation of the above conditions, take of this species is not anticipated.

2. <u>Fender's blue butterfly</u>

a. Biology and Status

Fender's blue butterfly (*Icaricia icarioides fenderi*), a candidate for Federal listing, was first described as *Plebejus maricopa fenderi*, from specimens collected in Yamhill County, Oregon. The genus *Plebejus* has since been split, with some of its members, including the Fender's blue butterfly, assigned to the genus *Icaricia*. Males of this subspecies are silvery-blue on the dorsal wing surface and gray on the ventral wing surface. The upper wing surface of female butterflies is a brown ground color, with a wing underside similar in appearance to that of the male. The ventral hindwing often has a series of small, black spots near the margin of the wing.

Only a limited number of collections were made between the time of the subspecies' discovery and Macy's last observation on 23 May, 1937 in Benton County, Oregon (Hammond and Wilson 1992). Searches were made, but a lack of information on the butterfly's host plant prevented researchers form focusing their efforts. Finally, in 1989, the Fender's blue butterfly was rediscovered by Dr. Paul Hammond at McDonald Forest, Benton County, Oregon on Kincaid's lupine *(Lupinus sulphureus* ssp. *kincaidii*) an uncommon species.

Prior to the rediscovery of this species in 1989, the taxonomy of the Fender's blue butterfly was unclear due to the limited number of specimens available. The confusion arises from the similarity in appearance between the Fender's blue butterfly and the Pardalis blue butterfly (*Icaricia icarioides pardalis*), an inhabitant of the central California Coast Range near San Francisco. Recent comparison of specimens (Hammond and Wilson 1993) indicates significant morphological differentiation between populations of Fender's blue butterflies and Pardalis blue butterflies, confirming the status of these two taxa as distinct subspecies.

The historic distribution of the Fender's blue butterfly is unknown due to the limited information initially collected on this species. Recent surveys, however, indicate that the Fender's blue butterfly is confined to the Willamette Valley and currently occupies 21 sites in Yamhill, Polk, Benton and Lane counties (Hammond and Wilson 1992). One population at Willow Creek is found in wet, *Deschampsia*-type prairie, while the remaining sites are found on drier upland prairies characterized by *Festuca* spp. Sites occupied by the Fender's blue butterfly are located almost exclusively on the valley's western side, within 26 km of the Willamette River.

This butterfly's life cycle appears to parallel that described for other subspecies of *Icaricia icarioides* (Hammond and Wilson 1993). Adult butterflies lay their eggs on host plants during May and June. Newly hatched larvae feed for a short time, reaching their second instar in the early summer, at which point they enter an extended diapause. Diapausing larvae remain at or near the base of the host plant through fall and winter and become active again the following March or April. Once diapause is broken, the larvae feed and grow through three to four additional instars, metamorphosing into adult butterflies in April and May. This life cycle allows for the completion of only one generation per year.

Behavioral observations of Fender's blue butterfly larvae indicate an extremely cautious nature, with individuals noted to drop from their feeding position on lupine leaves to the base of the plant at the slightest sign of disturbance (C. Schultz, University of Washington, pers. comm., 1994). Though many Lycaenids are tended by ants during their larval stage, observations of Fender's blue butterfly larvae in the field have failed to document such an a mutualistic association.

The preference of the Fender's blue butterfly for Kincaid's lupine has been supported through extensive searches of other neighboring lupine species throughout the butterfly's range. Of the many lupine species

examined, secondary use of only two additional lupine species has been documented--*L. laxiflorus* (spurred lupine) and *L. albicaulis* (sickle-keeled lupine). Feeding on these two lupines has been noted at seven of 21 sites that support Fender's blue butterflies. At each site, however, *L. sulphureus* ssp. *kincaidii* is present nearby and is the predominant lupine species in all but one instance (Hammond and Wilson 1992).

The Fender's blue butterfly is limited in range to upland prairie remnants in western Oregon. Current estimates indicate that fewer than 400 ha. (1,000 acres) of native upland prairie remain in the Willamette Valley, only one-tenth of 1 percent of the original upland prairie once available to the Fender's blue butterfly. The immediate threat of habitat loss has been well documented. Habitat in western Polk County is rapidly disappearing due to housing and tree farm development (Hammond 1996) . Between 1990 and 1992, three occurrences of both the Fender's blue butterfly and Kincaid's lupine were lost to the expansion of Christmas tree farming operations (Hammond 1994). Conversion of these three sites destroyed approximately 3 hectares (7 acres) of private and roadside habitat that comprised the nucleus of two Fender's blue butterfly populations. The two roadside occurrences of the butterfly that remain nearby are no longer considered viable due to the loss of the source butterfly populations and host plants. Urban development, agriculture, and tree farm cultivation have removed habitat from several additional populations since 1992, causing the butterflies to be extirpated or reduced to very low numbers. Housing development is also planned for the Dallas site in Polk County (Hammond 1996).

Fender's blue butterfly populations are additionally threatened by virtue of their small size. Over half of the sites occupied by these butterflies are parcels of 3 hectares or less. These occurrences, predominantly roadsides and fenceline/boundary sites, face an immediate threat of destruction through development, agriculture, roadside maintenance and herbicide application. Construction of a driveway resulted in the loss of one site in King's Valley, and another site was lost due to adjustment of a wheat field boundary near Buell (P. Hammond, Oregon State University, pers. comm.). Of the 21 sites, only three are considered secure, and two of these are facing management problems. Even without habitat destruction, such extremely small population fragments would be subject to the adverse effects of low genetic variability, as well as extirpation due to stochastic events.

b. Anticipated Impacts and Project Design Criteria

Effects to Fender's blue butterflies associated with JITW projects would most likely result from adverse modification of the species' habitat. In order to minimize disturbance to these butterflies and their habitat, the following measures will apply, as appropriate, to all current and future projects funded or partially funded by the JITW Program in western Oregon:

1. Restoration projects will not occur in known occupied habitats (i.e. Benton, Polk, Yamhill and Lane Counties) if modifications cannot be made to eliminate adverse impacts to the

butterflies' habitat.
2. A botanical survey, if required by the Service's endangered species biologist, will be conducted to determine the presence or absence of Kincaid's lupine at each project location. The optimal survey period is May to June.
3. Surveys for Fender's Blue will be conducted during May to June on any proposed project site that supports Kincaid's lupine.

With the incorporation of the above conditions, take of this species is not anticipated.

PLANTS

Federally listed plants on private land in Oregon receive little protection from take under the ESA, because this law prohibits take of listed plants only on Federal land, or in knowing violation of any state law, including criminal trespass. Because Oregon's JITW Program conducts projects only on private lands and in cooperation with landowners, no take restrictions, pursuant to the ESA, are applicable for plants. However, in order to minimize damage to rare plants in Oregon or their habitat, certain measures have been adopted by the JITW Program. These are enumerated below, for each plant species addressed in this consultation.

1. <u>Bradshaw's Lomatium</u>

a. Biology and Status

Bradshaw's lomatium (*Lomatium bradshawii*), a member of the carrot family (Apiaceae), grows from eight to twenty inches tall, with mature plants having only two to six leaves. Leaves are chiefly basal and are divided into very fine, almost threadlike, linear segments. The yellow flowers are small, measuring about 1 mm long and 0.5 mm across, and are grouped into asymmetrical umbels. Each umbel is composed of 5 to 14 umbellets, which are subtended by green bracts divided into three's. This bract arrangement differentiates *L. bradshawii* from other lomatiums. Bradshaw's lomatium blooms during April and early May, with fruits appearing in late May and June. Fruits are oblong, about one-half inch long, corky and thick-winged along the margin, and have thread-like ribs on the dorsal surface. This plant reproduces entirely from seed.

The majority of Bradshaw's lomatium populations occur on seasonally saturated or flooded prairies, adjacent to creeks and small rivers in the southern Willamette Valley. Soils at these sites are dense, heavy clays, with a slowly permeable clay layer located 15 to 30 cm below the surface. This clay layer results in a perched water table during winter and spring, and so is critical to the wetland character of

these grasslands, known as tufted hair-grass (*Deschampsia*) prairies. Insects observed to pollinate this plant include a number of beetles, ants, and some small native bees.

Endemic to and once widespread in the wet, open areas of the Willamette Valley of western Oregon, Bradshaw's lomatium is limited now to a few sites in Lane, Marion, and Benton Counties. The greatest concentrations of remaining sites and plants occur in and adjacent to the Eugene metropolitan area. Most of its habitat has been destroyed by land development for agriculture, industry, and housing. In addition, water diversions and flood control structures have changed historic flooding patterns, which may be critical to seedling establishment. Reductions in natural flooding cycles also permit invasion of trees and shrubs, and eventual conversion of wet prairies to woodlands. Bradshaw's lomatium was listed as Federally endangered on September 30, 1988 (53 FR 38451).

b. Anticipated Impacts and Project Design Criteria

For Bradshaw's lomatium, the following measures will apply, as appropriate, for all current and future projects funded or partially funded by the JITW Program in western Oregon:

1. Restoration activities will not occur in habitats containing this species (i.e. in the Willamette Valley) if modifications cannot be made to a project to eliminate or reduce adverse impacts to this plant.
2. Appropriate recommendations will be given to the project coordinator, in cooperation with Service botanist, if the project will still be implemented with non-federal project funds.
3. A botanical survey, if required by the Service's endangered/threatened species botanist, will be conducted to determine the presence or absence of the species at each project location. The optimal survey period for this species is during April to mid-May.

2. <u>Applegate's Milk-Vetch (*Astragalus applegatei*)</u>

a. Biology and Status

A member of the pea family (Fabaceae), Applegate's milk-vetch is a slender, herbaceous perennial, often decumbent, with stems to sixteen inches long, which have seven to eleven narrow, slightly strigose leaflettes. The flowers, whitish to lilac in color, are small with petals only one-fourth of an inch long. The seed pods, up to one-half of an inch long, are faintly mottled. Applegate's milk-vetch blooms and produces seed pods from June to early August. It is distinguished from other sympatric *Astragalus* species by its slightly curved stems, the number and location of the flowers, and its apparent inability to colonize dry, disturbed areas (USFWS 1993).

Applegate's milk-vetch was discovered near Klamath Falls, Oregon in 1927, and is known to exist only in one or two sites in Klamath County in southern Oregon. The site of only population with more than 10 individuals is in an expanding industrial area of Klamath Falls.

Applegate's milk-vetch grows in flat, open, seasonally moist remnants of floodplain alkaline grassland of the Klamath Basin. The substrate is poorly drained, fine silt loam, with an underlying hardpan 10 to 20 inches below. The species may be adversely affected by lack of seasonal flooding, which may formerly have been instrumental in reducing competition and providing openings for colonization. Irrigation withdrawals and water control structures along the Klamath River have eliminated the area's natural flooding regimes. The "large" population of this species, comprising about 1000 plants on 6 acres, has been impacted by road construction; the area it occupies is zoned for commercial or industrial use. Applegate's milk-vetch was listed as Federally endangered on July 28, 1993 (58 FR 40551).

b. Anticipated Impacts and Project Design Criteria

In order to minimize damage to Applegate's milk-vetch or its habitat, the following measures will apply, as appropriate, for all current and future projects funded or partially funded by the JITW Program in western Oregon:

1. Restoration activities will not occur in habitats containing this species (See Map A-7) if modifications cannot be made to a project to eliminate or reduce adverse impacts to this plant. Any restoration projects conducted within or near the area shown on Map A-7 could benefit this species, if conducted with care and coordinated with the Service or The Nature Conservancy (TNC) botanists, as appropriate.
2. If any project adversely affecting this species is to be implemented with non-federal project funds appropriate recommendations will be given to the project coordinator, in cooperation with Service or TNC botanists.
3. A botanical survey, if required by the Service's endangered/threatened species botanist, will be conducted to determine the presence or absence of the species at each project location. The optimal survey period for this species is from June to early August.

3. <u>Nelson's Checkermallow</u>

a. Biology and Status

Nelson's checkermallow (*Sidalcea nelsoniana*) in the mallow family (Malvaceae), is a perennial herb with pinkish-lavender to pinkish-purple flowers born in clusters at the end of 1 to 2.5 foot tall stems.. The majority of sites for the species occur in the Willamette Valley of Oregon; the plant is also found at several sites in the Coast Range of Oregon and at one site in the Coast Range in Cowlitz County,

Washington. Thus the range of the plant extends from southern Benton County, Oregon, north to Cowlitz County, Washington, and from central Linn County, Oregon, west to just west of the crest of the Coast Range.

Inflorescences of plants from the Willamette Valley are usually somewhat spike-like, usually elongate and somewhat open (Hitchcock 1957). Inflorescences of plants from the Coast Range are shorter and not as open (Chambers, botanist and professor emeritus, Oregon State University, pers. comm.). Plants have either perfect flowers (male and female) or pistillate flowers (female). The plant can reproduce vegetatively, by rhizomes, and produces seeds that drop near the parent plant. Flowering can occur as early as mid-May and extend into September in the Willamette Valley. Fruits have been observed as early as mid-June and as late as mid-October. Coast Range populations generally flower later and produce seed earlier, probably because of the shorter growing season (CH2M Hill 1991).

Within the Willamette Valley, Nelson's checkermallow most frequently occurs in *Fraxinus* (ash) swales and meadows with wet depressions, or along streams. The species also grows in wetlands within remnant prairie grasslands. Some sites occur along roadsides at stream crossings where exotics such as blackberry (*Rubus* spp.) and Queen Anne's lace (*Daucus carota)* are also present. Nelson's checkermallow primarily occurs in open areas with little or no shade and will not tolerate encroachment of woody species.

Prior to European colonization of the Willamette Valley, naturally occurring fires and fires set by Native Americans maintained suitable Nelson's checkermallow habitat. Current fire control and prevention practices allow succession of introduced and native species, which may gradually replace habitat for Nelson's checkermallow (Bureau of Land Management 1985). No natural prairie remains in the Willamette Valley without the obvious effects of livestock grazing, fire suppression, or agricultural land conversion. (Moir and Mika 1972). Stream channel alterations, such as straightening, splash dams, and rip-rapping cause an increase in instream flow and reduce the amount of water that is diverted naturally into adjacent meadow areas. As a result, areas that would support Nelson's checkermallow are lost. The species is now known to occur in 48 patches within five relict population centers in Oregon, and at one site in Washington (CH2M Hill 1991). Four additional sites with occurrences recorded since 1985 apparently have been extirpated as a result of plowing, deposition of fill material or yard debris, or intense roadside vegetation management. Nelson's checkermallow was listed as threatened on February 12, 1993 (58 FR 8242).

b. Anticipated Impacts and Project Design Criteria

In order to minimize damage to Nelson's checkermallow or its habitat, the following measures will apply, as appropriate, for all current and future projects funded or partially funded by the JITW Program in western Oregon:

1. Restoration activities will not occur in habitats containing this species (i.e., in the Willamette Valley and the Coast Range) if modifications cannot be made to a project to eliminate or reduce adverse impacts to this plant.
2. Appropriate recommendations will be given to the project coordinator, in cooperation with Service botanist, if the project will still be implemented with non-federal project funds.
3. A botanical survey, if required by the Service's endangered/threatened species botanist, will be conducted to determine the presence or absence of the species at each project location. The optimal survey period for this species is in June and July.

4. Western Lily

a. Biology and Status

The western lily (*Lilium occidentale*), a perennial in the lily family (Liliaceae), grows from a short unbranched, rhizomatous bulb, reaching a height of up to 1.8 meters (5 feet (ft)). Leaves grow along the unbranched stem singly or in whorls and are long and pointed, roughly 1 centimeter (cm) wide and 10 cm long (0.5 inch (in) by 4 in). The nodding flowers are red, sometimes deep orange, with yellow to green centers in the shape of a star and spotted with purple. The six petals (tepals) are 3 to 4 cm (1 to 1.5 in) long and curve strongly backwards.

The western lily has an extremely restricted distribution within 2 miles (3.2 kilometers) of the coast, from Hauser, Coos County, Oregon to Loleta, Humboldt County, California. This range encompasses approximately the southern one-third of the Oregon coast and the northern 100 miles (161 km) of the California coast. The plant is currently known from 7 widely separated regions along the coast, and occurs in 31 small (2 square meters to 4 hectares), isolated, densely clumped populations. Of the 25 populations known in 1987 and 1988, 9 contained only 2 to 6 plants, 5 contained 10 to 50 plants, 6 contained 51 to 200 plants, 4 contained 201 to 600 plants, and 1 contained almost 1,000 plants (Schultz 1989). At some sites, particularly the sites with more than 200 plants, the majority of plants were non-flowering, which is probably an indication of stress (Schultz 1989). Since then, an estimated total of 1,000 to 2,000 flowering plants have been discovered at 4 sites near Crescent City, California, where none were previously known (Dave Imper, Humboldt State University Foundation, pers. comm. 1991). In addition, a population of about 125 flowering plants was discovered near Brookings, Oregon, in 1991 (Margie Willis, Oregon Department of Parks and Recreation, pers. comm. 1991), and a population of 13 flowering plants was discovered near Bandon, Oregon, in 1992.

The western lily grows at the edges of sphagnum bogs and in forest or thicket openings along the margins of ephemeral ponds and small channels. It also grows in coastal prairie and scrub near the ocean where fog is common. Historical records indicate that the western lily was once more common than it is today. After the ice age, rising sea levels flooded marine benches, creating much more extensive bogs

and coastal scrub than exist today. That may account for the patchiness of the western lily's current distribution. It is known or assumed to be extirpated in at least nine historical sites, due to forest succession, cranberry farm development, livestock grazing, highway construction, and other development. These factors continue to threaten the lily, with development taking a primary role. Two known populations near Brookings, Oregon were partially or totally destroyed by unpermitted development-related wetland fill activity in 1991. The largest known population and three smaller populations near Crescent City, California are currently threatened by housing and recreation development. The western lily was listed as Federally endangered on August 17, 1994 (59 FR 42176).

b. Anticipated Impacts and Project Design Criteria

In order to minimize damage to the western lily or its habitat, the following measures will apply, as appropriate, for all current and future projects funded or partially funded by the JITW Program in western Oregon:

1. Restoration activities will not occur in habitats containing this species (i.e., coastal areas of Coos and Curry Counties) if modifications cannot be made to a project to eliminate or reduce adverse impacts to this plant.
2. Appropriate recommendations will be given to the project coordinator, in cooperation with Service botanist, if the project will still be implemented with non-federal project funds.
3. A botanical survey, if required by the Service's endangered/threatened species botanist, will be conducted to determine the presence or absence of the species at each project location. The optimal survey period for this species is in late June - July.

5. <u>Rough Popcornflower</u>

a. Biology and Status

An annual herb in the Borage family (Boraginaceae), the rough popcornflower (*Plagiobothrys hirtus*) is an annual herb with a stout stem, erect or reclining, that grows 1 to 2 feet long. The leaves are linear, the lower paired and the upper alternate, 10 to 25 cm in length. The flowers are white with yellow centers, 5-petaled, radially symmetrical, up to 20 mm across, and are arranged in curled racemes typical of the borage family. The nutlets (seeds) are ovate, 2 mm long, with a prominent dorsal keel. It can be distinguished from other sympatric *Plagiobothrys* species by its distinctive, wide-spreading hairs, in contrast to the appressed hairs of the other species. The species is an annual, or creeping perennial with rooting stems, a unique trait for the genus.

The rough popcornflower is a narrow endemic, which occurs at only 4 known sites in Oregon's Umpqua Valley, near Sutherlin, in Douglas County. The sites are all located within 5 miles of one

another and total under 10 acres in area. Fewer than 3,000 plants exist. The species occurs in moist, open areas on poorly drained silty clay soils in flat valley bottoms. Its habitat is maintained by the seasonal ponding of water.

The rough popcornflower is highly threatened by development, ditching, road building and maintenance, grazing, and competition with non-native weeds. One population actually occurs within the town of Sutherlin, on a vacant lot surrounded by residential areas. Another population occurs along the shoulder of Interstate 5, at the Sutherlin exit. The third population is crossed by a series of drainage ditches, and has had fill dirt dumped on it, which has introduces non-native weeds to the site. The fourth site has a history of sheep grazing, and is presently grazed by cattle (Gamon and Kagan 1985). Listing of this species is urgently needed, although some recovery work is already in progress (Amsberry and Meinke 1997).

b. Anticipated Impacts and Project Design Criteria

In order to minimize damage to the rough popcornflower or its habitat, the following measures will apply, as appropriate, for all current and future projects funded or partially funded by the JITW Program in western Oregon:

1. Restoration activities will not occur in habitats containing this species (i.e. in Douglas County) if modifications cannot be made to eliminate adverse impacts to this plant.
2. Appropriate recommendations will be given to the project coordinator, in cooperation with Service botanist, if the project will still be implemented with nonfederal project funds.
3. A botanical survey, if required by the Service's endangered/threatened species botanist, will be conducted to determine the presence or absence of the species at each project location. The optimal survey period for this species is in mid-June to early July.

6. <u>Cook's Lomatium</u>

a. Biology and Status

Cook=s Lomatium (*Lomatium cookii*) is a perennial herb that grows to a height of 8 to 15 inches, from a slender, twisted taproot. The species grows in vernal pools or other seasonally wet habitat, on soils that have a shallow hard or clay pan layer that maintains seasonally wet soils at the surface. The species is known from 4 populations, in total occupying some 60 ha (150 ac). The plants occur in two disjunct clusters in southwestern Oregon: the Illinois Valley (Josephine County) and the Agate Desert (Jackson County),.

Because Cook=s lomatium was first collected only in 1981, estimates of historic population size are difficult. However, based on known historic distribution of vernal pools in the area, it may be that over

99 percent of the species= habitat has been lost (J. Kagan, Oregon Natural Heritage Program, pers. comm. 1997). The Nature Conservancy owns and actively manages two sites in the Agate Desert, the Agate Desert Preserve (approximately 12.5 acres of habitat) and the recently acquired Whetstone Savannah Preserve (about 1.2 acres of habitat).

Lomatium cookii is imminently threatened by habitat destruction, primarily from residential and industrial development, including road and powerline construction. Within the past 10 years, numerous populations have been bisected by roads and powerlines and sewer lines, lost to department store and sports park complex and residential construction. Other factors contributing to habitat loss include ORV use, gold mining, and overgrazing.

Development in the area is remarkably rapid. Since the listing package was submitted, a large population [500 plants] in the Illinois Valley (Josephine County) was destroyed by a housing development during the summer of 1996. Additionally, one of three subpopulations north of Rough and Ready Creek in Josephine County (containing 250 plants) was lost to agriculture.

Other threats loom. The most serious of these is a state prison proposed by the City of Medford to be sited within one of the largest population cluster adjacent to TNC=s preserve for this species (D. Borgias, TNC botanist, pers. comm. January 1997).

The only *Lomatium cookii* site on Federal land is located near French Flat and managed by BLM. Gold mining operations threaten some 600 plants on BLM land. Mining activities could result in direct habitat loss, or could alter hydrologic regimes upon which *L. cookii* depends.

With many plants, in cases of inevitable habitat loss, transplantation may be an option of last resort in preserving individuals and maintaining genetic diversity. However, transplantation does not appear to be feasible for Cook=s lomatium. The plant=s twisted taproot is so horizontally extensive above the pan layer and the root hairs so interwoven with the rocky substrate that a tremendous amount of material would have to be moved with the plant to avoid root injury and subsequent mortality. Where transplantation has been attempted, the plants have died (D. Borgias, pers comm. 1/8/97).

b. Anticipated Impacts and Project Design Criteria

In order to minimize damage to Cook's lomatium or its habitat, the following measures will apply, as appropriate, for all current and future projects funded or partially funded by the JITW Program in western Oregon:

1. Restoration activities will not occur in habitats containing this species (i.e. in Jackson and Josephine County vernal pool habitat) if modifications cannot be made to eliminate adverse

impacts to this plant.
2. Appropriate recommendations will be given to the project coordinator, in cooperation with Service botanist, if the project will still be implemented with nonfederal project funds.
3. A botanical survey, if required by the Service's endangered/threatened species botanist, will be conducted to determine the presence or absence of the species at each project location. The optimal survey period for this species is in mid-March through April.

7. Gentner's Fritillary

a. Biology and Status

A member of the Lily family (Liliaceae), Gentner's fritillary (*Fritillaria gentneri*) flowers from April to June, producing striking racemes of reddish-purple flowers, with yellow streaks. It is known only from a few scattered localities along the Rogue and Illinois River drainages, in Jackson and Josephine Counties. The species occurs in rather dry, open woods of fir and oak, at low elevations.

Prized by collectors, this rare lily is threatened by over-collection, especially as some populations are located adjacent to well-traveled roadways. Grazing and logging are also potential threats.

b. Anticipated Impacts and Project Design Criteria

In order to minimize damage to Gentner's lily or its habitat, the following measures will apply, as appropriate, for all current and future projects funded or partially funded by the JITW Program in western Oregon:

1. Restoration activities will not occur in habitats containing this species (i.e. in Jackson and Josephine Counties) if modifications cannot be made to eliminate adverse impacts to this plant.
2. Appropriate recommendations will be given to the project coordinator if the project will still be implemented with nonfederal project funds.
3. A botanical survey, if required by the Service's endangered/threatened species botanist, will be conducted to determine the presence or absence of the species at each project location. The optimal survey period for this species is from April through June.

8. Umpqua Mariposa Lily (*Calochortus umpquaensis*)

a. Biology and Status

This member of the lily family (Liliaceae) is a bulbous perennial, with a single, dark green basal leaf 8 - 12 inches long and a flowering stalk 8-20 inches high. This stalk bears one to five three-petaled flowers,

which measure 1.5 to 3 inches in diameter. Flowers are white, with a deep purple spot near the base of the petal. Blooming occurs in June and July.

Calochortus umpquaensis is known only from an area of less than 5 x 10 miles, in Douglas County, Oregon. Within this limited range, the species is restricted to serpentine soils, but does not seem restricted to a particular aspect or slope type. Fourteen populations are presently known extant.

Studies have shown that this lily is significantly affected by grazing, which removes the individual's single leaf. Feeding by deer, rabbits and insects alone can cause serious damage; cattle grazing could readily lead to extirpation of populations (Fredricks *et al*. 1992). Like other members of its genus, this showy lily is also highly sought after in the horticultural trade.

b. Anticipated Impacts and Project Design Criteria

In order to minimize damage to the Umpqua mariposa lily or its habitat, the following measures will apply, as appropriate, for all current and future projects funded or partially funded by the JITW Program in western Oregon:

1. Restoration activities will not occur in habitats containing this species (i.e. in Douglas County) if modifications cannot be made to eliminate adverse impacts to this plant.
2. Appropriate recommendations will be given to the project coordinator, in cooperation with Service botanist, if the project will still be implemented with non-federal project funds.
3. A botanical survey, if required by the Service's endangered/threatened species botanist, will be conducted to determine the presence or absence of the species at each project location. The optimal survey period for this species is during June and July.

9. Willamette Daisy (*Erigeron decumbens* var. *decumbens*)

a. Biology and Status

A member of the sunflower family, this plant is a perennial herb, 6-24 inches tall. Basal leaves are 2-7 inches long and less than ½ inch wide, becoming gradually shorter along the stem. The flowering stems, which are taller than the vegetative stems, produce 2-5 flower heads in June and July. The flowers are daisy-like, with yellow centers and 25-50 pinkish to blue rays, often fading to white with age.

The Willamette daisy is endemic to the state of Oregon, where it is known only from the Willamette Valley. Historically, this plant likely was widespread throughout the Valley. Presently, 18 sites are known, distributed over an area of some 100 km by 70 km, between Grand Ronde and Goshen,

Oregon. The plant is known to have been extirpated from an additional 19 historic locations (Clark *et al*. 1993).

Willamette daisy populations are known from both bottomland and upland prairie remnants. Prior to European settlement, these prairies were maintained by fire, which prevented the establishment of woody species. Prairie remnants are considered to be among the rarest habitats in western Oregon and are threatened by fragmentation, agriculture and urban growth. Most sites are small and privately owned. Only four sites are in secure ownership (Clark *et al*. 1993).

b. Anticipated Impacts and Project Design Criteria

In order to minimize damage to the Willamette daisy or its habitat, the following measures will apply, as appropriate, for all current and future projects funded or partially funded by the JITW Program in western Oregon:

1. Restoration activities will not occur in habitats containing this species (i.e. in the Willamette Valley) if modifications cannot be made to eliminate adverse impacts to this plant.
2. Appropriate recommendations will be given to the project coordinator, in cooperation with Service botanist, if the project will still be implemented with non-federal project funds.
3. A botanical survey, if required by the Service's endangered/threatened species botanist, will be conducted to determine the presence or absence of the species at each project location. The optimal survey period for this species is from mid-June to early July.

D. CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, local, or private activities that are reasonably certain to occur within the action area considered in this opinion. Future Federal actions that may be related to the proposed actions are not considered in this section because they require separate consultation, pursuant to section 7 of the Act.

Cumulative effects resulting from JITW Program activities would most likely be positive. As adjacent landowners and other members of local communities view the results of completed JITW projects, further private citizen involvement in watershed restoration projects is likely to be promoted. Additionally, the displaced timber workers who are conducting JITW project work are receiving information that will foster increased understanding of ecological processes, and skills that will enable these individuals to contribute further to the effort to conserve and restore degraded watersheds.

E. CONCLUSION

After reviewing the current status of all listed species and critical habitat under consideration in this consultation, it is the Service's biological opinion that the Jobs in the Woods Program for Western Oregon is not likely to jeopardize the continued existence of any endangered or threatened species covered in this consultation, or to adversely modify designated critical habitat for any listed species. In considering the effects of the JITW projects to listed and other rare species, it is worth noting that these projects, by their very nature and intent, are designed to restore watersheds. In the long run, rare and other native species will likely benefit from these project activities.

III. INCIDENTAL TAKE STATEMENT

General

Section 9 of the Act prohibits taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or the applicant. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

Amount or Extent of Take

1. The Service anticipates no adverse habitat modification, but authorizes disturbance take, to a low but unquantifiable number of spotted owls, marbled murrelets, Aleutian Canada geese, bald eagles, peregrine falcons, western snowy plovers, brown pelicans, Columbian white-tailed deer, and Oregon silverspot butterflies during the implementation of JITW projects.

2. The Service anticipates no adverse habitat modification, but authorizes take of a small but unquantifiable number of Oregon chub, Lost River suckers and shortnose suckers during the implementation of JITW projects.

Reasonable And Prudent Measures

1. Avoid projects that involve silvicultural or other activities that would permanently alter the habitat of any listed or candidate terrestrial species.

2. Avoid projects involving activities that would permanently degrade the habitat of any listed or candidate aquatic species.

3. Time projects to eliminate or minimize interference with reproductive cycles, migratory movements, foraging or other behaviors of listed and candidate species.

4. Conduct surveys, as appropriate, to verify the presence of species or their habitats in relation to potential JITW projects.

Terms and Conditions

With the full implementation of the Project Design Criteria, as described individually for each listed and candidate species (Part V), no further terms and conditions are required. If these criteria are not followed, the protective coverage of section 7(o)(2) may lapse.

Project Design Criteria provided in the BA and in Part V of this Opinion for plants and for candidate animals are legally discretional; however, the JITW Program intends to implement these measures fully for these species. Based on available information, the Service concludes that if the Project Design Criteria for spotted frogs, bull trout, and Fender's Blue butterflies are fully implemented, as detailed above, no further terms and conditions are anticipated, should these species become proposed in the future.

The incidental take statement included in this biological opinion is limited to the Act. It does not constitute authorization for take of listed migratory birds under the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, or any other Federal statutes.

If, during the course of any action covered under this consultation, the amount or extent of the anticipated incidental take described above is exceeded, if the action is modified, if the scope of the action is increased, or if new information indicates that any listed species covered in this consultation is to be adversely affected, the JITW Program must reinitiate consultation with the Service.

The Service is to be notified within 3 working days upon locating a dead, injured, or sick endangered or threatened species specimen. Initial notification must be made to the nearest Fish and Wildlife Service Law Enforcement Office. Notification must include the date, time, precise location of the injured animal or carcass, and any other pertinent information. Care should be taken in handling sick or injured

specimens to preserve biological materials in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured endangered species or preservation of biological materials from a dead animal, the finder has the responsibility to ensure that evidence associated with the specimen is not unnecessarily disturbed. In Oregon, contact the law enforcement office at (503) 231-6186 or the Oregon State Office at (503) 231-6179.

Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities designed to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

The Service recommends that the following conservation measures be implemented:

1. Selecting projects that would benefit aquatic resources within the areas mapped in Appendix A could also be of benefit to certain rare plant and animal species.

2. For potential projects that could adversely affect listed plants, coordination with endangered species staff botanist is recommended, even if the project does not go forward.

3. For potential projects where environmental contaminants are noted on-site, coordination with environmental contaminants staff is recommended, even if the project does not go forward.

Information on the implementation of any conservation recommendations will be exchanged during the annual inter-program staff meeting(s), as described in Part II. above.

IV. REINITIATION NOTICE-CLOSING STATEMENT

This concludes formal consultation on the Jobs in the Woods Program for Western Oregon. According to 50 CFR §402.16, reinitiation of this formal consultation will be required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) any of the actions described in the BA are subsequently modified in a manner that causes an effect to the listed species that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by any agency action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation of formal

consultation. If you have any questions regarding this opinion, please contact Judy Jacobs or Nancy Lee of our Forest Endangered Species Program staff.

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APPENDIX A - RANGE MAPS FOR SELECTED LISTED SPECIES