5.0 Taxonomical Group and Species Evaluation

This section of the BA evaluates and quantifies the effects of the proposed action on 73 threatened, endangered, proposed, and selected sensitive (TEPS) species and their designated or proposed critical habitat (see Table 1.0-1 for a listing of these species). Information in this section will be critical to facilitating determinations of effect to listed species.

This section includes an analysis of the direct and indirect effects of the proposed action (and its interrelated and interdependent activities) on TEPS species and/or their critical habitat. These determinations of effect were based on factors suggested by the jointly developed ESA Consultation Handbook (NOAA Fisheries and USFWS, 1998), assumptions documented in the Evaluation of Effects Memoranda developed in collaboration with the Services (Appendix 2-B), and the analysis of an extensive geographic and biological data set collected through this consultation. Evaluation methods are described in detail in Section 2, and summarized below.

5.1 Summary of Evaluation Methods

Analysis of the effects of the proposed action was conducted in close coordination with the Services, as well as State agency personnel. The Level 1 Working Group (described in Section 2 and Appendix 2-C) developed assumptions for each listed species for use in evaluating the effects of the proposed action (Appendix 2-B).

All potential effects on TEPS species were assessed in light of the proposed environmental performance standards, which target these potential effects; ultimately becoming the Terms and Conditions of the Biological Opinion. The environmental performance standards are presented in Section 3 of this BA.

The potential effects of the proposed action on fish, wildlife, and plant species were evaluated based on Service-approved or Service-drafted reports and Biological Opinions as well as on professional knowledge and data provided by local resource specialists. GIS data used in this analysis are a product of these reports, and of confirmed GIS information obtained through this consultation. As described in Section 2, the GIS data were critical to screening, describing, and calculating the effects of the proposed action on listed species and their habitats. Interpretation of the data was also jointly conducted with Level 1 Working Group participants and other resource and regulatory agency staff. Steps in data analysis were described in Section 2.

As described in Section 2, the effects of the Bridge Program on TEPS species are considered in the context of effects pathways, (i.e., soil, air, water, chemicals, or vegetation). Actions that can affect the viability of TEPS species are delivered through these pathways, and can alter one or more of the physical, chemical, or biological parameters necessary for continued viability and recovery. In addition, direct effects to individuals can occur during any activity that requires handling or that would otherwise displace TEPS species. These effects are considered to result from the species pathway.

As discussed in Section 2, effects analyses are discussed in terms of both "gross" and "net" effects. Numerous bridge APIs overlap, and the areas of effect therefore include the specific bridge API, as well as a portion of an adjacent, overlapping bridge API. Both net and gross effects are provided in the individual species evaluations.

The remainder of this section addresses potential effects to Fish (Sections 5.2 and 5.3), Wildlife (Section 5.4), and Plants (Section 5.5). With some variation depending on the species or taxonomic group, the analyses include the following major elements:

- Life history and status
- Species specific effects pathways
- Minimization and avoidance measures
- Analysis of effect
- Determination of effect.

Methodology and assumptions used in determining effects to listed fish, and estimation of potential take, are discussed separately in Sections 5.2.3 for anadromous species, and 5.3.3 for resident species.

5.2 Fish (Anadromous) Species

5.2.1 Life History and Status

There are five species of Pacific salmon and steelhead in Oregon: chinook salmon (*O. tshawytscha*), coho salmon (*O. kisutch*), chum salmon (*O. keta*), sockeye salmon (*O. nerka*), and steelhead (*O. mykiss*). Different populations of these species exist in different ecoregions of the state. The ESA considers distinct populations to be different species, but does not specify how distinctness should be evaluated for populations within a species. In an effort to efficiently and appropriately implement ESA regulations for salmonids, NOAA Fisheries has developed a species policy to guide ESA listings for Pacific salmon and steelhead in order to conserve genetic diversity (Waples 1995). According to the policy, a population or group of populations is considered distinct if it represents an Evolutionarily Significant Unit (ESU) of the species. The unifying theme of the policy is the desire to identify and conserve important genetic resources, thus allowing evolution to continue, largely unaffected by human factors (Waples 1995). **An ESU is a population with the distinct genetic resources necessary to allow resilience to changing environmental conditions and to allow the evolutionary process to continue.** In Oregon, the Federal ESA currently lists 11 Pacific salmon and steelhead ESUs as threatened, and three as endangered.

The life histories and current status of the Pacific salmon and steelhead addressed in this BA are well documented; existing information is abundant. Therefore, to more efficiently address potential effects of Bridge Program activities on Pacific salmon and steelhead, this section refers to other documents that provide this information. Life history information is critical to the determination of the potential effects that the proposed action may have on Pacific salmon and steelhead. Detailed life histories of the five Pacific salmon and steelhead species addressed in

this BA can be found in the Federal Register and in other reports prepared by NOAA Fisheries. Table 5.2.1-1 provides reference information on Pacific salmon and steelhead and ESU listing.

Table 5.2.1-1. Oregon Pacific salmon and steelhead life history, status, and Federal listing information.

Species	ESU	ESA Status	Federal Register Documentation
Chinook salmon	Lower Columbia River	Threatened	64 FR 14308, 65 FR 7764
	Snake River	Threatened	57 FR 14653, 58 FR 68543
	Upper Columbia River	Endangered	64 FR 14308
	Upper Willamette River	Threatened	64 FR 14308, 65 FR 7764
Coho salmon	Northern California/ Southern Oregon Coasts	Threatened	62 FR 24588, 64 FR 24049
	Oregon Coast	Threatened	63 FR 42587, 65 FR 7764
Chum salmon	Columbia River	Threatened	64 FR 14508, 65 FR 7764
Sockeye salmon	Snake River	Endangered	56 FR 58619, 58 FR 68543
Steelhead trout	Lower Columbia River	Threatened	64 FR 14517, 65 FR 7764
	Middle Columbia River	Threatened	64 FR 14517, 65 FR 7764
	Upper Columbia River	Endangered	62 FR 43937
	Snake River Basin	Threatened	64 FR 14517, 65 FR 7764
	Upper Willamette River	Threatened	64 FR 14517, 65 FR 7764
Coastal cutthroat trout	SW Washington/Columbia River	Not Listed	64 FR 16397, 65 FR 24420

5.2.2 Analysis of Effects on Fish (Anadromous)

As a functional group, the anadromous fish species addressed in this BA include chinook, coho, sockeye, and chum salmon, as well as steelhead and coastal cutthroat trout. These species have similar life histories and habitat requirements, and all depend on the same basic habitat elements necessary to carry out the various life history stages (spawning, rearing, and migration). Anadromous species are unique in that they migrate to sea to feed and mature after an early freshwater cycle. Upon maturation, they generally return to natal streams to spawn. It is during the early freshwater phase (including incubation and rearing) and the spawning phase that they are most dependent on habitat features that are subject to degradation by human activities. Essential habitat features include substrate composition; water quality; water quantity, depth, and

velocity; water temperature; channel gradient and stability; food availability; cover and habitat complexity; habitat area, access, and passage; and floodplain and habitat connectivity (Roni et al. 1999). Degradation of any of these elements will reduce the viability of anadromous fish populations and species.

5.2.2.1 Effects Pathways

This BA provides an analysis of the potential effects of the proposed action on the habitat elements that are critical for sustained, viable populations of Federally listed fish. Actions can affect the viability of listed species by altering one or more physical, chemical, or biological parameters. All effects are delivered via the displacement, disruption, removal, or other alteration of soil, air, water, chemicals, or vegetation. In addition, incidental take of the species (e.g., via direct physical injury) may occur. Throughout this section of the BA, the Bridge Program's effects on Federally listed fish are considered in the context of the above pathways. A further discussion of each of these effects pathways follows.

<u>Soil</u>

The displacement and transport of soil can result in turbidity and sedimentation within stream channels. The effects of suspended sediments (turbidity) may be sub-lethal or lethal, and are generally correlated to the concentration of sediment within the water column. Fish death can be a result of a combination of factors, and thus is difficult to attribute to suspended sediment alone (Waters 1995). The sub-lethal effects of turbidity generally include avoidance and distribution, reduced feeding and growth, respiratory impairment, reduced tolerance to disease and toxicants, and physiological stress (Lloyd 1987 *in* Waters 1995). Reproductive failure can be attributed to both deposited and suspended sediment. Deposited sediments can smother salmon redds by filling interstitial spaces or by entrapping emerging fry under a layer of consolidated sediments. Excessive turbidity can smother embryos and sac fry, and clog gills. Physical habitat is generally most affected by deposited sediments; naturally loose substrates such as cobble and gravel can become embedded with fine sediment, thus limiting available spawning habitat and diminishing the amount of available cover for overwintering juveniles and fry. Additionally, the infilling of pools reduces overhead cover for juveniles and adults (Waters 1995). Substrate embeddedness has also been shown to affect aquatic macroinvertebrate abundance and species composition, thus altering the availability and suitability of a critical food source. Lastly, soils can act as a delivery mechanism for transferring chemical pollutants from upland sources.

<u>Water</u>

Alterations to fluvial processes can have sub-lethal and lethal effects on anadromous salmonids as well as direct effects on their habitat. Alterations in channel hydraulics are triggered by the direct removal of habitat elements, which contribute to channel complexity, or by altering the flow regime of rivers and streams. These alterations can indirectly affect salmonids by inhibiting run timing and by degrading habitat refugia. The addition of hardened structures (i.e., bridge bents) within a fluvial channel can alter the

hydrology of the system by increasing flow velocities, encouraging scour, and limiting the natural movement of bedload materials—thus causing sub-lethal effects on salmonids. Changes to the hydrologic regimes of streams and rivers are a potential pathway for these types of effects.

Changes in hydrology may occur as a result of increases in road density (e.g., impervious surfaces) or by stormwater conveyance within a watershed, particularly when these changes occur near streams. Hydrologic alterations may be manifested as increases in the frequency and magnitude of peak flows and as reductions in base flow levels, all of which can have sub-lethal and lethal effects on salmonids. Increasing the magnitude of peak flows will often have an indirect effect on salmonids by promoting channel scour and degradation, the loss of floodplain connectivity, and overall habitat simplification. Decreasing base flows can allow water temperatures to increase beyond tolerable levels and can even dewater sections of rivers and backwater areas, cutting off important habitat for spawning and rearing salmonid. Lowered base flows can have sub-lethal or lethal effects on salmonids.

Water may also be a pathway for the conveyance of hydroacoustic effects on anadromous fish. Hydroacoustic effects are generally created during activities that generate excessive noise within the water column, typically pile-driving (NOAA Fisheries 2003a). Pile-driving for in-water structures can cause intense temporary underwater sounds that may affect the behavior of salmon up to approximately 2,000 feet away (NOAA Fisheries 2003c). These hydroacoustic effects can kill salmonids (e.g., by ruptured swim bladders), or can be sub-lethal (e.g., injury or harassment and displacement from productive feeding habitats).

Chemicals

The delivery of chemicals to streams and rivers is another pathway for adverse effects on anadromous salmonids. Chemical contamination can alter fecundity, increase disease, shift biotic communities, and reduce the overall health of migrating salmon. If contamination levels are high enough, direct lethal effects are possible through the disruption of biological processes. The introduction of chemicals can be acute, occurring as a result of an accidental spill or equipment leaks during construction activities, or chronic, resulting from increased stormwater runoff to waterways. The effects of stormwater on salmonids may be sub-lethal or lethal, and are generally correlated to the concentration of chemical contaminants within the water column.

Vegetation

Plants are an important element of functioning anadromous fish habitat. Riparian vegetation provides cover for fish, streambank stability, stream temperature control, and habitat for prey (Meehan 1991). Cover is provided by overhanging vegetation and undercut banks. Fallen riparian vegetation provides channel-forming large woody material (LWM) that promotes pool formation and the retention of bedload material. The removal of riparian vegetation can reduce soil cohesion and bank stability, inducing

erosion and streambank loss; this degradation of overall habitat conditions can have sub-lethal effects on salmonids. Additionally, temperature increases may result from increased solar radiation due to the loss of overstory vegetation, and loss of bank stability can result in streams becoming wide and shallow, further increasing stream temperature during summer low-flow conditions. Terrestrial insects inhabit riparian vegetation and provide food for fish when they fall into water. Detritus falling into streams provides food for aquatic insects, which can, in turn, become food for fish. Thus, the removal of riparian vegetation can also lead to diminished primary and secondary productivity in streams (Meehan 1991).

The loss of riparian vegetation can affect channel morphology if recruitment of woody material is diminished. Woody material retains sediments of various sizes, including gravels suitable for spawning. The loss of woody material can allow sediments to be more quickly flushed through the system, thus depleting available spawning habitat and reducing productivity/fecundity. Wood in streams also provides a substrate for aquatic insect populations, which may diminish with the depletion of instream woody material.

Where watersheds are already at risk due to prior disturbance, the removal of riparian habitat may trigger habitat changes that exceed the tolerance of anadromous fish. For instance, small temperature increases may have no detectable adverse effects on fish in a stream with a well developed riparian corridor and summer temperatures well within the tolerable range—but small temperature increases in a stream with already high summer temperatures may create unacceptable conditions for individuals and populations.

Species

In addition to effects via the pathways described above, direct effects (sub-lethal and lethal) on anadromous fish species can occur during any activity that requires handling or that would otherwise displace listed fish species, (e.g., by blocking passage or access to habitats and displace fish from cover.) However, anadromous salmonid outmigrants, particularly during downstream passage through the mainstem Columbia River, are less likely to be affected during capture and handling efforts associated with the Bridge Program. Data cited in Floyd (2003) indicate that juvenile outmigrants within the Columbia River are primarily in a migration phase and tend to pass quickly through the system. Additionally, steelhead trout, chinook salmon, and sockeye salmon tend to stay out in the river rather than orienting to the shoreline. Although chinook salmon will seek resting and feeding areas, particularly during periods of low flow. Individuals of those ESUs that would be present in the Columbia River only as migrants and would not otherwise be present in proximity to Bridge Program activities (i.e., Upper Columbia River chinook and steelhead, and Snake River sockeye) are unlikely to be encountered during capture and handling efforts. Snake River Fall Run chinook salmon do occupy shallows of the Columbia River estuary, although no program bridges occur in these areas.

Direct effects may also occur if incubating eggs or larvae are destroyed as a result of any activity. Additionally, disturbances that increase stress or energy loss of spawning adults can reduce productivity/fecundity.

5.2.2.2 Minimization and Avoidance Measures

The effects of actions proposed under this consultation may be delivered by one or multiple pathways. The degree to which The Bridge Program affects anadromous salmonid populations or habitat is dependent on the intensity, magnitude, duration, timing, and frequency of the activity having the effect. The efforts to minimize the effects of the proposed action are focused on restricting the pathways through which the habitat elements critical for sustaining viable salmonid populations can be degraded. Minimization and avoidance measures for the bridge program consist of environmental performance standards and conservation measures that provide proactive methods for habitat and species conservation during bridge design and construction. Section 3.3 lists and defines these environmental performance standards.

5.2.2.3 Effects on the Environmental Baseline

The potential effects of the proposed action were evaluated with regard to the individual habitat elements critical for sustained, viable anadromous fish populations, and the environmental performance standards (Section 3.3) were specifically developed to minimize Bridge Program effects on these critical habitat elements.

Habitat-altering actions affect salmonid population viability by affecting the physical, chemical, and biological parameters central to salmon survival in freshwater ecosystems (NOAA Fisheries 1999). When evaluating actions that affect freshwater habitat elements, NOAA Fisheries defines the biological requirements of the species in terms of the concept of properly functioning condition (PFC). Properly functioning condition is characterized by the sustained presence in a watershed of natural habitat-forming processes that are necessary for the long-term survival and recovery of salmon and steelhead. Natural habitat-forming processes include, but are not limited to, bedload transport, large woody material recruitment, and riparian vegetation succession. The concept of PFC constitutes the habitat component of a species' biological requirements.

Actions that affect habitat have the potential to affect population abundance, productivity, and diversity. These effects can be particularly acute when populations are at low levels. Freshwater habitat degradation is a factor for decline in every salmon listing on the West Coast. By analyzing the effects of a given action on the habitat portion of a species' biological requirements, NOAA Fisheries is able to gauge how that action will affect the population and ultimately, how the action will affect the species' current and future recovery.

NOAA Fisheries has designated 18 distinct habitat parameters that influence the continued existence of anadromous salmonids (NOAA Fisheries 1999). Their effects on anadromous salmonids are determined by the degree to which a proposed action alters the baseline condition of these parameters, which are assessed at the individual watershed scale. The proposed Bridge Program will be carried out statewide, and will encompass a variety of habitat types and conditions. Therefore, effects on the baseline condition of these parameters will be analyzed at

the scale of the ESU rather than an individual watershed. These parameters and their components are described below.

Water Quality

Temperature
Temperature has a significant effect on cold-water fish (such as trout, salmon, and steelhead), including effects on both behavioral and physiological processes. High water temperatures are often associated with poor conditions in other water quality parameters, such as algal density, sedimentation, habitat modification, dissolved oxygen, and bacteria. The removal of riparian vegetation can cause elevated stream temperatures by increasing solar radiation loading.

Riparian vegetation removal will be necessary within action area stream corridors. However, the amount of riparian vegetation to be cleared at individual bridge sites is small relative to the amount of riparian vegetation available to the stream systems within the action areas. This clearing will rarely extend more than a few hundred feet on either side of a replaced bridge. For most systems, temperature increases due to riparian vegetation removal on this scale will be undetectable. In accordance with the Site Restoration Environmental Performance Standard (Section 3.3), site clearing will be minimized and all vegetation removed will be replaced with a functional equivalent, unless the cleared area is part of the new permanent bridge footprint. The standard also requires a monitoring plan that will ensure the long-term survival of replacement plantings. Some temporary minor effects on water temperature in some stream systems may be expected while the replaced riparian vegetation matures, but over time, the new growth will be functionally equivalent to the vegetation removed. The effects of riparian vegetation removal on stream temperature are therefore considered to be temporary, and in most cases minor.

Sediment/Turbidity
Turbidity within and across action areas varies significantly. All work will adhere to environmental performance standards designed to minimize erosion and turbidity stemming from bridge work within or near stream channels. However, temporary, localized effects are possible during bridge replacement and repair activities. The condition of this parameter should improve over the long term, with the restoration of more natural sediment transport regimes at many bridge sites throughout the state.

Chemical Contamination
Many of the bridges proposed for replacement occur within watersheds that have been listed on the Oregon Department of Environmental Quality (ODEQ) 303(d) list for chemical contamination exceedances (ODEQ 1999). Therefore, the environmental baseline for this parameter varies throughout the action area. Contamination sources are numerous and consist of point and non-point sources.

Two primary sources of chemical contamination to waterbodies that may result from the proposed action are roadway pollutants delivered in stormwater runoff and accidental

spills. The latter includes catastrophic releases of hazardous substances within or near a waterbody and/or leaky equipment operating within or near a waterbody. Contamination due to stormwater is a long-term effect on salmonids. The Bridge Program will improve this condition through implementation of the Water Quality Environmental Performance Standard (Section 3.3). The effects of leaky equipment and spills are associated with construction, and are therefore temporary.

Environmental performance standards (Section 3.3) will be followed to minimize the potential for chemical contamination of project action areas. Relevant elements of these standards include proper equipment staging, the preparation of Pollution and Erosion Control Plans, and stormwater management. All construction sites are subject to minor spills and drips of materials that could eventually cause minor chemical contamination of streams and water. However, these small, localized effects on water quality are expected to be negligible relative to the long-term beneficial effects of the proposed Bridge Program.

Habitat Access

Physical Barriers

Natural and anthropogenic barriers to fish passage exist throughout Oregon. On many streams and rivers, natural stream size and gradient are the limiting factors. Too often, though, migration barriers are partially or wholly due to human activities. Diversions can reduce stream depth and divert fish from streams; stream crossings can block fish passage through improperly placed culverts; and fish passage barriers can restrict the access of migrating adults to spawning grounds, which can significantly or totally limit successful spawning. In addition, fish passage barriers such as dams limit the downstream migration of juvenile anadromous salmonids during outmigration, which can significantly limit survival and maturation.

The proposed action will not create new barriers to fish passage. However, temporary (i.e., lasting a few hours at a time) barriers may occur during activities that require in-water work-area isolation and stream diversions. The implementation of the environmental performance standards will ensure that fish passage will be maintained during in-water work, or that blockages will be temporary and allowed only with regulatory agency approval. Therefore, it is expected that no new, permanent barriers to fish passage will be created by the proposed action. The replacement of some bridges may even improve existing fish passage conditions, by eliminating in-channel structures and flow constriction (i.e., culverts and bridge bents). Furthermore, it is anticipated that a number of culverts that currently function as fish passage barriers will be replaced as part of the Bridge Program; these culverts will be replaced with structures that allow fish passage, providing a net improvement in fish passage conditions.

Habitat Elements

Substrate

Stream substrates within the action areas vary significantly and are influenced at a watershed scale by topography, geology, hydrology, land cover, and anthropogenic land uses. Substrate quality is an extremely important parameter for sustaining viable anadromous salmonid populations. All salmonids require appropriately-sized substrates with a low level of embeddedness for successful spawning and egg incubation. The recruitment of appropriately-sized substrate is a function of an adequate substrate source combined with the habitat elements (i.e., large wood, channel complexity) needed to retain substrate assemblages under various flows.

Bridge and roadway construction may disturb soil over large areas, increasing the potential for delivery of fine sediment to streams. Additionally, roadway surfaces collect and transport sediment to streams through various modes such as stormwater runoff. Because the Bridge Program will follow the environmental performance standards defined in Section 3.3, the proposed action will likely have no long-term adverse effect on the substrate of the streams within the action areas. Rather, because replaced bridges will allow normative fluvial processes that may be hindered at existing bridges, the proposed action should have long-term beneficial effects on substrate conditions. Short-term, localized effects on substrates may occur during the in-stream activities associated with bridge removal and construction; however, substrate embeddedness potentially caused by the proposed action will be limited by the implementation of the erosion and sediment control measures outlined in the standards. In some cases, the removal of bridges that are currently causing channel constrictions or otherwise blocking normative stream channel or floodplain functions may locally improve substrate conditions.

Large Wood

Riparian vegetation is a critical source of LWM inputs to fluvial systems. Large wood within stream channels provides or promotes a multitude of habitat conditions such as pool formation, sediment retention, and cover necessary for sustaining viable anadromous salmonid populations. The extensive clearing of riparian corridors as a result of urbanization and agricultural activities has limited the recruitment of LWM to stream channels throughout Oregon. The proposed action will require the removal of riparian vegetation that would otherwise constitute LWM sources for stream channels. Adherence to the environmental performance standards (Section 3.3) will limit the amount of riparian vegetation removed and ensure that what is removed is replaced with a functional equivalent. Where feasible, wood removed for bridge replacement and repair will be left on site or within stream channels to promote large wood input to streams. Disturbed areas will be re-planted and restored, providing future LWM recruitment. Although there may be a temporary reduction in large wood availability while the replaced riparian vegetation matures, over time the new growth will be functionally equivalent to the vegetation removed. Existing large wood will not be removed from the action area in the stream channel or floodplain areas. Furthermore, application of the Fluvial Environmental Performance Standard will allow for undisrupted transport of LWM through the action area. Therefore, the removal of riparian vegetation that could

contribute large wood to stream systems will have only minor and temporary effects on most bridges.

Pool Frequency and Quality
The frequency and quality of pools within a waterbody are influenced by many factors, including downed large wood volumes, watershed hydrology, streambank conditions, floodplain connectivity, longitudinal gradient, and the level of sediment transport. Watersheds that experience intensive urban and agricultural land uses tend to have lower pool frequency and quality due to the alteration of pool-forming habitat elements discussed above. Pool infilling occurs when the load of fine sediments is substantially greater than the transport capacity of the flow (Castro and Cluer 2003).

The Fluvial Environmental Performance Standard (Section 3.3) will be followed during bridge design and replacement activities to allow normative physical processes within the stream-floodplain corridor. Implementation of this standard could affect pool frequency and quality by having long-term beneficial effects or localized adverse effects. Implementation of the Fluvial Environmental Performance Standard on stream systems containing pools caused by the bridge structure (i.e., bridge pier or contraction scour pools) may locally reduce the frequency and/or quality of current pool habitat. However, implementation of the Fluvial Environmental Performance Standard will allow unimpeded transport of habitat elements such as LWM, improving the overall condition of fluvial systems.

Off-Channel Habitat
Off-channel habitats are critical for sustaining viable anadromous salmonid populations. This habitat provides rearing areas for juveniles during high flow events, promotes proper channel and streambank evolution, and promotes healthy riparian and floodplain corridors. In many of the watersheds addressed in this BA, off-channel habitats have diminished as a result of stream channel and floodplain confinement, increases in width/depth ratios, incision, and overall degradation, all of which have been caused primarily by agricultural and urban development.

Temporary detour routes, detour and work bridges, temporary fill near streams and general construction disturbance associated with the proposed action have the potential to encroach upon off-channel habitats. The Fluvial Environmental Performance Standard for the Bridge Program details the reduction of fills within functional floodplains and allows normative physical processes to occur within the stream-floodplain corridor (Section 3.3). This will likely improve the stream/floodplain interface, which could lead to off-channel habitat development or improve the existing off-channel habitat. Efforts will be made at the design stage of each bridge repair and replacement project to minimize effects on sensitive areas, including off-channel habitats. Vegetation clearing will be minimized and cleared vegetation will be replaced as part of the implementation of the environmental performance standards (Section 3.3). Temporary detour roads and structures will be completely obliterated upon project completion and disturbed areas will be restored to pre-project conditions. Any adverse effects associated with construction (e.g., vegetation removal and temporary detour roads) will be temporary. Implementation of the

environmental performance standards will promote long-term benefits with respect to off-channel habitat by conserving, and promoting the development of, essential habitat elements.

Refugia

Refugia are complex habitat elements such as off-channel ponds, side channels (and other areas flooded during over-bank flows), undercut banks, large boulders, overhanging logs and roots, root wads, and debris jams. Such habitats are important for sensitive aquatic organisms because they provide protection and cover from predators, high-energy stream flow, temperature extremes, and other potential threats. Habitat refugia has been reduced or eliminated in areas where stream channels and floodplains have been modified.

The proposed Bridge Program may have an effect on refugia through removal of riparian vegetation, hydrologic alterations, channel simplification and loss of floodplain connectivity; however, application of the environmental performance standards (Section 3.3) will minimize these effects. In some cases, the application of these standards and the removal of some bridges, may improve the processes that form refugia by restoring normative channel and floodplain processes.

Width/Depth Ratio

Channel width/depth ratios directly affect salmonid populations. Excessively wide and/or shallow stream reaches promote stream warming and pose water quality problems for salmonids. Channelization associated with flood prevention and agricultural activities has had a significant affect on the width/depth ratio of many streams within the state, especially in those portions of the action area that occur in low gradient reaches. In addition, the removal of riparian vegetation, loss of natural streambed material (e.g., large wood), and destabilization of streambanks has promoted a departure from properly functioning width/depth ratios.

Width/depth ratios may be affected as a result of the Bridge Program due to temporary loss of riparian vegetation and subsequent destabilization of streambanks, but application of the environmental performance standards (Section 3.3) will minimize these effects. In particular, the Fluvial Environmental Performance Standard, which requires the maintenance of normative physical processes within the stream-floodplain corridor, will ensure that the proposed action will not adversely affect this parameter. Furthermore, in locations where the existing bridge impedes natural channel evolution and the stream/floodplain interface, bridge replacement will have beneficial effects on this parameter.

Streambank Condition

Streambank condition reflects many variables that occur within a stream channel, floodplain, and riparian corridor. The increased magnitude and intensity of runoff from impervious surfaces (i.e., roadway) associated with the transportation system is a common cause of streambank degradation. Channelization and the modification of floodplain and riparian areas also have direct and indirect consequences on streambank condition. Streambank conditions within action area fluvial systems vary greatly and are

subject to many watershed processes; they also depend on the level and type of land uses within a watershed.

The proposed action will have temporary effects on streambanks due to vegetation removal for equipment access or other construction activity; however, it may also have permanent effects on streambanks directly underneath proposed structures (e.g., where an existing structure has been widened, requiring vegetation removal and possibly additional riprap armoring for bridge repair projects). Implementation of the environmental performance standards defined in Section 3.3 will minimize these potential effects. Site restoration activities in disturbed areas will generally involve grading streambanks to appropriate slopes and replacing any vegetation removed. Many of the bridges that are proposed for replacement currently promote streambank degradation by encroaching upon floodplains and constricting flows. In addition, many have required the placement of riprap or other armoring materials within or near stream channels, which has had adverse effects on streambank conditions both at the bridge location and downstream. Improvements to these bridges will likely result in localized beneficial effects on streambank conditions across the State.

Floodplain Connectivity
Floodplain connectivity throughout Oregon is limited primarily by development, road corridors, and agriculture. In addition, flood prevention activities— including stream channelization and the construction of levees and dams—have disrupted fluvial processes, leading to fragmented floodplains and an overall reduction in floodplain connectivity. Exaggerated flow regimes (i.e., increased peak flows) associated with impervious surface increases may cause scour and degradation of stream channels, resulting in reduced frequency of overbank flows.

To help protect and restore this habitat parameter, the Bridge Program will implement the Fluvial Environmental Performance Standard (Section 3.3), which is intended to allow normative physical processes within the stream-floodplain corridor. Specifically, this will be achieved partly by improving the longitudinal continuity and connectivity of the stream-floodplain system. Therefore, bridges for which the Fluvial Environmental Performance Standard applies will not significantly affect the existing level of floodplain connectivity on a given stream. Furthermore, the replacement of existing bridges will likely result in localized beneficial effects on floodplain connectivity where the existing structures fragment, constrict, or otherwise degrade the floodplain connectivity of the system.

<u>Flow/Hydrology</u>

Peak/Base Flows
Development, dams, agriculture, road construction, and other activities that alter natural drainage networks have altered peak and base flows within many stream systems. Impervious surface increases have had a significant effect on this parameter by increasing the magnitude and frequency of peak stream flows during precipitation events. Watersheds containing large areas of impervious surfaces experience increased runoff

rates and volumes, and experience reduced infiltration of precipitation events into underlying aquifers. Bridge crossings of streams and rivers in more developed and urbanized watersheds are likely to have disrupted hydrologic regimes.

The proposed action will likely cause minor increases in the impervious surfaces associated with bridge replacement. Many of the program bridges will be widened for safety upgrades, and their associated roadway approaches will be widened as well. Adherence to the environmental performance standards (Section 3.3) will improve the long-term hydrologic conditions associated with increased runoff from the road network within the action areas. This will be accomplished by eliminating direct discharge from the existing bridge decks to aquatic systems and increasing the amount of stormwater runoff infiltration. Many of the bridges proposed for replacement currently discharge stormwater directly to the system spanned. The proposed action will include measures to collect, convey, detain, treat, and release stormwater generated on bridge surfaces in appropriate locations without causing the erosion or sedimentation of waterbodies. Stormwater detention and infiltration measures will reduce the frequency, magnitude, and duration of peak flows relative to pre-project conditions for most storm events, and provide infiltration where possible. The proposed action is not expected to impair the recovery of the existing peak/base flow conditions within the action area.

Drainage Network

Flooding periodically occurs in some of the alluvial portions of the action area. Flood control activities, sewer systems, agriculture, and stormwater runoff have greatly affected the natural drainage of many of the action area watersheds. Roads are also a major contributor to the increase in drainage networks.

The proposed action will involve an increase in impervious surfaces and alterations to existing drainage networks. However, application of the environmental performance standards (Section 3.3) will ensure that stormwater is properly treated to maintain or improve water quality and hydraulic conditions. The proposed action will not require new roadways, although minor realignment of existing roads may be required. Therefore, the Bridge Program is not expected to increase the overall drainage network within the action area.

Watershed Conditions

Road Density and Location

Road density is proportional to the degree of habitat fragmentation caused by roads, as well as potential road-related mass wasting and sedimentation problems. NOAA Fisheries has developed a road-density threshold for watersheds in order to determine the point at which road density has adverse effects on Federally listed salmonids. Watersheds with road densities of 3 miles per square mile, or higher, are considered to be not properly functioning. Most of the watersheds encompassed by the Bridge Program likely have road densities above the NOAA Fisheries threshold for a properly functioning condition.

The proposed action may involve minor relocation of existing roads for new bridge alignments, and may include temporary detour roads; however, the overall permanent road density will not increase, and thus no long-term adverse effects on aquatic habitats are expected. Detour roads may require placement in sensitive areas. However, by following the environmental performance standards (Section 3.3), these disturbances will be minimized and existing conditions will be restored following construction.

Disturbance History

Historic disturbance in the project action areas includes urban development and agricultural activities, as well as natural resources extraction. The Bridge Program involves the repair and replacement of approximately 430 bridges throughout the State over eight to nine years. The potential effects of the proposed action include temporary construction-related effects, and those that have a more prolonged effect on salmonids and salmonid habitat (e.g., bridge design). Waterbody systems have been disturbed by the construction of hydroelectric and/or flood control dams in most of the major river basins in Oregon. Urban development has caused a loss of wetlands and floodplain integrity as well as increases in impervious surfaces and runoff rates. Agricultural activities have included the ditching of stream channels and draining of wetlands to create land adequate for farming. All of these activities have caused significant disturbance to the ecological processes of watersheds in the action areas.

Riparian Reserves

Intact riparian reserves are critical for sustaining many habitat elements that support anadromous salmonids. Riparian reserves have become degraded in many parts of Oregon as a result of urbanization, agricultural development, and forest practices. These activities occur throughout Oregon's watersheds. The ability of many riparian corridors along fluvial systems throughout Oregon to provide adequate shading and allochthonous energy sources to stream channels has been degraded, reducing primary and secondary production and overall complexity of aquatic systems. In addition, many riparian corridors lack mature trees, limiting both shade and large wood input to streams. Invasive native and non-native species that have replaced these trees in many sites are unable to provide adequate stream shading or functional habitat for fish.

As previously discussed, riparian vegetation removal will be necessary within action area stream corridors. However, riparian vegetation clearing at individual bridge sites will be small relative to the amount of riparian vegetation available to the stream systems within the action areas. Vegetation clearing will be limited to that which is absolutely necessary to complete bridge replacement or repair activities. In most case, riparian clearing will likely affect only about a few hundred feet of vegetation on either streambank within the immediate vicinity of the bridges. In accordance with the environmental performance standards (described in Section 3), site clearing will be minimized and all vegetation removed will be replaced, unless the cleared area is part of the new permanent bridge footprint. Adherence to these standards also requires development of monitoring plans to ensure the long-term survival of replacement plantings. Some temporary reductions of existing riparian reserves and riparian functions may be expected while the replaced riparian vegetation matures. However, over time, the new growth will be functionally

equivalent to the vegetation removed. The effects of riparian vegetation removal on riparian reserves are therefore considered to be temporary, and in most cases minor.

Environmental performance standards (Section 3.3) have been developed to address potential short- and long-term adverse effects on fluvial systems spanned by these structures. These standards address the major effects pathways that pose risks to the anadromous salmonid functional group. They will likely result in the Bridge Program having long-term beneficial effects on habitat conditions in many of the action areas.

5.2.3 Determination of Effects Methodology

The implementation of the Bridge Program will occur over an eight to nine year period, and the duration of its potential effects will be limited by the temporal nature of the construction. Furthermore, the construction of each bridge will be a one-time event, and the actual work will span only one or two construction seasons. Program bridges are not new or undisturbed sites; construction at these sites involves the repair and replacement of existing structures. The range of potential effects is therefore predictable (i.e., the systems have already responded to a constriction, barrier, pollutant source, etc.). The proposed action's potential effects on anadromous salmonids include those that occur during the construction process (i.e., increases in turbidity, chemical contamination, and direct physical harm from construction materials or fish handling procedures) and those that occur as a result of habitat changes from the replaced or repaired bridge (i.e., channel constriction, floodplain fragmentation, and streambank degradation). Environmental performance standards have been developed to guide the implementation of conservation measures that will minimize the effects of bridge construction and design on these species. These standards aim to minimize disturbance to the key habitat components for salmonids before, during, and after construction. The results of the analysis of effects process for all anadromous fish species is presented in Table 5.2.3-1.

Implementation of the environmental performance standards will limit fish deaths to the few associated with fish salvage (i.e., capture and release) activities and the isolation of in-water work areas. Any other adverse effects will likely be transitory, and juvenile and adult salmonid should be able to avoid them by bypassing or temporarily leaving the proposed action area, resulting in non-lethal take.

It is impossible to accurately quantify the take associated with the proposed action's effects on habitat, or to measure the resulting long-term effect on populations. Therefore, although ODOT/FHWA expects the habitat-related effects to cause a low level of incidental take, the best scientific and commercial data available are not sufficient to enable ODOT/FHWA to estimate a specific amount of incidental take due to habitat-related effects. The isolation of in-water work

Table 5.2.3-1. Summary results of Federally listed anadromous fish species in Oregon.

Species	BA Section	Bridges				Bridges/Ecoregion								Streambank Disturbance (River Miles)	
		Total	In ESU	Within 2 mi of ESU	In Migration Corridor	Willamette	Coast Range	East Cascades	West Cascades	Columbia Basin	Lava Plains	Klamath Mountains	Blue Mountains	Permanent	Temporary
Lower Columbia River Chinook Salmon ESU	5.2.4	44	43	1	N/A	18	6	4	16	N/A	N/A	N/A	N/A	0.33	2.50
Upper Columbia River Chinook Salmon ESU	5.2.5	43	N/A	N/A	43	10	6	8	13	6	N/A	N/A	N/A	0.32	2.40
Snake River Spring/Summer Run Chinook Salmon ESU	5.2.6	56	13	N/A	43	10	6	8	13	6	N/A	N/A	13	0.42	3.18
Snake River Fall Run Chinook Salmon ESU	5.2.7	43	N/A	N/A	43	10	6	8	13	6	N/A	N/A	13	0.32	2.40
Upper Willamette River Chinook Salmon ESU	5.2.8	155	136	3	16	142	9	N/A	4	N/A	N/A	N/A	N/A	1.20	8.80
Oregon Coast Coho Salmon ESU	5.2.9	100	94	6	N/A	4	46	N/A	1	N/A	N/A	43	N/A	0.24	1.76
N. CA/S. OR Coast Coho Salmon ESU	5.2.10	45	45	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	45	N/A	0.34	2.50
Lower Columbia River Coho Salmon	5.2.11	44	43	1	N/A	18	6	4	16	N/A	N/A	N/A	N/A	0.33	2.5
Columbia River Chum Salmon ESU	5.2.12	42	42	N/A	N/A	15	6	8	13	N/A	N/A	N/A	N/A	0.31	2.40
Snake River Sockeye Salmon ESU	5.2.13	43	N/A	43	N/A	10	6	8	13	6	N/A	N/A	N/A	0.32	2.40

Table 5.2.3-1. (continued).

Species	BA Section	Bridges				Bridges/Ecoregion								Streambank Disturbance (River Miles)	
Lower Columbia River Steelhead ESU	5.2.14	44	36	3	5	18	6	4	16	N/A	N/A	N/A	N/A	0.33	2.5
Middle Columbia River Steelhead ESU	5.2.15	74	41	4	29	10	6	8	13	12	17	N/A	8	0.56	4.20
Upper Columbia River Steelhead ESU	5.2.16	43	N/A	N/A	43	10	6	8	13	6	N/A	N/A	N/A	0.32	2.40
Snake River Basin Steelhead ESU	5.2.17	56	13	N/A	43	10	6	8	13	6	N/A	N/A	13	0.42	3.20
Upper Willamette River Steelhead ESU	5.2.18	90	75	4	11	80	8	N/A	2	N/A	N/A	N/A	N/A	0.68	5.00
SW WA/Lower Columbia R. Coastal Cutthroat ESU	5.2.19	51	50	1	N/A	18	6	8	16	3	N/A	N/A	N/A	0.38	3.00

areas and subsequent fish handling procedures are assumed to be the components of the program with the greatest potential to result in lethal and sub-lethal take of listed anadromous salmonids. Given the lack of a comprehensive dataset regarding the density of anadromous salmonid populations throughout the range of the Bridge Program, the life histories of these species, and their seasonal migration behavior, estimating the level of take from these activities requires certain assumptions to be made. Review of previous ESA consultations regarding similar actions within the range of Federally listed anadromous salmonids provides guidance for estimating take from projects requiring in-water work, stream diversion, and fish handling/salvage (NOAA Fisheries 2003a). Estimates using these assumptions are presented below.

Lethal Take

ODOT/FHWA has made the following five assumptions to quantify the level of lethal take for this functional group based on Bridge Program data analysis and a review of ESA consultations for similar actions:

> All water-spanning bridges within an ESU will require in-water work area isolation and fish capture and release.
>
> Some larger bridge repair and replacement operations will require multiple years of work, and in-water work may occur during more than one work season.
>
> Each project requiring in-water work area isolation is likely to capture and release up to 100 salmonids per in-water work season (NOAA Fisheries 2003a).
>
> Species composition of captured and handled salmonids is assumed to be evenly distributed among ESUs intersected by a given bridge project.
>
> Captured salmonids would be assumed to belong to the ESU in which a given bridge site is located. For example, all steelhead trout captured downstream of Willamette Falls would be assumed to be part of the Lower Columbia River ESU.
>
> Take of adult anadromous salmonids due to harassment or capture and release activities is expected to be non-lethal take: adult fish can be harassed out of the area prior to and during work area isolation, reducing the need to capture and release them.
>
> Of the ESA-listed juvenile salmonids to be captured and handled, 98% or more are expected to survive with no long-term effects, and less than two percent are expected to be injured or killed (including those that die later as a result of injury)

The higher estimate of six percent lethal take per 100 juvenile fish will be used for bridges requiring in-water work, to allow for variations in experience and work conditions, to provide coverage for unforeseen takings from bridge construction with no in-water work, to provide coverage for bridge repair and replacement operations that occur over more than one work season (i.e., requiring multiple fish capture and release operations), and to account for those bridges which may require minor in-water work extensions. Even if monitoring confirms the six

percent death rate, the isolation of in-water work area activities will not affect Federally listed salmonids at the population level.

Streambank Disturbance

ODOT/FHWA has estimated the amount of streambank disturbance that is likely to occur at bridges that cross water (Appendix 2-B). Permanent and temporary streambank disturbances are estimated below. Permanent disturbance is defined as the additional area that results when a replacement bridge footprint is larger than the original. Temporary disturbance is defined as the area on one or both sides of a bridge where temporary work bridges, detour bridges, falsework, and access roads may be constructed. These areas will be disturbed during construction only and will be stabilized, graded, and re-vegetated to replace properly functioning streambank elements following construction. While these numbers cannot be used to estimate lethal or non-lethal take of salmonids, they can give an estimate of the magnitude of likely disturbance, consistent with the Habitat Approach (NOAA Fisheries 1999) to evaluating affects to listed fish species.

5.2.4 Lower Columbia River Chinook Salmon ESU

There are 44 bridges where repair and replacement activities may affect the Oregon portion of the Lower Columbia River (LCR) ESU for chinook salmon: 43 bridges within the range of the ESU and one bridge within 2 miles of the ESU boundary (this bridge drains to the ESU) (Figure 5.2.4-1; Table 5.2.4-1). Of the 44 bridges where repair and replacement activities may affect LCR chinook salmon, six bridges occur in the Coast Range ecoregion, 18 occur in the Willamette Valley ecoregion, 16 occur in the West Cascades ecoregion, and four occur in the East Cascades ecoregion.

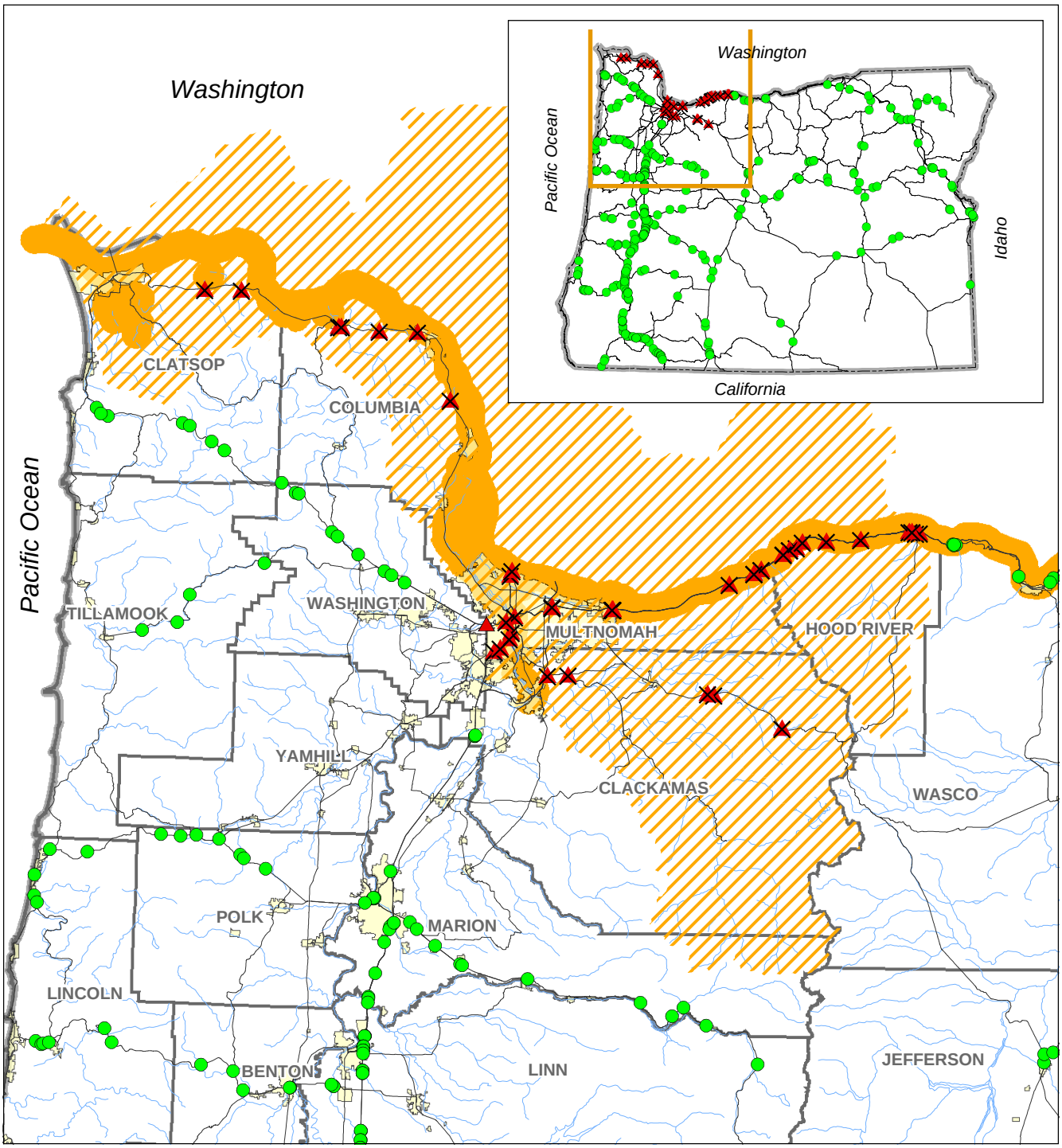
There are 13 5th Field HUCs affected by bridges within the ESU. Within the ESU, the greatest concentration of bridges occurs in the Columbia Slough/Willamette River, Columbia Gorge Tributaries, Middle Columbia/Eagle Creek, Lower Sandy River, and Middle Columbia/Grays Creek watersheds; these account for 70% of the gross API.

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, likely to adversely affect** for the LCR Chinook Salmon ESU. Approximately 44 bridges in this ESU will require isolation of the in-water work area, and therefore, capture and handling of LCR chinook salmon. As previously discussed in Section 5.2.3, it is expected that lethal take may occur—of six percent or less of the LCR chinook salmon captured and handled at each bridge—as a result of handling stress or injury, or from unforeseen takings resulting from bridge construction. Therefore, it is expected that approximately 910 juvenile LCR chinook salmon will be handled for all proposed bridge repair and replacement work within this ESU and that a maximum lethal taking of 54 juvenile LCR chinook salmon will occur as a result of fish handling activities.

In addition to the lethal take estimated for fish handling activities, the disturbance of streambanks may have indirect effects on the LCR chinook salmon ESU (and all other species within the anadromous and resident fish functional groups). Although take cannot be determined from such disturbance, the amount of streambank disturbed can be estimated to help determine

the magnitude of impacts. This anticipated streambank disturbance was estimated by multiplying the number of bridges that could potentially affect the LCR chinook salmon ESU (44) by the permanent and temporary streambank disturbance area for each bridge (40 feet of permanent disturbance and 300 feet of temporary disturbance). The total amount of permanent streambank disturbance at the bridges where the proposed action may affect the ESU is approximately 1,760 feet, or 0.33 river mile. The total amount of temporary streambank disturbance that may affect the ESU is approximately 13,200 feet, or 2.5 river miles. The total amount of temporary riparian disturbance that may affect this ESU is 45.5 acres.

After reviewing the best available scientific and commercial information regarding the current status of the LCR Chinook Salmon ESU, the environmental baseline for the action area, the effects of the proposed action, the environmental performance standards proposed, and the cumulative effects, ODOT/FHWA makes a determination that the Bridge Program, as proposed, is **not likely to destroy or adversely modify** designated or previously designated critical habitat. This conclusion is based on the following considerations: (1) the Bridge Program requires individual review of each project to ensure that the proposed action will be in compliance with the environmental performance standards identified herein, and that each applicable standard is included as an enforceable condition of the permit and contract documents; (2) the cumulative effect of the conservation measures applied to each project will ensure that any short-term effects on water quality, habitat access, habitat elements, channel conditions and dynamics, flows, and watershed conditions are brief, minor, and scheduled to occur at the times that are least sensitive for the species' life-cycle (i.e., designated in-water work periods); (3) the ecological design approach that will be applied to each program bridge to protect and stimulate natural habitat-forming processes is expected to result in many projects that will have long-term beneficial effects on aquatic habitat parameters (e.g., the removal of bridge piers from the active channel and reductions in riprap); and (4) the individual and combined effects of all actions permitted are not expected to impair currently properly functioning habitats, to appreciably reduce the functioning of already impaired habitats, or to retard the long-term progress of impaired habitats toward the properly functioning condition essential to survival and recovery at the population or ESU scale.



OTIA III Bridges

- Potential to Affect - Within ESU
- Potential to Affect - Within 2 Miles of ESU
- Potential to Affect - Within 2 Miles of Migration Corridor (outside of ESU)
- No Potential to Affect
- Chinook Salmon ESU *(Selected for Species)*
- Chinook Salmon Migratory Corridor
- City
- County
- Streams and Rivers
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

N W E S

0 2 4 8 12 16 20
Miles

Figure 5.2.4-1

OTIA III: Statewide Bridge Delivery Program
Lower Columbia River Chinook Salmon

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
screening/BA Figures/chinook_lcr.mxd. Mar 1, 2004

Table 5.2.4-1. Program Bridge projects that may affect Lower Columbia River Chinook Salmon.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
1	9591	Lewis & Clark Br Conn	3	Beaver Cr./Columbia R.	Green Cr./ Columbia Side Ch.	within ESU
2	7722	Lost Cr.	3	Beaver Cr./Columbia R.	Middle Beaver Cr.	within ESU
3	00338A	Tide Cr.	4	Beaver Cr./Columbia R.	Tide Cr.	within ESU
4	7417	Big Cr.	3	Big Cr.	Big Cr.	within ESU
5	921	Gnat Cr.	4	Big Cr.	Gnat Cr.	within ESU
6	7519	Clatskanie R.	3	Clatskanie R.	Lower Clatskanie R.	within ESU
7	7715	Swedetown County Rd	4	Clatskanie R.	Lower Clatskanie R.	within ESU
8	02176A	Hwy 100 & UPRR (Dodson)	10	Columbia Gorge Tributaries	Hamilton Cr.	within ESU
9	02062A	Tanner Cr.	6	Columbia Gorge Tributaries	Tanner Cr.	within ESU
10	02062B	Tanner Cr.	6	Columbia Gorge Tributaries	Tanner Cr.	within ESU
11	02194A	Moffett Cr.	5	Columbia Gorge Tributaries	Tanner Cr.	within ESU
12	02194B	Moffett Cr.	5	Columbia Gorge Tributaries	Tanner Cr.	within ESU
13	8195	Unknown	3	Columbia Slough/Willamette R.	Columbia Slough	within ESU
14	8197	Unknown	13	Columbia Slough/Willamette R.	Columbia Slough	within ESU
15	08588B	Unknown	16	Columbia Slough/Willamette R.	Columbia Slough	within ESU
16	09254D	Conn to SW Market St	2	Columbia Slough/Willamette R.	Columbia Slough	within ESU

Table 5.2.4-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
17	13514E	Hwy 2 Conns #2 &#3 &Hwy 64 Conns #1 & #2	8	Columbia Slough/Willamette R.	Willamette R./Columbia R.	within ESU
18	02163A	Unknown	11	Columbia Slough/Willamette R.	Willamette R./Columbia R.	within ESU
19	04516A	Unknown	1	Columbia Slough/Willamette R.	Willamette R./Columbia R.	within ESU
20	7458	UPRR	6	Hood R.	Lower Hood R.	within ESU
21	8662	UPRR	10	Hood R.	Lower Hood R.	within ESU
22	08203B	Unknown	3	Johnson Cr.	Tyson Cr./Willamette R.	within ESU
23	08205R	Unknown	6	Johnson Cr.	Tyson Cr./Willamette R.	within ESU
24	01439A	Rock Cr.	3	Lower Clackamas R.	Clackamas R. / Rock Cr.	within ESU
25	7867	UPRR Mainline	5	Lower Clackamas R.	Clackamas R. / Rock Cr.	within ESU
26	6875	Sandy R.	10	Lower Sandy R.	Beaver Cr.	within ESU
27	06875A	Sandy R.	10	Lower Sandy R.	Beaver Cr.	within ESU
28	6945	Conn #2 (Jordan Rd)	1	Lower Sandy R.	Beaver Cr.	within ESU
29	06945A	Conn #2 (Jordan Rd)	1	Lower Sandy R.	Beaver Cr.	within ESU
30	2285	SW Canyon Rd (Sylvan)	4	Lower Tualatin R.	Fanno Cr.	within 2 miles of ESU
31	8605	Hwy 2 WB Conn to Hwy 100	4	Middle Columbia/Eagle Cr.	Carson Cr.	within ESU
32	08605W	Hwy 2 WB Conn to Hwy 100	3	Middle Columbia/Eagle Cr.	Carson Cr.	within ESU

Table 5.2.4-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
33	8610	Moody St (Cascade Locks)	5	Middle Columbia/Eagle Cr.	Carson Cr.	within ESU
34	08610W	Moody St (Cascade Locks)	5	Middle Columbia/Eagle Cr.	Carson Cr.	within ESU
35	8623	Herman Cr. Conn	3	Middle Columbia/Eagle Cr.	Carson Cr.	within ESU
36	07403A	Herman Cr.	3	Middle Columbia/Eagle Cr.	Herman Cr.	within ESU
37	07496A	Jaymar Rd (Westcliff Dr)	3	Middle Columbia/Grays Cr.	Grays Cr.	within ESU
38	8534	Conn Viento Intchg	3	Middle Columbia/Grays Cr.	Grays Cr.	within ESU
39	8604	Conn (Wyeth Intchg)	3	Middle Columbia/Grays Cr.	Grays Cr.	within ESU
40	7398	Conn 2	3	Middle Columbia/Grays Cr.	Rowena Cr.	within ESU
41	00665B	Alder Cr.	3	Middle Sandy R.	Lower Middle Sandy R.	within ESU
42	00689B	Wildcat Cr.	3	Middle Sandy R.	Upper Middle Sandy R.	within ESU
43	7333	Unknown	16	Salmon Cr.	Vancouver	within ESU
44	03026A	Zig Zag R.	3	Zigzag R.	Zigzag Canyon	within ESU

5.2.5 Upper Columbia River Chinook Salmon ESU

No OTIA III program bridges are located within the Upper Columbia River (UCR) ESU for chinook salmon (Figure 5.2.5-1). Upper Columbia River chinook salmon use Oregon waters (the Columbia River) primarily as a migration corridor to reach their natal waters in eastern Washington. There are 43 bridges located within 2 miles of the Columbia River, and their replacement could affect UCR ESU chinook salmon. Of these, six bridges occur in the Coast Range ecoregion, 10 occur in the Willamette Valley ecoregion, 13 occur in the West Cascades ecoregion, eight occur in the East Cascades ecoregion, and six occur in the Columbia Basin ecoregion; Table 5.2.5-1).

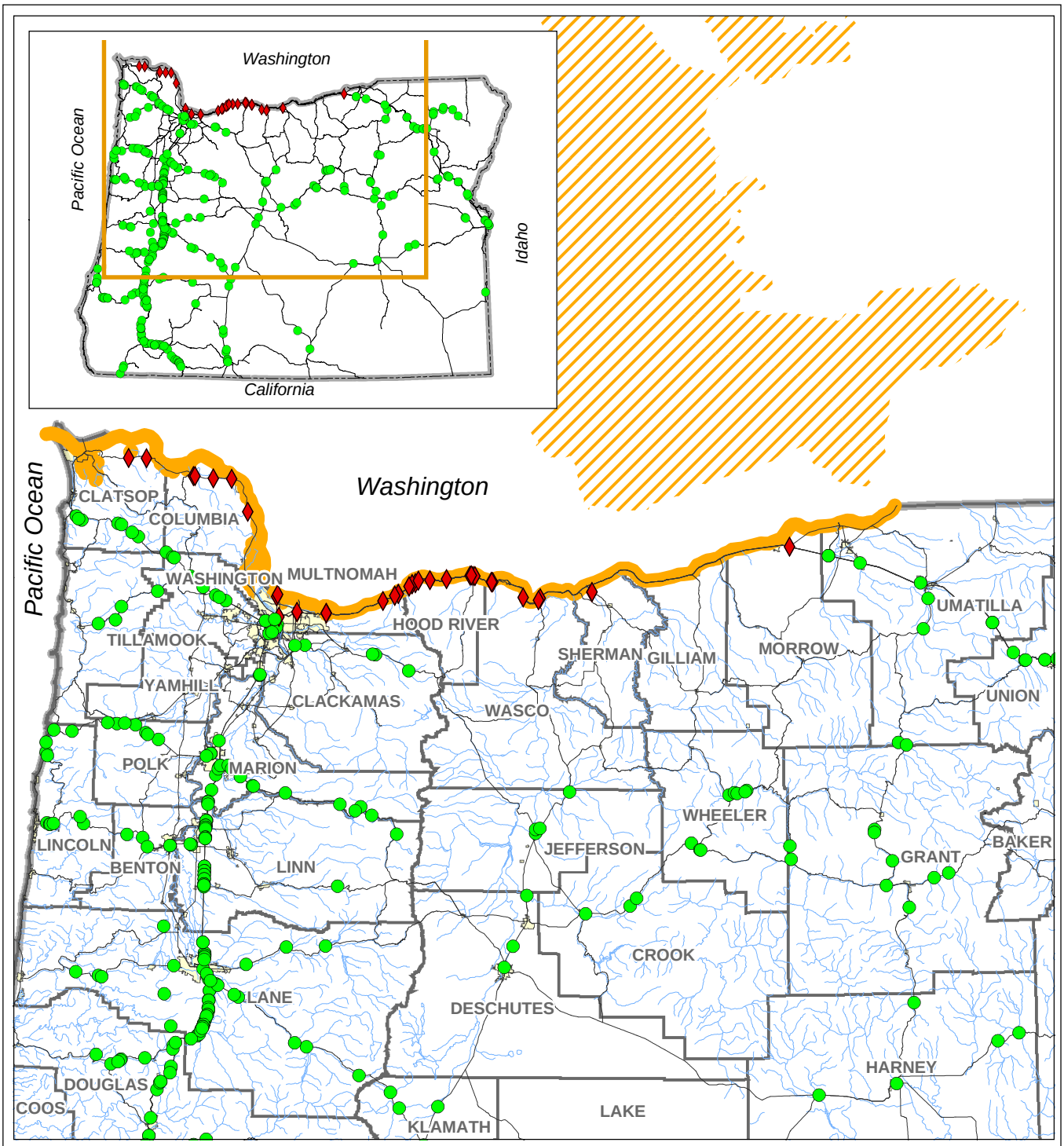
Bridges where repair and replacement activities may affect the UCR Chinook Salmon ESU occur in 14 5th Field HUCs. The greatest concentration of these bridges occur in the Columbia Slough/Willamette River, Columbia Gorge Tributaries, Middle Columbia/Eagle Creek, Mosier Creek, Lower Sandy River, and Middle Columbia/Grays Creek watersheds; these account for 80% of the gross API.

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, not likely to adversely affect** for the UCR Chinook Salmon ESU. Juvenile UCR chinook salmon pass through the mainstem Columbia River quickly and tend to prefer the mid-channel (Floyd 2003). Additionally, because of the low numbers of this population and the relatively few Bridge Program projects expected to occur where this ESU may be affected, the likelihood of adverse effects is considered negligible.

The total amount of permanent streambank disturbance at the 43 bridges where the proposed action may affect the ESU is approximately 1,720 feet, or 0.32 river mile, and potential effects are limited to downstream habitat modifications, which may necessitate the handling of fish within 2 miles of the Columbia River. The total amount of temporary streambank disturbance that may affect the ESU is approximately 12,900 feet, or 2.4 river miles. The total amount of temporary riparian disturbance expected to occur is 43.6 acres.

After reviewing the best available scientific and commercial information available regarding the current status of the UCR Chinook Salmon ESU, the environmental baseline for the proposed action area, the effects of the proposed action, the environmental performance standards proposed, and the cumulative effects, ODOT/FHWA makes a determination that the Bridge Program, as proposed, is **not likely to destroy or adversely modify** designated or previously designated critical habitat. This conclusion is based on the following considerations: (1) no bridge work will occur within this ESU, and potential impacts are limited to downstream habitat modifications, which may necessitate the handling of fish within 2 miles of the Columbia River; (2) the Bridge Program requires individual review of each project to ensure that the proposed action will be in compliance with the environmental performance standards identified herein, and that each applicable standard is included as an enforceable condition of the permit and contract documents; (3) the cumulative effect of the conservation measures applied to each project will ensure that any short-term effects on water quality, habitat access, habitat elements, channel conditions and dynamics, flows, and watershed conditions are brief, minor, and scheduled to occur at the times that are least sensitive for the species' life-cycle (i.e., designated in-water work

periods); (4) the ecological design approach that will be applied to each program bridge to protect and stimulate natural habitat-forming processes is expected to result in many projects that will have long-term beneficial effects on aquatic habitat parameters (e.g., the removal of bridge piers from the active channel and reductions in riprap); and (5) the individual and combined effects of all actions permitted are not expected to impair currently properly functioning habitats, appreciably reduce the functioning of already impaired habitats, or retard the long-term progress of impaired habitats toward the properly functioning condition essential to survival and recovery at the population or ESU scale.



OTIA III Bridges

- Potential to Affect - Within ESU
- Potential to Affect - Within 2 Miles of ESU
- Potential to Affect - Within 2 Miles of Migration Corridor (outside of ESU)
- No Potential to Affect
- *Chinook Salmon ESU (Selected for Species - Not in Oregon)*
- Chinook Salmon Migratory Corridor
- City
- County
- Streams and Rivers
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.2.5-1

OTIA III: Statewide Bridge Delivery Program
Upper Columbia River Chinook Salmon

N W E S

0 5 10 20 30 40
Miles

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
screening/BA Figures/chinook_ucr.mxd. Mar 1, 2004

Table 5.2.5-1. Program Bridge projects that may affect Upper Columbia River Chinook Salmon.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC
1	9591	Lewis & Clark Br Conn	3	Beaver Cr./Columbia R.	Green Cr./ Columbia Side Ch.
2	7722	Lost Cr.	3	Beaver Cr./Columbia R.	Middle Beaver Cr.
3	00338A	Tide Cr.	4	Beaver Cr./Columbia R.	Tide Cr.
4	7417	Big Cr.	3	Big Cr.	Big Cr.
5	921	Gnat Cr.	4	Big Cr.	Gnat Cr.
6	7519	Clatskanie R.	3	Clatskanie R.	Lower Clatskanie R.
7	7715	Swedetown County Rd	4	Clatskanie R.	Lower Clatskanie R.
8	02176A	Hwy 100 & UPRR (Dodson)	10	Columbia Gorge Tributaries	Hamilton Cr.
9	02062A	Tanner Cr.	6	Columbia Gorge Tributaries	Tanner Cr.
10	02062B	Tanner Cr.	6	Columbia Gorge Tributaries	Tanner Cr.
11	02194A	Moffett Cr.	5	Columbia Gorge Tributaries	Tanner Cr.
12	02194B	Moffett Cr.	5	Columbia Gorge Tributaries	Tanner Cr.
13	08588B	Unknown	16	Columbia Slough/Willamette R.	Columbia Slough
14	13514E	Hwy 2 Conns #2 &#3 & Hwy 64 Conns #1 & #2	8	Columbia Slough/Willamette R.	Willamette R./Columbia R.
15	02163A	Unknown	11	Columbia Slough/Willamette R.	Willamette R./Columbia R.
16	04516A	Unknown	1	Columbia Slough/Willamette R.	Willamette R./Columbia R.

Table 5.2.5-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC
17	00308A	Fifteen Mile Cr.	5	Fifteenmile Cr.	Lower Fifteenmile Cr.
18	7458	UPRR	6	Hood R.	Lower Hood R.
19	8662	UPRR	10	Hood R.	Lower Hood R.
20	6875	Sandy R.	10	Lower Sandy R.	Beaver Cr.
21	06875A	Sandy R.	10	Lower Sandy R.	Beaver Cr.
22	6945	Conn #2 (Jordan Rd)	1	Lower Sandy R.	Beaver Cr.
23	06945A	Conn #2 (Jordan Rd)	1	Lower Sandy R.	Beaver Cr.
24	8605	Conn to Hwy 100	4	Middle Columbia/Eagle Cr.	Carson Cr.
25	08605W	Conn to Hwy 100	3	Middle Columbia/Eagle Cr.	Carson Cr.
26	8610	Moody St (Cascade Locks)	5	Middle Columbia/Eagle Cr.	Carson Cr.
27	08610W	Moody St (Cascade Locks)	5	Middle Columbia/Eagle Cr.	Carson Cr.
28	8623	Herman Cr. Conn	3	Middle Columbia/Eagle Cr.	Carson Cr.
29	07403A	Herman Cr.	3	Middle Columbia/Eagle Cr.	Herman Cr.
30	07496A	Jaymar Rd (Westcliff Dr)	3	Middle Columbia/Grays Cr.	Grays Cr.
31	8534	Conn Viento Intchg	3	Middle Columbia/Grays Cr.	Grays Cr.
32	8604	Conn (Wyeth Intchg)	3	Middle Columbia/Grays Cr.	Grays Cr.

Table 5.2.5-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC
33	7398	Conn 2	3	Middle Columbia/Grays Cr.	Rowena Cr.
34	8276	Hostetler Way Conn	3	Middle Columbia/Mill Cr.	Columbia R./Murdock
35	7771	The Dalles Dam Access Conn	1	Middle Columbia/Mill Cr.	Middle Columbia/Threemile Cr.
36	7393	Mosier Cr.	3	Mosier Cr.	Lower Mosier Cr.
37	07626A	Unknown	4	Mosier Cr.	Lower Mosier Cr.
38	7392	Rock Cr.	3	Mosier Cr.	Rock Cr.
39	7397	Unknown	3	Mosier Cr.	Rock Cr.
40	7333	Unknown	16	Salmon Cr.	Vancouver
41	08931E	Irrigon Junction Intchg Conn	5	Upper Lake Umatilla	Lower Paterson Slough
42	8893	Spanish Hollow Cr.	3	Upper Middle Columbia/Hood	Spanish Hollow Cr.
43	8894	Spanish Hollow Cr.	3	Upper Middle Columbia/Hood	Spanish Hollow Cr.

Note: All bridges are located within 2 miles of a migratory corridor for this ESU.

5.2.6 Snake River Spring/Summer Run Chinook Salmon ESU

There are 13 bridges where repair and replacement activities may affect the Oregon portion of the Snake River Spring/Summer Run (SRSSR) ESU for chinook salmon (Figure 5.2.6-1; Table 5.2.6-1). All of these bridges occur within the ESU, and no bridges are within 2 miles of the ESU boundary (and drain to the ESU). Snake River Spring/Summer Run chinook salmon use the lower and middle Columbia River as a migratory corridor to reach their natal waters in northeast Oregon, Washington, and Idaho. Therefore, chinook salmon of the SRSSR chinook salmon ESU may be present near program bridges in downstream portions of the Columbia River. Migrating SRSSR ESU chinook salmon may be affected by the repair or replacement of 43 bridges occurring within 2 miles of the Columbia River. Of the bridges where the proposed action may affect SRSSR ESU chinook salmon, six occur in the Coast Range ecoregion, 10 occur in the Willamette Valley ecoregion, 13 occur in the West Cascades ecoregion, eight occur in the East Cascades ecoregion, six occur in the Columbia Basin ecoregion, and 13 occur in the Blue Mountains ecoregion.

There are seven 5th Field HUCs affected by bridges within the SRSSR ESU. Within this ESU, the greatest concentration of bridges occurs in the Grande Ronde River/Five Points Creek watershed, which accounts for 33% of the gross API.

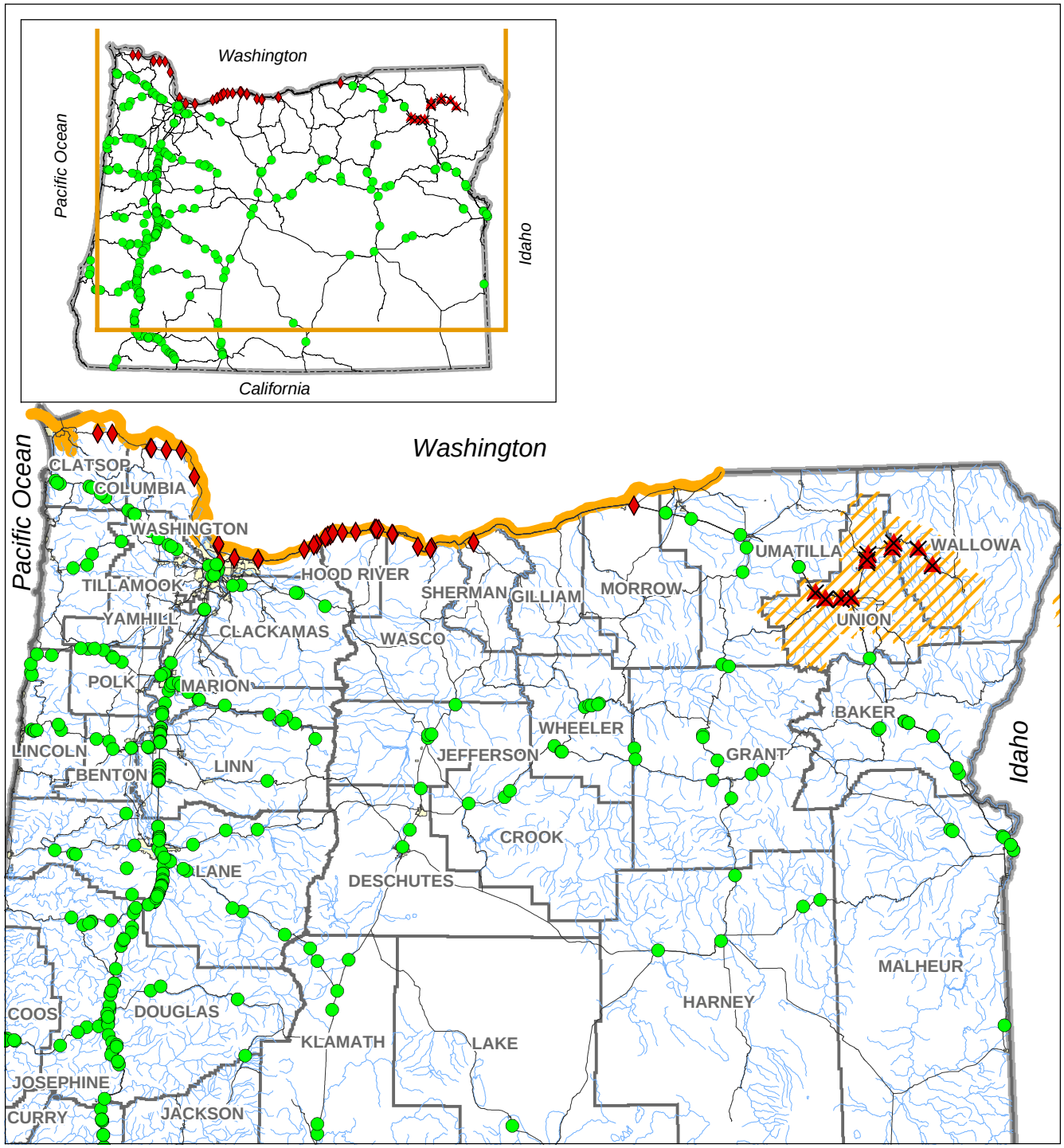
Of the bridges located along the Columbia River migration corridor of the SRSSR ESU, the greatest concentration of bridges occurs in the Columbia Slough/Willamette River, Columbia Gorge Tributaries, Middle Columbia/Eagle Creek, Mosier Creek, Lower Sandy River, and Middle Columbia/Grays Creek watersheds; these account for 79% of the total API outside the ESU and along the migratory corridor.

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, likely to adversely affect** for the SRSSR Chinook Salmon ESU. Approximately 56 bridges within this ESU or along the migration corridor of this ESU will require isolation of the in-water work area. The isolation of in-water work areas may cause local and temporary reductions in water quality and may necessitate the handling of SRSSR chinook salmon Therefore, it is expected that up to 650 juvenile SRSSR chinook salmon will be handled for all bridge repair and replacement and repair work within the ESU, and that a maximum lethal taking of 39 juvenile SRSSR chinook salmon may occur as a result of bridge work within 2 miles of the ESU.

The total amount of permanent streambank disturbance at the 56 bridges is approximately 2,240 feet, or 0.42 river mile. The total amount of temporary streambank disturbance that may affect the ESU is approximately 16,800 feet, or 3.18 river miles. The total amount of riparian disturbance is expected to be no more than 57.8 acres.

After reviewing the best available scientific and commercial information available regarding the current status of the SRSSR Chinook Salmon ESU, the environmental baseline for the action area, the effects of the Bridge Program, the environmental performance standards proposed, and the cumulative effects, ODOT/FHWA makes a determination of is not likely to destroy or

adversely modify designated or previously designated critical habitat. These conclusions are based on the following considerations: (1) the Bridge Program requires individual review of each bridge project to ensure that the proposed action will be in compliance with the environmental performance standards identified herein, and that each applicable standard is included as an enforceable condition of the permit document and contract documents; (2) the cumulative effect of the environmental performance standards applied to each project will ensure that any short-term effects on water quality, habitat access, habitat elements, channel conditions and dynamics, flows, and watershed conditions are brief, minor, and scheduled to occur at the times that are least sensitive for the species' life-cycle (i.e., designated in-water work periods); (3) the ecological design approach that will be applied to each program bridge to protect and stimulate natural habitat-forming processes is expected to result in many projects that will have long-term beneficial effects on aquatic habitat parameters (e.g., the removal of bridge piers from the active channel and reductions in riprap); and (4) the individual and combined effects of all actions permitted are not expected to impair currently properly functioning habitats, appreciably reduce the functioning of already impaired habitats, or retard the long-term progress of impaired habitats toward the properly functioning condition essential to survival and recovery at the population or ESU scale.



OTIA III Bridges

- Potential to Affect - Within ESU
- Potential to Affect - Within 2 Miles of ESU
- Potential to Affect - Within 2 Miles of Migration Corridor (outside of ESU)
- No Potential to Affect
- *Chinook Salmon ESU (Selected for Species)*
- Chinook Salmon Migratory Corridor
- City
- County
- Streams and Rivers
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

0 5 10 20 30 40 50
Miles

Figure 5.2.6-1

OTIA III: Statewide Bridge Delivery Program
Snake River Chinook Salmon
(Spring/Summer Run)

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
screening/BA Figures/chinook_srss.mxd.Mar 1, 2004

Table 5.2.6-1. Program Bridge projects that may affect Snake River Spring/Summer Chinook Salmon.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Chinook SRSS ESU
1	9591	Lewis & Clark Br Conn	3	Beaver Cr./Columbia R.	Green Cr./ Columbia Side Ch.	within 2 miles of Migr. Corr.
2	7722	Lost Cr.	3	Beaver Cr./Columbia R.	Middle Beaver Cr.	within 2 miles of Migr. Corr.
3	00338A	Tide Cr.	4	Beaver Cr./Columbia R.	Tide Cr.	within 2 miles of Migr. Corr.
4	7417	Big Cr.	3	Big Cr.	Big Cr.	within 2 miles of Migr. Corr.
5	921	Gnat Cr.	4	Big Cr.	Gnat Cr.	within 2 miles of Migr. Corr.
6	7519	Clatskanie R.	3	Clatskanie R.	Lower Clatskanie R.	within 2 miles of Migr. Corr.
7	7715	Swedetown County Rd	4	Clatskanie R.	Lower Clatskanie R.	within 2 miles of Migr. Corr.
8	02176A	Hwy 100 & UPRR (Dodson)	10	Columbia Gorge Tributaries	Hamilton Cr.	within 2 miles of Migr. Corr.
9	02062A	Tanner Cr.	6	Columbia Gorge Tributaries	Tanner Cr.	within 2 miles of Migr. Corr.
10	02062B	Tanner Cr.	6	Columbia Gorge Tributaries	Tanner Cr.	within 2 miles of Migr. Corr.
11	02194A	Moffett Cr.	5	Columbia Gorge Tributaries	Tanner Cr.	within 2 miles of Migr. Corr.
12	02194B	Moffett Cr.	5	Columbia Gorge Tributaries	Tanner Cr.	within 2 miles of Migr. Corr.
13	08588B	Unknown	16	Columbia Slough/Willamette R.	Columbia Slough	within 2 miles of Migr. Corr.
14	13514E	Hwy 2 Conns #2 &#3 & Hwy 64 Conns #1 & #2	8	Columbia Slough/Willamette R.	Willamette R./Columbia R.	within 2 miles of Migr. Corr.
15	02163A	Unknown	11	Columbia Slough/Willamette R.	Willamette R./Columbia R.	within 2 miles of Migr. Corr.

Table 5.2.6-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Chinook SRSS ESU
17	00308A	Fifteen Miles Cr.	5	Fifteenmiles Cr.	Lower Fifteenmiles Cr.	within 2 miles of Migr. Corr.
18	04841A	Grande Ronde R. (Hilgard)	3	Grande Ronde R./Beaver Cr.	Grande Ronde R./Hilgard	within ESU
19	8502	Hwy 6 (Hilgard Intchg)	4	Grande Ronde R./Beaver Cr.	Grande Ronde R./Hilgard	within ESU
20	1996	Grande Ronde R. (Northeast Elgin)	4	Grande Ronde R./Cabin Cr.	Grande Ronde R./Partridge Cr.	within ESU
21	04821A	Grande Ronde R. (Island City)	3	Grande Ronde R./Five Points Cr.	Grande Ronde R./Haywire Canyon	within ESU
22	8431	Unknown	7	Grande Ronde R./Five Points Cr.	Grande Ronde R./Wright Slough	within ESU
23	08431A	Unknown	4	Grande Ronde R./Five Points Cr.	Grande Ronde R./Wright Slough	within ESU
24	00449A	Emigrant Hill Frtg Rd & UPRR (Glover)	5	Grande Ronde R./Five Points Cr.	Pelican Cr.	within ESU
25	00800A	Grande Ronde R. (S. Elgin)	6	Grande Ronde R./Indian Cr.	Grande Ronde R./Lower Clark Cr.	within ESU
26	8780	Grande Ronde R. & INP RR (Indian Cr.)	6	Grande Ronde R./Indian Cr.	Grande Ronde R./Lower Clark Cr.	within ESU
27	7458	UPRR	6	Hood R.	Lower Hood R.	within 2 miles of Migr. Corr.
28	8662	UPRR	10	Hood R.	Lower Hood R.	within 2 miles of Migr. Corr.
29	7573	Lostine R.	3	Lostine R.	Lower Lostine R.	within ESU
30	6875	Sandy R.	10	Lower Sandy R.	Beaver Cr.	within 2 miles of Migr. Corr.

Table 5.2.6-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Chinook SRSS ESU
31	06875A	Sandy R.	10	Lower Sandy R.	Beaver Cr.	within 2 miles of Migr. Corr.
32	6945	Conn #2 (Jordan Rd)	1	Lower Sandy R.	Beaver Cr.	within 2 miles of Migr. Corr.
33	06945A	Conn #2 (Jordan Rd)	1	Lower Sandy R.	Beaver Cr.	within 2 miles of Migr. Corr.
34	2184	Wallowa R. (Bear Cr.)	5	Lower Wallowa R.	Wallowa R./Water Canyon	within ESU
35	8605	Conn to Hwy 100	4	Middle Columbia/Eagle Cr.	Carson Cr.	within 2 miles of Migr. Corr.
36	08605W	Conn to Hwy 100	3	Middle Columbia/Eagle Cr.	Carson Cr.	within 2 miles of Migr. Corr.
37	8610	Moody St (Cascade Locks)	5	Middle Columbia/Eagle Cr.	Carson Cr.	within 2 miles of Migr. Corr.
38	08610W	Moody St (Cascade Locks)	5	Middle Columbia/Eagle Cr.	Carson Cr.	within 2 miles of Migr. Corr.
39	8623	Herman Cr. Conn	3	Middle Columbia/Eagle Cr.	Carson Cr.	within 2 miles of Migr. Corr.
40	07403A	Herman Cr.	3	Middle Columbia/Eagle Cr.	Herman Cr.	within 2 miles of Migr. Corr.
41	07496A	Jaymar Rd (Westcliff Dr)	3	Middle Columbia/Grays Cr.	Grays Cr.	within 2 miles of Migr. Corr.
42	8534	Conn Viento Intchg	3	Middle Columbia/Grays Cr.	Grays Cr.	within 2 miles of Migr. Corr.
43	8604	Conn (Wyeth Intchg)	3	Middle Columbia/Grays Cr.	Grays Cr.	within 2 miles of Migr. Corr.
44	7398	Conn 2	3	Middle Columbia/Grays Cr.	Rowena Cr.	within 2 miles of Migr. Corr.
45	8276	Hostetler Way Conn	3	Middle Columbia/Mill Cr.	Columbia R./Murdock	within 2 miles of Migr. Corr.
46	7771	The Dalles Dam Access Conn	1	Middle Columbia/Mill Cr.	Middle Columbia/Threemiles Cr.	within 2 miles of Migr. Corr.
47	01038A	Wallowa R. (Minam)	6	Minam R.	Lower Minam R.	within ESU

Table 5.2.6-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Chinook SRSS ESU
48	5192	Minam Viaduct	8	Minam R.	Lower Minam R.	within ESU
49	7393	Mosier Cr.	3	Mosier Cr.	Lower Mosier Cr.	within 2 miles of Migr. Corr.
50	07626A	Unknown	4	Mosier Cr.	Lower Mosier Cr.	within 2 miles of Migr. Corr.
51	7392	Rock Cr.	3	Mosier Cr.	Rock Cr.	within 2 miles of Migr. Corr.
52	7397	Unknown	3	Mosier Cr.	Rock Cr.	within 2 miles of Migr. Corr.
53	7333	Unknown	16	Salmon Cr.	Vancouver	within 2 miles of Migr. Corr.
54	08931E	Irrigon Junction Intchg Conn	5	Upper Lake Umatilla	Lower Paterson Slough	within 2 miles of Migr. Corr.
55	8893	Spanish Hollow Cr.	3	Upper Middle Columbia/Hood	Spanish Hollow Cr.	within 2 miles of Migr. Corr.
56	8894	Spanish Hollow Cr.	3	Upper Middle Columbia/Hood	Spanish Hollow Cr.	within 2 miles of Migr. Corr.

Note: All bridges are located within 2 miles of a migratory corridor for this ESU.

5.2.7 Snake River Fall Run Chinook Salmon ESU

There are no bridges where repair and replacement activities will affect the Oregon portion of the Snake River Fall Run (SRFR) ESU for chinook salmon (Figure 5.2.7-1). Specifically, there are no bridges located within the ESU and no bridges are within 2 miles of the ESU boundary (and drain to the ESU). However, SRFR chinook salmon use the lower and middle Columbia River as a migratory corridor to reach their natal waters in northeast Oregon, Washington, and Idaho. Migrating SRFR chinook salmon could be affected by the repair or replacement of 43 bridges occurring within 2 miles of the Columbia River. Of the bridges where the proposed action may affect SRFR ESU chinook salmon, six occur in the Coast Range ecoregion, 10 occur in the Willamette Valley ecoregion, 13 occur in the West Cascades ecoregion, eight occur in the East Cascades ecoregion, and six occur in the Columbia Basin ecoregion (Table 5.2.7-1).

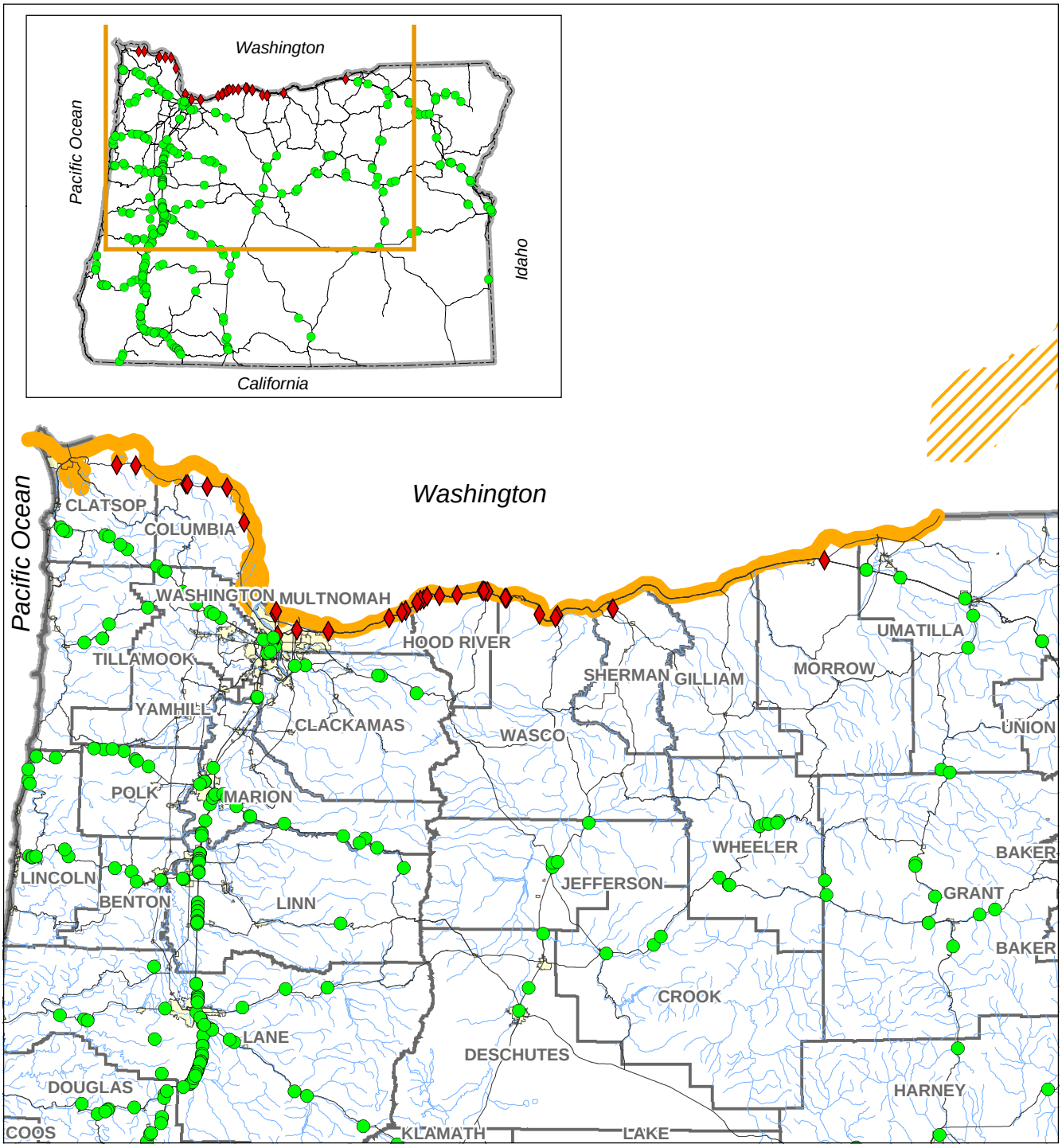
Of the bridges located along the migration corridor of the SRFR ESU, the greatest concentration of bridges occurs in the Columbia Slough/Willamette River, Columbia Gorge Tributaries, Middle Columbia/Eagle Creek, Mosier Creek, Lower Sandy River, and Middle Columbia/Grays Creek watersheds; these account for 79% of the total API outside the ESU and along the migratory corridor.

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, not likely to adversely affect** for the SRFR Chinook Salmon ESU. No program bridges occur in the Oregon portion of the ESU and no program bridges cross waters of the Columbia River estuary where outmigrating SRFR chinook salmon potentially would be present. Therefore, the likelihood that fish capture and handling activities would encounter individuals of this ESU is considered discountable.

The total amount of permanent streambank disturbance at the 43 bridges where the proposed action may affect the migration corridor of this ESU is approximately 1,720 feet, or 0.32 river mile. The total amount of temporary streambank disturbance that may affect the ESU is approximately 12,900 feet, or 2.4 river miles. The total area of riparian disturbance that may affect this ESU is 43.6 acres

After reviewing the best available scientific and commercial information available regarding the current status of the SRFR Chinook Salmon ESU, the environmental baseline for the action area, the effects of the Bridge Program, the environmental performance standards proposed, and the cumulative effects, ODOT/FHWA makes a determination of **not likely to destroy or adversely modify** designated or previously designated critical habitat. These conclusions are based on the following considerations: (1) the Bridge Program requires individual review of each bridge project to ensure that the proposed action will be in compliance with the environmental performance standards identified herein, and that each applicable standard is included as an enforceable condition of the permit and contract document; (2) the cumulative effect of the conservation measures applied to each project will ensure that any short-term effects on water quality, habitat access, habitat elements, channel conditions and dynamics, flows, and watershed conditions are brief, minor, and scheduled to occur at the times that are least sensitive for the species' life-cycle (i.e., designated in-water work periods); (3) the ecological design approach

that will be applied to each program bridge to protect and stimulate natural habitat-forming processes is expected to result in many projects that will have long-term beneficial effects on aquatic habitat parameters (e.g., the removal of bridge piers from the active channel and reductions in riprap); and (4) the individual and combined effects of all actions permitted are not expected to impair currently properly functioning habitats, appreciably reduce the functioning of already impaired habitats, or retard the long-term progress of impaired habitats toward the properly functioning condition essential to survival and recovery at the population or ESU scale.



OTIA III Bridges

- Potential to Affect - Within ESU
- Potential to Affect - Within 2 Miles of ESU
- Potential to Affect - Within 2 Miles of Migration Corridor (outside of ESU)
- No Potential to Affect
- *Chinook Salmon ESU (Selected for Species)*
- Chinook Salmon Migratory Corridor
- City
- County
- Streams and Rivers
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.2.7-1

OTIA III: Statewide Bridge Delivery Program
Snake River Chinook Salmon (Fall Run)

N W E S

0 5 10 20 30 40
Miles

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
screening/BA Figures/chinook_srf.mxd. Mar 1, 2004

Table 5.2.7-1. Program Bridge projects that may affect Snake River Fall Chinook Salmon.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC
1	9591	Hwy 2W	3	Beaver Cr./Columbia R.	Green Cr./ Columbia Side Ch.
2	7722	Lost Cr.	3	Beaver Cr./Columbia R.	Middle Beaver Cr.
3	00338A	Tide Cr.	4	Beaver Cr./Columbia R.	Tide Cr.
4	7417	Big Cr.	3	Big Cr.	Big Cr.
5	921	Gnat Cr.	4	Big Cr.	Gnat Cr.
6	7519	Clatskanie R.	3	Clatskanie R.	Lower Clatskanie R.
7	7715	Swedetown County Rd	4	Clatskanie R.	Lower Clatskanie R.
8	02176A	Hwy 100 & UPRR (Dodson)	10	Columbia Gorge Tributaries	Hamilton Cr.
9	02062A	Tanner Cr.	6	Columbia Gorge Tributaries	Tanner Cr.
10	02062B	Tanner Cr.	6	Columbia Gorge Tributaries	Tanner Cr.
11	02194A	Moffett Cr.	5	Columbia Gorge Tributaries	Tanner Cr.
12	02194B	Moffett Cr.	5	Columbia Gorge Tributaries	Tanner Cr.
13	08588B	Unknown	16	Columbia Slough/Willamette R.	Columbia Slough
14	13514E	Hwy 2 Conns #2 &#3 & Hwy 64 Conns #1 & #2	8	Columbia Slough/Willamette R.	Willamette R./Columbia R.
15	02163A	Unknown	11	Columbia Slough/Willamette R.	Willamette R./Columbia R.
16	04516A	Unknown	1	Columbia Slough/Willamette R.	Willamette R./Columbia R.

Table 5.2.7-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC
17	00308A	Fifteen Mile Cr.	5	Fifteenmile Cr.	Lower Fifteenmile Cr.
18	7458	UPRR (2nd St)	6	Hood R.	Lower Hood R.
19	8662	UPRR	10	Hood R.	Lower Hood R.
20	6875	Sandy R.	10	Lower Sandy R.	Beaver Cr.
21	06875A	Sandy R., Hwy 2 WB	10	Lower Sandy R.	Beaver Cr.
22	6945	Conn #2 (Jordan Rd)	1	Lower Sandy R.	Beaver Cr.
23	06945A	Conn #2 (Jordan Rd)	1	Lower Sandy R.	Beaver Cr.
24	8605	Hwy 2 WB Conn to Hwy 100	4	Middle Columbia/Eagle Cr.	Carson Cr.
25	08605W	Hwy 2 WB Conn to Hwy 100	3	Middle Columbia/Eagle Cr.	Carson Cr.
26	8610	Moody St (Cascade Locks)	5	Middle Columbia/Eagle Cr.	Carson Cr.
27	08610W	Moody St (Cascade Locks)	5	Middle Columbia/Eagle Cr.	Carson Cr.
28	8623	Herman Cr. Conn	3	Middle Columbia/Eagle Cr.	Carson Cr.
29	07403A	Herman Cr.	3	Middle Columbia/Eagle Cr.	Herman Cr.
30	07496A	Jaymar Rd (Westcliff Dr)	3	Middle Columbia/Grays Cr.	Grays Cr.
31	8534	Conn Viento Intchg	3	Middle Columbia/Grays Cr.	Grays Cr.
32	8604	Conn (Wyeth Intchg)	3	Middle Columbia/Grays Cr.	Grays Cr.

Table 5.2.7-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC
33	7398	Conn 2	3	Middle Columbia/Grays Cr.	Rowena Cr.
34	8276	Hostetler Way Conn	3	Middle Columbia/Mill Cr.	Columbia R./Murdock
35	7771	The Dalles Dam Access Conn	1	Middle Columbia/Mill Cr.	Middle Columbia/Threemile Cr.
36	7393	Mosier Cr.	3	Mosier Cr.	Lower Mosier Cr.
37	07626A	Unknown	4	Mosier Cr.	Lower Mosier Cr.
38	7392	Rock Cr.	3	Mosier Cr.	Rock Cr.
39	7397	Unknown	3	Mosier Cr.	Rock Cr.
40	7333	Unknown	16	Salmon Cr.	Vancouver
41	08931E	Irrigon Junction Intchg Conn	5	Upper Lake Umatilla	Lower Paterson Slough
42	8893	Spanish Hollow Cr.	3	Upper Middle Columbia/Hood	Spanish Hollow Cr.
43	8894	Spanish Hollow Cr.	3	Upper Middle Columbia/Hood	Spanish Hollow Cr.

Note: All bridges are located within 2 miles of a migratory corridor for this ESU.

5.2.8 Upper Willamette River Chinook Salmon ESU

There are 155 bridges where repair and replacement activities may affect the Upper Willamette River (UWR) ESU for chinook salmon: 136 bridges are within the range of the ESU, three bridges are within 2 miles of the ESU boundary (and drain to the ESU), and the remaining six bridges are located downstream of the ESU (Willamette Falls) near either the Willamette or Columbia Rivers (Figure 5.2.8-1; Table 5.2.8-1). Repair and replacement of these bridges will potentially affect habitat within the UWR Chinook Salmon ESU. UWR chinook salmon use the lower Willamette and Columbia Rivers as a migratory corridor to reach their natal waters. Therefore, UWR chinook salmon may be present near bridges in downstream portions of the Columbia River. Migrating UWR chinook salmon could be affected by the repair or replacement of 16 bridges occurring within 2 miles of the lower Willamette River and lower Columbia River. Of the bridges where the proposed action may affect UWR chinook salmon, nine occur in the Coast Range ecoregion, 142 occur in the Willamette Valley ecoregion, and four occur in the West Cascades ecoregion.

There are 25 5th Field HUCs affected by bridges within this ESU. The greatest concentration of bridges occurs in the Calapooia River, Lower Coast Fork Willamette River, Upper Coast Fork Willamette River, Willamette River/Chehalem Creek, Muddy Creek, and Oak Creek watersheds; these account for 60% of the total API for program bridges with the potential to affect this ESU.

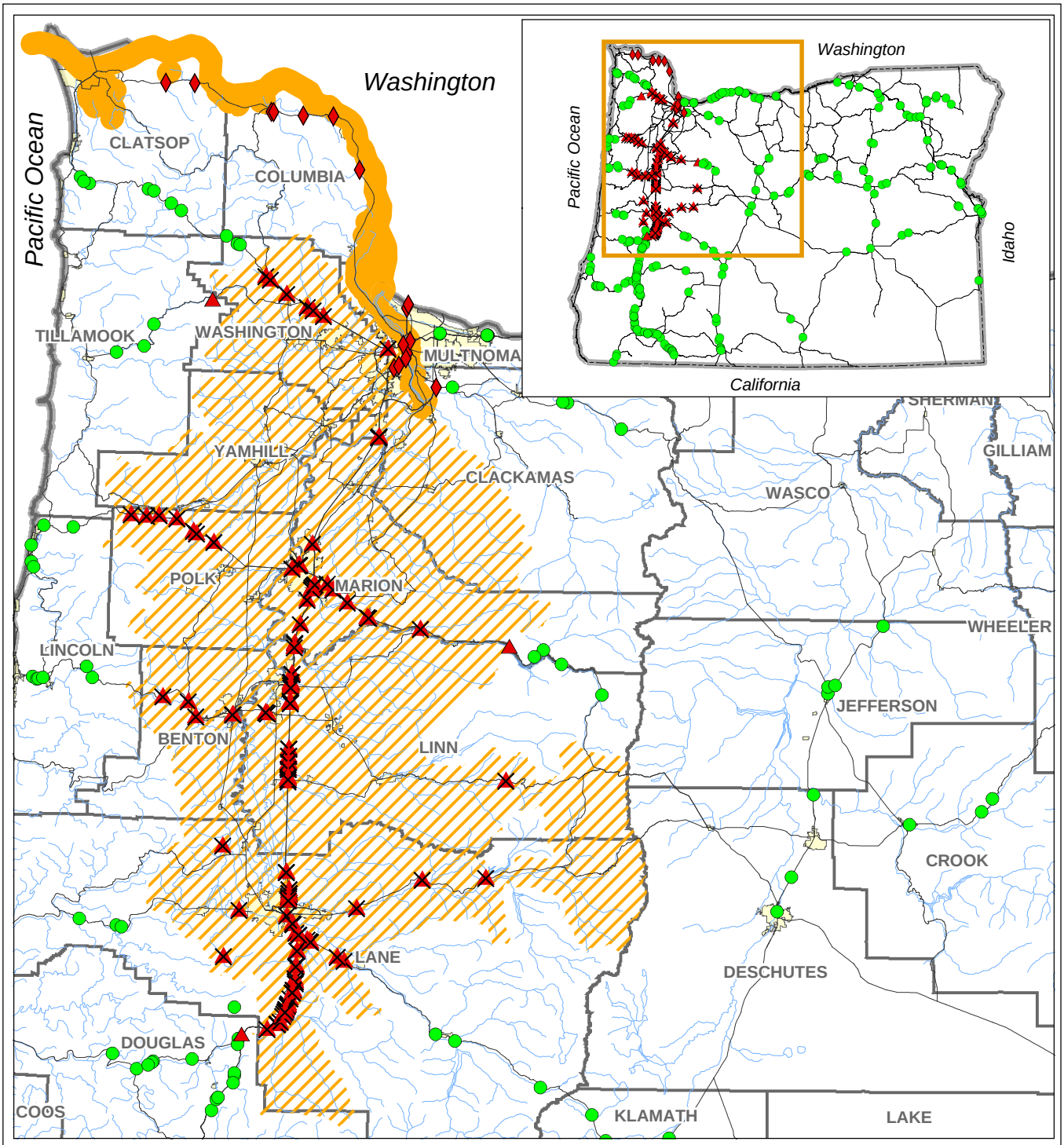
Of the bridges located along the migration corridor of this ESU, the greatest concentration of bridges occurs in the Columbia Slough/Willamette River watershed, which accounts for 57% of the total API outside the ESU and inside the migratory corridor.

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, likely to adversely affect** for the UWR Chinook Salmon ESU. Approximately 155 bridges within this ESU will require isolation of the in-water work area. The isolation of in-water work areas may cause local and temporary reductions in water quality and may necessitate the handling of UWR chinook salmon. Therefore, it is expected that up to 10,000 juvenile UWR chinook salmon will be handled for all bridge repair and replacement and repair work within the ESU. A maximum lethal taking of 600 juvenile UWR chinook salmon may occur as a result of bridge work within 2 miles of the Columbia and Willamette Rivers and within the ESU itself.

The total amount of permanent streambank disturbance at the 155 bridges where the proposed action may affect the ESU is approximately 6,200 feet, or 1.2 river miles. The total amount of temporary streambank disturbance that may affect the ESU is approximately 46,500 feet, or 8.8 river miles. The area of riparian disturbance that may affect this ESU is expected to be no more than 160 acres.

After reviewing the best available scientific and commercial information available regarding the current status of the UWR Chinook Salmon ESU, the environmental baseline for the action area, the effects of the proposed action, the environmental performance standards proposed, and the cumulative effects, ODOT/FHWA makes a determination of **not likely to destroy or adversely modify** designated or previously designated critical habitat. These findings are based on the following considerations: (1) the Bridge Program requires individual review of each project to

ensure that the proposed action will be in compliance with the environmental performance standards identified herein, and that each applicable standard is included as an enforceable condition of the permit document; (2) the cumulative effect of the conservation measures applied to each project will ensure that any short-term effects on water quality, habitat access, habitat elements, channel conditions and dynamics, flows, and watershed conditions are brief, minor, and scheduled to occur at the times that are least sensitive for the species' life-cycle (i.e., designated in-water work periods); (3) the ecological design approach that will be applied to each program bridge to protect and stimulate natural habitat-forming processes is expected to result in many projects that will have long-term beneficial effects on aquatic habitat parameters (e.g., the removal of bridge piers from the active channel and reductions in riprap); and (4) the individual and combined effects of all actions permitted are not expected to impair currently properly functioning habitats, appreciably reduce the functioning of already impaired habitats, or retard the long-term progress of impaired habitats toward the properly functioning condition essential to survival and recovery at the population or ESU scale.



OTIA III Bridges

- Potential to Affect - Within ESU
- Potential to Affect - Within 2 Miles of ESU
- Potential to Affect - Within 2 Miles of Migration Corridor (outside of ESU)
- No Potential to Affect
- *Chinook Salmon ESU (Selected for Species)*
- Chinook Salmon Migratory Corridor
- City
- County
- Streams and Rivers
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

N W E S

0 5 10 20 30
Miles

Figure 5.2.8-1

OTIA III: Statewide Bridge Delivery Program
Upper Willamette River Chinook Salmon

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
screening/BA Figures/chinook_uwr.mxd. Mar 1, 2004

Table 5.2.8-1. Program Bridge projects that may affect Upper Willamette River Chinook Salmon.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
1	07794A	Hwy 51 SB	3	Abernethy Cr.	Coffee Lake Cr.	within ESU
2	07794B	Hwy 51 SB	3	Abernethy Cr.	Coffee Lake Cr.	within ESU
3	9870	Hwy 1 Conn #1	3	Abernethy Cr.	Coffee Lake Cr.	within ESU
4	9591	Lewis & Clark Br Conn	3	Beaver Cr./Columbia R.	Green Cr./ Columbia Side Ch.	within 2 miles of Migr. Corr.
5	7417	Big Cr.	3	Big Cr.	Big Cr.	within 2 miles of Migr. Corr.
6	921	Gnat Cr.	4	Big Cr.	Gnat Cr.	within 2 miles of Migr. Corr.
7	08232N	Butte Cr.	3	Calapooia R.	Butte Cr.	within ESU
8	08232S	Butte Cr.	3	Calapooia R.	Butte Cr.	within ESU
9	08236N	Calapooia R.	4	Calapooia R.	Calapooia R. / Courtney Cr.	within ESU
10	08236S	Calapooia R.	4	Calapooia R.	Calapooia R. / Courtney Cr.	within ESU
11	08239N	Sodom Ditch Overflow	3	Calapooia R.	Calapooia R. / Courtney Cr.	within ESU
12	08239S	Sodom Ditch Overflow	3	Calapooia R.	Calapooia R. / Courtney Cr.	within ESU
13	08241N	Courtney Cr.	3	Calapooia R.	Calapooia R. / Courtney Cr.	within ESU
14	08241S	Courtney Cr.	3	Calapooia R.	Calapooia R. / Courtney Cr.	within ESU
15	8252	Hwy 212	4	Calapooia R.	Calapooia R. / Courtney Cr.	within ESU
16	08233N	Sodom Ditch	8	Calapooia R.	Calapooia R. / Sodom Ditch	within ESU
17	08233S	Sodom Ditch	8	Calapooia R.	Calapooia R. / Sodom Ditch	within ESU

Table 5.2.8-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
18	08235N	Calapooia Overflow	5	Calapooia R.	Calapooia R. / Sodom Ditch	within ESU
19	08235S	Calapooia Overflow	5	Calapooia R.	Calapooia R. / Sodom Ditch	within ESU
20	7519	Clatskanie R.	3	Clatskanie R.	Lower Clatskanie R.	within 2 miles of Migr. Corr.
21	7715	Swedetown County Rd	4	Clatskanie R.	Lower Clatskanie R.	within 2 miles of Migr. Corr.
22	8195	Unknown	3	Columbia Slough/Willamette R.	Columbia Slough	within 2 miles of Migr. Corr.
23	8197	Unknown	13	Columbia Slough/Willamette R.	Columbia Slough	within 2 miles of Migr. Corr.
24	08588B	Unknown	16	Columbia Slough/Willamette R.	Columbia Slough	within 2 miles of Migr. Corr.
25	09254D	Hwy 47 EB Conn to SW Market St	2	Columbia Slough/Willamette R.	Columbia Slough	within 2 miles of Migr. Corr.
26	7964	Unknown	17	Detroit Reservoir/Blow Out Divide Cr.	Detroit Reservoir/Kinney Cr.	within 2 miles of ESU
27	4041	Bear Cr.	7	Long Tom R.	Long Tom R./Bear Cr.	within ESU
28	7867	UPRR Mainline	5	Lower Clackamas R.	Clackamas R. / Rock Cr.	within 2 miles of Migr. Corr.
29	07736A	Camas Swale	3	Lower Coast Fk. Willamette R.	Lower Camas Swale Cr.	within ESU
30	07736C	Camas Swale	3	Lower Coast Fk. Willamette R.	Lower Camas Swale Cr.	within ESU
31	07739A	Hwy 1 (Creswell)	7	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Bear Cr.	within ESU
32	07740A	Hill Cr.	1	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Bear Cr.	within ESU

Table 5.2.8-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
33	07740C	Hill Cr.	1	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Bear Cr.	within ESU
34	07743A	Tunnel Mill Race	3	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Bear Cr.	within ESU
35	07745A	Coast Fk. Willamette R.	8	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Bear Cr.	within ESU
36	07756A	Coast Fk. Relief Opening	4	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Bear Cr.	within ESU
37	07757A	Gettings Cr.	5	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Hill Cr.	within ESU
38	07757B	Gettings Cr.	5	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Hill Cr.	within ESU
39	07793A	Brown Cr.	3	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Hill Cr.	within ESU
40	7825	Saginaw Rd. over Hwy 1	5	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Hill Cr.	within ESU
41	01324A	Gate Cr.	4	Lower Mckenzie R.	Gate Cr.	within ESU
42	2285	SW Canyon Rd (Sylvan)	4	Lower Tualatin R.	Fanno Cr.	within ESU
43	6768	Lost Cr.	5	Middle Fk. Willamette/Lookout Point	Lost Cr.	within ESU
44	8076	Unknown	3	Mill Cr./Willamette R.	Beaver Cr.	within ESU
45	9413	Calapooia Overflow	5	Oak Cr.	Calapooia R.	within ESU

Table 5.2.8-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
46	9414	Calapooia Overflow	3	Oak Cr.	Calapooia R.	within ESU
47	12205B	Calapooia R.	8	Oak Cr.	Calapooia R.	within ESU
48	7941	Unknown	5	Rickreall Cr.	Bashaw Cr.	within ESU
49	745	Unknown	5	Upper S. Yamhill R.	Gold Cr.	within ESU
50	2081	Unknown	3	Upper S. Yamhill R.	Gold Cr.	within ESU
51	00123K	Unknown	33	Willamette R./Chehalem Cr.	Croisan Cr.	within ESU
52	07253B	Unknown	35	Willamette R./Chehalem Cr.	Croisan Cr.	within ESU
53	07253R	Unknown	8	Willamette R./Chehalem Cr.	Croisan Cr.	within ESU
54	7366	Unknown	3	Willamette R./Chehalem Cr.	Croisan Cr.	within ESU
55	07440A	UPRR Main Line	3	Willamette R./Chehalem Cr.	Croisan Cr.	within ESU
56	07441A	Marietta St SE	4	Willamette R./Chehalem Cr.	Croisan Cr.	within ESU
57	07522A	Turner Rd SE	3	Willamette R./Chehalem Cr.	Croisan Cr.	within ESU
58	07538A	Boone Rd SE	3	Willamette R./Chehalem Cr.	Croisan Cr.	within ESU
59	8889	Unknown	7	Willamette R./Chehalem Cr.	Croisan Cr.	within ESU
60	07855E	Hwy 72 (Salem Pkwy)	4	Willamette R./Chehalem Cr.	Glenn Cr.	within ESU
61	07793B	Brown Cr.	3	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Hill Cr.	within ESU
62	5286	Coast Fk. Willamette R.	7	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette	within ESU

Table 5.2.8-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
					R./Papenfus Cr.	
63	05285A	Coast Fk. Willamette R. Relief Opening	5	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Papenfus Cr.	within ESU
64	05287B	Willamette R. Relief Opening	5	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Papenfus Cr.	within ESU
65	06836A	Franklin Blvd & UPRR (Goshen)	5	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Papenfus Cr.	within ESU
66	07732A	Hwy 18 & Conn	6	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Papenfus Cr.	within ESU
67	07732B	Hwy 18 & Conn (Goshen Grade)	6	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Papenfus Cr.	within ESU
68	2262	COR (Oakhill)	8	Long Tom R.	Lower Coyote Cr.	within ESU
69	2472	Devils Lake Fk. Wilson R.	9	Wilson R.	Lower Devils Lake Fk. Of Wilson R.	within 2 miles of ESU
70	2366	E. Fk. Dairy Cr.	4	Dairy Cr.	Lower E. Fk. Of Dairy Cr.	within ESU
71	2367	PNWR (Vadis)	8	Dairy Cr.	Lower E. Fk. Of Dairy Cr.	within ESU
72	7347	Unknown	7	Little N. Santiam R.	Lower Little N. Santiam R.	within ESU
73	8616	Hwy 33 EB	10	Marys R.	Lower Marys R.	within ESU
74	8617	Hwy 33	3	Marys R.	Lower Marys R.	within ESU
75	2365	McKay Cr.	5	Dairy Cr.	Lower Mckay Cr.	within ESU

Table 5.2.8-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
76	2015	Unknown	3	Mill Cr./S. Yamhill R.	Lower Mill Cr.	within ESU
77	01756A	Unknown	5	Mill Cr./S. Yamhill R.	Lower Mill Cr.	within ESU
78	7439	Mill Cr., Hwy 1 NB	3	Mill Cr./Willamette R.	Lower Mill Cr./Willamette R.	within ESU
79	07439A	Mill Cr.	3	Mill Cr./Willamette R.	Lower Mill Cr./Willamette R.	within ESU
80	08171N	Muddy Cr.	3	Muddy Cr.	Lower Muddy Cr. / Dry Muddy Cr.	within ESU
81	08171S	Muddy Cr.	3	Muddy Cr.	Lower Muddy Cr. / Dry Muddy Cr.	within ESU
82	8121	Santiam Overflow No 2	6	Lower N. Santiam R.	Lower N. Santiam R.	within ESU
83	8122	Santiam Overflow No 3	3	Lower N. Santiam R.	Lower N. Santiam R.	within ESU
84	8124	Santiam Overflow No 4	5	Lower N. Santiam R.	Lower N. Santiam R.	within ESU
85	08226N	AERC (Tallman Branch)	5	Oak Cr.	Lower Oak Cr.	within ESU
86	08226S	AERC (Tallman Branch)	5	Oak Cr.	Lower Oak Cr.	within ESU
87	08227N	Oak Cr.	3	Oak Cr.	Lower Oak Cr.	within ESU
88	08227S	Oak Cr.	3	Oak Cr.	Lower Oak Cr.	within ESU
89	01323A	Blue R. Bridge	2	Mckenzie R./Quartz Cr.	Mckenzie R. / Elk Cr.	within ESU
90	1516	EWEB Canal (Walterville)	3	Lower Mckenzie R.	Mckenzie R. / Walterville Canal	within ESU
91	08175N	McKenzie R. & Frtg Rd (Spores)	11	Lower Mckenzie R.	Mckenzie R. / Walterville Canal	within ESU

Table 5.2.8-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
92	08175S	McKenzie R. & Frtg Rd (Spores)	11	Lower Mckenzie R.	Mckenzie R. / Walterville Canal	within ESU
93	08178N	McKenzie Overflow	4	Lower Mckenzie R.	Mckenzie R. / Walterville Canal	within ESU
94	08178S	McKenzie Overflow	4	Lower Mckenzie R.	Mckenzie R. / Walterville Canal	within ESU
95	07524B	Hwy 1E NB (Commercial St SE)	3	Mill Cr./Willamette R.	Mckinney Cr.	within ESU
96	7722	Lost Cr.	3	Beaver Cr./Columbia R.	Middle Beaver Cr.	within 2 miles of Migr. Corr.
97	01075A	Marys R. (Noon)	3	Marys R.	Middle Marys R.	within ESU
98	02362A	Unknown	4	Dairy Cr.	Middle W. Fk. Of Dairy Cr.	within ESU
99	7110	UPRR (Pleasant Hill)	8	Lower Middle Fk. Of Willamette R.	Rattlesnake Cr.	within ESU
100	4573	Unknown	3	Upper S. Yamhill R.	Rogue Cr.	within ESU
101	7830	OP&ERR (Abandoned)	3	Row R.	Row R./Dorena Lake	within ESU
102	7832	Unknown	6	Row R.	Row R./Dorena Lake	within ESU
103	07828B	Cr.	3	Row R.	Row R./Dorena Lake	within ESU
104	07829A	Row R.	5	Row R.	Row R./Dorena Lake	within ESU
105	07833A	Row R. Rd (Cottage Grove)	3	Row R.	Row R./Dorena Lake	within ESU
106	07833B	Row R. Rd (Cottage Grove)	3	Row R.	Row R./Dorena Lake	within ESU
107	07871A	Row R. Overflow	6	Row R.	Row R./Dorena Lake	within ESU

Table 5.2.8-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
108	07871B	Row R. Overflow	6	Row R.	Row R./Dorena Lake	within ESU
109	01612A	Unknown	3	Upper S. Yamhill R.	Rowell Cr.	within ESU
110	1706	Soda Fk.	3	S. Santiam R.	Soda Fk.	within ESU
111	00338A	Tide Cr.	4	Beaver Cr./Columbia R.	Tide Cr.	within 2 miles of Migr. Corr.
112	08203B	Unknown	3	Johnson Cr.	Tyson Cr./Willamette R.	within 2 miles of Migr. Corr.
113	08205R	Unknown	6	Johnson Cr.	Tyson Cr./Willamette R.	within 2 miles of Migr. Corr.
114	07809A	Coast Fk. Willamette R.	5	Upper Coast Fk. Willamette R.	Upper Coast Fk. Willamette R./Martin Cr.	within ESU
115	07809B	Coast Fk. Willamette R.	5	Upper Coast Fk. Willamette R.	Upper Coast Fk. Willamette R./Martin Cr.	within ESU
116	07810A	Latham Rd	4	Upper Coast Fk. Willamette R.	Upper Coast Fk. Willamette R./Martin Cr.	within ESU
117	07810B	Latham Rd	4	Upper Coast Fk. Willamette R.	Upper Coast Fk. Willamette R./Martin Cr.	within ESU
118	07861B	Martin Cr.	3	Upper Coast Fk. Willamette R.	Upper Coast Fk. Willamette R./Martin Cr.	within ESU
119	7860	Hwy 1	6	Upper Coast Fk. Willamette R.	Upper Coast Fk. Willamette R./Silk Cr.	within ESU
120	7863	Row R. Rd	4	Upper Coast Fk. Willamette R.	Upper Coast Fk. Willamette R./Silk Cr.	within ESU

Table 5.2.8-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
121	07863A	Row R. Rd	4	Upper Coast Fk. Willamette R.	Upper Coast Fk. Willamette R./Silk Cr.	within ESU
122	07864A	16th Street (Landess Rd)	3	Upper Coast Fk. Willamette R.	Upper Coast Fk. Willamette R./Silk Cr.	within ESU
123	07865A	Taylor Ave	3	Upper Coast Fk. Willamette R.	Upper Coast Fk. Willamette R./Silk Cr.	within ESU
124	4056	Hayes Cr., Hwy 200	1	Long Tom R.	Upper Coyote Cr.	within ESU
125	8071	Unknown	3	Abiqua Cr./Pudding R.	Upper Little Pudding R.	within ESU
126	8073	Unknown	3	Abiqua Cr./Pudding R.	Upper Little Pudding R.	within ESU
127	01205A	Harris Rd & WPRR (Wren Conn)	6	Marys R.	Upper Marys R.	within ESU
128	00866B	Marys R. & WPRR	6	Marys R.	Upper Marys R. / Horton Cr.	within ESU
129	8069	Unknown	3	Mill Cr./Willamette R.	Upper Mill Cr./Willamette R.	within ESU
130	8070	Unknown	3	Mill Cr./Willamette R.	Upper Mill Cr./Willamette R.	within ESU
131	07584A	Comstock Cemetery Rd	3	Elk Cr.	Upper Pass Cr.	within 2 miles of ESU
132	2001	Unknown	3	Salt Cr./S. Yamhill R.	Upper Salt Cr.	within ESU
133	2672	Unknown	5	Dairy Cr.	Upper W. Fk. Of Dairy Cr.	within ESU
134	2673	Unknown	5	Dairy Cr.	Upper W. Fk. Of Dairy Cr.	within ESU
135	8329	Willamette R. & Hwy 15 & UPRR	19	Muddy Cr.	Upper Willamette / Spring Cr.	within ESU

Table 5.2.8-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
136	8445	Hwy 225	7	Muddy Cr.	Upper Willamette / Spring Cr.	within ESU
137	8870	Hwy 225 Conn (McVay Access)	1	Muddy Cr.	Upper Willamette / Spring Cr.	within ESU
138	9587	Unknown	4	Muddy Cr.	Upper Willamette / Spring Cr.	within ESU
139	08180N	McKenzie Overflow	3	Muddy Cr.	Upper Willamette / Spring Cr.	within ESU
140	08180S	McKenzie Overflow	3	Muddy Cr.	Upper Willamette / Spring Cr.	within ESU
141	08182N	UPRR (Abandoned) & Game Farm Rd	6	Muddy Cr.	Upper Willamette / Spring Cr.	within ESU
142	08182S	UPRR (Abandoned) & Game Farm Rd	6	Muddy Cr.	Upper Willamette / Spring Cr.	within ESU
143	8217	Murder Cr.	3	Oak Cr.	Upper Willamette R.	within ESU
144	8223	Unknown	6	Oak Cr.	Upper Willamette R.	within ESU
145	08218A	Murder Cr. Rd	3	Oak Cr.	Upper Willamette R.	within ESU
146	08218B	Hwy 1 SB over Murder Cr. Rd	3	Oak Cr.	Upper Willamette R.	within ESU
147	08221A	Knox Butte Rd (N. Albany Intchg)	3	Oak Cr.	Upper Willamette R.	within ESU
148	08221B	Hwy 58 NB (N. Albany Intchg)	4	Oak Cr.	Upper Willamette R.	within ESU
149	08221C	Knox Butte Rd (N. Albany Intchg)	3	Oak Cr.	Upper Willamette R.	within ESU

Table 5.2.8-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
150	08221D	Hwy 58 NB (N. Albany Intchg)	4	Oak Cr.	Upper Willamette R.	within ESU
151	08221E	Knox Butte Rd (N Albany Int)	3	Oak Cr.	Upper Willamette R.	within ESU
152	08222N	Cox Cr.	3	Oak Cr.	Upper Willamette R.	within ESU
153	08222S	Cox Cr.	3	Oak Cr.	Upper Willamette R.	within ESU
154	7333	Unknown	16	Salmon Cr.	Vancouver	within 2 miles of Migr. Corr.
155	04516A	Unknown	1	Columbia Slough/Willamette R.	Willamette R./Columbia R.	within 2 miles of Migr. Corr.

5.2.9 Oregon Coast Coho Salmon ESU

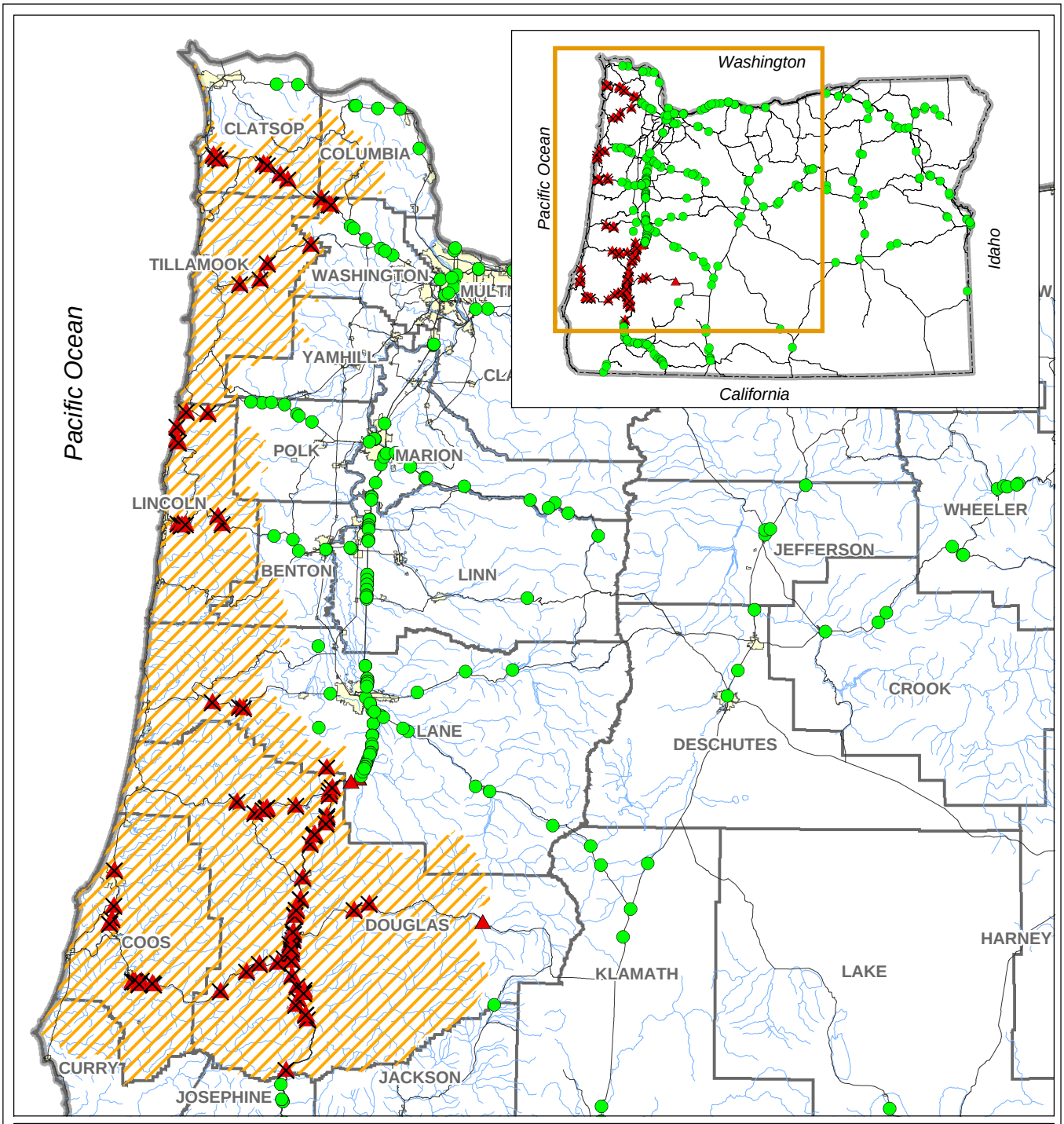
There are 100 bridges where repair and replacement activities may affect the Oregon Coast Coho Salmon ESU: 94 are within the range of the ESU and six are within 2 miles of the ESU boundary (and drain to the ESU) (Figure 5.2.9-1; Table 5.2.9-1). The 94 bridges within the Oregon Coast Coho ESU are distributed throughout four ecoregions, with the majority located in the Coast Range and Klamath Mountains ecoregions. Specifically, 46 bridges are located in the Coast Range ecoregion, 43 occur in the Klamath Mountains ecoregion, four are in the Willamette Valley ecoregion (due to proximity to these bridges API), and one is in the West Cascades ecoregion. There are 24 5th field HUCs affected by bridges within the Oregon Coast ESU. Within this ESU, the greatest concentration of bridges occurs in the Elk Creek Watershed (15 bridges), Lower South Umpqua River (10 bridges), the Middle Fork Coquille (nine bridges), the Middle South Umpqua River (eight bridges), and the Lower North Umpqua River (eight bridges); these account for 53% of the total API for program bridges with the potential to affect this ESU.

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, likely to adversely affect** for the Oregon Coast Coho Salmon ESU. Approximately 62 bridges in this ESU will require isolation of the in-water work area. The isolation of in-water work areas and the removal of trapped fish may require handling of juvenile coho salmon; it is expected that handling of up to 100 Oregon Coast coho salmon at each bridge site may be required during fish removal operations conducted prior to commencement of any work area dewatering activities. As previously discussed in Section 5.2.3, it is expected that a lethal take may occur—of six percent or less of the anticipated 100 Oregon Coast coho salmon at each bridge—as a result of handling stress or injury, or from unforeseen takings resulting from bridge construction. Therefore, it is expected that approximately 6,200 juvenile Oregon Coast coho salmon will be handled for all proposed bridge repair and replacement work within this ESU and that a maximum lethal taking of 372 juvenile Oregon Coast coho salmon will occur as a result of fish-handling activities.

The total amount of permanent streambank disturbance at the 62 bridges where the proposed action may affect the Oregon Coast Coho salmon ESU is approximately 2,480 feet, or 0.24 river mile. The total amount of temporary streambank disturbance that may affect the Oregon Coast Coho salmon ESU is approximately 18,600 feet, or 1.76 river miles. The area of riparian disturbance that may affect this ESU is not expected to exceed 32 acres.

After reviewing the best available scientific and commercial information available regarding the current status of the Oregon Coastal Coho Salmon ESU, the environmental baseline for the action area, the effects of the proposed action, the environmental performance standards proposed, and the cumulative effects, ODOT/FHWA makes a determination of **not likely to destroy or adversely modify** designated or previously designated critical habitat. These conclusions are based on the following considerations: (1) the Bridge Program requires individual review of each project to ensure that the proposed action will be in compliance with the environmental performance standards identified herein, and that each applicable standard is included as an enforceable condition of the permit document and contract documents; (2) the cumulative effect of the conservation measures applied to each project will ensure that any short-

term effects on water quality, habitat access, habitat elements, channel conditions and dynamics, flows, and watershed conditions are brief, minor, and scheduled to occur at the times that are least sensitive for the species' life-cycle (i.e., designated in-water work periods); (3) the ecological design approach applied to each bridge to protect and stimulate natural habitat-forming processes is expected to result in many projects that will have long-term beneficial effects on aquatic habitat parameters (e.g., the removal of bridge piers from the active channel and reductions in riprap) ; and (4) the individual and combined effects of all actions permitted are not expected to impair currently properly functioning habitats, appreciably reduce the functioning of already impaired habitats, or retard the long-term progress of impaired habitats toward the properly functioning condition essential to survival and recovery at the population or ESU scale.



OTIA III Bridges

- Potential to Affect - Within ESU
- Potential to Affect - Within 2 Miles of ESU
- Potential to Affect - Within 2 Miles of Migration Corridor (outside of ESU)
- No Potential to Affect
- Coho Salmon ESU
- City
- County
- Streams and Rivers
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

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Miles

Figure 5.2.9-1

OTIA III: Statewide Bridge Delivery Program
Oregon Coast Coho Salmon

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
screening/BA Figures/coho_oc.mxd. Mar 1, 2004

Table 5.2.9-1. Program Bridge projects that may affect Oregon Coast Coho Salmon.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
1	07563A	Calapooya Cr.	7	Calapooya Cr.	Polloc Cr.	within ESU
2	1950	North Bend	3	Coos Bay	Coos Bay	within ESU
3	03172A	COR	3	Coos Bay	Lower Millicoma	within ESU
4	8281	Hwy 9 NB	3	Coos Bay	Lower Millicoma	within ESU
5	1424	Hardscrabble Cr.	3	Elk Cr.	Hardscrabble Cr.	within ESU
6	1406	Elk Cr.	5	Elk Cr.	Lower Big Elk Cr.	within ESU
7	1465	Elk Cr.	6	Elk Cr.	Lower Big Elk Cr.	within ESU
8	1601	Elk Cr.	6	Elk Cr.	Lower Big Elk Cr.	within ESU
9	1614	Elk Cr.	6	Elk Cr.	Lower Big Elk Cr.	within ESU
10	07567B	Elk Cr.	3	Elk Cr.	Theft Cr.	within ESU
11	07572A	Curtis Cr.	4	Elk Cr.	Theft Cr.	within ESU
12	07636A	Elkhead Rd	3	Elk Cr.	Theft Cr.	within ESU
13	07469B	Bear Cr.	4	Elk Cr.	Upper Pass Cr.	within ESU
14	07569A	Buck Cr. Rd	3	Elk Cr.	Upper Pass Cr.	within ESU
15	07584A	Comstock Cemetery Rd	3	Elk Cr.	Upper Pass Cr.	within ESU
16	07640A	COR (Yoncalla)	5	Elk Cr.	Yoncalla Cr.	within ESU

Table 5.2.9-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
17	07644A	Rice Hill Frtg Rd	3	Elk Cr.	Yoncalla Cr.	within ESU
18	7640	COR (Yoncalla)	3	Elk Cr.	Yoncalla Cr.	within ESU
19	7642	Hwy 1	4	Elk Cr.	Yoncalla Cr.	within ESU
20	03173A	Beaver Cr.	24	Lower Coquille	Beaver Slough	within ESU
21	03173B	Beaver Cr.	24	Lower Coquille	Beaver Slough	within ESU
22	2496	N. Umpqua R. (Lone Rock)	7	Lower N. Umpqua R.	Bradley Cr.	within ESU
23	07627A	Rogers Rd Conn	3	Lower N. Umpqua R.	Plat I	within ESU
24	07627B	Rogers Rd Conn	3	Lower N. Umpqua R.	Plat I	within ESU
25	07631A	CORP & County Rd	6	Lower N. Umpqua R.	Winchester	within ESU
26	07663A	N Umpqua R & CORP & Cr. & Co Rd	17	Lower N. Umpqua R.	Winchester	within ESU
27	07663C	N Umpqua R & CORP & Cr. & Co Rd (Winchester)	18	Lower N. Umpqua R.	Winchester	within ESU
28	7631	CORP & County Rd	4	Lower N. Umpqua R.	Winchester	within ESU
29	7632	Hwy 1 (Winchester)	3	Lower N. Umpqua R.	Winchester	within ESU
30	2164	Unknown	14	Lower Nehalem R.	Cow Cr.	within ESU
31	2165	Unknown	12	Lower Nehalem R.	Cow Cr.	within ESU

Table 5.2.9-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
32	1831	Unknown	3	Lower Nehalem R.	Humbug Cr.	within ESU
33	1832	Unknown	3	Lower Nehalem R.	Humbug Cr.	within ESU
34	07804N	Speedway Rd	3	Lower S. Umpqua R.	Roberts Cr.	within ESU
35	07835A	Roberts Cr. Rd	4	Lower S. Umpqua R.	Roberts Cr.	within ESU
36	7806	Hwy 1	4	Lower S. Umpqua R.	Roberts Cr.	within ESU
37	7835	Roberts Cr. Rd	4	Lower S. Umpqua R.	Roberts Cr.	within ESU
38	07670A	Portland Ave (Fairgrounds Intchg)	5	Lower S. Umpqua R.	Roseburg W.	within ESU
39	07711A	McLain Ave (Garbage Dump Rd)	3	Lower S. Umpqua R.	Roseburg W.	within ESU
40	07713A	S. Umpqua R. & CORP (Shady)	12	Lower S. Umpqua R.	Roseburg W.	within ESU
41	1923	S. Umpqua R. (Winston)	7	Lower S. Umpqua R.	Roseburg W.	within ESU
42	7404	S. Umpqua R. (Vets)	6	Lower S. Umpqua R.	Roseburg W.	within ESU
43	7667	Unknown	4	Lower S. Umpqua R.	Roseburg W.	within ESU
44	00925A	Unknown	5	Lower Siletz R./Drift Cr.	Lower Drift Cr./Siletz R.	within ESU
45	00924A	Unknown	6	Lower Siletz R./Drift Cr.	Schooner Cr.	within ESU
46	8370	Knowles Cr.	3	Lower Siuslaw R.	Knowles Cr.	within ESU

Table 5.2.9-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
47	7530	Beaver Cr.	3	Lower Yaquina R.	Drift Cr.	within ESU
48	7532	Beaver Cr.	3	Lower Yaquina R.	Drift Cr.	within ESU
49	7533	Beaver Cr.	3	Lower Yaquina R.	Drift Cr.	within ESU
50	7534	Little Beaver Cr.	3	Lower Yaquina R.	Drift Cr.	within ESU
51	09352A	Conn (Glendale Intchg)	3	Middle Cow Cr.	Cow Cree/Fortune Branch	within ESU
52	00559B	Middle Fk. Coquille R.	3	Middle Fk. Coquille	Camas Valley	within ESU
53	07931N	S. Umpqua R. (Missouri Bottom)	6	Middle S. Umpqua R.	Lane Judd	within ESU
54	07931S	S. Umpqua R. (Missouri Bottom)	6	Middle S. Umpqua R.	Lane Judd	within ESU
55	07952A	COR (Weaver)	5	Middle S. Umpqua R.	Lane Judd	within ESU
56	7952	COR (Weaver)	5	Middle S. Umpqua R.	Lane Judd	within ESU
57	8024	Hwy 1	5	Middle S. Umpqua R.	Lane Judd	within ESU
58	07900A	Boomer Hill Rd Conn #2	3	Middle S. Umpqua R.	Willis Vandine	within ESU
59	7839	Clarks Branch Rd Conn #2	3	Middle S. Umpqua R.	Willis Vandine	within ESU
60	7950	Myrtle Cr. Conn (Myrtle Cr. Intchg)	3	Middle S. Umpqua R.	Willis Vandine	within ESU
61	1697	Paradise Cr.	5	Middle Umpqua R.	Paradise Cr.	within ESU

Table 5.2.9-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
62	03212A	Endicot Cr.	3	Middle Fk. Coquille	Lower Mf Coquille	within ESU
63	8830	Middle Fk. Coquille R.	5	Middle Fk. Coquille	Lower Mf Coquille	within ESU
64	8842	Middle Fk. Coquille R.	8	Middle Fk. Coquille	Lower Mf Coquille	within ESU
65	8843	Hwy 242	3	Middle Fk. Coquille	Lower Mf Coquille	within ESU
66	8875	Middle Fk. Coquille R.	5	Middle Fk. Coquille	Lower Mf Coquille	within ESU
67	8876	Middle Fk. Coquille R.	4	Middle Fk. Coquille	Lower Mf Coquille	within ESU
68	8935	Middle Fk. Coquille R.	7	Middle Fk. Coquille	Lower Mf Coquille	within ESU
69	8936	Middle Fk. Coquille R.	5	Middle Fk. Coquille	Lower Mf Coquille	within ESU
70	03091A	Unknown	1	Necanicum R.	Lower Necanicum R.	within ESU
71	03092A	Unknown	1	Necanicum R.	Middle Necanicum R.	within ESU
72	2601	Unknown	4	Necanicum R.	Middle Necanicum R.	within ESU
73	00587C	Olalla Cr. (Upper Lookingglass)	3	Ollala Cr./Lookingglass	Lookinglass Cr.	within ESU
74	00805C	Lower Looking Glass Cr.	3	Ollala Cr./Lookingglass	Lookinglass Cr.	within ESU
75	00588C	Tenmiles Cr.	3	Ollala Cr./Lookingglass	Shields	within ESU
76	7904	Rock Cr.	5	Rock Cr./N. Umpqua R.	Lower Rock Cr.	within ESU
77	07364A	5th St (Canyonville)	3	S. Umpqua R.	Canyon Cr.	within ESU

Table 5.2.9-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
78	08028N	Irwin Access Conn	3	S. Umpqua R.	Lower Shively Oshea	within ESU
79	08028S	Irwin Access Conn	3	S. Umpqua R.	Lower Shively Oshea	within ESU
80	00922A	Unknown	3	Salmon R./Siletz/Yaquina Bay	Devils Lake	within ESU
81	13491	Unknown	3	Salmon R./Siletz/Yaquina Bay	Lower Salmon R.	within ESU
82	4192	Unknown	9	Salmon R./Siletz/Yaquina Bay	Upper Salmon R.	within ESU
83	07809A	Coast Fk. Willamette R.	5	Upper Coast Fk. Willamette R.	Upper Coast Fk. Willamette R./Martin Cr.	within 2 miles of ESU
84	07809B	Coast Fk. Willamette R.	5	Upper Coast Fk. Willamette R.	Upper Coast Fk. Willamette R./Martin Cr.	within 2 miles of ESU
85	07810A	Latham Rd	4	Upper Coast Fk. Willamette R.	Upper Coast Fk. Willamette R./Martin Cr.	within 2 miles of ESU
86	07810B	Latham Rd	4	Upper Coast Fk. Willamette R.	Upper Coast Fk. Willamette R./Martin Cr.	within 2 miles of ESU
87	07861B	Martin Cr.	3	Upper Coast Fk. Willamette R.	Upper Coast Fk. Willamette R./Martin Cr.	within 2 miles of ESU
88	16861	Rough Cr. (Penstock)	5	Upper N. Umpqua	Soda Springs Reservoir	within 2 miles of ESU
89	02364A	Unknown	3	Upper Nehalem R.	Lousignont Cr.	within ESU
90	02027A	Unknown	3	Upper Nehalem R.	Wolf Cr.	within ESU
91	2029	Unknown	3	Upper Nehalem R.	Wolf Cr.	within ESU
92	4062	S. Fork Siuslaw R.	4	Upper Siuslaw R.	S. Fk. Siuslaw R.	within ESU
93	8446	Siuslaw R.	3	Upper Siuslaw R.	Upper Siuslaw R./Whitaker Cr.	within ESU
94	683	Yaquina R.	4	Upper Yaquina R.	Middle Yaquina R.	within ESU

Table 5.2.9-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
95	654	Hayes Cr.	6	Upper Yaquina R.	Simpson Cr.	within ESU
96	8554	Wildcat Cr.	3	Wildcat Cr.	Lower Wildcat Cr.	within ESU
97	01872A	Jordon Cr.	4	Wilson R.	Jordan Cr.	within ESU
98	2472	Devils Lake Fk. Wilson R.	9	Wilson R.	Lower Devils Lake Fk. Of Wilson R.	within ESU
99	01869A	Wilson R.	11	Wilson R.	Lower Wilson R.	within ESU
100	1868	Wilson R. (Mills)	3	Wilson R.	Lower Wilson R.	within ESU

5.2.10 Northern California/Southern Oregon Coast Coho Salmon ESU

There are 45 bridges where repair and replacement activities may affect the Oregon portion of the Northern California/Southern Oregon Coast (NCSOC) ESU for coho salmon (Figure 5.2.10-1; Table 5.2.10-1). All of the bridges fall within the range of the ESU and no bridges are located within 2 miles (and drain to the ESU). All of these bridges are located within the Klamath Mountains ecoregion.

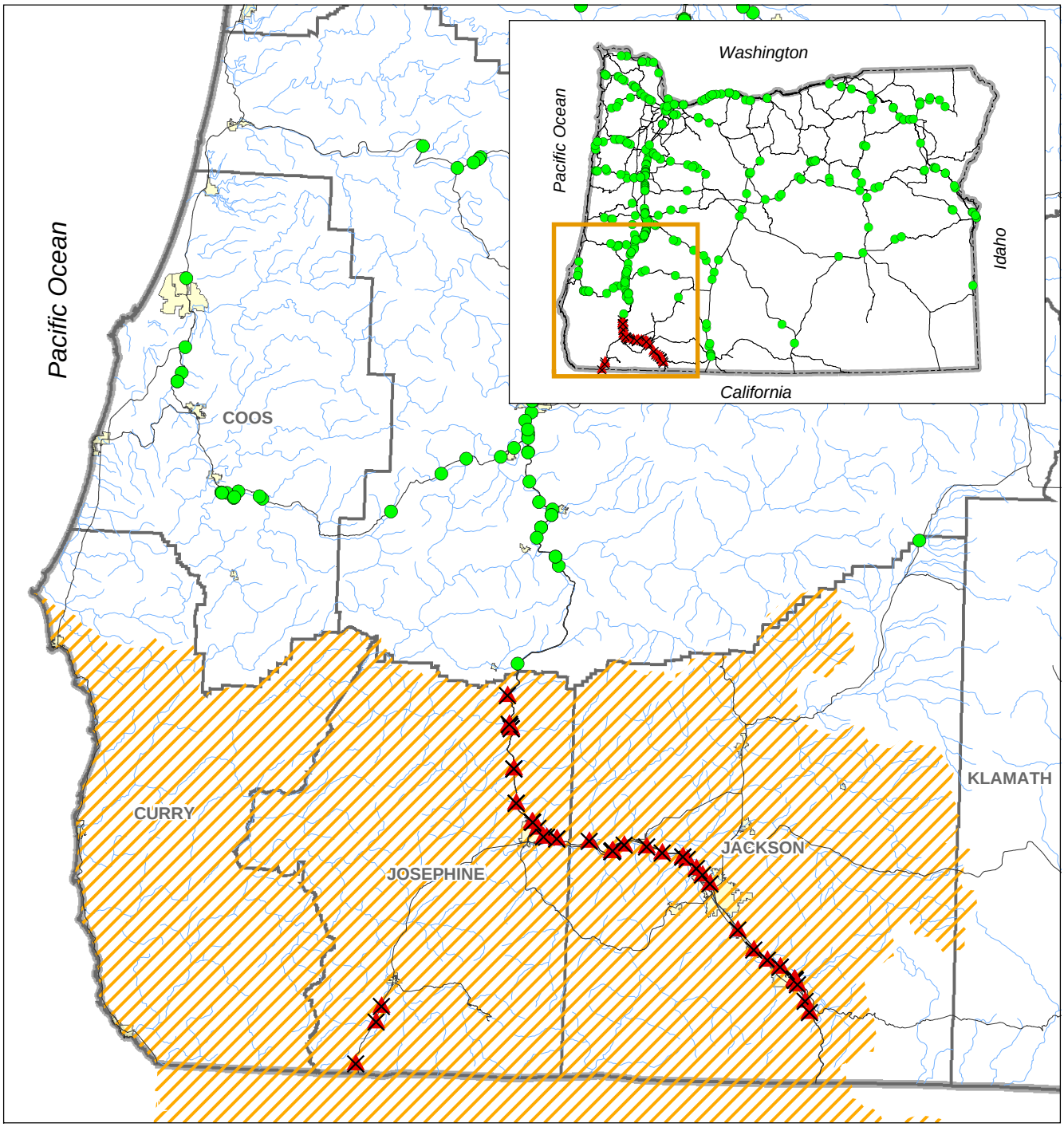
There are six 5th Field HUCs affected by bridges within the ESU. Within this ESU, the greatest concentration of bridges occurs in the Bear Creek watershed, which accounts for 39% of the gross API.

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, likely to adversely affect** for the NCSOC Coho Salmon ESU. Approximately 45 bridges in this ESU will require isolation of the in-water work area. The isolation of in-water work areas and the removal of trapped fish may require handling of juvenile coho salmon; it is expected that handling of NCSOC coho salmon at each bridge site may be required during fish removal operations conducted prior to commencement of any work area dewatering activities. As previously discussed in Section 5.2.3, it is expected that lethal take may occur—of six percent or less of the NCSOC coho salmon at each bridge—as a result of handling stress or injury, or from unforeseen takings resulting from bridge construction. Therefore, it is expected that approximately 4,500 juvenile NCSOC coho salmon will be handled for all proposed bridge repair and replacement work within this ESU and that a maximum lethal taking of 270 juvenile NCSOC coho salmon will occur as a result of fish-handling activities.

The total amount of permanent streambank disturbance at the 45 bridges where the proposed action may affect the NCSOC Coho salmon ESU is approximately 1,800 feet, or 0.34 river mile. The total amount of temporary streambank disturbance that may affect the NCSOC Coho salmon ESU is approximately 13,500 feet, or 2.5 river miles. The area of riparian disturbance that may affect this ESU is not expected to exceed 45.5 acres.

After reviewing the best available scientific and commercial information available regarding the current status of the NCSOC Coho Salmon ESU, the environmental baseline for the action area, the effects of the proposed action, the environmental performance standards proposed, and the cumulative effects, ODOT/FHWA makes a determination of **not likely to destroy or adversely modify** designated or previously designated critical habitat. These conclusions are based on the following considerations: (1) the Bridge Program requires individual review of each project to ensure that the proposed action will be in compliance with the environmental performance standards identified herein, and that each applicable standard is included as an enforceable condition of the permit document and contract documents; (2) the cumulative effect of the conservation measures applied to each project will ensure that any short-term effects on water quality, habitat access, habitat elements, channel conditions and dynamics, flows, and watershed conditions are brief, minor, and scheduled to occur at the times that are least sensitive for the species' life-cycle (i.e., designated in-water work periods); (3) the ecological design approach applied to each bridge to protect and stimulate natural habitat-forming processes is expected to

result in many projects that will have long-term beneficial effects on aquatic habitat parameters (e.g., the removal of bridge piers from the active channel and reductions in riprap) ; and (4) the individual and combined effects of all actions permitted are not expected to impair currently properly functioning habitats, appreciably reduce the functioning of already impaired habitats, or retard the long-term progress of impaired habitats toward the properly functioning condition essential to survival and recovery at the population or ESU scale.



OTIA III Bridges

- Potential to Affect - Within ESU
- Potential to Affect - Within 2 Miles of ESU
- Potential to Affect - Within 2 Miles of Migration Corridor (outside of ESU)
- No Potential to Affect
- Coho Salmon ESU
- City
- County
- Streams and Rivers
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

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Figure 5.2.10-1

OTIA III: Statewide Bridge Delivery Program Northern California/Southern Oregon Coast Coho Salmon

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
screening/BA Figures/coho_ncso.mxd. Mar 1, 2004

Table 5.2.10-1. Program Bridge projects that may affect N. California/Southern Oregon/ Coastal Coho Salmon.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC
1	8682	Unknown	5	Bear Cr.	Anderson Cr./Fern Valley
2	8743	Unknown	4	Bear Cr.	Bear Cr./Hamilton Cr.
3	08738N	Eagle Mill Rd.	4	Bear Cr.	Bear Cr./Hamilton Cr.
4	08738S	Eagle Mill Rd.	5	Bear Cr.	Bear Cr./Hamilton Cr.
5	08742N	Bear Cr.	5	Bear Cr.	Bear Cr./Hamilton Cr.
6	08742S	Bear Cr.	5	Bear Cr.	Bear Cr./Hamilton Cr.
7	8542	Hwy 1	7	Bear Cr.	Bear Cr./Larson Cr.
8	8543	Unknown	14	Bear Cr.	Bear Cr./Larson Cr.
9	08540A	Hwy 1	4	Bear Cr.	Bear Cr./Larson Cr.
10	7777	COR (Seven Oaks)	9	Bear Cr.	Bear Cree/Jackson Cr.
11	8539	Hwy 1 (Seven Oaks Intchg)	8	Bear Cr.	Bear Cree/Jackson Cr.
12	07777B	COR (Seven Oaks)	9	Bear Cr.	Bear Cree/Jackson Cr.
13	8681	Unknown	6	Bear Cr.	Bear Cree/Meyer Cr.
14	8693	Hwy 1 (N Ashland Intchg)	6	Bear Cr.	Bear Cree/Meyer Cr.
15	8745	Hwy 1	4	Bear Cr.	Neil Cr.
16	8749	Unknown	6	Bear Cr.	Neil Cr.
17	9184	Neil Cr. Rd	3	Bear Cr.	Neil Cr.
18	9439	Sunny Valley Rd	3	Grave Cr.	Grave Cr./Sunny Valley
19	9440	Leland Rd	3	Grave Cr.	Grave Cr./Sunny Valley
20	06493A	Grave Cr.	6	Grave Cr.	Grave Cr./Sunny Valley
21	09439A	Sunny Valley Rd	3	Grave Cr.	Grave Cr./Sunny Valley
22	09440A	Leland Rd	3	Grave Cr.	Grave Cr./Sunny Valley
23	9339	S Wolf Cr. Conn	3	Grave Cr.	Wolf/Cr.
24	08018N	Louse Cr. & Conn	4	Jumpoff Joe Cr.	Louse Cr.
25	08018S	Louse Cr. & Conn	4	Jumpoff Joe Cr.	Louse Cr.

Table 5.2.10-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC
26	08094N	Jumpoff Joe Cr.	6	Jumpoff Joe Cr.	Middle Jumpoff Joe Cr.
27	08094S	Jumpoff Joe Cr.	6	Jumpoff Joe Cr.	Middle Jumpoff Joe Cr.
28	8339	Beacon Dr	4	Rogue R./Grants Pass	Lower Rogue R./Grants Pass
29	8341	Hwy 25 Spur	6	Rogue R./Grants Pass	Lower Rogue R./Grants Pass
30	8500	Scoville Rd	3	Rogue R./Grants Pass	Lower Rogue R./Grants Pass
31	8501	Hwy 25 NB	3	Rogue R./Grants Pass	Lower Rogue R./Grants Pass
32	8333	Foothill Blvd	3	Rogue R./Grants Pass	Upper Rogue R./Grants Pass
33	8375	Creek & County Rd. + Corp	9	Rogue R./Grants Pass	Upper Rogue R./Grants Pass
34	08335N	Foothill Blvd	5	Rogue R./Grants Pass	Upper Rogue R./Grants Pass
35	08335S	Foothill Blvd	5	Rogue R./Grants Pass	Upper Rogue R./Grants Pass
36	07601B	Hwy 1 (S Gold Hill)	4	Rogue R./Snyder Cr.	Rogue R./Galls Cr.
37	07773A	Foley Lane Frontage Rd	3	Rogue R./Snyder Cr.	Rogue R./Galls Cr.
38	8382	Unknown	5	Rogue R./Snyder Cr.	Rogue R./Sardine Cr.
39	08381N	Rogue R. (Homestead)	8	Rogue R./Snyder Cr.	Rogue R./Sardine Cr.
40	08381S	Rogue R.(Homestead)	9	Rogue R./Snyder Cr.	Rogue R./Sardine Cr.
41	08383N	Hwy 60	5	Rogue R./Snyder Cr.	Rogue R./Sardine Cr.
42	08383S	Hwy 60	5	Rogue R./Snyder Cr.	Rogue R./Sardine Cr.
43	01074A	Elk Cr.	3	W. Fk. Illinois R.	Elk Cr. (Illinois)
44	01108A	W. Fk. Illinois R.	5	W. Fk. Illinois R.	Lower W. Fk. Illinois R.
45	01107A	Rough And Ready Cr.	3	W. Fk. Illinois R.	Rough And Ready Cr.

Note: All bridges are located within the ESU.

5.2.11 Lower Columbia River Coho Salmon

There are 44 bridges where repair and replacement activities may affect State-listed Lower Columbia River (LCR) coho salmon: 43 bridges within the range of the population and one bridge within 2 miles of the range of LCR coho (and drain to the lower Columbia River) (Figure 5.2.11-1; Table 5.2.11-1). Of the total number of bridges where repair and replacement activities may affect LCR coho salmon, six bridges occur in the Coast Range ecoregion, 18 occur in the Willamette Valley ecoregion, 16 occur in the West Cascades ecoregion, and four occur in the East Cascades ecoregion.

There are 14 5th Field HUCs affected by bridges within the ESU. Within the range of LCR coho, the greatest concentration of bridges occurs in the Columbia Slough/Willamette River, Middle Columbia/Eagle Creek, and the Columbia Gorge Tributaries watersheds; these account for 54% of the gross API.

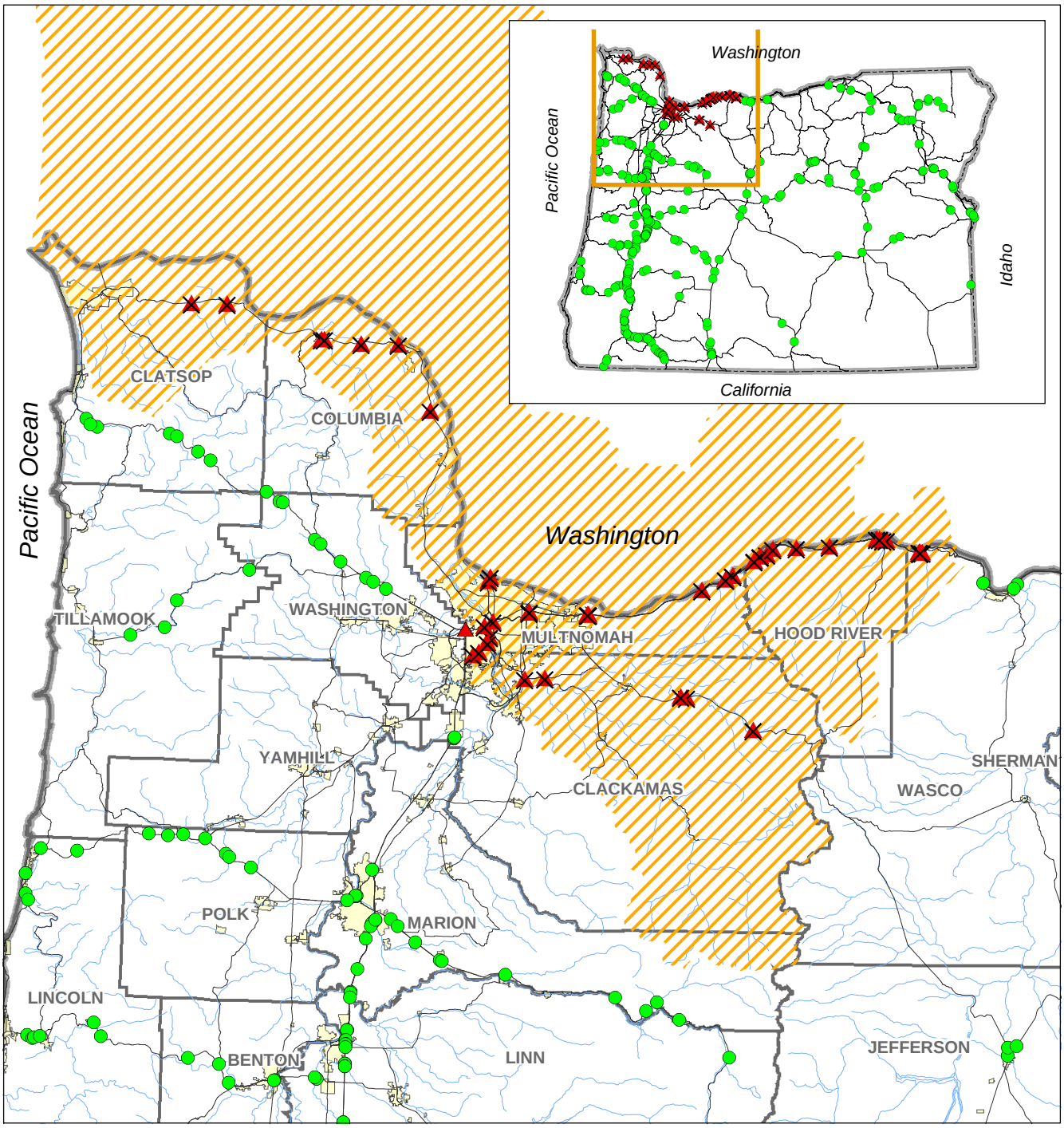
Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination **of may affect, likely to adversely affect** for the LCR coho salmon. Approximately 44 bridges in this ESU will require isolation of the in-water work area. The isolation of in-water work areas and the removal of trapped fish may require handling of juvenile LCR coho salmon; it is expected that handling of LCR coho salmon at each bridge site may be required during fish removal operations conducted prior to commencement of any work area dewatering activities. As previously discussed in Section 5.2.3, it is expected that lethal take may occur—of six percent or less of the LCR coho salmon at each bridge—as a result of handling stress or injury, or from unforeseen takings resulting from bridge construction. Therefore, it is expected that approximately 1,010 juvenile LCR coho salmon will be handled for all proposed bridge repair and replacement work within this population and that a maximum lethal take of 61 juvenile LCR coho salmon will occur as a result of fish-handling activities.

The total amount of permanent streambank disturbance at the 44 bridges where the proposed action may affect the ESU is approximately 1,760 feet, or 0.3 river mile. The total amount of temporary streambank disturbance that may affect the ESU is approximately 13,200 feet, or 2.5 river miles. The area of riparian disturbance that may affect this ESU is not expected to exceed 45.5 acres.

After reviewing the best available scientific and commercial information available regarding the current status of LCR coho salmon, the environmental baseline for the action area, the effects of the proposed action, the environmental performance standards proposed, and the cumulative effects, ODOT/FHWA makes a determination of **not likely to destroy or adversely modify** designated or previously designated critical habitat for LCR coho salmon.

These conclusions are based on the following considerations: (1) the Bridge Program requires individual review of each project to ensure that the proposed action will be in compliance with the environmental performance standards identified herein, and that each applicable standard is included as an enforceable condition of the permit document and contract documents; (2) the cumulative effect of the conservation measures applied to each project will ensure that any short-term effects on water quality, habitat access, habitat elements, channel conditions and dynamics,

flows, and watershed conditions are brief, minor, and scheduled to occur at the times that are least sensitive for the species' life-cycle (i.e., designated in-water work periods); (3) the ecological design approach applied to each bridge to protect and stimulate natural habitat-forming processes is expected to result in many projects that will have long-term beneficial effects on aquatic habitat parameters (e.g., the removal of bridge piers from the active channel and reductions in riprap) ; and (4) the individual and combined effects of all actions permitted are not expected to impair currently properly functioning habitats, appreciably reduce the functioning of already impaired habitats, or retard the long-term progress of impaired habitats toward the properly functioning condition essential to survival and recovery at the population scale.



OTIA III Bridges

- Potential to Affect - Within Species Management Unit (SMU)
- Potential to Affect - Within 2 Miles of SMU
- Potential to Affect - Within 2 Miles of Migration Corridor (outside of SMU)
- No Potential to Affect
- Coho Salmon Species Management Unit (SMU)
- City
- County
- Streams and Rivers
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

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Miles

Figure 5.2.11-1

OTIA III: Statewide Bridge Delivery Program
Lower Columbia River Coho Salmon

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
screening/BA Figures/coho_lcr.mxd. Mar 1, 2004

Table 5.2.11-1. Program Bridge projects that may affect Lower Columbia River Coho Salmon.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Coho LCR ESU
1	9591	Hwy 2w	3	Beaver Cr./Columbia R.	Green Cr./ Columbia Side Ch.	within ESU
2	7722	Lost Cr.	3	Beaver Cr./Columbia R.	Middle Beaver Cr.	within ESU
3	00338A	Tide Cr.	4	Beaver Cr./Columbia R.	Tide Cr.	within ESU
4	7417	Big Cr.	3	Big Cr.	Big Cr.	within ESU
5	921	Gnat Cr.	4	Big Cr.	Gnat Cr.	within ESU
6	7519	Clatskanie R.	3	Clatskanie R.	Lower Clatskanie R.	within ESU
7	7715	Swedetown County R	4	Clatskanie R.	Lower Clatskanie R.	within ESU
8	02176A	Hwy 100 & UPRR	10	Columbia Gorge Tributaries	Hamilton Cr.	within ESU
9	02062A	Tanner Cr.	6	Columbia Gorge Tributaries	Tanner Cr.	within ESU
10	02062B	Tanner Cr.	6	Columbia Gorge Tributaries	Tanner Cr.	within ESU
11	02194A	Moffett Cr.	5	Columbia Gorge Tributaries	Tanner Cr.	within ESU
12	02194B	Moffett Cr.	5	Columbia Gorge Tributaries	Tanner Cr.	within ESU
13	8195	Unknown	3	Columbia Slough/Willamette R.	Columbia Slough	within ESU
14	8197	Unknown	13	Columbia Slough/Willamette R.	Columbia Slough	within ESU
15	08588B	Unknown	16	Columbia Slough/Willamette R.	Columbia Slough	within ESU
16	09254D	Hwy 061 I-405	2	Columbia Slough/Willamette R.	Columbia Slough	within ESU
17	02163A	Unknown	11	Columbia Slough/Willamette R.	Willamette R./Columbia R.	within ESU
18	04516A	Unknown	1	Columbia Slough/Willamette R.	Willamette R./Columbia R.	within ESU

Table 5.2.11-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Coho LCR ESU
19	13514E	Hwy2 Con n2&3/Hwy64 Con 1&2	8	Columbia Slough/Willamette R.	Willamette R./Columbia R.	within ESU
20	7458	Uprr	6	Hood R.	Lower Hood R.	within ESU
21	8662	Uprr	10	Hood R.	Lower Hood R.	within ESU
22	08203B	Unknown	3	Johnson Cr.	Tyson Cr./Willamette R.	within ESU
23	08205R	Unknown	6	Johnson Cr.	Tyson Cr./Willamette R.	within ESU
24	7867	Uprr	5	Lower Clackamas R.	Clackamas R. / Rock Cr.	within ESU
25	01439A	Rock Cr.	3	Lower Clackamas R.	Clackamas R. / Rock Cr.	within ESU
26	6875	Sandy R.	10	Lower Sandy R.	Beaver Cr.	within ESU
27	6945	Conn 2 Jordan Rd.	1	Lower Sandy R.	Beaver Cr.	within ESU
28	06875A	Sandy R.	10	Lower Sandy R.	Beaver Cr.	within ESU
29	06945A	Conn 2 Jordan Rd.	1	Lower Sandy R.	Beaver Cr.	within ESU
30	2285	Canyon Rd.	4	Lower Tualatin R.	Fanno Cr.	within 2 Miles of ESU
31	8605	Hwy 100	4	Middle Columbia/Eagle Cr.	Carson Cr.	within ESU
32	8610	Moody St	5	Middle Columbia/Eagle Cr.	Carson Cr.	within ESU
33	8623	Conn Herman Cr.	3	Middle Columbia/Eagle Cr.	Carson Cr.	within ESU
34	08605W	Hwy 100	3	Middle Columbia/Eagle Cr.	Carson Cr.	within ESU

Table 5.2.11-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Coho LCR ESU
35	08610W	Moody St	5	Middle Columbia/Eagle Cr.	Carson Cr.	within ESU
36	07403A	Herman Cr.	3	Middle Columbia/Eagle Cr.	Herman Cr.	within ESU
37	8534	Conn Viento Int	3	Middle Columbia/Grays Cr.	Grays Cr.	within ESU
38	8604	Conn Wyeth Int	3	Middle Columbia/Grays Cr.	Grays Cr.	within ESU
39	07496A	Jaymar Rd	3	Middle Columbia/Grays Cr.	Grays Cr.	within ESU
40	7398	Conn 2	3	Middle Columbia/Grays Cr.	Rowena Cr.	within ESU
41	00665B	Alder Cr.	3	Middle Sandy R.	Lower Middle Sandy R.	within ESU
42	00689B	Wildcat Cr.	3	Middle Sandy R.	Upper Middle Sandy R.	within ESU
43	7393	Mosier Cr.	3	Mosier Cr.	Lower Mosier Cr.	within ESU
44	07626A	Unknown	4	Mosier Cr.	Lower Mosier Cr.	within ESU
45	7392	Rock Cr.	3	Mosier Cr.	Rock Cr.	within ESU
46	7397	Unknown	3	Mosier Cr.	Rock Cr.	within ESU
47	7333	Unknown	16	Salmon Cr.	Vancouver	within ESU
48	03026A	Zig Zag R.	3	Zigzag R.	Zigzag Canyon	within ESU

5.2.12 Columbia River Chum Salmon ESU

There are 42 bridges where repair and replacement activities may affect the Columbia River ESU for chum salmon (Figure 5.2.12-1; Table 5.2.12-1). All of these bridges are within the range of the ESU. Of the 42 bridges where repair and replacement activities may affect Columbia River chum salmon, six bridges occur in the Coast Range ecoregion, 15 occur in the Willamette Valley ecoregion, 13 occur in the West Cascades ecoregion, and eight occur in the East Cascades ecoregion.

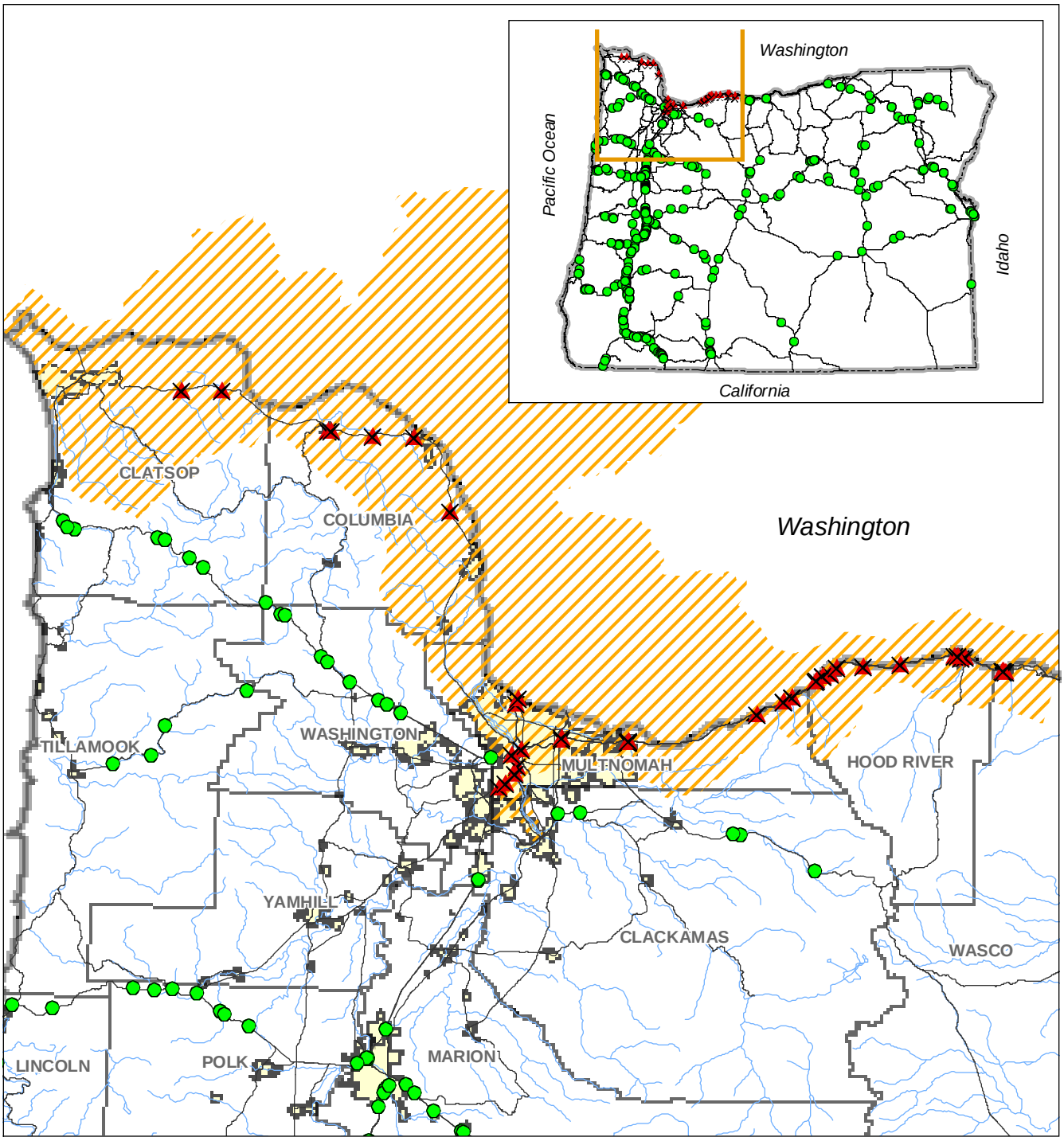
There are 11 5th Field HUCs affected by bridges within the ESU. Within this ESU, the greatest concentration of bridges occurs in the Columbia Slough/Willamette River watershed, which accounts for 31% of the gross API.

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, likely to adversely affect** for the Columbia River Chum Salmon ESU. Approximately 42 bridges in this ESU will require isolation of the in-water work area. The isolation of in-water work areas and the removal of trapped fish may require handling of juvenile Columbia River chum salmon; it is expected that handling of Columbia River chum salmon at each bridge site may be required during fish removal operations conducted prior to commencement of any work area dewatering activities. As previously discussed in Section 5.2.3, it is expected that lethal take may occur—of six percent or less of the chum salmon at each bridge—as a result of handling stress or injury, or from unforeseen takings resulting from bridge construction. Therefore, it is expected that approximately 885 juvenile Columbia River chum salmon will be handled for all proposed bridge repair and replacement work within this population and that a maximum lethal take of 53 juvenile Columbia River chum salmon will occur as a result of fish-handling activities.

The total amount of permanent streambank disturbance at the 42 bridges where the proposed action may affect the Columbia River chum salmon is approximately 1,680 feet, or 0.31 river mile. The total amount of temporary streambank disturbance that may affect Columbia River chum salmon is approximately 12,600 feet, or 2.4 river miles. The area of riparian disturbance that may affect this ESU is not expected to exceed 43.6 acres.

After reviewing the best available scientific and commercial information available regarding the current status of Columbia River chum salmon, the environmental baseline for the action area, the effects of the proposed action, the environmental performance standards proposed, and the cumulative effects, ODOT/FHWA makes a determination of **not likely to destroy or adversely modify** designated or previously designated critical habitat for the Columbia River Chum Salmon ESU. These conclusions are based on the following considerations: (1) the Bridge Program requires individual review of each project to ensure that the proposed action will be in compliance with the environmental performance standards identified herein, and that each applicable standard is included as an enforceable condition of the permit document and contract documents; (2) the cumulative effect of the conservation measures applied to each project will ensure that any short-term effects on water quality, habitat access, habitat elements, channel conditions and dynamics, flows, and watershed conditions are brief, minor, and scheduled to

occur at the times that are least sensitive for the species' life-cycle (i.e., designated in-water work periods); (3) the ecological design approach applied to each bridge to protect and stimulate natural habitat-forming processes is expected to result in many projects that will have long-term beneficial effects on aquatic habitat parameters (e.g., the removal of bridge piers from the active channel and reductions in riprap) ; and (4) the individual and combined effects of all actions permitted are not expected to impair currently properly functioning habitats, appreciably reduce the functioning of already impaired habitats, or retard the long-term progress of impaired habitats toward the properly functioning condition essential to survival and recovery at the population scale.



OTIA III Bridges

- Potential to Affect - Within ESU
- Potential to Affect - Within 2 Miles of ESU
- Potential to Affect - Within 2 Miles of Migration Corridor
- No Potential to Affect
- *Columbia River Chum ESU (selected for species)*
- City
- County
- Streams and Rivers
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

0 10
Miles

Figure 5.2.12-1

OTIA III: Statewide Bridge Delivery Program
Columbia River Chum Salmon

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
screening/BA Figures/chum.mxd. Mar 1, 2004

Table 5.2.12-1. Program Bridge projects that may affect Columbia River Chum Salmon.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC
1	9591	Hwy 2W	3	Beaver Cr./Columbia R.	Green Cr./ Columbia Side Ch.
2	7722	Lost Cr.	3	Beaver Cr./Columbia R.	Middle Beaver Cr.
3	00338A	Tide Cr.	4	Beaver Cr./Columbia R.	Tide Cr.
4	7417	Big Cr.	3	Big Cr.	Big Cr.
5	921	Gnat Cr.	4	Big Cr.	Gnat Cr.
6	7519	Clatskanie R.	3	Clatskanie R.	Lower Clatskanie R.
7	7715	Swedetown County Rd	4	Clatskanie R.	Lower Clatskanie R.
8	02176A	Hwy 100 & UPRR (Dodson)	10	Columbia Gorge Tributaries	Hamilton Cr.
9	02062A	Tanner Cr.	6	Columbia Gorge Tributaries	Tanner Cr.
10	02062B	Tanner Cr.	6	Columbia Gorge Tributaries	Tanner Cr.
11	02194A	Moffett Cr.	5	Columbia Gorge Tributaries	Tanner Cr.
12	02194B	Moffett Cr.	5	Columbia Gorge Tributaries	Tanner Cr.
13	8195	Unknown	3	Columbia Slough/Willamette R.	Columbia Slough
14	8197	Unknown	13	Columbia Slough/Willamette R.	Columbia Slough
15	08588B	Unknown	16	Columbia Slough/Willamette R.	Columbia Slough
16	09254D	SW Market St	2	Columbia Slough/Willamette R.	Columbia Slough
17	02163A	Unknown	11	Columbia Slough/Willamette R.	Willamette R./Columbia R.
18	04516A	Unknown	1	Columbia Slough/Willamette R.	Willamette R./Columbia R.
19	13514E	Hwy 2 & Hwy 64	8	Columbia Slough/Willamette R.	Willamette R./Columbia R.
20	7458	UPRR	6	Hood R.	Lower Hood R.
21	8662	UPRR	10	Hood R.	Lower Hood R.
22	08203B	Unknown	3	Johnson Cr.	Tyson Cr./Willamette

Table 5.2.12-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC
23	08205R	Unknown	6	Johnson Cr.	Tyson Cr./Willamette
24	6875	Sandy R.	10	Lower Sandy R.	Beaver Cr.
25	6945	Conn #2 (Jordan Rd)	1	Lower Sandy R.	Beaver Cr.
26	06875A	Sandy R.	10	Lower Sandy R.	Beaver Cr.
27	06945A	Conn #2 (Jordan Rd)	1	Lower Sandy R.	Beaver Cr.
28	8605	Hwy 2 WB Conn to Hwy 100	4	Middle Columbia/Eagle Cr.	Carson Cr.
29	8610	Moody St (Cascade Locks)	5	Middle Columbia/Eagle Cr.	Carson Cr.
30	8623	Herman Cr. Conn	3	Middle Columbia/Eagle Cr.	Carson Cr.
31	08605W	Hwy 2 WB Conn to Hwy 100	3	Middle Columbia/Eagle Cr.	Carson Cr.
32	08610W	Moody St (Cascade Locks)	5	Middle Columbia/Eagle Cr.	Carson Cr.
33	07403A	Herman Cr.	3	Middle Columbia/Eagle Cr.	Herman Cr.
34	8534	Conn Viento Intchg	3	Middle Columbia/Grays Cr.	Grays Cr.
35	8604	Conn (Wyeth Intchg)	3	Middle Columbia/Grays Cr.	Grays Cr.
36	07496A	Jaymar Rd (Westcliff Dr)	3	Middle Columbia/Grays Cr.	Grays Cr.
37	7398	Conn 2	3	Middle Columbia/Grays Cr.	Rowena Cr.
38	7393	Mosier Cr.	3	Mosier Cr.	Lower Mosier Cr.
39	07626A	Unknown	4	Mosier Cr.	Lower Mosier Cr.
40	7392	Rock Cr.	3	Mosier Cr.	Rock Cr.
41	7397	Unknown	3	Mosier Cr.	Rock Cr.
42	7333	Unknown	16	Salmon Cr.	Vancouver

Note: All bridges are located within this ESU.

5.2.13 Snake River Sockeye Salmon ESU

No OTIA III bridges are located within the Snake River ESU for sockeye salmon (Figure 5.2.13). Snake River sockeye salmon use Oregon waters (the Columbia River) primarily as a migration corridor to reach their natal waters in eastern Idaho. Therefore, sockeye salmon of the Snake River ESU may be present near OTIA III bridge work. There are 43 bridges located within 2 miles of the Columbia or Snake Rivers, and their replacement may affect Snake River sockeye salmon. Of these, six bridges occur in the Coast Range ecoregion, 10 occur in the Willamette Valley ecoregion, 13 occur in the West Cascades ecoregion, eight occur in the East Cascades ecoregion, and six occur in the Columbia Basin ecoregion (Table 5.2.13-1).

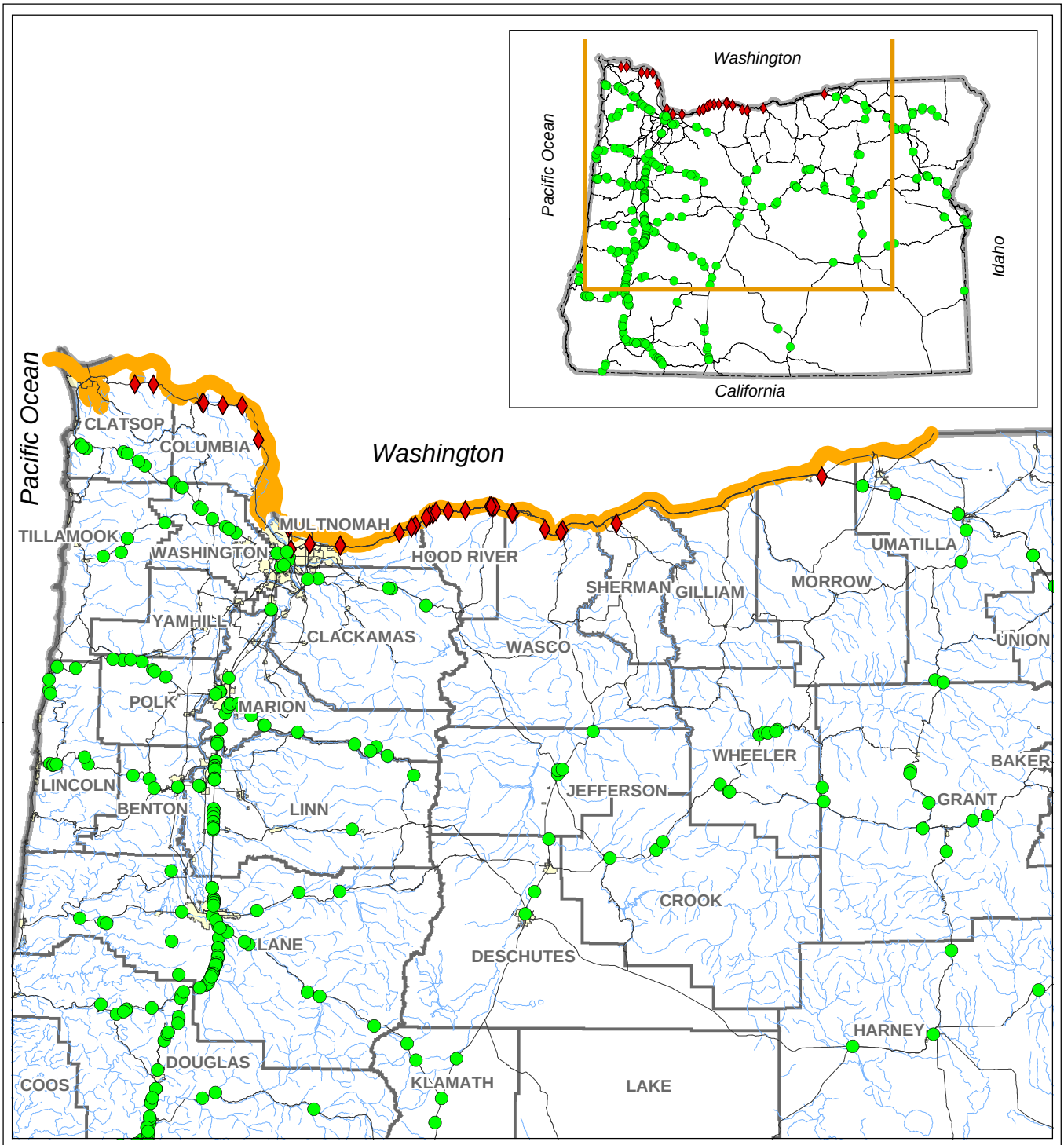
Bridges where repair and replacement activities may affect the Snake River Sockeye Salmon ESU occur in 14 5th Field HUCs. The greatest concentration of these bridges occurs in the Middle Columbia/Eagle Creek watershed, which accounts for 15% of the total API outside the ESU and along the migratory corridor.

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, not likely to adversely affect** for the Snake River Sockeye Salmon ESU. Juvenile Snake River sockeye salmon pass through the mainstem Columbia River quickly and tend to prefer the mid-channel (Floyd 2003). Additionally, because of the low numbers of this population and the relatively few Bridge Program projects expected to occur where this ESU may be affected, the likelihood of adverse effects is considered negligible.

The total amount of permanent streambank disturbance at the 43 bridges where the proposed action may affect the Snake River Sockeye Salmon ESU is approximately 1,720 feet, or 0.32 river mile. The total amount of temporary streambank disturbance that may affect the ESU is approximately 12,900 feet, or 2.4 river miles. The area of riparian disturbance that may affect this ESU is not expected to exceed 43.6 acres.

After reviewing the best available scientific and commercial information available regarding the current status of the Snake River Sockeye Salmon ESU, the environmental baseline for the action area, the effects of the proposed action, the environmental performance standards proposed, and the cumulative effects, ODOT/FHWA makes a determination of **not likely to destroy or adversely modify** designated or previously designated critical habitat. These conclusions are based on the following considerations: (1) no bridge work will occur within this ESU and potential impacts are limited to downstream habitat modifications, which may necessitate the handling of fish within 2 miles of the Columbia River: (2) the Bridge Program requires individual review of each project to ensure that the proposed action will be in compliance with the environmental performance standards identified herein, and that each applicable standard is included as an enforceable condition of the permit and contract documents; (3) the cumulative effect of the conservation measures applied to each project will ensure that any short-term effects on water quality, habitat access, habitat elements, channel conditions and dynamics, flows, and watershed conditions are brief, minor, and scheduled to occur at the times that are least sensitive for the species' life-cycle (i.e., designated in-water work periods); (4) the ecological design approach that will be applied to each program bridge to

protect and stimulate natural habitat-forming processes is expected to result in authorization of many projects that will have long-term beneficial effects on aquatic habitat parameters (e.g., the removal of bridge piers from the active channel reductions in riprap, etc.); and (5) the individual and combined effects of all actions permitted are not expected to impair currently properly functioning habitats, appreciably reduce the functioning of already impaired habitats, or retard the long-term progress of impaired habitats toward the properly functioning condition essential to survival and recovery at the population or ESU scale.



OTIA III Bridges

- Potential to Affect - Within ESU
- Potential to Affect - Within 2 Miles of ESU
- Potential to Affect - Within 2 Miles of Migration Corridor (outside of ESU)
- No Potential to Affect
- *Sockeye ESU (Selected for Species)*
- Migratory Corridor
- City
- County
- Streams and Rivers
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.2.13-1

OTIA III: Statewide Bridge Delivery Program
Snake River Sockeye

N W E S

0 5 10 20 30 40
Miles

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
screening/BA Figures/sockeye.mxd. Mar 1, 2004

Table 5.2.13-1. Program Bridge projects that may affect Snake River Sockeye Salmon.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC
1	9591	Hwy 2W	3	Beaver Cr./Columbia R.	Green Cr./ Columbia Side Ch.
2	7722	Lost Cr.	3	Beaver Cr./Columbia R.	Middle Beaver Cr.
3	00338A	Tide Cr.	4	Beaver Cr./Columbia R.	Tide Cr.
4	7417	Big Cr.	3	Big Cr.	Big Cr.
5	921	Gnat Cr.	4	Big Cr.	Gnat Cr.
6	7519	Clatskanie R.	3	Clatskanie R.	Lower Clatskanie R.
7	7715	Swedetown County Rd	4	Clatskanie R.	Lower Clatskanie R.
8	02176A	Hwy 100 & UPRR (Dodson)	10	Columbia Gorge Tributaries	Hamilton Cr.
9	02062A	Tanner Cr.	6	Columbia Gorge Tributaries	Tanner Cr.
10	02062B	Tanner Cr.	6	Columbia Gorge Tributaries	Tanner Cr.
11	02194A	Moffett Cr.	5	Columbia Gorge Tributaries	Tanner Cr.
12	02194B	Moffett Cr.	5	Columbia Gorge Tributaries	Tanner Cr.
13	08588B	Unknown	16	Columbia Slough/Willamette R.	Columbia Slough
14	02163A	Unknown	11	Columbia Slough/Willamette R.	Willamette R./Columbia R.
15	04516A	Unknown	1	Columbia Slough/Willamette R.	Willamette R./Columbia R.
16	13514E	Hwy 2 Conns #2 &#3 & Hwy 64 Conns #1 & #2	8	Columbia Slough/Willamette R.	Willamette R./Columbia R.
17	00308A	Fifteen Mile Cr.	5	Fifteenmile Cr.	Lower Fifteenmile Cr.
18	7458	UPRR	6	Hood R.	Lower Hood R.
19	8662	UPRR	10	Hood R.	Lower Hood R.
20	6875	Sandy R.	10	Lower Sandy R.	Beaver Cr.
21	6945	Conn #2 (Jordan Rd)	1	Lower Sandy R.	Beaver Cr.
22	06875A	Sandy R.	10	Lower Sandy R.	Beaver Cr.

Table 5.2.13-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC
23	06945A	Conn #2 (Jordan Rd)	1	Lower Sandy R.	Beaver Cr.
24	8605	Hwy 2 WB Conn to Hwy 100	4	Middle Columbia/Eagle Cr.	Carson Cr.
25	8610	Moody St (Cascade Locks)	5	Middle Columbia/Eagle Cr.	Carson Cr.
26	8623	Herman Cr. Conn	3	Middle Columbia/Eagle Cr.	Carson Cr.
27	08605W	Hwy 2 WB Conn to Hwy 100	3	Middle Columbia/Eagle Cr.	Carson Cr.
28	08610W	Moody St (Cascade Locks)	5	Middle Columbia/Eagle Cr.	Carson Cr.
29	07403A	Herman Cr.	3	Middle Columbia/Eagle Cr.	Herman Cr.
30	8534	Conn Viento Intchg	3	Middle Columbia/Grays Cr.	Grays Cr.
31	8604	Conn (Wyeth Intchg)	3	Middle Columbia/Grays Cr.	Grays Cr.
32	07496A	Jaymar Rd (Westcliff Dr)	3	Middle Columbia/Grays Cr.	Grays Cr.
33	7398	Conn 2	3	Middle Columbia/Grays Cr.	Rowena Cr.
34	8276	Hostetler Way Conn	3	Middle Columbia/Mill Cr.	Columbia R./Murdock
35	7771	The Dalles Dam Access Conn	1	Middle Columbia/Mill Cr.	Middle Columbia/Threemile Cr.
36	7393	Mosier Cr.	3	Mosier Cr.	Lower Mosier Cr.
37	07626A	Unknown	4	Mosier Cr.	Lower Mosier Cr.
38	7392	Rock Cr.	3	Mosier Cr.	Rock Cr.
39	7397	Unknown	3	Mosier Cr.	Rock Cr.
40	7333	Unknown	16	Salmon Cr.	Vancouver
41	08931E	Irrigon Junction Intchg Conn	5	Upper Lake Umatilla	Lower Paterson Slough
42	8893	Spanish Hollow Cr.	3	Upper Middle Columbia/Hood	Spanish Hollow Cr.
43	8894	Spanish Hollow Cr.	3	Upper Middle Columbia/Hood	Spanish Hollow Cr.

Note: All bridges are located within 2 miles of a migratory corridor for this ESU.

5.2.14 Lower Columbia River Steelhead Trout ESU

There are 44 bridges where repair and replacement activities may affect the Oregon portion of the Lower Columbia River (LCR) ESU for steelhead trout: 36 are within the range of the ESU, three are within 2 miles of the ESU boundary (and drain to the ESU), and five are within 2 miles of the ESU's migratory corridor (Figure 5.2.14-1; Table 5.2.14-1). Of the 44 bridges where repair and replacement activities may affect LCR steelhead trout, five bridges occur in the Coast Range ecoregion, 18 occur in the Willamette Valley ecoregion, 16 occur in the West Cascades ecoregion, and four occur in the East Cascades ecoregion.

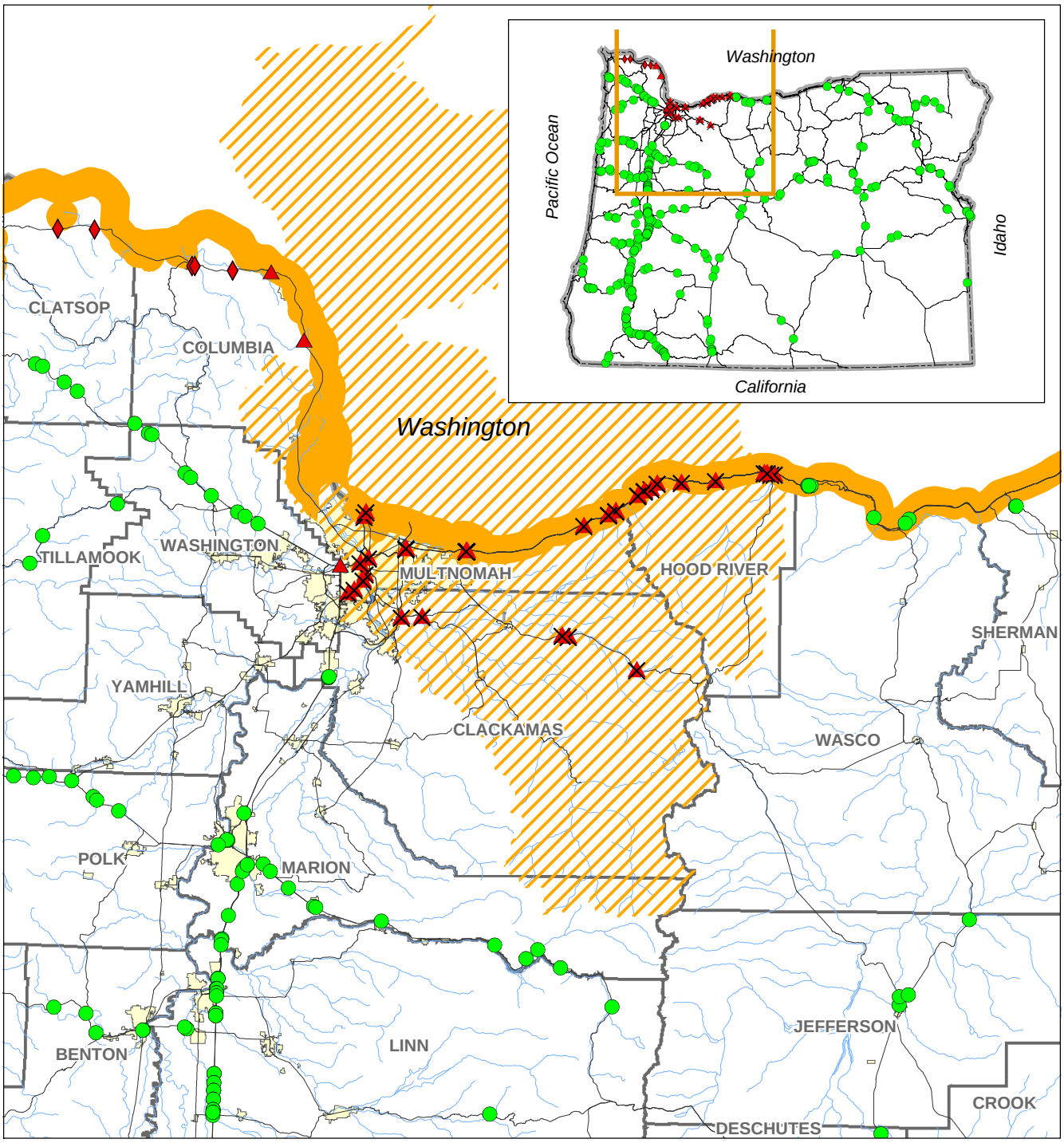
There are 12 5th Field HUCs affected by bridges within the ESU. Within this ESU, the greatest concentration of bridges occurs in the Columbia Slough/Willamette River watershed, which accounts for 35% of the gross API.

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, likely to adversely affect** for the LCR Steelhead Trout ESU. Approximately 39 bridges in this ESU will require isolation of the in-water work area. The isolation of in-water work areas and the removal of trapped fish may require handling of juvenile steelhead trout; it is expected that handling of LCR steelhead trout at each bridge site may be required during fish removal operations conducted prior to commencement of any work area dewatering activities. As previously discussed in Section 5.2.3, it is expected that lethal take may occur—of six percent or less of LCR steelhead trout at each bridge—as a result of handling stress or injury, or from unforeseen takings resulting from bridge construction. Therefore, it is expected that approximately 735 juvenile LCR steelhead trout will be handled for all proposed bridge repair and replacement work within this ESU and that a maximum lethal taking of 44 juvenile LCR steelhead trout will occur as a result of fish handling activities.

The total amount of permanent streambank disturbance at the 44 bridges where the proposed action may affect the ESU is approximately 1,760 feet, or 0.3 river mile. The total amount of temporary streambank disturbance that may affect the ESU is approximately 13,200 feet, or 2.5 river miles. The area of riparian disturbance that may affect this ESU is not expected to exceed 45.5 acres.

After reviewing the best available scientific and commercial information regarding the current status of the LCR Steelhead Trout ESU, the environmental baseline for the action area, the effects of the proposed action, the environmental performance standards proposed, and the cumulative effects, ODOT/FHWA makes a determination of **not likely to destroy or adversely modify** designated or previously designated critical habitat. These conclusions are based on the following considerations: (1) the Bridge Program requires individual review of each project to ensure that the proposed action will be in compliance with the environmental performance standards identified herein, and that each applicable standard is included as an enforceable condition of the permit and contract documents; (2) the cumulative effect of the conservation measures applied to each project will ensure that any short-term effects on water quality, habitat access, habitat elements, channel conditions and dynamics, flows, and watershed conditions are brief, minor, and scheduled to occur at the times that are least sensitive for the species' life-cycle

(i.e., designated in-water work periods); (3) the ecological design approach that will be applied to each program bridge to protect and stimulate natural habitat-forming processes is expected to result in authorization of many projects that will have long-term beneficial effects on aquatic habitat parameters (e.g., the removal of bridge piers from the active channel, reductions in riprap etc.); and (4) the individual and combined effects of all actions permitted are not expected to impair currently properly functioning habitats, appreciably reduce the functioning of already impaired habitats, or retard the long-term progress of impaired habitats toward the properly functioning condition essential to survival and recovery at the population or ESU scale.



OTIA III Bridges

- Potential to Affect - Within ESU
- Potential to Affect - Within 2 Miles of ESU
- Potential to Affect - Within 2 Miles of Migration Corridor
- No Potential to Affect
- *Steelhead ESU (Selected for Species)*
- Steelhead Migratory Corridor
- City
- County
- Streams and Rivers
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.2.14-1

OTIA III: Statewide Bridge Delivery Program
Lower Columbia River Steelhead

N W E S

0 5 10 20 30 40
Miles

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
screening/BA Figures/steelhead_lcr.mxd. Mar 1, 2004

Table 5.2.14-1. Program Bridge projects that may affect Lower Columbia River Steelhead Trout.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
1	9591	Hwy 2W	3	Beaver Cr./Columbia R.	Green Cr./ Columbia Side Ch.	within 2 miles of ESU
2	7722	Lost Cr.	3	Beaver Cr./Columbia R.	Middle Beaver Cr.	within 2 miles of Migr. Corr.
3	00338A	Tide Cr.	4	Beaver Cr./Columbia R.	Tide Cr.	within 2 miles of ESU
4	7417	Big Cr.	3	Big Cr.	Big Cr.	within 2 miles of Migr. Corr.
5	921	Gnat Cr.	4	Big Cr.	Gnat Cr.	within 2 miles of Migr. Corr.
6	7519	Clatskanie R.	3	Clatskanie R.	Lower Clatskanie R.	within 2 miles of Migr. Corr.
7	7715	Swedetown County Rd	4	Clatskanie R.	Lower Clatskanie R.	within 2 miles of Migr. Corr.
8	02176A	Hwy 100 & UPRR (Dodson)	10	Columbia Gorge Tributaries	Hamilton Cr.	within ESU
9	02062A	Tanner Cr.	6	Columbia Gorge Tributaries	Tanner Cr.	within ESU
10	02062B	Tanner Cr.	6	Columbia Gorge Tributaries	Tanner Cr.	within ESU
11	02194A	Moffett Cr.	5	Columbia Gorge Tributaries	Tanner Cr.	within ESU
12	02194B	Moffett Cr.	5	Columbia Gorge Tributaries	Tanner Cr.	within ESU
13	8195	Unknown	3	Columbia Slough/Willamette R.	Columbia Slough	within ESU
14	8197	Unknown	13	Columbia Slough/Willamette R.	Columbia Slough	within ESU
15	08588B	Unknown	16	Columbia Slough/Willamette R.	Columbia Slough	within ESU
16	09254D	Hwy 61	2	Columbia Slough/Willamette R.	Columbia Slough	within ESU

Table 5.2.14-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
17	02163A	Unknown	11	Columbia Slough/Willamette R.	Willamette R./Columbia R.	within ESU
18	04516A	Unknown	1	Columbia Slough/Willamette R.	Willamette R./Columbia R.	within ESU
19	13514E	Hwy 2 Conns #2 &#3 & Hwy 64 Conns #1 & #2	8	Columbia Slough/Willamette R.	Willamette R./Columbia R.	within ESU
20	7458	UPRR	6	Hood R.	Lower Hood R.	within ESU
21	8662	UPRR	10	Hood R.	Lower Hood R.	within ESU
22	08203B	Unknown	3	Johnson Cr.	Tyson Cr./Willamette R.	within ESU
23	08205R	Unknown	6	Johnson Cr.	Tyson Cr./Willamette R.	within ESU
24	7867	UPRR Mainline	5	Lower Clackamas R.	Clackamas R. / Rock Cr.	within ESU
25	01439A	Rock Cr.	3	Lower Clackamas R.	Clackamas R. / Rock Cr.	within ESU
26	6875	Sandy R.	10	Lower Sandy R.	Beaver Cr.	within ESU
27	6945	Conn #2 (Jordan Rd)	1	Lower Sandy R.	Beaver Cr.	within ESU
28	06875A	Sandy R.	10	Lower Sandy R.	Beaver Cr.	within ESU
29	06945A	Conn #2 (Jordan Rd)	1	Lower Sandy R.	Beaver Cr.	within ESU
30	2285	SW Canyon Rd (Sylvan)	4	Lower Tualatin R.	Fanno Cr.	within 2 miles of ESU
31	8605	Hwy 2 WB Conn to Hwy 100	4	Middle Columbia/Eagle Cr.	Carson Cr.	within ESU

Table 5.2.14-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
32	8610	Moody St (Cascade Locks)	5	Middle Columbia/Eagle Cr.	Carson Cr.	within ESU
33	8623	Herman Cr. Conn	3	Middle Columbia/Eagle Cr.	Carson Cr.	within ESU
34	08605W	Hwy 2 WB Conn to Hwy 100	3	Middle Columbia/Eagle Cr.	Carson Cr.	within ESU
35	08610W	Moody St (Cascade Locks)	5	Middle Columbia/Eagle Cr.	Carson Cr.	within ESU
36	07403A	Herman Cr.	3	Middle Columbia/Eagle Cr.	Herman Cr.	within ESU
37	8534	Conn Viento Intchg	3	Middle Columbia/Grays Cr.	Grays Cr.	within ESU
38	8604	Conn (Wyeth Intchg)	3	Middle Columbia/Grays Cr.	Grays Cr.	within ESU
39	07496A	Jaymar Rd (Westcliff Dr)	3	Middle Columbia/Grays Cr.	Grays Cr.	within ESU
40	7398	Conn 2	3	Middle Columbia/Grays Cr.	Rowena Cr.	within ESU
41	00665B	Alder Cr.	3	Middle Sandy R.	Lower Middle Sandy R.	within ESU
42	00689B	Wildcat Cr.	3	Middle Sandy R.	Upper Middle Sandy R.	within ESU
43	7333	Unknown	16	Salmon Cr.	Vancouver	within ESU
44	03026A	Zig Zag R.	3	Zigzag R.	Zigzag Canyon	within ESU

5.2.15 Middle Columbia River Steelhead ESU

There are 74 bridges where repair and replacement activities may affect the Oregon portion of the Middle Columbia River (MCR) ESU for steelhead trout: 41 are within the ESU and four are within 2 miles of the ESU boundary (and drain to the ESU) (Figure 5.2.15-1; Table 5.2.15-1). MCR steelhead trout use the lower and middle Columbia River as a migratory corridor to reach their natal waters in northeast Oregon and Washington. Therefore, steelhead trout of the MCR steelhead trout ESU may be present near OTIA III bridge work in downstream portions of the Columbia River. Migrating MCR steelhead trout could be affected by the repair or replacement of 29 bridges occurring within 2 miles of the Columbia River. Of the bridges where the proposed action may affect MCR steelhead trout, six bridges occur in the Coast Range ecoregion, 10 occur in the Willamette Valley ecoregion, 13 occur in the West Cascades ecoregion, eight occur in the East Cascades ecoregion, 12 occur in the Columbia Basin ecoregion, eight occur in the Blue Mountains ecoregion, and 17 occur in the Lava Plains ecoregion.

There are 27 5th Field HUCs affected by bridges within the Oregon portion of the MCR ESU. Within this ESU, the greatest concentration of bridges occurs in the Mosier Creek watershed, which accounts for 10% of the gross API.

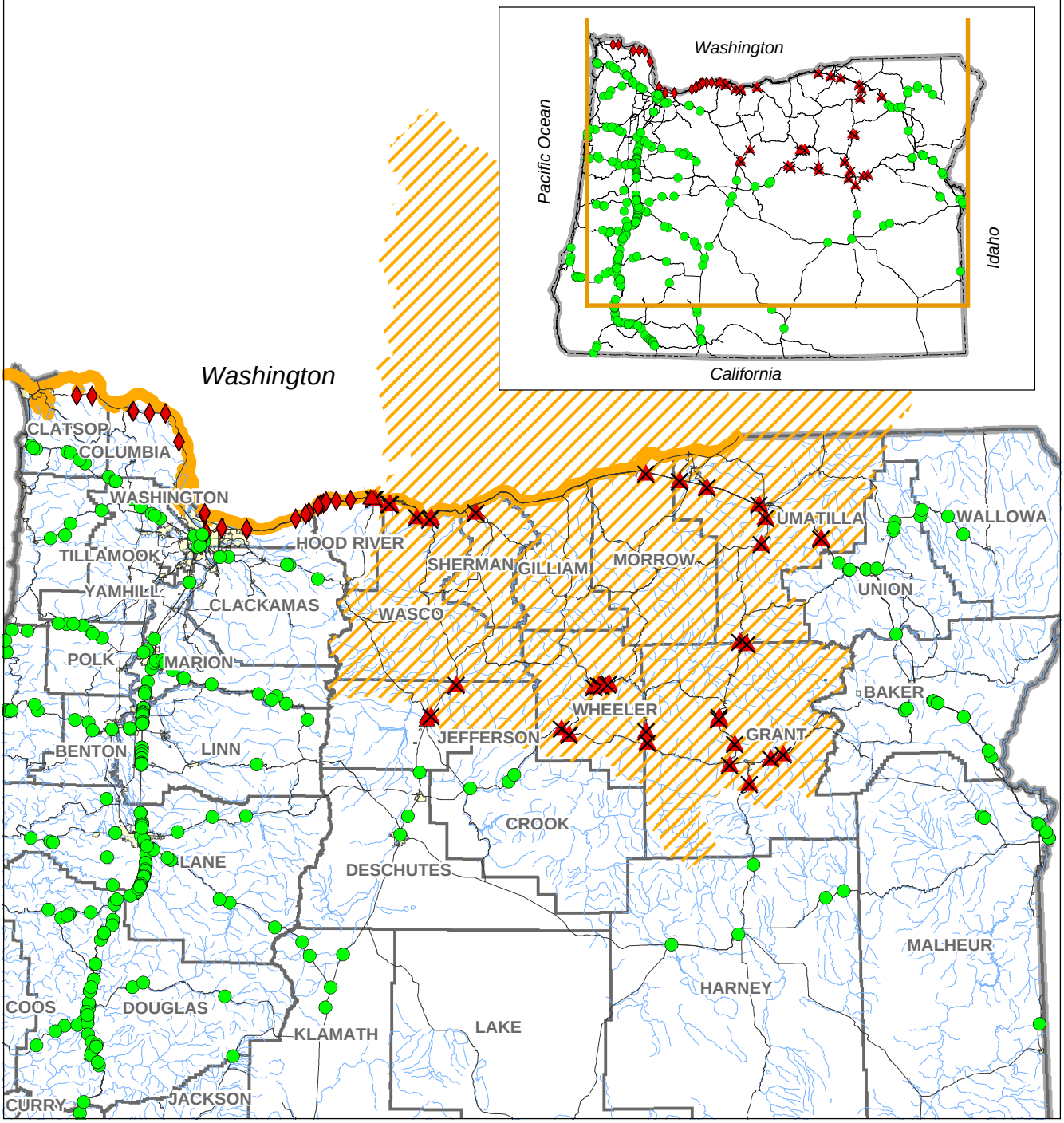
Of the bridges located along the Columbia River migration corridor of the MCR Steelhead Trout ESU, the greatest concentration of bridges occurs in the Beaver Creek/Columbia River watershed, which accounts for five percent of the total API outside the ESU and along the migratory corridor.

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect likely to adversely affect** for the MCR Steelhead Trout ESU. Approximately 41 bridges are within this ESU will require isolation of the in-water work area. The isolation of in-water work areas may cause local and temporary reductions in water quality and may necessitate the handling of MCR steelhead trout. It is expected that lethal take may occur—of six percent or less of the MCR steelhead trout captured and handled at each bridge—as a result of handling stress or injury, or from unforeseen takings resulting from bridge construction. Therefore, it is expected that up to 3,483 juvenile MCR steelhead trout will be handled for all bridge replacement and repair work along the migration corridor of this ESU and within the ESU, and that a maximum lethal taking of 209 juvenile MCR steelhead trout may occur as a result of bridge work within the ESU.

The total amount of permanent streambank disturbance at the 74 bridges where the proposed action may affect the ESU is approximately 2,960 feet, or 0.56 river mile. The total amount of temporary streambank disturbance that may affect the ESU is approximately 22,200 feet, or 4.2 river miles. The area of riparian disturbance that may affect this ESU is not expected to exceed 76.3 acres.

After reviewing the best available scientific and commercial information available regarding the current status of the MCR Steelhead Trout ESU, the environmental baseline for the action area, the effects of the proposed action, the environmental performance standards proposed, and the

cumulative effects, ODOT/FHWA makes a determination of **not likely to destroy or adversely modify** designated or previously designated critical habitat. These conclusions are based on the following considerations: (1) the Bridge Program requires individual review of each project to ensure that the proposed action will be in compliance with the environmental performance standards identified herein, and that each applicable standard is included as an enforceable condition of the permit and contract documents; (2) the cumulative effect of the conservation measures applied to each project will ensure that any short-term effects on water quality, habitat access, habitat elements, channel conditions and dynamics, flows, and watershed conditions are brief, minor, and scheduled to occur at the times that are least sensitive for the species' life-cycle (i.e., designated in-water work periods); (3) the ecological design approach that will be applied to each program bridge to protect and stimulate natural habitat-forming processes is expected to result in many projects that will have long-term beneficial effects on aquatic habitat parameters (e.g., the removal of bridge piers from the active channel and reductions in riprap); and (4) the individual and combined effects of all actions permitted are not expected to impair currently properly functioning habitats, appreciably reduce the functioning of already impaired habitats, or retard the long-term progress of impaired habitats toward the properly functioning condition essential to survival and recovery at the population or ESU scale.



OTIA III Bridges

- Potential to Affect - Within ESU
- Potential to Affect - Within 2 Miles of ESU
- Potential to Affect - Within 2 Miles of Migration Corridor (outside of ESU)
- No Potential to Affect
- *Steelhead ESU (Selected for Species)*
- Migratory Corridor
- City
- County
- Streams and Rivers
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

N W E S

0 5 10 20 30 40

Miles

Figure 5.2.15-1

OTIA III: Statewide Bridge Delivery Program
Middle Columbia River Steelhead

MB&G

Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
screening/BA Figures/steelhead_mcr.mxd. Mar 1, 2004

Table 5.2.15-1. Program Bridge projects that may affect Middle Columbia River Steelhead Trout.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
1	9591	Hwy 2W	3	Beaver Cr./Columbia R.	Green Cr./ Columbia Side Ch.	within 2 miles of Migr. Corr.
2	7722	Lost Cr.	3	Beaver Cr./Columbia R.	Middle Beaver Cr.	within 2 miles of Migr. Corr.
3	00338A	Tide Cr.	4	Beaver Cr./Columbia R.	Tide Cr.	within 2 miles of Migr. Corr.
4	03553A	Beech Cr.	3	Beech Cr.	Clear Cr.	within ESU
5	7417	Big Cr.	3	Big Cr.	Big Cr.	within 2 miles of Migr. Corr.
6	921	Gnat Cr.	4	Big Cr.	Gnat Cr.	within 2 miles of Migr. Corr.
7	2561	E. Fk. Birch Cr. (Pilot Rock)	3	Birch Cr.	Lower E. Birch Cr.	within ESU
8	7372	Bridge Cr.	3	Bridge Cr.	Upper Bridge Cr.	within ESU
9	7490	Bridge Cr.	3	Bridge Cr.	Upper Bridge Cr.	within ESU
10	7491	Bridge Cr.	3	Bridge Cr.	Upper Bridge Cr.	within ESU
11	03558A	Canyon Cr.	3	Canyon Cr.	Lower Canyon Cr.	within ESU
12	7519	Clatskanie R.	3	Clatskanie R.	Lower Clatskanie R.	within 2 miles of Migr. Corr.
13	7715	Swedetown County Rd	4	Clatskanie R.	Lower Clatskanie R.	within 2 miles of Migr. Corr.
14	02176A	Hwy 100 & UPRR (Dodson)	10	Columbia Gorge Tributaries	Hamilton Cr.	within 2 miles of Migr. Corr.
15	02062A	Tanner Cr.	6	Columbia Gorge Tributaries	Tanner Cr.	within 2 miles of Migr. Corr.
16	02062B	Tanner Cr.	6	Columbia Gorge Tributaries	Tanner Cr.	within 2 miles of Migr. Corr.
17	02194A	Moffett Cr.	5	Columbia Gorge Tributaries	Tanner Cr.	within 2 miles of Migr. Corr.

Table 5.2.15-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
18	02194B	Moffett Cr.	5	Columbia Gorge Tributaries	Tanner Cr.	within 2 miles of Migr. Corr.
19	08588B	Unknown	16	Columbia Slough/Willamette R.	Columbia Slough	within 2 miles of Migr. Corr.
20	02163A	Unknown	11	Columbia Slough/Willamette R.	Willamette R./Columbia R.	within 2 miles of Migr. Corr.
21	04516A	Unknown	1	Columbia Slough/Willamette R.	Willamette R./Columbia R.	within 2 miles of Migr. Corr.
22	13514E	Hwy 2 Conns #2 &#3 & Hwy 64 Conns #1 & #2	8	Columbia Slough/Willamette R.	Willamette R./Columbia R.	within 2 miles of Migr. Corr.
23	6204	Smith Cr.	1	Cottonwood Cr.	Upper Fox Cr.	within ESU
24	6205	Fox Cr.	1	Cottonwood Cr.	Upper Fox Cr.	within ESU
25	00308A	Fifteen Miles Cr.	5	Fifteenmiles Cr.	Lower Fifteenmiles Cr.	within ESU
26	7458	UPRR	6	Hood R.	Lower Hood R.	within ESU
27	8662	UPRR	10	Hood R.	Lower Hood R.	within 2 miles of ESU
28	2655	John Day R. (Goose Rock)	6	John Day R./Johnson Cr.	Johnny Cr.	within ESU
29	7696	John Day R. (Coles)	3	Laycock Cr.	Lower Beech Cr.	within ESU
30	4728	Camas Cr.	4	Lower Camas Cr.	Bridge	within ESU
31	02233A	Harper Cr.	3	Lower John Day R./Kahler Cr.	Harper Cr.	within ESU
32	04979A	Juniper Cr.	4	Lower John Day R./Kahler Cr.	Harper Cr.	within ESU
33	04981A	Mathas Cr.	3	Lower John Day R./Kahler Cr.	Harper Cr.	within ESU

Table 5.2.15-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
34	2235	Mule Shoe Cr.	3	Lower John Day R./Service Cr.	Service Cr.	within ESU
35	02236A	Alder Cr.	5	Lower John Day R./Service Cr.	Service Cr.	within ESU
36	6875	Sandy R.	10	Lower Sandy R.	Beaver Cr.	within 2 miles of Migr. Corr.
37	6945	Conn #2 (Jordan Rd)	1	Lower Sandy R.	Beaver Cr.	within 2 miles of Migr. Corr.
38	06875A	Sandy R.	10	Lower Sandy R.	Beaver Cr.	within 2 miles of Migr. Corr.
39	06945A	Conn #2 (Jordan Rd)	1	Lower Sandy R.	Beaver Cr.	within 2 miles of Migr. Corr.
40	00815A	Trout Cr.	5	Lower Trout Cr.	Trout Cr.	within ESU
41	16453	Hwy 70 EB	3	Lower Umatilla R.	Lower Umatilla R./Columbia R.	within ESU
42	16454	Hwy 70 EB	3	Lower Umatilla R.	Lower Umatilla R./Columbia R.	within ESU
43	8050	McKay Cr.	3	Mckay Cr.	Mckay Cr./Umatilla R.	within ESU
44	08498E	Frtg Rd & UPRR (Meacham)	6	Meacham Cr.	Beaver Cr.	within ESU
45	08498W	Frtg Rd & UPRR (Meacham)	6	Meacham Cr.	Beaver Cr.	within ESU
46	8605	Hwy 2 WB Conn to Hwy 100	4	Middle Columbia/Eagle Cr.	Carson Cr.	within 2 miles of Migr. Corr.
47	8610	Moody St (Cascade Locks)	5	Middle Columbia/Eagle Cr.	Carson Cr.	within 2 miles of Migr. Corr.
48	8623	Herman Cr. Conn	3	Middle Columbia/Eagle Cr.	Carson Cr.	within 2 miles of Migr. Corr.
49	08605W	Hwy 2 WB Conn to Hwy 100	3	Middle Columbia/Eagle Cr.	Carson Cr.	within 2 miles of Migr. Corr.
50	08610W	Moody St (Cascade Locks)	5	Middle Columbia/Eagle Cr.	Carson Cr.	within 2 miles of Migr. Corr.

Table 5.2.15-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
51	07403A	Herman Cr.	3	Middle Columbia/Eagle Cr.	Herman Cr.	within 2 miles of Migr. Corr.
52	8534	Conn Viento Intchg	3	Middle Columbia/Grays Cr.	Grays Cr.	within 2 miles of Migr. Corr.
53	8604	Conn (Wyeth Intchg)	3	Middle Columbia/Grays Cr.	Grays Cr.	within 2 miles of Migr. Corr.
54	07496A	Jaymar Rd (Westcliff Dr)	3	Middle Columbia/Grays Cr.	Grays Cr.	within 2 miles of ESU
55	7398	Conn 2	3	Middle Columbia/Grays Cr.	Rowena Cr.	within ESU
56	8276	Hostetler Way Conn	3	Middle Columbia/Mill Cr.	Columbia R./Murdock	within ESU
57	7771	The Dalles Dam Access Conn	1	Middle Columbia/Mill Cr.	Middle Columbia/Threemiles Cr.	within ESU
58	7393	Mosier Cr.	3	Mosier Cr.	Lower Mosier Cr.	within ESU
59	07626A	Unknown	4	Mosier Cr.	Lower Mosier Cr.	within ESU
60	7392	Rock Cr.	3	Mosier Cr.	Rock Cr.	within ESU
61	7397	Unknown	3	Mosier Cr.	Rock Cr.	within ESU
62	4729	N. Fk. John Day R. (Dale)	5	N. Fk. John Day R./Potamus Cr.	Deerhorn	within ESU
63	02734A	Rock Cr. (Picture Gorge)	3	Rock Cr.	Lower Rock Cr.	within ESU
64	7333	Unknown	16	Salmon Cr.	Vancouver	within 2 miles of Migr. Corr.
65	2463	Indian Cr.	3	Strawberry Cr.	Castle Cr.	within ESU
66	2466	Dixie Cr. (Prairie City)	3	Strawberry Cr.	Dixie Meadows	within ESU

Table 5.2.15-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
67	9314	Hwy 6 (Stanfield Jct Intchg)	4	Umatilla R./Alkali Canyon	Furnish Ditch/Umatilla R.	within ESU
68	9636	Unknown	4	Umatilla R./Mission Cr.	Mission Cr.	within ESU
69	08931E	Irrigon Junction Intchg Conn	5	Upper Lake Umatilla	Lower Paterson Slough	within ESU
70	8893	Spanish Hollow Cr.	3	Upper Middle Columbia/Hood	Spanish Hollow Cr.	within ESU
71	8894	Spanish Hollow Cr.	3	Upper Middle Columbia/Hood	Spanish Hollow Cr.	within ESU
72	2269	BNSF	3	Willow Cr.	Lower Willow Cr.	within 2 miles of ESU
73	8600	Irrigation Canal	3	Willow Cr.	Lower Willow Cr.	within ESU
74	00971A	Willow Cr.	1	Willow Cr.	Lower Willow Cr.	within 2 miles of ESU

5.2.16 Upper Columbia River Steelhead ESU

No OTIA III bridges are located within the Upper Columbia River (UCR) ESU for steelhead trout (Figure 5.2.16-1). UCR steelhead trout use Oregon waters (the Columbia River) primarily as a migration corridor to reach their natal waters in eastern Washington. Therefore, steelhead trout of the UCR ESU could occur within the proximity of OTIA III bridge work. There are 43 bridges located within 2 miles of the Columbia River and their replacement could affect UCR steelhead trout. Of these, six bridges occur in the Coast Range ecoregion, 10 occur in the Willamette Valley ecoregion, 13 occur in the West Cascades ecoregion, eight occur in the East Cascades ecoregion, and six occur in the Columbia Basin ecoregion (Table 5.2.16-1).

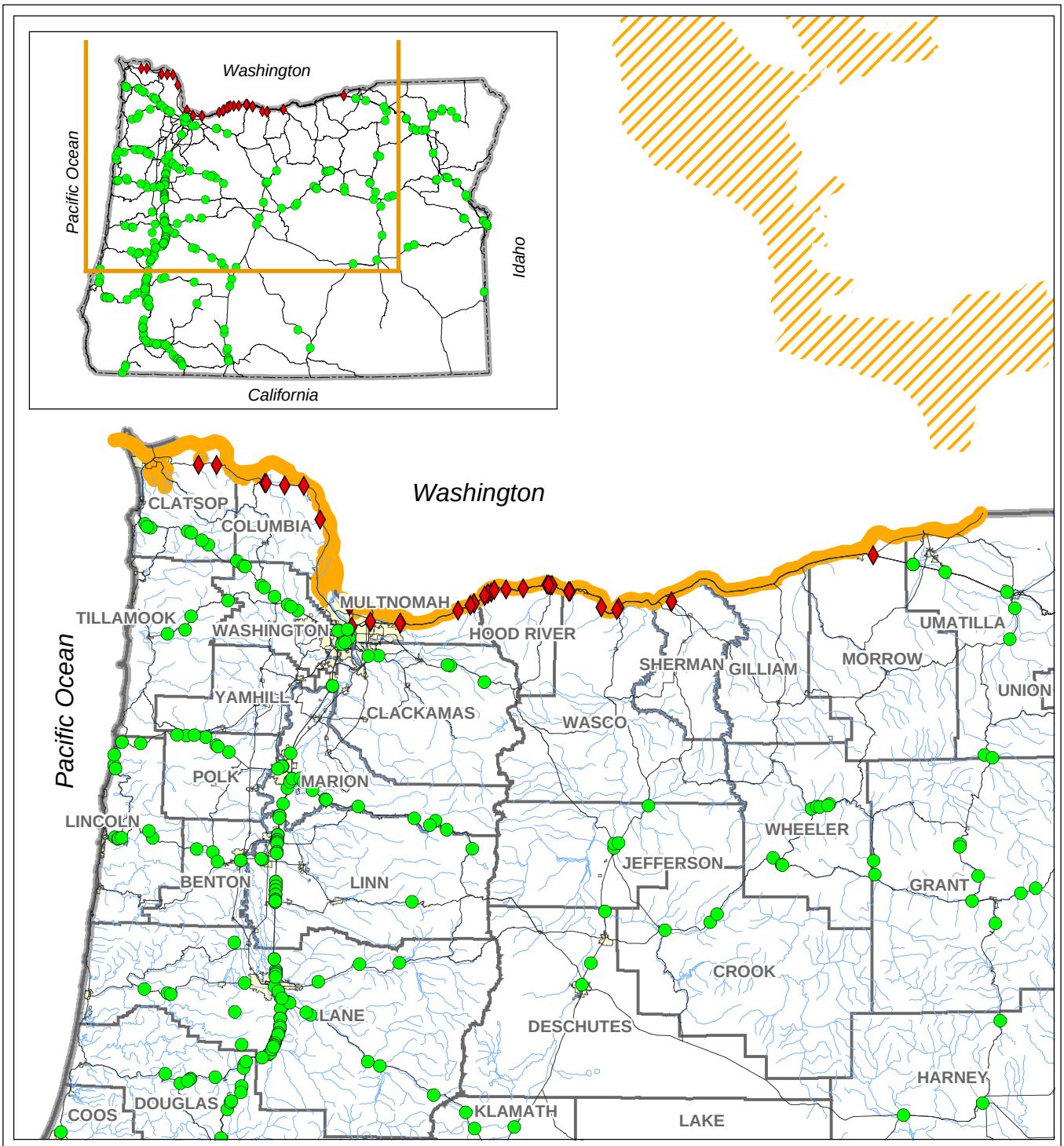
Bridges where repair and replacement activities may affect the UCR Steelhead Trout ESU occur in 14 5th Field HUCs. The greatest concentration of these bridges occurs in the Middle Columbia/Eagle Creek watershed, which accounts for 15% of the gross API.

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, not likely to adversely affect** for the UCR Steelhead Trout ESU. Juvenile UCR steelhead trout pass through the mainstem Columbia River quickly and tend to prefer the mid-channel (Floyd 2003). Additionally, because of the low numbers of this population and the relatively few Bridge Program projects expected to occur where this ESU may be affected, the likelihood of adverse effects is considered negligible.

The total amount of permanent streambank disturbance at the 43 bridges where the proposed action may affect the ESU is approximately 1,720 feet, or 0.32 river mile. The total amount of temporary streambank disturbance that may affect the ESU is approximately 12,900 feet, or 2.4 river miles. The area of riparian d-+69*isturbance that may affect this ESU is not expected to exceed 43.6 acres.

After reviewing the best available scientific and commercial information available regarding the current status of the UCR Steelhead Trout ESU, the environmental baseline for the action area, the effects of the proposed action, the environmental performance standards proposed, and the cumulative effects, ODOT/FHWA makes a determination of not likely to destroy or adversely modify designated or previously designated critical habitat. These conclusions are based on the following considerations: (1) no bridge work will occur within this ESU and potential effects are limited to downstream habitat modifications, which may necessitate the handling of fish within 2 miles of the Columbia River: (2) the Bridge Program requires individual review of each project to ensure that the proposed action will be in compliance with the environmental performance standards identified herein, and that each applicable standard is included as an enforceable condition of the permit document; (3) the cumulative effect of the conservation measures applied to each project will ensure that any short-term effects on water quality, habitat access, habitat elements, channel conditions and dynamics, flows, and watershed conditions are brief, minor, and scheduled to occur at the times that are least sensitive for the species' life-cycle (i.e., designated in-water work periods); (4) the ecological design approach that will be applied to each program bridge to protect and stimulate natural habitat-forming processes is expected to result in many projects that will have long-term beneficial effects on aquatic habitat parameters

(e.g., the removal of bridge piers from the active channel and reductions in riprap); and (5) the individual and combined effects of all actions permitted are not expected to impair currently properly functioning habitats, appreciably reduce the functioning of already impaired habitats, or retard the long-term progress of impaired habitats toward the properly functioning condition essential to survival and recovery at the population or ESU scale.



OTIA III Bridges

- Potential to Affect - Within ESU
- Potential to Affect - Within 2 Miles of ESU
- Potential to Affect - Within 2 Miles of Migration Corridor (outside of ESU)
- No Potential to Affect
- *Steelhead ESU (Selected for Species)*
- Migratory Corridor
- City
- County
- Streams and Rivers
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

0 5 10 20 30 40 50
Miles

Figure 5.2.16-1

OTIA III: Statewide Bridge Delivery Program
Upper Columbia River Steelhead

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
screening/BA Figures/steelhead_ucr.mxd. Mar 1, 2004

Table 5.2.16-1. Program Bridge projects that may affect Upper Columbia River Steelhead Trout.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC
1	9591	Hwy 2W	3	Beaver Cr./Columbia R.	Green Cr./ Columbia Side Ch.
2	7722	Lost Cr.	3	Beaver Cr./Columbia R.	Middle Beaver Cr.
3	00338A	Tide Cr.	4	Beaver Cr./Columbia R.	Tide Cr.
4	7417	Big Cr.	3	Big Cr.	Big Cr.
5	921	Gnat Cr.	4	Big Cr.	Gnat Cr.
6	7519	Clatskanie R.	3	Clatskanie R.	Lower Clatskanie R.
7	7715	Swedetown County Rd	4	Clatskanie R.	Lower Clatskanie R.
8	02176A	Hwy 100 & UPRR (Dodson)	10	Columbia Gorge Tributaries	Hamilton Cr.
9	02062A	Tanner Cr.	6	Columbia Gorge Tributaries	Tanner Cr.
10	02062B	Tanner Cr.	6	Columbia Gorge Tributaries	Tanner Cr.
11	02194A	Moffett Cr.	5	Columbia Gorge Tributaries	Tanner Cr.
12	02194B	Moffett Cr.	5	Columbia Gorge Tributaries	Tanner Cr.
13	08588B	Unknown	16	Columbia Slough/Willamette R.	Columbia Slough
14	02163A	Unknown	11	Columbia Slough/Willamette R.	Willamette R./Columbia R.
15	04516A	Unknown	1	Columbia Slough/Willamette R.	Willamette R./Columbia R.
16	13514E	Hwy 2 Conns #2 &#3 & Hwy 64 Conns #1 & #2	8	Columbia Slough/Willamette R.	Willamette R./Columbia R.
17	00308A	Fifteen Mile Cr.	5	Fifteenmile Cr.	Lower Fifteenmile Cr.
18	7458	UPRR	6	Hood R.	Lower Hood R.
19	8662	UPRR	10	Hood R.	Lower Hood R.
20	6875	Sandy R.	10	Lower Sandy R.	Beaver Cr.
21	6945	Conn #2 (Jordan Rd)	1	Lower Sandy R.	Beaver Cr.
22	06875A	Sandy R.	10	Lower Sandy R.	Beaver Cr.

Table 5.2.16-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC
23	06945A	Conn #2 (Jordan Rd)	1	Lower Sandy R.	Beaver Cr.
24	8605	Hwy 2 WB Conn to Hwy 100	4	Middle Columbia/Eagle Cr.	Carson Cr.
25	8610	Moody St (Cascade Locks)	5	Middle Columbia/Eagle Cr.	Carson Cr.
26	8623	Herman Cr. Conn	3	Middle Columbia/Eagle Cr.	Carson Cr.
27	08605W	Hwy 2 WB Conn to Hwy 100	3	Middle Columbia/Eagle Cr.	Carson Cr.
28	08610W	Moody St (Cascade Locks)	5	Middle Columbia/Eagle Cr.	Carson Cr.
29	07403A	Herman Cr.	3	Middle Columbia/Eagle Cr.	Herman Cr.
30	8534	Conn Viento Intchg	3	Middle Columbia/Grays Cr.	Grays Cr.
31	8604	Conn (Wyeth Intchg)	3	Middle Columbia/Grays Cr.	Grays Cr.
32	07496A	Jaymar Rd (Westcliff Dr)	3	Middle Columbia/Grays Cr.	Grays Cr.
33	7398	Conn 2	3	Middle Columbia/Grays Cr.	Rowena Cr.
34	8276	Hostetler Way Conn	3	Middle Columbia/Mill Cr.	Columbia R./Murdock
35	7771	The Dalles Dam Access Conn	1	Middle Columbia/Mill Cr.	Middle Columbia/Threemile Cr.
36	7393	Mosier Cr.	3	Mosier Cr.	Lower Mosier Cr.
37	07626A	Unknown	4	Mosier Cr.	Lower Mosier Cr.
38	7392	Rock Cr.	3	Mosier Cr.	Rock Cr.
39	7397	Unknown	3	Mosier Cr.	Rock Cr.
40	7333	Unknown	16	Salmon Cr.	Vancouver
41	08931E	Irrigon Junction Intchg Conn	5	Upper Lake Umatilla	Lower Paterson Slough

Table 5.2.16-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC
42	8893	Spanish Hollow Cr.	3	Upper Middle Columbia/Hood	Spanish Hollow Cr.
43	8894	Spanish Hollow Cr.	3	Upper Middle Columbia/Hood	Spanish Hollow Cr.

Note: All bridges are located within 2 miles of a migratory corridor for this ESU.

5.2.17 Snake River Basin Steelhead ESU

There are 56 bridges where repair and replacement activities may affect Snake River Basin ESU for steelhead trout (Figure 5.2.17-1). Thirteen bridges are located within the Snake River Basin (SRB) ESU for steelhead trout, and all 13 occur in the Blue Mountains Ecoregion. Snake River steelhead trout use Oregon waters (the Columbia River) primarily as a migration corridor to reach their natal waters in Idaho. Therefore, steelhead trout of the SRB ESU could occur near OTIA III bridge work. There are also 43 bridges located within 2 miles of the Columbia or Snake Rivers and their replacement could affect Snake River steelhead trout. Of these, six occur in the Coast Range ecoregion, 10 occur in the Willamette Valley ecoregion, 13 occur in the West Cascades ecoregion, eight occur in the East Cascades ecoregion, and six occur in the Columbia Basin ecoregion (Table 5.2.17-1).

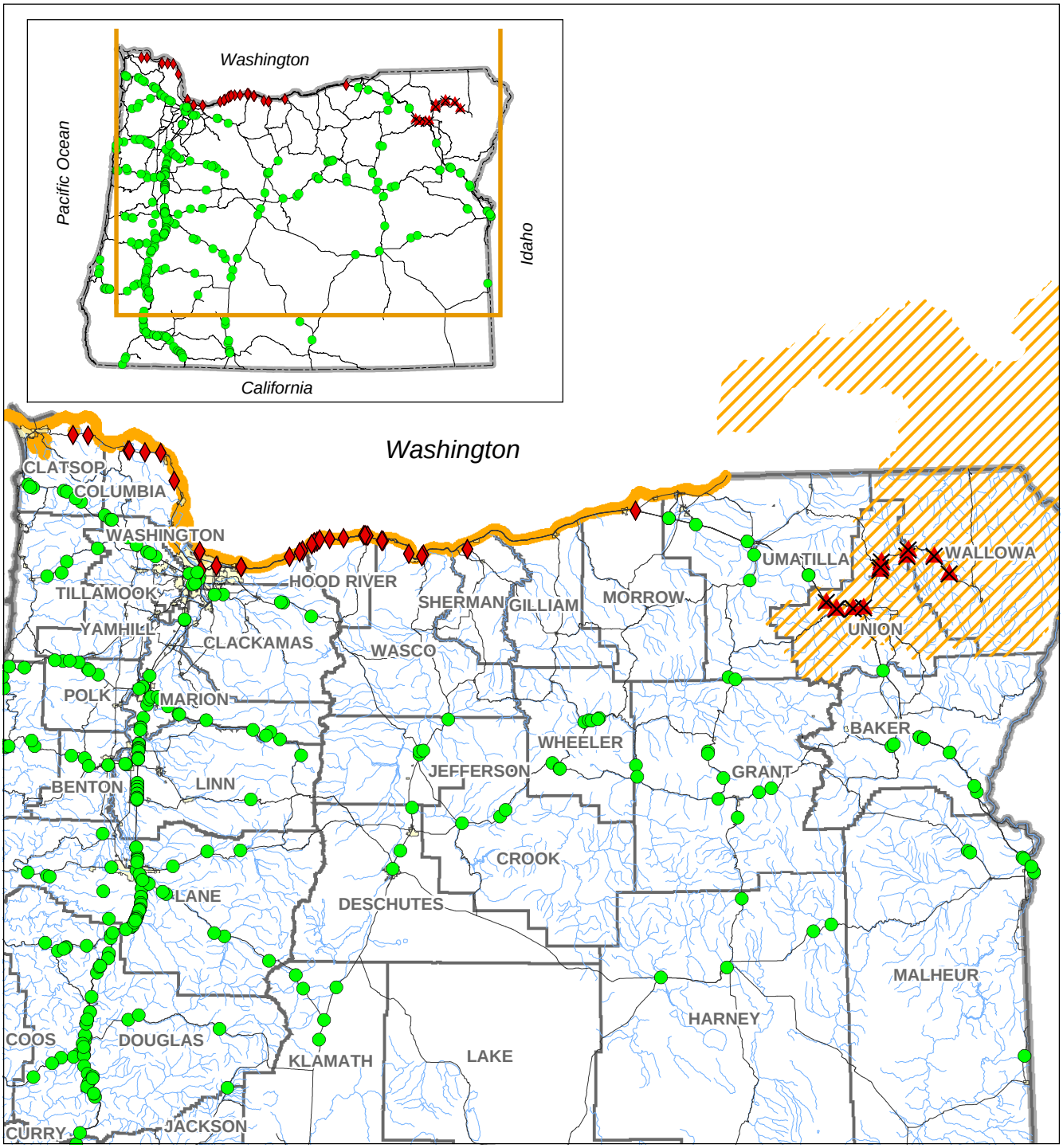
Bridges where repair and replacement activities may affect the Snake River steelhead trout ESU occur in 21 5th Field HUCs. The greatest concentration of these bridges occurs in the Middle Columbia/Eagle Creek watershed, which accounts for 11% of the gross API. Of the bridges located along the Columbia River migration corridor of the SRB Steelhead Trout ESU, the greatest concentration of bridges occurs in the Middle Columbia/Eagle Creek watersheds; these account for 15% of the total API outside the ESU and along the migratory corridor.

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, likely to adversely affect** for the SRB steelhead trout ESU. Approximately 13 bridges within the ESU and 43 bridges along the migration corridor of this ESU will require isolation of the in-water work area. The isolation of in-water work areas within the ESU may cause local and temporary reductions in water quality or the handling of Snake River Basin steelhead trout. While the handling of SRB steelhead trout is expected to be minimal as a result of bridge construction within the ESU, incidental take may occur as a result of bridge activities. It is expected that lethal take may occur—of six percent or less of the SRB steelhead trout at each bridge—as a result of handling stress or injury, or from unforeseen takings resulting from bridge construction. Therefore, it is expected that up to 650 juvenile SRB steelhead trout will be handled for all bridge repair and replacement work along the migration corridor of this ESU, and that a maximum lethal taking of 39 juvenile SRB steelhead trout may occur as a result of bridge work within the ESU.

The total amount of permanent streambank disturbance at the 56 bridges where the proposed action may affect the ESU is approximately 2,240 feet, or 0.42 river mile. The total amount of temporary streambank disturbance that may affect the ESU is approximately 16,800 feet, or 3.2 river miles. The area of riparian disturbance that may affect this ESU is not expected to exceed 58.2 acres.

After reviewing the best available scientific and commercial information available regarding the current status of the UCR Steelhead Trout ESU, the environmental baseline for the action area, the effects of the proposed action, the environmental performance standards proposed, and the cumulative effects, ODOT/FHWA makes a determination of **not likely to destroy or adversely modify** designated or previously designated critical habitat. These conclusions are based on the

following considerations: (1) no bridge work will occur within this ESU and potential impacts are limited to downstream habitat modifications, which may necessitate the handling of fish within 2 miles of the Columbia River: (2) the Bridge Program requires individual review of each project to ensure that the proposed action will be in compliance with the environmental performance standards identified herein, and that each applicable standard is included as an enforceable condition of the permit and contract documents; (3) the cumulative effect of the conservation measures applied to each project will ensure that any short-term effects on water quality, habitat access, habitat elements, channel conditions and dynamics, flows, and watershed conditions are brief, minor, and scheduled to occur at the times that are least sensitive for the species' life-cycle (e.g., designated in-water work periods); (4) the ecological design approach that will be applied to each program bridge to protect and stimulate natural habitat-forming processes is expected to result in authorization of many projects that will have long-term beneficial effects on aquatic habitat parameters (e.g., the removal of bridge piers from the active channel and reductions in riprap); and (5) the individual and combined effects of all actions permitted are not expected to impair currently properly functioning habitats, appreciably reduce the functioning of already impaired habitats, or retard the long-term progress of impaired habitats toward the properly functioning condition essential to survival and recovery at the population or ESU scale.



OTIA III Bridges

- Potential to Affect - Within ESU
- Potential to Affect - Within 2 Miles of ESU
- Potential to Affect - Within 2 Miles of Migration Corridor (outside of ESU)
- No Potential to Affect
- *Steelhead ESU (Selected for Species)*
- Migratory Corridor
- City
- County
- Streams and Rivers
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

0 5 10 20 30 40
Miles

Figure 5.2.17-1

OTIA III: Statewide Bridge Delivery Program
Snake River Basin Steelhead

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
screening/BA Figures/steelhead_srb.mxd. Mar 1, 2004

Table 5.2.17-1. Program Bridge projects that may affect Snake River Basin Steelhead Trout.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
1	9591	Hwy 2W	3	Beaver Cr./Columbia R.	Green Cr./ Columbia Side Ch.	within 2 miles of Migr. Corr.
2	7722	Lost Cr.	3	Beaver Cr./Columbia R.	Middle Beaver Cr.	within 2 miles of Migr. Corr.
3	00338A	Tide Cr.	4	Beaver Cr./Columbia R.	Tide Cr.	within 2 miles of Migr. Corr.
4	7417	Big Cr.	3	Big Cr.	Big Cr.	within 2 miles of Migr. Corr.
5	921	Gnat Cr.	4	Big Cr.	Gnat Cr.	within 2 miles of Migr. Corr.
6	7519	Clatskanie R.	3	Clatskanie R.	Lower Clatskanie R.	within 2 miles of Migr. Corr.
7	7715	Swedetown County Rd	4	Clatskanie R.	Lower Clatskanie R.	within 2 miles of Migr. Corr.
8	02176A	Hwy 100 & UPRR (Dodson)	10	Columbia Gorge Tributaries	Hamilton Cr.	within 2 miles of Migr. Corr.
9	02062A	Tanner Cr.	6	Columbia Gorge Tributaries	Tanner Cr.	within 2 miles of Migr. Corr.
10	02062B	Tanner Cr.	6	Columbia Gorge Tributaries	Tanner Cr.	within 2 miles of Migr. Corr.
11	02194A	Moffett Cr.	5	Columbia Gorge Tributaries	Tanner Cr.	within 2 miles of Migr. Corr.
12	02194B	Moffett Cr.	5	Columbia Gorge Tributaries	Tanner Cr.	within 2 miles of Migr. Corr.
13	02163A	Unknown	11	Columbia Slough/ Willamette R.	Willamette R./Columbia R.	within 2 miles of Migr. Corr.
14	08588B	Unknown	16	Columbia Slough/ Willamette R.	Columbia Slough	within 2 miles of Migr. Corr.

Table 5.2.17-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
15	04516A	Unknown	1	Columbia Slough/Willamette R.	Willamette R./Columbia R.	within 2 miles of Migr. Corr.
16	13514E	Hwy 2 Conns #2 &#3 & Hwy 64 Conns #1 & #2	8	Columbia Slough/ Willamette R.	Willamette R./Columbia R.	within 2 miles of Migr. Corr.
17	00308A	Fifteen Mile Cr.	5	Fifteenmile Cr.	Lower Fifteenmile Cr.	within 2 miles of Migr. Corr.
18	8502	Hwy 6 (Hilgard Intchg)	4	Grande Ronde R./Beaver Cr.	Grande Ronde R./Hilgard	within ESU
19	04841A	Grande Ronde R. (Hilgard)	3	Grande Ronde R./Beaver Cr.	Grande Ronde R./Hilgard	within ESU
20	1996	Grande Ronde R. (NE Elgin)	4	Grande Ronde R./Cabin Cr.	Grande Ronde R./Partridge Cr.	within ESU
21	04821A	Grande Ronde R. (Island City)	3	Grande Ronde R./Five Points Cr.	Grande Ronde R./Haywire Canyon	within ESU
22	8431	Unknown	7	Grande Ronde R./Five Points Cr.	Grande Ronde R./Wright Slough	within ESU
23	08431A	Unknown	4	Grande Ronde R./Five Points Cr.	Grande Ronde R./Wright Slough	within ESU
24	00449A	Emigrant Hill Frtg Rd & UPRR (Glover)	5	Grande Ronde R./Five Points Cr.	Pelican Cr.	within ESU
25	8780	Grande Ronde R. & INP RR (Indian Cr.)	6	Grande Ronde R./Indian Cr.	Grande Ronde R./Lower Clark Cr.	within ESU

Table 5.2.17-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
26	00800A	Grande Ronde R. (S. Elgin)	6	Grande Ronde R./Indian Cr.	Grande Ronde R./Lower Clark Cr.	within ESU
27	7458	UPRR	6	Hood R.	Lower Hood R.	within 2 miles of Migr. Corr.
28	8662	UPRR	10	Hood R.	Lower Hood R.	within 2 miles of Migr. Corr.
29	7573	Lostine R.	3	Lostine R.	Lower Lostine R.	within ESU
30	6875	Sandy R.	10	Lower Sandy R.	Beaver Cr.	within 2 miles of Migr. Corr.
31	6945	Conn #2 (Jordan Rd)	1	Lower Sandy R.	Beaver Cr.	within 2 miles of Migr. Corr.
32	06875A	Sandy R.	10	Lower Sandy R.	Beaver Cr.	within 2 miles of Migr. Corr.
33	06945A	Conn #2 (Jordan Rd)	1	Lower Sandy R.	Beaver Cr.	within 2 miles of Migr. Corr.
34	2184	Wallowa R. (Bear Cr.)	5	Lower Wallowa R.	Wallowa R./Water Canyon	within ESU
35	8605	Hwy 2 WB Conn to Hwy 100	4	Middle Columbia/Eagle Cr.	Carson Cr.	within 2 miles of Migr. Corr.
36	8610	Moody St (Cascade Locks)	5	Middle Columbia/Eagle Cr.	Carson Cr.	within 2 miles of Migr. Corr.
37	8623	Herman Cr. Conn	3	Middle Columbia/Eagle Cr.	Carson Cr.	within 2 miles of Migr. Corr.
38	08605W	Hwy 2 WB Conn to Hwy 100	3	Middle Columbia/Eagle Cr.	Carson Cr.	within 2 miles of Migr. Corr.
39	08610W	Moody St (Cascade Locks)	5	Middle Columbia/Eagle Cr.	Carson Cr.	within 2 miles of Migr. Corr.

Table 5.2.17-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
40	07403A	Herman Cr.	3	Middle Columbia/Eagle Cr.	Herman Cr.	within 2 miles of Migr. Corr.
41	8534	Conn Viento Intchg	3	Middle Columbia/Grays Cr.	Grays Cr.	within 2 miles of Migr. Corr.
42	8604	Conn (Wyeth Intchg)	3	Middle Columbia/Grays Cr.	Grays Cr.	within 2 miles of Migr. Corr.
43	07496A	Jaymar Rd (Westcliff Dr)	3	Middle Columbia/Grays Cr.	Grays Cr.	within 2 miles of Migr. Corr.
44	7398	Conn 2	3	Middle Columbia/Grays Cr.	Rowena Cr.	within 2 miles of Migr. Corr.
45	8276	Hostetler Way Conn	3	Middle Columbia/Mill Cr.	Columbia R./Murdock	within 2 miles of Migr. Corr.
46	7771	The Dalles Dam Access Conn	1	Middle Columbia/Mill Cr.	Middle Columbia/Threemile Cr.	within 2 miles of Migr. Corr.
47	5192	Minam Viaduct	8	Minam R.	Lower Minam R.	within ESU
48	01038A	Wallowa R. (Minam)	6	Minam R.	Lower Minam R.	within ESU
49	7393	Mosier Cr.	3	Mosier Cr.	Lower Mosier Cr.	within 2 miles of Migr. Corr.
50	07626A	Unknown	4	Mosier Cr.	Lower Mosier Cr.	within 2 miles of Migr. Corr.
51	7392	Rock Cr.	3	Mosier Cr.	Rock Cr.	within 2 miles of Migr. Corr.
52	7397	Unknown	3	Mosier Cr.	Rock Cr.	within 2 miles of Migr. Corr.
53	7333	Unknown	16	Salmon Cr.	Vancouver	within 2 miles of Migr. Corr.
54	08931E	Irrigon Junction Intchg Conn	5	Upper Lake Umatilla	Lower Paterson Slough	within 2 miles of Migr. Corr.

Table 5.2.17-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
55	8893	Spanish Hollow Cr.	3	Upper Middle Columbia/Hood	Spanish Hollow Cr.	within 2 miles of Migr. Corr.
56	8894	Spanish Hollow Cr.	3	Upper Middle Columbia/Hood	Spanish Hollow Cr.	within 2 miles of Migr. Corr.

5.2.18 Upper Willamette River Steelhead ESU

There are 90 bridges where repair and replacement activities may affect the Upper Willamette River (UWR) ESU for steelhead trout: 75 bridges are within the range of the ESU and four are within 2 miles of the ESU boundary (and drain to the ESU); the remaining 11 are located downstream of the ESU (Willamette Falls) near either the Willamette or Columbia Rivers (Figure 5.2.18-1; Table 5.2.18-1). Repair and replacement of these bridges will potentially affect habitat within the UWR Steelhead Trout ESU. UWR steelhead trout use the lower Willamette and Columbia Rivers as a migratory corridor to reach their natal waters. Therefore, UWR steelhead trout could be present near OTIA III bridges in downstream portions of the Columbia River. Migrating UWR steelhead trout could be affected by the repair or replacement of 11 bridges that are within 2 miles of the lower Willamette River and lower Columbia River. Of the bridges where the proposed action may affect UWR steelhead trout, eight occur in the Coast Range ecoregion, 80 occur in the Willamette Valley ecoregion, and two occur in the West Cascades ecoregion.

There are 19 5th Field HUCs impacted by bridges within this ESU. Within this ESU, the greatest concentration of bridges occurs in the Oak Creek watershed, which accounts for 23% of the total API for program bridges with the potential to affect this ESU.

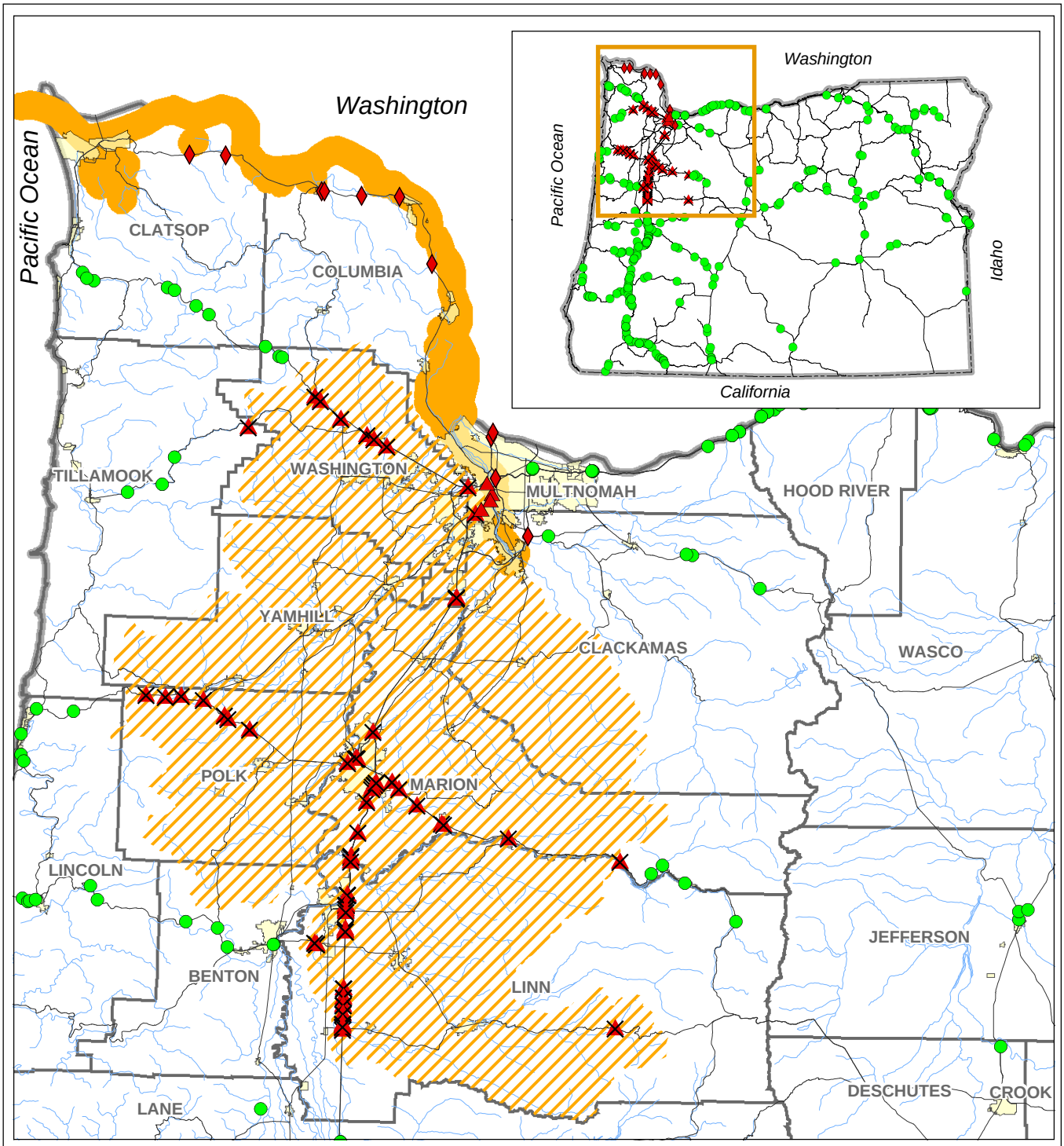
Of the bridges located along the migration corridor of this ESU, the greatest concentration of bridges occurs in the Columbia Slough/Willamette River watershed, which accounts for 45% of the total API outside the ESU and inside the migratory corridor.

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, likely to adversely affect** for the UWR Steelhead trout ESU. Approximately 75 bridges within this ESU will require isolation of the in-water work area. The isolation of in-water work areas may cause local and temporary reductions in water quality and may necessitate the handling of UWR steelhead trout. It is expected that lethal take may occur—of six percent or less of the UWR steelhead trout captured and handled at each bridge—as a result of handling stress or injury, or from unforeseen takings resulting from bridge construction. Therefore, it is expected that up to 3,767 juvenile UWR steelhead trout will be handled for all bridge replacement and repair work within the ESU and along the migration corridor of this ESU. A maximum lethal taking of 226 juvenile UWR steelhead trout may occur as a result of bridge work within 2 miles of the ESU.

The total amount of permanent streambank disturbance at the 90 bridges where the proposed action may affect the ESU is approximately 3,600 feet, or 0.68 river mile. The total amount of temporary streambank disturbance that may affect the ESU is approximately 27,000 feet, or five river miles. The area of riparian disturbance that may affect this ESU is not expected to exceed 91 acres.

After reviewing the best available scientific and commercial information available regarding the current status of the UWR Steelhead Trout ESU, the environmental baseline for the action area, the effects of the proposed action, the environmental performance standards proposed, and the cumulative effects, ODOT/FHWA makes a determination of **not likely to destroy or adversely**

modify designated or previously designated critical habitat. These findings are based on the following considerations: (1) the Bridge Program requires individual review of each project to ensure that the proposed action will be in compliance with the environmental performance standards identified herein, and that each applicable standard is included as an enforceable condition of the permit document; (2) the cumulative effect of the conservation measures applied to each project will ensure that any short-term effects on water quality, habitat access, habitat elements, channel conditions and dynamics, flows, and watershed conditions are brief, minor, and scheduled to occur at the times that are least sensitive for the species' life-cycle (i.e., designated in-water work periods); (3) the ecological design approach that will be applied to each program bridge to protect and stimulate natural habitat-forming processes is expected to result in many projects that will have long-term beneficial effects on aquatic habitat parameters (e.g., the removal of bridge piers from the active channel and reductions in riprap); and (4) the individual and combined effects of all actions permitted are not expected to impair currently properly functioning habitats, appreciably reduce the functioning of already impaired habitats, or retard the long-term progress of impaired habitats toward the properly functioning condition essential to survival and recovery at the population or ESU scale.



OTIA III Bridges

- Potential to Affect - Within ESU
- Potential to Affect - Within 2 Miles of ESU
- Potential to Affect - Within 2 Miles of Migration Corridor (outside of ESU)
- No Potential to Affect
- *Steelhead ESU (Selected for Species)*
- Migratory Corridor
- City
- County
- Streams and Rivers
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.2.18-1

OTIA III: Statewide Bridge Delivery Program
Upper Willamette River Steelhead

N W E S

0 2 4 8 12 16 20
Miles

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
screening/BA Figures/steelhead_uwr.mxd. Mar 1, 2004

Table 5.2.18-1. Program Bridge projects that may affect Upper Willamette River Steelhead Trout.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
1	9870	Hwy 51 NB	3	Abernethy Cr.	Coffee Lake Cr.	within ESU
2	07794A	Hwy 51 SB	3	Abernethy Cr.	Coffee Lake Cr.	within ESU
3	07794B	Hwy 51 SB	3	Abernethy Cr.	Coffee Lake Cr.	within ESU
4	8071	Unknown	3	Abiqua Cr./Pudding R.	Upper Little Pudding R.	within ESU
5	8073	Unknown	3	Abiqua Cr./Pudding R.	Upper Little Pudding R.	within ESU
6	9591	Hwy 2W	3	Beaver Cr./Columbia R.	Green Cr./ Columbia Side Ch.	within 2 miles of Migr. Corr.
7	7722	Lost Cr.	3	Beaver Cr./Columbia R.	Middle Beaver Cr.	within 2 miles of Migr. Corr.
8	00338A	Tide Cr.	4	Beaver Cr./Columbia R.	Tide Cr.	within 2 miles of Migr. Corr.
9	7417	Big Cr.	3	Big Cr.	Big Cr.	within 2 miles of Migr. Corr.
10	921	Gnat Cr.	4	Big Cr.	Gnat Cr.	within 2 miles of Migr. Corr.
11	08232N	Butte Cr.	3	Calapooia R.	Butte Cr.	within ESU
12	08232S	Butte Cr.	3	Calapooia R.	Butte Cr.	within ESU
13	8252	Hwy 1	4	Calapooia R.	Calapooia R. / Courtney Cr.	within ESU
14	08236N	Calapooia R.	4	Calapooia R.	Calapooia R. / Courtney Cr.	within ESU
15	08236S	Calapooia R.	4	Calapooia R.	Calapooia R. / Courtney Cr.	within ESU

Table 5.2.18-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
16	08239N	Sodom Ditch Overflow	3	Calapooia R.	Calapooia R. / Courtney Cr.	within ESU
17	08239S	Sodom Ditch Overflow	3	Calapooia R.	Calapooia R. / Courtney Cr.	within ESU
18	08241N	Courtney Cr.	3	Calapooia R.	Calapooia R. / Courtney Cr.	within ESU
19	08241S	Courtney Cr.	3	Calapooia R.	Calapooia R. / Courtney Cr.	within ESU
20	08233N	Sodom Ditch	8	Calapooia R.	Calapooia R. / Sodom Ditch	within ESU
21	08233S	Sodom Ditch	8	Calapooia R.	Calapooia R. / Sodom Ditch	within ESU
22	08235N	Calapooia Overflow	5	Calapooia R.	Calapooia R. / Sodom Ditch	within ESU
23	08235S	Calapooia Overflow	5	Calapooia R.	Calapooia R. / Sodom Ditch	within ESU
24	7519	Clatskanie R.	3	Clatskanie R.	Lower Clatskanie R.	within 2 miles of Migr. Corr.
25	7715	Swedetown County Rd	4	Clatskanie R.	Lower Clatskanie R.	within 2 miles of Migr. Corr.
26	8195	Unknown	3	Columbia Slough/Willamette R.	Columbia Slough	within 2 miles of ESU
27	8197	Unknown	13	Columbia Slough/Willamette R.	Columbia Slough	within 2 miles of ESU
28	08588B	Unknown	16	Columbia Slough/Willamette R.	Columbia Slough	within 2 miles of Migr. Corr.
29	09254D	Hwy 61	2	Columbia	Columbia Slough	within 2 miles of ESU

Table 5.2.18-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
				Slough/Willamette R.		
30	04516A	Unknown	1	Columbia Slough/Willamette R.	Willamette R./Columbia R.	within 2 miles of Migr. Corr.
31	2366	E. Fk. Dairy Cr.	4	Dairy Cr.	Lower E. Fk. Of Dairy Cr.	within ESU
32	2367	PNWR (Vadis)	8	Dairy Cr.	Lower E. Fk.. Of Dairy Cr.	within ESU
33	2365	McKay Cr.	5	Dairy Cr.	Lower Mckay Cr.	within ESU
34	02362A	Unknown	4	Dairy Cr.	Middle W. Fk. Of Dairy Cr.	within ESU
35	2672	Unknown	5	Dairy Cr.	Upper W. Fk. Of Dairy Cr.	within ESU
36	2673	Unknown	5	Dairy Cr.	Upper W. Fk. Of Dairy Cr.	within ESU
37	7964	Unknown	17	Detroit Reservoir/Blow Out Divide Cr.	Detroit Reservoir/Kinney Cr.	within ESU
38	08203B	Unknown	3	Johnson Cr.	Tyson Cr./Willamette R.	within 2 miles of ESU
39	08205R	Unknown	6	Johnson Cr.	Tyson Cr./Willamette R.	within ESU
40	7347	Unknown	7	Little N. Santiam R.	Lower Little N. Santiam R.	within ESU
41	7867	UPRR Mainline	5	Lower Clackamas R.	Clackamas R. / Rock Cr.	within 2 miles of Migr. Corr.
42	8121	Santiam Overflow No 2	6	Lower N. Santiam R.	Lower N. Santiam R.	within ESU
43	8122	Santiam Overflow No 3	3	Lower N. Santiam R.	Lower N. Santiam R.	within ESU
44	8124	Santiam Overflow No 4	5	Lower N. Santiam R.	Lower N. Santiam R.	within ESU

Table 5.2.18-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
45	2285	SW Canyon Rd (Sylvan)	4	Lower Tualatin R.	Fanno Cr.	within ESU
46	2015	Unknown	3	Mill Cr./S. Yamhill R.	Lower Mill Cr.	within ESU
47	01756A	Unknown	5	Mill Cr./S. Yamhill R.	Lower Mill Cr.	within ESU
48	8076	Unknown	3	Mill Cr./Willamette R.	Beaver Cr.	within ESU
49	7439	Mill Cr.	3	Mill Cr./Willamette R.	Lower Mill Cr./Willamette R.	within ESU
50	07439A	Mill Cr.	3	Mill Cr./Willamette R.	Lower Mill Cr./Willamette R.	within ESU
51	07524B	Hwy 1E NB (Commercial St SE)	3	Mill Cr./Willamette R.	Mckinney Cr.	within ESU
52	8069	Unknown	3	Mill Cr./Willamette R.	Upper Mill Cr./Willamette R.	within ESU
53	8070	Unknown	3	Mill Cr./Willamette R.	Upper Mill Cr./Willamette R.	within ESU
54	9413	Calapooia Overflow	5	Oak Cr.	Calapooia R.	within ESU
55	9414	Calapooia Overflow	3	Oak Cr.	Calapooia R.	within ESU
56	12205B	Calapooia R.	8	Oak Cr.	Calapooia R.	within ESU
57	08226N	AERC (Tallman Branch)	5	Oak Cr.	Lower Oak Cr.	within ESU
58	08226S	AERC (Tallman Branch)	5	Oak Cr.	Lower Oak Cr.	within ESU
59	08227N	Oak Cr.	3	Oak Cr.	Lower Oak Cr.	within ESU
60	08227S	Oak Cr.	3	Oak Cr.	Lower Oak Cr.	within ESU

Table 5.2.18-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
61	8217	Murder Cr.	3	Oak Cr.	Upper Willamette R.	within ESU
62	8223	Unknown	6	Oak Cr.	Upper Willamette R.	within ESU
63	08218A	Murder Cr. Rd	3	Oak Cr.	Upper Willamette R.	within ESU
64	08218B	Murder Cr. Rd	3	Oak Cr.	Upper Willamette R.	within ESU
65	08221A	Knox Butte Rd (N. Albany Intchg)	3	Oak Cr.	Upper Willamette R.	within ESU
66	08221B	Hwy 58 NB (N. Albany Intchg)	4	Oak Cr.	Upper Willamette R.	within ESU
67	08221C	Knox Butte Rd (N. Albany Intchg)	3	Oak Cr.	Upper Willamette R.	within ESU
68	08221D	Hwy 58 NB (N. Albany Intchg)	4	Oak Cr.	Upper Willamette R.	within ESU
69	08221E	Knox Butte Rd (N Albany Int)	3	Oak Cr.	Upper Willamette R.	within ESU
70	08222N	Cox Cr.	3	Oak Cr.	Upper Willamette R.	within ESU
71	08222S	Cox Cr.	3	Oak Cr.	Upper Willamette R.	within ESU
72	7941	Unknown	5	Rickreall Cr.	Bashaw Cr.	within ESU
73	1706	Soda Fk.	3	S. Santiam R.	Soda Fk.	within ESU
74	7333	Unknown	16	Salmon Cr.	Vancouver	within 2 miles of Migr. Corr.

Table 5.2.18-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
75	2001	Unknown	3	Salt Cr./S. Yamhill R.	Upper Salt Cr.	within ESU
76	745	Unknown	5	Upper S. Yamhill R.	Gold Cr.	within ESU
77	2081	Unknown	3	Upper S. Yamhill R.	Gold Cr.	within ESU
78	4573	Unknown	3	Upper S. Yamhill R.	Rogue Cr.	within ESU
79	01612A	Unknown	3	Upper S. Yamhill R.	Rowell Cr.	within ESU
80	7366	Unknown	3	Willamette R./Chehalem Cr.	Croisan Cr.	within ESU
81	8889	Unknown	7	Willamette R./Chehalem Cr.	Croisan Cr.	within ESU
82	00123K	Unknown	33	Willamette R./Chehalem Cr.	Croisan Cr.	within ESU
83	07253B	Unknown	35	Willamette R./Chehalem Cr.	Croisan Cr.	within ESU
84	07253R	Unknown	8	Willamette R./Chehalem Cr.	Croisan Cr.	within ESU
85	07440A	UPRR Main Line	3	Willamette R./Chehalem Cr.	Croisan Cr.	within ESU
86	07441A	Marietta St SE	4	Willamette R./Chehalem Cr.	Croisan Cr.	within ESU
87	07522A	Turner Rd SE	3	Willamette R./Chehalem Cr.	Croisan Cr.	within ESU

Table 5.2.18-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
88	07538A	Boone Rd SE	3	Willamette R./Chehalem Cr.	Croisan Cr.	within ESU
89	07855E	Hwy 72 (Salem Pkwy)	4	Willamette R./Chehalem Cr.	Glenn Cr.	within ESU
90	2472	Devils Lake Fk. Wilson R.	9	Wilson R.	Lower Devils Lake Fk. Of Wilson R.	within ESU

5.2.19 Southwestern Washington/Columbia River Coastal Cutthroat Trout DPS

There are 51 bridges where repair and replacement activities may affect the Oregon portion of the Southwestern Washington/Columbia River (SWCR) DPS for coastal cutthroat trout; 50 are within the range of the DPS and one is within 2 miles of the DPS boundary (and drains to the DPS) (Figure 5.2.19-1; Table 5.2.19-1). Of the 51 bridges where repair and replacement activities may affect SWCR coastal cutthroat trout, six occur in the Coast Range ecoregion, 18 occur in the Willamette Valley ecoregion, 16 occur in the West Cascades ecoregion, three occur in the Columbia Basin ecoregion, and eight occur in the East Cascades ecoregion.

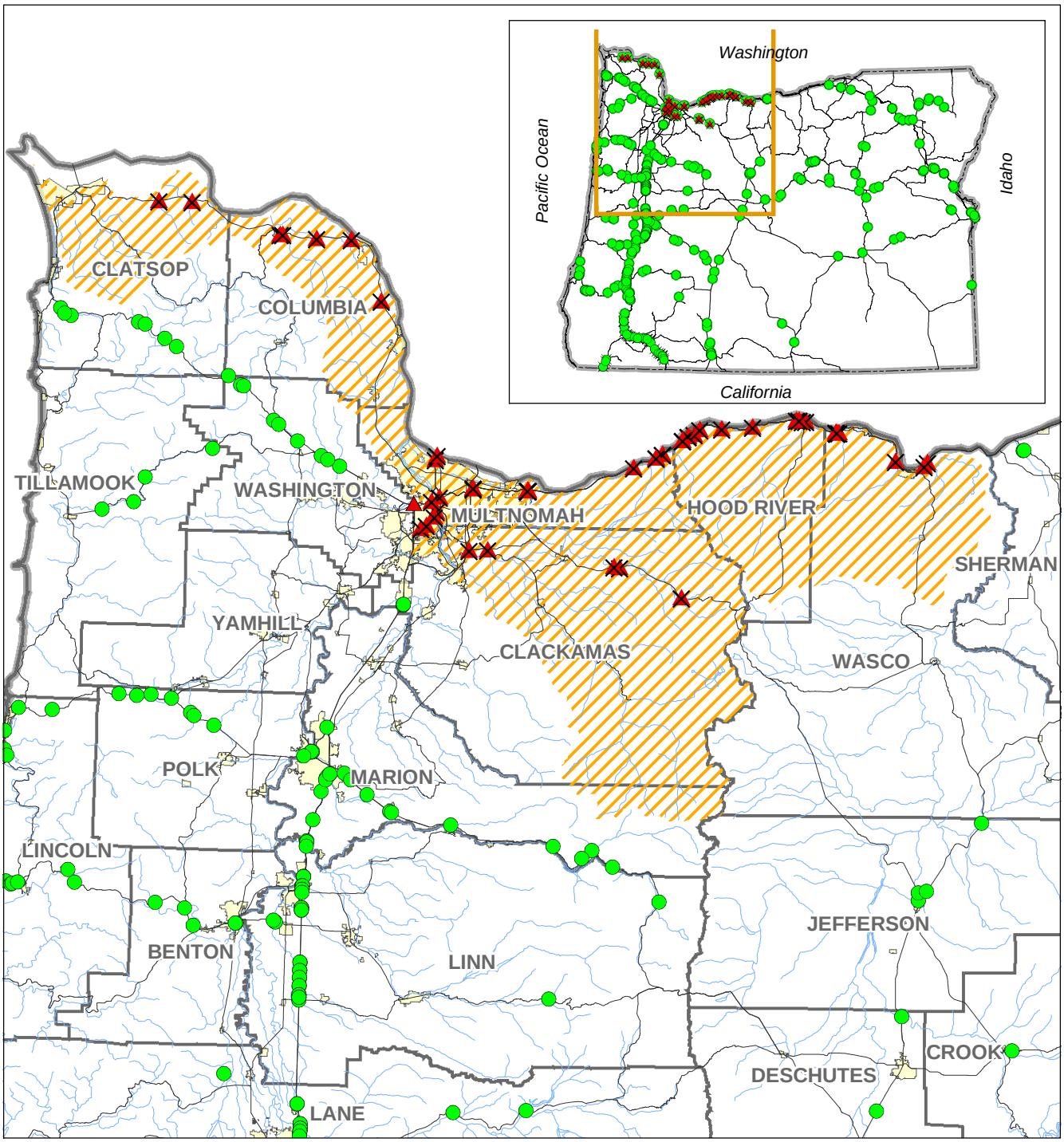
There are 16 5th Field HUCs impacted by bridges within the ESU. Within this ESU, the greatest concentration of bridges occurs in the Columbia Slough/Willamette River and Middle Columbia/Eagle Creek watersheds; these account for 20% of the gross API.

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, likely to adversely affect** for the SWCR Coastal Cutthroat Trout DPS if the DPS becomes listed during the life of the Bridge Program. Approximately 51 bridges in this DPS will require isolation of the in-water work area. The isolation of in-water work areas and the removal of trapped fish may require handling of juvenile coastal cutthroat trout; it is expected that handling of SWCR coastal cutthroat trout at each bridge site may be required during fish removal operations conducted prior to commencement of any work area dewatering activities. As previously discussed in Section 5.2.3, it is expected that lethal take may occur—of six percent or less of the coastal cutthroat trout captured at each bridge—as a result of handling stress or injury, or from unforeseen takings resulting from bridge construction. Therefore, it is expected that approximately 1,160 juvenile coastal cutthroat trout will be handled for all proposed bridge repair and replacement work within this DPS and that a maximum lethal taking of 70 juvenile coastal cutthroat trout will occur as a result of fish handling activities.

The total amount of permanent streambank disturbance at the 51 bridges where the proposed action may affect the DPS is approximately 2,040 feet, or 0.38 river mile. The total amount of temporary streambank disturbance that may affect the DPS is approximately 15,300 feet, or three river miles. The area of riparian disturbance that may affect this DPS is not expected to exceed 54.5 acres.

After reviewing the best available scientific and commercial information available regarding the current status of the SWCR Coastal Cutthroat Trout DPS, the environmental baseline for the action area, the effects of the proposed action, the environmental performance standards proposed, and the cumulative effects, ODOT/FHWA makes a determination of **may affect, is not likely to adversely affect** critical habitat for this species if critical habitat is designated during the life of the Bridge Program. These conclusions are based on the following considerations: (1) the Bridge Program requires individual review of each project to ensure that the proposed action will be in compliance with the environmental performance standards identified herein, and that each applicable standard is included as an enforceable condition of the permit and contract documents; (2) the cumulative effect of the conservation measures applied to each project will ensure that any short-term effects on water quality, habitat access, habitat

elements, channel conditions and dynamics, flows, and watershed conditions are brief, minor, and scheduled to occur at the times that are least sensitive for the species' life-cycle (i.e., designated in-water work periods); (3) the ecological design approach that will be applied to each program bridge to protect and stimulate natural habitat-forming processes is expected to result in many projects that will have long-term beneficial effects on aquatic habitat parameters (e.g., the removal of bridge piers from the active channel and reductions in riprap); and (4) the individual and combined effects of all actions permitted are not expected to impair currently properly functioning habitats, appreciably reduce the functioning of already impaired habitats, or retard the long-term progress of impaired habitats toward the properly functioning condition essential to survival and recovery at the population or DPS scale.



OTIA III Bridges

- Potential to Affect - Within DPS
- Potential to Affect - Within 2 Miles of DPS
- Potential to Affect - Within 2 Miles of Migration Corridor
- No Potential to Affect
- Cutthroat Trout DPS
- City
- County
- Streams and Rivers
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.2.19-1
OTIA III: Statewide Bridge Delivery Program
SW Washington / Columbia River
Cutthroat Trout

N W E S

0 2 4 8 12 16 20
Miles

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
screening/BA Figures/cutthroat.mxd. Mar 1, 2004

Table 5.2.19-1. Program Bridge projects that may affect Southwestern Washington/Columbia River Coastal Cutthroat Trout.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
1	9591	Hwy 2W	3	Beaver Cr./Columbia R.	Green Cr./ Columbia Side Ch.	within ESU
2	7722	Lost Cr.	3	Beaver Cr./Columbia R.	Middle Beaver Cr.	within ESU
3	00338A	Tide Cr.	4	Beaver Cr./Columbia R.	Tide Cr.	within ESU
4	7417	Big Cr.	3	Big Cr.	Big Cr.	within ESU
5	921	Gnat Cr.	4	Big Cr.	Gnat Cr.	within ESU
6	7519	Clatskanie R.	3	Clatskanie R.	Lower Clatskanie R.	within ESU
7	7715	Swedetown County Rd	4	Clatskanie R.	Lower Clatskanie R.	within ESU
8	02176A	Hwy 100 & UPRR (Dodson)	10	Columbia Gorge Tributaries	Hamilton Cr.	within ESU
9	02062A	Tanner Cr.	6	Columbia Gorge Tributaries	Tanner Cr.	within ESU
10	02062B	Tanner Cr.	6	Columbia Gorge Tributaries	Tanner Cr.	within ESU
11	02194A	Moffett Cr.	5	Columbia Gorge Tributaries	Tanner Cr.	within ESU
12	02194B	Moffett Cr.	5	Columbia Gorge Tributaries	Tanner Cr.	within ESU
13	8195	Unknown	3	Columbia Slough/Willamette R.	Columbia Slough	within ESU
14	8197	Unknown	13	Columbia Slough/Willamette R.	Columbia Slough	within ESU
15	08588B	Unknown	16	Columbia Slough/Willamette R.	Columbia Slough	within ESU
16	09254D	Hwy 61	2	Columbia Slough/Willamette R.	Columbia Slough	within ESU
17	02163A	Unknown	11	Columbia Slough/Willamette R.	Willamette R./Columbia R.	within ESU

Table 5.2.19-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
18	04516A	Unknown	1	Columbia Slough/Willamette R.	Willamette R./Columbia R.	within ESU
19	13514E	Hwy 2 Conns & Hwy 64	8	Columbia Slough/Willamette R.	Willamette R./Columbia R.	within ESU
20	00308A	Fifteen Mile Cr.	5	Fifteenmile Cr.	Lower Fifteenmile Cr.	within ESU
21	7458	UPRR	6	Hood R.	Lower Hood R.	within ESU
22	8662	UPRR	10	Hood R.	Lower Hood R.	within ESU
23	08203B	Unknown	3	Johnson Cr.	Tyson Cr./Willamette R.	within ESU
24	08205R	Unknown	6	Johnson Cr.	Tyson Cr./Willamette R.	within ESU
25	7867	UPRR Mainline	5	Lower Clackamas R.	Clackamas R. / Rock Cr.	within ESU
26	01439A	Rock Cr.	3	Lower Clackamas R.	Clackamas R. / Rock Cr.	within ESU
27	6875	Sandy R.	10	Lower Sandy R.	Beaver Cr.	within ESU
28	6945	Conn #2 (Jordan Rd)	1	Lower Sandy R.	Beaver Cr.	within ESU
29	06875A	Sandy R.	10	Lower Sandy R.	Beaver Cr.	within ESU
30	06945A	Conn #2 (Jordan Rd)	1	Lower Sandy R.	Beaver Cr.	within ESU
31	2285	SW Canyon Rd (Sylvan)	4	Lower Tualatin R.	Fanno Cr.	within 2 miles of ESU
32	8605	Hwy 2 WB Conn to Hwy 100	4	Middle Columbia/Eagle Cr.	Carson Cr.	within ESU
33	8610	Moody St (Cascade Locks)	5	Middle Columbia/Eagle Cr.	Carson Cr.	within ESU

Table 5.2.19-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
34	8623	Herman Cr. Conn	3	Middle Columbia/Eagle Cr.	Carson Cr.	within ESU
35	08605W	Hwy 2 WB Conn to Hwy 100	3	Middle Columbia/Eagle Cr.	Carson Cr.	within ESU
36	08610W	Moody St (Cascade Locks)	5	Middle Columbia/Eagle Cr.	Carson Cr.	within ESU
37	07403A	Herman Cr.	3	Middle Columbia/Eagle Cr.	Herman Cr.	within ESU
38	8534	Conn Viento Intchg	3	Middle Columbia/Grays Cr.	Grays Cr.	within ESU
39	8604	Conn (Wyeth Intchg)	3	Middle Columbia/Grays Cr.	Grays Cr.	within ESU
40	07496A	Jaymar Rd (Westcliff Dr)	3	Middle Columbia/Grays Cr.	Grays Cr.	within ESU
41	7398	Conn 2	3	Middle Columbia/Grays Cr.	Rowena Cr.	within ESU
42	8276	Hostetler Way Conn	3	Middle Columbia/Mill Cr.	Columbia R./Murdock	within ESU
43	7771	The Dalles Dam Access Conn	1	Middle Columbia/Mill Cr.	Middle Columbia/Threemile Cr.	within ESU
44	00665B	Alder Cr.	3	Middle Sandy R.	Lower Middle Sandy R.	within ESU
45	00689B	Wildcat Cr.	3	Middle Sandy R.	Upper Middle Sandy R.	within ESU
46	7393	Mosier Cr.	3	Mosier Cr.	Lower Mosier Cr.	within ESU
47	07626A	Unknown	4	Mosier Cr.	Lower Mosier Cr.	within ESU
48	7392	Rock Cr.	3	Mosier Cr.	Rock Cr.	within ESU
49	7397	Unknown	3	Mosier Cr.	Rock Cr.	within ESU
50	7333	Unknown	16	Salmon Cr.	Vancouver	within ESU

Table 5.2.19-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
51	03026A	Zig Zag R.	3	Zigzag R.	Zigzag Canyon	within ESU

5.3 Fish (Resident) Species

Resident fish species addressed under this consultation include bull trout, Lahontan cutthroat trout, shortnose sucker, Lost River sucker, Warner sucker, Oregon chub, Borax Lake chub, Hutton tui chub, Foskett speckled dace, Modoc sucker, and three non-listed lamprey species. These species have widely varying life history patterns, and thus their habitat requirements also vary substantially. Some require the very cold, flowing water and clean substrates found only in mountainous headwaters (e.g., bull trout). Others require the backwaters and sloughs with silty organic and vegetated substrates more likely found in low lying rivers and floodplains (e.g., Oregon chub). However, all of these species depend on the same basic habitat elements (water quality, space, food, and cover) necessary to carry out their various life history stages. Degradation of any of these habitat elements will reduce the viability of resident fish populations, and will limit the recovery of the species.

5.3.1 Life History and Status

5.3.1.1 Bull Trout *(Salvelinus confluentus)*

Status

The USFWS issued a final rule listing the Columbia River and Klamath River Distinct Population Segments (DPS) of bull trout as threatened species under the Federal Endangered Species Act on June 10, 1998 (June 10, 1998, 63 FR 31647). The Columbia River population segment is represented by widespread subpopulations that have declined in both overall range and numbers of fish. The majority of Columbia River bull trout occur in isolated, fragmented habitats that support low numbers of fish and are inaccessible to migratory bull trout (June 10, 1998, 63 FR 31647). A few remaining bull trout “strongholds” still remain in the Columbia River basin. These are found in large areas of contiguous habitat in the Snake River basin of the central Idaho mountains, upper Clark Fork and Flathead Rivers in Montana, and several streams in the Blue Mountains in Washington and Oregon (June 10, 1998, 63 FR 31647). The USFWS considers this DPS threatened as a result of habitat degradation and fragmentation, the blockage of migratory corridors, poor water quality, the historical management practices of fisheries, and the introduction of non-native species (June 10, 1998, 63 FR 31647). The Klamath River population segment is limited to seven geographically isolated stream areas representing a fraction of the historical habitat. The distribution and numbers of bull trout have declined in the Klamath River basin due to habitat isolation, loss of migratory corridors, poor water quality, and the introduction of non-native species.

Critical Habitat

Critical habitat was proposed for the Columbia River Bull Trout DPS on November 29, 2002 (November 29, 2002, 67 FR 71235). For the Klamath River DPS, the proposed critical habitat designation includes approximately 296 miles of streams and 33,939 acres of lakes and marshes in Oregon. For the Columbia River DPS, the proposed critical habitat designation totals approximately 18,175 miles of streams and 498,782 acres of lakes and reservoirs, which

includes: approximately 8,958 miles of streams and 205,639 acres of lakes and reservoirs in the State of Idaho; 3,319 miles of streams and 217,577 acres of lakes and reservoirs in the State of Montana; 3,391 miles of streams and 44,670 acres of lakes and reservoirs in the State of Oregon; and 2,507 miles of streams and 30,897 acres of lakes and reservoirs in the State of Washington. (November 29, 2002, 67 FR 71235)

The biological needs of bull trout in the two population segments are not sufficiently known to permit identification of critical habitat. Insufficient information is available on the number of individuals or spawning reaches required to support viable subpopulations throughout the distinct population segment. In addition, the extent of habitat required and specific management measures needed for the recovery of these fish have not been identified. This information is considered essential for determining critical habitat for these population segments.

Life History

Historically, bull trout occurred throughout the Columbia River Basin; east to Montana, south to the Jarbidge River in northern Nevada, the Klamath Basin in Oregon, and the McCloud River in California; and north to Alberta, British Columbia, and possibly southeastern Alaska. In Oregon, bull trout occurrences represent a fraction of the species' historic distribution. A total of 69 bull trout populations in 12 basins are currently identified in Oregon (Buchanan et al. 1997). These basins include the Klamath River, Willamette River, Hood River, Deschutes River, John Day River, Umatilla River, Walla Walla River, Grande Ronde River, Imnaha River, Pine Creek, Powder River, and Malheur River. Within these basins, bull trout populations are highly fragmented and in some cases only exist within a small portion of the basin.

Bull trout exhibit two basic life history strategies: resident and migratory. Migratory bull trout live in larger river and lake systems and migrate to small stream headwaters to spawn. In general, migratory fish are larger than resident fish. Research indicates that various types of bull trout interbred at times, which helped maintain viable populations throughout the fish's range (Rieman and McIntyre 1993).

Bull trout reach sexual maturity in five to seven years and spawn from the end of August through November. Spawning may occur annually for some populations, and every other year for the rest. Migration for spawning is initiated by warming water temperatures in downstream reaches. The distances traveled by migratory bull trout to spawn are on average farther than other non-anadromous salmonids (Fraley and Shepard 1989). Females select redd sites that are characterized by gravel substrates with low compaction, ground water inputs, and proximity to cover (Rieman and McIntyre 1996). Bull trout require particularly clean gravel substrates to build their redds. Increased sediment suffocates eggs by reducing dissolved oxygen. If 20% of the solids in spawning substrate are fine sediments, spawning success falls by more than 50%; a 40% proportion of fine sediments reduces success by 99% (Rieman and McIntyre 1996).

Bull trout eggs incubate over the winter and hatch in the late winter or early spring. Emergence usually requires an incubation period of 120 to 200 days. Incubation success is highly sensitive to temperature. Although adults can withstand water temperature up to 64ºF, eggs develop better with temperatures below 36ºF. Temperatures above 46ºF can reduce survival by more than 75%

(Rieman and McIntyre 1996). Alevins require 65-90 days to absorb their yolk sacs (Pratt 1992), and emergence typically occurs after a peak in stream discharge from early April through May (Pratt 1992).

As juveniles, resident and migratory bull trout occur together, but it is not known if they represent a single or separate population (Rieman and McIntyre 1993). Juveniles migrate to areas upstream from spawning beds to grow and take advantage of cool headwater temperatures. Bull trout less than one year old are generally found in areas along stream margins and in side channels. Distribution of juvenile bull trout is strongly associated with stream substrate. Pratt (1985) found that juvenile bull trout smaller than 0.3 inch usually remained near the stream bottom, close to streambed materials and submerged fine debris. As bull trout grow they become less associated with the streambed. Most migratory juvenile bull trout remain in headwater tributaries for one to three years before emigrating downstream to larger stream reaches. Emigration usually takes place from June to August.

Limiting Factors

Land and water management activities that degrade bull trout habitat and threaten all of the bull trout population segments in the coterminous United States include dams, forest management practices, livestock grazing, agriculture and agricultural diversions, roads, and mining (June 10, 1998, 63 FR 31647). The effects of these land and water management practices often extend from the immediately affected area to a considerable distance downstream or downslope, because of increased sediment loads in the stream and shifts in the hydrologic regime.

Timber harvesting and cattle grazing have removed important riparian vegetation from stream banks throughout the Pacific Northwest (Gregory et al. 1991); this reduces instream woody material important for rearing and winter habitat, and reduces stream cover that results in increased water temperatures. These temperatures often exceed the range of successful bull trout spawning, egg incubation, and juvenile rearing. All activities which cause a loss of riparian buffer zones, including overgrazing, logging and road construction, also increase overland flow of runoff to the stream, carrying increased sediment loads and increasing bank destabilization through higher velocities (Ziller 1992). Improper grazing can also lead to collapsing streambanks and increased stream width-to-depth ratio (Ziller 1992). Streams suffering from such effects warm faster because they are wider and shallower, which exposes more units of water to warming per unit of sunlight. Collapsed banks also reduce suitable bank habitat available for bull trout.

Water management activities can impair bull trout by fragmenting populations, changing water flow patterns, and degrading water quality. Dams and other passage barriers collectively have a significant effect on bull trout throughout their range. Metapopulation function can be disabled by a series of dams on the major rivers of the Pacific Northwest such as in the Columbia River basin. Passage barriers delay or often block upstream migration of adult bull trout to their spawning areas and can limit genetic interchange between bull trout populations (Ratliff and Howell 1992). Many migratory bull trout populations have been extirpated as a result of dams in the Columbia River basin (Goetz 1989) and bull trout populations on the upper Columbia River are clearly fragmented by dams without adequate fish passage facilities.

The use of river water for irrigation also affects bull trout in mainstream rivers (Ratliff and Howell 1992). Irrigation creates four distinct impairments of bull trout habitat and water conditions: irrigation practices remove water from rivers and reduce instream flows; irrigation return water is frequently warmer than 64ºF and thus creates a thermal barrier that can behaviorally block fish from spawning areas and ultimately reduce genetic diversity; irrigation return water is laden with sediments and agricultural chemicals, which represent a major source of point and non-point source pollution in fluvial systems (Allen 1995); and finally, migrating juvenile bull trout may also be stranded through unscreened irrigation diversions and passage through dams (Ratliff and Howell 1992, Ziller 1992).

The degradation of the condition of the bull trout has been compounded by the introduction of non-native salmonid species to native bull trout waters. Around the turn of the century, brook trout (*Salvelinus fontinalis*) were introduced into the rivers and streams of the Pacific Northwest. The brook trout is genetically close enough to bull trout to permit hybridization, although offspring of the bull trout / brook trout cross are infertile (Kitano et al. 1994). Brook trout often have a higher fecundity rate and lower age at first reproduction. When bull trout and brook trout occur in the same waters, the brook trout will greatly outnumber the bull trout because of their greater reproductive potential (Kitano et al. 1994). Because of the physiological and habitat similarities of brook trout and bull trout, forage competition has become a serious problem for bull trout conservation. This problem is exaggerated in headwater areas, where bull trout are frequently isolated as non-migratory populations (Kitano et al. 1994). Brown and lake trout were also introduced in the Pacific Northwest around the turn of the century, and have occupied mainstem streams and lakes formerly inhabited by bull trout. These species may also compete with bull trout for forage resources.

5.3.1.2 Lost River Sucker (*Deltistes luxatus*) and Shortnose Sucker (*Chasmistes brevirostris*)

Status

The Lost River sucker and shortnose sucker occupy similar habitat and have similar life history traits. Therefore, the two species will be addressed concurrently to efficiently describe their status, life histories, and limiting factors. The Lost River and shortnose suckers were listed as endangered under the Federal ESA throughout their entire range on July 18, 1988 (July 18, 1988, 53 FR 27130 and 53 FR 27134).

Critical habitat (the shoreline area of Upper Klamath Lake) for both species was proposed on December 1, 1994; however, the designation of critical habitat by USFWS has not occurred to date (December 1, 1994, 59 FR 61744 and December 1, 1994, 59 FR 61759). The proposed designation includes a total of approximately 456,000 acres of stream, river, lake, and shoreline areas as critical habitat for the shortnose sucker—and approximately 424,000 acres of stream, river, lake, and shoreline areas as critical habitat for the Lost River sucker—in Klamath County (December 1, 1994, 59 FR 61744, December 1, 1994, 59 FR 61759). The USFWS has determined that the physical and biological features (referred to as the primary constituent elements, or PCEs) that support spawning, foraging, cover, refugia, growth, and dispersal, as

well as corridors between these areas, are essential to the conservation of these species. Only lands or waters that contain one or more primary constituent elements are included in the proposed designation. Areas within the 100-year floodplain that have been previously developed are not likely to provide PCEs. Thus, paved areas, road and rail corridors, built-up areas within municipalities, and other previously developed areas are not likely to provide PCEs and so would not be affected by the proposed designation.

The Lost River sucker is native to Upper Klamath Lake (Williams et al. 1985) and its tributaries, including the Williamson River, the Sprague River, the Wood River, Crooked Creek, Seven Mile Creek, Four Mile Creek and Slough, Odessa Creek, and Crystal Creek. The Lost River sucker is the only species in the genus *Deltistes*, therefore the entire genus is endanger of extinction The Lost River sucker also historically inhabited the Lost River watershed, Tule Lake, Lower Klamath Lake, and Sheepy Lake (Moyle 1976), but it is not considered native to the Klamath River. The present distribution of the Lost River sucker includes Upper Klamath Lake and its tributaries (Buettner and Scoppettone 1990), Clear Lake Reservoir and its tributaries (USFWS 1993a), Tule Lake and the Lost River up to Anderson-Rose Dam (USFWS 1993a), and the Klamath River downstream to Copco Reservoir (Beak 1987) and probably to Iron Gate Reservoir (USFWS 1993a).

Shortnose suckers historically occurred throughout Upper Klamath Lake and its tributaries (Williams et al. 1985, Miller and Smith 1981), although Moyle (1976) also includes 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, the 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.

Life History

Lost River and shortnose suckers are lake-dwelling, but spawn in tributary streams or springs (July 18, 1988, 53 FR 27130). Both species of suckers spawn near the stream bottom; when gravel is available, eggs are dispersed within the top several centimeters. Spawning occurs between February and May, depending on water depth and stream temperature (Buettner and Scoppettone 1990, Andreasen 1975). When spawning occurs over cobble and armored substrate, eggs fall between crevices or are swept downstream (Buettner and Scoppettone 1990). More detailed spawning information for both sucker species is provided by Buettner and Scoppettone (1990) and USBR (1992).

Larval Lost River and shortnose suckers spend relatively little time in tributary streams, and migrate back to the lake shortly after emergence. Buettner and Scoppettone (1990) found that in 1987 and 1988 over 90% of larval Lost River sucker emigrated back to Upper Klamath Lake between May 5 and June 15. They found that the majority of larval shortnose suckers emigrated within a six-week period after May 1 in 1978 and after May 7 in 1988. 90% of larvae were found in water depths of less than 1.6 inches, and were surface-oriented and over sand, mud, and

concrete; they were absent from soft organic mud and silt bottom (Buettner and Scoppettone 1990).

Adult Lost River and shortnose suckers usually spend relatively little time in tributary streams before they migrate back to Upper Klamath Lake. However, only areas of the lake near inflows from streams or springs maintain relatively low densities of algae and consistently provide the water quality needed to support the suckers through stressful periods (USFWS 1993a). Refugial areas of relatively good water quality are important for fish in Upper Klamath Lake during the summer and early fall when dissolved oxygen and pH levels can be stressful or lethal in much of the lake (Coleman and McGie 1988).

Limiting Factors

The final rule listing the Lost River and shortnose suckers as endangered species cited the following reasons for their decline: the damming of rivers, instream flow diversions, hybridization, competition and predation by exotic species, insularization of habitat, dredging and draining of marshes, and water quality problems associated with timber harvest, the removal of riparian vegetation, livestock grazing, and agricultural practices (July 18, 1988, FR 53 27130). Reduction and degradation of lake and stream habitats in the upper Klamath Basin is considered by USFWS as the most important factor in the decline of both species (USFWS 1993a). A shift toward hypereutrophication in Upper Klamath Lake has been documented (Vincent 1968, Miller and Tash 1967) and is considered by USFWS to be a probable cause for the decline of Lost River and shortnose suckers and a major limiting factor in recovery of the species. Tule Lake, the lower portions of the Lost River, Lake Ewauna, and the Klamath River above Keno Dam also have severe water quality problems associated with hypereutrophication. Over-harvest and chemical contaminants may also have contributed to the decline. For more information regarding limiting factors and the decline on Lost River and shortnose suckers see the Lost River and Shortnose Sucker Recovery Plan, USFWS 1993.

5.3.1.3 Oregon Chub (Oregonichthys crameri)

Status

The Oregon chub is a small minnow endemic to the Willamette River basin. The species was listed as endangered under the Federal ESA on October 18, 1993 (October 18, 1993, 58 FR 53800). The species currently does not have designated critical habitat and is not represented in different DPS. Historically, the species was distributed throughout low land areas of the Willamette River drainage in lowland off-channel habitats such as sloughs, alcoves, and overflow ponds. The historical records note collections from the Clackamas River, Molalla River, Mill Creek, Luckiamute River, North Santiam River, South Santiam River, Calapooia River, Long Tom River, Muddy Creek, McKenzie River, Coast Fork Willamette River, Middle Fork Willamette River, and the mainstem Willamette River (Scheerer et al. 2002).

At the time of listing, there were only five known viable Oregon chub populations (Markle et al. 1989). By 2000, survey data existed for 25 Oregon chub populations in three different sub-basins within the Willamette River watershed. Of these populations, two were considered to be

decreasing, seven were stable, and four were increasing. The remaining 12 populations had insufficient data or insufficient detections of Oregon chub to estimate population size or establish a population trend. Only 11 of the 25 populations contained 500 or more individuals. Seven introduced populations existed, ranging from 15 to >14,000 individuals (Scheerer et al. 2001).

Currently, Oregon chub distribution is approximately two percent of its historic range (October 18, 1993, 58 FR 53800). Current distribution is limited to populations in the Santiam River, Muddy Creek(s), Camas Creek, and the Middle Fork Willamette River drainages. Most populations are located in the Middle Fork Willamette River and Santiam River drainages (Scheerer et al. 2002). Oregon chub have been reintroduced into seven new habitats since 1994. There are seven other locations where Oregon chub were collected at one time or another between 1991-1997, yet were absent during subsequent sampling conducted more recently. Currently, there are 23 known locations that contain Oregon chub, including the introduced populations (Scheerer et al. 2002).

Life History

Life history information on the Oregon chub is somewhat limited and was derived primarily from observations made at the Shady Dell Pond (Pearsons 1989). Oregon chub spawn from April through September. Spawning activity has only been observed at temperatures exceeding 61ºF. Males over 1.4 inches have been observed exhibiting spawning behavior. The number of eggs produced per female typically range from 150-670. During spawning periods, Oregon chub primarily feed on copepods, cladoceransm, and chronomid larvae (Markle et al. 1991).

Limiting Factors

A variety of factors are likely responsible for the decline of the Oregon chub. These include habitat alteration; the proliferation of non-native fish and amphibians; accidental chemical spills; runoff from herbicide application on farms and timberlands or along roadways, railways, and power line rights-of way; the application of rotenone to manage sport fisheries; desiccation of habitats; unauthorized water withdrawals, diversions, or fill and removal activities; sedimentation resulting from timber harvesting in the watershed; and possibly the demographic risks that result from a fragmented distribution of small, isolated populations (October 18, 1993, 58 FR 53800).

The decline of Oregon chub has been correlated with the construction of dams. Eight of 11 flood control projects in the Willamette River drainage were completed between 1953 and 1968 (ACOE 1970). Other structural changes along the Willamette River corridor—such as revetment and channelization, diking and drainage, and the removal of floodplain vegetation—have eliminated or altered the slack water habitats of the Oregon chub (Li et al. 1987, Hjort et al. 1984, Sedell and Froggatt 1984, Willamette Basin Task Force 1969). Channel confinement, isolation of the Willamette River from the majority of its floodplain, and the elimination or degradation of both seasonal and permanent wetland habitats within the floodplain began as early as 1872 and, for example, has reduced the 15.5 miles reach between Harrisburg and the McKenzie River confluence from over 155 miles of shoreline in 1854 to less than 40 miles currently (Sedell et al. 1990, Sedell and Froggatt 1984).

The establishment and expansion of non-native species in Oregon have contributed to the decline of the Oregon chub, and limited the species' ability to expand beyond its current range. Many species of non-native fish have been introduced and are common throughout the Willamette Valley, including largemouth bass *(Micropterus salmoides)*, smallmouth bass *(M. dolomieui)*, crappie *(Pomoxis* sp.), bluegill *(Lepomis macrochirus*), and western mosquitofish (*Gambusia affinis*). The bullfrog (*Rana catesbiana*), an omnivorous nonnative amphibian, also occurs in the valley and breeds in habitats preferred by the Oregon chub (Scheerer et al. 1992, Hjort et al. 1984, Willamette Basin Task Force 1969). The severe decline of the Oregon chub did not occur simultaneously with the initial dates of introduction of nonindigenous species. However, many sites formerly inhabited by the Oregon chub are now occupied by non-native species (Markle et al. 1989). Currently, 24 sites are known to contain Oregon chub; 15 of these sites are also inhabited by non-native fishes or amphibians (Scheerer and Jones 1997). Since 1995, non-native fish have been discovered for the first time in six locations containing Oregon chub; the Oregon chub populations have subsequently declined in all of these sites. The 1996 flooding in the Santiam River was probably responsible for three of these appearances of non-native fish (Scheerer and Jones 1997). The other three sites, located in the Middle Fork Willamette River drainage, were likely the result of unauthorized introductions or spread of non-native fish from reservoirs (Scheerer and Jones 1997).

Many of the known extant populations of Oregon chub occur near rail, highway, and power transmission corridors, as well as within public park and campground facilities. These populations are threatened by stormwater runoff, chemical spills from overturned truck or rail tankers, runoff or accidental spills of vegetation control chemicals, overflow from chemical toilets in campgrounds, the sedimentation of shallow habitats from construction activities, and changes in water level or flow conditions from construction, diversions, or natural desiccation. Oregon chub populations near agricultural areas are subject to poor water quality as a result of runoff laden with sediment, herbicide, and nutrients. Logging in the watershed can result in increased sedimentation and herbicide runoff.

5.3.1.4 Pacific lamprey (*Lampetra tridentate*), river lamprey (*Lampetra ayresi)*, and western brook lamprey (*Lampetra richardsoni)*

Status

Three species of lamprey native to Oregon—Pacific lamprey, river lamprey, and western brook lamprey—are currently not listed under the Federal or State ESA, but the limited available data regarding these species indicates that current populations are well below historic levels (PSMFC 1997, Kostow 2002). On January 28, 2003, 11 conservation organizations in Oregon, California, and Washington petitioned the USFWS to list the three species of lamprey as Federally threatened or endangered. The USFWS is currently reviewing the petition and current status of the three lamprey species to identify the need for Federal protection.

Lampreys became a conservation concern in the early 1990s when tribal co-managers and some ODFW staff noted that populations of Pacific lampreys were apparently declining to perilously low numbers (Kostow 2002). Pacific lamprey was listed as an Oregon State sensitive species in

1993 and was given further legal protection status by the State in 1997 (OAR 635-044-0130). Lamprey status is difficult to assess for several reasons: 1) most observations of lampreys in fresh water are juveniles and it is difficult to distinguish between various species at this life stage; 2) data on lamprey are only collected incidental to monitoring of salmonids, and the design and efficiency of the data collection effort is not always adequate for lampreys; and 3) very little historic data is available on various lamprey species (Kostow 2002).

Life History

Oregon has between eight and twelve species of lamprey. The current distribution of Pacific lamprey, river lamprey, and western brook lamprey is not fully understood due to a lack of historic management attention and their phenotypic similarities to other lamprey species (Kostow 2002). Current information regarding the status of the three lamprey species is largely anecdotal, and has been derived from sightings of the species during management activities intended for other aquatic species. Lampreys occur in the Columbia River Basin, including the lower Snake River; along the Oregon Coast; in the upper Klamath River Basin; and in the Goose Lake Basin in southeastern Oregon. All lamprey species in Oregon begin life in fresh water, where juveniles burrow into silt and filter feed on algae (Kostow 2002). As some species approach adulthood, they migrate to marine or lacustrine environments where they briefly become ecto-parasites, feeding on live fishes by attaching to them with sucker disc mouths (e.g., Pacific lamprey and river lamprey). Other species remain non-parasitic (e.g., western brook lamprey).

Ammocoetes from different species are difficult to distinguish. Therefore, life history descriptions tend to be generalized across all species (Moore and Mallatt 1980, Potter 1980). An exception is the detailed observations of the Western brook lamprey, and to a lesser extent the Pacific lamprey, made by Pletcher (1963). The major difference noted between species is the duration of the ammocoete stage. A general description of ammocoete behavior and habitat use is provided here—with specifics by species, to the extent that they are known, presented below. The following descriptions largely follow Pletcher (1963) and Potter (1980).

Lamprey eggs are sticky and dense and are deposited in redds by spawning adults. Upon completion of a redd, the eggs are buried beneath sand and gravel. The length of egg incubation appears to be influenced by temperature, and perhaps varies by species, and falls between ten and twenty days. Upon hatching, early larva spend another week to a month in the redd. They eventually emerge from the natal redd at night and move downstream to areas with fine silt deposits and a mild current where they burrow into the silt. At this age they are about 0.5 inch long (Kostow 2002). Successful spawning grounds appear to be those located in riffle/gravel areas close to pools or other silt deposits so that the initial movement into burrows by the tiny larva is successful. The burrow is U-shaped, with the lamprey's mouth at the surface of one end from where it filter feeds.

For the next three to seven years (depending on species and regional variation), lamprey ammocoetes will remain in burrows, filter feeding on algae, mostly diatoms. They will move gradually downstream, moving primarily at night, seeking coarser sand/silt substrates and deeper water as they grow. Older ammocoetes tend to accumulate in lower basins and flood plains. Growth rate may vary seasonally, influenced by water temperature and food supply. The most

rapid increase in length occurs in the first years, during which ammocoetes of most species reach about four inches in length. Lipid accumulation begins once the ammocoetes reach this size, and growth rate in length declines in preparation for the non-feeding period of metamorphism. The age of ammocoetes is very difficult to determine because the species lack bony structures.

The courtship and spawning behaviors of northwest lampreys have been described for only a few species, and in some cases only in captivity. Pletcher (1963) described these behaviors for Western brook lamprey in both captivity and the wild, and for Pacific lamprey mostly in captivity. Beamish (1980) described the behaviors for captive river lamprey. There is enough similarity between these descriptions that a single discussion is provided here.

Courtship occurs on spawning gravels and involves nest-building and mutual displays that are tactile and probably chemical. Solitary males, and perhaps some females, may begin by preparing multiple rudimentary nests. Either gender may initiate courtship by way of a "courtship glide", where one lamprey slithers along the body of a prospective mate. A receptive mate will accompany the initiator to the rudimentary nest. Initial nests may be communal, occupied by as many as a dozen individuals of both genders. Pletcher (1963) believed that receptive females emits a chemical stimulus that attracts other lamprey. Communal courtship generally breaks into pairs or smaller groups and disperses to separate nests before actual spawning begins. The female lies in the rudimentary nest and undulates while the male performs most of the nest building. Lamprey will carry small rocks to the edge of the nest in their oral disks. Larger rocks may be pushed and finer substrates may be moved by rapid swimming motions.

When the lampreys are ready to spawn the male grasps the female by the back of her head and twists his tail around her. They vibrate together, depositing eggs and burying them. Spawning is mostly done in pairs, but may include additional lamprey. Both polygamous and polyandrous group matings have been observed. A female will deposit about 100 to 500 eggs in each spawning bout. Between bouts, the female rests while the male departs briefly. He resumes nest building upon return, enlarging the nest upstream so that previous egg deposits are undisturbed. Another spawning bout will be followed by another rest. A female probably deposits all her eggs in about 12 hours. Both sexes of all lampreys are expected to die soon after spawning. However, ODFW staff on the southern Oregon coast have apparently observed healthy lamprey out-migrating to marine waters soon after spawning (Kostow 2002).

Limiting Factors

Lamprey and salmonids utilize similar freshwater habitats and are affected by similar effects pathways; therefore lamprey species have encountered similar habitat problems. Historical splash damming for logging operations has resulted in the scouring of substrates down to bedrock in many locations inhabited by lamprey. This has resulted in the removal of habitat necessary for the species' early life cycles (PSMFC 1997). Dams can hinder adult and juvenile passage or completely cut off prime spawning habitat. Logging and grazing practices can alter stream flows and degrade habitat by removing riparian vegetation and altering stream channel form.

The first four to six years of life are critical times for lamprey species. Animals that filter water and mud for food are very susceptible to pollutants in the water column and to sediments. Lamprey may be adversely affected by pollutants from urban and agricultural runoff that can concentrate in the sediments (PSMFC 2003). Because this species depends on muddy bottoms, backwater areas, and low gradient areas during its juvenile life stage, it is susceptible to loss of wetlands, side channels, back eddies, and beaver ponds resulting from agriculture, forestry, urban development, or channelization for flood control (Kostow 2002). High stream temperatures and lack of stream cover can also reduce the lampreys' food supply.

5.3.2 Analysis of Effects

5.3.2.1 Effects Pathways

Effects pathways to resident fish are the same as those described for the anadromous fish functional group (Section 5.2.2). Essentially all effects are delivered via the displacement, disruption, removal or addition of one or more of the following:

<u>Soil</u>

The displacement and transport of soil can create turbidity and sedimentation within stream channels and sloughs occupied by listed resident fish. The direct and indirect effects (sub-lethal and lethal) of soil inputs to waterways occupied by resident fish species are similar to those described for anadromous fish species (Section 5.2.2.1). These include sedimentation of substrates necessary for spawning and macroinvertebrate production, infilling of pools and other essential habitats such as sloughs, and the displacement of individual fish. Resident fish may be more susceptible than anadromous fish to soil effects such as turbidity, because they spend their entire lives in the streams and waters that may be affected by bridge construction.

<u>Water</u>

Alterations to fluvial processes can have adverse effects on the habitat of listed resident fish species. Alterations in channel hydraulics are triggered by the removal of habitat elements which contribute to channel complexity, or by altering the flow regime of rivers and streams. In addition, channel hydraulics can be modified by the introduction of structures such as piers below the bankfull elevation. Changes to the hydrologic regimes of lakes and streams are a potential pathway for these types of effects, providing both sub-lethal and lethal effects on resident fish species.

Hydrologic alterations may be manifested as increases in the frequency and magnitude of peak flows, as well as reductions of base flow levels. Increasing the magnitude of peak flows will often result in channel scour and degradation, potentially leading to loss of floodplain connectivity and overall habitat simplification (i.e., sub-lethal effects). Decreasing base flows can allow water temperatures to increase beyond tolerable levels, or even dewater sections of rivers and backwater areas, cutting off important habitat for spawning and rearing (i.e., lethal effects). Desiccation of backwater habitats can greatly

affect species such as the Oregon chub, which is wholly dependent on this type of habitat (Paul Sheerer, biologist, ODFW, pers. comm., November 27, 2003). For the primarily lake-dwelling species (e.g., suckers), diminished flows at locations such as lake inlets may reduce available refuge from low dissolved oxygen and high algal densities found during warm summer months (USFWS 1993a).

Hydroacoustic effects can also be deleterious to resident fish species, causing acute physiological damage to juvenile and adult fish, larvae, and incubating eggs. The magnitude of the hydroacoustic disturbance and the proximity of the disturbance to resident fish determines the level of effect on resident fish species (e.g., sub-lethal vs. lethal).

Chemicals

The delivery of chemicals to streams and rivers has adverse effects on resident fish species. Chemical contamination can alter fecundity, increase disease, shift biotic communities, and reduce the overall health of resident fish species. The introduction of chemicals can be acute, occurring as a result of an accidental spills or equipment leaks during construction activities or the use of herbicide near streams. Chronic delivery of chemical pollutants may also occur, as a result of increased stormwater runoff to waterways. The effects of chemical contamination on resident fish habitat may be sub-lethal or lethal, and are generally correlated to the concentration of chemical contaminants within the water column. Resident fish may be more susceptible than anadromous fish to chronic chemical contamination, because they spend their entire lives in the streams and waters that may be affected by bridge construction, whereas anadromous fish spend much of their lives in larger rivers, estuaries and the open ocean. Juvenile fish and larvae may be more sensitive than adult fish to chemical exposure because they are more limited in their ability to disperse and avoid exposure.

Vegetation

Resident fish species and their habitats rely on plant material to provide and maintain habitat elements and nutrient sources in the same manner as that described for anadromous species (Section 5.2.2.1). In addition, some resident fish species are somewhat more reliant on the presence of native aquatic vegetation for cover and food throughout their life cycles, as opposed to anadromous fish, which spend much of their life in larger rivers, estuaries and the open ocean. Thus, the removal of vegetation from perennially and seasonally inundated habitats may have more acute and direct effects on resident fish species than on anadromous species.

Species

As with anadromous fish species, direct effects on resident fish species can occur during any activity that requires handling or that would otherwise displace them from cover, refugia, and food sources. Direct effects may also occur if incubating eggs or larvae are

destroyed as a result of any activity. Indirect effects on species occur as a result of effects delivered via any of the previously described pathways.

5.3.2.2 Minimization and Avoidance Measures

The effects of actions proposed under this consultation may be delivered by one or multiple pathways. The degree to which Bridge Program affects resident fish populations or habitat is dependent on the intensity, magnitude, duration, timing, and frequency of the activity causing the effect. Efforts to minimize the effects on resident fish are focused on eliminating or restricting the pathways by which the habitat elements critical for sustaining viable resident fish populations can be degraded. Minimization and avoidance measures for the Bridge Program consist of environmental performance standards that provide proactive methods for conservation of habitat and species during bridge design and construction. Section 3.3 of this BA lists and defines the environmental performance standards.

5.3.2.3 Effects on Environmental Baseline

Evaluation of potential effects from the proposed action on the resident fish functional group has been completed by assessing the individual habitat elements critical for sustained viable populations; the environmental performance standards proposed in this BA have been developed to minimize Bridge Program effects on these critical habitat elements.

The habitat elements that support anadromous and resident fish species in freshwater habitats are very similar. Furthermore, changes in freshwater habitat have similar repercussions for both anadromous and resident fish. For actions that affect freshwater habitat, the USFWS has developed a checklist for assessing and documenting environmental baseline conditions and project effects on those baselines conditions in order to determine the overall effect a proposed action will have on a resident fish species. The checklist incorporates the same 18 habitat elements found in the NOAA Fisheries matrix for anadromous salmonids and incorporates five additional parameters related to resident fish viability.

The USFWS has designated 23 distinct habitat parameters that influence the continued existence of resident freshwater fish species. Effects on resident fish species are determined by the degree to which a proposed action alters the baseline condition of these 23 habitat parameters. These habitat parameters are intended to be assessed at the individual watershed (5th Field HUC) scale. Due to the spatial scale of the Bridge Program and the broad habitat types and conditions encompassed by the various bridge locations, effects on the baseline condition of these parameters are analyzed by assessing the effect of general mitigated bridge activities on these habitat parameters.

<u>Subpopulation Characteristics</u>

Subpopulation Size

The effects of an action on fish subpopulations have direct implications for the continued survival of the species. Resident fish populations can be fragmented by natural or anthropogenic causes. The known size of a subpopulation is important for determining

the level of effect relative to the overall species population. The resident fish species addressed in this BA have relatively fragmented subpopulations as a result of long-term anthropogenic effects on the species. Recovery goals for species such as Oregon chub and bull trout include the strengthening of existing subpopulations and establishment of new subpopulations within their range. Therefore, the effect of the proposed Bridge Program on these species at the subpopulation level is critical in determining the overall effect at the species level.

The proposed Bridge Program has been developed to minimize temporary (construction-related) and long-term (design-related) effects on Federally listed fish species. By following the environmental performance standards, the proposed action will likely have no long-term adverse affect on subpopulation levels of listed resident fish species. Adherence to the environmental performance standards will avoid or minimize effects on these populations to the maximum extent practicable. Some minor reductions in subpopulations are expected, from unavoidable take associated with fish handling during in-water work isolations activities, accidental spills of hazardous materials, or other unforeseen construction accidents. However, based on current available information on the distribution and size of species subpopulations and the broad spatial scale of the Bridge Program coupled with the proposed environmental performance standards, the Bridge Program is not expected to significantly reduce the size of current subpopulations of any resident fish species.

Growth and Survival

Most fish species have the ability to adapt and recover from short-term disturbances to their habitat. Disturbances over a variety of spatial and temporal scales have caused fish species to adapt and evolve to achieve a certain level of resilience. However, the intensity, frequency, and duration of disturbances have direct implications for the continued growth and survival of a population or entire species. Anthropogenic disturbance can limit the ability of resident fish species to adapt to natural disturbances. In many cases the effects of natural disturbances on freshwater habitat are intensified by the influence of anthropogenic disturbances.

The resident fish species addressed in this BA have varying levels of resilience against short-term disturbance. However, because of their current listing status, these species are considered to be very sensitive to both short-term and long-term disturbances. Species distribution, habitat requirements, and the degree of existing and new disturbance play a large role in determining the ability for a species to recover and survive disturbing events.

The program bridges are widely distributed throughout Oregon, though they are concentrated near the two major interstate systems (I-5 and I-84). Bridge work will occur in many areas known to sustain listed resident fish species. The distribution of proposed bridge work and species occurrence across the state, combined with implementation of the proposed environmental performance standards, is expected to minimize the potential adverse effects of the proposed action on this parameter. While some minor, short-term adverse effects on the growth and survival of some resident fish subpopulations may

occur, it is expected that the long-term effects will either be neutral or beneficial for all bridges covered by this consultation.

Life History Diversity and Isolation:
Relative to their historic distribution, the Federally listed resident fish species addressed in this BA are isolated and subject to reduced genetic diversity. Habitat fragmentation and population isolation are key components of the decline of bull trout, Oregon chub, Lost River sucker, and shortnose sucker. In some cases, historic distribution was limited to a single ecoregion or drainage basin. However, even in these cases, the relative reduction in distribution and the loss of habitat within these critical areas has led to the isolation of these species (and sub-populations) relative to their historic ranges.

The proposed action presents a relatively small area of potential effect in terms of species distributions and watershed-scale habitat elements. However, a concentration of bridge activities within one watershed or area supporting a key metapopulation of resident fish species could have significant effects on the entire species. To minimize the effects of the Bridge Program on resident fish species, environmental performance standards have been proposed for bridges qualifying under this consultation. For example, the bridges will not create permanent barriers to fish passage or to the movement of key habitat components (e.g., large wood, substrate materials). Impediments may exist temporarily, during work isolation activities that alter existing flow and channel conditions. However, due to the location of proposed bridge work, the existing ranges of listed resident fish, and the implementation of environmental performance standards, the proposed Bridge Program is not expected to adversely affect the existing diversity or isolation level for resident fish species. In some cases, the replacement of bridges that are currently impeding properly functioning habitat conditions may actually improve this parameter.

Persistence and Genetic Integrity:
Low levels of subpopulation connectivity and high levels of habitat fragmentation have reduced the condition of this parameter for Federally listed resident fish species within Oregon. In addition, competing species have displaced or hybridized these populations, which has led to decreases in some subpopulation sizes and in genetic integrity.

The listed resident fish species addressed in this BA have specific habitat requirements that have been and are affected by historic and current land uses. Specifically, bull trout require colder water temperatures and cleaner substrates than other species in order to complete their life cycles. Oregon chub require functioning off-channel habitat associated with large lowland river reaches within the Willamette River basin. Lost River and shortnose suckers require specific temperature and flow conditions that are often disrupted by agricultural practices within the Klamath River basin. These species-specific habitat requirements, coupled with anthropogenic habitat degradation, have led to reductions in genetic integrity and subpopulation persistence.

The Bridge Program has been developed to protect, and in some cases improve, the lateral and longitudinal connectivity of fluvial systems. Specifically, the proposed Fluvial Environmental Performance Standard (Section 3.3) will allow normative physical

processes within the stream-floodplain corridor by (1) promoting natural sediment transport patterns, (2) providing improved conditions for fluvial debris movement, and (3) improving the longitudinal continuity and connectivity of the stream-floodplain system. Implementation of this standard will improve existing subpopulation connectivity where bridges proposed for replacement impair the normative physical processes within the subject stream-floodplain corridor. The effects of construction on these areas will also be minimized by implementation of the other environmental performance standards (Section 3.3). Because the proposed action will follow the environmental performance standards to ensure that both short- and long-term adverse effects are minimized or avoided, the proposed action is not expected to have long-term adverse effects on the genetic integrity and persistence of any resident fish subpopulations.

Species and Habitat

Integration of Species and Habitat Conditions

The habitat elements that support subpopulations of listed resident fish have been disrupted by human influence to the extent that there is a clear declining trend in subpopulation size for all of the resident fish species addressed in this BA. The decline in these subpopulations and their habitat represents a long-term trend beginning with European settlement of the Pacific Northwest in the late nineteenth century, and continuing to the present. The cumulative effect of this ongoing trend has caused many subpopulations of resident fish to respond negatively to natural environmental disturbances (e.g., periodic flooding, seasonal reductions in water quality, wildfire).

The habitat requirements, location, and life history strategies of all of the listed fish species addressed in this BA (both resident and anadromous) have been taken into account in the development of environmental performance standards for the Bridge Program. These performance standards will minimize and, in most cases, avoid adverse effects of construction or repair of program bridges to listed resident fish species. To some degree, most of the bridges proposed for replacement or repair currently impair the function of the fluvial systems they span, and as a result, threaten the long-term viability of listed resident fish species. By applying environmental performance standards to the replacement and repair of program bridges, the chances for long-term survival of listed resident fish will likely be increased by removing existing impediments to proper habitat function, and improving the conditions under which functioning habitats develop.

Water Quality

Temperature: See Analysis of Effects section 5.2.2.

Sediment/Turbidity: See Analysis of Effects section 5.2.2.

Chemical Contamination: See Analysis of Effects section 5.2.2.

Habitat Access

Physical Barriers: See Analysis of Effects section 5.2.2.

Habitat Elements

Substrate: See Analysis of Effects section 5.2.2.

Large Wood: See Analysis of Effects section 5.2.2.

Pool Frequency and Quality: See Analysis of Effects section 5.2.2.

Off-Channel Habitat: See Analysis of Effects section 5.2.2.

Refugia: See Analysis of Effects section 5.2.2.

Width/Depth Ratio: See Analysis of Effects section 5.2.2.

Streambank Condition: See Analysis of Effects section 5.2.2.

Floodplain Connectivity: See Analysis of Effects section 5.2.2.

Flow/Hydrology

Peak/Base Flows: See Analysis of Effects section 5.2.2.

Drainage Network: See Analysis of Effects section 5.2.2.

Watershed Conditions

Road Density and Location: See Analysis of Effects section 5.2.2.

Disturbance History: See Analysis of Effects section 5.2.2.

5.3.3 Determination of Effects Methodology

The implementation of the Bridge Program will occur over an eight to nine year period, and the duration of its potential effects will be limited by the temporal nature of the construction. Furthermore, the construction of each bridge will be a one-time event, and the actual work will span only one or two construction seasons. Potential effects on resident fish species resulting from proposed bridge work are identical to those that affect anadromous fish in that they include those that occur during the construction process (i.e., increases in turbidity, chemical contamination, and direct physical harm from construction materials or fish handling procedures), and those that occur as a result of habitat changes from the constructed bridge (i.e., channel constriction, floodplain fragmentation, and streambank degradation). Environmental performance standards have been developed to guide the implementation of conservation

measures to minimize the effects of bridge construction and design on these species. These standards aim to minimize disturbance of the key habitat components for resident fish before, during, and after construction.

The screening of effects from the proposed action on bull trout and Oregon chub was developed using a process that was more geographically specific than the methods used for anadromous fish (ESUs) and suckers (4th Field HUCs). Bull trout and Oregon chub screening was completed by using specific management protocols and information from agency experts. The following paragraphs describe the effect screening process for these two fish species.

Bull trout in Oregon are part of either the Columbia River or the Klamath River DPS; there are 22 recovery units within the Columbia River DPS, and one recovery unit in the Klamath River DPS. Recovery units are composed of core areas, core habitats, and proposed critical habitat. The screening of bridges where repair and replacement activities may affect bull trout was completed by determining which bridges occurred in bull trout core areas and proposed critical habitat. Bridges outside of this designation were considered to have no effect on bull trout.

According to Scheerer et al. (2003), Oregon chub are endemic to the Willamette Valley of western Oregon. The species was formerly distributed throughout the Willamette Valley from Oregon City to Oakridge, in off-channel habitats such as beaver ponds, oxbows, stable backwater sloughs, and flooded marshes. Currently, there are 32 known populations of Oregon chub; eight are introduced populations.

Survey data were gathered by Scheerer et al. (2003) from the 40 OTIA III bridge sites within the Willamette Basin that are scheduled to begin construction in 2004. Each surveyed site was given a ranking of High, Medium, or Low to describe the relative quality of habitat for Oregon chub. The three rankings are generally defined as follows:

> High – Oregon chub present or site determined suitable habitat for chub
> Medium – Habitat not significantly degraded; most suitable for other native species such as salmonids (e.g., fast water); not suitable for Oregon chub
> Low – Site dominated by non-native fish species, and lacking in essential habitat elements such as water (i.e., dry channels), or otherwise degraded (e.g., ongoing grazing and/or cattle access) at the time of the survey

The remaining Willamette River Basin bridge sites that are suspected to either be occupied by Oregon chub or to encompass suitable habitat will be surveyed in 2004. The remaining bridges to be surveyed will begin construction no sooner than 2005. This survey and construction schedule will facilitate application of the appropriate environmental performance standards to protect Oregon chub and their habitat.

Bridges meeting the following criteria were determined to potentially affect Oregon chub:

- Bridges within the Willamette River Basin, south of the Santiam River confluence (Paul Scheerer, Biologist, Oregon Department of Fish and Wildlife, pers. comm., January 26, 2004);

- Bridge sites within the Basin and documented by Scheerer et al. (2003) as containing Oregon chub and/or having a habitat ranking of "Medium" or "High" quality;
- Bridges located below 1,640 feet elevation; and
- Bridges that cross waterbodies.

Conservation measures described in the environmental performance standards will limit fish deaths to the few associated with fish capture and release activities and the isolation of in-water work areas. All other direct adverse effects will likely be transitory, and both juvenile and adult fish should be able to avoid them by bypassing or temporarily leaving the proposed action area, resulting in non-lethal take.

The isolation of in-water work areas and subsequent fish handling procedures are assumed to be the components of the program with the greatest potential to result in lethal and sub-lethal take of listed resident fish. The most appropriate type of fish handling and removal technique will be carried out for each species according to the recommendations of ODFW regional biologists. Given the lack of a comprehensive dataset regarding the density and range of resident fish populations throughout the extent of the Bridge Program, the dynamic life histories of these species, their seasonal migration behavior (i.e., bull trout and suckers), and the lack of commercial/sport fishing hatchery supplementation and hatchery population data, estimating the level of take from these activities requires certain assumptions to be made. Review of previous ESA consultations regarding similar actions within the range of Federally listed resident fish provides guidance for estimating take from projects requiring in-water work, stream diversion, and fish handling/salvage. Estimates using these assumptions are presented below.

Lethal Take

ODOT/FHWA has made the following assumptions to quantify the level of lethal take for each species within this functional group based on Bridge Program data analysis and review of ESA consultations for similar actions:

Bull Trout

All water-spanning bridges within a bull trout DPS will require in-water work area isolation and possibly fish capture and release.

Each project requiring in-water work area isolation within a bull trout core area is likely to capture up to 20 bull trout adults and juveniles (in aggregate);

Of the 20 bull trout to be captured and handled in this way, 98% or more are expected to survive with no long-term effects and less than two percent are expected to be injured or killed (including those that die later as a result of injury).

The higher estimate of six percent lethal take per 20 bull trout will be used for bridges requiring in-water work, to allow for variations in experience and work conditions, to provide coverage for unforeseen takings from bridge construction with no in-water work, and to account for those bridges which may require minor in-water work extensions and

more than one in-water work operation. Even if monitoring proves the six percent death rate to be accurate, isolation of in-water work area activities will not affect Federally listed bull trout at the population level.

Suckers

All bridges that are within the range of Federally listed suckers or are within 2 miles of (and drain to) the range of Federally listed suckers will require in-water work area isolation and possibly fish capture and release.

Each project requiring in-water work area isolation within the range of the Lost River sucker and shortnose sucker is likely to capture up to 20 adult and juvenile (in aggregate) Federally listed suckers;

Of the 20 Federally listed suckers to be captured and handled in this way, 98% or more are expected to survive with no long-term effects and less than two percent are expected to be injured or killed (including those that die later as a result of injury).

The higher estimate of six percent lethal take per 20 Federally listed suckers will be used for bridges requiring in-water work to allow for variations in personnel experience and work conditions, to provide coverage for unforeseen takings from bridge construction with no in-water work, and to account for the estimated 30 percent of program bridges which may require minor in-water work extensions. Even if monitoring proves the six percent death rate to be accurate, isolation of in-water work area activities will not affect Federally listed Lost River and shortnose suckers at the population level.

Oregon chub

In-water work area isolation and possibly fish capture and release will be required for all of the bridges within the range of Oregon chub that span water or directly affect off-channel habitat.

Each project requiring in-water work area isolation or disturbance to off-channel habitat within the range of the Oregon chub is likely to capture up to 100 Oregon chub adults and juveniles (in aggregate) (Paul Scheerer, Biologist, Oregon Department of Fish and Wildlife, pers. comm., January 26, 2004).

Of the 100 Oregon chub to be captured and handled in this way, 99% or more are expected to survive with no long-term effects and less than one percent are expected to be injured or killed (including those that die later as a result of injury).

The higher estimate of two percent lethal take per 100 Oregon chub will be used for bridges requiring in-water work or disturbance of off-channel habitat to allow for variations in experience and work conditions, to provide coverage for unforeseen takings from bridge construction with no in-water work, and to account for those bridges which may require minor in-water work extensions. Even if monitoring proves the six percent

death rate to be accurate, isolation of in-water work area activities will not affect Federally listed Oregon chub at the population level.

Streambank Disturbance

ODOT/FHWA has estimated the amount of streambank disturbance that is likely to occur at bridges that cross water. Permanent disturbance is defined as the additional area that results when the replacement bridge footprint is larger than the original bridge footprint. Temporary disturbance is defined as the area on one or both sides of a bridge where temporary work bridges, detour bridges, falsework, and access roads may be constructed. These areas will be disturbed during construction only, and will be re-contoured and re-vegetated to replace properly functioning streambank elements following construction. While these numbers cannot be used to estimate lethal or non-lethal take of resident fish, they can give an estimate of the magnitude of likely construction disturbance.

Permanent Disturbance Assumptions

Only bridges crossing perennial streams or waters may affect streambanks that provide habitat functions to fish.

Each bridge will be widened by an average of 20 feet to include lane width and shoulder increases for safety purposes.

Both banks of the stream crossing will be affected equally by width increases, for a total of 40 feet of permanent streambank disturbance at each bridge site over perennial streams or waters. It is assumed that permanent riparian disturbance may extend up to 150 feet away from the streambank. This will provide an estimate of the potential area of permanent riparian disturbance.

Temporary Disturbance Assumptions

Only bridges crossing perennial streams or waters may affect streambanks that provide habitat functions to fish.

All bridges over perennial streams or waters will have the following temporary structures installed during construction:

- One 40-foot wide work bridge
- One 40-foot wide detour bridge
- One 30-foot wide access road
- 30 feet of fill materials (e.g., for temporary detour bridge approach embankments)
- Bridge falsework that results in 10 feet of disturbance

The temporary disturbance on each side will total 150 feet. Both banks of the stream crossing will be affected equally by temporary structures, for a total of 300 feet of

temporary streambank disturbance at each bridge site over perennial streams. It is assumed that temporary riparian disturbance may extend up to 150 feet away from the streambank. This will provide an estimate of the potential area of temporary riparian disturbance.

5.3.4 Bull Trout

Columbia River Bull Trout DPS

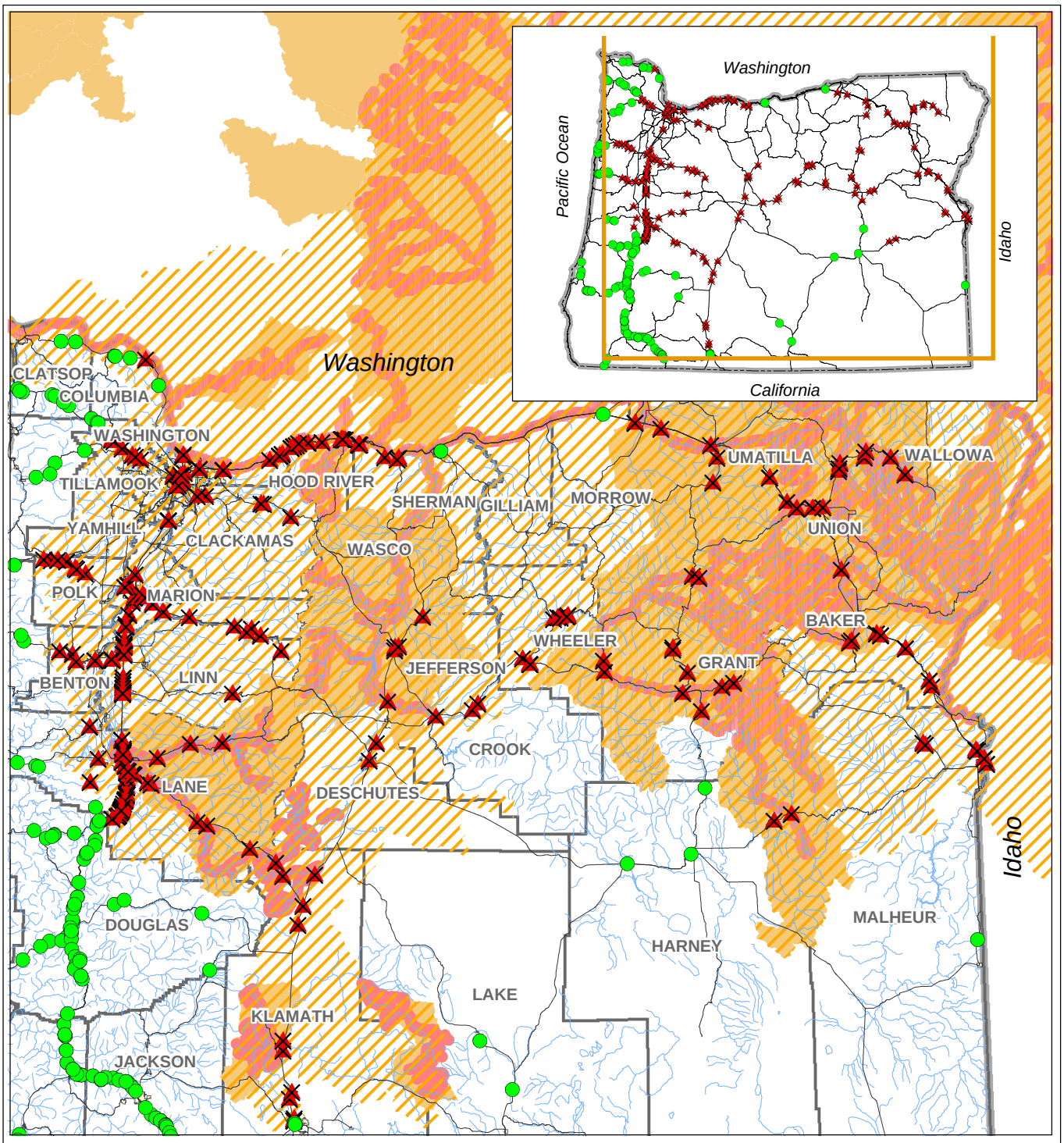
There are 271 bridges within the range of the Columbia River DPS for bull trout (Figure 5.3.4-1; Table 5.3.4-1). Of these, 80 are bridges where repair and replacement activities may affect the Columbia River DPS. Of these, there are seven bridges in the West Cascades ecoregion, 10 in the High Lava Plains ecoregion, six in the East Cascades ecoregion, six in the Columbia Basin ecoregion, 21 in the Willamette Valley ecoregion, two in the Owyhee Uplands ecoregion, and 28 in the Blue Mountains ecoregion (Table 5.3.4-2).

Within the Columbia River recovery unit, no bridges occur in, or within 2 miles of, a core area. Two bridges within this recovery unit are located within 2 miles of critical habitat.

Within the Deschutes River Basin recovery unit, there are 14 bridges. Five bridges occur in, or within 2 miles of, the Lower Deschutes core area. Of the bridges located within 2 miles of this core area, one bridge also occurs within 2 miles of proposed critical habitat. Three bridges occur within 2 miles of proposed critical habitat but are greater than 2 miles from any core area.

Within the Grande Ronde River Basin recovery unit, there are 13 bridges, all of which occur in, or within 2 miles of, the Grande Ronde River core area. Of the bridges located within 2 miles of this core area, 12 bridges also occur within 2 miles of proposed critical habitat.

Within the Hells Canyon Complex recovery unit, there are 11 bridges. Seven bridges occur in, or within 2 miles of, the Powder River core area. Of the bridges located within 2 miles of this core area, three bridges also occur within 2 miles of proposed critical habitat.



OTIA III Bridges

- Potential to Affect - Within DPS
- Potential to Affect - Within 2 Miles of DPS
- Potential to Affect - Within 2 Miles of Migration Corridor
- No Potential to Affect
- Bull Trout Proposed Critical Habitat
- Bull Trout DPS
- Bull Trout Core Areas
- City
- County
- Highway
- Streams and Rivers
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

N W E S

0 5 10 20 30 40 50

Miles

Figure 5.3.4-1

OTIA III: Statewide Bridge Delivery Program Bull Trout

MB&G

Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.

screening/BA Figures/b_trout.mxd. Mar 1, 2004

Table 5.3.4-1. Program Bridge projects that may affect Bull Trout.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
1	9870	Hwy 51 NB	3	Abernethy Cr.	Coffee Lake Cr.	within a Recovery Unit
2	07794A	Hwy 51 SB	3	Abernethy Cr.	Coffee Lake Cr.	within a Recovery Unit
3	07794B	Hwy 51 SB	3	Abernethy Cr.	Coffee Lake Cr.	within a Recovery Unit
4	8071	Unknown	3	Abiqua Cr./Pudding R.	Upper Little Pudding R.	within a Recovery Unit
5	8073	Unknown	3	Abiqua Cr./Pudding R.	Upper Little Pudding R.	within a Recovery Unit
6	9591	Hwy 2W	3	Beaver Cr./Columbia R.	Green Cr./ Columbia Side Ch.	within 2 miles of Critical Habitat
7	00338A	Tide Cr.	4	Beaver Cr./Columbia R.	Tide Cr.	within 2 miles of Critical Habitat
8	03553A	Beech Cr.	3	Beech Cr.	Clear Cr.	Recovery Unit & Core Area
9	2561	E. Fk. Birch Cr. (Pilot Rock)	3	Birch Cr.	Lower E. Birch Cr.	Recovery Unit & Core Area
10	7372	Bridge Cr.	3	Bridge Cr.	Upper Bridge Cr.	within a Recovery Unit
11	7490	Bridge Cr.	3	Bridge Cr.	Upper Bridge Cr.	within a Recovery Unit
12	7491	Bridge Cr.	3	Bridge Cr.	Upper Bridge Cr.	within a Recovery Unit
13	08232N	Butte Cr.	3	Calapooia R.	Butte Cr.	within a Recovery Unit
14	08232S	Butte Cr.	3	Calapooia R.	Butte Cr.	within a Recovery Unit
15	8252	Hwy 1	4	Calapooia R.	Calapooia R. / Courtney Cr.	within a Recovery Unit
16	08236N	Calapooia R.	4	Calapooia R.	Calapooia R. / Courtney Cr.	within a Recovery Unit

Table 5.3.4-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
17	08236S	Calapooia R.	4	Calapooia R.	Calapooia R. / Courtney Cr.	within a Recovery Unit
18	08239N	Sodom Ditch Overflow	3	Calapooia R.	Calapooia R. / Courtney Cr.	within a Recovery Unit
19	08239S	Sodom Ditch Overflow	3	Calapooia R.	Calapooia R. / Courtney Cr.	within a Recovery Unit
20	08241N	Courtney Cr.	3	Calapooia R.	Calapooia R. / Courtney Cr.	within a Recovery Unit
21	08241S	Courtney Cr.	3	Calapooia R.	Calapooia R. / Courtney Cr.	within a Recovery Unit
22	08233N	Sodom Ditch	8	Calapooia R.	Calapooia R. / Sodom Ditch	within a Recovery Unit
23	08233S	Sodom Ditch	8	Calapooia R.	Calapooia R. / Sodom Ditch	within a Recovery Unit
24	08235N	Calapooia Overflow	5	Calapooia R.	Calapooia R. / Sodom Ditch	within a Recovery Unit
25	08235S	Calapooia Overflow	5	Calapooia R.	Calapooia R. / Sodom Ditch	within a Recovery Unit
26	03558A	Canyon Cr.	3	Canyon Cr.	Lower Canyon Cr.	within 2 miles of Critical Habitat
27	02176A	Hwy 100 & UPRR (Dodson)	10	Columbia Gorge Tributaries	Hamilton Cr.	within 2 miles of Critical Habitat
28	02062A	Tanner Cr.	6	Columbia Gorge Tributaries	Tanner Cr.	within 2 miles of Critical Habitat
29	02062B	Tanner Cr.	6	Columbia Gorge Tributaries	Tanner Cr.	within 2 miles of Critical Habitat
30	02194A	Moffett Cr.	5	Columbia Gorge Tributaries	Tanner Cr.	within 2 miles of Critical Habitat

Table 5.3.4-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
31	02194B	Moffett Cr.	5	Columbia Gorge Tributaries	Tanner Cr.	within 2 miles of Critical Habitat
32	8195	Unknown	3	Columbia Slough/Willamette R.	Columbia Slough	within a Recovery Unit
33	8197	Unknown	13	Columbia Slough/Willamette R.	Columbia Slough	within a Recovery Unit
34	08588B	Unknown	16	Columbia Slough/Willamette R.	Columbia Slough	within a Recovery Unit
35	09254D	SW Market St	2	Columbia Slough/Willamette R.	Columbia Slough	within a Recovery Unit
36	02163A	Unknown	11	Columbia Slough/Willamette R.	Willamette R./Columbia R.	within a Recovery Unit
37	04516A	Unknown	1	Columbia Slough/Willamette R.	Willamette R./Columbia R.	within 2 miles of Critical Habitat
38	13514E	Hwy 2 Conns #2 &#3 & Hwy 64 Conns #1 & #2	8	Columbia Slough/Willamette R.	Willamette R./Columbia R.	within a Recovery Unit
39	6204	Smith Cr.	1	Cottonwood Cr.	Upper Fox Cr.	Recovery Unit & Core Area
40	6205	Fox Cr.	1	Cottonwood Cr.	Upper Fox Cr.	Recovery Unit & Core Area
41	1825	Crescent Cr.	3	Crescent Cr.	Middle Crescent Cr.	within 2 miles of Critical Habitat
42	2366	E. Fk. Dairy Cr.	4	Dairy Cr.	Lower E. Fk. Of Dairy Cr.	within a Recovery Unit
43	2367	PNWR (Vadis)	8	Dairy Cr.	Lower E. Fk. Of Dairy Cr.	within a Recovery Unit

Table 5.3.4-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
44	2365	McKay Cr.	5	Dairy Cr.	Lower Mckay Cr.	within a Recovery Unit
45	02362A	Unknown	4	Dairy Cr.	Middle W. Fk. Of Dairy Cr.	within a Recovery Unit
46	2672	Unknown	5	Dairy Cr.	Upper W. Fk. Of Dairy Cr.	within a Recovery Unit
47	2673	Unknown	5	Dairy Cr.	Upper W. Fk. Of Dairy Cr.	within a Recovery Unit
48	1826	Odell Cr.	3	Deschutes R./Browns Cr.	Middle Odell Cr.	within 2 miles of Critical Habitat
49	8888	N. Unit Canal & Swalley Canal	3	Deschutes R./Mckenzie Canyon	Deschutes Junction	within a Recovery Unit
50	01675B	Pilot Butte Canal	2	Deschutes R./Mckenzie Canyon	Deschutes Junction	within a Recovery Unit
51	7017	Unknown	4	Detroit Reservoir/Blow Out Divide Cr.	Detroit Reservoir/French Cr.	within a Recovery Unit
52	7295	Unknown	3	Detroit Reservoir/Blow Out Divide Cr.	Detroit Reservoir/French Cr.	within a Recovery Unit
53	7964	Unknown	17	Detroit Reservoir/Blow Out Divide Cr.	Detroit Reservoir/Kinney Cr.	within a Recovery Unit
54	00308A	Fifteen Miles Cr.	5	Fifteenmiles Cr.	Lower Fifteenmiles Cr.	within 2 miles of Critical Habitat
55	8502	Hwy 6 (Hilgard Intchg)	4	Grande Ronde R./Beaver Cr.	Grande Ronde R./Hilgard	within 2 miles of Critical Habitat
56	04841A	Grande Ronde R. (Hilgard)	3	Grande Ronde R./Beaver Cr.	Grande Ronde R./Hilgard	within 2 miles of Critical Habitat

Table 5.3.4-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
57	1996	Grande Ronde R. (Northeast Elgin)	4	Grande Ronde R./Cabin Cr.	Grande Ronde R./Partridge Cr.	within 2 miles of Critical Habitat
58	04821A	Grande Ronde R. (Island City)	3	Grande Ronde R./Five Points Cr.	Grande Ronde R./Haywire Canyon	within 2 miles of Critical Habitat
59	8431	Unknown	7	Grande Ronde R./Five Points Cr.	Grande Ronde R./Wright Slough	within 2 miles of Critical Habitat
60	08431A	Unknown	4	Grande Ronde R./Five Points Cr.	Grande Ronde R./Wright Slough	within 2 miles of Critical Habitat
61	00449A	Emigrant Hill Frtg Rd & UPRR (Glover)	5	Grande Ronde R./Five Points Cr.	Pelican Cr.	Recovery Unit & Core Area
62	8780	Grande Ronde R. & INP RR, Hwy 10 (Indian Cr.)	6	Grande Ronde R./Indian Cr.	Grande Ronde R./Lower Clark Cr.	within 2 miles of Critical Habitat
63	00800A	Grande Ronde R. (South Elgin)	6	Grande Ronde R./Indian Cr.	Grande Ronde R./Lower Clark Cr.	within 2 miles of Critical Habitat
64	7171	Private Logging Rd.	3	Hills Cr. Reservoir	Middle Fk. Willamette R. / Gray Cr.	within 2 miles of Critical Habitat
65	7894	Willamette R. (Barnard)	8	Hills Cr. Reservoir	Middle Fk. Willamette R. / Gray Cr.	within 2 miles of Critical Habitat
66	7458	UPRR	6	Hood R.	Lower Hood R.	within 2 miles of Critical Habitat
67	8662	UPRR	10	Hood R.	Lower Hood R.	within 2 miles of Critical Habitat
68	2655	John Day R. (Goose Rock)	6	John Day R./Johnson Cr.	Johnny Cr.	within 2 miles of Critical Habitat

Table 5.3.4-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
69	08203B	Unknown	3	Johnson Cr.	Tyson Cr./Willamette R.	within a Recovery Unit
70	08205R	Unknown	6	Johnson Cr.	Tyson Cr./Willamette R.	within a Recovery Unit
71	7301	Algoma Log Pond	3	Klamath Lake	3mile/4mile/5miles 1	within a Recovery Unit
72	7302	Barkley Springs Irrigation Canal	3	Klamath Lake	3mile/4mile/5miles 1	within a Recovery Unit
73	8345	USBR Canal	4	Klamath Lake	3mile/4mile/5miles 1	within a Recovery Unit
74	8352	UPRR & Pelican City Rd (Lakefront Blvd)	4	Klamath Lake	3mile/4mile/5miles 1	within a Recovery Unit
75	8510	Unknown	3	Klamath Lake	3mile/4mile/5miles 1	within a Recovery Unit
76	7696	John Day R. (Coles)	3	Laycock Cr.	Lower Beech Cr.	within 2 miles of Critical Habitat
77	7347	Unknown	7	Little N. Santiam R.	Lower Little N. Santiam R.	within a Recovery Unit
78	7929	UPRR	8	Little Walker Mountain	Corral Springs	within a Recovery Unit
79	7984	Hwy 4 SB	3	Little Walker Mountain	N. Paunina	within a Recovery Unit
80	4041	Bear Cr.	7	Long Tom R.	Long Tom R./Bear Cr.	within a Recovery Unit
81	2262	COR (Oakhill)	8	Long Tom R.	Lower Coyote Cr.	within a Recovery Unit
82	4056	Hayes Cr.	1	Long Tom R.	Upper Coyote Cr.	within a Recovery Unit
83	7573	Lostine R.	3	Lostine R.	Lower Lostine R.	within 2 miles of Critical Habitat
84	9354	Lime Intchg Conn	4	Lower Burnt R.	Burnt R./Jett Cr.	within a Recovery Unit

Table 5.3.4-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
85	01786A	Burnt R. (Dixie Cr.)	3	Lower Burnt R.	Burnt R./Jett Cr.	within a Recovery Unit
86	4728	Camas Cr.	4	Lower Camas Cr.	Bridge	within 2 miles of Critical Habitat
87	7867	UPRR Mainline	5	Lower Clackamas R.	Clackamas R. / Rock Cr.	within a Recovery Unit
88	01439A	Rock Cr.	3	Lower Clackamas R.	Clackamas R. / Rock Cr.	within a Recovery Unit
89	07736A	Camas Swale	3	Lower Coast Fk. Willamette R.	Lower Camas Swale Cr.	within a Recovery Unit
90	07736C	Camas Swale	3	Lower Coast Fk. Willamette R.	Lower Camas Swale Cr.	within a Recovery Unit
91	07739A	Hwy 1 (Creswell)	7	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Bear Cr.	within a Recovery Unit
92	07740A	Hill Cr.	1	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Bear Cr.	within a Recovery Unit
93	07740C	Hill Cr.	1	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Bear Cr.	within a Recovery Unit
94	07743A	Tunnel Mill Race	3	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Bear Cr.	within a Recovery Unit
95	07745A	Coast Fk. Willamette R.	8	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Bear Cr.	within a Recovery Unit
96	07756A	Coast Fk. Relief Opening	4	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Bear Cr.	within a Recovery Unit
97	7825	Hwy 1	5	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Hill Cr.	within a Recovery Unit

Table 5.3.4-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
98	07757A	Gettings Cr.	5	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Hill Cr.	within a Recovery Unit
99	07757B	Gettings Cr.	5	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Hill Cr.	within a Recovery Unit
100	07793A	Brown Cr.	3	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Hill Cr.	within a Recovery Unit
101	07793B	Brown Cr.	3	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Hill Cr.	within a Recovery Unit
102	5286	Coast Fk. Willamette R.	7	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Papenfus Cr.	Recovery Unit & Core Area
103	05285A	Coast Fk. Willamette R. Relief Opening	5	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Papenfus Cr.	Recovery Unit & Core Area
104	05287B	Willamette R. Relief Opening	5	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Papenfus Cr.	Recovery Unit & Core Area
105	06836A	Franklin Blvd & UPRR (Goshen)	5	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Papenfus Cr.	within 2 miles of Critical Habitat
106	07732A	Hwy 18 & Conn	6	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Papenfus Cr.	within 2 miles of Critical Habitat
107	07732B	Hwy 18 & Conn (Goshen Grade)	6	Lower Coast Fk. Willamette R.	Lower Coast Fk. Willamette R./Papenfus Cr.	within 2 miles of Critical Habitat
108	7768	BNSF (Terrebonne)	4	Lower Crooked R. Grasslands	Lower Crooked R. Gorge	within 2 miles of Critical Habitat
109	02233A	Harper Cr.	3	Lower John Day R./Kahler	Harper Cr.	within a Recovery Unit

Table 5.3.4-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
				Cr.		
110	04979A	Juniper Cr.	4	Lower John Day R./Kahler Cr.	Harper Cr.	within a Recovery Unit
111	04981A	Mathas Cr.	3	Lower John Day R./Kahler Cr.	Harper Cr.	within a Recovery Unit
112	2235	Mule Shoe Cr.	3	Lower John Day R./Service Cr.	Service Cr.	within a Recovery Unit
113	02236A	Alder Cr.	5	Lower John Day R./Service Cr.	Service Cr.	within a Recovery Unit
114	01324A	Gate Cr. (Vida)	4	Lower Mckenzie R.	Gate Cr.	within 2 miles of Critical Habitat
115	1516	EWEB Canal (Walterville)	3	Lower Mckenzie R.	Mckenzie R. / Walterville Canal	within 2 miles of Critical Habitat
116	08175N	McKenzie R. & Frtg Rd (Spores)	11	Lower Mckenzie R.	Mckenzie R. / Walterville Canal	within 2 miles of Critical Habitat
117	08175S	McKenzie R. & Frtg Rd (Spores)	11	Lower Mckenzie R.	Mckenzie R. / Walterville Canal	within 2 miles of Critical Habitat
118	08178N	McKenzie Overflow	4	Lower Mckenzie R.	Mckenzie R. / Walterville Canal	within 2 miles of Critical Habitat
119	08178S	McKenzie Overflow	4	Lower Mckenzie R.	Mckenzie R. / Walterville Canal	within 2 miles of Critical Habitat
120	7110	UPRR (Pleasant Hill)	8	Lower Middle Fk. Of Willamette R.	Rattlesnake Cr.	within 2 miles of Critical Habitat
121	8121	Santiam Overflow No 2	6	Lower N. Santiam R.	Lower N. Santiam R.	within a Recovery Unit

Table 5.3.4-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
122	8122	Santiam Overflow No 3	3	Lower N. Santiam R.	Lower N. Santiam R.	within a Recovery Unit
123	8124	Santiam Overflow No 4	5	Lower N. Santiam R.	Lower N. Santiam R.	within a Recovery Unit
124	2201	Ochoco Cr.	1	Lower Ochoco Cr.	Ochoco Main Canal\Lower Ochoco Cr.	within 2 miles of Critical Habitat
125	6875	Sandy R.	10	Lower Sandy R.	Beaver Cr.	within 2 miles of Critical Habitat
126	6945	Conn #2 (Jordan Rd)	1	Lower Sandy R.	Beaver Cr.	within 2 miles of Critical Habitat
127	06875A	Sandy R.	10	Lower Sandy R.	Beaver Cr.	within 2 miles of Critical Habitat
128	06945A	Conn #2 (Jordan Rd)	1	Lower Sandy R.	Beaver Cr.	within 2 miles of Critical Habitat
129	00815A	Trout Cr., Hwy 4	5	Lower Trout Cr.	Trout Cr.	Recovery Unit & Core Area
130	2285	SW Canyon Rd (Sylvan)	4	Lower Tualatin R.	Fanno Cr.	within a Recovery Unit
131	16453	Hwy 70 EB	3	Lower Umatilla R.	Lower Umatilla R./Columbia R.	within 2 miles of Critical Habitat
132	16454	Hwy 70 EB	3	Lower Umatilla R.	Lower Umatilla R./Columbia R.	within 2 miles of Critical Habitat
133	2184	Wallowa R. (Bear Cr.)	5	Lower Wallowa R.	Wallowa R./Water Canyon	within 2 miles of Critical Habitat
134	02585A	Kern Cr.	1	Lower Willow Cr.	Kern Cr.	within a Recovery Unit
135	02586A	Lancaster Cr.	1	Lower Willow Cr.	Kern Cr.	within a Recovery Unit
136	8616	Hwy 1W SB	10	Marys R.	Lower Marys R.	within a Recovery Unit
137	8617	WPRR	3	Marys R.	Lower Marys R.	within a Recovery Unit

Table 5.3.4-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
138	01075A	Marys R. (Noon)	3	Marys R.	Middle Marys R.	within a Recovery Unit
139	01205A	Harris Rd & WPRR (Wren Conn)	6	Marys R.	Upper Marys R.	within a Recovery Unit
140	00866B	Marys R. & WPRR	6	Marys R.	Upper Marys R. / Horton Cr.	within a Recovery Unit
141	8050	McKay Cr.	3	Mckay Cr.	Mckay Cr./Umatilla R.	Recovery Unit & Core Area
142	01323A	Blue R. Bridge	2	Mckenzie R./Quartz Cr.	Mckenzie R. / Elk Cr.	within 2 miles of Critical Habitat
143	08498E	Frtg Rd & UPRR (Meacham)	6	Meacham Cr.	Beaver Cr.	Recovery Unit & Core Area
144	08498W	Frtg Rd & UPRR (Meacham)	6	Meacham Cr.	Beaver Cr.	Recovery Unit & Core Area
145	8605	Hwy 2 WB Conn to Hwy 100	4	Middle Columbia/Eagle Cr.	Carson Cr.	within 2 miles of Critical Habitat
146	8610	Moody St (Cascade Locks)	5	Middle Columbia/Eagle Cr.	Carson Cr.	within 2 miles of Critical Habitat
147	8623	Herman Cr. Conn	3	Middle Columbia/Eagle Cr.	Carson Cr.	within 2 miles of Critical Habitat
148	08605W	Hwy 2 WB Conn to Hwy 100	3	Middle Columbia/Eagle Cr.	Carson Cr.	within 2 miles of Critical Habitat
149	08610W	Moody St (Cascade Locks)	5	Middle Columbia/Eagle Cr.	Carson Cr.	within 2 miles of Critical Habitat
150	07403A	Herman Cr.	3	Middle Columbia/Eagle Cr.	Herman Cr.	within 2 miles of Critical Habitat

Table 5.3.4-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
151	8534	Conn Viento Intchg	3	Middle Columbia/Grays Cr.	Grays Cr.	within 2 miles of Critical Habitat
152	8604	Conn (Wyeth Intchg)	3	Middle Columbia/Grays Cr.	Grays Cr.	within 2 miles of Critical Habitat
153	07496A	Jaymar Rd (Westcliff Dr)	3	Middle Columbia/Grays Cr.	Grays Cr.	within 2 miles of Critical Habitat
154	7398	Conn 2	3	Middle Columbia/Grays Cr.	Rowena Cr.	within 2 miles of Critical Habitat
155	8276	Hostetler Way Conn	3	Middle Columbia/Mill Cr.	Columbia R./Murdock	within 2 miles of Critical Habitat
156	7771	The Dalles Dam Access Conn	1	Middle Columbia/Mill Cr.	Middle Columbia/Threemiles Cr.	within 2 miles of Critical Habitat
157	6768	Lost Cr.	5	Middle Fk. Willamette/Lookout Point	Lost Cr.	within 2 miles of Critical Habitat
158	00665B	Alder Cr.	3	Middle Sandy R.	Lower Middle Sandy R.	within a Recovery Unit
159	00689B	Wildcat Cr.	3	Middle Sandy R.	Upper Middle Sandy R.	within a Recovery Unit
160	2015	Unknown	3	Mill Cr./S. Yamhill R.	Lower Mill Cr.	within a Recovery Unit
161	01756A	Unknown	5	Mill Cr./S. Yamhill R.	Lower Mill Cr.	within a Recovery Unit
162	8076	Unknown	3	Mill Cr./Willamette R.	Beaver Cr.	within a Recovery Unit
163	7439	Mill Cr.	3	Mill Cr./Willamette R.	Lower Mill Cr./Willamette R.	within a Recovery Unit
164	07439A	Mill Cr.	3	Mill Cr./Willamette R.	Lower Mill Cr./Willamette R.	within a Recovery Unit

Table 5.3.4-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
165	07524B	Commercial St SE	3	Mill Cr./Willamette R.	Mckinney Cr.	within a Recovery Unit
166	8069	Unknown	3	Mill Cr./Willamette R.	Upper Mill Cr./Willamette R.	within a Recovery Unit
167	8070	Unknown	3	Mill Cr./Willamette R.	Upper Mill Cr./Willamette R.	within a Recovery Unit
168	5192	Minam Viaduct	8	Minam R.	Lower Minam R.	within 2 miles of Critical Habitat
169	01038A	Wallowa R.	6	Minam R.	Lower Minam R.	within 2 miles of Critical Habitat
170	7393	Mosier Cr.	3	Mosier Cr.	Lower Mosier Cr.	within 2 miles of Critical Habitat
171	07626A	Unknown	4	Mosier Cr.	Lower Mosier Cr.	within 2 miles of Critical Habitat
172	7392	Rock Cr.	3	Mosier Cr.	Rock Cr.	within 2 miles of Critical Habitat
173	7397	Unknown	3	Mosier Cr.	Rock Cr.	within 2 miles of Critical Habitat
174	08171N	Muddy Cr.	3	Muddy Cr.	Lower Muddy Cr. / Dry Muddy Cr.	within a Recovery Unit
175	08171S	Muddy Cr.	3	Muddy Cr.	Lower Muddy Cr. / Dry Muddy Cr.	within a Recovery Unit
176	8329	Willamette R. & Hwy 15 & UPRR	19	Muddy Cr.	Upper Willamette / Spring Cr.	within 2 miles of Critical Habitat
177	8445	Hwy 1	7	Muddy Cr.	Upper Willamette / Spring Cr.	within 2 miles of Critical Habitat
178	8870	Hwy 225 Conn (McVay Access)	1	Muddy Cr.	Upper Willamette / Spring Cr.	within 2 miles of Critical Habitat
179	9587	Unknown	4	Muddy Cr.	Upper Willamette / Spring Cr.	within 2 miles of Critical Habitat

Table 5.3.4-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
180	08180N	McKenzie Overflow	3	Muddy Cr.	Upper Willamette / Spring Cr.	within 2 miles of Critical Habitat
181	08180S	McKenzie Overflow	3	Muddy Cr.	Upper Willamette / Spring Cr.	within 2 miles of Critical Habitat
182	08182N	UPRR (Abandoned) & Game Farm Rd	6	Muddy Cr.	Upper Willamette / Spring Cr.	within 2 miles of Critical Habitat
183	08182S	UPRR (Abandoned) & Game Farm Rd	6	Muddy Cr.	Upper Willamette / Spring Cr.	within 2 miles of Critical Habitat
184	4729	N. Fk. John Day R. (Dale)	5	N. Fk. John Day R./Potamus Cr.	Deerhorn	within 2 miles of Critical Habitat
185	07292B	UPRR (North Powder)	3	N. Powder R.	Lower N. Powder R.	within 2 miles of Critical Habitat
186	9413	Calapooia Overflow	5	Oak Cr.	Calapooia R.	within a Recovery Unit
187	9414	Calapooia Overflow	3	Oak Cr.	Calapooia R.	within a Recovery Unit
188	12205B	Calapooia R.	8	Oak Cr.	Calapooia R.	within a Recovery Unit
189	08226N	AERC (Tallman Branch)	5	Oak Cr.	Lower Oak Cr.	within a Recovery Unit
190	08226S	AERC (Tallman Branch)	5	Oak Cr.	Lower Oak Cr.	within a Recovery Unit
191	08227N	Oak Cr.	3	Oak Cr.	Lower Oak Cr.	within a Recovery Unit
192	08227S	Oak Cr.	3	Oak Cr.	Lower Oak Cr.	within a Recovery Unit
193	8217	Murder Cr.	3	Oak Cr.	Upper Willamette R.	within a Recovery Unit
194	8223	Unknown	6	Oak Cr.	Upper Willamette R.	within a Recovery Unit

Table 5.3.4-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
195	08218A	Murder Cr. Rd	3	Oak Cr.	Upper Willamette R.	within a Recovery Unit
196	08218B	Hwy 1 SB over	3	Oak Cr.	Upper Willamette R.	within a Recovery Unit
197	08221A	Knox Butte Rd (N. Albany Intchg)	3	Oak Cr.	Upper Willamette R.	within a Recovery Unit
198	08221B	Hwy 58 NB (N. Albany Intchg)	4	Oak Cr.	Upper Willamette R.	within a Recovery Unit
199	08221C	Knox Butte Rd (N. Albany Intchg)	3	Oak Cr.	Upper Willamette R.	within a Recovery Unit
200	08221D	Hwy 58 NB (N. Albany Intchg)	4	Oak Cr.	Upper Willamette R.	within a Recovery Unit
201	08221E	Knox Butte Rd (N Albany Int)	3	Oak Cr.	Upper Willamette R.	within a Recovery Unit
202	08222N	Cox Cr.	3	Oak Cr.	Upper Willamette R.	within a Recovery Unit
203	08222S	Cox Cr.	3	Oak Cr.	Upper Willamette R.	within a Recovery Unit
204	08302E	Conn & UPRR (Encina Intchg)	5	Powder R./Salisbury	Ebell Cr.	Recovery Unit & Core Area
205	08302W	Conn & UPRR (Encina Intchg)	5	Powder R./Salisbury	Ebell Cr.	Recovery Unit & Core Area
206	7316	Powder R. (Rancheria)	3	Powder R./Salisbury	Powder R./Stices Gulch	within 2 miles of Critical Habitat
207	7431	Powder R. (Salisbury)	3	Powder R./Salisbury	Powder R./Stices Gulch	within 2 miles of Critical Habitat

Table 5.3.4-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
208	7987	Pritchard Cr. & UPRR	6	Pritchard Cr.	Pritchard Cr.	within a Recovery Unit
209	07987A	Pritchard Cr. & UPRR	6	Pritchard Cr.	Pritchard Cr.	within a Recovery Unit
210	08423E	Alder Cr. Rd	3	Pritchard Cr.	Upper Alder Cr.	Recovery Unit & Core Area
211	08423W	Alder Cr. Rd	3	Pritchard Cr.	Upper Alder Cr.	Recovery Unit & Core Area
212	7941	Unknown	5	Rickreall Cr.	Bashaw Cr.	within a Recovery Unit
213	02734A	Rock Cr. (Picture Gorge)	3	Rock Cr.	Lower Rock Crek	within 2 miles of Critical Habitat
214	7830	OP&ERR (Abandoned)	3	Row R.	Row R./Dorena Lake	within a Recovery Unit
215	7832	Unknown	6	Row R.	Row R./Dorena Lake	within a Recovery Unit
216	07828B	Cr.	3	Row R.	Row R./Dorena Lake	within a Recovery Unit
217	07829A	Row R.	5	Row R.	Row R./Dorena Lake	within a Recovery Unit
218	07833A	Row R. Rd	3	Row R.	Row R./Dorena Lake	within a Recovery Unit
219	07833B	Row R. Rd	3	Row R.	Row R./Dorena Lake	within a Recovery Unit
220	07871A	Row R. Overflow	6	Row R.	Row R./Dorena Lake	within a Recovery Unit
221	07871B	Row R. Overflow	6	Row R.	Row R./Dorena Lake	within a Recovery Unit
222	1706	Soda Fk.	3	S. Santiam R.	Soda Fk.	within a Recovery Unit
223	7333	Unknown	16	Salmon Cr.	Vancouver	within 2 miles of Critical Habitat
224	2001	Unknown	3	Salt Cr./S. Yamhill R.	Upper Salt Cr.	within a Recovery Unit

Table 5.3.4-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
225	7188	Half Viaduct	9	Salt Cr./Willamette R.	Middle Salt Cr.	Recovery Unit & Core Area
226	7970	Hwy 6	5	Snake R./Jacobsen Gulch	Jacobsen Gulch	within a Recovery Unit
227	7971	Doman Rd.	3	Snake R./Jacobsen Gulch	Jacobsen Gulch	within a Recovery Unit
228	08107E	Snake R.	10	Snake R./Locket Gulch	Plummer Slough	within a Recovery Unit
229	08107W	Snake R.	10	Snake R./Locket Gulch	Plummer Slough	within a Recovery Unit
230	08397E	UPRR (Ore-Ida)	3	Snake R./Locket Gulch	Plummer Slough	within a Recovery Unit
231	08397W	UPRR (Ore-Ida)	3	Snake R./Locket Gulch	Plummer Slough	within a Recovery Unit
232	01961A	Stinkingwater Cr.	3	Stinkingwater Cr.	Lower Stinkingwater Cr.	Recovery Unit & Core Area
233	2463	Indian Cr.	3	Strawberry Cr.	Castle Cr.	within 2 miles of Critical Habitat
234	2466	Dixie Cr. (Prairie City)	3	Strawberry Cr.	Dixie Meadows	within 2 miles of Critical Habitat
235	9314	Hwy 6 (Stanfield Jct Intchg)	4	Umatilla R./Alkali Canyon	Furnish Ditch/Umatilla R.	within 2 miles of Critical Habitat
236	9636	Unknown	4	Umatilla R./Mission Cr.	Mission Cr.	within 2 miles of Critical Habitat
237	07809A	Coast Fk. Willamette R.	5	Upper Coast Fk. Willamette R.	Upper Coast Fk. Willamette R./Martin Cr.	within a Recovery Unit
238	07809B	Coast Fk. Willamette R.	5	Upper Coast Fk. Willamette R.	Upper Coast Fk. Willamette R./Martin Cr.	within a Recovery Unit
239	07810A	Latham Rd	4	Upper Coast Fk. Willamette R.	Upper Coast Fk. Willamette R./Martin Cr.	within a Recovery Unit

Table 5.3.4-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
240	07810B	Latham Rd	4	Upper Coast Fk. Willamette R.	Upper Coast Fk. Willamette R./Martin Cr.	within a Recovery Unit
241	07861B	Martin Cr.	3	Upper Coast Fk. Willamette R.	Upper Coast Fk. Willamette R./Martin Cr.	within a Recovery Unit
242	7860	Hwy 1	6	Upper Coast Fk. Willamette R.	Upper Coast Fk. Willamette R./Silk Cr.	within a Recovery Unit
243	7863	Row R. Rd	4	Upper Coast Fk. Willamette R.	Upper Coast Fk. Willamette R./Silk Cr.	within a Recovery Unit
244	07863A	Row R. Rd	4	Upper Coast Fk. Willamette R.	Upper Coast Fk. Willamette R./Silk Cr.	within a Recovery Unit
245	07864A	16th Street (Landess Rd)	3	Upper Coast Fk. Willamette R.	Upper Coast Fk. Willamette R./Silk Cr.	within a Recovery Unit
246	07865A	Taylor Ave	3	Upper Coast Fk. Willamette R.	Upper Coast Fk. Willamette R./Silk Cr.	within a Recovery Unit
247	7454	Crescent Conn	3	Upper Little Deschutes R.	Gilchrist	within 2 miles of Critical Habitat
248	01962A	Middle Fk. Malheur R.	4	Upper Malheur R./Warm Springs Reservoir	Cottonwood Cr.	within 2 miles of Critical Habitat
249	8893	Spanish Hollow Cr.	3	Upper Middle Columbia/Hood	Spanish Hollow Cr.	within 2 miles of Critical Habitat
250	8894	Spanish Hollow Cr.	3	Upper Middle Columbia/Hood	Spanish Hollow Cr.	within 2 miles of Critical Habitat
251	5978	Unknown	3	Upper N. Santiam R.	Boulder Cr./Marys Cr.	within a Recovery Unit

Table 5.3.4-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
252	6806	Unknown	3	Upper N. Santiam R.	Bugaboo Cr. / Minto Cr.	within a Recovery Unit
253	2553	Marks Cr.	3	Upper Ochoco Cr.	Lower Marks Cr.	within a Recovery Unit
254	7649	Marks Cr.	3	Upper Ochoco Cr.	Lower Marks Cr.	within a Recovery Unit
255	745	Unknown	5	Upper S. Yamhill R.	Gold Cr.	within a Recovery Unit
256	2081	Unknown	3	Upper S. Yamhill R.	Gold Cr.	within a Recovery Unit
257	4573	Unknown	3	Upper S. Yamhill R.	Rogue Cr.	within a Recovery Unit
258	01612A	Unknown	3	Upper S. Yamhill R.	Rowell Cr.	within a Recovery Unit
259	7366	Unknown	3	Willamette R./Chehalem Cr.	Croisan Cr.	within a Recovery Unit
260	8889	Unknown	7	Willamette R./Chehalem Cr.	Croisan Cr.	within a Recovery Unit
261	00123K	Unknown	33	Willamette R./Chehalem Cr.	Croisan Cr.	within a Recovery Unit
262	07253B	Unknown	35	Willamette R./Chehalem Cr.	Croisan Cr.	within a Recovery Unit
263	07253R	Unknown	8	Willamette R./Chehalem Cr.	Croisan Cr.	within a Recovery Unit
264	07440A	UPRR Main Line	3	Willamette R./Chehalem Cr.	Croisan Cr.	within a Recovery Unit
265	07441A	Marietta St SE	4	Willamette R./Chehalem	Croisan Cr.	within a Recovery Unit

Table 5.3.4-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC	Location
				Cr.		
266	07522A	Turner Rd SE	3	Willamette R./Chehalem Cr.	Croisan Cr.	within a Recovery Unit
267	07538A	Boone Rd SE	3	Willamette R./Chehalem Cr.	Croisan Cr.	within a Recovery Unit
268	07855E	Hwy 72 (Salem Pkwy)	4	Willamette R./Chehalem Cr.	Glenn Cr.	within a Recovery Unit
269	6884	Spring Cr.	3	Williamson R. Below Klamath Marsh	Williamson R/Spring	Recovery Unit & Core Area
270	6886	Hwy 422 (Chiloquin)	3	Williamson R. Below Klamath Marsh	Williamson/Sprague R.s	Recovery Unit & Core Area
271	2269	BNSF	3	Willow Cr.	Lower Willow Cr.	Recovery Unit & Core Area
272	8600	Irrigation Canal	3	Willow Cr.	Lower Willow Cr.	Recovery Unit & Core Area
273	00971A	Willow Cr.	1	Willow Cr.	Lower Willow Cr.	Recovery Unit & Core Area
274	03026A	Zig Zag R.	3	Zigzag R.	Zigzag Canyon	within a Recovery Unit

Table 5.3.4-2. Summary of program bridges in the bull trout Columbia River DPS and Klamath River DPS by ecoregion.

Ecoregion	Columbia River DPS	Klamath River DPS
	Bridges	
Blue Mountains	33	N/A
Coast Range	3	N/A
Columbia Basin	9	N/A
East Cascades	12	7
Lava Plains	22	N/A
Owyhee Uplands	10	N/A
West Cascades	28	N/A
Willamette Valley	147	N/A
Total	264	7
Permanent Streambank Disturbance (River Miles)	2	0.02
Temporary Streambank Disturbance (River Miles)	15	0.1

Within the Hood River Basin recovery unit, there are 24 bridges. Five bridges occur in, or within 2 miles of, the Hood River core area. All of the bridges located within 2 miles of this core area are also within 2 miles of proposed critical habitat. Sixteen bridges occur within 2 miles of proposed critical habitat but are greater than 2 miles from any core area.

Within the John Day River Basin recovery unit, there are 19 bridges. Eleven bridges occur in, or within 2 miles of, the John Day River core area. Of the bridges located within 2 miles of this core area, eight bridges also occur within 2 miles of proposed critical habitat.

Within the Lower Columbia River Basin recovery unit, there are six bridges, none of which are in, or within 2 miles of, a core area. However, all six bridges within this recovery unit are within 2 miles of critical habitat.

Within the Malheur River Basin recovery unit, there are four bridges. Two bridges occur in, or within 2 miles of, the Malheur River core area. Of the bridges located within 2 miles of this core area, one bridge also occurs within 2 miles of proposed critical habitat.

Within the Odell Lake recovery unit, there is one bridge. This bridge occurs in, or within 2 miles of, the Odell Lake core area. This bridge is also within 2 miles of proposed critical habitat.

Within the Umatilla-Walla Walla River Basins recovery unit, there are eight bridges, all of which occur in, or within 2 miles of, the Umatilla River core area. Of the bridges located within 2 miles of this core area, four bridges also occur within 2 miles of proposed critical habitat.

Within the Willamette River Basin recovery unit, there are 156 bridges. Twenty-six bridges occur in, or within 2 miles of the Upper Willamette River core area. Of the bridges located within 2 miles of this core area, 22 bridges also occur within 2 miles of proposed critical habitat. Two bridges occur within 2 miles of proposed critical habitat but are greater than 2 miles from any core area.

The 80 bridges that occur in or within 2 miles of a core area have the potential to affect bull trout of the Columbia River DPS and their habitat. The greatest concentration of bridges occurs in the Blue Mountains ecoregion, which accounts for 34% percent of the total API for bridges where repair and replacement activities may affect Columbia River bull trout as a result of the proposed action (Table 5.3.4-1).

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, likely to adversely affect** for the Columbia River Bull Trout DPS. Approximately 80 bridges within this DPS are located in or within 2 miles of a core area and will require isolation of the in-water work area. The isolation of in-water work areas may cause local and temporary reductions in water quality and may necessitate the handling of juvenile bull trout. It is expected that lethal take may occur—of six percent or less of the anticipated 20 bull trout at each bridge—as a result of handling stress or injury, or from unforeseen take resulting from bridge construction. Therefore, potentially up to 1,600 bull trout will be handled for all bridge replacement and repair work within the DPS.

Streambank disturbance occurring during bridge work within the Columbia River Bull Trout DPS may have indirect effects on bull trout of this DPS. This disturbance area was estimated in the same manner as it was for anadromous fish (Section 5.2.3). The total amount of permanent streambank disturbance at the 80 bridges where the proposed action may affect the DPS is approximately 3,200 feet, or 0.6 river mile. The total amount of temporary streambank disturbance that may affect the DPS is approximately 24,000 feet, or 4.5 river miles. The area of riparian disturbance that may affect this DPS will not exceed 82 acres.

After reviewing the best available scientific and commercial information available regarding the current status of the Columbia River Bull Trout DPS, the environmental baseline for the action area, the effects of the proposed action, the environmental performance standards proposed, and the cumulative effects, ODOT/FHWA makes a determination of **may affect, not likely to adversely affect** proposed critical habitat. These conclusions are based on the following considerations: (1) the Bridge Program requires individual review of each project to ensure that the proposed action will be in compliance with the environmental performance standards identified herein, and that each applicable standard is included as an enforceable condition of the permit and contract documents; (2) the cumulative effect of the conservation measures applied to each project will ensure that any short-term effects on water quality, habitat access, habitat elements, channel conditions and dynamics, flows, and watershed conditions are brief, minor, and scheduled to occur at the times that are least sensitive for the species' life-cycle (i.e.,

designated in-water work periods); (3) the ecological design approach that will be applied to each program bridge to protect and stimulate natural habitat-forming processes is expected to result in many projects that will have long-term beneficial effects on aquatic habitat parameters (e.g., the removal of bridge piers from the active channel and reductions in riprap); and (4) the individual and combined effects of all actions permitted are not expected to impair currently properly functioning habitats, appreciably reduce the functioning of already impaired habitats, or retard the long-term progress of impaired habitats toward the properly functioning condition essential to survival and recovery at the population or DPS scale.

Klamath River Bull Trout DPS

There are seven bridges within the range of the Klamath River DPS for bull trout. All of these bridges are located within the East Cascades ecoregion. Within the Klamath River Basin recovery unit, two bridges occur in, or within 2 miles of, the Upper Klamath core area. However, none of these bridges are located within 2 miles of proposed critical habitat. Five bridges occur outside of proposed critical habitat and are greater than 2 miles from any core area. The two bridges that meet these criteria have the potential to affect bull trout of the Klamath River DPS and their habitat (Table 5.3.4-1).

Of the bridges occurring within the Klamath River DPS for bull trout, five are located in the Klamath Lake watershed, and two are located within the Williamson River watershed below Klamath March. The greatest concentration of bridges occurs in the Klamath Lake watershed, which accounts for 67% of the total API for program bridges with the potential to affect this DPS.

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, likely to adversely affect** for the Klamath River Bull Trout DPS. Approximately two bridges within this DPS are located in or within 2 miles of a core area and/or are located in or within 2 miles and will require isolation of the in-water work area. The isolation of in-water work areas may cause local and temporary reductions in water quality and may necessitate the handling of juvenile bull trout. It is expected that lethal take may occur—of six percent or less of the anticipated 20 bull trout at each bridge—as a result of handling stress or injury, or from unforeseen takings resulting from bridge construction. Therefore, it is expected that up to 40 bull trout will be handled for all bridge replacement and repair work within the DPS, and that a maximum lethal taking of three Klamath River bull trout may occur as a result of bridge work within the DPS.

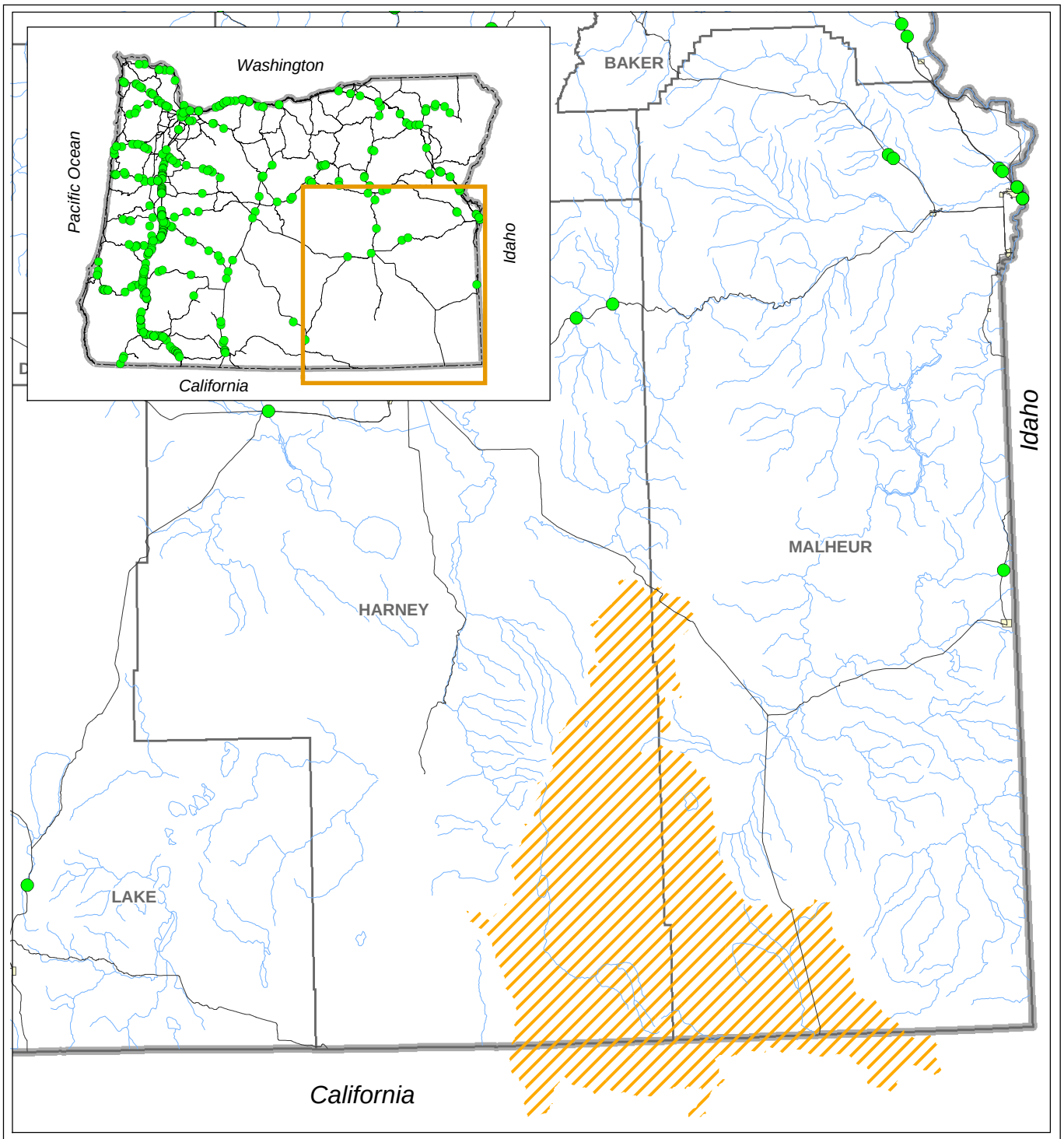
Streambank disturbance occurring as a result of bridge work within the Klamath River Bull Trout DPS may have indirect effects on bull trout of this DPS. The total amount of permanent streambank disturbance at the two bridges where the proposed action may affect the DPS is approximately 80 feet, or 0.02 river mile. The total amount of temporary streambank disturbance that may affect the DPS is approximately 600 feet, or 0.1 river mile. The area of riparian disturbance that may affect this DPS will not exceed 2 acres.

After reviewing the best available scientific and commercial information available regarding the current status of the Klamath River Bull Trout DPS, the environmental baseline for the action

area, the effects of the proposed action, the environmental performance standards proposed, and the cumulative effects, ODOT/FHWA makes a determination of **may affect, not likely to adversely affect** proposed critical habitat. These conclusions are based on the following considerations: (1) the Bridge Program requires individual review of each project to ensure that the proposed action will be in compliance with the environmental performance standards identified herein, and that each applicable standard is included as an enforceable condition of the permit and contract documents; (2) the cumulative effect of the conservation measures applied to each project will ensure that any short-term effects on water quality, habitat access, habitat elements, channel conditions and dynamics, flows, and watershed conditions are brief, minor, and scheduled to occur at the times that are least sensitive for the species' life-cycle (i.e., designated in-water work periods); (3) the ecological design approach that will be applied to each program bridge to protect and stimulate natural habitat-forming processes is expected to result in many projects that will have long-term beneficial effects on aquatic habitat parameters (e.g., the removal of bridge piers from the active channel and reductions in riprap); and (4) the individual and combined effects of all actions permitted are not expected to impair currently properly functioning habitats, appreciably reduce the functioning of already impaired habitats, or retard the long-term progress of impaired habitats toward the properly functioning condition essential to survival and recovery at the population or DPS scale.

5.3.5 Lahontan Cutthroat Trout

On July 16, 1975 the Lahontan cutthroat trout was designated as Federally threatened in its entire range (July 16, 1975 40 FR 29863). Critical habitat has not been designated for this species. According to the Lahontan cutthroat trout recovery plan, Oregon populations of Lahontan cutthroat trout are limited to the Upper Quinn and Alvord 4th field HUCs (USFWS 1994) (Figure 5.3.5-1). The proposed action does not involve bridge work within the Upper Quinn and Alvord 4th field HUCs. Therefore, given the location of known populations of this species and the range of bridge work proposed, the proposed action will have **No Effect** on the Lahontan cutthroat trout.



OTIA III Bridges

- Potential to Affect
- No Potential to Affect
- Lahontan Cutthroat Trout
- Streams and Rivers
- City
- County
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

N W E S

0 4 8 16 24 32 40

Miles

Figure 5.3.5-1

OTIA III: Statewide Bridge Delivery Program
Lahontan Cutthroat Trout

MB&G

Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

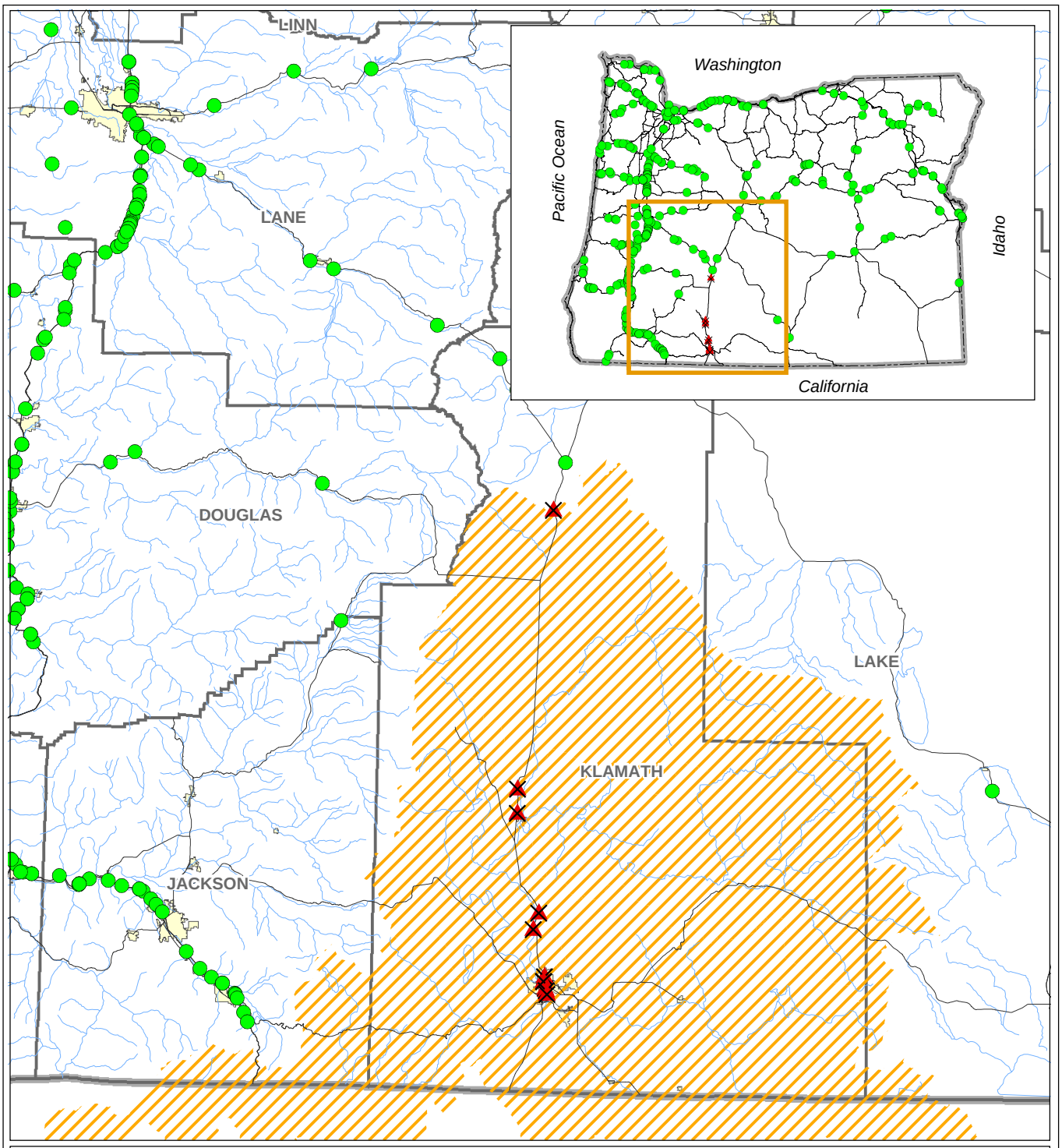
Spatial Data Source: See Document Bibliography.

noeffect\BA_figures\lc_trout.mxd. Mar 1, 2004

5.3.6 Shortnose Sucker

There are 11 bridges within the range of the shortnose sucker (Figure 5.3.6-1; Table 5.3.6-1). Of these, ten bridges are within the species' range, while one is outside of the species' range, but within 2 miles and spans a stream that drains to the species' range. All of these bridges are located within the East Cascades ecoregion Table 5.3.6-2.

Within the range of the shortnose sucker, two bridges occur in the Williamson River 4th field HUC, no bridges occur in the Sprague River 4th field HUC, five bridges occur in the Upper Klamath Lake 4th field HUC, no bridges occur in the Upper Klamath River 4th field HUC, and three bridges occur in the Lost River 4th field HUC. Within the species' range, the greatest concentration of bridges occurs in the Upper Klamath Lake watershed, which accounts for 41% of the total API for the shortnose sucker resulting from proposed ODOT bridge repair and replacement activities.



OTIA III Bridges

- Potential to Affect - Within Range
- Potential to Affect - Within 2 Miles of Range
- No Potential to Affect
- Shortnose Sucker Population Range
- County
- Streams and Rivers
- City
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.3.6-1

OTIA III: Statewide Bridge Delivery Program Shortnose Sucker

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Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
screening/BA Figures/s_sucker.mxd. Mar 1, 2004

Table 5.3.6-1. Program Bridge projects that may affect the Shortnose Sucker DPS.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC
1	7301	Algoma Log Pond	3	Klamath Lake	3mile/4mile/5mile 1
2	7302	Barkley Springs Irrigation Canal	3	Klamath Lake	3mile/4mile/5mile 1
3	8345	USBR Canal	4	Klamath Lake	3mile/4mile/5mile 1
4	8352	UPRR & Pelican City Rd (Lakefront Blvd)	4	Klamath Lake	3mile/4mile/5mile 1
5	8510	Unknown	3	Klamath Lake	3mile/4mile/5mile 1
6	8346	Oxing California Ave (Klamath Falls)	8	Lake Ewauna/Upper Klamath R.	Lake Ewauna
7	9692	Green Springs Dr (Old Alignment) & BNSF	5	Lake Ewauna/Upper Klamath R.	Lake Ewauna
8	08347A	Unknown	6	Lake Ewauna/Upper Klamath R.	Lake Ewauna
9	7929	UPRR	8	Little Walker Mountain	Corral Springs
10	6884	Spring Cr.	3	Williamson R. Below Klamath Marsh	Williamson R./Spring
11	6886	Hwy 422 (Chiloquin)	3	Williamson R. Below Klamath Marsh	Williamson/Sprague R.

Note: All bridges are located within the DPS.

Table 5.3.6-2. Shortnose and Lost River sucker screening summary table.

4th Field HUC	Bridges
Williamson River	2
Sprague River	0
Upper Klamath Lake	5
Upper Klamath River	0
Lost River	3
Total	10
Gross Acreage	3,800
Net Acreage	3,100
Permanent Streambank Disturbance (River Miles)	0.08
Temporary Streambank Disturbance (River Miles)	0.6

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, likely to adversely affect** for the shortnose sucker. Approximately 11 bridges within the range of the species or within 2 miles of the range and span a stream that drains to the species' range will require isolation of the in-water work area. The isolation of in-water work areas may cause local and temporary reductions in water quality and may necessitate the handling of juvenile shortnose suckers. It is expected that lethal take may occur—of six percent or less of the anticipated 20 shortnose suckers at each bridge—as a result of handling stress or injury, or from unforeseen takings resulting from bridge construction. Therefore, it is expected that up to 220 juvenile shortnose suckers will be handled for all bridge replacement and repair work within the range of the species, and that a maximum lethal taking of 13 juvenile shortnose suckers may occur as a result of bridge work within the species' range.

Streambank disturbance occurring from bridge work within the shortnose sucker population may have indirect effects on the shortnose sucker. The total amount of permanent streambank disturbance at the 11 bridges where the proposed action may affect the range of the shortnose sucker is approximately 440 feet (0.08 river mile). The total amount of temporary streambank disturbance that may affect the range of the shortnose sucker is approximately 3,330 feet (0.6 river mile). The area of riparian disturbance that may affect this population will not exceed 11.5 acres.

After reviewing the best available scientific and commercial information regarding the current status of the shortnose sucker, the environmental baseline for the action area, the effects of the proposed action, the environmental performance standards proposed, and the cumulative effects,

ODOT/FHWA makes a determination of **may affect, not likely to adversely affect** proposed critical habitat. These conclusions are based on the following considerations: (1) the Bridge Program requires individual review of each project to ensure that the proposed action will be in compliance with the environmental performance standards identified herein, and that each applicable standard is included as an enforceable condition of the permit and contract documents; (2) the cumulative effect of the conservation measures applied to each project will ensure that any short-term effects on water quality, habitat access, habitat elements, channel conditions and dynamics, flows, and watershed conditions are brief, minor, and scheduled to occur at the times that are least sensitive for the species' life-cycle (i.e., designated in-water work periods); (3) the ecological design approach that will be applied to each program bridge to protect and stimulate natural habitat-forming processes is expected to result in many projects that will have long-term beneficial effects on aquatic habitat parameters (e.g., the removal of bridge piers from the active channel and reductions in riprap); and (4) the individual and combined effects of all actions permitted are not expected to impair currently properly functioning habitats, appreciably reduce the functioning of already impaired habitats, or retard the long-term progress of impaired habitats toward the properly functioning condition essential to survival and recovery at the population or species' range scale.

5.3.7 Lost River Sucker

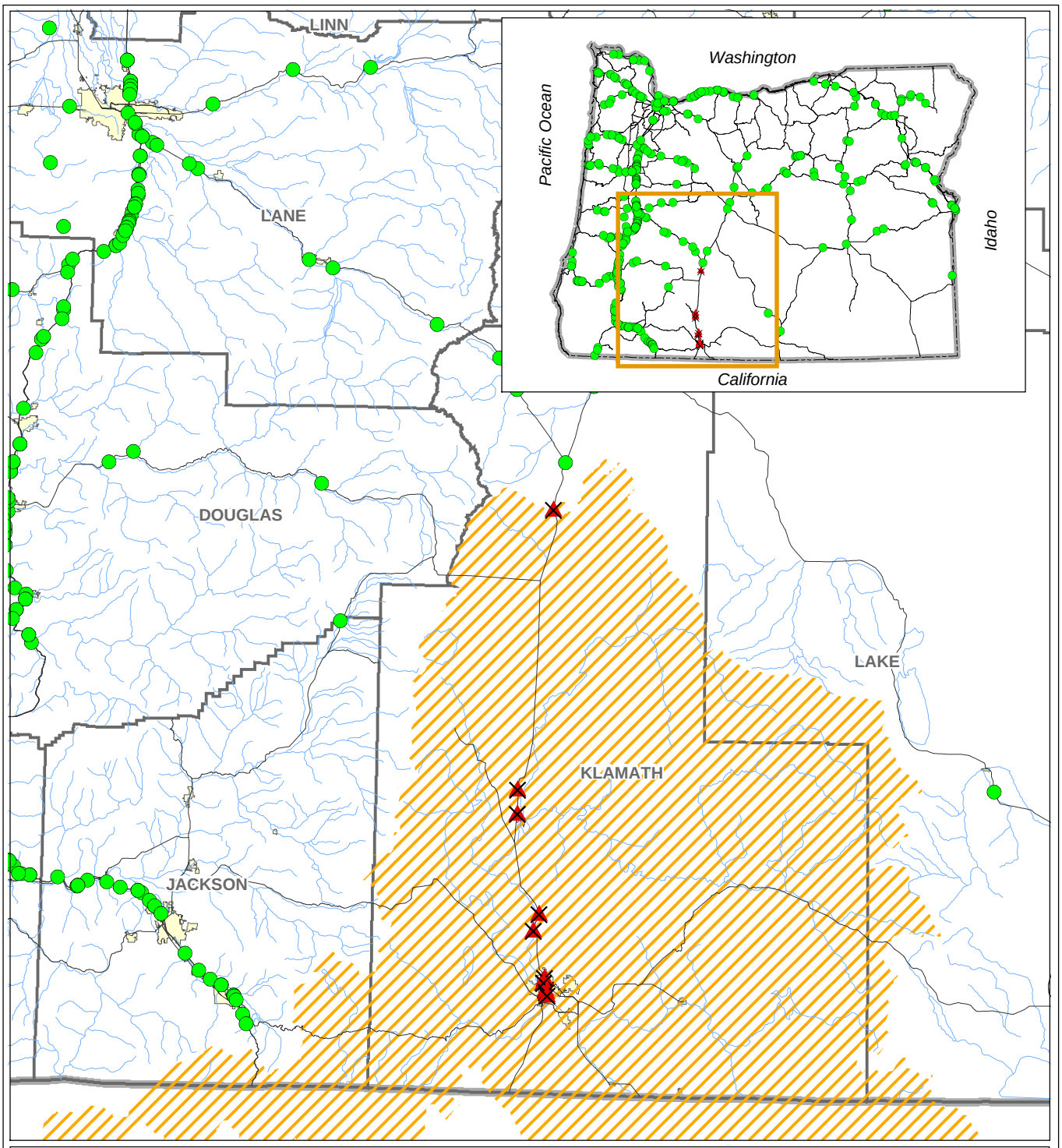
There are 11 bridges within the range of the Lost River sucker (Figure 5.3.7-1; Table 5.3.7-1). Of these, 10 are within the species' range, while one is outside of the species' range, but is within 2 miles and drains to the species' range. All of these bridges are located within the East Cascades ecoregion (shown previously in Table 5.3.6-2).

Within the range of the Lost River sucker, two bridges occur in the Williamson River 4th field HUC, no bridges occur in the Sprague River 4th field HUC, five bridges occur in the Upper Klamath Lake 4th field HUC, no bridges occur in the Upper Klamath River 4th field HUC, and three bridges occur in the Lost River 4th field HUC. Within the species' range, the greatest concentration of bridges occurs in the Upper Klamath Lake watershed, which accounts for 41% of the total API for the Lost River sucker resulting from proposed ODOT bridge repair and replacement activities.

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect likely to adversely affect** for the Lost River sucker. Approximately 11 bridges within the range of the species or within 2 miles of the range and spanning a stream that drains to the species' range will require isolation of the in-water work area. The isolation of in-water work areas may cause local and temporary reductions in water quality and may necessitate the handling of juvenile Lost River suckers. It is expected that lethal take may occur—of six percent or less of the anticipated 20 Lost River suckers at each bridge—as a result of handling stress or injury, or from unforeseen takings resulting from bridge construction. Therefore, it is expected that up to 220 juvenile Lost River suckers will be handled for all bridge replacement and repair work within the range of the species, and that a maximum lethal taking of 13 juvenile Lost River suckers may occur as a result of bridge work within the species' range.

Streambank disturbance occurring from bridge work within the Lost River sucker population range may have indirect effects on the Lost River sucker. The total amount of permanent streambank disturbance at the 11 bridges where the proposed action may affect the range of the Lost River sucker is approximately 440 feet (0.08 river mile). The total amount of temporary streambank disturbance that may affect the range of the Lost River sucker is approximately 3,330 feet (0.6 river mile). The area of riparian disturbance that may affect this population will not exceed 11.5 acres.

After reviewing the best available scientific and commercial information regarding the current status of the Lost River sucker, the environmental baseline for the action area, the effects of the proposed action, the environmental performance standards proposed, and the cumulative effects, ODOT/FHWA makes a determination of **may affect, not likely to adversely affect** proposed critical habitat. These conclusions are based on the following considerations: (1) the Bridge Program requires individual review of each project to ensure that the proposed action will be in compliance with the environmental performance standards identified herein, and that each applicable standard is included as an enforceable condition of the permit document; (2) the cumulative effect of the conservation measures applied to each project will ensure that any short-term effects on water quality, habitat access, habitat elements, channel conditions and dynamics, flows, and watershed conditions are brief, minor, and scheduled to occur at the times that are least sensitive for the species' life-cycle (i.e., designated in-water work periods); (3) the ecological design approach that will be applied to each program bridge to protect and stimulate natural habitat-forming processes is expected to result in many projects that will have long-term beneficial effects on aquatic habitat parameters (e.g., the removal of bridge piers from the active channel and reductions in riprap); and (4) the individual and combined effects of all actions permitted are not expected to impair currently properly functioning habitats, appreciably reduce the functioning of already impaired habitats, or retard the long-term progress of impaired habitats toward the properly functioning condition essential to survival and recovery at the population or species' range scale.



OTIA III Bridges

- Potential to Affect - Within Range
- Potential to Affect - Within 2 Miles of Range
- No Potential to Affect
- Lost River Sucker Population Range
- Streams and Rivers
- County
- City
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

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Figure 5.3.7-1

OTIA III: Statewide Bridge Delivery Program
Lost River Sucker

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Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
screening/BA Figures/lr_sucker.mxd. Mar 1, 2004

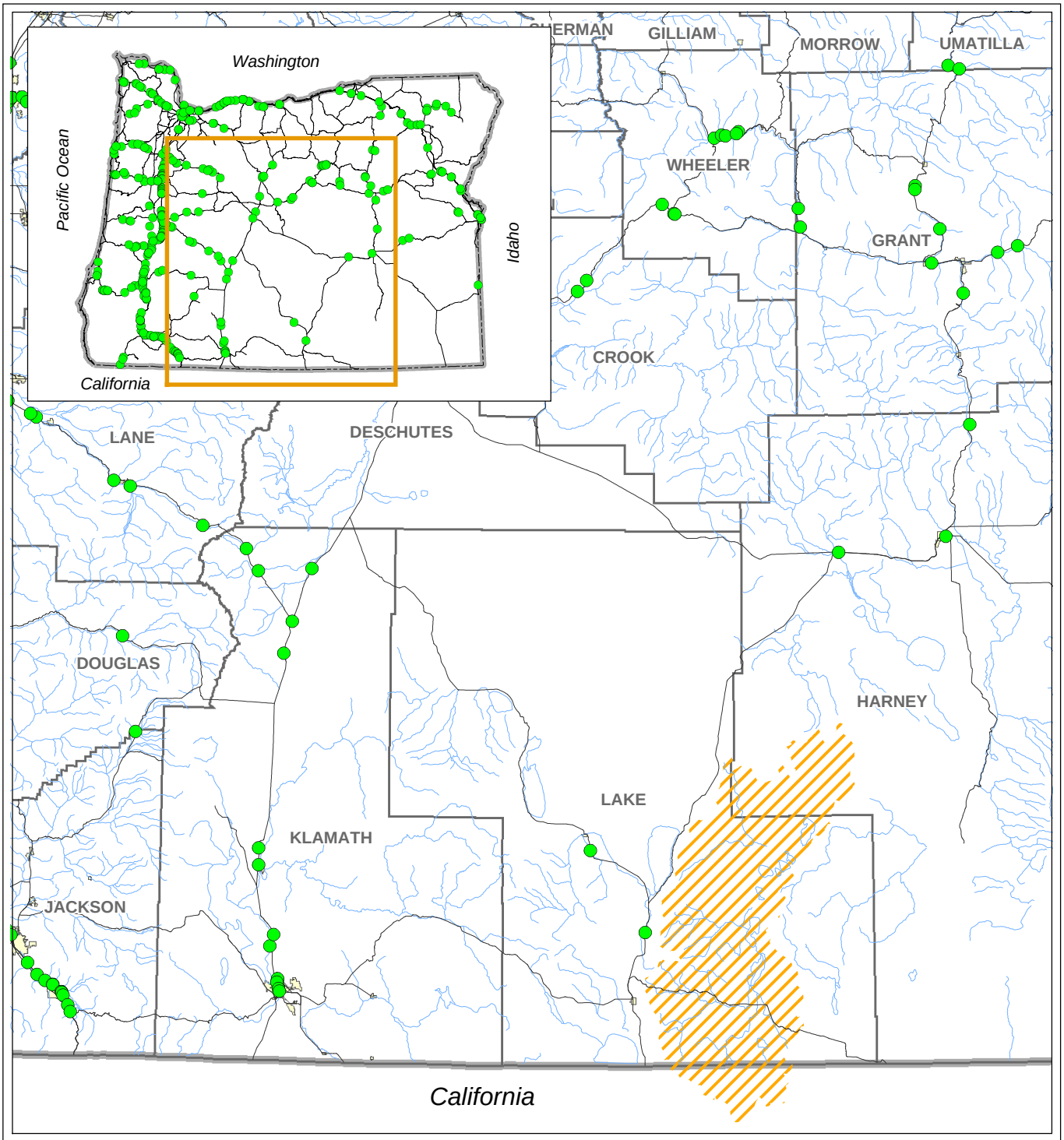
Table 5.3.7-1. Program Bridge projects that may affect the Lost River Sucker DPS.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC
1	7301	Algoma Log Pond	3	Klamath Lake	3mile/4mile/5mile 1
2	7302	Barkley Springs Irrigation Canal	3	Klamath Lake	3mile/4mile/5mile 1
3	8345	USBR Canal	4	Klamath Lake	3mile/4mile/5mile 1
4	8352	UPRR & Pelican City Rd (Lakefront Blvd)	4	Klamath Lake	3mile/4mile/5mile 1
5	8510	Unknown	3	Klamath Lake	3mile/4mile/5mile 1
6	8346	Oxing California Ave (Klamath Falls)	8	Lake Ewauna/Upper Klamath R.	Lake Ewauna
7	9692	Green Springs Dr (Old Alignment) & BNSF	5	Lake Ewauna/Upper Klamath R.	Lake Ewauna
8	08347A	Unknown	6	Lake Ewauna/Upper Klamath R.	Lake Ewauna
9	7929	UPRR	8	Little Walker Mountain	Corral Springs
10	6884	Spring Cr.	3	Williamson R. Below Klamath Marsh	Williamson R./Spring
11	6886	Hwy 422 (Chiloquin)	3	Williamson R. Below Klamath Marsh	Williamson/Sprague R.

Note: All bridges are located within the DPS.

5.3.8 Warner Sucker

On September 27, 1985 the Warner sucker was listed as threatened throughout its range (September 27, 1985, 50 FR 39117). Critical habitat has been designated for the Warner sucker (September 27, 1985, 50 FR 39117). According to the Federal Register (September 27, 1985, 50 FR 39117), the range (in Oregon) of the Warner Sucker is limited to the Warner Valley in south central Oregon (Figure 5.3.8-1). Specifically, habitat for the Warner sucker is limited to Crump and Hart Lakes, the spillway north of Hart Lake, and portions of Snyder, Honey, Twenty Mile, and Twelve Mile Creeks. Critical habitat is designated as a 50-ft buffer on portions of the above-listed streams. Therefore, the entire range of the Warner sucker (within Oregon) is within the Warner Lakes 4th field HUC. The proposed action does not involve work within the Warner Lakes 4th field HUC. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for the Warner sucker.



OTIA III Bridges

- Potential to Affect
- No Potential to Affect
- Warner Sucker Population Range
- Streams and Rivers
- City
- County
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.3.8-1

OTIA III: Statewide Bridge Delivery Program
Warner Sucker

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Miles

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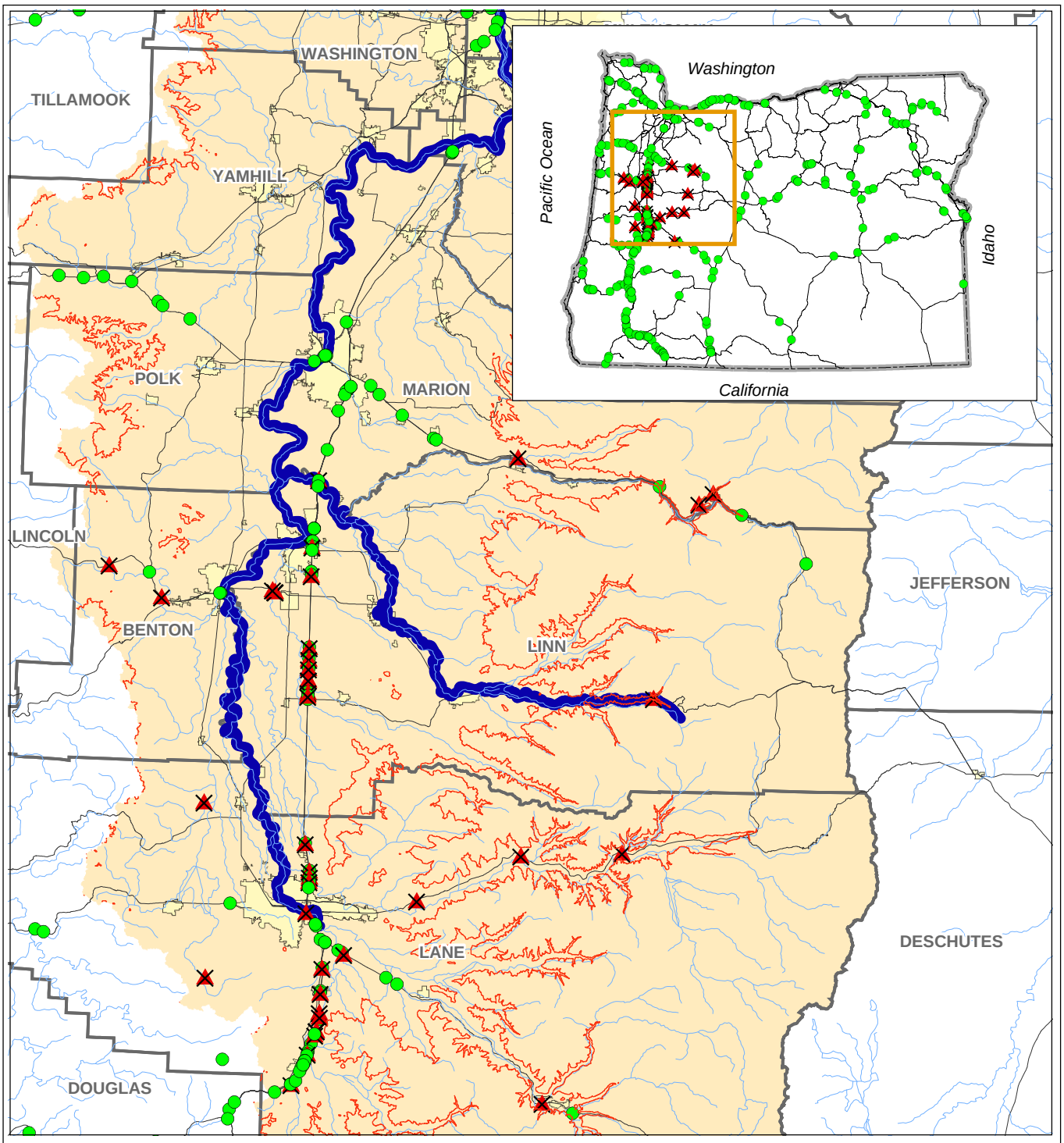
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
noeffect\BA_figures\warner.mxd. Mar 1, 2004

5.3.9 Oregon Chub

There are 105 bridges located within the current range of the Oregon chub, which includes the entire Willamette River Basin below the 1,640-foot elevation and upstream of the Santiam River-Willamette River confluence[1] (Figure 5.3.9-1; Table 5.3.9-1). In 2003, ODFW surveyed 40 Bridge Program sites and found Oregon chub were present at two sites. Seven sites showed no presence but did contain habitat considered suitable to support Oregon chub. The remaining 31 sites were considered unsuitable habitat for Oregon chub (Paul Scheerer, Biologist, Oregon Department of Fish and Wildlife, pers. comm., November 6, 2003). Bridges where the proposed action may affect Oregon chub include the nine surveyed bridges shown to have chub and/or suitable habitat, and 31 additional unsurveyed bridges crossing water within the current range of Oregon chub (Table 5.3.9-2).

[1]Assumed uppermost elevation of historic Oregon chub presence based on prescece of typical co-occurring native fish species. No known Oregon chub populations exist in the Willamette River Basin downstream of the Santiam River (Scheerer 2003). Recovery goals for Oregon chub do not include establishment of populations downstream of the Santiam River (USFWS 1998).



OTIA III Bridges

- Potential to Affect
- No Potential to Affect
- Confluence of Willamette & Santiam Rivers
- Willamette River Basin *(3rd field HUC)*
- City
- County
- Streams and Rivers
- Highway
- State Boundary
- 1640 Feet Countour Line

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.3.9-1

OTIA III: Statewide Bridge Delivery Program
Oregon Chub

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Spatial Data Source: See Document Bibliography.
screening/BA Figures/chub.mxd. Mar 1, 2004

Table 5.3.9-1. Program Bridge projects that may affect Oregon Chub DPS.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC
1	8073	Unknown	3	Abiqua Cr./Pudding R.	Upper Little Pudding R.
2	9591	Hwy 2W	3	Beaver Cr./Columbia R.	Green Cr./ Columbia Side Ch.
3	08232N	Butte Cr.	3	Calapooia R.	Butte Cr.
4	08232S	Butte Cr.	3	Calapooia R.	Butte Cr.
5	08233N	Sodom Ditch	8	Calapooia R.	Sodom Ditch
6	08233S	Sodom Ditch	8	Calapooia R.	Sodom Ditch
7	8195	Unknown	3	Columbia Slough/Willamette R.	Columbia Slough
8	1601	Elk Cr.	6	Elk Cr.	Lower Big Elk Cr.
9	07567B	Elk Cr.	3	Elk Cr.	Theft Cr.
10	9440	Leland Rd	3	Grave Cr.	Grave Cr./Sunny Valley
11	09440A	Leland Rd	3	Grave Cr.	Grave Cr./Sunny Valley
12	08203B	Unknown	3	Johnson Cr.	Tyson Cr./Willamette R.
13	08018N	Louse Cr. & Conn	4	Jumpoff Joe Cr.	Louse Cr.
14	08094N	Jumpoff Joe Cr.	6	Jumpoff Joe Cr.	Middle Jumpoff Joe Cr.
15	7302	Barkley Springs Irrigation Canal	3	Klamath Lake	3mile/4mile/5mile 1
16	7929	UPRR	8	Little Walker Mountain	Corral Springs
17	7573	Lostine R.	3	Lostine R.	Lower Lostine R.

Table 5.3.9-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC
18	07732B	Hwy 18 & Conn (Goshen Grade)	6	Lower Coast Fk. Willamette R.	Papenfus Cr.
19	04981A	Mathas Cr.	3	Lower John Day R./Kahler Cr.	Harper Cr.
20	07663C	N. Umpqua R & CORP & Cr. & Co Rd	18	Lower N. Umpqua R.	Winchester
21	8370	Knowles Cr.	3	Lower Siuslaw R.	Knowles Cr.
22	7530	Beaver Cr.	3	Lower Yaquina R.	Drift Cr.
23	07931S	S. Umpqua R. (Missouri Bottom)	6	Middle S. Umpqua R.	Lane Judd
24	7950	Myrtle Cr. Conn (Myrtle Cr. Intchg)	3	Middle S. Umpqua R.	Willis Vandine
25	07900A	Boomer Hill Rd Conn #2	3	Middle S. Umpqua R.	Willis Vandine
26	00665B	Alder Cr.	3	Middle Sandy R.	Lower Middle Sandy R.
27	03091A	Unknown	1	Necanicum R.	Lower Necanicum R.
28	08227S	Oak Cr.	3	Oak Cr.	Lower Oak Cr.
29	8217	Murder Cr.	3	Oak Cr.	Upper Willamette R.
30	7941	Unknown	5	Rickreall Cr.	Bashaw Cr.
31	02734A	Rock Cr. (Picture Gorge)	3	Rock Cr.	Lower Rock Crek
32	07871B	Row R. Overflow	6	Row R.	Row R./Dorena Lake

Table 5.3.9-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	5th Field HUC	6th Field HUC
33	08028S	Irwin Access Conn	3	S. Umpqua R.	Lower Shively Oshea
34	9636	Unknown	4	Umatilla R./Mission Cr.	Mission Cr.
35	07810B	Latham Rd	4	Upper Coast Fk. Willamette R.	Martin Cr.
36	07863A	Row R. Rd	4	Upper Coast Fk. Willamette R.	Silk Cr.
37	4062	S. Fork Siuslaw R.	4	Upper Siuslaw R.	S. Fk. Siuslaw R.
38	683	Yaquina R.	4	Upper Yaquina R.	Middle Yaquina R.
39	07440A	UPRR Main Line	3	Willamette R./Chehalem Cr.	Croisan Cr.
40	07538A	Boone Rd SE	3	Willamette R./Chehalem Cr.	Croisan Cr.

Table 5.3.9-2. Summary of survey results to date.

Results	Bridges
Species Presence	2
Suitable Habitat	7
No Presence/No Suitable Habitat	31
Total	40
Bridges still needing surveys	31

Based on GIS analysis and assumptions stated in the effects screening process for Oregon chub (Appendix 2-A) there are a total of 40 program bridges where repair or replacement activities have the potential to affect the Oregon chub. The 31 bridge sites within the currently occupied range of Oregon chub that have not been surveyed by ODFW will be surveyed prior to their scheduled construction. Based on knowledge of the remaining (unsurveyed) sites, ODFW believes that approximately five of the remaining sites encompass functioning habitat, and thus have the potential to be occupied by Oregon chub (Paul Scheerer, Biologist, Oregon Department of Fish and Wildlife, pers. comm., November 26, 2004). None of the remaining unsurveyed sites encompass known populations currently being monitored by ODFW. Therefore, by adding these five sites to the nine sites identified in ODFW surveys, approximately 14 program bridges are expected to encompass habitat suitable for Oregon chub and/or be occupied by Oregon chub. This estimate is consistent with survey results obtained for bridge sites surveyed in 2003 in terms of the relative proportions of sites surveyed to sites with chub presence and/or suitable habitat. Of the 40 bridges (nine surveyed and 31 unsurveyed sites) where the proposed action may affect habitat within the range of Oregon chub, 33 are located within the Willamette Valley ecoregion, six bridges are located within the West Cascades ecoregion, and one bridge is located within the Coast Range ecoregion (Table 5.3.9-3 and Table 5.3.9-4).

Table 5.3.9-3. Summary of screening results by ecoregion for bridges with the potential to affect Oregon chub. These include nine of the surveyed sites and the 31 remaining unsurveyed sites.

Ecoregion	Bridges
Coast Range	1
West Cascades	6
Willamette Valley	33
Total	40
Total Gross API Acreage	14,870
Total Net API Acreage	13,210
Temporary Streambank Disturbance (River Miles)	2.3
Permanent Streambank Disturbance (River Miles)	0.3

Table 5.3.9-4. **Summary of screening results by 4th field HUC for bridges with the potential to affect Oregon chub. These include nine of the surveyed sites and the 31 remaining unsurveyed sites.**

4th Field HUC	Bridges
Upper Willamette River	19
Coast Fork Willamette River	10
McKenzie River	5
North Santiam River	4
Middle Fork Willamette River	1
South Santiam River	1
Total	40

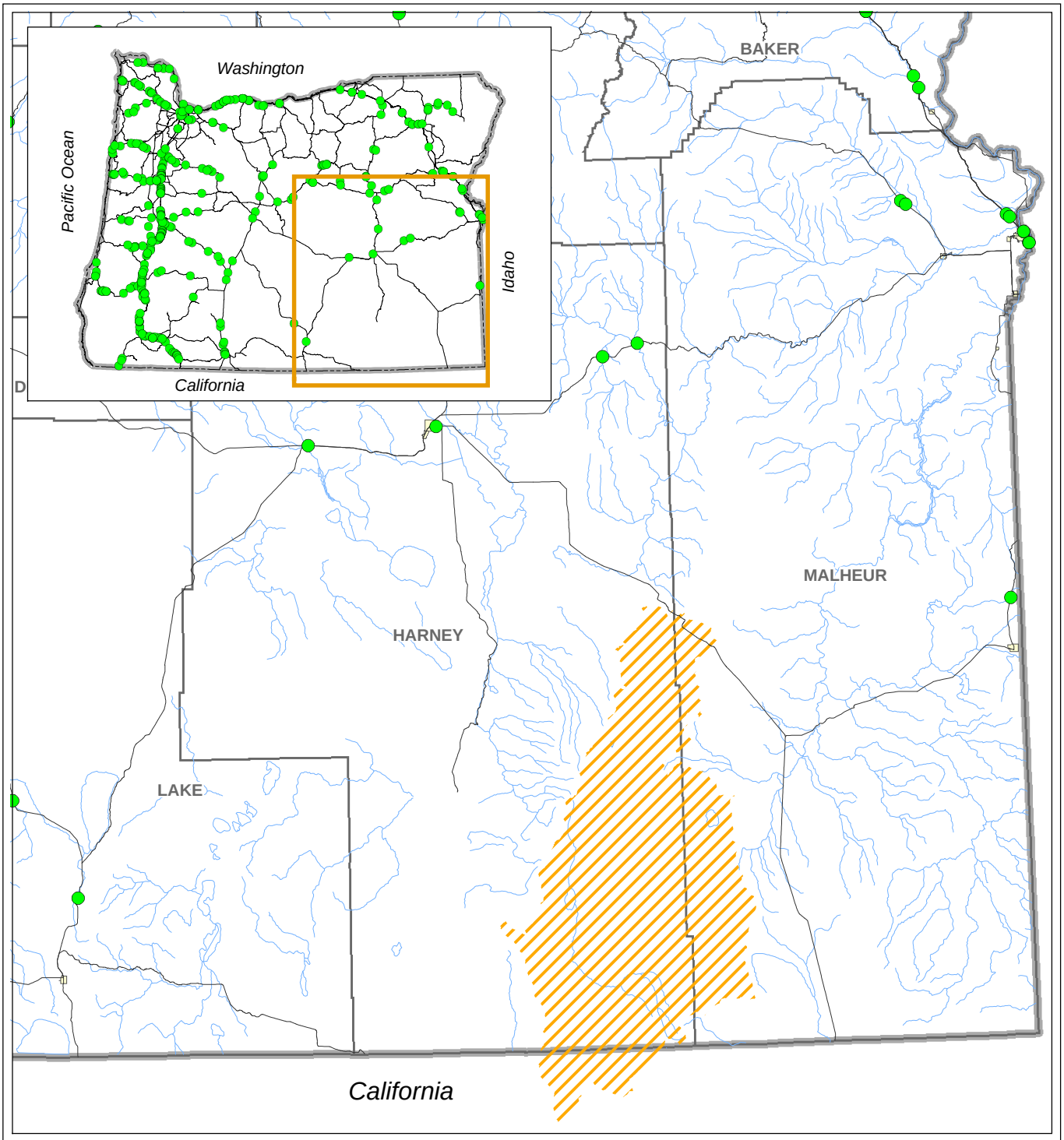
Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, likely to adversely affect** for the Oregon chub. Approximately 40 bridges within the range of the species will require isolation of the in-water work area or disturbance to off-channel habitat; however, it is expected that approximately 14 sites will contain Oregon chub and/or habitat suitable for Oregon chub. Isolation of in-water work areas at these 14 sites may cause local and temporary reductions in water quality and may necessitate the handling of Oregon

chub. It is expected that lethal take—of two percent or less of the anticipated 100 Oregon chub at each bridge—may occur as a result of handling stress or injury, or from unforeseen takings resulting from bridge construction. Therefore, it is expected that up to 1,400 Oregon chub will be handled for all bridge replacement and repair work within the range of the species.

The total amount of permanent streambank disturbance at the 40 bridges where the proposed action may affect the range of the Oregon chub is approximately 1,600 feet (0.3 river mile). The total amount of temporary streambank disturbance that may affect the range of the Oregon chub is approximately 12,000 feet (2.3 river miles). The area of riparian disturbance that may affect Oregon chub habitat will not exceed 41 acres.

5.3.10 Borax Lake Chub

On May 28, 1980, the Borax Lake chub was designated as Federally endangered throughout its entire range (May 28, 1980, 45 FR 35821). Critical habitat for the Borax Lake chub was designated on October 5, 1982 (October 5, 1982, 47 FR 43957). Borax Lake chub are only found in Borax Lake (a 10.2-acre natural thermal lake), its outflow, and Lower Borax Lake, located in the Alvord Basin of south central Oregon (Harney County) (Figure 5.3.10-1). These areas provide the Borax Lake chub with all the necessary requirements for survival and reproduction (i.e., food, spawning habitat, and appropriate water temperatures) (October 5, 1982, 47 FR 43957). Therefore, the entire range of the Borax Lake chub is completely within the Alvord Lakes 4th field HUC. The proposed action does not involve work within the Alvord Lakes 4th field HUC. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for the Borax Lake chub.



OTIA III Bridges

- Potential to Affect
- No Potential to Affect
- Borax Lake Chub Population Range
- City
- Streams and Rivers
- County
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.3.10-1

OTIA III: Statewide Bridge Delivery Program
Borax Lake Chub

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Miles

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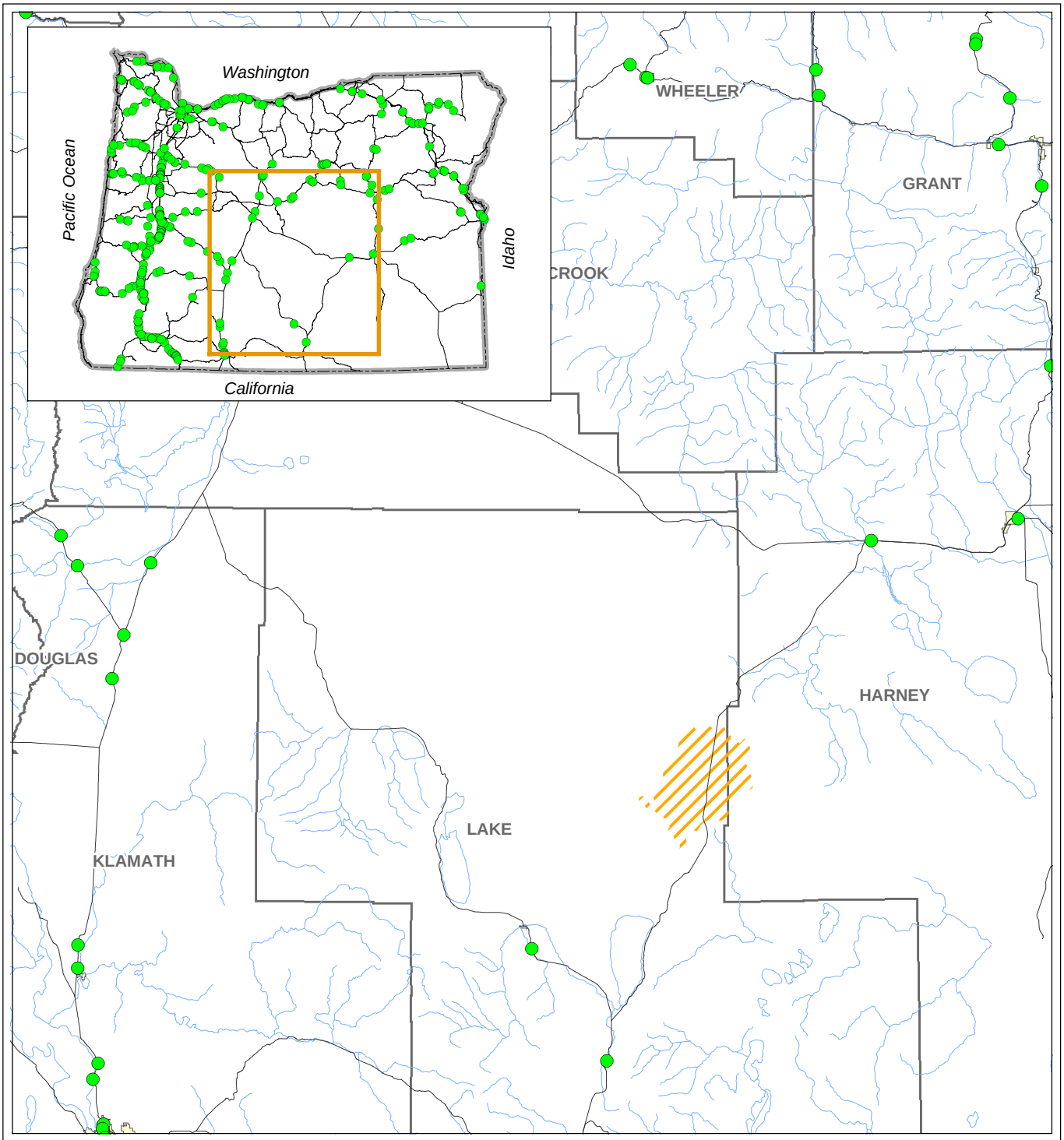
Spatial Data Source: See Document Bibliography.
noeffect\BA_figures\borax.mxd. Mar 1, 2004

5.3.11 Hutton Tui Chub

On March 28, 1985, the Hutton tui chub was designated as threatened (March 28, 1985, 50 FR 12302). Critical habitat is not designated for this species. According to the Recovery Plan for the Native Fishes of the Warner Basin, the range of the Hutton tui chub is contained within the Alkali Subbasin (USFWS 1998a) (Figure 5.3.11-1). Specifically, the Hutton tui chub is found in two springs in the Alkali Subbasin—the Hutton Spring and an unnamed spring located 1,700 feet southeast of the Hutton Spring. Therefore, the entire range of the Hutton Tui chub is contained within the Alkali Lake Subbasin (5th field watershed). The proposed action does not involve work within the Alkali Lake Subbasin (5th field watershed). Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for the Hutton tui chub.



OTIA III Bridges

- Potential to Affect
- No Potential to Affect
- Hutton Tui Chub Habitat
- City
- Streams and Rivers
- County
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.3.11-1

OTIA III: Statewide Bridge Delivery Program
Hutton Tui Chub

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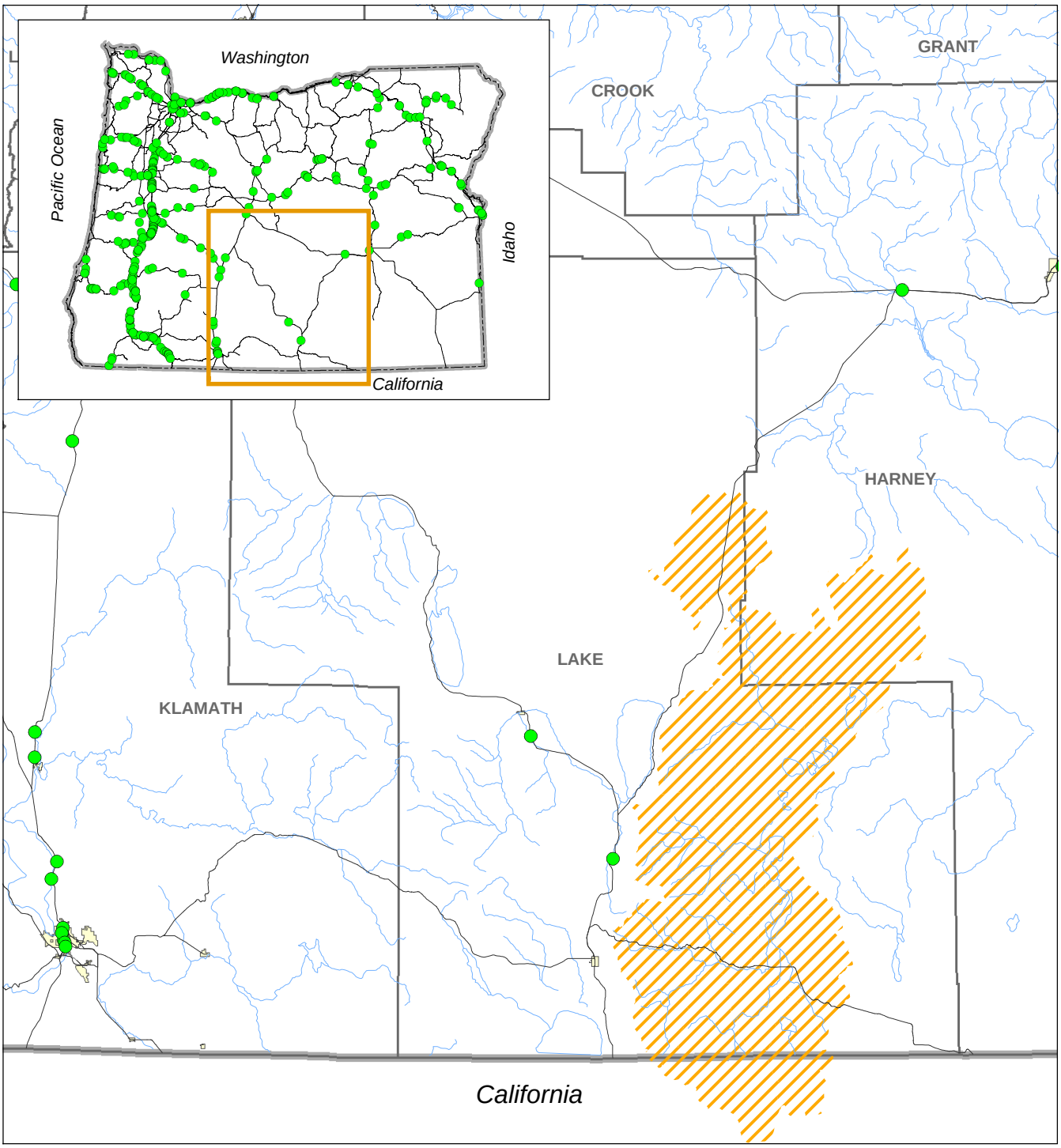
Miles

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
noeffect\BA_figures\hutton.mxd. Mar 1, 2004

5.3.12 Foskett Speckled Dace

On March 28, 1985, the Foskett speckled dace was designated as threatened (March 28, 1985, 50 FR 12302). Critical habitat is not designated for this species. According to the Recovery Plan for the Native Fishes of the Warner Basin (USFWS 1998a), the range of the Foskett speckled dace is contained within the Warner Lake Basin (Figure 5.3.12-1). Specifically, the Foskett speckled dace is found in two springs in the Warner Basin—Foskett Spring and Dace Spring. Therefore, the entire range of the Foskett speckled dace is contained within the Warner Lakes 4th field HUC. The proposed action does not involve work within the Alkali Lake Subbasin (5th field watershed). Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for the Foskett speckled dace.



OTIA III Bridges

- Potential to Affect
- No Potential to Affect
- Foskett Speckled Dace Habitat
- Streams and Rivers
- City
- County
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.3.12-1

OTIA III: Statewide Bridge Delivery Program
Foskett Speckled Dace

N W E S

0 3 6 12 18 24 30
Miles

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
noeffect\BA_figures\foskett.mxd. Mar 1, 2004

5.3.13 Lamprey

The current status and growing attention to the apparent declining trend of Pacific lamprey, river lamprey, and western brook lamprey in Oregon makes these species likely candidates for future Federal and/or State protection under ESA. Effects on these species as a result of the proposed action have been assessed in a broad sense, and environmental performance standards have been developed that will minimize adverse effects on the life history requirements and habitat utilization of these lamprey species.

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, likely to adversely affect** for the Pacific lamprey, river lamprey, and western brook lamprey in the event that they are Federally listed as endangered or threatened during the life of the Bridge Program.

After reviewing the best available scientific and commercial information available regarding the current status of the Pacific lamprey, river lamprey, and western brook lamprey, the environmental baseline for the action area, the effects of the proposed action, the environmental performance standards proposed, and the cumulative effects, ODOT/FHWA makes a determination of **may affect, not likely to adversely affect** critical habitat for this species if critical habitat for these species were to be designated during the life of the Bridge Program. These conclusions are based on the following considerations: (1) the Bridge Program requires individual review of each project to ensure that the proposed action will be in compliance with the environmental performance standards identified herein, and that each applicable standard is included as an enforceable condition of the permit and contract documents; (2) the cumulative effect of the conservation measures applied to each project will ensure that any short-term effects on water quality, habitat access, habitat elements, channel conditions and dynamics, flows, and watershed conditions are brief, minor, and scheduled to occur at the times that are least sensitive for the species' life-cycle (i.e., designated in-water work periods); (3) the ecological design approach that will be applied to each program bridge to protect and stimulate natural habitat-forming processes is expected to result in many projects that will have long-term beneficial effects on aquatic habitat parameters (e.g., the removal of bridge piers from the active channel and reductions in riprap); and (4) the individual and combined effects of all actions permitted are not expected to impair currently properly functioning habitats, appreciably reduce the functioning of already impaired habitats, or retard the long-term progress of impaired habitats toward the properly functioning condition essential to survival and recovery at the population or metapopulation scale.

5.3.14 Modoc Sucker

On June 11, 1985, the Modoc sucker was designated as Endangered throughout its range (June 11, 1985, 50 FR 24526). Critical habitat for the Modoc Sucker was designated on June 11, 1985 (June 11, 1985, 50 FR 24526). Within the area covered by this listing, the Modoc sucker is known to occur in California (June 11, 1985, 50 FR 24526). The Modoc sucker historically occurred in small tributaries of the upper Pit River in Lassen and Modoc Counties, California. Currently, the Modoc sucker is found only in two small drainage systems (Turner and Rush

Creeks) in Modoc County, California (June 11, 1985, 50 FR 24526). The proposed action does not involve work within the current range of the Modoc sucker. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for the Modoc sucker.

5.4 Wildlife Species

Potential effects of the Bridge Program on Federally and State-listed birds, mammals, reptiles, and invertebrates are discussed in this section of the BA. The Effects Pathways section provides a description of how adverse effects may be delivered to wildlife species. This is followed by an effects analysis for each listed species that may be adversely affected by the proposed action (sections 5.4.3 to 5.4.15). Listed species that will not be affected by proposed action are discussed separately in section 5.14.5 (Other Wildlife).

5.4.1 Effects Pathways

This BA provides an analysis of the potential effects of the proposed action on the habitat elements that are critical for sustained, viable populations of Federally listed wildlife. Actions can affect the viability of listed wildlife species by altering one or more physical, chemical, or biological parameters. All effects are delivered via the displacement, disruption, removal, or other alteration of soil, air, water, chemicals, and vegetation. In addition, incidental take of the species (e.g., via direct physical injury) may occur. Throughout this section of the BA, the Bridge Program's effects on Federally listed wildlife species are considered in the context of the above pathways. A further discussion of each of these effects pathways follows.

<u>Air</u>

Air is the medium through which light and sound waves travel. Activities that may be detected either visually or audibly by terrestrial species are disruptive if they prevent or inhibit behaviors that are essential to a species. Sensitivity to noise and visual disturbance varies by species; and effects may be significantly influenced by environmental conditions such as topography, vegetation, and weather. As a result, species thresholds for disturbance are poorly understood and are generally based on estimates from a limited body of research.

Noise-related effects
Sound is conducted through the air as a series of pressure waves that have kinetic energy. The ear converts (transduces) these pulses into electrical activity in sensory nerves, and interprets such nervous activities as sounds. The kinetic energy of these sound waves can be quantified in decibels. The decibel (or dBA) scale for noise ranges from 0 (for the threshold of perception of sound) to approximately 140 dBA (for the threshold of human pain at the ear) (Peterson and Gross 1972).

Noise decreases with increasing distance from the source. The rate of noise reduction is governed by several factors, such as the nature of the source, atmospheric conditions (wind and rain), topography and vegetation, and the level of destructive interference from other sound sources. Reductions in noise levels are greatest along "soft site" conditions

where sloping topography and vegetation decrease sound levels over distances. Interrupting the line of sight between the source and a receptor can further reduce or mask noise from distant sources.

Noises detected by wildlife that are significantly above existing ambient conditions may cause direct adverse effects by altering behavior essential for survival. Noise disturbance can cause adults to flush from a nest or natal den area, leaving eggs or young vulnerable to predation, exposure, and/or malnutrition (as a result of missed feedings). Noise disturbance that occurs for an extended length of time or during times that are sensitive for a species may have an indirect lethal effect by preventing individuals from accessing areas essential to survival, such as foraging areas, migration corridors, roosting sites, dens, or breeding grounds. In general, impulse noises such as those generated by pile-driving have the greatest potential for direct and indirect disturbances to wildlife. This is also the type of noise to which species are less likely to become habituated.

Wildlife can become familiar with certain disturbances, thus lessening the effects they have. If a species is accustomed to a disturbance, and the disturbance offers no known direct threat, then the species is likely to ignore it. If the disturbance is new, intermittent, or unexpected, then the species will be less tolerant of that disturbance.

Background (i.e., ambient) noise is present in every natural setting. It is generally accepted that noise generated by construction activities can have direct adverse effects on wildlife if it consistently exceeds ambient noise levels by 10 dBA at the receptor site. Most construction activities, including pile-driving and guardrail installation, are naturally attenuated to within 10 dBA of ambient conditions within 0.5 mile of the source (USDOT 1980, USDOT 1979, USDOT 1977, WHI 1971) However, blasting can be an exception, and may require distances of up to 1.0 mile to attenuate to within 10 dBA of ambient levels. The effects of noise disturbance can be minimized through timing and seasonal restrictions on noise-generating activities; scheduling a potential disturbing activity outside of a species' peak daily activity period can significantly minimize adverse effects.

Visual effects

Effects are said to be visual when they arise because the sight of human beings or their activities disrupts the animal's normal behavior. Visual disturbance is similar to noise disturbance in that it varies depending on the species' ability to detect the activity, the species' relative familiarity with the changes, the species' tolerance of visual changes, and the species' ability to avoid the potential disturbance. Visual factors affecting whether a human activity can disturb wildlife include the distance, intensity, and color of the activity (depending on the animal's ability to see colors), and its relative height and size. Due to this variability, visual disturbance thresholds for a particular species are subjective and based on limited research. For the purposes of this BA, it is assumed that adverse visual effects occur when individuals have a direct line-of-sight to human activity ranging from 300 feet to 0.5 mile, depending on the individual species being considered (see sections 5.4.3 to 5.4.14 for species-specific criteria).

Visual disturbances can have indirect sub-lethal effects on wildlife by causing animals to abandon normal resting and feeding areas critical to their survival. A sudden visual change may cause adults to abandon established nest or den sites, leaving eggs or young vulnerable to predation and to an increased risk of death due to missed feedings or lack of care. Wildlife can become acclimated to localized disturbances if such disturbances are not perceived to be a threat.

Chemicals

The introduction of chemicals into the environment through construction activities and accidental discharges can have lethal and sub-lethal effects on wildlife. Applications of herbicides can remove or alter vegetation communities needed by wildlife species for cover, food, and nesting habitat. Pesticides and other chemicals can poison wildlife, or indirectly affect wildlife by removing prey species. Accidental discharges can have an immediate lethal effect (i.e., from chemical burns or adsorption through skin) or can have indirect lethal and sub-lethal effects as a result of contaminated soil or vegetation, or the alteration of habitat required for feeding, breeding, and sheltering.

Vegetation

The assemblage of plants within a particular area is one of the most important parameters that define "habitat" for most wildlife species. Wildlife species rely on assemblages of plants (i.e., plant communities or habitat types) for foraging, reproduction, migration, cover, and escape or concealment. Many animals have specific plant community requirements that must be met in order to survive (e.g., Fender's blue butterfly must have Kincaid's lupine). Certain plant communities may play a role essential to a species by serving as preferred habitat for feeding, breeding, and sheltering. Intact and contiguous vegetation communities are also essential for daily wildlife movements and seasonal migration.

The direct removal of vegetation that provides a critical habitat element for a particular species can have immediate adverse sub-lethal effects by forcing the species to abandon the area. For example, the removal of fruit- or seed-bearing vegetation can immediately affect food availability and foraging habits, requiring an animal to look elsewhere for food. Site clearing can also lead to indirect sub-lethal effects through the inadvertent introduction of exotic weed species and the exclusion of native vegetation; wildlife that has adapted to a specific assemblage of native plants may be forced to leave the disturbed area.

The removal or alteration of currently nonfunctional habitat can also have a delayed adverse effect on wildlife. Habitat that is now considered nonfunctional habitat for one species may develop through natural succession into favorable habitat if such habitat is allowed to grow undisturbed. The clearing of vegetation for construction can interrupt normal plant succession and affect the quality and type of habitat in future years.

Soil

Soils are the media upon which many wildlife species depend for shelter and cover. The displacement of soils during land clearing and construction can have a direct effect on wildlife by removing dens or burrows critical for shelter and the rearing of young. Indirect sub-lethal effects may result from the removal of den sites, forcing wildlife to relocate to adjacent undisturbed areas. Soil erosion from improperly stabilized slopes can also expose dens or burrows, forcing the abandonment of a site. In wetlands and other aquatic sites, sedimentation or erosion can cause indirect sub-lethal effects by smothering or altering vegetation that wildlife species are dependent upon for food and shelter. Large erosive events (e.g., mass wasting or mudslides) can have indirect effects on wildlife by destroying existing habitat and altering landforms.

Water

Water is one of the principle elements that defines the wildlife habitats that occupy a particular region. The presence of both upland and wetland wildlife habitats within a particular area is largely dependent upon the availability and duration of water supplies. Changes in existing hydrology can have immediate direct and indirect effects on wildlife species by removing water sources critical for drinking, the maintenance of existing habitats, and the protection and rearing of young (e.g., nest sites next to open bodies of water). Changes in seasonal or permanent hydrology can also affect water-dependent habitats such as forested wetlands or vernal pools.

Changes in hydrology may result from construction-related activities such as the filling of wetlands and the redirecting of streams or springs, as well as from an increase in the amount of impervious surface. Altering hydrology typically results in a conversion of habitat and a corresponding indirect effect on the wildlife dependent upon the affected habitat.

Species

Direct lethal and sublethal effects on listed wildlife can occur during any activity that results in physical contact with listed wildlife. Direct lethal effects on wildlife species, though rare, can occur from the removal of active nest trees and the destruction of occupied dens or burrows. Site clearing or other activities can result in direct lethal effects on relatively immobile wildlife species or young through outright contact with construction equipment. In most instances, healthy adults will be able to disperse from a project site and utilize other functional habitat in the area. Sub-lethal direct effects on wildlife species may occur when animals are injured but not killed by such activities, or when animals are handled during trapping and relocation.

Migration/Dispersal

The construction of new bridges or roadways can have sub-lethal indirect effects on wildlife by altering established daily habits or seasonal migration patterns. New bridges

and roadways generally have the most profound effects, since they force immediate adaptation to their presence, as well as deviation from preferred movement and migration corridors critical to wildlife survival. At established bridge sites and roadways, bridge repair and replacement activities generally have minimal sub-lethal indirect effects on wildlife migration and dispersal; in most instances, wildlife in the vicinity of an established bridge have long since adapted to the presence of the bridge by establishing new daily and seasonal migration patterns. Repair of an existing bridge could have temporary adverse effects during the actual period of construction; however, such adverse effects would mainly be limited to the period of active construction.

The effects on migration and dispersal patterns would also be dependent on the size of the bridge structure. On small bridge structures, it is reasonable to assume that larger, highly mobile wildlife species would be affected less than smaller, less mobile species. Larger species generally have larger home ranges, and are more mobile and thus more capable of avoiding blocked corridors. However, the effects of a smaller bridge may be species-specific, particularly when the bridge blocks or restricts movement along a preferred corridor such as a riparian forest. In some instances, the replacement of a small existing bridge structure with a larger structure may have a beneficial effect on wildlife migration/dispersal by creating a larger opening underneath the bridge to facilitate wildlife movement. Replacement with a larger bridge structure may reestablish historic migration corridors that were blocked by the construction of the original bridge. Any action that improves wildlife movement under or around a new bridge would be considered to have a beneficial effect on wildlife.

5.4.2 Minimization and Avoidance Measures

The effects of actions proposed under this consultation may be delivered by one or multiple pathways. These effects can vary in magnitude and severity between the individual organism, population, and community scales. The degree to which the proposed action affects a particular species or habitat is dependent on the intensity, magnitude, duration, timing, and repetition of the action causing the effect.

Minimization and avoidance measures for the Bridge Program consist of specific environmental performance standards that provide for habitat and species conservation during bridge repair and replacement. Section 3.3 of this BA provides detailed information regarding these environmental performance standards and conservation measures. The following sections (5.4.3 to 5.4.15) of this BA provide a discussion of the effects of the proposed action on each of the 18 Federally listed wildlife species in Oregon.

5.4.3 Steller sea lion (*Eumetopias jubatus*)

5.4.3.1 Life History and Status

On December 4, 1990, the Steller sea lion was designated as threatened throughout its range under the Federal ESA (November 26, 1990, 55 FR 49204). Primary threats to the Steller sea lion include disease, incidental take in fishing gear, shooting, and natural or anthropogenic

changes in the abundance and species composition of its prey (August 27, 1993, 58 FR 45269). The Steller sea lion population was determined to have two genetically and reproductively isolated populations (Robin Brown, NOAA Fisheries, pers. comm., November 11, 2003). As a result, in 1997 NOAA Fisheries re-classified the Steller sea lion as two Distinct Population Segments (DPSs) (May 5, 1997, 62 FR 24345). The western DPS, which consists of breeding colonies located west of 144° West Longitude (line near Cape Suckling, Alaska) is listed as endangered, and the eastern DPS east of 114° West Longitude is listed as threatened (Figure 5.4.3-1).

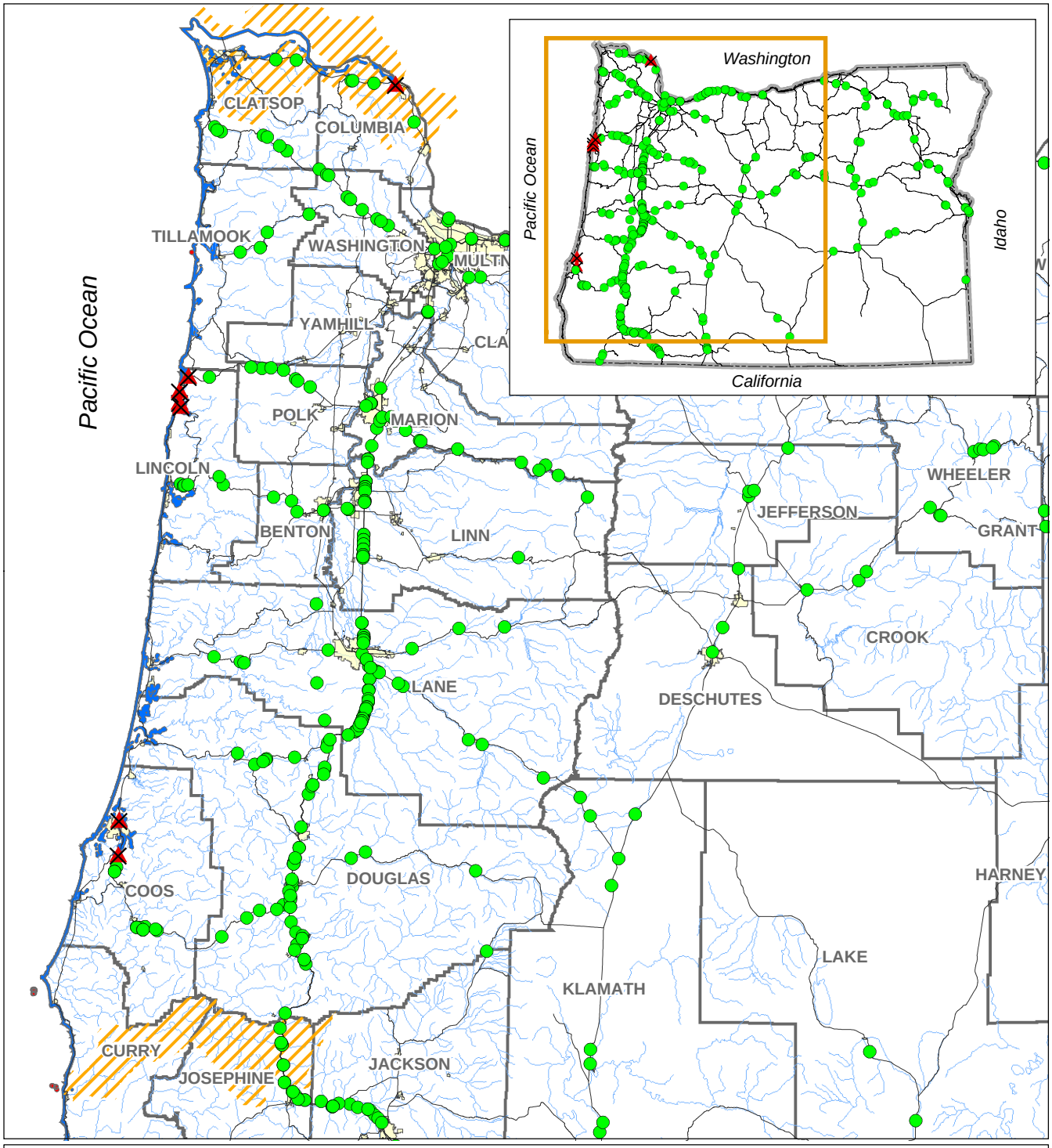
The eastern DPS of the Steller sea lion ranges from southeast Alaska south to central California (November 26, 1990, 55 FR 49204). Oregon is near the southern extent of their eastern range, where species abundance and distribution are reduced (November 26, 1990, 55 FR 49204). However, numbers in the eastern DPS and specifically at rookery sites in Oregon are increasing (Robin Brown, NOAA Fisheries, pers. comm., November 11, 2003). Between 1975 and 1990, non-pup (adults and juveniles) aerial counts at the Rogue Reef have increased 53% (from 802 to 1,229 non-pups), and counts at the Orford Reef rookery have increased seven percent (from 716 to 766 non-pups) (NOAA Fisheries 1992). Steller sea lion numbers statewide are increasing at an average of four percent annually, and the possibility of de-listing the eastern population is being considered (Robin Brown, NOAA Fisheries, pers. comm., November 11, 2003).

Steller sea lions spend most of their time at sea feeding on a variety of fish species (August 27, 1993, 58 FR 45269). The Steller sea lion is not known to migrate, but they disperse widely outside the breeding season (NOAA Fisheries 1992). Primary terrestrial habitats include remote islands, rocks, reefs, and beaches, often in areas exposed to wind and waves, where access by terrestrial predators is limited (NOAA Fisheries 1992). Females appear to select birthing areas (known as rookeries) that are gently sloping and protected from waves; they will frequently return to the same pupping site in successive years (NOAA Fisheries 1992). Pupping occurs from late April to early July (Robin Brown, NOAA Fisheries, pers. comm., November 11, 2003). Pups normally stay on land for about two weeks (NOAA Fisheries 1992), then spend an increasing amount of time in waters adjacent to rookeries, as will post-parturient females whose foraging range (usually in shallow waters within 20 nautical miles of the rookery) is restricted by the need to return to the rookery to nurse pups (August 27, 1993, 58 FR 45269).

In addition to rookeries, haulouts are essential habitat for Steller sea lions. In Oregon, Steller sea lions may be found hauled out at Astoria East Mooring Basin and at the end of the South Jetty of the Columbia River, and also at Tillamook Rock, Three Arch Rocks, Cascade Head, Seal Rock, Sea Lion Caves, Cape Arago, Rogue Reef, Blacklock Point, Blanco Reef, Orford Reef, and Mack Reef (Robin Brown, NOAA Fisheries, pers. comm., November 11, 2003). These haulouts can be used any time of the year. In addition, Steller sea lions have been observed foraging up to 8 miles upriver on the Rogue River during the spring and fall Chinook salmon runs. Small numbers of Steller sea lions may be found in the lower Rogue River at any time of the year since the largest rookery in the State is located just 2 miles northwest of the river mouth. Steller sea lions have also been observed foraging up the Columbia River as far as Longview, Washington, primarily during fall and spring salmon migration periods and during the winter smelt run (Robin Brown, NOAA Fisheries, pers. comm., November 11, 2003). In Oregon, Steller sea lions may be found at any of the above-listed rookeries, haulout areas, or river mouths at any time of year;

however, most occurrences in Oregon are during June and July, which corresponds with the Steller sea lion's reproduction period.

Critical habitat for the Steller sea lion was designated on September 27, 1993 and includes (in Oregon) an air and aquatic zone that extends 3,000 feet from any historically occupied sea lion rookery (August 27, 1993, 58 FR 45269). In Oregon, the major rookeries designated as critical habitat are the Rogue Reef Pyramid Rock Site, the Orford Reef Long Brown Rock Site, and the Seal Rock Site (August 27, 1993, 58 FR 45269). Not all known Steller sea lion locations in Oregon have been designated as critical habitat. The Three Arch National Wildlife Refuge in Tillamook County has a smaller, less successful rookery and is not designated, but is protected by a 500-foot buffer enforced by the Oregon Marine Board (Robin Brown, NOAA Fisheries, pers. comm., November 11, 2003). Haulouts in Oregon are not included in critical habitat designation (August 27, 1993, 58 FR 45269). For regulatory purposes, rookeries and haulout boundaries are defined as the mean lower-water mark (August 27, 1993, 58 FR 45269).



OTIA III Bridges

- Potential to Affect
- No Potential to Affect
- Steller Sea Lion Foraging Areas
- Steller Sea Lion Critical Habitat Zones
- Steller Sea Lion Habitat
- City
- County
- Streams and Rivers
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

N W E S

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Miles

Figure 5.4.3-1

OTIA III: Statewide Bridge Delivery Program
Steller Sea Lion

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
screening/BA Figures/slion.mxd. Mar 1, 2004

5.4.3.2 Species-Specific Effects Pathways

Effects pathways include the media through which effects are delivered to any species. Essentially all effects on Steller sea lions are delivered through the displacement, disruption, removal, or addition of one or more of the following media:

Air

Noise Disturbance/Harassment
Adverse effects on the Steller sea lion from noise harassment may lead to flushing from haulout sites, an increase in energy expenditure, or an overall avoidance or abandonment of functional habitat. Occasional noise disturbance at low levels may have little long-term effect (NOAA Fisheries 1992).

There is no documented threshold for noise harassment for sea lions. However, NOAA Fisheries evaluates the effects of noise-generating activities, such as pile driving and blasting, on marine mammals within a 1,640-foot radius of the activities (Caltrans 2001). Thus, for the purposes of the Bridge Program, the noise harassment area for Steller sea lion is encompassed by a 1,640-feet perimeter surrounding the API.

Visual Disturbance/Harassment
Close approach by humans may cause resting sea lions to go into the water, and disturbances that cause stampedes on rookeries may cause a trampling or abandonment of pups (NOAA Fisheries 1992). Areas exposed to repeated disturbance may be avoided or permanently abandoned, which could adversely affect the condition and survival of pups by interrupting normal nursing cycles (NOAA Fisheries 1992).

Visual harassment can adversely affect the Steller sea lion; however, there is no documented visual harassment threshold for Steller sea lions. Critical habitat in Oregon includes an air zone that extends 3,000 feet vertically and an aquatic zone that extends 3,000 feet seaward (horizontally) from historically occupied sea lion rookeries (August 27, 1993, 58 FR 45269). For the purposes of the Bridge Program, adverse effects from visual harassment are considered possible if the visual disturbance occurs within a distance of 3,000 feet from known haulout or rookery sites.

Chemicals

Because Steller sea lions inhabit the marine environment and occasionally the lower Rogue and Columbia Rivers (both large river systems), there is no potential for a construction-related spill (usually a few gallons at most) to affect them.

Species

Direct effects on the species may occur if there is direct physical contact with humans or their equipment. Steller sea lion haulout and rookery sites include remote islands, rocks, reefs, and beaches, often in areas exposed to wind and waves where access by terrestrial

predators is limited (NOAA Fisheries 1992). The Bridge Program will not directly affect these areas; therefore, direct effects on Steller sea lions will not occur.

5.4.3.3 Minimization and Avoidance Measures

Minimization and avoidance measures have been developed to reduce the proposed action's adverse affects on Steller sea lion populations. The environmental performance standards in Section 3.3 detail these minimization measures as well as the methods developed for habitat and species conservation during bridge construction.

5.4.3.4 Analysis of Effects

ODOT/FHWA assessed the likely effects of the Bridge Program on the Steller sea lion using GIS analyses. A screening process was applied to all program bridges to identify where bridge repair and replacement activities have the potential to affect the Steller sea lion. The methods and assumptions used to perform this screening process are presented in summary below, and in detail in the Effect Screening Layer memos (Appendix 2-A). The methods and assumptions used to assess the effects on the Steller sea lion via the various pathways are presented below, and in detail in the Evaluation of Effect memos (Appendix 2-B). Both the Effect Screening Layer memo and the Evaluation of Effect memo for this species were reviewed by the Services as part of the ongoing consultation process for the Bridge Program.

For the purposes of the Bridge Program, Steller sea lion habitat includes all areas: 1) within 1 mile of the Pacific Ocean shoreline, or 2) within the Johnson and O'Neil (2001) Bays & Estuaries habitat type, or 3) within the lower 8 miles of the Rogue River or the lower 70 miles of the Columbia River (i.e., below Longview), or 4) within 3,000 feet of a designated critical habitat area or Three Arch National Wildlife Refuge. A total of 7 Program Bridges meet one or more of these criteria; construction activities at these 7 bridges are considered to have the potential to affect Steller sea lions (Table 5.4.3-1). These 7 bridges are further analyzed below to determine what, if any, adverse effects their repair and replacement activities may have on the Steller sea lion via the various effects pathways.

Table 5.4.3-1. Program Bridge projects that may affect Steller Sea Lion.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	Ecoregion Name
1	1950	Central OR RR	3	Coast Range
2	8281	US 101 NB (Hwy 009)	3	Coast Range
3	9591	Hwy 2W	3	Coast Range
4	13491	Unknown	3	Coast Range
5	00922A	Unknown	3	Coast Range

Table 5.4.3-1. Program Bridge projects that may affect Steller Sea Lion.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	Ecoregion Name
6	00924A	Unknown	6	Coast Range
7	00925A	Unknown	5	Coast Range

Air

Noise Disturbance/Harassment
For purposes of the Bridge Program, the potential for noise harassment was assumed to exist if the bridge API is within 1,640 feet of Steller sea lion habitat. The area of potential noise harassment to Steller sea lions for individual bridges ranges depending on bridge size and proximity of the bridge to a haulout or rookery site. For all 7 bridges, a total area of 974 net acres (1,036 gross acres) of Steller sea lion habitat may be affected by noise harassment disturbance. Bridge Program activities will be carried out in conformance with the Wildlife Avoidance Environmental Performance Standard; this will minimize noise levels and restrict loud noises to certain times of the year (see Section 3.3), thus minimizing adverse effects on Steller sea lions.

Visual Disturbance/Harassment
For purposes of the Bridge Program, the potential for visual harassment was assumed to exist if the bridge API is within 3,000 feet of haulout or rookery sites. No bridges meet this criterion.

Chemicals

Because Steller sea lions inhabit the marine environmental and occasionally the lower Rogue and Columbia Rivers (both large river systems), there is no potential for a construction-related spill (usually a few gallons at most) to affect Steller sea lions. Implementation of the Pollution & Erosion Control Environmental Performance Standard will further ensure that there are no adverse effects on this species through the chemical effects pathway.

Species

Steller sea lion haulout and rookery sites include remote islands, rocks, reefs, and beaches, often in areas exposed to wind and waves where access by terrestrial predators is limited (NOAA Fisheries 1992). The Bridge Program will not directly affect these areas. Implementation of the Wildlife Avoidance Environmental Performance Standard will ensure that direct effects on Steller sea lions do not occur.

5.4.3.5 Determination of Effect

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, not likely to adversely affect** for Steller sea lions. Implementation of environmental performance standards at all 7 bridges where the potential exists for adverse effects on Steller sea lions will serve to minimize effects on this species to the greatest extent practicable. Although large areas of Steller sea lion habitat have the potential to be affected by noise, visual disturbance, and chemical contamination, the probability of adverse effects actually occurring is remote.

5.4.4 Columbian White-tailed Deer (*Odocoileus virginianus leucurus*)

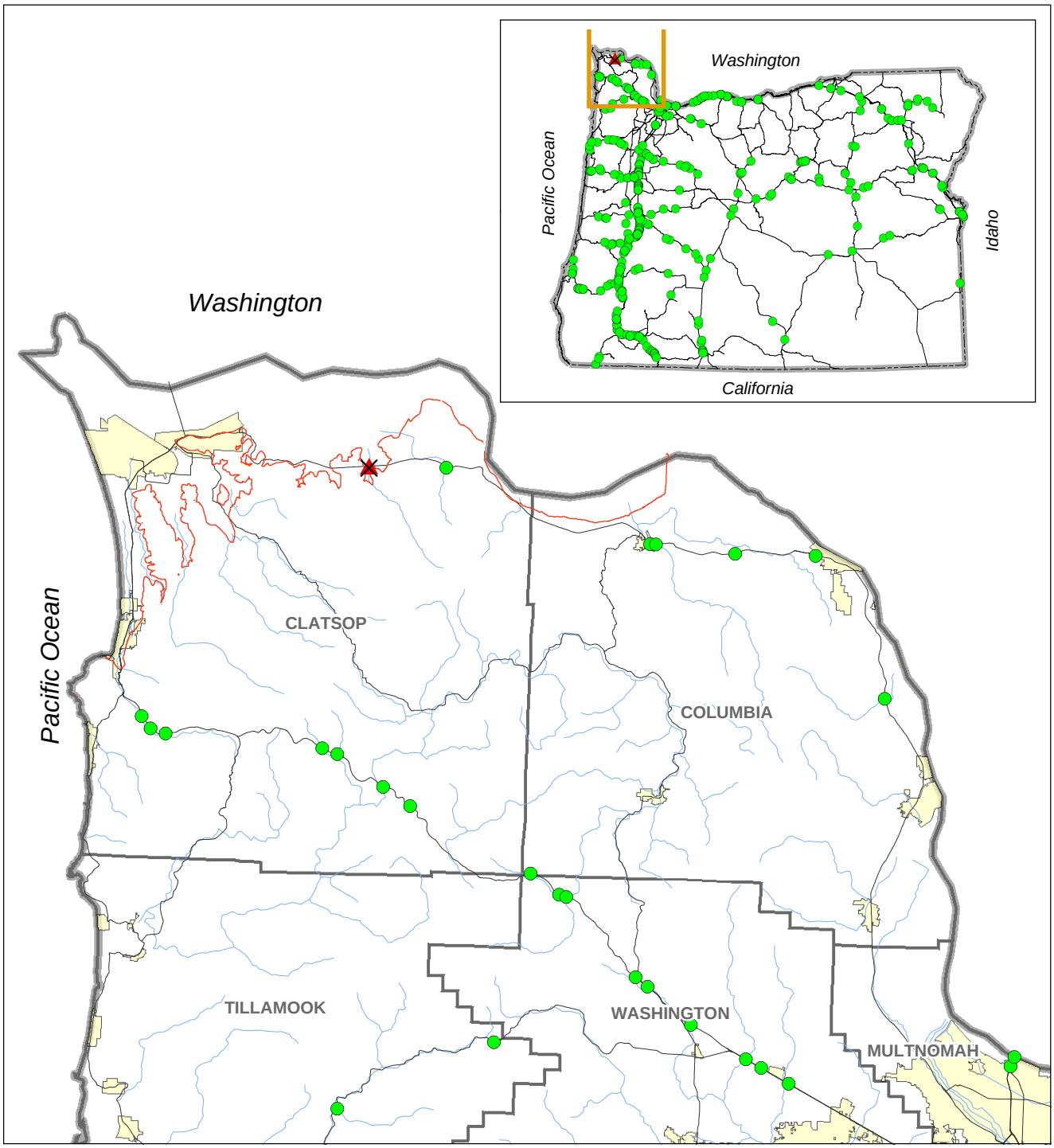
5.4.4.1 Life History and Status

The Columbian white-tailed deer was Federally listed as endangered on March 11, 1967. There are two populations of Columbian white-tailed deer in Oregon: the Douglas County population and the Columbia River population. These populations are separated by a distance of more than 200 miles, much of which is discontinuous or nonfunctional habitat. These populations are considered Distinct Population Segments (DPSs) (July 24, 2003, 68 FR 43647). On July 24, 2003 the Douglas County DPS was Federally de-listed; however, the Columbia River DPS remains Federally listed (July 24, 2003, 68 FR 43647) (Figure 5.4.4-1).

Recovery of the Columbia River DPS of the Columbian white-tailed deer will occur after: 1) the attainment of at least three self-sustaining subpopulations, two of which need to be in secure habitat, and 2) the existence of at least 400 adult animals in the population (USFWS 1976). Currently there are 600-800 adult animals in four subpopulations occupying an area of approximately 16,000 acres (USFWS 2002a). A fifth subpopulation is being established through reintroduction of transplanted deer in 1999 and 2000. However, these subpopulations and their habitat are still susceptible to flooding, dike erosion, predation, and competition from elk (*Cervus elaphus)*. As a result, the USFWS is reintroducing 60 adults to an island complex in the Columbia River that includes approximately 964 acres on Fisher Island, Hump Island, Walker Island, and Lord Island (USFWS 2002a).

The Columbian white-tailed deer historically ranged from Roseburg in southern Oregon to the south end of Puget Sound in Washington (USFWS 1976). Their drastic decline is predominantly the result of habitat loss due to increased agriculture, development, and fire suppression (USFWS 1976).

The existing populations of the Columbia River DPS are in Columbia and Clatsop County in Oregon, in adjacent Washington counties, and on the islands and within the floodplain of the



OTIA III Bridges

- Potential to Affect
- No Potential to Affect
- 100 Foot Elevation Contour
- City
- Streams and Rivers
- County
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

N W E S

0 1 2 4 6 8 10

Miles

Figure 5.4.4-1

OTIA III: Statewide Bridge Delivery Program Columbia White-Tailed Deer

MB&G

Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
screening/BA Figures/wt_deer.mxd. Mar 1, 2004

Columbia River (ODFW 1995). Preferred habitats for this DPS include the riparian forest, brushlands, and pastures within the tidally influenced floodplains of the Columbia River, generally below 10 feet in elevation (ODFW 1995, WDFW 1990).

Critical habitat has not been designated for the Columbian white-tailed deer; however, several recovery areas for the Columbian white-tailed deer have been designated in the Columbian White-Tailed Deer Recovery Plan (USFWS 1976) (Table 5.4.4-1).

Table 5.4.4-1. Lands classified by the USFWS as essential to the survival and recovery of Columbian white-tailed Deer (USFWS 1976).

Location	Township	Range	Section
Tennasillahe Island	8 North	6 West	4 and 5
	9 North	6 West	28 and 33
Westport Area	7 North	6 West	1 Northeast ¼ (north of Highway 30)
	8 North	6 West	25 South ½
	8 North	6 West	36 (north and east of Highway 30)
	7 North	5 West	6 (north of Highway 30)
	8 North	5 West	30 South ½
Wallace Island, Anurdes Island Area, Kinnunen Cut, and adjacent shorelines	8 North	5 West	25, 31, 34 (northeast ¼), 35, and 36 (north ½ that part of Anurdes Island with the section)
	8 North	4 West	30 and 31
	7 North	4 West	6 and that part of Kinnunen Cut in the northeast ¼)

The Columbian white-tailed deer rut begins in November and peaks in the second week of November. A Columbian white-tailed deer needs to be at least 18 months old to breed. Nearly all females will breed each year, and have either one or two fawns. The fawning season is from mid-May to mid-June, peaking during the second week in June (ODFW 1995, USFWS 1976).

5.4.4.2 Species-Specific Effects Pathways

Effects pathways include the media through which effects are delivered to any species. Actions that may affect Columbian white-tailed deer are delivered through the displacement, disruption, removal, or addition of one or more of the following media:

Air

Noise Disturbance/Harassment
The response of Columbian white-tailed deer to disturbance is influenced by the type of disturbance, the predictability of the activity causing the disturbance, the frequency and magnitude of the activity, the timing (e.g., during breeding or-non breeding season), and the relative proximity or position of the activity (e.g., above versus below on a slope) (Canfield et al. 1999). For Columbian white-tailed deer, the adverse effects of noise disturbance may range from general alertness and increased heart rate to outright flight and avoidance of, or even displacement from, functioning habitats (Canfield et al.1999). Noise disturbance can be particularly detrimental to nursing females, which may abandon fawns or reduce attentiveness, which can result in increased vulnerability to predation or malnourishment. Consequently, activities that occur within a certain distance of functional habitat during the summer fawning season, and that require heavy equipment, chainsaws, aircraft, or blasting, have the potential to significantly disrupt the feeding or sheltering of fawns, which can result in harassment take (USFWS 1976).

There is no documented threshold for noise disturbance for Columbian white-tailed deer. However, the USFWS typically evaluates the effects of noise-generating activities on other species, such as the bald eagle, if the species and/or critical habitat exists within a 0.25 mile of the activity. For open air blasting and other major disturbances, the distance is increased to 1 mile. Thus, for the purposes of the Bridge Program, adverse effects from noise disturbance are considered possible if habitat exists within a 1-mile perimeter surrounding the API.

Visual Disturbance/Harassment
Hiding/concealment cover is an important element of deer habitat. Typically, hiding cover consists of either a topographical barrier or vegetation capable of hiding 90% of a standing adult deer from the view of a human at a distance equal to or less than 200 feet (USFS 1979). Columbian white-tailed deer will seldom forage farther than 750 feet from a woodland edge (i.e., from hiding cover) (WDFW 1990).

The Columbian white-tailed deer's responses to visual disturbance are similar to those for noise disturbance, ranging from general alertness and increased heart rate, to a slow retreating movement or outright flight (Canfield et al. 1999) Visual disturbance events can be more detrimental to nursing does, which may abandon fawns or become less attentive to them, thus increasing their vulnerability to predation or malnourishment.

There is no documented Columbian white-tailed deer threshold for visual disturbance. For the purposes of the Bridge Program, adverse effects from visual disturbance are

considered possible if the disturbance occurs within a distance of 1,500 feet from habitat within the range of the DPS.

Vegetation

Habitat loss and degradation are the greatest threats to the Columbian white-tailed deer (USFWS 1976). The removal of trees and shrubs can reduce hiding cover, and can alter the quantity or quality of foraging habitat by promoting invasive competing species. For the purposes of the Bridge Program, adverse effects due to vegetation alteration are considered possible within the API of any bridges within the range of the DPS.

Species

Direct effects on the species may occur if there is direct physical contact with humans or their equipment. Bridge repair and replacement activities will not result in the direct physical take of Columbian white-tailed deer.

5.4.4.3 Minimization and Avoidance Measures

Minimization and avoidance measures have been developed to reduce the proposed action's adverse affects on Columbian white-tailed deer populations. The environmental performance standards in Section 3.3 detail these minimization measures as well as the methods developed for habitat and species conservation during bridge construction.

5.4.4.4 Analysis of Effects

ODOT/FHWA assessed the likely effects of the Bridge Program on the Columbian white-tailed deer using GIS analyses. A screening process was applied to all program bridges to identify where bridge repair and replacement activities have the potential to affect Columbian white-tailed deer. The methods and assumptions used to perform this screening process are presented in summary below, and in detail in the Effect Screening Layer memos (Appendix 2-A). The methods and assumptions used to assess the effects on Columbian white-tailed deer via the various pathways are presented below, and in detail in the Evaluation of Effect memos (Appendix 2-B). Both the Effect Screening Layer memo and the Evaluation of Effect memo for this species were reviewed by the Services as part of the ongoing consultation process for the Bridge Program.

For the purposes of the Bridge Program, potential Columbian white-tailed deer habitat includes all areas: 1) within the 4th field HUC of Lower Columbia/Clatskanie or Grays/Elokoman and 2) below 100 feet elevation.

ODOT/FHWA determined that a single program bridge (Big Creek Bridge - No. 07417) met these criteria; construction activities at this bridge were considered to have the potential to affect Columbian white-tailed deer. This bridge is further analyzed below to determine what, if any, adverse effects repair and replacement activities may have on Columbian white-tailed deer via the various effects pathways.

Air

Noise Disturbance/Harassment
For the purposes of the Bridge Program, the potential for noise disturbance was assumed to exist within all Columbian white-tailed deer habitat within 1 mile of the perimeter of the Big Creek Bridge (No. 07417) API. This was calculated to be 3,913 acres. Bridge Program activities will be carried out in conformance with the Wildlife Avoidance Environmental Performance Standard; this will minimize noise levels and restrict loud noises to certain times of the year (see Section 3.3), thus minimizing adverse effects on Columbian white-tailed deer.

Visual Disturbance/Harassment
For purposes of the Bridge Program, the potential for visual disturbance was assumed to exist in the area within 1,500 feet of the Big Creek Bridge (No. 07417) API. This area was calculated to be 959 acres.

Vegetation
For purposes of the Bridge Program, effects on vegetation are assumed to be limited to 2 acres per bridge site. This is a safe estimate of the actual area of habitat impacts based on past ODOT bridge projects (Appendix 2-B). Since only one bridge site is within the vicinity of Columbian white-tailed deer habitat, ODOT/FHWA estimates that 2 acres of habitat will be affected. The Big Creek Bridge replacement project is one of the smaller projects in the Bridge Program; thus the actual effect on Columbia white-tailed deer habitat is expected to be less than 2 acres. The Habitat Avoidance and Site Restoration Environmental Performance Standards (Section 3.3) will be followed to limit the amount of vegetation cleared and to ensure that any vegetation removed outside of a specific bridge footprint is restored.

Species

Bridge repair and replacement activities will not result in the direct physical take of Columbian white-tailed deer. Implementation of the Wildlife Avoidance and Habitat Avoidance Environmental Performance Standards at the Big Creek Bridge – No. 07417 will ensure that direct effects on Columbian white-tailed deer do not occur.

5.4.4.5 Determination of Effect

Only one bridge (Big Creek Bridge – No. 07417) was identified as being within habitat for Columbian white-tailed deer. This bridge is located along Highway 30 in Clatsop County, between the rural communities of Svensen and Knappa Junction. The USFWS considers the Big Creek Bridge area to be just outside the known range of the Columbian white-tailed deer (Al Clark, Biologist, Julia Butler Hanson National Wildlife Refuge, pers. comm., January 26, 2004). Adherence to the Wildlife Passage and Migration Performance Standard will avoid or minimize potential long-term effects to white-tailed deer that may disperse into the vicinity of the Big Creek Bridge. Adherence to the Site Restoration and Habitat Avoidance Environmental

Performance Standards during the replacement of the Big Creek Bridge will serve to greatly minimize adverse effects on Columbian white-tailed deer habitat. Due to the high levels of noise and disturbance around the bridge site, the location of the bridge outside the known range of the species, and application of the Environmental Performance Standards, the likelihood of adverse effects to the Columbia white-tailed deer are discountable. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, not likely to adversely affect** for the Columbian white-tailed deer.

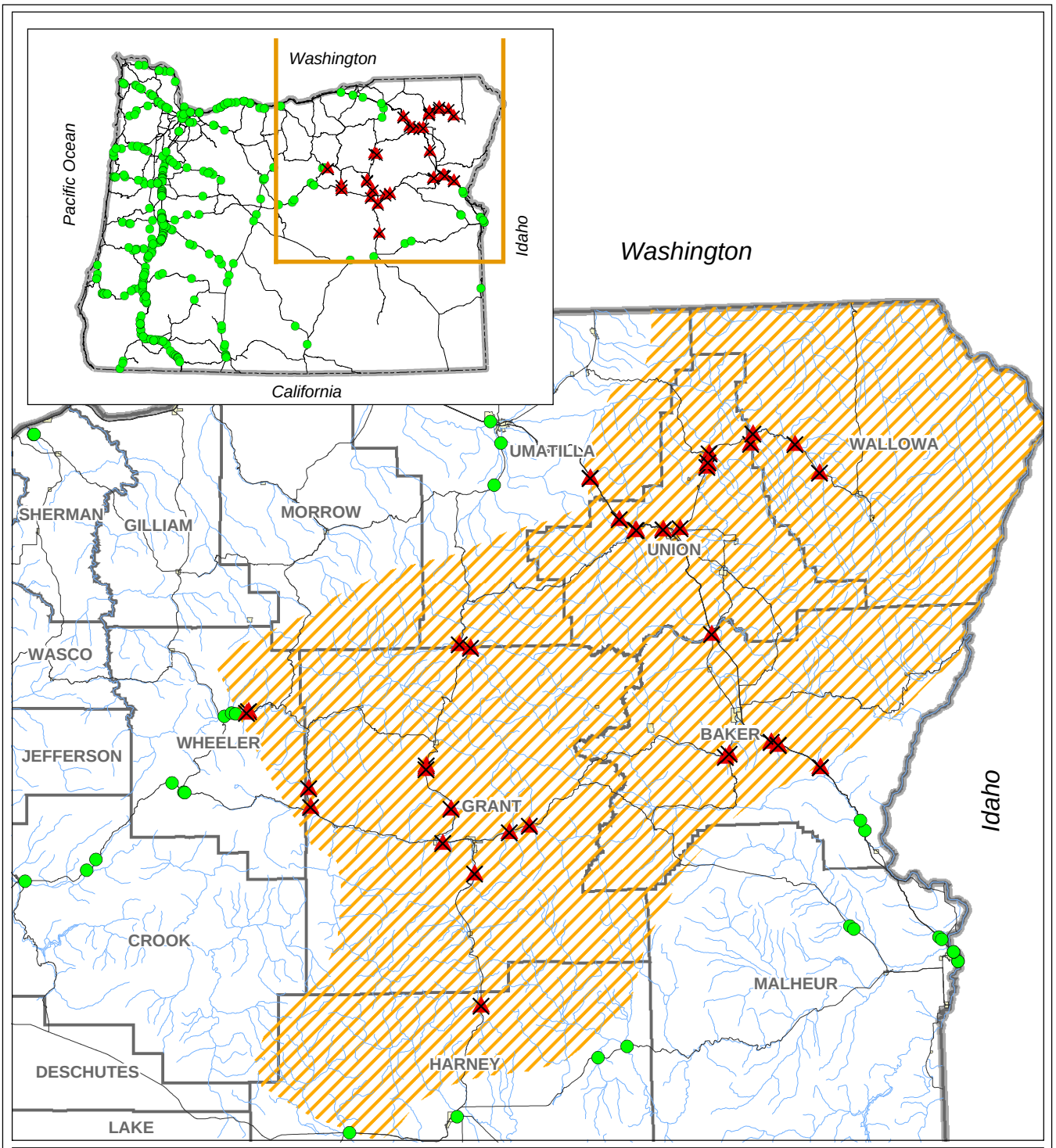
5.4.5 Canada Lynx (*Lynx canadensis*)

5.4.5.1 Life History and Status

On March 24, 2000 the Canada Lynx was Federally listed as threatened throughout its range (March 24, 2000, 65 FR 16051) (Figure 5.4.5-1). Critical habitat was not designated for the species because the species and its habitat are continually shifting across the landscape. Therefore critical habitat would provide a static designation of broad geographic areas that would include many areas of nonfunctional habitat that are not critical to the species (March 24, 2000, 65 FR 16051).

The Canada lynx ranges throughout Alaska, Canada, the western mountainous states (Montana, Wyoming, Colorado, Utah, Idaho, Oregon, and Washington), the Great Lakes region (Minnesota, Wisconsin, and Michigan), and the northeast United States (New York, Pennsylvania, Vermont, New Hampshire, Maine, and Massachusetts) (March 24, 2000, 65 FR 16051). In Oregon, there are limited historic lynx records indicating presence in the Willamette Valley, Cascade Mountains, Steens Mountain, Stinkingwater Mountains, Blue Mountains, and Wallowa Mountains (Verts and Carraway 1998). Based on the limited number of verified records, lack of evidence of lynx reproduction, frequency of presence in atypical habitat, and correlation of such occurrences with cyclic highs, the USFWS believes lynx occur in Oregon as dispersers; that is, individual animals that have left an area they originally occupied for various reasons (such as a decline in a snowshoe hare population) (July 3, 2003, 68 FR 40076). The Blue Mountain Ecoregion in northeastern Oregon provides the highest potential for supporting lynx because of its proximity to occupied habitat, higher elevations, and appropriate forest type. This area also has the greatest number of historical occurrences in Oregon.

Specific habitat associations vary throughout the range of Canada lynx. In the Pacific Northwest, lynx are associated with the high elevation boreal forests that typify northern latitudes; these forests are primarily found above 4,500 feet in Oregon (Lee et al. 1998). Lynx require a mosaic of early successional forests with high prey densities for foraging, and late-successional forests with an accumulation of downed logs to use for denning and for thermal and hiding cover (Lee et al. 1998). The lynx breeding season begins in mid-March to early April; the kittens are born in May and remain with the mother until the onset of the following breeding season (Verts and Carraway 1998). Litter size, age of breeding, and reproductive rates are cyclic and directly correlate to snowshoe hare populations cycles (Lee et al. 1998).



OTIA III Bridges

- Potential to Affect
- No Potential to Affect
- Canada Lynx Area of Concern
- Streams and Rivers
- City
- County
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.4.5-1

OTIA III: Statewide Bridge Delivery Program
Canada Lynx

N W E S

0 5 10 20 30 40
Miles

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
screening/BA Figures/Lynx.mxd. Mar 1, 2004

5.4.5.2 Effects Pathways

Effects pathways include the media through which effects are delivered to a species. Essentially all effects on the Canada lynx are delivered through the displacement, disruption, removal or addition of one or more of the following media:

Air

Noise Disturbance
There is little information regarding the Canada lynx's susceptibility to noise harassment; however, several anecdotal observations suggest that lynx can be relatively tolerant of human activity and even continued presence (Ruediger et al. 2000, Joslins and Youmans 1999, Ruggiero et al. 1999). However, noise disturbance may result in an overall avoidance of an area. Disturbances that occur close to a den site during denning season would be more detrimental, resulting in reduced kitten survival due to abandonment or the moving of kittens to an alternate site (Joslins and Youmans 1999).

There is no documented threshold for noise harassment for Canada lynx. However, the USFWS typically evaluates the effects of noise-generating activities if the species and/or critical habitat exists within a 0.25 mile of the activity. For open air blasting and other major disturbances, the distance is increased to 1 mile. Thus, for the purposes of the Bridge Program, adverse effects from noise disturbance are considered possible if habitat exists within a 1-mile perimeter surrounding the API.

Visual Disturbance
Anecdotal observations suggest that lynx are tolerant of human disturbance (Ruediger et al. 2000, Joslins and Youmans 1999, Ruggiero et al. 1999). Reactions to visual disturbance are similar to those for noise disturbance. If the activity is near a den, there may be reduced kitten survival due to den abandonment or the moving of kittens to an alternate site (Joslins and Youmans 1999). Vegetation or topography capable of concealing an adult Canada lynx may be important in providing lynx with an insulating buffer from the visual disturbance. Snow tracking research in north central Washington determined that Canada lynx travel the edges of meadows, but only cross meadows where openings are less than 330 feet (Ruggiero et al. 1999).

There is no documented Canada lynx threshold for visual disturbance. For the purposes of the Bridge Program, adverse effects from visual disturbance are considered possible if the disturbance occurs within a distance of 330 feet from habitat.

Vegetation

There is little information regarding the effects of small scale vegetation removal on Canada lynx; however, any vegetation removal has the potential to decrease functional habitat for preferred prey, to decrease available cover for the Canada lynx, and to promote the introduction or expansion of non-native invasive species. However, it is very unlikely that the areas immediately adjacent to highway bridges are preferred habitat for

lynx due to the relatively high level of human presence. Nonetheless, for the purposes of the Bridge Program, adverse effects due to vegetation alteration are considered possible within the API of any bridges within the range of the species.

Species

Direct effects on the species may occur if there is direct physical contact with humans or their equipment. Lynx deaths from vehicular collisions drastically increase with relatively small increase in traffic volumes and speed; however, this appears to be a minimal risk to Canada lynx in Oregon due to the few lynx present (Ruediger et al. 2000). Highways speeds will be temporarily reduced during the period of active bridge construction. Bridge repair and replacement activities will not result in the direct physical take of Canada lynx.

5.4.5.3 Minimization and Avoidance Measures

Minimization and avoidance measures have been developed to reduce the proposed action's adverse affects on Canada lynx populations. The environmental performance standards in Section 3.3 detail these minimization measures as well as the methods developed for habitat and species conservation during bridge construction.

5.4.5.4 Analysis of Effects

ODOT/FHWA assessed the likely effects of the Bridge Program on the Canada lynx using GIS analyses. A screening process was applied to all program bridges to identify where bridge repair and replacement activities have the potential to affect the Canada lynx. The methods and assumptions used to perform this screening process are summarized below, and detailed in the Effect Screening Layer memos (Appendix 2-A). The methods and assumptions used to assess the effects on the Canada lynx via the various pathways are presented below, and in detail in the Evaluation of Effect memos (Appendix 2-B). Both the Effect Screening Layer memo and the Evaluation of Effect memo for this species were reviewed by the Services as part of the ongoing consultation process for the Bridge Program.

For the purposes of the Bridge Program, Canada lynx habitat includes all areas within the lynx Area of Concern as identified by the USFWS (USFWS 2003). A total of 38 Program Bridges fall within this area (Table 5.4.5-1). These 38 bridges are further analyzed below to determine what, if any, adverse effects their repair and replacement activities may have on the Canada lynx via the various effects pathways.

Table 5.4.5-1. Program Bridge Projects That May Affect Canada Lynx.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	Ecoregion Name
1	1996	Grande Ronde R (Elgin)	4	Blue Mountains
2	2184	Wallowa River (Bear Cr Br.)	5	Blue Mountains
3	3596	Trout C. Overflow	1	Blue Mountains
4	4728	Camas C.	4	Blue Mountains
5	4729	N. Fk. John Day R.(Dale)	5	Blue Mountains
6	5192	Minam Viaduct	8	Blue Mountains
7	6204	Smith Cr.	1	Blue Mountains
8	6205	Fox Cr.	1	Blue Mountains
9	7316	Powder R. (Rancheria)	3	Blue Mountains
10	7431	Powder R. (Salisbury)	3	Blue Mountains
11	7573	Lostine R.	3	Blue Mountains
12	7987	UPRR/Pritchard Cr.	6	Blue Mountains
13	8431	Unknown	7	Blue Mountains
14	8502	Hilgard Interchange	4	Blue Mountains
15	8780	Inp/Grande Ronde (Indian)	6	Blue Mountains
16	00449A	UPRR & Frontage Rd.	5	Blue Mountains
17	00800A	Grande Ronde R. (S Elgin)	6	Blue Mountains
18	01038A	Wallowa R.-Minam Br.	6	Blue Mountains
19	03553A	Beech C. (6th Xing)	3	Blue Mountains
20	03558A	Canyon C.	3	Blue Mountains
21	04821A	Grande Ronde R/Island Ct	3	Blue Mountains
22	04841A	Grande Ronde R(Hilgard)	3	Blue Mountains
23	07292B	UPRR	3	Blue Mountains
24	07987A	UPRR/Pritchard Cr.	6	Blue Mountains

Table 5.4.5-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	Ecoregion Name
25	08302E	Encina Interchange	5	Blue Mountains
26	08302W	Encina Interchange	5	Blue Mountains
27	08423E	Alder Cr. Rd.	3	Blue Mountains
28	08423W	Alder Cr. Rd.	3	Blue Mountains
29	08431A	Unknown	4	Blue Mountains
30	08498E	UPRR & Meacham Cr.	6	Blue Mountains
31	08498W	UPRR & Meacham Cr.	6	Blue Mountains
32	2463	Indian Cr.	3	Lava Plains
33	2466	Dixie Cr.-Prairie City	3	Lava Plains
34	2655	John Day R. (Goose Rock)	6	Lava Plains
35	7696	John Day R. (Coles)	3	Lava Plains
36	02233A	Harper Cr.	3	Lava Plains
37	02734A	Rock Cr. (Picture Gorge)	3	Lava Plains
38	04981A	Mathas Cr.	3	Lava Plains

Air

Noise Disturbance/Harassment
For the purposes of the Bridge Program, the potential for noise harassment was assumed to exist within 1 mile of the perimeter of program bridge APIs within the lynx Area of Concern. A total of 114,665 net acres (148,995 gross acres) of lynx habitat therefore have the potential of being affected by noise disturbance. Due to the variation in the annual timing of lynx dispersal, it would not be feasible to apply a seasonal restriction to minimize the potential effects of noise disturbance.

Visual Disturbance/Harassment
For purposes of the Bridge Program, visual disturbance was assumed to occur in all habitats within 330 feet of the perimeter of program bridge APIs within the lynx Area of Concern. This area was calculated to be approximately 14,462 net acres (17,002 gross acres). As noted above, it would not be feasible to apply a seasonal restriction to minimize the potential effects of visual disturbance on dispersing Canada lynx.

Vegetation

For purposes of the Bridge Program, effects on vegetation are assumed to be limited to 2 acres per bridge site. This is a safe estimate of the actual area of habitat impacts based on past ODOT bridge projects (Appendix 2-B). Thus, approximately 76 acres of vegetation will be disturbed in the vicinity of program bridges within the lynx Area of Concern. It is unlikely that very much of the area where vegetation disturbance will occur is functional lynx habitat.

The Habitat Avoidance and Site Restoration Environmental Performance Standards (Section 3.3) will be followed to limit the amount of vegetation cleared and to ensure that any vegetation removed outside of a specific bridge footprint is restored. There is no designated critical habitat for the Canada lynx; therefore no critical habitat will be removed.

Species
Bridge repair and replacement activities will not result in the direct physical take of Canada lynx. Implementation of the Wildlife Avoidance and Habitat Avoidance Environmental Performance Standards will ensure that direct effects on Canada lynx do not occur.

5.4.5.5 Determination of Effect

A total of 38 program bridges were identified within the Canada lynx Area of Concern. The potential effects of the Bridge Program on the Canada lynx delivered through pathways above will be discountable or avoided with the application of environmental performance standards to these 38 bridges. Canada lynx are extremely rare in Oregon, and exist only as dispersing or possibly breeding individuals; there is no established breeding population (July 3, 2003, 68 FR

40076). However, due to the high baseline level of noise along the roadways; the very unlikely chance of a lynx denning near a bridge and the improvement of habitat connectivity via bridges along the riparian corridors, the likelihood of adverse effects to lynx are discountable. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, not likely to adversely affect** for the Canada lynx.

5.4.6 Marbled Murrelet (*Brachyramphus marmoratus*)

5.4.6.1 Life History and Status

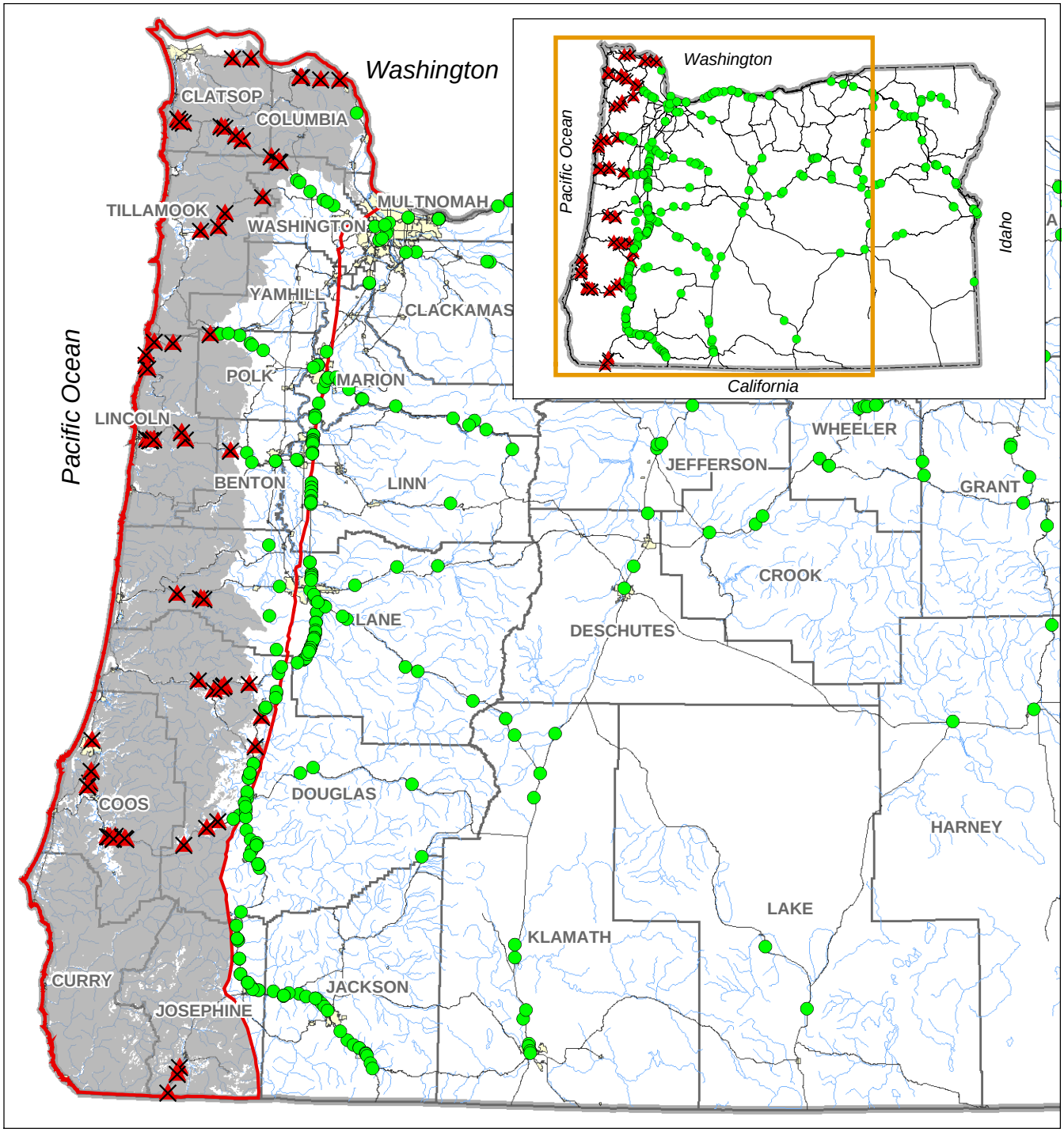
The marbled murrelet is a robin-sized seabird that inhabits coastal areas from Alaska to south-central California. Marbled murrelets spend most of their lives in the marine environment, where they feed primarily on small fish and invertebrates in the near-shore marine water (May 24, 1996, 61 FR 26256). Typically, murrelets live within 1-2 miles of the shore and concentrate at the mouth of rivers and creeks. In Oregon, marbled murrelets nest in coastal forests as far as 40 miles inland of the Pacific Ocean (Evans-Mack et al. 2003).

The marbled murrelet was Federally listed as threatened on October 1, 1992, due to the loss of older forested habitat associated with its nest sites (October 1, 1992, 57 FR 45328). Lesser threats include oil spills and gill-net mortalities (October 1, 1992, 57 FR 45328). In Oregon, the current population is much smaller than its historic population, but is thought to have been stable since 1987 (USFWS 1997).

The USFWS designated critical habitat for nesting marbled murrelets on May 24, 1996 (May 24, 1996, 61 FR 26256). Lands identified as critical habitat provide nesting habitat; they are near to marine foraging habitat, are typically large continuous blocks, are distributed throughout the range of the species, and are adequate for existing protection and management (May 24, 1996, 61 FR 26256) (Figure 5.4.6-1). Not all functional or occupied marbled murrelet nesting habitat is designated critical habitat.

Marbled murrelets typically nest in large-diameter old-growth trees in low-elevation forest with multi-layered canopies (May 24, 1996, 61 FR 26256, Nelson 1990). Functional nesting trees have branches of at least 5 inches in diameter, and deformities or other natural structures that provide a platform for nesting (January 27, 1994, 59 FR 3811). The platform is typically covered with moss or duff, creating the necessary nest substrate, and the trees typically have dense over-hanging branches that provide protection from predators and weather (Hamer et al. 1993). Nests are typically in trees greater than 32 inches in diameter at breast height, and are frequently located in the largest trees available in the stand (January 27, 1994, 59 FR 3811, Hamer et al. 1993).

Marbled murrelet nesting occurs from early April to August (Carter and Sealy 1987). A single egg is laid and both sexes incubate in alternating 24-hour shifts for approximately 30 days; the young fledge after approximately 28 days (Singer et al. 1991, Hirsch et al. 1981, Simons 1980). Chicks are fed once daily. The adults commonly fly inland from the ocean feeding areas to the nest site at dusk and dawn, although these flights may occur at any time of day (Hamer and Cummins 1991). Murrelets frequently follow linear openings, such as roads, creeks, or other natural or human-made corridors to directly approach and depart from nest stands (USFWS 2003a).



OTIA III Bridges

- Potential to Affect
- No Potential to Affect
- Pacific Shoreline + 40 Miles Inland
- Johnson & O'Neil Habitat Types
- City
- Streams and Rivers
- County
- Highway
- State Boundary

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N W E S

0 5 10 20 30
Miles

Figure 5.4.6-1

OTIA III: Statewide Bridge Delivery Program Marbled Murrelet

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
screening\BA_figures\mamu.mxd. Mar 1, 2004

5.4.6.2 Effects Pathways

Effects pathways include the media through which effects are delivered to the species. Essentially, all effects on marbled murrelets are delivered through the displacement, disruption, degradation, removal, or addition of the following:

Air

Noise Disturbance
Murrelets may be adversely affected by noise during the breeding season. Activities involving heavy equipment, chainsaws, aircraft, or blasting within specified distances during the critical breeding season (approximately April 1 to August 5) have the potential to cause disturbance and harassment by significantly disrupting breeding, feeding, or sheltering. For murrelets, the adverse effects of noise disturbance may also lead to nest abandonment by adults, reduced nest attentiveness (leading to increased vulnerability to predation for juveniles), aborted feeding visits, premature fledging, and avoidance of otherwise functional habitat (Hamer and Nelson 1998). The sensitivity of an individual murrelet to disturbance is likely related to the baseline level of disturbance the bird is accustomed to, the proximity of the disturbance, and the timing of the disturbance within the nesting cycle and daily activity periods (Hamer and Nelson 1998).

In the past the USFWS typically determined the threshold of general noise harassment to be within a 0.25-mile radius of the activity, and within a 1.0-mile radius for larger disturbances such as open air blasting (USFWS 2003b). However, based on information contained in a recent Olympic National Forest ESA consultation (USFWS 2003a), the USFWS has refined the thresholds for noise harassment for marbled murrelets (Table 5.4.6-1). This recent guidance was used by ODOT/FHWA in developing marbled murrelet environmental performance standards and evaluating the effects of the proposed action. For the purposes of the Bridge Program, adverse effects from noise disturbance are considered possible if the disturbance occurs within a 1-mile perimeter surrounding the API. Adverse effects from noise disturbance from sources other than blasting are considered possible if the other noise-generating activities occur within a 300-foot perimeter surrounding the API.

Table 5.4.6-1. Noise disturbance thresholds for marbled murrelets.

Activity	Threshold Distance
Blast (greater than 2 lb charge)	1.0 mile
Blast (less than a 2 lb charge)	360 feet
Pile driving, jackhammer, or rock drill	180 feet
Helicopter or single-engine Aircraft	360 feet
Chainsaws	135 feet
Heavy equipment	105 feet

Source: USFWS 2003a.

Visual Disturbance/Harassment

Anecdotal observations presented in Long and Ralph (1998), as well as limited controlled experiments conducted by Hamer and Nelson (1998), suggest that murrelets may be adversely affected by visual disturbance. Due to the murrelets' ecological position as a prey item for several species of birds and mammals, visual disturbances that resemble those of their predators have the greatest potential to adversely affect marbled murrelets (USFWS 1997). For example, the presence of people walking near a nest, and of corvids flying or perching nearby, has disturbed murrelets by causing adults to abort feeding visits, flush from the nest, or freeze on the landing pad or in the nest until the perceived threat had passed. Long and Ralph (1998) reported the findings of several studies on other seabird species which showed reduced reproductive success in areas where human presence (often researchers) caused disturbance. Again this was believed to be due to reduced nest attentiveness and increased predation. Hamer and Nelson (1998) found that adults were more likely than nestlings to show a severe response to a disturbance (e.g., aborting a feeding visit or flushing from the nest).

For their programmatic ESA consultation (USFWS 2003a), the Olympic National Forest compiled information from experienced marbled murrelet biologists as well as incidental observation of visual disturbance to determine the estimated sight-only injury threshold—the distance at which a murrelet would be flushed from its nest or miss feeding its young merely by the sight (not sight *and* sound) of human activity. Overall, the farthest murrelets flushed from perches or nests due to the presence of pedestrians (without motorized equipment) was 33 feet. However, the USFWS has yet to adopt this visual harassment threshold and continues to evaluate the effects of visual harassment that occurs within 300 feet of a marbled murrelet nest or suitable unsurveyed habitat. Thus, for the purposes of the Bridge Program, adverse effects from visual disturbance are considered possible if the disturbance occurs within a 300-foot perimeter surrounding the API.

Chemicals

Because marbled murrelets inhabit the marine environment, there is no potential for a construction-related spill to affect them. Implementation of the Pollution & Erosion Control Environmental Performance Standard will further ensure that there are no adverse effects on this species through the chemical effects pathway.

Vegetation

Some bridge repair and replacement activities may require vegetation removal (including cutting of large trees), which may result in the removal of functional nesting habitat. The greatest threat to marbled murrelet recovery is continued loss of nesting habitat (Ralph et al. 1995). For the purposes of the Bridge Program, adverse effects due to vegetation alteration are considered possible at bridges within the range of the species, if those bridges have murrelet habitat within 500 feet of the center of the bridge.

Species

Removal of occupied nesting habitat during the breeding season has the potential to directly take marbled murrelets by killing juveniles. In addition, human activity and the clearing of vegetation adjacent to marbled murrelet nests may increase the presence of corvids, a primary predator of marbled murrelets, which would make juveniles and incubating adults vulnerable to predation.

5.4.6.3 Minimization and Avoidance Measures

Minimization and avoidance measures have been developed to reduce the proposed action's adverse affects on marbled murrelet populations. The environmental performance standards in Section 3.3 detail these minimization measures as well as the methods developed for habitat and species conservation during bridge construction.

5.4.6.4 Analysis of Effects

ODOT/FHWA assessed the likely effects of the Bridge Program on the marbled murrelet using GIS analyses. A screening process was applied to all program bridges to identify where bridge repair and replacement activities have the potential to affect the marbled murrelet. The methods and assumptions used to perform this screening process are presented in summary below, and in detail in the Effect Screening Layer memos (Appendix 2-A). The methods and assumptions used to assess the effects on the marbled murrelet via the various pathways are presented below, and in detail in the Evaluation of Effect memos (Appendix 2-B). Both the Effect Screening Layer memo and the Evaluation of Effect memo for this species were reviewed by the Services as part of the ongoing consultation process for the Bridge Program.

For the purposes of the Bridge Program, marbled murrelet habitat includes all areas: 1) within 40 miles of the Pacific Ocean shoreline, and 2) within the Johnson and O'Neil (2001) Westside Lowland Conifer-Hardwood Forest, Southwest Oregon Mixed Conifer-Hardwood Forest, Bays and Estuaries, Marine Nearshore, and Marine Shelf habitat types.

A total of 87 program bridges are within 40 miles of the Pacific Ocean, but only 63 of these have marbled murrelet habitat (as defined above) within 1 mile of their API (Table 5.4.6-2). These bridges are further analyzed below to determine what, if any, adverse effects their associated repair and replacement activities may have on the marbled murrelet via the various effects pathways.

Table 5.4.6-2. Program Bridge projects that may affect Marbled Murrelet.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	Ecoregion Name
1	654	Hayes Cr.	6	Coast Range
2	683	Yaquina R.	4	Coast Range
3	921	Gnat Cr.	4	Coast Range
4	1406	Elk Cr. 4th Xing	5	Coast Range
5	1465	Elk Cr. 3rd Xing	6	Coast Range
6	1601	Elk Cr. 2nd Xing	6	Coast Range
7	1614	Elk Cr. 1st Xing	6	Coast Range
8	1697	Paradise Cr.	5	Coast Range
9	1831	Unknown	3	Coast Range
10	1832	Unknown	3	Coast Range
11	1868	Wilson R. Mills Br.	3	Coast Range
12	1950	Central OR RR	3	Coast Range
13	2029	Unknown	3	Coast Range
14	2164	Unknown	14	Coast Range
15	2165	Unknown	12	Coast Range
16	2472	Devils Lake Fk. #2	9	Coast Range
17	2601	Unknown	4	Coast Range

Table 5.4.6-2.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	Ecoregion Name
18	4192	Unknown	9	Coast Range
19	4573	Unknown	3	Coast Range
20	7417	Big Cr.	3	Coast Range
21	7519	Clatskanie R.	3	Coast Range
22	7530	Beaver Cr.	3	Coast Range
23	7532	Beaver Cr.	3	Coast Range
24	7533	Beaver Cr.	3	Coast Range
25	7534	Little Beaver Cr.	3	Coast Range
26	7715	Swedetown County Rd.	4	Coast Range
27	7722	Lost Cr.	3	Coast Range
28	8281	Us 101 NB (Hwy 009)	3	Coast Range
29	8370	Knowles Cr.	3	Coast Range
30	8446	Siuslaw R.	3	Coast Range
31	8554	Wildcat Cr.	3	Coast Range
32	8830	Coquille R.	5	Coast Range
33	8842	Coquille R.	8	Coast Range
34	8843	Hwy 242	3	Coast Range
35	8875	Coquille R.	5	Coast Range
36	8876	Coquille R.	4	Coast Range
37	8935	Coquille R.	7	Coast Range
38	8936	Coquille R.	5	Coast Range
39	9591	Hwy 2W	3	Coast Range
40	13491	Unknown	3	Coast Range
41	00866B	WPRR & Marys R.	6	Coast Range

Table 5.4.6-2.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	Ecoregion Name
42	00922A	Unknown	3	Coast Range
43	00924A	Unknown	6	Coast Range
44	00925A	Unknown	5	Coast Range
45	01869A	Wilson R. 2nd Xing	11	Coast Range
46	01872A	Jordon Cr.	4	Coast Range
47	02027A	Unknown	3	Coast Range
48	02364A	Unknown	3	Coast Range
49	03091A	Unknown	1	Coast Range
50	03092A	Unknown	1	Coast Range
51	03172A	Central OR RR	3	Coast Range
52	03173A	Beaver Cr.	24	Coast Range
53	03173B	Beaver Cr.	24	Coast Range
54	03212A	Endicot Cr.	3	Coast Range
55	1424	Hardscrabble Cr.	3	Klamath Mountains
56	00559B	Middle Fk. Coquille R.	3	Klamath Mountains
57	00587C	Olalla Cr.	3	Klamath Mountains
58	00588C	Tenmile Cr.	3	Klamath Mountains
59	01074A	Elk Cr.	3	Klamath Mountains
60	01107A	Rough & Ready Cr.	3	Klamath Mountains
61	01108A	W Fk. Illinois R.	5	Klamath Mountains
62	07563A	Calapooya Cr.	7	Klamath Mountains
63	07644A	Rice Hill Front Rd.	3	Klamath Mountains

Air

Noise Disturbance
For the purposes of the Bridge Program, adverse effects from noise disturbance are considered possible if the disturbance occurs within a 1-mile perimeter surrounding the API. Adverse effects from noise disturbance from sources other than blasting are considered possible if the other noise-generating activities occur within a 300-foot perimeter surrounding the API.

Construction noise occurring within the range of the marbled murrelet may affect marbled murrelets at the nest site as well as those traveling to or from the nest. Consequently, construction noise at all 87 bridges within the range of the marbled murrelet, regardless of whether or not functional habitat is present in the vicinity, has the potential to affect marbled murrelets. Assuming that noises from bridge repair and replacement activities will attenuate to near background levels within 1.0 mile of the activity, the area of potential noise disturbance at individual bridges ranges from 3,824 acres to 4,725 acres depending on bridge size. A total of 153,445 net acres (255,463 gross acres) of land area could be affected by noise disturbance. However, the Wildlife Avoidance Environmental Performance Standard (Section 3.3) will essentially eliminate the potential adverse effects of noise on marbled murrelets by prohibiting high noise activities when murrelets may be present. Furthermore, the Bridge Program will be carried out over a period of 7-10 years, so any potential effects on murrelets will be spread out geographically and temporally.

Visual Disturbance
For the purposes of the Bridge Program, adverse effects from visual disturbance are considered possible if the disturbance occurs within a 300-foot perimeter surrounding the API. Only 61 bridges have functional murrelet nesting habitat within 300 feet of their API. A total of about 19,127 net acres (21,095 gross acres) of murrelet habitat is present in the vicinity of these 61 bridges. However, it is unlikely that construction activities at any of the bridges will actually affect marbled murrelets through visual disturbance. Marbled murrelets nesting near highways would be acclimated to higher noise levels and to the presence of people; therefore, they are less likely to be affected by a potential visual disturbance. Furthermore, the Bridge Program will be carried out over a period of 7-10 years, so any potential effects on murrelets will be spread out geographically and temporally.

Chemicals

Because marbled murrelets inhabit the marine environment, there is no potential for a construction-related spill to affect them. Implementation of the Pollution & Erosion Control Environmental Performance Standard will further ensure that there are no adverse effects on this species through the chemical effects pathway.

Vegetation

For purposes of the Bridge Program, effects on vegetation are assumed to be limited to 2 acres per bridge (for all bridges with murrelet habitat within 500 feet of the bridge center). This is a safe estimate of the actual area of habitat impacts based on past ODOT bridge projects (Appendix 2-B). Fifty bridges meet this criterion. Thus, approximately 100 acres of vegetation will be disturbed in the vicinity of program bridges with potential marbled murrelet habitat nearby. It is unlikely that very much of the area where vegetation disturbance will occur is functional murrelet habitat.

Only two bridges have marbled murrelet designated critical habitat present within 500 feet of the bridge center point. Both of these bridges are completely within designated critical habitat. By following the Habitat Avoidance Performance Standard, no primary constituent elements will be removed as a result of this project.

The Habitat Avoidance and Site Restoration Environmental Performance Standards (Section 3.3) will be followed to limit the amount of vegetation cleared and to ensure that any vegetation removed outside of a specific bridge footprint is restored. Implementation of the Wildlife Avoidance Environmental Performance Standard will ensure that murrelet critical habitat and functional habitat will not be removed during the breeding season unless surveys indicate that murrelets are not present. No documented marbled murrelet nest trees or primary constituent elements of marbled murrelet critical habitat will be removed per this environmental performance standard.

Species

Direct removal of habitat may affect marbled murrelets currently occupying that habitat. However, by adhering to the Habitat Avoidance Environmental Performance Standard, no marbled murrelet habitat will be removed during the breeding season unless surveys show that murrelets are not present. Thus no direct physical take of marbled murrelets will occur.

5.4.6.5 Determination of Effect

Through the application of environmental performance standards, adverse effects on marbled murrelets will be minimized to the greatest extent practicable. However, the possibility exists that marbled murrelets could be adversely affected by noise and visual harassment, and some marbled murrelet functional habitat may be removed. However, any potential effects on murrelets will be spread out geographically and temporally and are expected to be minor. Based on this analysis for the Bridge Program, ODOT/FHWA makes the determination of **may affect, likely to adversely affect** for the marbled murrelet via harassment and habitat effects and **may affect, not likely to adversely affect** the marbled murrelet via adverse modification of designated critical habitat.

5.4.7 Bald Eagle (*Haliaeetus leucocephalus*)

5.4.7.1 Life History and Status

The bald eagle was down-listed from Federally endangered to threatened in the lower 48 states on July 12, 1995 (July 12, 1995, 60 FR 36000). Habitat loss due to logging, recreational and urban development, and mineral exploration and extraction has affected the habitat functionality of breeding, wintering, and foraging areas (USFWS 1986). In addition, contaminants such as dichlorodiphenyl dichloroethylene (DDE), which is the derivative of dichlorodiphenyl trichloroethane (DDT), and polychlorinated biphenyl (PCB) continue to threaten bald eagles by lowering reproductive success (July 12, 1995, 60 FR 36000). Other threats include lead poisoning from ingesting prey items that contain lead shot, poisoning from eating baited carcasses, and illegal shootings (July 12, 1995, 60 FR 36000). No critical habitat has been designated for bald eagles (USFWS 2000a).

The Pacific Recovery Region for bald eagles includes Oregon, Washington, California, Nevada, Idaho, Wyoming, and Montana. The de-listing goal for this recovery region is 800 nesting pairs with an average reproductive rate of 1.0 fledge young per pair and an average success rate per occupied site of not less than 65% over a five-year period. De-listing would also require the attainment of breeding population goals in at least 80% of management zones and stable or increasing wintering populations (July 12, 1995, 60 FR 36000). De-listing goals have been met in all categories except nest distribution in zones with nesting targets (July 12, 1995, 60 FR 36000). In Oregon, the number of nesting territories has either increased or remained stable in each recovery zone since 1998 (Isaacs and Anthony 2003) (Figure 5.4.7-1).

Bald eagles are found throughout the Pacific Northwest in close association with freshwater, estuarine, and marine ecosystems that provide abundant prey and functional habitat for nesting and communal roosting (Watson et al. 1991). Breeding territories are typically located within 1 mile of permanent water in predominantly coniferous, variably aged forest stands with old-growth structural components (Anthony and Isaacs 1989, Stalmaster 1987, Anthony et al. 1982). Bald eagle pairs in Oregon often have alternate nests in their territories that are used in different years (Anthony and Isaacs 1981).

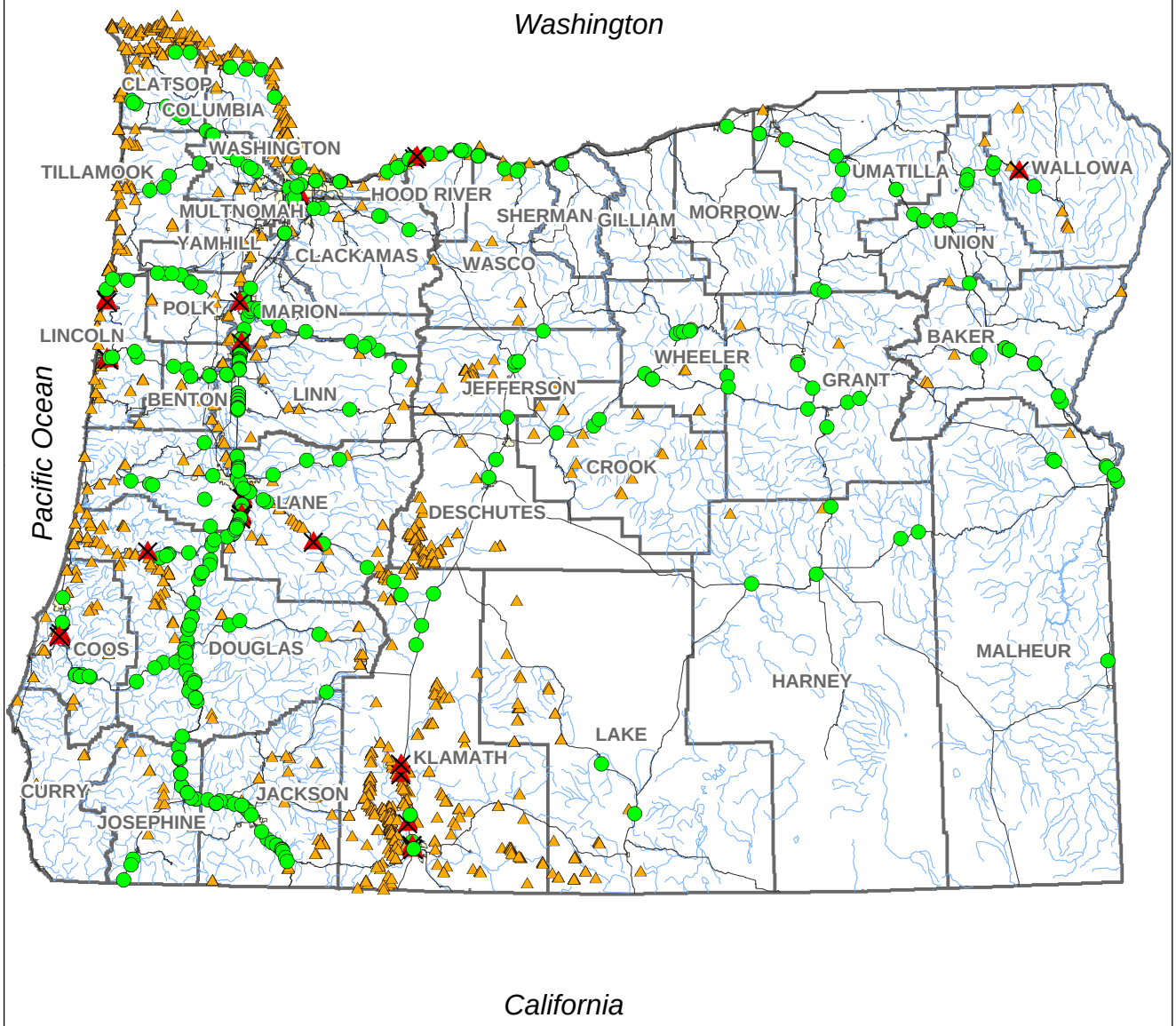
Bald eagles in the Pacific Northwest nest in relatively open forests where the average crown closure is less than 50% (Anthony et al. 1982, Anthony and Isaacs 1981). Nest trees are usually the largest tree or snag in a stand that provides an unobstructed view of the surrounding area and a clear flight path to and from the nest (Rodrick and Milner 1991, Stalmaster 1987). A pilot tree within 100 feet of the nest is often used as a perch site and an access to the nest. Additional snags and trees with exposed lateral limbs or dead tops within a nesting territory typically serve as perching or roosting sites (USFWS 1986).

Bald eagles winter along lakes, streams, and rivers. Their concentrations reflect winter food sources, although perch availability and level of human disturbance are also important (Stalmaster 1980, Steenhof 1978, USFS 1977). If sufficient winter food sources are available around a nest site, the nesting pair may remain in the area throughout the winter (Swenson et al.

1986). Fish, waterfowl, and carrion are important winter food sources for bald eagles (USFWS 1986). Most eagles that breed in Oregon and Washington winter in the vicinity of their nests (Garrett et al. 1988).

During the winter, bald eagles often form communal night roosts consisting of two to more than 500 birds. Roosts occur in areas that are sheltered from the wind, and where conditions are otherwise favorable for conserving energy (WDFW 2001). Although the advantages to communal roosting are not completely understood, these roosting areas may provide a place for pairs to form bonds and a place for eagles to learn of food sources (WDFW 2001). Communal night roosting typically occurs near a foraging area, in forested stands that are variably aged with older dominant trees with broken crowns (WDFW 2001). In areas that lack coniferous forest stands, roosts will occur in dominant cottonwood (*Populus* spp.) trees or willows (*Salix* spp.) (USFWS 1986).

Nesting behaviors typically begin in January, with egg laying and incubation occurring in February and March (Isaacs et al. 1983). Young are reared throughout April, May, and June. Fledging occurs in July and August. Disturbances during the nesting period may result in increased energy expenditure from avoidance flights, and decreased energy intake due to interference with feeding activities (Knight 1984). Distance to disturbance is the most important factor affecting the influence of human disturbance on bald eagles (Grubb and King 1991). However, their tolerance of loud noises appears to increase if the source is concealed from view by vegetation (Stalmaster and Newman 1978, Steenhof 1978).



OTIA III Bridges

- Potential to Affect
- No Potential to Affect
- Bald Eagle Nest Sites
- City
- Streams and Rivers
- County
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.4.7-1

OTIA III: Statewide Bridge Delivery Program
Bald Eagle

N W E S

0 5 10 20 30 40 50 60
Miles

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
screening/BA Figures/eagle.mxd. Mar 1, 2004

5.4.7.2 Species-Specific Effects Pathways

Effects pathways include the media through which effects are delivered to the species. Essentially all effects on bald eagles are delivered through the displacement, disruption, removal, or addition of one or more of the following:

Air

Noise Disturbance/Harassment
Bald eagles may be susceptible to harassment from noise during the breeding season and at communal winter roost. Consequently, the UFWS considers activities requiring the use of heavy equipment, chainsaws, aircraft, or blasting during the breeding season (approximately January 1 to August 15) within specified distances to bald eagle nests, and from October 31 to March 15 within specified distances to communal winter roost sites, to have the potential to significantly disrupt breeding, feeding or sheltering of bald eagles (USFWS 1981). For bald eagles, the adverse effects of harassment range from behavioral responses such as flushing, reduced nest attendance, or nest failure, to displacement or avoidance of functional habitat (WDFW 2001). The sensitivity of an individual bald eagle to disturbance is likely related to its prior experience and the density of nesting bald eagles in the area. Other factors include the proximity, duration, frequency, line-of-sight, sound, and position of the disturbance in relation to the bird (WDFW 2001).

The USFWS evaluates the effects of general disturbance activities within a 1,300-foot radius of the activity, and within a 1.0-mile radius for major disturbances such as open air blasting (USFWS 1986). For the purposes of the Bridge Program, adverse effects from noise disturbance are considered possible if nest or communal roost sites are present within a 1-mile perimeter surrounding the API. Adverse effects from noise disturbance from sources other than blasting are considered possible if nest or communal roost sites are present within a 1300-foot perimeter surrounding the API.

Visual Disturbance/Harassment
Bald eagles are susceptible to harassment from visual activity in proximity to their nests during the breeding season (January 1 and August 15) and at communal winter roost sites between October 31 and March 15. Bald eagle responses to visual harassment are similar to those for noise harassment, including flushing, reduced nest attendance, and displacement from functional habitat (WDFW 2001). The USFWS evaluates visual harassment of bald eagles to occur if the activity is within line-of-sight of a nest or roost site, to a distance of 2,600 feet (0.5 mile) (USFWS 1986). Thus, for the purposes of the Bridge Program, adverse effects from visual disturbance are considered possible if nest or communal roost sites are present within a 2,600-foot (0.5 mile) perimeter surrounding the API.

Chemicals

The Bridge Program has the potential to affect bald eagles through contamination resulting from an accidental chemical spill during bridge construction. A chemical spill may affect bald eagles directly, via chemical contact with an individual eagle (highly unlikely), or indirectly, through the mortality or contamination of primary prey species. The distance required to dilute a chemical spill to an undetectable level would vary depending on the type of chemical, the amount spilled, and the environmental conditions under which the spill occurred. It is assumed for the purposes of the Bridge Program that only chemical spills at over-water bridges have the potential to affect bald eagles, and that all chemicals spills would be diluted to undetectable levels within 1.0 mile of the contamination site.

Vegetation

Vegetation removal within the vicinity of eagle nests or roosting areas may adversely affect bald eagles. In the extreme, vegetation clearing could result in the cutting of nesting or roosting sites. The removal of vegetation may also alter the microclimate of the nest or roosting site, thereby decreasing the site's energetic benefits or increasing the site's susceptibility to windthrow (WDFW 2001). Vegetation removal adjacent to nest sites and roosting areas may increase the site's susceptibility to disturbance by removing the vegetation screen that buffers line-of-sight disturbances and loud noises. The bald eagle management guidelines for Oregon and Washington recommend restricting all land development and timber harvest activities within 660 feet surrounding a bald eagle nest site (USFWS 1981). However, more recent recommendations include the prohibition of clear-cut logging, road building, hiking trails, and boat launches within 1,300 feet of a nest site (Anthony and Isaacs 1989). For the purposes of the Bridge Program, adverse effects due to vegetation alteration are considered possible at bridges within the range of the species, if a bald eagle nest or communal roost site is present within 1,300 feet of the center of the bridge.

Species

The removal of occupied nest trees during the breeding season has the potential to directly affect bald eagles by killing nestlings or incubating adults. However, this activity will be prohibited as described in the Habitat Avoidance Environmental Performance Standard. Thus, no direct effect on the species will occur.

5.4.7.3 Minimization and Avoidance Measures

Minimization and avoidance measures have been developed to reduce the proposed action's adverse affects on bald eagle populations. The environmental performance standards in Section 3.3 detail these minimization measures as well as the methods developed for habitat and species conservation during bridge construction.

5.4.7.4 Analysis of Effects

ODOT/FHWA assessed the likely effects of the Bridge Program on the bald eagle using GIS analyses. A screening process was applied to all program bridges to identify where bridge repair and replacement activities have the potential to affect the bald eagle. The methods and assumptions used to perform this screening process are presented in summary below, and in detail in the Effect Screening Layer memos (Appendix 2-A). The methods and assumptions used to assess the effects on the bald eagle via the various pathways are presented below, and in detail in the Evaluation of Effect memos (Appendix 2-B). Both the Effect Screening Layer memo and the Evaluation of Effect memo for this species were reviewed by the Services as part of the ongoing consultation process for the Bridge Program.

For the purposes of the Bridge Program, bridge construction activities were assumed to have the potential to affect bald eagles if a known bald eagle nest or communal roost site is present within a 1-mile perimeter surrounding the API. A total of 31 program bridges meet this criterion (Table 5.4.7-1). These 31 bridges are further analyzed below to determine what, if any, adverse effects their repair and replacement activities may have on the bald eagle via the various effects pathways.

Table 5.4.7-1. Program Bridge projects that may affect Bald Eagle.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	Ecoregion Name
1	2184	Wallowa R. (Bear Cr. Br.)	5	Blue Mountains
2	1697	Paradise Cr.	5	Coast Range
3	7530	Beaver Cr.	3	Coast Range
4	7532	Beaver Cr.	3	Coast Range
5	00924A	Unknown	6	Coast Range
6	00925A	Unknown	5	Coast Range
7	03172A	Central OR RR	3	Coast Range
8	03173A	Beaver Cr.	24	Coast Range
9	03173B	Beaver Cr.	24	Coast Range
10	6884	Spring Cr.	3	East Cascades
11	6886	Hwy 422	3	East Cascades
12	7301	Algoma Log Pond	3	East Cascades

Table 5.4.7-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	Ecoregion Name
13	8345	USBR Canal	4	East Cascades
14	8346	California Ave	8	East Cascades
15	8510	Unknown	3	East Cascades
16	08347A	Unknown	6	East Cascades
17	7894	Willamette R.	8	West Cascades
18	8623	Conn Herman Cr.	3	West Cascades
19	07403A	Herman Cr.	3	West Cascades
20	8124	Santiam Overflow No 4	5	Willamette Valley
21	8195	Unknown	3	Willamette Valley
22	8197	Unknown	13	Willamette Valley
23	8889	Unknown	7	Willamette Valley
24	00123K	Unknown	33	Willamette Valley
25	07253B	Unknown	35	Willamette Valley
26	07736A	Camas Swale	3	Willamette Valley
27	07736C	Camas Swale	3	Willamette Valley
28	07745A	Coast Fk. Willamette R.	8	Willamette Valley
29	07756A	Coast Fk. Relief Opening	4	Willamette Valley
30	07757A	Gettings Cr.	5	Willamette Valley
31	07757B	Gettings Cr.	5	Willamette Valley

Air

Noise Disturbance/Harassment

For the purposes of the Bridge Program, adverse effects from high noise harassment such as that generated by open air blasting, are considered possible if nest or communal roost sites are present within a 1-mile perimeter surrounding the API. Adverse effects from

noise harassment from sources other than blasting are considered possible if nest or communal roost sites are present within a 1,300-foot (0.25-mile) perimeter surrounding the API. There are 17 bald eagle pairs associated with the 31 bridges within 1 mile of a bridge API (the additional 14 sites are alternate nest sites). Therefore, open air blasting activities at the 31 bridges have the potential to adversely affect 17 pairs of bald eagles due to noise harassment; however, only two of the 14 sites are within 1,320 feet (0.25 mile) of the API;. The Wildlife Avoidance Environmental Performance Standard (Section 3.3) will avoid or minimize noise harassment on bald eagles by prohibiting high-noise activities from occurring during critical nesting periods, or providing a daily limited operating period to minimize harassment during daily activity periods.

Visual Disturbance/Harassment

For the purposes of the Bridge Program, adverse effects from visual disturbance are considered possible if nest or communal roost sites are present within a 2,640-foot (0.5 mile) perimeter surrounding the API. Fourteen bald eagle nest or roost sites (at 12 different bridges; two bridges have two sites each) are within 2,640 feet (0.5 mile) of a bridge API; 14 nest/roost sites are from 1,320-2,640 feet (0.25-0.5 mile) from the API. These 14 nest or roost sites lie within 9 different bald eagle pair territories (some pairs have alternate nests). Therefore, visual disturbance has the potential to affect up to 9 pairs of bald eagles. Many of the nest sites within 2,640 feet (0.5 mile)of a bridge API, particularly those more than 1,320 feet (0.25 mile)from the API, will not be in line-of-sight (due to the presence of screening vegetation or topography), which will eliminate the likelihood of visual harassment on those bald eagle nest sites. Furthermore, the Bridge Program will be carried out over a period of 7-10 years, so any potential effects on bald eagles will be spread out geographically and temporally. In summary, adverse effects on bald eagles due to visual disturbance are expected.

<u>Chemicals</u>

Chemical effects resulting from a chemical spill entering a waterway near bald eagle foraging habitat may affect bald eagles or their prey. For the purposes of this Bridge Program BA, it is assumed that such chemical effects would likely be contained or diluted to an undetectable level within 1.0 mile of the bridge API. Only 12 of the bridges that span water (and thus have the potential to transport a chemical spill affecting bald eagles) are within 1.0 mile of a bald eagle nest or communal roost site. These 12 bridges lie within eight bald eagle pairs' nesting territories. Therefore, up to eight pairs of bald eagles could be affected by chemical spills. However, implementation of the environmental performance standards (Section 3.3) will ensure that most foreseeable chemical spills are avoided, or contained or cleaned up before they could affect bald eagles or their prey. Therefore, the risks to bald eagles from chemical spills are considered discountable.

<u>Vegetation</u>

For purposes of the Bridge Program, effects on vegetation are assumed to be limited to 2 acres per bridge (for all bridges with a bald eagle nest or communal roost site within

1,320 feet [0.25 mile] of the bridge center). This is a high estimate of the actual area of habitat impacts based on past ODOT bridge projects (Appendix 2-B). ODOT/FHWA has determined that only two bridges are within 1,300 feet of a nest or communal roost site (one is 1,305 feet from the bridge center point, and the other is 830 feet). Thus, a maximum of 4 acres of bald eagle habitat will be disturbed by Bridge Program construction activities.

The Habitat Avoidance and Site Restoration Environmental Performance Standards (Section 3.3) will be followed to limit the amount of vegetation cleared and to ensure that any vegetation removed outside of a specific bridge footprint is restored. Implementation of the Wildlife Avoidance Environmental Performance Standard will ensure that documented bald eagle nest or communal roost sites will not be removed. Because bald eagle critical habitat has not been designated, the Bridge Program will not affect critical habitat.

Species

Direct removal of occupied nest or roost trees habitat may affect bald eagles currently occupying that habitat. However, by adhering to the Habitat Avoidance Environmental Performance Standard, no known bald eagle nest or roost trees will be removed. No bald eagle habitat will be removed during the breeding season unless surveys show that bald eagles are not present. Thus no incidental take of habitat within an occupied bald eagle nest or roost site will occur.

5.4.7.5 Determination of Effect

Through the application of environmental performance standards, adverse effects on bald eagles will be minimized to the greatest extent practicable. However, the possibility exists that bald eagles could be affected by noise and visual disturbance, and some bald eagle functional habitat may be removed. However, any potential effects on bald eagles will be spread out geographically and temporally and are expected to be minor. Based on this analysis for the Bridge Program, ODOT/FHWA makes the determination of **may affect, likely to adversely affect** the bald eagle via harassment and habitat effects. There will be no effect on critical habitat as bald eagle critical habitat has not been designated.

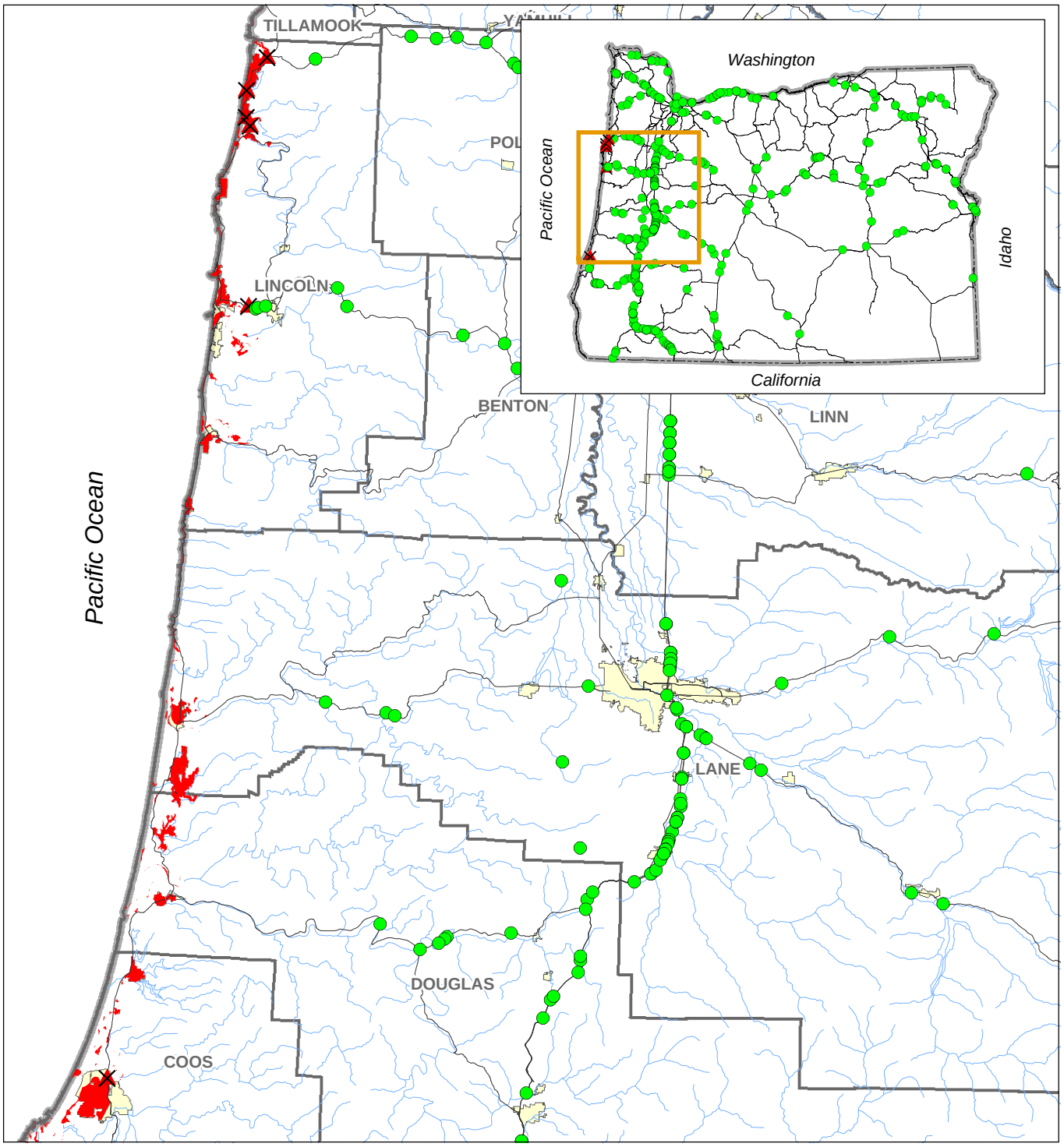
5.4.8 Brown Pelican (*Pelecanus occidentalis californicus*)

5.4.8.1 Life History and Status

The brown pelican was designated as Endangered throughout its range (except for the U.S. Atlantic Coast, Florida, and Alabama) on June 2, 1970 (June 2, 1970, 35 FR 8491). Brown pelicans are threatened by a limited food supply, oceanic pollution, persistent pesticides, disturbance at nest locations, coastal development, disease, and accidental death resulting from recreational and sport fishing (June 2, 1970, 35 FR 8491, USFWS 1983). There are two genetically and geographically distinct subspecies of brown pelican, both of which are listed as endangered. The California brown pelican (*P.o. californicus*) occurs along the Pacific Coast and

the eastern brown pelican (*P.o. carolinensis*) occurs along the Gulf of Mexico and Atlantic Coast. Critical habitat has not been designated for this species.

The California brown pelican breeds in nesting colonies on islands in the Gulf of California and along the Pacific Coast from Baja California to Santa Barbara Island, and non-breeding brown pelicans range from Colima, Mexico to British Columbia, Canada (USFWS 1983). Brown pelicans in Oregon are non-breeding individuals that are limited to the coastline; however, pelicans have been detected inland as far the Willamette Valley after large storm events (Figure 5.4.8-1). Non-breeding pelicans' dispersal patterns are dependent on food availability and oceanographic conditions, such as temperature and currents (USFWS 1983). Both breeding and non-breeding pelicans require roosting and loafing sites free from human disturbance for resting and drying their feathers (USFWS 2002b). Roosting and loafing sites include offshore rocks and islands, river mouths with sandbars, breakwaters, pilings, and jetties (USFWS 1983).



OTIA III Bridges

- Potential to Affect
- No Potential to Affect
- Brown Pelican Habitat
- City
- Streams and Rivers
- County
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.4.8-1

OTIA III: Statewide Bridge Delivery Program Brown Pelican

N W E S

0 2 4 8 12 16 20

Miles

MB&G

Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.

screening/BA Figures/Pelican.mxd. Mar 1, 2004

5.4.8.2 Species-Specific Effects Pathways

Effects pathways include the media through which effects are delivered to the species. Essentially all effects on brown pelicans are delivered through the displacement, disruption, removal, or addition of the following:

Air

Noise Disturbance/Harassment
Adverse effects on brown pelicans from noise harassment may lead to flushing from roost or loafing sites, resulting in an increase in energy expenditures, and possible avoidance or abandonment of functional habitat. Bridge construction activities may affect brown pelicans at roosting or loafing sites along the Oregon Coast. The sensitivity of an individual pelican to disturbance is likely related to the baseline level of disturbance the bird is accustomed to and the proximity of the disturbance to the individual bird. There is no documented threshold for noise disturbance for brown pelicans; however, the USFWS typically evaluates the potential for noise effects on other species within a 0.25-mile radius of the activity, or within a 1-mile radius for large disturbance activities such as open air blasting. Thus, for the purposes of the Bridge Program, adverse effects from noise harassment are considered possible if habitat exists within a 1-mile perimeter surrounding the API.

Visual Disturbance/Harassment
There is no documented visual harassment threshold for brown pelicans. However, the Channel Island National Park in California has designated a brown pelican "protection zone" on West Anacapa Island to protect a brown pelican nesting colonies from human disturbance (USFWS 1983). This zone is on the west side of the island between Portuguese Rock and Frenchy's Cove, and extends from the high tide mark seaward to a water depth of 120 feet, which is an estimated distance of 1,500 feet from the island's shoreline (USFWS 1983). For the purposes of the Bridge Program, adverse effects from visual harassment are considered possible if habitat exists within a 1,500-foot perimeter surrounding the API.

Chemicals

Because brown pelicans inhabit the marine environment and occasionally the lower reaches of large river systems near the marine environment, there is no potential for a construction-related spill (usually a few gallons at most) to affect them.

Species

Direct effects on the species may occur if there is direct physical contact with humans or their equipment. This is very unlikely.

5.4.8.3 Minimization and Avoidance Measures

Minimization and avoidance measures have been developed to reduce the proposed action's adverse affects on brown pelican populations. The environmental performance standards in Section 3.3 detail these minimization measures as well as the methods developed for habitat and species conservation during bridge construction.

5.4.8.4 Analysis of Effects

ODOT/FHWA assessed the likely effects of the Bridge Program on the brown pelican using GIS analyses. A screening process was applied to all program bridges to identify where bridge repair and replacement activities have the potential to affect the brown pelican. The methods and assumptions used to perform this screening process are presented in summary below, and in detail in the Effect Screening Layer memos (Appendix 2-A). The methods and assumptions used to assess the effects on the brown pelican via the various pathways are presented below, and in detail in the Evaluation of Effect memos (Appendix 2-B). Both the Effect Screening Layer memo and the Evaluation of Effect memo for this species were reviewed by the Services as part of the ongoing consultation process for the Bridge Program.

Table 5.4.8-1. Program Bridge projects that may affect Brown Pelican.

Record Number	Bridge ID No.	Feature Crossed	No. of Spans	Ecoregion Name
1	1950	Central OR RR	3	Coast Range
2	7530	Beaver Cr.	3	Coast Range
3	13491	Unknown	3	Coast Range
4	00922A	Unknown	3	Coast Range
5	00924A	Unknown	6	Coast Range
6	00925A	Unknown	5	Coast Range

For the purposes of the Bridge Program, brown pelican habitat includes all areas: 1) within 5 miles of the Pacific Ocean, <u>and</u> 2) within 1 mile of the Johnson and O'Neil (2001) Bays & Estuaries, Urban and Mixed Environs, Marine Nearshore, and Coastal Headlands and Islets habitat types. A total of six Program Bridges meet these criteria (Table 5.4.8-1); construction activities at these six bridges are considered to have the potential to affect brown pelicans. These six bridges are further analyzed below to determine what, if any, adverse effects their repair and replacement activities may have on the brown pelicans via the various effects pathways.

Air

Noise Disturbance/Harassment
For the purposes of the Bridge Program, adverse effects on brown pelicans from noise harassment are considered possible if habitat exists within a 1-mile perimeter surrounding the API. The area of potential noise harassment to brown pelicans for individual bridges ranges from 39 acres to 1,361 acres depending on bridge size and proximity of the bridge to brown pelican habitat. For all six bridges, a total area of 4,981 net acres (5,716 gross acres) of brown pelican habitat may be affected by noise. Bridge Program activities will be carried out in conformance with the Wildlife Avoidance Environmental Performance Standard; this will minimize noise levels and restrict loud noises to certain times of the year (see Section 3.3), thus minimizing adverse effects on brown pelicans. Because, brown pelicans are uncommon in Oregon and are only transient, non-nesting individuals, actual effects on brown pelicans due to noise disturbance will be very minor, at most.

Visual Disturbance/Harassment
For the purposes of the Bridge Program, adverse effects from visual harassment are considered possible if habitat exists within a 1,500-foot perimeter surrounding the API. A total of 5 bridges meet this criterion. The area of potential visual harassment for individual bridges ranges from 180 acres to 530 acres depending on bridge size, resulting in a total area of 1,780 net acres (1,900 gross acres) of brown pelican habitat that could be affected by visual disturbance. Because, brown pelicans are uncommon in Oregon and are only transient, non-nesting individuals, actual effects on brown pelicans due to visual disturbance will be discountable.

Chemicals

Because brown pelicans inhabit the marine environment and occasionally the lower reaches of large river systems near the marine environment, there is no potential for a construction-related spill (usually a few gallons at most) to affect them.

Species

Direct effects on the species may occur if there is direct physical contact with humans or their equipment. Nest sites will not be disturbed as brown pelicans do not nest in Oregon. Furthermore, the occasional transient birds that may be present will fly away if approached by humans. Therefore there is no potential for the Bridge Program to directly affect brown pelicans.

5.4.8.5 Determination of Effect

Through the application of environmental performance standards, the lack of brown pelican breeding in Oregon, and the high baseline level of activity at the bridge sites, adverse effects on brown pelicans from the bridge program are expected to be insignificant. Although up to 5,716 acres of brown pelican foraging habitat may be affected by noise and visual disturbance, the habitat is only rarely occupied by brown pelicans and is subject to a high baseline level of

activity at the existing bridges. Thus, these effects are expected to be insignificant and discountable to the species. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, not likely to adversely affect** the brown pelican. There will be no effect on critical habitat as critical habitat has not been designated for the species.

5.4.9 Northern Spotted Owl (*Strix occidentalis*)

5.4.9.1 Life History and Status

The northern spotted owl was Federally listed as threatened throughout its range on June 26, 1990 (June 26, 1990, 55 FR 26114) (Figure 5.4.9-1). Primary threats to the northern spotted owl include the loss and alteration of habitat (mainly resulting from timber harvesting) and catastrophic events such as volcanic eruptions, fires, and wind storms (June 26, 1990, 55 FR 26114). Additionally, the barred owl (*Strix varia*) has been expanding its range west and south. As a result, spotted owls are being out-competed by barred owls for nesting territories. Critical habitat was designated for the northern spotted owl on January 15, 1992 (January 15, 1992, 57 FR 1796).

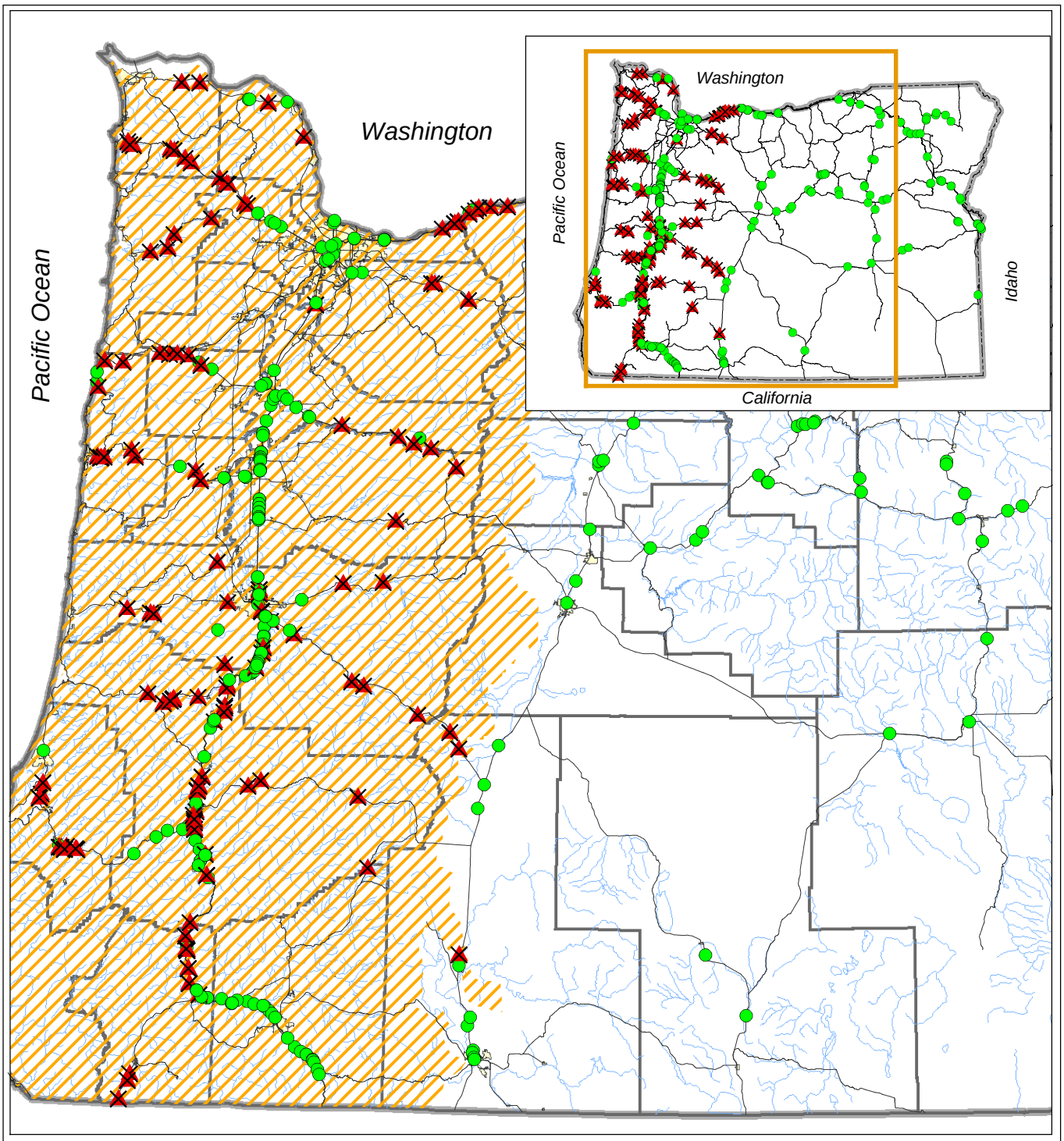
Northern spotted owls range from southwestern British Columbia to the coast range of northwestern California and as far south as San Francisco. The northern spotted owl is a forest-dwelling owl that favors mature to old-growth mixed conifer forest habitats (USFWS 1990a). Northern spotted owls will occupy second-growth forests if key components of mature forests are present; however, population density and reproductive success are usually lower than in old-growth forests (USFWS 1989). Major roosting and nesting areas are generally dispersed throughout a territory, and their use varies seasonally (Forsman et al. 1984).

Determinants of northern spotted owl nesting habitat in west-side forests (i.e., west of the summit of the Cascade Mountains) include abundant dead and down woody material, a medium- to high-closure canopy, multiple layers in the forest canopy, and mature trees (generally 200 years or older) greater than 32 inches in diameter at breast height (dbh) (Thomas et al. 1990). Northern spotted owl functional habitat east of the Cascade Mountain crest does not typically fit the west-side functional habitat definition. The Deschutes National Forest defines functional nesting, roosting, and foraging northern spotted owl habitat as occurring in mixed conifer stands and within riparian areas (USFS 2002). These stands typically have multi-storied canopies containing some larger trees. The canopy cover is typically greater than or equal to 40% with an overstory comprised of at least five percent of trees greater than 21 inches dbh (USFS 2002).

Northern spotted owls usually do not breed until their third year, and have a life expectancy of up to 15 years in the wild. Northern spotted owl pairs are capable of reproducing every year, but seldom do, and offspring survival varies annually and geographically (USFS 1988). The breeding season is from February to August, and young usually disperse from the nesting areas by mid-August to mid-October.

Northern spotted owls prey on a variety of small animals including mammals, birds, and insects. Diet varies considerably between regions and habitat types; however, small mammals are the principal prey throughout their range (Barrows 1985, Forsman et al. 1984). Dusky-footed

woodrats (*Neotoma fuscipes*), flying squirrels (*Glaucomys sabrinus*), and red tree voles (*Arborimus longicaudus*) are the three most common prey species for northern spotted owls, and diet is usually determined by prey abundance (USFWS 1989).



OTIA III Bridges

- Potential to Affect
- No Potential to Affect
- Northern Spotted Owl Range
- City
- County
- Streams and Rivers
- Highway
- State Boundary

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Figure 5.4.9-1

OTIA III: Statewide Bridge Delivery Program Northern Spotted Owl

N W E S

0 5 10 20 30 40 50

Miles

MB&G

Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
screening/BA Figures/nso.mxd. Mar 1, 2004

5.4.9.2 Species-Specific Effects Pathways

Effects pathways include the media through which effects are delivered to the species. Essentially all effects on northern spotted owls are delivered through the displacement, disruption, removal, or addition of the following:

Air

Noise Disturbance/Harassment
Northern spotted owls may be adversely affected by noise during the breeding season. Activities involving heavy equipment, chainsaws, aircraft, or blasting within specified distances during the early breeding season (early March to mid-July) have the potential to significantly disrupt breeding, feeding, or sheltering—that is, result in incidental take due to harassment. Harassment may lead spotted owls to flush from the nest, abort a feeding, or postpone a feeding (USFWS 2003a). The sensitivity of an individual owl to disturbance is likely related to the baseline level of disturbance the bird is accustomed to, the level and proximity of the disturbance, and the timing of the disturbance within the nesting cycle and nightly activity period.

The USFWS typically considers the harassment threshold for general noise generating activities within a 0.25-mile radius (125-acre area) of the activity, or within a 1.0-mile radius (2,176-acre area) for large disturbance activities such as open air blasting (USFWS 2003a). However, based on a recent Olympic National Forest ESA consultation (USFWS 2003a), the USFWS is refining the distances and thresholds for noise disturbance for northern spotted owls (Table 5.4.9-1). This recent guidance was used by ODOT/FHWA in developing spotted owl environmental performance standards and evaluating the effects of the proposed action. For the purposes of the Bridge Program, adverse effects from noise disturbance are considered possible if the disturbance occurs within a 300-ft perimeter surrounding the API. Adverse effects from noise harassment from blasting are not considered in this analysis because blasting will be conducted outside of the sensitive nesting period for northern spotted owls.

Table 5.4.9-1. Noise disturbance thresholds for northern spotted owls.

Activity	Injury Threshold Distance
Blast (greater than 2 lb charge)	1.0 mile
Blast (less than a 2 lb charge)	360 feet
Effect pile driving, jackhammer, or a rock drill	180 feet
Helicopter or single-engine aircraft	360 feet
Chainsaws	135 feet
Heavy equipment	105 feet

Source: USFWS 2003a.

Visual Disturbance/Harassment

For their programmatic ESA consultation (USFWS 2003a), the Olympic National Forest compiled information from experienced spotted owl biologists and results from similar species studies to determine the estimated sight-only injury threshold—the distance at which a spotted owl would be flushed from its nest or perch merely by the sight (not sight *and* sound) of human activity. The flushing distance ranged from 6 feet to 78 feet. However, the USFWS has yet to adopt this visual disturbance threshold. For the purposes of the Bridge Program, an area similar to that used for noise harassment is used to determine adverse effects from visual harassment. Visual harassment is considered possible if the harassment occurs within a 300-foot perimeter surrounding the API.

Vegetation

Bridge repair and replacement activities may require vegetation removal (including cutting of large trees), which may result in the removal of functional habitat or increase the exposure of the nest to predators or adverse weather conditions. Loss and adverse modification of functional habitat has been identified as a primary threat to northern spotted owls; therefore, further habitat removal may adversely affect northern spotted owls. For the purposes of the Bridge Program, adverse effects due to vegetation alteration are considered possible at bridges within the range of the species, if those bridges have spotted owl habitat within 500 feet of the center of the bridge.

Species

The removal of occupied nesting habitat during the breeding season has the potential to directly affect northern spotted owls by killing eggs or nestlings.

5.4.9.3 Minimization and Avoidance Measures

Minimization and avoidance measures have been developed to reduce the proposed action's adverse affects on northern spotted owl populations. The environmental performance standards in Section 3.3 detail these minimization measures as well as the methods developed for habitat and species conservation during bridge construction.

5.4.9.4 Analysis of Effects

ODOT/FHWA assessed the likely effects of the Bridge Program on the northern spotted owl using GIS analyses. A screening process was applied to all program bridges to identify where bridge repair and replacement activities have the potential to affect the northern spotted owl. The methods and assumptions used to perform this screening process are presented in summary below, and in detail in the Effect Screening Layer memos (Appendix 2-A). The methods and assumptions used to assess the effects on the northern spotted owl via the various pathways are presented below, and in detail in the Evaluation of Effect memos (Appendix 2-B). Both the Effect Screening Layer memo and the Evaluation of Effect memo for this species were reviewed by the Services as part of the ongoing consultation process for the Bridge Program.

For the purposes of the Bridge Program, bridge projects that may affect the northern spotted owl are those bridges with: 1) an API within 1.0 mile of the range of the spotted owl (REO 2003), <u>and</u> 2) any of the following Johnson and O'Neil (2001) habitat types within 500 feet of the bridge centerpoint: Westside Lowland Conifer-Hardwood Forest, Westside Oak and Dry Douglas-fir Forest & Woodland, Southwest Oregon Mixed Conifer-Hardwood Forest, Montane Mixed Conifer Forests, Eastside (Interior) Mixed Conifer Forests, Lodgepole Pine Forest & Woodland, Ponderosa Pine & Eastside White Oak Forest & Woodlands, and Upland Aspen Forests. A total of 336 bridges with API's within 1.0 mile of the range of the northern spotted owl were identified. Of these 336 bridges, 141 bridges contained suitable Johnson and O'Neil habitat within 500 feet of the bridge center point. Construction activities at these 141 bridges are considered to have the potential to affect northern spotted owls (Table 5.4.9-2). These 141 bridges are further analyzed below to determine what, if any, adverse effects their repair and replacement activities may have on the northern spotted owl via the various effects pathways.

<u>Air</u>

Noise Disturbance/Harassment

For the purposes of the Bridge Program, adverse effects to the northern spotted owl from noise harassment are considered possible if the harassment occurs within a 300-foot perimeter surrounding the bridge center point. Project-related activities may result in noise harassment at the 141 bridges identified in the initial screening process. A total of 915 acres surrounding the center points of the 141 bridges have the potential to be affected by noise harassment. The Wildlife Avoidance Environmental Performance Standard (Section 3.3) will minimize the potential adverse effects of noise on spotted owls by limiting high noise activities and prohibiting blasting during critical times of the

Table 5.4.9-2. Program Bridge projects that may affect Northern Spotted Owl.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	Ecoregion Name
1	654	Hayes Cr.	6	Coast Range
2	683	Yaquina R.	4	Coast Range
3	921	Gnat Cr.	4	Coast Range
4	1406	Elk Cr. 4th Xing	5	Coast Range
5	1465	Elk Cr. 3rd Xing	6	Coast Range
6	1601	Elk Cr. 2nd Xing	6	Coast Range
7	1614	Elk Cr. 1st Xing	6	Coast Range
8	1697	Paradise Cr.	5	Coast Range
9	1831	Unknown	3	Coast Range
10	1832	Unknown	3	Coast Range
11	1868	Wilson R. Mills Br..	3	Coast Range
12	2029	Unknown	3	Coast Range
13	2164	Unknown	14	Coast Range
14	2165	Unknown	12	Coast Range
15	2472	Devils Lake Fk. #2	9	Coast Range
16	2601	Unknown	4	Coast Range
17	4192	Unknown	9	Coast Range
18	4573	Unknown	3	Coast Range
19	7417	Big Cr.	3	Coast Range
20	7530	Beaver Cr.	3	Coast Range
21	7532	Beaver Cr.	3	Coast Range
22	7533	Beaver Cr.	3	Coast Range
23	7534	Little Beaver Cr.	3	Coast Range
24	7722	Lost Cr.	3	Coast Range

Table 5.4.9-2. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	Ecoregion Name
25	8281	US 101 NB (Hwy 009)	3	Coast Range
26	8370	Knowles Cr.	3	Coast Range
27	8446	Siuslaw R.	3	Coast Range
28	8554	Wildcat Cr.	3	Coast Range
29	8830	Coquille R.	5	Coast Range
30	8843	Hwy 242	3	Coast Range
31	8875	Coquille R.	5	Coast Range
32	8876	Coquille R.	4	Coast Range
33	8935	Coquille R.	7	Coast Range
34	8936	Coquille R.	5	Coast Range
35	13491	Unknown	3	Coast Range
36	00925A	Unknown	5	Coast Range
37	01869A	Wilson R. 2nd Xing	11	Coast Range
38	01872A	Jordon Cr.	4	Coast Range
39	02027A	Unknown	3	Coast Range
40	02364A	Unknown	3	Coast Range
41	03091A	Unknown	1	Coast Range
42	03092A	Unknown	1	Coast Range
43	03172A	Central OR RR	3	Coast Range
44	03173A	Beaver Cr.	24	Coast Range
45	03173B	Beaver Cr.	24	Coast Range
46	03212A	Endicot Cr.	3	Coast Range
47	1825	Crescent Cr.	3	E. Cascades
48	6884	Spring Cr.	3	E. Cascades

Table 5.4.9-2. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	Ecoregion Name
49	1424	Hardscrabble Cr.	3	Klamath Mountains
50	2496	N Umpqua R. (Lone Rock)	7	Klamath Mountains
51	7631	I-5 @ Corp & Co. Rd	4	Klamath Mountains
52	7632	I-5 (001), Winchester	3	Klamath Mountains
53	7640	Central OR RR	3	Klamath Mountains
54	7806	I-5 (Hwy 001)	4	Klamath Mountains
55	7835	Roberts Cr. Rd	4	Klamath Mountains
56	7950	Myrtle Cr Inter	3	Klamath Mountains
57	8339	Beacon Dr	4	Klamath Mountains
58	9339	S Wolf Cr Conn	3	Klamath Mountains
59	9439	Sunny Valley Rd	3	Klamath Mountains
60	9440	Leland Rd	3	Klamath Mountains
61	01074A	Elk Cr.	3	Klamath Mountains
62	01107A	Rough & Ready Cr.	3	Klamath Mountains
63	01108A	W Fk. Illinois R.	5	Klamath Mountains
64	07567B	Elk Cr.	3	Klamath Mountains
65	07572A	Curtis Cr.	4	Klamath Mountains
66	07627A	Rogers Rd Conn	3	Klamath Mountains
67	07627B	Rogers Rd Conn	3	Klamath Mountains
68	07631A	I-5 @ Corp & Co Rd	6	Klamath Mountains
69	07636A	Elkhead Rd	3	Klamath Mountains
70	07663A	N Umpqua,Corp,Cr, & Co R	17	Klamath Mountains
71	07663C	N Umpqua,Corp,Cr, & Co R	18	Klamath Mountains
72	07670A	I-5 @ Portland Ave	5	Klamath Mountains

Table 5.4.9-2. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	Ecoregion Name
73	07711A	I-5 @ Mclain Rd	3	Klamath Mountains
74	07713A	S Umpqua R, & Corp	12	Klamath Mountains
75	07804N	I-5 @ Speedway Rd	3	Klamath Mountains
76	07835A	Roberts Cr. Rd	4	Klamath Mountains
77	08018N	Louse Cr, Frontage Rd	4	Klamath Mountains
78	08018S	Louse Cr, Frontage Rd	4	Klamath Mountains
79	08028N	Irwin Access	3	Klamath Mountains
80	08028S	Irwin Access	3	Klamath Mountains
81	08094N	Jumpoff Joe Cr.	6	Klamath Mountains
82	08094S	Jumpoff Joe Cr.	6	Klamath Mountains
83	09352A	Glendale Int	3	Klamath Mountains
84	09439A	Sunny Valley Rd	3	Klamath Mountains
85	09440A	Leland Rd	3	Klamath Mountains
86	1706	Soda Fk.	3	W. Cascades
87	1826	Odell Cr.	3	W. Cascades
88	3461	Rogue R.	4	W. Cascades
89	5978	Unknown	3	W. Cascades
90	6806	Unknown	3	W. Cascades
91	7171	Private Logging Rd.	3	W. Cascades
92	7188	Half Viaduct	9	W. Cascades
93	7295	Unknown	3	W. Cascades
94	7894	Willamette R.	8	W. Cascades
95	7904	Rock Cr.	5	W. Cascades
96	7964	Unknown	17	W. Cascades

Table 5.4.9-2. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	Ecoregion Name
97	8534	Conn Viento Int	3	W. Cascades
98	8604	Conn Wyeth Int	3	W. Cascades
99	8623	Conn Herman Cr.	3	W. Cascades
100	16861	PP&L Penstock	5	W. Cascades
101	00665B	Alder Cr.	3	W. Cascades
102	00689B	Wildcat Cr.	3	W. Cascades
103	01323A	Blue R. Bridge	2	W. Cascades
104	01324A	Gate Cr.	4	W. Cascades
105	02062A	Tanner Cr.	6	W. Cascades
106	02062B	Tanner Cr.	6	W. Cascades
107	02176A	Hwy 100 & UPRR	10	W. Cascades
108	02194A	Moffett Cr.	5	W. Cascades
109	02194B	Moffett Cr.	5	W. Cascades
110	03026A	Zig Zag R.	3	W. Cascades
111	07403A	Herman Cr.	3	W. Cascades
112	08610W	Moody St	5	W. Cascades
113	745	Unknown	5	Willamette Valley
114	2081	Unknown	3	Willamette Valley
115	2262	Central OR RR	8	Willamette Valley
116	2672	Unknown	5	Willamette Valley
117	2673	Unknown	5	Willamette Valley
118	4041	Bear Cr.	7	Willamette Valley
119	4062	S Fk. Siuslaw R.	4	Willamette Valley
120	6768	Lost Cr.	5	Willamette Valley

Table 5.4.9-2. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	Ecoregion Name
121	7347	Unknown	7	Willamette Valley
122	8445	I-5 (Hwy 001)	7	Willamette Valley
123	8870	Mcvay Access	1	Willamette Valley
124	00338A	Tide Cr.	4	Willamette Valley
125	01075A	Marys R.	3	Willamette Valley
126	01205A	WPRR & Harris Rd	6	Willamette Valley
127	01612A	Unknown	3	Willamette Valley
128	01756A	Unknown	5	Willamette Valley
129	05285A	Willamette R Relief Opng	5	Willamette Valley
130	07469B	Bear Cr.	4	Willamette Valley
131	07569A	Buck Cr Rd	3	Willamette Valley
132	07745A	Coast Fk. Willamette Rive	8	Willamette Valley
133	07757A	Gettings Cr.	5	Willamette Valley
134	07757B	Gettings Cr.	5	Willamette Valley
135	07794A	Hwy 51	3	Willamette Valley
136	07794B	Hwy 51	3	Willamette Valley
137	07864A	16th St.	3	Willamette Valley
138	08175N	Mckenzie R. & Front Rd	11	Willamette Valley
139	08175S	Mckenzie R. & Front Rd	11	Willamette Valley
140	08180N	Mckenzie Overflow	3	Willamette Valley
141	08180S	Mckenzie Overflow	3	Willamette Valley

year. Furthermore, the Bridge Program will be carried out over a period of 7-10 years, so any adverse effects on spotted owl populations will be spread out geographically and temporally.

Visual Disturbance/Harassment

For the purposes of the Bridge Program, adverse effects to the northern spotted owl from visual disturbance are considered possible if the disturbance occurs within a 300-foot perimeter surrounding the bridge center point. However, the 300-foot threshold for disturbance is generous, as it is not uncommon for northern spotted owl to nest within 150 to 300 feet of an active road (USFWS 2003a). In addition, the USFWS protocol for determining the nest and reproductive status of northern spotted owls requires humans to be near nesting northern spotted owls (USFWS 1992). Therefore, it is unlikely that actions at any of the bridges will actually affect northern spotted owls via visual disturbance or harassment. Project-related activities may result in visual disturbance at the 141 bridges identified in the initial screening process. A total of 915 acres surrounding the center points of the 141 bridges have the potential to be affected by visual disturbance. The Wildlife Avoidance Environmental Performance Standard (Section 3.3) will minimize the potential adverse effects of visual disturbance on spotted owls by limiting highly disruptive activities (such as blasting and pile driving) during critical times of the year. Furthermore, the Bridge Program will be carried out over a period of 7-10 years, so any adverse effects on spotted owl populations will be spread out geographically and temporally.

Vegetation

For purposes of the Bridge Program, effects on vegetation are assumed to be limited to 2 acres per bridge (for all bridges with suitable Johnson and O'Neil spotted owl habitat within 500 feet of the bridge center point). This is a safe estimate of the actual area of habitat impacts based on past ODOT bridge projects (Appendix 2-B). 141 bridges have suitable Johnson and O'Neil northern spotted owl habitat within 500 feet of the bridge center point. Thus, approximately 282 acres of vegetation will be disturbed in the vicinity of program bridges with potential spotted owl habitat nearby. It is likely that some of the area where vegetation disturbance will occur is functional spotted owl habitat.

Only 10 bridges have northern spotted owl designated critical habitat present within 500 feet of the bridge center point. However, by following the Habitat Avoidance Environmental Performance Standard, the removal of primary constituent elements of designated northern spotted owl critical habitat will be avoided, thus adverse effects to northern spotted owls from critical habitat disturbance or removal will be discountable.

The Habitat Avoidance and Site Restoration Environmental Performance Standards (Section 3.3) will be followed to limit the amount of vegetation cleared and to ensure that any vegetation removed outside of a specific bridge footprint is restored. Implementation of the Habitat Avoidance Environmental Performance Standard will ensure that spotted owl critical habitat and functional habitat will not be removed during the breeding season

unless surveys indicate that spotted owls are not present. No spotted owl nest trees or primary constituent elements of spotted owl critical habitat will be removed at any time per this environmental performance standard.

Species

Direct removal of habitat may affect spotted owls currently occupying that habitat. Following the Habitat Avoidance Environmental Performance Standard, no spotted owl habitat will be removed during the breeding season unless surveys show that spotted owls are not present. Therefore there is no potential for the Bridge Program to directly affect northern spotted owls.

5.4.9.5 Determination of Effect

Through the application of environmental performance standards, adverse effects on the northern spotted owl will be minimized to the greatest extent practicable. However, approximately 915 acres of potential northern spotted owl habitat could be affected by noise and visual disturbance/harassment. Furthermore, approximately 282 acres of functional northern spotted owl habitat may be disturbed. Ten bridges are located within designated northern spotted owl critical habitat, but no primary constituent elements of designated critical habitat will be removed, thus adverse effects are discountable. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, is likely to adversely affect** the northern spotted owl via harassment and habitat removal. This proposed action **may affect, is not likely to adversely affect** the northern spotted owl designated critical habitat.

5.4.10 Western Snowy Plover (Coastal Population), (*Charadrius alexandrinus nivosus*)

5.4.10.1 Life History and Status

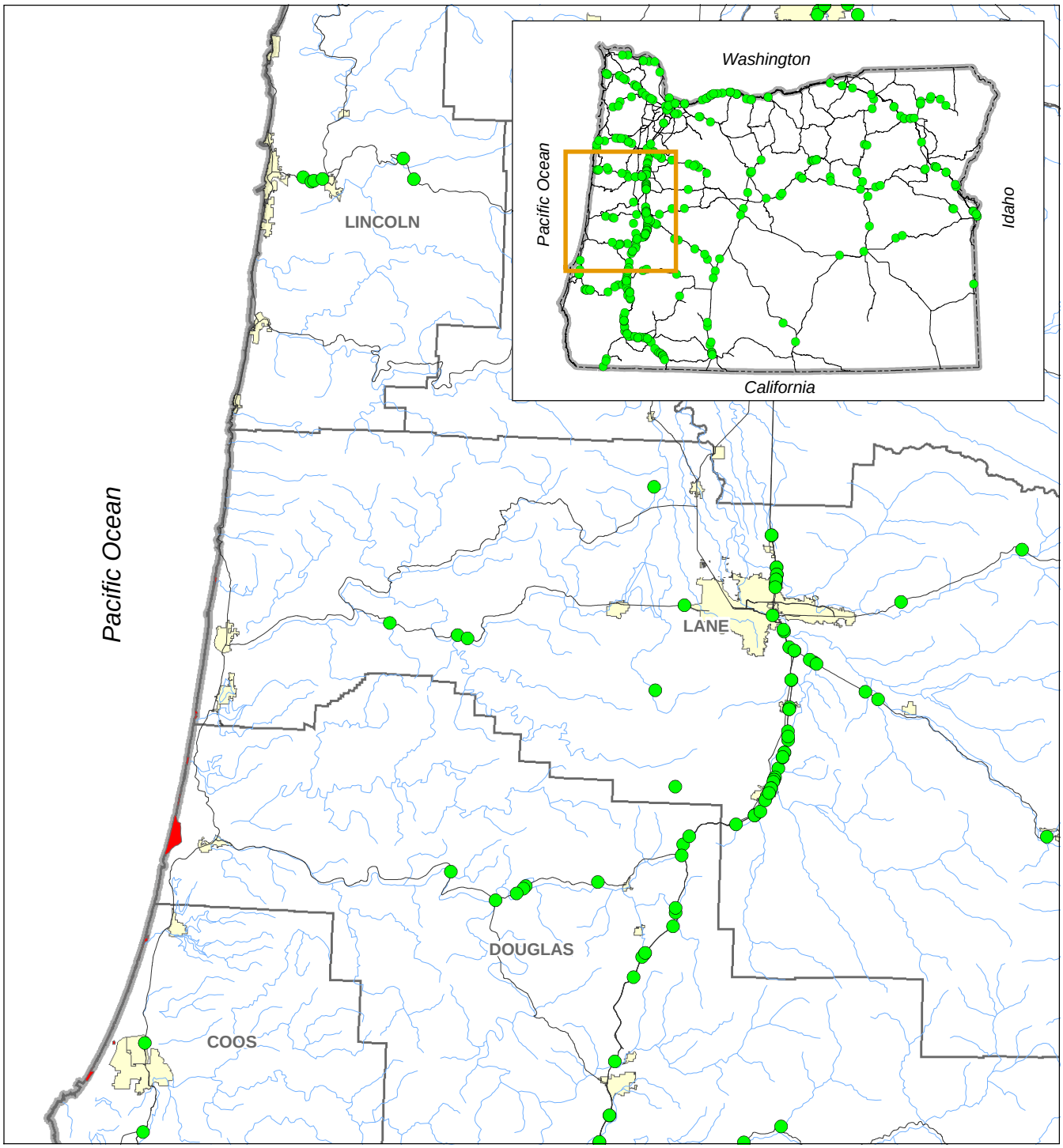
The western snowy plover (Pacific Coast population) was listed as threatened on March 5, 1993 (March 5, 1993, 58 FR 12864) (Figure 5.4.10-1). Threats to the western snowy plover include: coastal development and beach and shoreline stabilization; sand removal; dredging and disposal of dredged materials; driftwood removal; beach fires and camping within nesting habitat; water course diversion, impoundment, or stabilization; encroachment of introduced beachgrass or other non-native vegetation; habitat conversion for other special status species; predation; limited protection of breeding habitat; disturbance from domestic animals and humans, including beach walkers and joggers; beach cleaning (mechanized or around nesting habitat); and poor water quality and urban runoff.

The population of western snowy plovers along the Oregon Coast has increased steadily since 1993 (USFWS 2001a). The 2003 nesting season was the most successful breeding season on record, with a dramatic increase in reproductive success. This increased reproductive success can be attributed to good weather, habitat enhancement, successful restriction of public access into nesting areas, and increased chick survival. An additional measure contributing to this success

was the implementation of predator control at the recovery units (Lauten, D. et al. 2003, David Leal, biologist, USFWS, pers. comm., November 6, 2003).

Western snowy plovers breed primarily above the high tide line on coastal beaches, sand spits, dune-backed beaches, sparsely-vegetated dunes, beaches at creek and river mouths, and salt pans at lagoons and estuaries (USFWS 2001a). Less common nesting habitats include bluff-backed beaches, dredged material disposal sites, salt pond levees, dry salt ponds, and river bars (USFWS 2001a). In winter, western snowy plovers are found on many of their nesting beaches as well as on beaches where they do not nest, in man-made salt ponds, and on estuarine sand and mud flats. The breeding season for the western snowy plover extends from early March through late September. In Oregon, the critical nesting period is April 1 through August 15 (USFWS 2001a).
There are two distinct populations of western snowy plover in Oregon: a Pacific coast population and an interior population. Federal listing applies only to the Pacific Coast population, defined as those individuals that nest adjacent to tidal waters, which include all nesting birds on the mainland coast, peninsulas, offshore islands, adjacent bays, estuaries, and coastal rivers (December 7, 1999, 64 FR 68507).

The USFWS designated critical habitat areas for the western snowy plover on December 7, 1999 (Pacific Coast population) (64 FR 68507). Areas supporting at least four nesting western snowy plover pairs or 10 wintering plovers were designated as critical habitat areas (64 FR 68507). Seven of 28 critical habitat areas in Oregon are located along the Pacific shoreline; these areas support 97% of the nesting and 98% of the wintering plovers in Oregon (64 FR 68507). In addition to critical habitat areas, the USFWS has drafted a recovery plan with proposed recovery units and recovery locations. These recovery locations are also known to support nesting western snowy plovers. These recovery units are assumed to account for the entire range of western snowy plovers along the Oregon Coast.



OTIA III Bridges

- Potential to Affect
- No Potential to Affect
- Western Snowy Plover Recovery Unit
- City
- Streams and Rivers
- County
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.4.10-1

OTIA III: Statewide Bridge Delivery Program
Western Snowy Plover (Coastal Population)

N W E S

0 2 4 8 12 16 20

Miles

MB&G

Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
noeffect\BA_figures\snowy.mxd. Mar 1, 2004

5.4.10.2 Analysis of Effects

Western snowy plover (Pacific Coast population) habitat is limited to the Coast Range ecoregion. Within the Coast Range ecoregion, the identified and mapped recovery units account for the entire known range of western snowy plovers along the Oregon Coast. The Bridge Program does not include any bridges within the range of the western snowy plover.

5.4.10.3 Determination of Effect

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for the western snowy plover.

5.4.11 Peregrine Falcon (*Falco peregrinus anatum*)

5.4.11.1 Life History and Status

The American peregrine falcon is listed as endangered under the State of Oregon's ESA. The American peregrine falcon was Federally listed as endangered on October 13, 1970 and was removed from the Federal Endangered Species List on August 25, 1999 (August 25, 1999, 64 FR 46542). This determination was based on the subspecies recovery following restrictions on organochlorine (DDT and PCBs) pesticides in the United States and Canada.

The peregrine population continues to be below historic levels due to eggshell thinning and other reproductive failure correlated with widespread use of organochlorine contaminants (Aulman 1992, Pagel and Jarman 1991, Pacific Coast American Peregrine Falcon Recovery Team 1982). Other pollutants, disturbance, loss of nesting and foraging habitats, shooting, and collisions with transmission lines and their supporting structures have also contributed to the reduction in peregrine numbers (Pacific Coast American Peregrine Falcon Recovery Team 1982). Blasting, road construction, low-flying aircraft, and recreational activities (i.e., photographers, bird watchers, hikers, and rock climbers) may disturb nesting peregrines and result in nest failure. Disturbances that occur during courtship and incubation are more likely to result in nest abandonment, whereas disturbances that occur later in the nesting cycle do not, because nest tenacity increases as incubation progresses and hatching occurs.

Peregrines range from central Alaska to north-central Canada, south to central Arizona and Baja, California. Peregrines are found in a variety of habitats throughout North America, including plains, tundra, forests, coastal regions, and mountains up to 10,000 feet (Johnsgaard 1990). Peregrines prefer open habitat near a water source with available cliff faces or inaccessible ledges for nesting (Csuti et al. 1997). Peregrine nests, referred to as eyries, are usually located on a small scrape on the ledge of a cliff face, or on a man-made structure. A functional cliff face or structure is typically within 0.25-0.5 mile of riparian, lacustrine, or marine habitat. In wild sites, peregrines defend a territory that may extend 700-1,000 feet around an eyrie. The nest is located above the ground at approximately 40-80% of the total cliff height and is inaccessible to mammalian predators (Pagel 1992). The nest may consist of a small scrape, decomposed rock, or gravel. Nest sites in Oregon are mainly on tall cliffs (usually between 75-2,000 feet) in the

Cascade and Klamath mountains, the Grande Ronde River valley, and in the Portland metropolitan area (ODOT 2000).

As the population of peregrines increases, the number of peregrines using urban nest sites has increased as well. The most obvious attractants to urban nest sites are the abundant prey and ready availability of structures providing functional nest sites. Urban nest sites are usually buildings and power plants (61%), bridges and overpasses (30%), and other structures (9%). Other structures include water tanks, grain silos and elevated railroad bridges (Cade et al. 1996a).

Urban nest sites contain many hazards for both adult and fledging peregrines. Hazards include secondary poisoning from consuming poisoned prey, exposure to diseases acquired from prey, and shooting by pigeon breeders. Birds fledging from buildings and bridges often face a sheer drop-off from the nest ledge to the ground or water. Many nestlings fall out of the nest before they are ready to fly, and land on the ground. Once on the ground, they face traffic, predators, people, and starvation (if the adult fails to find and feed them) (Cade and Bird 1990).

In Oregon, peregrine falcon courtship begins in January and continues through March; however, some behaviors, such as copulation, can occur any month of the year. Timing is variable depending on elevation, weather, and the geographic location of the nesting territory (Table 5.4.11-1). Courtship activities normally last 6-8 weeks (Pagel 1992). There are eight distinct phases in the pre-incubation activity of peregrines: (1) the attraction of mates to one another, (2) mutual roosting on a ledge or cliff, (3) cooperative hunting excursions, (4) courtship flights, (5) courtship behavior on ledge or cliff, (6) courtship feeding, (7) copulation, and (8) nest scraping (Cade 1960).

Copulation begins about eight weeks after the onset of courtship and about three weeks prior to egg laying. Egg laying may begin as early as mid-March and as late as the end of May. Incubation of the eggs generally begins after the laying of the second to last egg (Nelson 1972). The eggs are incubated for 31 to 33 days, generally in the months of April and May. Peregrines that lose their eggs before or about the tenth day of incubation period usually produce a second clutch (Ratcliffe 1993, Newton 1979); this is called recycling.

Recycling will occur approximately 14 days after the first nesting attempt fails, and it may involve moving the nest site to an alternate ledge (Cade et al. 1996b). With recycling, egg laying can continue into June. Brooding is nearly continuous for the first three days and then gradually decreases; very little brooding occurs after 10 to 20 days (Cade et al. 1996b, Carlier 1993, Hovis et al. 1985). Fledging occurs when the nestlings are 35-45 days old, but they remain dependent on the adults for protection and food until their hunting skills have developed (Palmer and White 1988, Thelander 1978). The fledgling peregrines disperse as early as 3 weeks after fledging and as late as 3 months. Peregrines typically disperse as much as hundreds of miles away from the nest, although some urban birds have been known to nest within 10 miles of their natal nest (ODOT 2000).

Table 5.4.11-1. General nest chronology for peregrine falcons in Oregon.

Activity	January	February	March	April	May	June
Courtship (6 – 8 Weeks	Jan 1 to March 15					
Laying eggs (2-8 days)			March 15 to May 31			
Incubation (30-35 days)			March 15 to May 31			
Recycle (14 days)			March 15 to April 30			
Hatching (31-33 days)				April 1 to June 30		
Nestling (35-54 days)				April to June 30		
Fledge (14 days)					May 1 to June 30	
	Nesting Seasonal Restriction is January 1 to July 1					

Source: ODOT (2000).

5.4.11.2 Species-Specific Effects Pathways

Effects pathways include the media through which effects are delivered to any species. Essentially, all effects on peregrine falcons are delivered through the displacement, disruption, removal, or addition of the following:

<u>Air</u>

Noise Disturbance/Harassment
Peregrines may be adversely affected by noise harassment during the breeding season, especially at the onset of courtship behavior (early January through mid March). Consequently, activities using heavy equipment and aircraft or blasting during the breeding season (January 1 – June 30) within specified distances to a nest have the potential to significantly disrupt nesting peregrines, which can lead to crushing of eggs, nest abandonment by adults, reduced nest attentiveness, and premature fledging (Pacific Coast American Peregrine Falcon Recovery Team 1982). In addition, the level of impact that certain disturbances may have on peregrine falcons depends upon the familiarity of an individual or nesting pair to that particular disturbance (Olsen and Olsen 1978). If peregrines are accustomed to certain activities as a normal or routine occurrence, then the activity offers no direct threat, and the peregrines will likely ignore it. If the activity is new, intermittent, or unexpected, then the peregrines will be less tolerant of that activity. When peregrines have not experienced a routine or regular presence of humans, or if the activity is intermittent (e.g., log skidding, aircraft flight, or distant rockfall) then peregrines may become noticeably concerned (ranging from curiosity fly-overs, kacking, or intense territorial defense) (Pagel 2001).

Typically, the effects of general disturbance activities on peregrine falcons are evaluated based on management zones (nest zone, restricted zone, and sensitive zone) (ODOT 2000). The objective of each management zone is to establish spatial and temporal boundaries that will protect peregrine falcons. The zones are defined as spatial boundaries around a particular nest site where the majority of hunting, perching, and feeding activities occur during nesting. This concept has been widely accepted for non-urban peregrine nest sites (Pagel 2001, USFS 2000, WSDOT 1998). The Nest Zone, Restricted Zone, and Sensitive Zone will be used as the management zones for the Bridge Program. All of the management zones are 3-dimensional, radiating in all directions from the nest ledge. The management zone concept also encompasses temporal (also known as seasonal) boundaries which are for all of the management zones and include the entire nesting season of January 1 to July 1.

The nest zone is a radius extending up to 0.25 mile from the eyrie. The nest zone is established to protect the integrity of the nest site and to minimize harassment from humans. Usually no potentially harassing activity is allowed during the restriction period, and no resource extraction (e.g., road construction, structure placement, logging, mineral extraction) or other permanent or semi-permanent disturbance may occur even outside of the restriction period (Pagel 1995). The objective of the nest zone is to avoid or to minimize activities, visual changes, and noises to levels equal to or less severe than normal daily conditions.

The restricted zone is the radius extending 0.25-0.5 mile from the eyrie. This zone is considered to be a high use area for the peregrines for foraging and roosting. Specific activities (listed above under primary management zone restrictions) may be allowed within this zone based on site specifics (e.g., topography) (Pagel 1995). Usually no potentially harassing activities are allowed during the nesting season, and management activities outside of the seasonal restriction are designed to protect and maintain peregrine falcon habitat, with special emphasis on riparian areas used as foraging habitat (Pagel 1995). The objective of this area is to limit drastic visual changes to the area and to minimize noises excessively greater than ambient conditions (ODOT 2000).

The sensitive zone is the radius extending 2 miles from the eyrie (Pagel 1995). This zone is generally beyond the direct line-of-sight to the nest but is within visual/auditory range of other areas of peregrine activities such as roosting and foraging. Human activities in this zone have less potential to cause noise harassment, because of the distance to the nest site. The objective of this area is to avoid activities that generate extremely loud noises (such as blasting or helicopter use) (ODOT 2000). For the purposes of the Bridge Program, adverse effects from noise harassment are considered possible if a nest site is present within a 2-mile perimeter surrounding the API.

Visual Disturbance/Harassment

Visual harassment is evaluated in a 0.25-mile radius extending from known peregrine nests during the breeding season. Peregrine falcons are susceptible to visual harassment, especially during the onset of courtship behavior beginning in early January through mid-March (Pagel 1995). Nest sites have failed or been deserted due to visual harassment

caused by human activity. People disturb nesting birds both from the ground and from the air (with aircraft) and thus affect nesting outcomes (Pagel 1995). Peregrine falcons that have thin eggs, or that are on small or debris-filled ledges, can cause eggshell breakage or chick displacement if they bolt from the nest site when human disturbance intrudes. The chilling or overheating of eggs and young, and the diversion of energy to territorial defense, can also affect nesting outcomes (Grier and Fyfe 1987, Olsen and Olsen 1978, Fyfe and Olendorff 1976). For the purposes of the Bridge Program, adverse effects from visual disturbance are considered possible if a nest site is present within a 0.25-mile perimeter surrounding the API.

Chemicals

Historically peregrine falcons have been adversely affected by the use of organochlorine pesticides, such as DDT. The use of these pesticides has been restricted in the United States and Canada. Since the time of restriction, the peregrine falcon population has greatly increased. The Bridge Program will not involve the use of organochlorine pesticides, DDT, or PCBs. There is really no potential for a chemical spill to affect peregrine falcons either directly or through contact with contaminated prey since peregrine falcons take their prey (other birds) in flight.

Vegetation

Bridges may require vegetation removal, which may result in the removal of functional habitat for prey species important to peregrine falcons. Vegetation removal adjacent to the nest site may increase the site's susceptibility to disturbance by removing vegetation that breaks the line-of-sight and buffers high noise impacts. For the purposes of the Bridge Program, adverse effects due to vegetation alteration are considered possible at bridges if a peregrine falcon nest is present within 0.5 mile of the center of the bridge.

Species

Peregrine falcons frequently have eggs with thin shells and nest on small ledges. In such situations, eggshell breakage or chick displacement can occur when adults bolt from the nest site as a result of sudden human disturbance.

5.4.11.3 Minimization and Avoidance Measures

Minimization and avoidance measures have been developed to reduce the proposed action's adverse affects on peregrine falcon populations. The environmental performance standards in Section 3.3 detail these minimization measures as well as the methods developed for habitat and species conservation during bridge construction.

5.4.11.4 Analysis of Effects

ODOT/FHWA assessed the likely effects of the Bridge Program on the peregrine falcon using GIS analyses. A screening process was applied to all program bridges to identify where bridge repair and replacement activities have the potential to affect the peregrine falcon. The methods and assumptions used to perform this screening process are presented in summary below, and in detail in the Effect Screening Layer memo (Appendix 2-A).

For the purposes of the Bridge Program, bridge construction activities were assumed to have the potential to affect peregrine falcons if a known peregrine falcon nest is present within a 2-mile perimeter surrounding the API. A total of six program bridges meet this criterion (Table 5.4.11-2). These six bridges are further analyzed below to determine what, if any, adverse effects their repair and replacement activities may have on the peregrine falcon via the various effects pathways.

Table 5.4.11-2. Bridges within each management zone of a peregrine falcon nest site.

Nest Site Name/Number	Bridge(s) within the Nest Zone	Bridge(s) within the Restricted Zone	Bridge(s) within the Sensitive Zone
B. Normal (OE-038)	No bridges are within the Nest Zone	No bridges are within the Restricted Zone	Bridge Number -07392
Horsetail (OE-025)	Bridge Number – 02176A	No bridges are within the Restricted Zone	No bridges are within the Sensitive Zone
Shellrock (TOE-106)	No bridges are within the Nest Zone	No bridges are within the Restricted Zone	Bridge Number - 08604
Starving (OE-053)	No bridges are within the Nest Zone	No bridges are within the Restricted Zone	Bridge Number - 08534
Wyeth (OE-017)	No bridges are within the Nest Zone	No bridges are within the Restricted Zone	Bridge Number – 08604 Bridge Number - 08623

Air

Noise Disturbance/Harassment

For the purposes of the Bridge Program, adverse effects from noise harassment are considered possible if a nest site is present within a 2-mile perimeter surrounding the API. There are five peregrine falcon nest sites associated with four bridges within 2 miles of a bridge API. Therefore, construction activities at the four bridges have the potential to adversely affect five pairs of peregrine falcons and their young due to noise harassment. However, the Wildlife Avoidance Environmental Performance Standard (Section 3.3)

will essentially eliminate the potential adverse effects of noise on peregrine falcons by prohibiting high-noise activities from occurring during sensitive time periods.

Visual Disturbance/Harassment
For the purposes of the Bridge Program, adverse effects from visual harassment are considered possible if a nest site is present within a 0.25-mile perimeter surrounding the API. Only one falcon nest site is within the described area. The Wildlife Avoidance Environmental Performance Standard will minimize the potential for visual harassment to peregrine falcons.

Chemicals

Because peregrine falcons do not forage in the water or on the ground, there is no potential for a chemical spill to adversely affect them.

Vegetation

For purposes of the Bridge Program, effects on vegetation are assumed to be limited to 2 acres per bridge (for all bridges with a peregrine falcon nest present within 0.5 mile of the bridge center). Only one bridge meets this criterion. Thus, approximately 2 acres of vegetation will be disturbed in the vicinity of program bridges with a falcon nest nearby. The Habitat Avoidance and Site Restoration Environmental Performance Standards (Section 3.3) will be followed to limit the amount of vegetation cleared and to ensure that any vegetation removed outside of a specific bridge footprint is restored.

Species

Direct effects on peregrines are limited to disturbances that cause an adult peregrine falcon to crush its eggs during nesting, and/or abandon its young. The implementation of timing restrictions (Wildlife Avoidance Environmental Performance Standard) at bridges within 2 miles of known peregrine falcon occupied habitat will eliminate any direct species effects.

5.4.11.5 Determination of Effect

Through the application of environmental performance standards, adverse effects on peregrine falcons will be minimized to the greatest extent practicable. However, minor areas of peregrine falcon habitat could be affected by noise disturbance. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect** for the peregrine falcon.

5.4.12 Vernal Pool Fairy Shrimp (*Branchinecta lynchi*)

5.4.12.1 Life History and Status

The vernal pool fairy shrimp was Federally listed as threatened throughout its range on September 19, 1994 (September 19, 1994, 59 FR 48136) (Figure 5.4.12-1). The species was not discovered in Oregon until 1998, and is limited to Jackson County. Specifically, vernal pool fairy shrimp are limited to an area of 32 square miles known as the Agate Desert, north of Medford (August 6, 2003, 68 FR 46683).

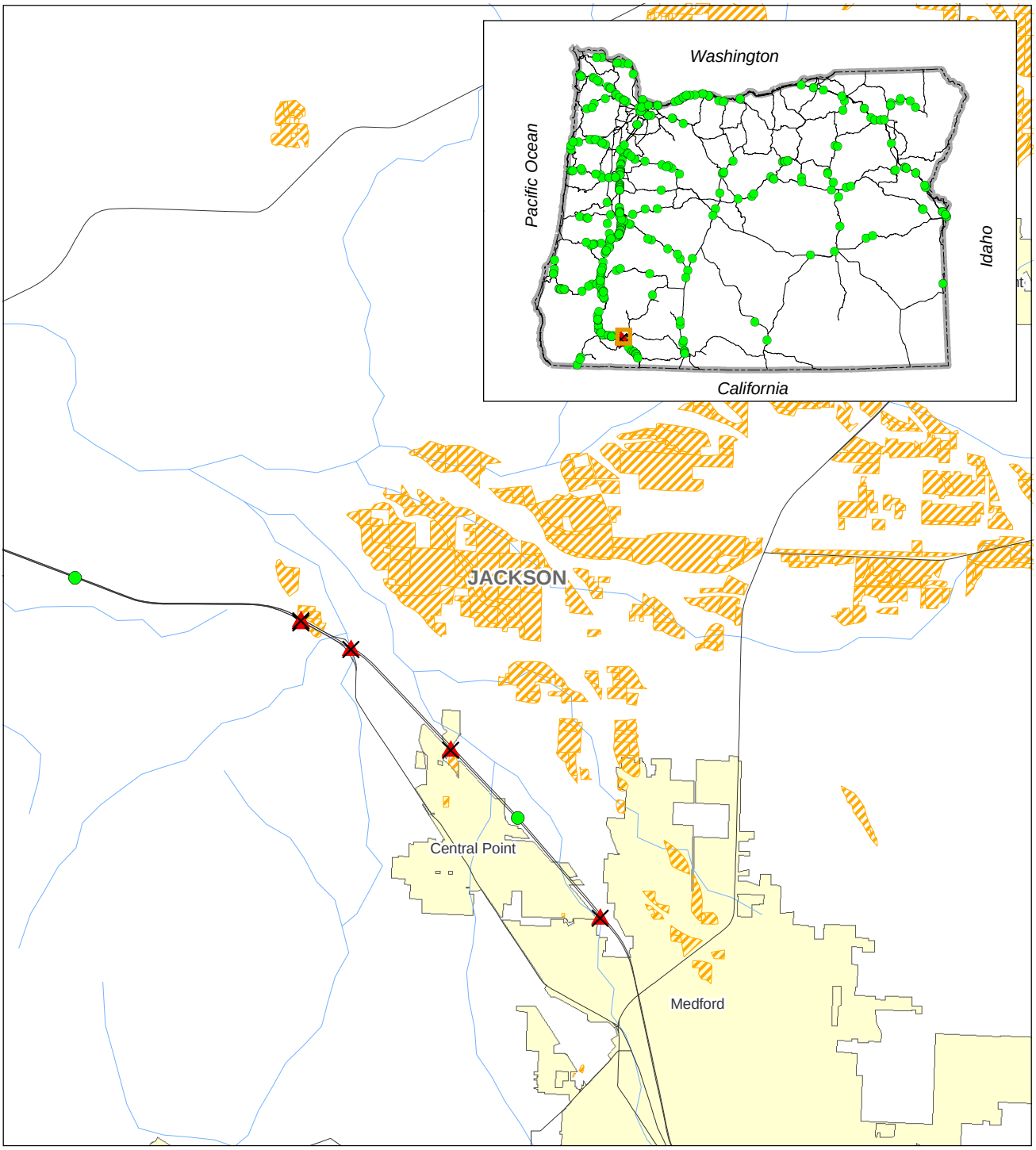
Critical habitat was designated for this species on August 6, 2003 (August 6, 2003, 68 FR 46683). Critical habitat units include vernal pool complexes rather than individual vernal pools. Therefore, the most accurate indication of the distribution and abundance of vernal pool fairy shrimp is the number of inhabited vernal pool complexes. Not all vernal pool habitat is accounted for in the critical habitat designation (August 6, 2003, 68 FR 46683), and it is likely that vernal pool fairy shrimp inhabit vernal pools that are not included in the critical habitat designation.

Determining the specific areas that vernal pool fairy shrimp occupy is difficult; their distribution depends on climatic factors and other natural variations in habitat conditions. The size of the localized area in which vernal pool fairy shrimp appear may fluctuate dramatically from one year to another. Therefore, it is likely that each of the critical habitat units include some areas that are unoccupied. However, populations may expand into unoccupied areas, which may serve to provide connectivity between groups of organisms within a unit (August 6, 2003, 68 FR 46683).

The USFWS has designated Critical Habitat to ensure the survival and propagation of vernal pool fairy shrimp (August 6, 2003, 68 FR 46683). Primary Constituent Elements (PCEs) of vernal pool fairy shrimp critical habitat are vernal pools, swales, and other ephemeral wetland features of appropriate sizes (1 square yard) and depths (1.2 to 48 inches) that typically both become inundated during winter rains and hold water for the length of time necessary for the vernal pool fairy shrimp to complete its life cycle (August 6, 2003, 68 FR 46683, CDFG 2002). This PCE is essential to the conservation of the vernal pool fairy shrimp because the species is ecologically dependent on the inundation and subsequent slow drying of their habitats to provide the soil moisture and aquatic environment required for seed germination, cyst hatching, growth, maturation, reproduction, dispersal, and the appropriate periods of dry-down for seed and cyst dormancy (August 6, 2003, 68 FR 46683).

The second PCE concerns the geographic, topographic, and edaphic features that support aggregations of vernal pool complexes. These complexes consist of hydrologically interconnected pools, swales, and other ephemeral wetlands and depressions within a matrix of surrounding uplands that together form hydrologically and ecologically functional units. The entire vernal pool complex—including the pools, swales, and associated uplands—is essential to maintaining both the aquatic phase and the drying phase of the vernal pool habitat. Although upland areas are not occupied by fairy shrimp, they are essential to maintaining the aquatic and drying phases of the vernal pool, and they provide nutrients and food sources to the vernal pool

(August 6, 2003, 68 FR 46683). In addition, moderate temperatures and specific chemical characteristics—such as low Total Dissolved Solids (TDS), conductivity, alkalinity, and chloride—are required to support juvenile and adult vernal pool fairy shrimp (CDFG 2002).



OTIA III Bridges

- Potential to Affect
- No Potential to Affect
- Vernal Pool Fairy Shrimp Habitat
- City
- Streams and Rivers
- County
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.4.12-1

OTIA III: Statewide Bridge Delivery Program
Vernal Pool Fairy Shrimp

N W E S

0 0.25 0.5 1 1.5 2 2.5 3
Miles

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
screening/BA Figures/shrimp.mxd. Mar 1, 2004

5.4.12.2 Species-Specific Effects Pathways

Effects pathways are the media through which effects are delivered to any species. Essentially all effects on vernal pool fairy shrimp are delivered through the displacement, disruption, removal, or addition of one or more of the following:

Soil

The displacement of soils during construction may have direct effects on vernal pool fairy shrimp. Erosion and/or sedimentation resulting from earth-moving activities can smother dormant cysts and eggs. Displacement of soil can also result in changes in the topography that supports vernal pools, or disturbance to the duripan soil layer, an impervious layer of soil that prevents surface water or shallow groundwater from infiltrating, and that allows water to perch on the surface, forming vernal pools. Vernal pools are susceptible to even minor changes in topography caused by soil-disturbing activities such as disking, grading, and leveling (USFWS 2002c). Disturbance of the duripan layer can allow water that ordinarily would either stay on the surface in a vernal pool, or flow along the ground surface or shallow pervious layer to supply a vernal pool, to instead infiltrate into the ground, thus reducing the amount of available water to a vernal pool. Disturbing soils that support vernal pool habitats usually results in adverse affects to the vernal pool fairy shrimp, as the overall function of the vernal pool is disrupted. For the purposes of the Bridge Program, potential adverse effects on vernal pool fairy shrimp from the displacement, disruption, removal, or addition of soil are considered possible if such actions occur within vernal pool habitat within the range of the species.

Water

Vernal pool fairy shrimp are ecologically dependent on a particular duration of inundation and rate of drying of their vernal pool habitats to provide the necessary soil moisture and aquatic environment for seed germination, cyst hatching, growth, maturation, reproduction, dispersal, and the appropriate periods of dry-down for seed and cyst dormancy (August 6, 2003, 68 FR 46683). Alterations in hydrology can thus cause changes to vernal pools. Vernal pools in a given location have formed over time in response to local topographic and hydrologic conditions. Changes in runoff, infiltration, or topography as a result of development can change the amount of water available to vernal pools. Increases in impervious surfaces within vernal pool watersheds can change the timing of flow events and reduce the amount of water that infiltrates into the shallow groundwater layer, which would normally provide a slow release of water into vernal pools. This can cause vernal pools to both fill up faster and dry out faster. In some cases re-direction of stormwater can reduce the total volume of water available to a vernal pool. The vernal pool fairy shrimp, while tolerant of drought in the cyst stage, requires water in the vernal pools in the amount and duration necessary to support the adult life stages. Therefore any alteration in the hydrology of vernal pools may affect the vernal pool fairy shrimp population. For the purposes of the Bridge Program, potential adverse effects on

vernal pool fairy shrimp from the displacement, disruption, removal, or addition of water are considered possible if such actions occur within vernal pool habitat within the range of the species.

Chemicals

The Bridge Project has the potential to affect vernal pool fairy shrimp through contamination as the result of an accidental chemical spill. A chemical spill may affect vernal pool fairy shrimp by infiltrating into groundwater through permeable soils, or by direct runoff into a vernal pool. The distance required to dilute chemicals to an undetectable level through either soils or water would vary depending on the type of chemical, the amount, and other environmental conditions. However, on level terrain where vernal pools exist, and considering the small volume of a potential spill (typically less than several gallons) it is likely that chemicals from a spill or release site (e.g., minor drips, leaks, or spills) would be confined to the immediate area of the contamination. For the purposes of the Bridge Program, potential adverse effects on vernal pool fairy shrimp from chemicals are considered possible if a chemical spill or release occurs within vernal pool habitat within the range of the species.

Vegetation

Vegetation removal within a vernal pool complex has the potential to alter the hydrology, soil moisture, temperature, chemical composition, inundation duration, and rate of drying of the vernal pools. In addition, vegetation removal may limit the amount of nutrient and food sources to vernal pools. Any of these changes may affect some or all of the vernal pool fairy shrimp's life cycle. For the purposes of the Bridge Program, potential adverse effects on vernal pool fairy shrimp from vegetation alteration are considered possible if such alteration occurs within vernal pool habitat within the range of the species.

Species

Any direct disturbance to a vernal pool occupied by vernal pool fairy shrimp has the potential to directly affect vernal pool fairy shrimp; for example, by mechanical harm or dewatering, and result in direct physical take of the species.

5.4.12.3 Minimization and Avoidance Measures

Minimization and avoidance measures have been developed to reduce the proposed action's adverse affects on vernal pool fairy shrimp populations. The environmental performance standards in Section 3.3 detail these minimization measures as well as the methods developed for habitat and species conservation during bridge construction.

5.4.12.4 Analysis of Effects

ODOT/FHWA assessed the likely effects of the Bridge Program on the vernal pool fairy shrimp using GIS analyses. A screening process was applied to all program bridges to identify where bridge repair and replacement activities have the potential to affect the vernal pool fairy shrimp. The methods and assumptions used to perform this screening process are presented in summary below, and in detail in the Effect Screening Layer memos (Appendix 2-A). The methods and assumptions used to assess the effects on the vernal pool fairy shrimp via the various pathways are presented below, and in detail in the Evaluation of Effect memos (Appendix 2-B). Both the Effect Screening Layer memo and the Evaluation of Effect memo for this species were reviewed by the Services as part of the ongoing consultation process for the Bridge Program.

For the purposes of the Bridge Program, vernal pool fairy shrimp habitat includes all areas: 1) within the Agate Desert in Jackson County, Oregon, and 2) mapped by the NRCS as Agate-Winlo Complex soils. A total of five Program Bridges meet both of these criteria within a portion of their API and thus are considered to have the potential to affect vernal pool fairy shrimp (Table 5.4.12-1). These five bridges are further analyzed below to determine what, if any, adverse effects their repair and replacement activities may have on the vernal pool fairy shrimp via the various effects pathways.

Table 5.4.12-1. Program Bridge projects that may affect Vernal Pool Fairy Shrimp.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	Ecoregion Name
1	7777	Central OR RR	9	Klamath Mountains
2	8539	I-5 (Hwy 001)	8	Klamath Mountains
3	8543	None	14	Klamath Mountains
4	07777B	Central OR RR	9	Klamath Mountains
5	08540A	I-5 (Hwy 001)	4	Klamath Mountains

Soil

For the purposes of the Bridge Program, potential adverse effects on vernal pool fairy shrimp from the displacement, disruption, removal, or addition of soil are considered possible if such actions occur within vernal pool habitat within the range of the species. A total of 63 net acres (119 gross acres) of vernal pool fairy shrimp habitat is present within the five bridge APIs. Of the 63 acres, 7 acres are located within habitat that contains severely altered vegetation and leveled topography—and thus, altered hydrology. Approximately 29 acres are located within habitat that has altered vegetation and weak hydrology and topography. The remaining 26 acres are located within altered-vegetation

habitat (Jackson County 2003). Thus, none of the 63 net acres are considered intact. Nonetheless, the Invertebrate Environmental Performance Standard will be followed (Section 3.3) to ensure that no disturbance to vernal pools occurs. As a result, effects on vernal pool fairy shrimp via the soil effects pathway are considered to be negligible.

Water

For the purposes of the Bridge Program, potential adverse effects on vernal pool fairy shrimp from the displacement, disruption, removal, or addition of water are considered possible if such actions occur within vernal pool habitat within the range of the species. Each of the five bridges identified as having vernal pool fairy shrimp habitat within their API will follow the Water Quality and Invertebrate Avoidance Environmental Performance Standards. The Invertebrate Avoidance Environmental Performance Standard requires that existing hydrologic regimes be maintained, while the implementation of the Stormwater Environmental Performance Standard ensure the maintenance of existing peak and base flows, and treatment of water quality (Section 3.3). As a result, effects on vernal pool fairy shrimp via the water effects pathway are considered to be negligible.

Chemicals

For the purposes of the Bridge Program, potential adverse effects on vernal pool fairy shrimp from chemicals are considered possible if a chemical spill or release occurs within vernal pool habitat within the range of the species. Such an effect has the potential to occur within the 63 acres of vernal pool fairy shrimp habitat within the five bridge APIs. However, implementation of the Water Quality Environmental Performance Standard and the Invertebrate Avoidance Environmental Performance Standard will ensure that most foreseeable chemical spills are avoided, or contained and cleaned up before they can adversely affect vernal pool habitat. The effect on vernal pool fairy shrimp from chemical spills is therefore considered to be negligible.

Vegetation

For the purposes of the Bridge Program, potential adverse effects on vernal pool fairy shrimp from vegetation alteration are considered possible if such alteration occurs within vernal pool habitat within the range of the species. Therefore, the potential for adverse effects on vegetation exists on 63 acres in the five bridge APIs. The Invertebrate Avoidance Environmental Performance Standard will be followed at each of these bridges to protect vernal pool fairy shrimp habitat. In addition, the Habitat Removal and Site Restoration Environmental Performance Standards will be followed to minimize the amount of vegetation cleared and to ensure that any vegetation removed outside of the bridge footprint area is restored, thus minimizing effects on vernal pool fairy shrimp from upland vegetation removal. As a result, effects on vernal pool fairy shrimp via the vegetation effects pathway are considered to be negligible.

Species

Direct removal of occupied habitat may affect vernal pool fairy shrimp. Implementation of the Invertebrate Avoidance Environmental Performance Standard for the five bridges with known vernal pool habitat will eliminate the potential for any direct species effects.

5.4.12.5 Determination of Effect

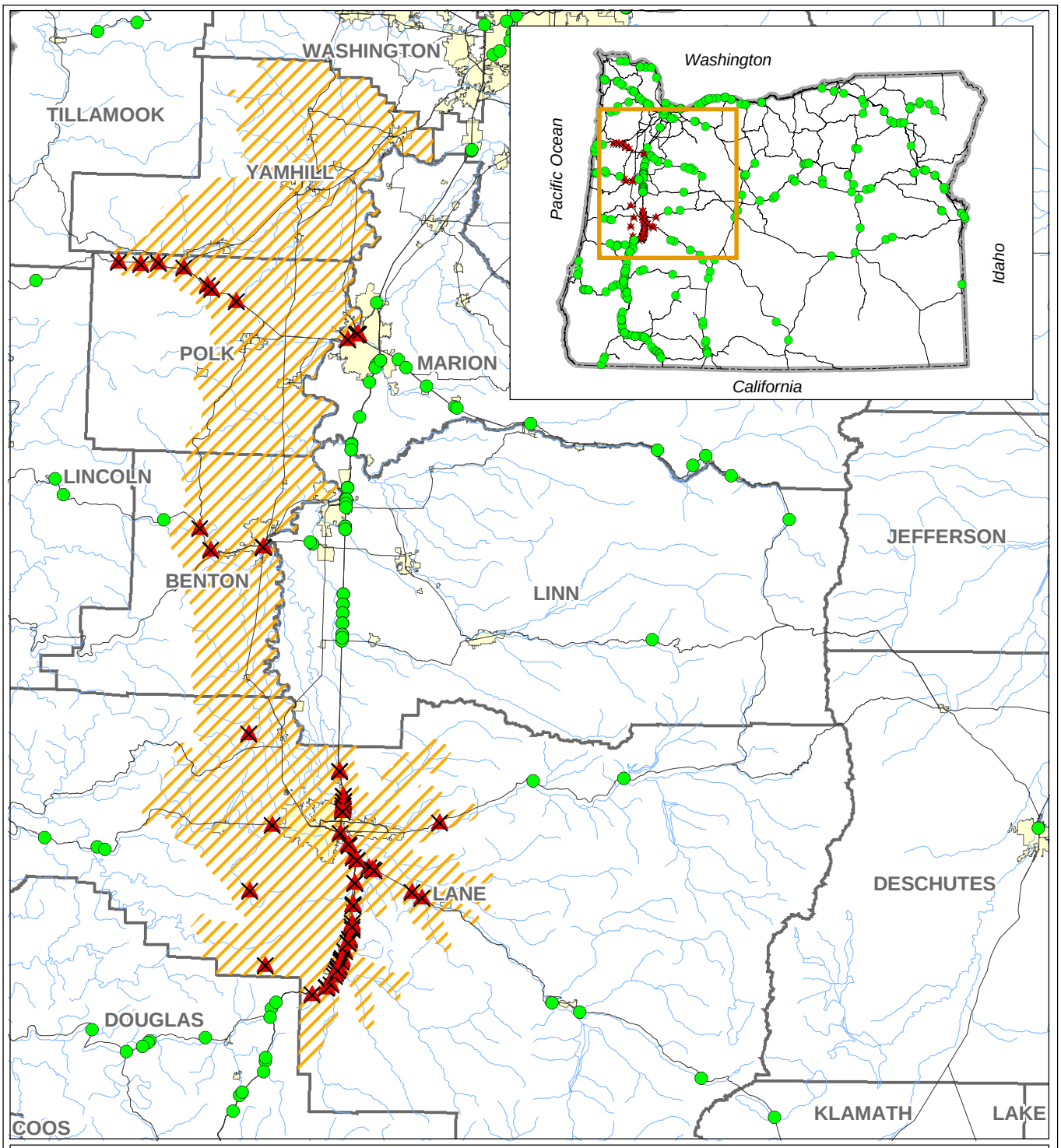
The application of environmental performance standards to the five bridges identified as potentially affecting vernal pool fairy shrimp will minimize effects to the greatest extent practicable. Effects on the 63 acres of vernal pool fairy shrimp habitat are likely to be negligible in light of these performance standards, and considering that none of the 63 acres are intact vernal pool habitat. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, not likely to adversely affect** for the vernal pool fairy shrimp and its designated critical habitat.

5.4.13 Fender's Blue Butterfly (*Icaricia icarioides fenderi*)

5.4.13.1 Life History and Status

The Fender's blue butterfly was Federally listed as endangered throughout its range on January 25, 2000 (January 25, 2000, 65 FR 3875) (Figure 5.4.13-1). Historically, the Fender's blue butterfly was widely distributed on approximately 685,000 acres of upland prairie habitats throughout the Willamette Valley (USFWS 2003c). However, due to extensive fire suppression, agricultural conversion, urbanization, and the introduction of invasive vegetation, upland prairie habitat has been depleted to less than 988 acres and limited to four counties (USFWS 2003c). As a result, the Fender's blue butterfly is confined to 32 known habitat patches in Yamhill, Polk, Benton, and Lane counties, Oregon (USFWS 2003c). Critical habitat has not been designated at this time.

The Fender's blue butterfly is known to use Kincaid's lupine (*Lupinus sulphureus kincaidii*), which is Federally listed as threatened (January 25, 2000, 65 FR 3875), as its primary larval food plant. It will also use spur lupine *(Lupinus laxiflorus*), and sickle-keeled lupine (*Lupinus albicaulis*) as secondary host plants for larvae (USFWS 2003c). Adult butterflies lay their eggs on the foliage of perennial lupine species in late May or early June; this foliage is also the food source for the caterpillar during May and June. The newly hatched larvae emerge to feed on the foliage for a short time during late June, reaching their second instar in the early summer, at which point they enter an extended diapause (January 25, 2000, 65 FR 3875). Diapausing larvae remain in the leaf litter at or near the base of the host plant through the fall and winter and may become active again in March or April of the following year. Adult Fender's blue butterflies feed on nectar. Nectar sources include but are not limited to: wild onion (*Allium amplectans*), cat's ear mariposa lily (*Calachortus tolmiei*), and common camas (*Camassia quamash*). Native wildflowers in the Willamette Valley prairies provide more nectar than non-native flowers for adult butterflies, and the Fender's blue butterfly population density is thus positively correlated with the density of native wildflowers (USFWS 2003c).



OTIA III Bridges

- Potential to Affect
- No Potential to Affect
- Fender's Blue Butterfly Range
- County
- Streams and Rivers
- City
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.4.13-1

OTIA III: Statewide Bridge Delivery Program
Fender's Blue Butterfly

N W E S

0 2.5 5 10 15 20 25
Miles

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
screening/BA Figures/b_butterfly.mxd. Mar 1, 2004

5.4.13.2 Species-Specific Effects Pathways

Effects pathways are the media through which effects are delivered to any species. Essentially all effects on Fender's blue butterflies are delivered through the displacement, disruption, removal, or addition of one or more of the following:

Chemicals

Chemical spills or releases are not expected to have any effect on Fender's blue butterfly. Herbicide application may affect the habitat for this species as discussed in the Vegetation section that follows.

Vegetation

Fender's blue butterfly habitat is limited to native upland prairie habitat in the Willamette Valley (USFWS 2003c). Fender's blue butterfly and Kincaid's lupine coexist at 27 of the 32 remnant habitat patches in Oregon (January 25, 2000, 65 FR 3875). Proposed actions include vegetation removal, which could result in the removal of habitat or the introduction or promotion of invasive species, which may out-compete host plants or plants that provide nectar sources. The Bridge Program may also require the use of herbicide for clearing lands, or for invasive species control during the site restoration phase of the project. Herbicides have the potential to have direct effects on eggs, larvae, or individuals and host plants. However a recent study on the effects of herbicide on the development of the Karner blue butterfly (*Lycaeides Melissa samuelis*) eggs and larvae (a species similar to Fender's blue butterfly) assessed different application methods and herbicide mixtures including glyphosate, sulfmeturon methyl, trichlor as active ingredients, and Entry II as the surfactant. The preliminary results indicated virtually no direct herbicide toxicity to Karner blue butterflies (USFWS 2003c). These results, as well as anecdotal observations of effects of herbicide use within Fender's blue butterfly populations indicate that Fender's blue butterfly will probably not be directly affected by herbicides. However even if herbicides do not directly kill Fender's blue butterfly, butterfly larva mortality (or loss of future breeding habitat) is still likely due to the death of the host plant. For the purposes of the Bridge Program, potential adverse effects on Fender's blue butterfly from vegetation alteration are considered possible if such alteration occurs in the vicinity of Kincaid's lupine plant populations.

Species

Removal or trampling of occupied host plants has the potential to directly take Fender's blue butterflies by removing or crushing eggs, larvae, or adult butterflies.

5.4.13.3 Minimization and Avoidance Measures

Minimization and avoidance measures have been developed to reduce the proposed action's adverse affects on Fender's blue butterfly populations. The environmental performance standards in Section 3.3 detail these minimization measures as well as the methods developed for habitat and species conservation during bridge construction.

5.4.13.4 Analysis of Effects

ODOT/FHWA assessed the likely effects of the Bridge Program on the Fender's blue butterfly using GIS analyses. A screening process was applied to all program bridges to identify where bridge repair and replacement activities have the potential to affect the Fender's blue butterfly. The methods and assumptions used to perform this screening process are presented in summary below, and in detail in the Effect Screening Layer memos (Appendix 2-A). The methods and assumptions used to assess the effects on the Fender's blue butterfly via the various pathways are presented below, and in detail in the Evaluation of Effect memos (Appendix 2-B). Both the Effect Screening Layer memo and the Evaluation of Effect memo for this species were reviewed by the Services as part of the ongoing consultation process for the Bridge Program.

For the purposes of the Bridge Program, Fender's blue butterfly habitat has the potential to occur in all areas: 1) within the Willamette Valley Ecoregion, and 2) within Yamhill, Polk, Benton, and Lane Counties, and 3) within the Johnson and O'Neil (2001) Westside Grasslands; Herbaceous Wetlands; or Agriculture, Pasture, and Mixed Environments habitat types. A total of 74 Program Bridges meet these criteria; construction activities at these 74 bridges are considered to have the potential to affect Fender's blue butterfly (Table 5.4.13-1). These 74 bridges are further analyzed below to determine what, if any, adverse effects their repair and replacement activities may have on the Fender's blue butterfly via the various effects pathways.

Table 5.4.13-1. Program Bridge projects that may affect Fender's Blue Butterfly.

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	Ecoregion Name
1	4573	Unknown	3	Coast Range
2	745	Unknown	5	Willamette Valley
3	1516	EWEB Canal	3	Willamette Valley
4	2001	Unknown	3	Willamette Valley
5	2015	Unknown	3	Willamette Valley
6	2081	Unknown	3	Willamette Valley
7	2262	Central OR RR	8	Willamette Valley

Table 5.4.13-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	Ecoregion Name
8	4041	Bear Cr.	7	Willamette Valley
9	4056	Hayes Cr.	1	Willamette Valley
10	4062	S. Fk. Siuslaw R.	4	Willamette Valley
11	5286	Coast Fk. Willamette R.	7	Willamette Valley
12	6768	Lost Cr.	5	Willamette Valley
13	7110	UPRR	8	Willamette Valley
14	7366	Unknown	3	Willamette Valley
15	7825	I-5 (Hwy 001)	5	Willamette Valley
16	7830	Abandoned RR	3	Willamette Valley
17	7832	Unknown	6	Willamette Valley
18	7860	I-5 (Hwy 001)	6	Willamette Valley
19	7863	Row R. Rd.	4	Willamette Valley
20	8329	Willamette R Hwy 015 UPRR	19	Willamette Valley
21	8445	I-5 (Hwy 001)	7	Willamette Valley
22	8616	Oxing SB Hwy 1W	10	Willamette Valley
23	8617	WPRR	3	Willamette Valley
24	8870	Mcvay Access	1	Willamette Valley
25	8889	Unknown	7	Willamette Valley
26	9587	Unknown	4	Willamette Valley
27	00123K	Unknown	33	Willamette Valley
28	01075A	Marys R.	3	Willamette Valley
29	01205A	WPRR & Harris Rd.	6	Willamette Valley
30	01612A	Unknown	3	Willamette Valley
31	01756A	Unknown	5	Willamette Valley

Table 5.4.13-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	Ecoregion Name
32	05285A	Willamette R. Relief Opening	5	Willamette Valley
33	05287B	Willamette R. Relief Opening	5	Willamette Valley
34	06836A	Franklin Blvd. & UPRR	5	Willamette Valley
35	07253B	Unknown	35	Willamette Valley
36	07253R	Unknown	8	Willamette Valley
37	07732A	Hwy 018 (Or 58) & Conn	6	Willamette Valley
38	07732B	OR 58 (Hwy 018) & Conn	6	Willamette Valley
39	07736A	Camas Swale	3	Willamette Valley
40	07736C	Camas Swale	3	Willamette Valley
41	07739A	I-5 (Hwy 001)	7	Willamette Valley
42	07740A	Hill Cr.	1	Willamette Valley
43	07740C	Hill Cr.	1	Willamette Valley
44	07743A	Tunnel Mill Race	3	Willamette Valley
45	07745A	Coast Fk. Willamette R.	8	Willamette Valley
46	07756A	Coast Fork Relief Opening	4	Willamette Valley
47	07757A	Gettings Cr.	5	Willamette Valley
48	07757B	Gettings Cr.	5	Willamette Valley
49	07793A	Brown Cr.	3	Willamette Valley
50	07793B	Brown Cr.	3	Willamette Valley
51	07809A	Coast Fk. Willamette R.	5	Willamette Valley
52	07809B	Coast Fk. Willamette R.	5	Willamette Valley
53	07810A	Latham Rd.	4	Willamette Valley
54	07810B	Latham Rd.	4	Willamette Valley
55	07828B	Creek	3	Willamette Valley

Table 5.4.13-1. (continued).

Record No.	Bridge ID No.	Feature Crossed	No. of Spans	Ecoregion Name
56	07829A	Row R.	5	Willamette Valley
57	07833A	Row R. Rd.	3	Willamette Valley
58	07833B	Row R. Rd.	3	Willamette Valley
59	07861B	Martin Cr. SB	3	Willamette Valley
60	07863A	Row R. Rd.	4	Willamette Valley
61	07864A	16th St.	3	Willamette Valley
62	07865A	Tayler St.	3	Willamette Valley
63	07871A	Row R. Overflow	6	Willamette Valley
64	07871B	Row R. Overflow	6	Willamette Valley
65	08171N	Muddy Cr. Overflow	3	Willamette Valley
66	08171S	Muddy Cr.	3	Willamette Valley
67	08175N	Mckenzie R. & Front Rd	11	Willamette Valley
68	08175S	Mckenzie R. & Front Rd	11	Willamette Valley
69	08178N	Mckenzie Overflow	4	Willamette Valley
70	08178S	Mckenzie Overflow	4	Willamette Valley
71	08180N	Mckenzie Overflow	3	Willamette Valley
72	08180S	Mckenzie Overflow	3	Willamette Valley
73	08182N	Game Farm Rd	6	Willamette Valley
74	08182S	Game Farm Rd	6	Willamette Valley

Vegetation

For purposes of the Bridge Program, effects on vegetation are assumed to be limited to 2 acres per bridge (for the 74 bridges where Fender's blue butterfly habitat has the potential to occur). Thus, approximately 148 acres of vegetation will be disturbed in the vicinity of program bridges; this vegetation has the potential to include the plant species upon which the Fender's blue butterfly relies for feeding and breeding. However, it is unlikely that

very much of the area where vegetation disturbance will occur actually supports these preferred plant species.

The Habitat Avoidance and Site Restoration Environmental Performance Standards (Section 3.3) will be followed to limit the amount of vegetation cleared and to ensure that any vegetation removed outside of a specific bridge footprint is restored. Implementation of the Invertebrate Avoidance Environmental Performance Standard will ensure that occupied or potential Fender's blue butterfly habitat will not be removed.

Species

Direct removal or trampling of host plant species could directly affect the Fender's blue butterfly. The implementation of the Invertebrate Avoidance Environmental Performance Standard will eliminate any direct species effects on individual Fender's blue butterflies.

5.4.13.5 Determination of Effect

The application of environmental performance standards to all bridges identified as potentially affecting Fender's blue butterflies will minimize the effects summarized above to the greatest extent practicable. However, some Fender's blue butterfly habitat could be indirectly affected by vegetation disturbance, including herbicide application, or from direct effects associated with vegetation removal or the trampling of Fender's blue butterflies. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, likely to adversely affect** the Fender's blue butterfly.

5.4.14 Oregon Silverspot Butterfly (*Speyeria zerene hippolyta*)

5.4.14.1 Life History and Status

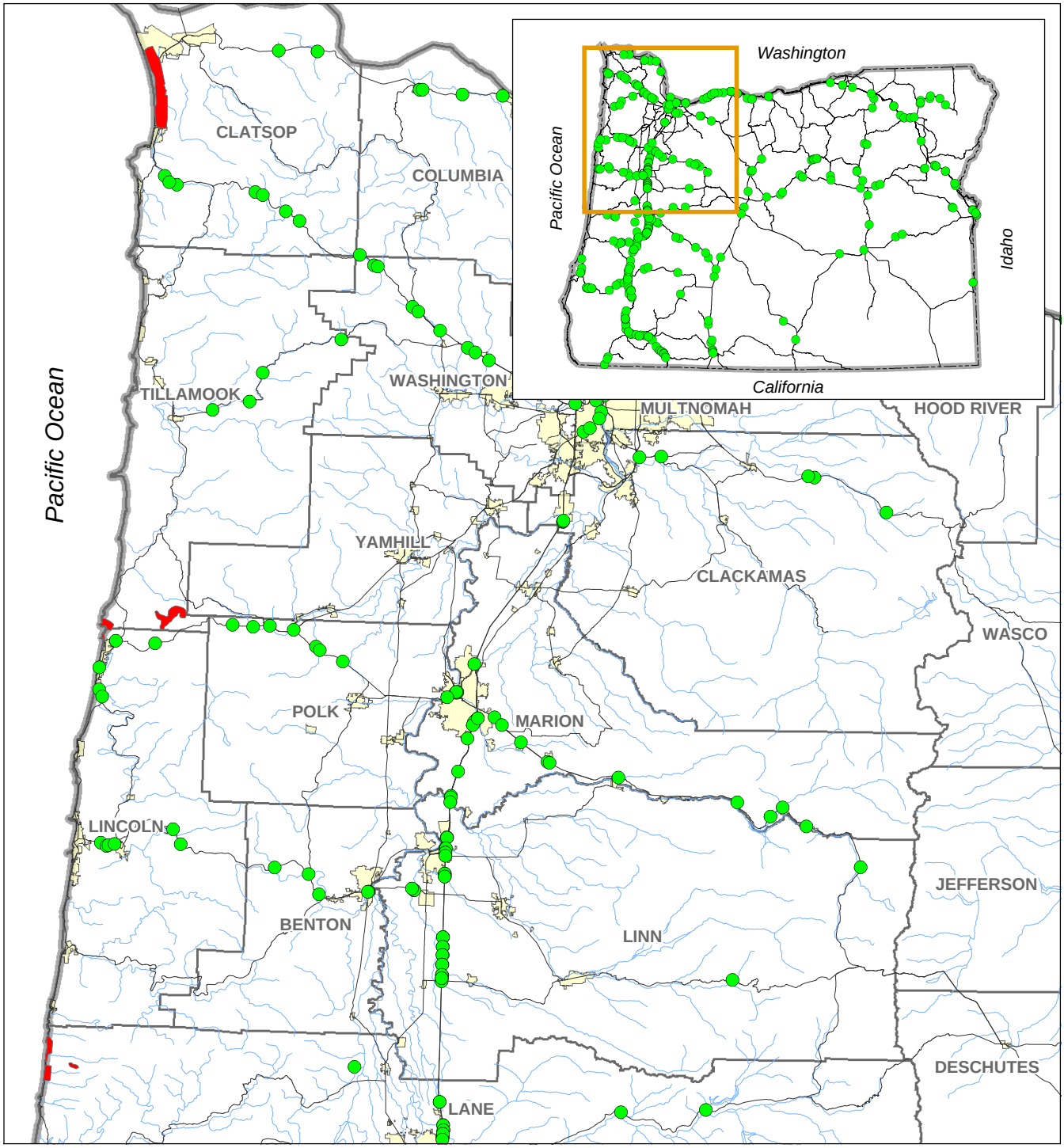
The Oregon silverspot butterfly was Federally listed as threatened, and critical habitat was designated, on July 2, 1980 (July 2, 1980, 45 FR 44935). At the time of listing, the only known viable population of Oregon silverspot butterflies was at the Rock Creek – Big Creek area in Lane County, Oregon. This population was threatened by loss of habitat due to housing development and recreational activities (July 2, 1980, 45 FR 44935, USFWS 2001b).

The Oregon silverspot butterfly has six larval and one pupal stage before metamorphosing into an adult. Newly hatched larvae enter diapause immediately and overwinter in this condition until the host plant, the common blue violet (*Viola adunca*), sends up new growth, which can be as early as March (USFWS 2001b). When the larvae emerge they feed on the violets, and will undergo six developmental stages before emerging as adults (WDFW 1993). Adult emergence and flight period typically correspond with the best coastal conditions, usually from July into September (WDFW 1993). As adults, they mate, lay eggs, and die, thus completing a year-long life cycle (WDFW 1993).

The Oregon silverspot butterfly inhabits early successional coastal grasslands with topography or forest fringe that provides protection from strong coastal winds (TNC 2003). Discovered

subsequent to Federal listing, grassland habitats that support Oregon silverspot butterfly populations are currently known to exist in marine terrace and coastal headland "salt spray" meadows, stabilized dunes, and montane grasslands in the higher elevations of the Oregon Coast Range (USFWS 2001b) (Figure 5.4.14-1). In addition to providing functional environmental conditions, these habitats provide an adequate supply of caterpillar host plants and adult nectar sources.

Extensive surveys of habitat conditions and populations throughout the range of the Oregon silverspot butterfly were conducted between 1982 and 1993 to determine known localities and also areas that may potentially support future populations. These surveys determined that the Oregon silverspot butterfly occurs at six sites: Lake Earl in California, the Rock Creek – Big Creek area (Lane County, Oregon), Bray Point (Lane County, Oregon), Cascade Head (Tillamook County, Oregon), Mt. Hebo (Tillamook County, Oregon), and the Clatsop Plains (Clatsop County, Oregon) (USFWS 2001b). These six sites were grouped according to their proximity and similarity of habitat to form Habitat Conservation Areas (HCAs) (USFWS 2001b). There are six HCAs, four of them in Oregon: Clatsop Plains HCA, Coastal Mountain HCA (at Mt. Hebo and Fairview Mt.), Cascade Head HCA, and Central Coast HCA (at Rock Creek – Big Creek and Bray Point). The only critical habitat area designated for Oregon silverspot butterfly is the Rock Creek-Big Creek area, which is entirely contained within the Central Coast HCA (July 2, 1980, 45 FR 44935, USFWS 2001b).



OTIA III Bridges

- Potential to Affect
- No Potential to Affect
- Oregon Silverspot Butterfly Habitat Conservation Areas
- City
- Streams and Rivers
- County
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.4.14-1

OTIA III: Statewide Bridge Delivery Program
Oregon Silverspot Butterfly

N W E S

0 3 6 12 18 24 30
Miles

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
noeffect\BA_figures\silverspot.mxd. Mar 1, 2004

5.4.14.2 Analysis of Effects

Within Oregon, the Oregon silverspot butterfly's habitat is limited to the four designated HCAs as determined by the recovery plan for this subspecies. The identified and mapped HCAs account for the entire range of the Oregon silverspot butterfly. The Bridge Program does not include the repair or replacement of bridges within the range of the Oregon silverspot butterfly (i.e., the four designated HCAs).

5.4.14.3 Determination of Effect

The Bridge Program does not include the repair or replacement of bridges within the range of the Oregon silverspot butterfly. Based on this analysis for the Bridge Program, ODOT makes a determination of **no effect** for the Oregon silverspot butterfly.

5.4.15 Other Wildlife species

5.4.15.1 Gray Wolf (*Canis lupus*)

The gray wolf (*Canis lupus*) in Oregon is listed as threatened under the Federal ESA (April 1, 2003, 68 FR 15803), and is classified as endangered under the Oregon ESA. In 1995, gray wolves were re-introduced into portions of Idaho, Montana, and Wyoming. The reintroduced populations of wolves are listed as "experimental, non-essential" under the ESA (November 22, 1994, 59 FR 60252).

The gray wolf was once widely distributed throughout the continental United States. By the 1930s, gray wolves were extirpated from the western U.S. Between 1999 and 2002, three wolves were confirmed in Oregon; two were killed and one captured and returned to Idaho. At present, there are no plans to re-introduce wolves into Oregon. However, as wolf populations in Idaho increase, individuals are expected to wander into Oregon (ODFW 2002). Since 2002, approximately 60 wolf or wolf track sightings have been made in eastern Oregon. However, no wolves are presently known to live in Oregon (ODFW 2003a).

Except for lone wolves, wolves travel in packs of 5 to 8 individuals. Pack wolves are territorial, and forage cooperatively. In the U.S., the home ranges of pack wolves have been identified as 50 to 5,000 square miles (Marshall et al., 1996).

Wolves tend to avoid populated areas, though they have been known to kill livestock in rural areas. Due to the gray wolf's extensive home range, rare occurrences in Oregon, and tendency to avoid human activity, it is unlikely the bridge repair and replacement would adversely affect gray wolves. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for the gray wolf.

5.14.5.2 Wolverine (*Gulo gulo*)

The wolverine (*Gulo gulo*) was listed as threatened under the Oregon State ESA in 1987 (OAR 635-100-0125). Oregon wolverine populations are currently considered not warranted for protection under the Federal ESA (April 19, 1995, 60 FR 19567).

The wolverine has a holarctic distribution throughout Alaska, Canada, and the western U.S. (Verts and Carraway 1998, Csuti et al. 1997). In Oregon, the species was long thought to have been extirpated (Bailey 1936). However, a series of live or skeletal wolverine sightings has occurred in the State between the 1960s and the 1990s (Verts and Carraway 1998). Wolverines in Oregon are typically found in forest environments at higher elevations and in alpine areas. Open, unvegetated areas are avoided by wolverines, and a key component of their presence is the absence of human activity or development (Hash 1987). The wolverine travels widely, maintaining a home range of 150 to 163 square miles (Verts and Carraway 1998).

The entire range of the wolverine (within Oregon) is within the Cascade and Blue Mountain provinces above 2,000 feet. Due to this species' rarity and its tendency to avoid human activity, it is unlikely that the bridge APIs provide functional habitat for wolverines. The wolverine is naturally rare in Oregon and typically prefers wilderness areas; therefore it unlikely that highway bridge construction would adversely affect the wolverine. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for the wolverine.

5.14.5.3 Washington Ground Squirrel (*Spermophilus washingtoni*)

The Washington ground squirrel (*Spermophilus washingtoni*) was listed as endangered under the Oregon State ESA in 2000 (OAR 635-100-0125). Both the Washington and Oregon populations of Washington ground squirrel were designated as candidates for listing under the Federal ESA on October 25, 1999 (October 25, 1999, 64 FR 57533).

The entire range of the Washington ground squirrel is defined by three fragmented populations. Two of these populations are in Washington and one is in Oregon. All three populations occur within the Columbia Basin physiographic region. In Oregon, Washington ground squirrels have been identified in Gilliam, Morrow, and Umatilla Counties (Verts and Carraway 1998). At the time of early settlement in the region these populations were likely contiguous; however, grazing, fire, cultivation, and irrigation have removed or altered much of the vegetation that supports Washington ground squirrels and, consequently, have limited the distribution of Washington ground squirrels into the existing fragmented populations (Verts and Carraway 1998).

The range of the Washington ground squirrel in Oregon is Gilliam, Morrow, and Umatilla Counties. Bridges within Gilliam, Morrow, and Umatilla County were evaluated by ODFW biologists Simon Wray, Russ Morgan, and Mark Henjum and were determined not to have Washington ground squirrel or their associated habitat (Randy Reeve, ODFW/ODOT liaison, ODOT, pers. comm. December 18, 2003).

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for the Washington ground squirrel.

5.14.5.4 Kit fox (*Vulpes macrotis*)

The kit fox (*Vulpes macrotis*) was listed as threatened under the Oregon State ESA in 1987 (OAR 635-100-0125). Oregon kit fox populations are currently considered not warranted for protection under the Federal ESA.

In Oregon, the kit fox is found in arid desert valleys dominated by halophytic plants (Csuti et al. 1997). Historic records of kit fox distribution in Oregon include Deschutes, Malheur, Harney, and Klamath Counties (Verts and Carraway 1998). However, current distribution is thought to only occur in a small portion of southern Harney County, and in Malheur County east and south of Steens Mountain (Csuti et al. 1997).

The entire range of the kit fox in Oregon is within the Alvord Lake, Crooked/Rattlesnake, Middle Owyhee, South Fork Owyhee, East Little Owyhee, and Upper Quinn 4th field HUCs. Bridges outside of the 4th field HUCs listed above will be documented as having no effect on the kit fox.

Kit foxes have a limited range and are naturally rare in Oregon. As a result, there are no bridges associated with the Bridge Program within the range of the kit fox. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for the kit fox.

5.4.15.5 Short-tailed Albatross (*Phoebastria albutrus*)

The only terrestrial area in U.S. jurisdiction that is currently used by the short-tailed albatross *(Phoebastria albatrus)* is the Midway Atoll (July 31, 2000, 65 FR 46643). Short-tailed albatrosses have been sighted within 6 miles of the shore of Alaska (with some sightings within 3 miles of the shore (July 31, 2000, 65 FR 46643). The marine range of the short-tailed albatross within U.S. territorial waters includes Alaska's vast coastal shelf break areas and the marine waters of Hawaii for foraging, but it is not known how much or to what extent the short-tailed albatross utilizes open ocean areas of the Gulf of Alaska, North Pacific Ocean, and Bering Sea (July 31, 2000, 65 FR 46643).

The short-tailed albatross range for migrating, foraging, roosting, or nesting does not come within 2 miles of a program bridge. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for the short-tailed albatross.

5.4.15.6 Aleutian Canada Goose (*Branta canadensis leucopareia*)

The Aleutian Canada goose *(Branta canadensis leucopareia)* was listed as endangered under the Oregon State ESA (ESA) in 1987 (OAR 635-100-0125). On March 11, 1967, the Aleutian Canada goose was listed as endangered under the Federal ESA (March 11, 1967, 32 FR 4001). On December 12, 1990, the Aleutian Canada goose was down-listed as threatened under the Federal ESA (December 12, 1990, 55 FR 51106). On March 20, 2001, the Aleutian Canada

goose was de-listed under the Federal ESA as populations were considered to be recovered from the threat of extinction (March 20, 2001, 66 FR 15643).

The Aleutian Canada goose is one of eleven generally recognized sub-species of Canada geese. It is the second-smallest species in the Pacific Flyway (Walker and Wiese 1995). The species historically nested on maritime islands from the Alaska Peninsula, westward along the Aleutian Chain, to the Commander and Kuril islands of Asia (ADFG 1999). Aleutian Canada geese winter in and use pastures and grain fields along the coasts of Oregon and northern California and in California's Central Valley. However, the vast majority of Aleutian Canada geese overwinter in California (Brad Bales, waterfowl biologist, ODFW, pers. comm., October 28, 2003). The species typically is found in shoreline and valley floodplain environments in Oregon’s coastal counties during fall and spring months, when they are migrating to or from their northern breeding grounds (Brad Bales, waterfowl biologist, ODFW, pers. comm., October 28, 2003). Some Aleutian Canada geese stray inland to the Willamette Valley during migration, but their numbers are insignificant and they are often impossible to distinguish from other Canada goose sub-species (Brad Bales, waterfowl biologist, ODFW, pers. comm., October 28, 2003).

The entire range of the Aleutian Canada goose in Oregon occurs within the Coast Range physiographic province. Bridges outside of the Coast Range province will be documented as having no effect on the Aleutian Canada goose.

Aleutian Canada geese are migratory in Oregon and only occur for a limited time in the fall and spring months. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for the Aleutian Canada goose.

5.4.15.7 Artic Peregrine Falcon (*Falco peregrinus tundrius*)

On October 13, 1970, the Artic peregrine falcon *(Falco peregrinus tundrius)* was listed as endangered under the Federal ESA (October 13, 1970, 35 FR 16047). The Arctic peregrine falcon was reclassified to Threatened on April 19, 1984 (March 24, 1984, 49 FR 10520). On October 5, 1994, the Artic peregrine falcon was removed from the Federal ESA list as populations were considered to be recovered from the threat of extinction (October 5, 1994, 59 FR 50796). The Artic peregrine falcon was listed as endangered under the Oregon State ESA (SESA) in 1987 (OAR 635-100-0125) and currently is protected by the SESA only.

The Artic peregrine falcon is one of three subspecies of peregrine falcon that occur in North America (October 5, 1994, 59 FR 50796). The Artic peregrine falcon nests in the tundra region of northern Alaska, across the Canadian tundra, and Greenland (October 5, 1994, 59 FR 50796). This species is highly migratory and winters as far south as Latin America, with some individuals wintering in northern Mexico and southern Florida (October 5, 1994, 59 FR 50796). In Oregon, the Artic peregrine falcon is a migratory species that appears between mid-September and mid-April (Snow 1972).

Artic peregrine falcons are migratory in Oregon and only occur for a limited time in the fall and spring months. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for the Arctic peregrine falcon.

5.4.15.8 Western Snowy Plover (Interior population) (*Charadrius alexandrinus*)

The western snowy plover (*Charadrius alexandrinus*) has two distinct populations in Oregon: a Pacific Coast population and an interior population. The western snowy plover was listed as threatened statewide under the Oregon ESA in 1989 (OAR 635-100-0125, ODFW 2003b). In 1993, the United States Fish and Wildlife Service Federally listed the Pacific Coast population of the western snowy plover as threatened; this population is defined as those individuals that nest adjacent to tidal waters, and includes all nesting birds on the mainland coast, peninsulas, offshore islands, adjacent bays, estuaries, and coastal rivers (March 5, 1993, 58 FR 12864, December 7, 1999, 64 FR 68507). Therefore this listing does not apply to the interior population, which is a state-listed species only.

The interior population of the western snowy plover is found in southeastern Oregon along the bare margins of alkali lakes in Harney and Lake Counties (Csuti et al. 1997). Alkali Lakes are generally barren flat areas that are associated with larger pluvial lake basins such as Alvord, Summer, Malheur, Catlow, and Pueblo Lakes (Adamus et al. 2001). Although this species has been recorded in the Klamath Falls area, breeding has not been confirmed (Adamus et al. 2001). The breeding season for western snowy plover is generally mid-May to July, with interior populations nesting later (Csuti et al. 1997). The interior population is migratory and winters along the California and Baja coasts (Csuti et al. 1997).

The bridge program has the potential to adversely effect snowy plover through alteration of a water course either temporarily (during construction) or permanently (by affecting water quality, promoting nonnative vegetation, or encouraging predators to the area) (USFWS 2001a). Each of these potential effects should have no effect on snowy plovers if they occur greater than 1.0 mile from snowy plover areas. Any potential for noise disturbance from construction activities will have no effect at distances greater than 1.0 mile.

The western snowy plover interior population habitat is limited to the margins of alkali lakes in southeastern Oregon. Only the bridges with an API within 1.0 mile of an alkali lake have the potential to affect the western snowy plover interior population. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for the western snowy plover interior population.

5.4.15.9 Sei Whale (*Balaenoptera borealis*)

In the North Pacific, the sei whale (*Balaenoptera borealis)* has been found mainly south of the Aleutian Islands (Leatherwood et al. 1982, Nasu 1974). Sei whales are present throughout the temperate North Pacific north of 40°N latitude. Throughout their range, sei whales appear predominantly in deep water; they are most common over the continental slope (Martin 1983, CeTAP 1982, Mitchell 1975). Their offshore distribution along the continental slope probably explains, at least in part, the infrequency of observations in shelf waters between northern California and Washington (Reeves et al. 1998a).

Because of their range and preference for deep water, sei whales will not be affected by bridge repair or replacement activities. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for the sei whale.

5.4.15.10 Blue Whale (*Balaenoptera musculus*)

The range of the blue whale (*Balaenoptera musculus*) is known to encompass much of the North Pacific Ocean, from Kamchatka to southern Japan in the west, and from the Gulf of Alaska and California south to at least Costa Rica in the east. The blue whale is not known to move through inland coastal waters of Oregon based on the information provided in the Recovery Plan for the Blue Whale (Reeves et al. 1998b).

The blue whale does not migrate or inhabit waters that will be affected by bridge repair or replacement activities. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for the blue whale.

5.4.15.11 Finback Whale (*Balaenoptera physalus*)

The migratory behavior of finback (*Balaenoptera physalus*) whales in the eastern North Pacific is complex. The finback whales can appear in any given season at many different latitudes (Reeves et al. 1998a). Finback whales have been observed in the summer off of the Oregon coast; however, fin whales do not travel near shore (Reeves et al. 1998a, Green et al. 1992).

Finback whales do not inhabit near shore areas that will be affected by bridge repair or replacement activities. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for the finback whale.

5.4.15.12 Northern Right Whale (*Eubalaena glacialis*)

The northern right whale (*Eubalaena glacialis*) is the world's most endangered large whale. No more than a few hundred individuals are estimated to exist (NOAA Fisheries 1991a). Right whales live over the continental shelf areas of the Pacific Ocean. In the summer, they may be nomadic, temporarily aggregating in areas with abundant food sources (NOAA Fisheries 1991a). Sightings of right whales during winter months have been made off of the coast of Washington, Oregon, California, Baja California, and near the Hawaiian Islands (Scarff 1986). Sightings have occurred approximately 4 to 8 miles offshore of Catalina Island (in California). There are no known wintering areas off the North American Pacific coastline (NOAA Fisheries 1991a).

Right whales do not travel close enough to shore to be affected by bridge repair or replacement activities. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for the northern right whale.

5.4.15.13 Humpback Whale (*Megaptera novaengliae*)

The humpback whale (*Megaptera novaengliae)* is distributed worldwide in all ocean basins. Humpback whales generally inhabit waters over continental shelves, along their edges, and

around some oceanic islands (Whitehead 1987, Balcomb and Nichols 1978). Humpback whales are typically found in waters at least 500 feet deep. Most humpback whales migrate considerable distances to high latitude summering areas. Summer ranges are often relatively close to shore, including major coastal embayments and channels. Sightings of humpback whales along the coast of Oregon occur less frequently than sightings in Central California and Southeast Alaska and it is unclear whether the whales use these waters for purposes other than migration (NOAA Fisheries 1991b). Historically, humpback whales were hunted off the coast of Oregon (usually from April through October) (NOAA Fisheries 1991b).

No bridge repair or replacement activities will affect the humpback whale due to the depth required for the humpback whale (i.e., humpback whales do not travel close to shore). Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for the humpback whale.

5.4.15.14 Sperm Whale (*Physeter macrocephalus*)

The sperm whale (*Physeter macrocephalus)* is one of the most widely distributed marine mammals (Rice 1989). In the North Pacific, the northernmost distribution boundary extends from Cape Navarin to the Pribilof Islands (Omura 1955). Females and young sperm whales usually remain in tropical and temperate waters year-round, while males are thought to move north in the summer to feed in the Gulf of Alaska, Bering Sea, and waters around the Aleutian Islands. Tag data from the days of commercial whaling revealed a great deal of east-west movement between Alaskan waters and the western North Pacific (Japan and the Bonin Islands), with little evidence of north-south movement in the eastern North Pacific (NOAA Fisheries 1998). The seasonal movement of sperm whales in the North Pacific at this time is not well understood (NOAA Fisheries 1998).

Sperm whales are naturally rare in Oregon; therefore it is unlikely they would be affected by bridge repair or replacement activities. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for the sperm whale.

5.4.15.15 Loggerhead Sea Turtle (*Caretta caretta*)

Most known loggerhead sea turtle (*Caretta caretta*) sightings are in southern California (Stinson 1984; Guess 1981a, Guess 1981b), with a few sightings in Grays Harbor Washington (Hodge 1982) and Alaska (Bane 1992). No additional sightings are known. With the exception of four records from Hawaii, U.S. Pacific sightings are confined to the west coast of the continent (NOAA Fisheries and USFWS 1998a). It is not known whether these individuals are resident or transient. The major nesting grounds for the loggerhead sea turtle are generally located in warm temperate and subtropical regions, with some scattered nesting in the tropics. There are no known nesting locations along the west coast of the United States (NOAA Fisheries and USFWS 1998a). Because nesting is not documented in the U.S. Pacific, the conclusion has been made that U.S. waters (principally those off of the California coastline) are used as foraging grounds and as migratory corridors. Sightings are typically confined to the summer months in the eastern Pacific, peaking from July through September off southern California and southwestern Baja California, Mexico (Ramirez-Cruz et al. 1991, Stinson 1984).

The loggerhead sea turtle is a rare occurrence in Oregon; therefore it would not be affected by bridge repair or replacement activities. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for the loggerhead sea turtle.

5.4.15.16 Green Sea Turtle (*Chelonia mydas*)

The green sea turtle (*Chelonia mydas)* is a circumglobal species found in tropical seas and to a lesser extent in subtropical waters (NOAA Fisheries and USFWS 1998b). The U.S. West Coast has no known nesting sites for green sea turtles (NOAA Fisheries and USFWS 1998b).

The green sea turtle is naturally rare in Oregon; therefore it is unlikely to be affected by bridge repair or replacement activities. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for the green sea turtle.

5.4.15.17 Leatherback Sea Turtle (*Dermochelys coriacea*)

The leatherback sea turtle (*Dermochelys coriacea*) is found worldwide (NOAA Fisheries and USFWS 1998c). Adult leatherback sea turtles exhibit broad thermal tolerances and are reported in the Pacific Ocean as far north as Alaska and the Bering Sea, and as far south as Chile and New Zealand (NOAA Fisheries and USFWS 1998c). The leatherback sea turtle has been known to inhabit waters within 30 miles of the shore. No nesting of the leatherback sea turtle occurs on beaches under U.S. jurisdiction (NOAA Fisheries and USFWS 1998c).

The leatherback sea turtle is naturally rare in Oregon; therefore it is unlikely to be affected by bridge repair or replacement activities. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for the leatherback sea turtle.

5.4.15.18 Olive Ridley Sea Turtle (*Lepidochelys olivacea*)

The preferred nesting areas for the Olive (Pacific) Ridley sea turtle (*Lepidochelys olivacea*) occur along continental margins and to a lesser extent on oceanic islands. No known nesting by the Olive Ridley sea turtle occurs in the United States or in any territory under U.S. jurisdiction (NOAA Fisheries and USFWS 1998d). The Olive (Pacific) Ridley sea turtle is naturally rare in Oregon; therefore it is unlikely it would be affected by bridge repair or replacement activities. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for the Olive Ridley sea turtle.

5.5 Plant Species

The potential effects of the Bridge Program on Federal and State-listed plant species are discussed in this section of the BA. ODOT relied on a combination of plant surveys conducted in 2003, Oregon Natural Heritage Information Center (ORNHIC) occurrence records, and USFWS data to make determinations of effect for the 18 Federally listed plant species that exist in Oregon and may potentially occur near the bridge APIs.

The methods used to assess the effects of the Bridge Program on Federally listed plants, including the screening of bridge APIs and the resulting categories of bridges, are discussed in Section 5.5.1. Section 5.5.2 includes a discussion of the primary pathways through which effects may be delivered to individuals or to populations of listed plant species. Minimization and avoidance measures for listed plants as a group are discussed in Section 5.5.3. Following these sections, the potential effects on individual plant species and species-specific determinations of effect are discussed in Sections 5.5.4 through 5.5.21.

5.5.1. Evaluation Methods and Results

ODOT developed a two-stage screening process to determine which of the 430 bridges in the Bridge Program required rare plant surveys in 2003. The first stage of the process identified bridges within 2 miles of rare plant occurrences based on ORNHIC records (ORNHIC 2003) (Figure 5.5.1-1). This initial ORNHIC screening indicated that 138 bridges required on-the-ground rare plant surveys (Otting and Lytjen 2003).

The second stage of ODOT's screening process involved literature reviews; discussions with agency, academic, and local botanists, including Ron Halvorson (Prineville District BLM), Nora Taylor (Burns District BLM), and Jean Wood (Umatilla National Forest); and related searches (Otting and Lytjen 2003) to determine additional locations where listed species may be present. The sources consulted during literature reviews included taxonomic keys and species guides (CPC 2003, Eastman 1990, Meinke 1982, Hitchcock et al. 1973, Hitchcock and Cronquist 1964, Peck 1961); these sources provided information on habitat requirements, morphological characteristics, phenology, and species ranges. This stage of the screening process added 37 bridge APIs to those identified in Stage 1 based on ORNHIC records. In conjunction with ODOTs initial screening, this resulted in a list of 175 bridges requiring on-the-ground rare plant surveys. ODOT completed surveys at many of these bridges in 2003.

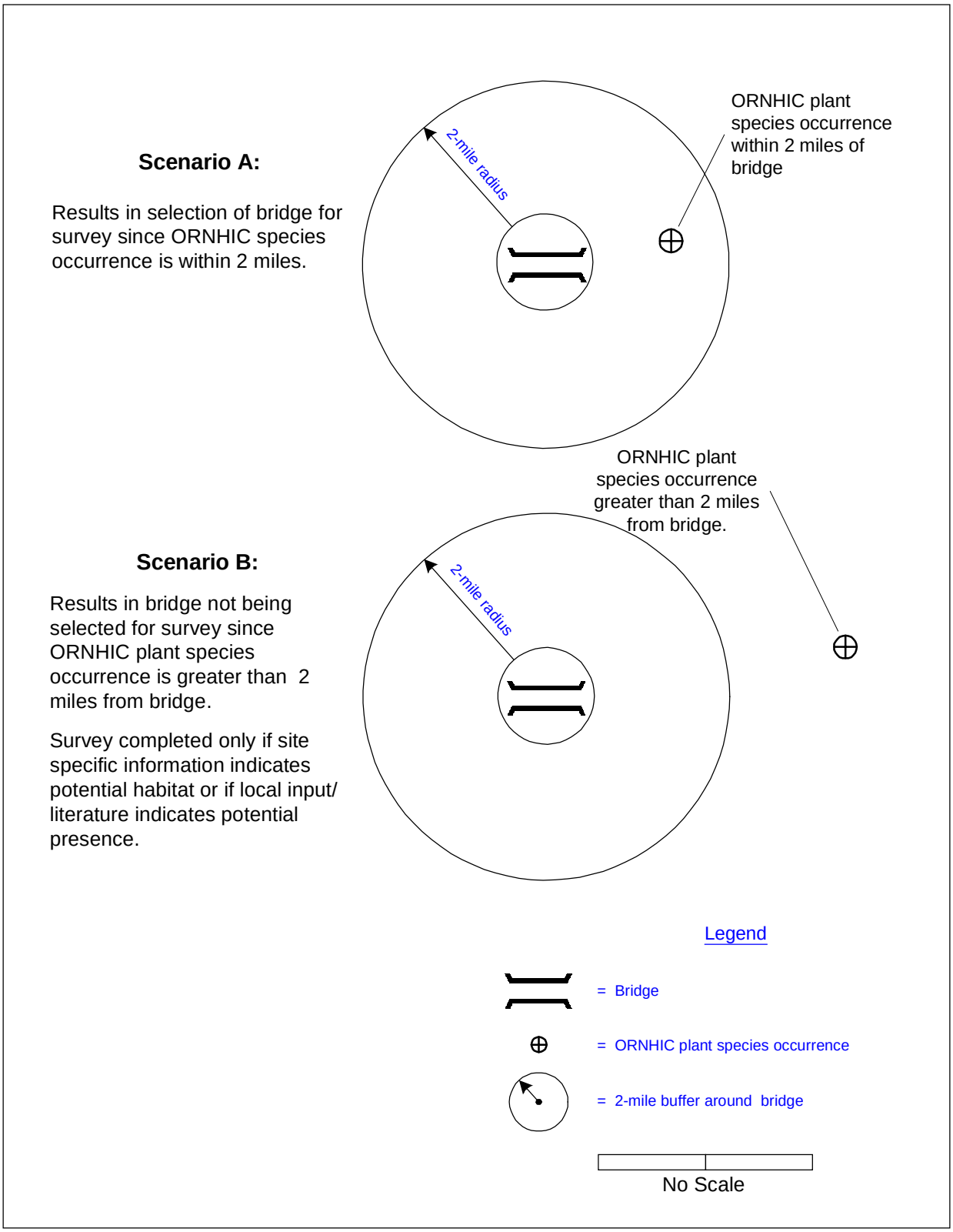


Figure 5.5.1-1. ODOT screening methodology for rare plant surveys.

After the ODOT rare plant surveys were completed and the data were compiled, ODOT applied a screening process developed by the USFWS to determine the possible presence of Federally listed plants associated with the program bridges (Robinson 2004, Robinson 2003). This approach served as an independent assessment of the potential occurrences of Federally listed plant species at all 430 bridges in the Bridge Program, and a means of finalizing survey sites for 2004. The USFWS screening process uses a plant GIS database (known as the XID plant database), that defines potential and known ranges of Federally listed plants. Potential range is defined by a combination of proximity to ORNHIC occurrences (within a 2.5-mile radius) and the area encompassed by any adjoining USGS quadrangle map. Known range is a subset of this area containing the soil series that the plant is associated with as mapped by the Natural Resource Conservation Service (NRCS). The USFWS screening approach is summarized in (Figure 5.5.1-2).

Implicit in the process by which survey sites are identified is that methods used to screen bridges have an acceptably low probability of Type II Error (i.e., the failure to identify the need for a survey at a particular bridge site when in fact a listed species is present). However, some level of error is likely to be present, as evidenced by an ODOT rare plant survey conducted in 2003 that documented an occurrence of Cook's lomatium (*Lomatium cookii*) at a bridge site that lacked the soil type preferred by this species. The XID plant database has since been updated based on this finding (Andy Robinson, USFWS, pers. comm., January 20, 2004).

Based on the results of rare pant surveys conducted to date, and the application of the USFWS screening process as described above, all program bridges were assigned to one of the following four categories:

Category 1: Bridges not requiring surveys based on USFWS screening. A total of 189 bridges are outside of the potential range of listed plants. Proposed actions at these bridges therefore have no potential to affect listed plants.

Category 2: Bridges that required a survey based on the USFWS screening, and that were subsequently surveyed by ODOT in 2003, where listed plant species were not found. A total of 92 bridges are in this category; proposed actions at these bridges are assumed to have no potential to affect Federally listed plants. Rare plant surveys conducted to date will be valid for the duration of Bridge Program, which is unlikely to be more than 10 years (i.e., to 2013; Andy Robinson, USFWS, pers. comm., January 21, 2004).

Category 3: Bridges that required a survey based on the USFWS screening, and that were subsequently surveyed by ODOT in 2003, where one or more plant species were found (this is sometimes referred to as documented plant presence). A total of nine bridges are in Category 3. Since construction of Category 3 bridges has the potential to affect threatened or endangered plant populations, species-specific analyses of potential effects are presented later in this Section. Direct take of listed plants will be avoided at all Category 3 bridges through implementation of the Plant Avoidance Environmental Performance Standard. Indirect effects on listed plants will be minimized through implementation of the other environmental performance standards

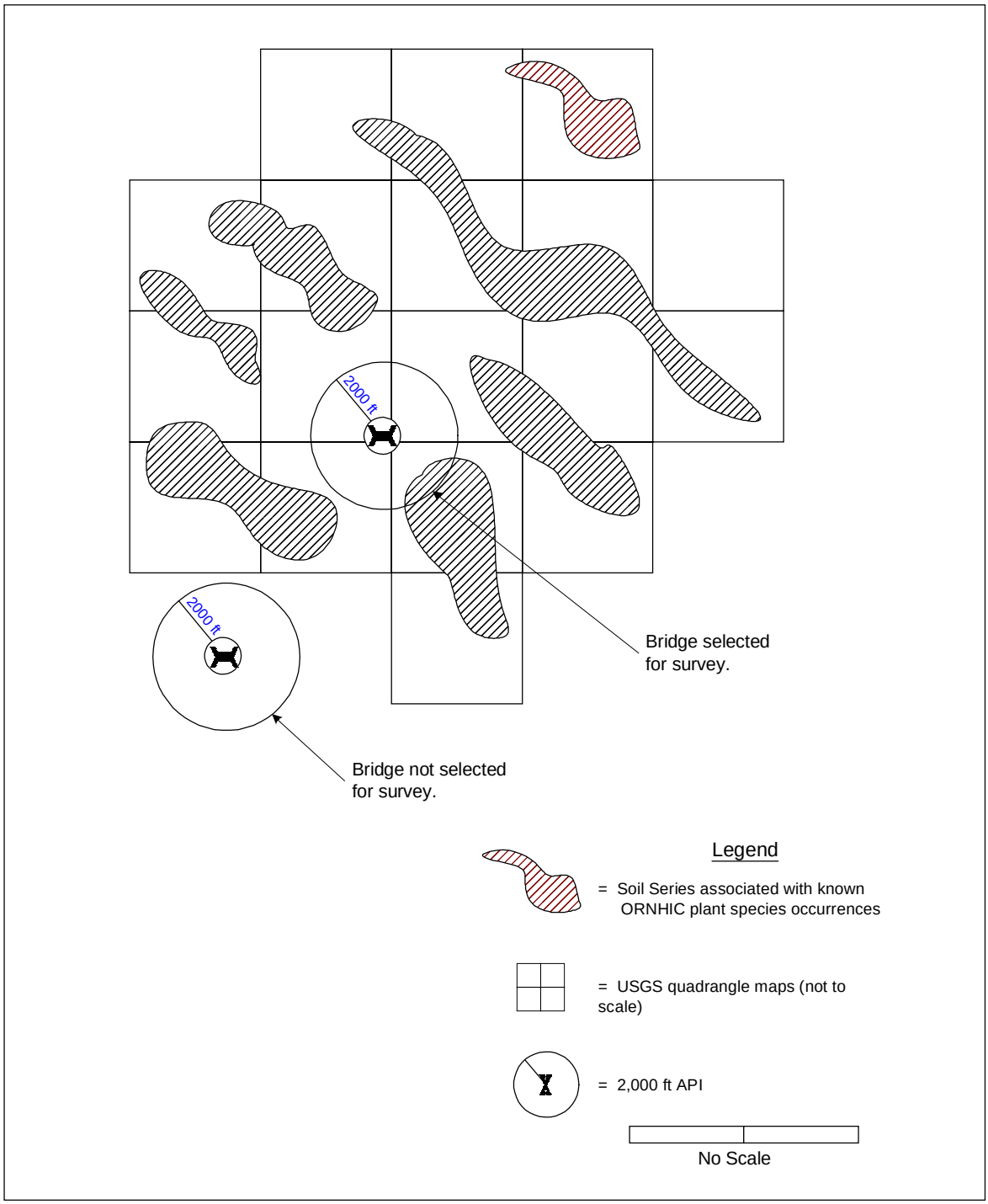
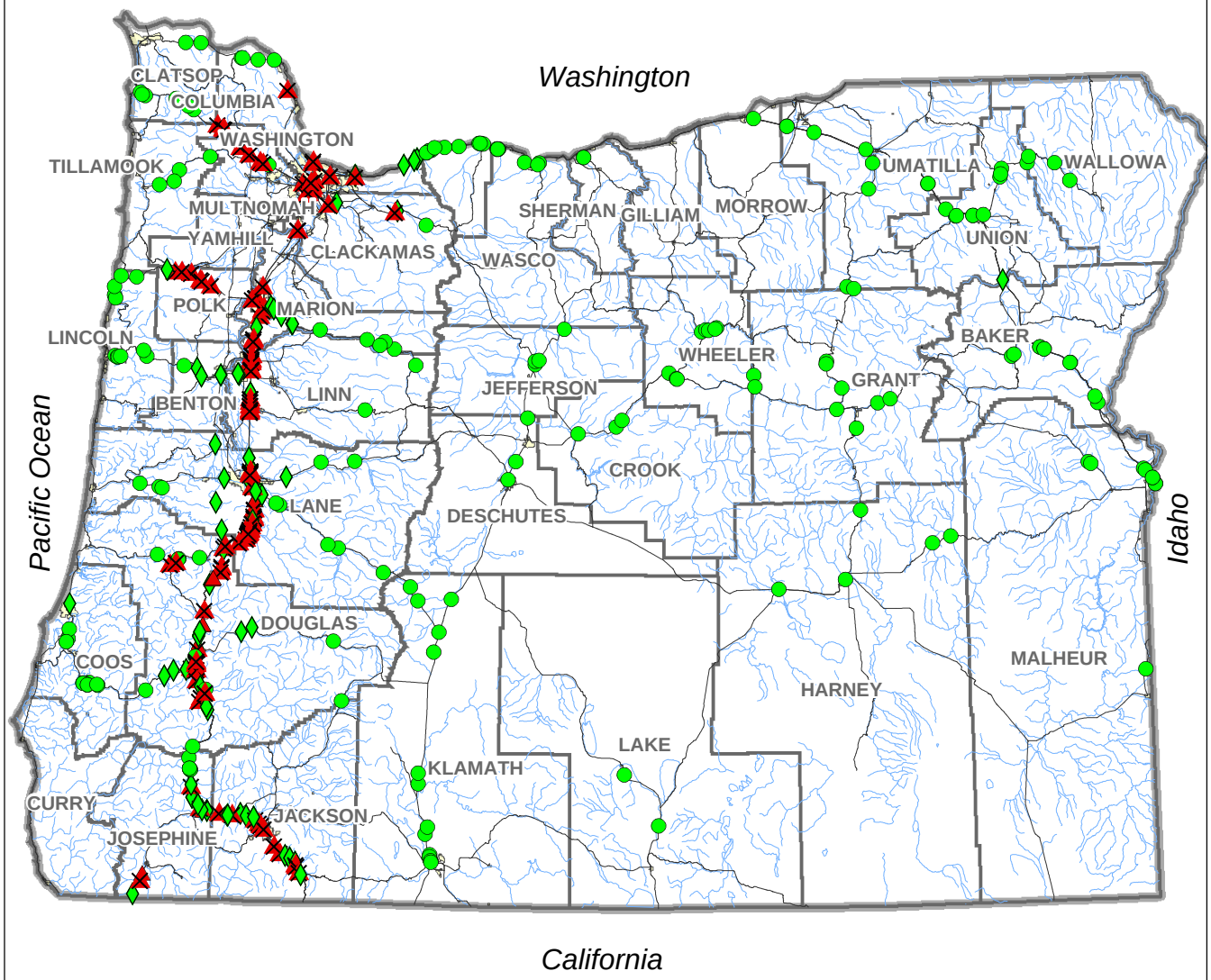


Figure 5.5.1-2. USFWS screening methodology for rare plant surveys.

presented in Section 3.3. Individual consultation with the USFWS will be required where incidental take of a species cannot be avoided.

Category 4: Bridges where rare plant surveys are required (based on the USFWS screening process as described above) but not yet conducted. A total of 140 bridges fall into Category 4 and remain to be surveyed. Direct take of any listed plants identified during the course of future surveys will be avoided at all Category 3 bridges through implementation of the Plant Avoidance Environmental Performance Standard. Indirect effects on listed plants will be minimized through implementation of the other environmental performance standards presented in Section 3.3. Individual consultation with the USFWS will be required where incidental take of a species cannot be avoided. A summary of screening results is shown below (Table 5.5.1-1) and in Figure 5.5.1-3.



OTIA III Bridges

- Remaining Survey Required (Category 4) -- 140 Bridges
- Surveyed, Presence Confirmed (Category 3) -- 9 Bridges
- Surveyed, Absence Confirmed (Category 2) -- 92 Bridges
- No Survey Required (Category 1) -- 189 Bridges
- City
- Streams and Rivers
- County
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.5.1-3

OTIA III: Statewide Bridge Delivery Program
Summary of Plant Screening Results

N W E S

0 20 40 80
Miles

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
plants\BA_figures\plant_ov.mxd. Mar 1, 2004

Table 5.5.1-1. Summary of results of the bridge API screening process by species.

		Category 1	Category 2	Category 3	Category 4
Plant Species	Federal Listing Status	Surveyed Bridges with no Rare Plant Populations	No Field Survey Required	Surveyed Bridges with Rare Plant Populations	Remaining Bridges to be Surveyed
Kincaid's Lupine	T	55	289	0	86
Water Howellia	T	34	304	0	92
Golden Paintbrush	T	15	361	0	54
Bradshaw's Lomatium	E	24	348	2	56
Willamette Daisy	E	30	356	0	44
Nelson's Checker-mallow	T	16	356	0	58
Gentner's Fritillary	E	22	397	1	10
Rough Popcornflower	E	7	413	5	5
Cook's Lomatium	E	8	414	1	7
Large-flowered Wooly Meadowfoam	E	2	425	0	3
Western Lily	E	1	429	0	0
Howell's Spectacular Thelypody	T	1	429	0	0
McDonald's Rock-cress	E	N/A	430	N/A	N/A
Marsh Sandwort	E	N/A	430	N/A	N/A
Applegate's Milk-vetch	E	N/A	430	N/A	N/A

Table 5.5.1-1. (continued).

		Category 1	Category 2	Category 3	Category 4
Plant Species	Federal Listing Status	Surveyed Bridges with no Rare Plant Populations	No Field Survey Required	Surveyed Bridges with Rare Plant Populations	Remaining Bridges to be Surveyed
MacFarlane's Four-o'clock	T	N/A	430	N/A	N/A
Spalding's Catchfly	T	N/A	430	N/A	N/A
Malheur Wire-lettuce	E	N/A	430	N/A	N/A
Totals[1]		92	189	9	140

[1] Totals do not sum due to species occurrence at multiple bridges.

Table 5.5.1-1 indicates that water howellia and golden paintbrush may be present at a relatively large number of bridges where surveys have not yet been conducted (Category 4). However, since the USFWS screening process did not identify plant/soil associations for these species, the much larger potential range, in contrast to the smaller known range, was used to identify the bridges where surveys for these plants are needed. This is likely a significant over-estimate of the actual number of bridges where these species will be found.

5.5.2 Effects Pathways

This BA provides an analysis of the potential effects of the proposed action on the habitat elements that are critical for sustained, viable populations of Federally listed plants. The viability of listed plants can be affected when one or more physical, chemical, or biological parameters are altered. All effects are delivered via the displacement, disruption, removal, or other alteration of soil, air, water, chemicals, and vegetation. In addition, incidental take of the species (e.g., via physical removal) may occur. Throughout this section of the BA, the Bridge Program's effects on Federally listed plant species are considered in the context of the above pathways. A further discussion of each of these effects pathways follows.

<u>Soil</u>

Soil is the medium through which plant species obtain nutrients, water, and minerals. The displacement of soil during earthwork may have direct and indirect lethal and sub-lethal effects on plants. Direct lethal effects may occur when areas that plants are occupying are excavated or filled. Direct sub-lethal effects may occur when soil movement temporarily alters plant life cycle processes or health, but does not lead to plant death. Soil movement may result from erosion, soil compaction, or construction related activities such as minor

grading, disking, and plowing. The restoration of habitat areas can also have beneficial effects, particularly when the plant species reproduces via bulblets, rhizomes, or other vegetative means. Earthwork may simultaneously increase land coverage and population numbers by facilitating species distribution.

Differing degrees of soil erosion (e.g., exposed ground, mud flows, mass wasting, and mudslides) caused by project work may have direct or indirect effects on plants by destroying existing habitats (and plants) or altering potentially functional habitat. Indirect lethal and sub-lethal effects may result when activities eliminate existing habitat critical for plant growth, or potential habitat suitable for plant growth. These indirect effects may occur when soil disturbance results in the introduction of invasive species or facilitates the growth of competing vegetation.

During dry conditions, wind erosion can cause sediments to become airborne (i.e., as dust). Activities that may result in the dispersal of airborne sediments onto plants have the potential to affect plant species by preventing or inhibiting the species from completing actions essential to propagation and survival. The presence of large amounts of airborne sediments on plants may result in indirect sub-lethal effects such as reduced opportunities for photosynthesis, and thus, reduced plant vigor, health, and growth. Airborne sediments may also result in lost opportunities for the pollination and subsequent fertilization of plants that reproduce sexually. For example, a layer of sediments on a flowering plant may reduce the likelihood of, or eliminate the opportunity for, appropriate pollination. This indirect sub-lethal effect may result in infertile seeds and the loss of reproductive opportunity.

Water

To a large extent, water determines the type and extent of plant populations within a particular region. Changes in hydrology can result from construction-related activities such as pumping; the alteration of topography and surface drainage patterns, installation of culvert inlets and outlets; the filling of wetlands; the redirection of streams or springs; and the creation of additional impervious surfaces. Plants may experience direct and indirect lethal or sub-lethal effects from project actions that alter existing runoff patterns or hydrologic regimes essential to plant survival. Direct lethal effects may occur when runoff is routed either into or away from an area, thereby killing the plant. Direct sub-lethal effects may occur when runoff is re-routed into or away from an area and the new condition adversely effects plant vigor, health, or reproductive capability. Indirect sub-lethal effects may occur when changes to runoff patterns make habitat no longer functional for specific plant species. These indirect sub-lethal effects may also be beneficial if they result in the creation of functional habitat or increased plant growth.

It should be noted that plant species associated with water-dependent habitats, such as wetlands or riparian areas, are more prone than upland plant species to adverse effects resulting from changes in runoff patterns and runoff-related contaminants since these wet areas serve as sinks for runoff.

Chemical

The introduction of chemicals into the environment can have both direct and indirect lethal and sub-lethal effects on plant species. Herbicide application may have a direct and lethal effect on plant species. Applications of herbicides can also result in both indirect lethal and sub-lethal effects on plants. Indirect lethal effects may occur if herbicides are sprayed in the vicinity of a plant species and eventually come into contact with the plant (e.g., through wind or runoff), causing death. Indirect sub-lethal effects may include herbicide applications that alter vegetation communities upon which threatened or endangered plant species depend upon. For example, herbicides may eliminate certain habitat elements (e.g., shade and wind protection) that some threatened and endangered plant species require.

Accidental chemical discharges can have direct lethal effects on plants if direct contact occurs and plant death results. If contact does not cause plant death, but does reduce plant health, vigor, or reproductive capabilities, a direct sub-lethal effect is realized.

Indirect lethal and sub-lethal effects may also occur if a plant absorbs chemicals via contaminated soil or water. In such instances, either plant death or reductions in plant vigor and/or reproductive processes result. Accidental chemical discharges can also result in the temporary or permanent alteration or loss of functional habitat, making an area incapable of facilitating the growth of a listed plant species in the future.

Vegetation

The assemblage of plants that comprise a vegetative community within a particular area is one of the most important parameters that define “habitat” for most plant species, and facilitate a species’ survival. Many plants have specific community or habitat type requirements relative to species diversity and stature that must be met in order for a species to become established, propagate, and survive. Specifically, some plant species rely on assemblages of other plants for protection from the elements (e.g., wind and sun), for the elimination of competitor or invasive species, for nutrients, and for other essential needs.

Changes in vegetation can be induced by complete or selective vegetation removal during project construction. These activities may include clearing, grubbing, mowing, and related activities. Vegetation removal activities can interrupt normal plant life cycles and affect the type of functional habitat both immediately and in future years.

Direct lethal effects can occur when vegetation removal eliminates threatened or endangered plants themselves (See the species pathway). Similarly, direct sub-lethal effects may occur if portions of plants are removed, resulting in a reduction of vigor, health, or reproductive capability. Indirect lethal and sub-lethal effects may occur when the vegetation necessary for a specific plant’s survival is altered or removed. For example, the elimination of overstory cover around a species that cannot survive in direct sunlight is an example of an indirect lethal effect, since without shade, the plant would

die. Alternatively, an indirect sub-lethal effect would occur if plant reproductive capability, vigor, or general growth was affected, but the death of the plant did not occur. Vegetation removal (e.g., site clearing) can also lead to indirect sub-lethal and lethal effects through the inadvertent introduction of exotic or invasive weed species that may out-compete threatened and endangered plant species. Alternatively, vegetation removal can beneficially affect threatened and endangered plant species if exotic or invasive species are removed and thus a listed plant's ability to become established, propagate, and survive is enhanced.

Species

Direct and indirect effects to plants can occur during any activity that requires physical contact with listed plants. Direct lethal and sub-lethal effects can occur if specific or general vegetation removal eliminates threatened or endangered plants themselves, or if portions of the plants are removed, resulting in an incremental reduction in plant health, vigor, and/or reproductive capability.

Activities that fragment a plant population or its habitat may cause direct and indirect lethal and sub-lethal effects on the genetic diversity of listed plant species. For example, the construction of detour routes, other roadwork, or any other activity that significantly alters the surrounding landscape may, over time, reduce a plant population's genetic diversity and thus increase the probability of genetic drift, reduced fitness, and the accumulation of deleterious mutations through inbreeding. Compared to large plant populations, small populations are more prone to genetic loss, because smaller populations typically lack the genetic variability necessary to respond to random environmental changes. Because of this increased risk, smaller populations may be more susceptible to pressures from pests and diseases (USFWS 2003d).

In addition, the more that populations become fragmented from one another, the greater the risk of limited gene exchange. Habitat fragmentation can also cause detriment to other species, such as wildlife, that depend on a specific listed plant for survival. An example is the symbiotic relationship between the Federally listed Fender's blue butterfly (*Icaricia icarioides fenderi*) and Kincaid's lupine.

Mitigation efforts involving the relocation of listed plants may have direct lethal or sub-lethal effects on species if the relocation is accomplished improperly or if the essential habitat elements necessary for successful relocation and plant survival do not exist at the mitigation site. Specifically, these actions may affect plant health, vigor, and subsequent reproductive capability.

5.5.3 Minimization and Avoidance

The effects of actions proposed under this consultation may be delivered by one or multiple pathways. These effects can vary in magnitude and severity between the individual organism, population, and community scales. The degree to which the proposed action affects a particular species or habitat is dependent on the intensity, magnitude, duration, timing, and repetition of the

action causing the effect. Minimization and avoidance measures for the Bridge Program consist of specific environmental performance standards that provide for habitat and species conservation during bridge repair and replacement. Section 3.3 of this BA provides detailed information regarding these environmental performance standards and conservation measures. The following sections (5.5.4 to 5.5.21) of this BA provide a discussion of the effects of the proposed action on each of the 18 Federally listed plant species in Oregon.

It must be noted that throughout sections 5.5.4 to 5.5.21, the term "population" is used to describe a group of plants at a specific geographic location. It is frequently used interchangeably with the terms "site" and "occurrence," and is not intended to necessarily define populations in a biological sense (i.e., a defined group of interbreeding plants where genetic exchange is sufficient enough to offset divergence due to natural selection or genetic drift [USFWS 1998b]).

5.5.4 Applegate's Milk-vetch (*Astragalus applegatei*)

5.5.4.1 Life History and Status

Applegate's milk-vetch (*Astragalus applegatei*) was Federally listed as an endangered species on July 28, 1993 (July 28, 1993, 58 FR 40547). Critical habitat has not been designated for this species (July 28, 1993, 58 FR 40547). Applegate's milk-vetch is endemic to Oregon and historically occurred at three sites near Klamath Falls in Klamath County; however, extensive agricultural use has likely extirpated one population near Keno (July 28, 1993, 58 FR 40547). The smaller of the remaining two populations supports approximately 30-80 individuals and occurs on less than 1 acre on the State's Klamath Management Area. The larger remaining population is estimated to support 30,000 individuals and is limited to 6 acres on private land that is zoned for industrial development (July 28, 1993, 58 FR 40547).

Applegate's milk-vetch is a slender perennial, which can be discerned from other *Astragalus* species by its slightly curved stems, the number and location of flowers, and its inability to colonize dry, disturbed areas (July 28, 1993, 58 FR 40547). The plant's whitish to lilac flowers bloom from June to early August (Eastman 1990, Meinke 1982). Applegate's milk-vetch grows at approximately 4,000 feet above mean sea level, on flat, open, and seasonally moist remnants of floodplain alkaline grasslands within the East Cascades ecoregion (July 28, 1993, 58 FR 40547, Robinson 2003, Meinke 1982).

Applegate's milk-vetch is found in association with other members of the bunchgrass-flat plant community in areas with about 10-20% exposed ground (July 28, 1993, 58 FR 40547). Potential threats to Applegate's milk-vetch include urban development, road construction, low population numbers, wildlife grazing, and management alterations to suppress fire and flood events (July 28, 1993, 58 FR 40547).

5.5.4.2 Analysis of Effects

The USFWS screening process (Section 5.5.1) was used to determine which program bridges may affect Applegate's milk-vetch (Robinson 2003). The results of this screening process

indicate that no program bridges are present within the known range of the Applegate's milk-vetch.

5.5.4.3 Determination of Effects

The results of the USFWS screening process indicate that all Bridge Program APIs are located outside the known range for Applegate's milk-vetch. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for Applegate's milk-vetch.

5.5.5 Bradshaw's Lomatium *(Lomatium bradshawii)*

5.5.5.1 Life History and Status

Listing and Critical Habitat

Bradshaw's lomatium (*Lomatium bradshawii*) was Federally listed as an endangered plant on September 30, 1988 (September 30, 1988, 53 FR 38448). The species merited listing because the few remnant populations, limited to the central and southern portions of the Willamette Valley, are being threatened by habitat alteration or destruction as a result of agricultural and residential development, as well as by competition with encroaching woody vegetation. Critical habitat has not been designated for this species (September 30, 1988, 53 FR 38448).

Plant Description

Bradshaw's lomatium is a small perennial herb in the Parsley family (*Apiaceae*) that grows from 8-20 inches tall, is glabrous, and has primarily basal leaves that are divided into very fine, almost threadlike, linear segments (Eastman 1990). The small, compact yellow flowers are subtended by green bracts divided into three or doubly divided into three. This bract arrangement differentiates it from other *Lomatium* species.

Bradshaw's lomatium blooms in April and May and fruits appear in late May and June (Eastman 1990). The large fruits have corky thickened wings, and usually fall to the ground fairly close to the parent plant. Fruits appear to float, and may be distributed by water. The population patterns do appear to follow seasonal micro-channels in the tufted hairgrass (*Deschampsia caespitosa*) prairies, but whether this is due to dispersal or habitat preference is not clear (USFWS 1993b). This species reproduces entirely by seed; however, a typical population is composed of many more vegetative plants than reproductive plants (USFWS 1993b).

Habitat, Range, and Associated Species

Bradshaw's lomatium is endemic to the Willamette Valley ecoregion, where it is associated with the native lowland prairie community. Once widespread in the valley, this species is now limited to a few sites in Benton, Linn, Lane, Polk, and Marion Counties. Bradshaw's lomatium occurs in two very distinct habitats.

The rarer habitat for this plant is shallow, stream-covered basalt areas in Marion and Linn Counties near the Santiam River. Bradshaw's lomatium plants at these sites occur in areas with almost no soil, usually in vernal wetlands or along stream channels.

Most Bradshaw's lomatium populations occur on seasonally saturated or flooded bottomland prairie habitats, which are common by creeks and small rivers in the southern Willamette Valley. They occur in areas with deep clays, usually in a matrix with alluvial silts. The soils at these sites are dense heavy clays with a slowly permeable clay layer located 6-12 inches below the surface. They are characterized as Dayton silt loams or Natroy or Bashaw clays by the NRCS (USFWS 1993b). This slowly permeable clay layer is critical to the seasonal wetland character of the grasslands, and results in a perched water table in winter and spring. As such, the soils are generally either saturated to the surface or slightly inundated during the wet season. These areas typically qualify as jurisdictional wetlands under the Federal wetland delineation criteria (USFWS 1993b).

Associated plant species within both habitats include tufted hairgrass, red fescue (*Festuca rubra*), California oatgrass (*Danthonia californica*), field woodrush (*Luzula campestris*), sweet vernal grass (*Anthoxanthum odoratum*), common velvetgrass (*Holcus lanatus*), Kentucky bluegrass (*Poa pratensis*), redtop (*Agrostis alba*), orchardgrass (*Dactylus glomerata*), and tall fescue (*F. arundinacea*). Various sedge (*Carex* spp.) and rush (*Juncus* spp.) species are also noted as associates in the wetter habitats. Several native forbs are also associated with Bradshaw's lomatium, including the Willamette daisy (*Erigeron decumbens* ssp. *decumbens*), Kincaid's lupine (*Lupinus sulphereus* var. *kincaidii*), White-topped aster (*Aster curtus*), peacock larkspur (*Delphinium pavaenocium*), and Nelson's checker-mallow (*Sidalcea nelsoniana*) (USFWS 1993b).

<u>Occurrences and Population Status</u>

Bradshaw's lomatium is known to have occurred historically from Salem to Creswell, Oregon, but it is now reduced to 14 known populations scattered from Stayton to just south of Eugene (September 30, 1988, 53 FR 38448, USFWS 1993b). Known plant populations vary in size from approximately 50 individuals to over 25,000 individuals. Over 90% of the known plants are located within a 10-mile radius of the City of Eugene, Oregon, with the greatest concentrations found in West Eugene. According to the 1993 recovery plan for Bradshaw's lomatium, known plants then totaled approximately 52,250 individuals (USFWS 1993b).

The recovery plan for Bradshaw's lomatium calls for the establishment of 10 populations with at least 2,000 flowering plants occupying at least 20 acres of secure habitat before down-listing this species to threatened status. The 10 populations are to be distributed in the four established Willamette Valley recovery areas as follows: the North Central recovery area will have two populations, the Central recovery area will have two populations, the Southwest recovery area will have four populations, and the Southeast recovery area will have two populations (USFWS 1993b).

The 14 extant sites of Bradshaw's lomatium occur in four major areas in the Willamette Valley. These four areas correspond with the recovery areas outlined in the recovery plan for Bradshaw's

lomatium (USFWS 1993b). The following narrative summarizes known locations, acreage, and population estimates from the recovery plan (USFWS 1993b).

- The North Central recovery area is at the northern edge of the range of Bradshaw's lomatium. This area is located near the North Santiam River between Linn and Marion Counties, and includes one known site in each county. These sites range from 2-5 acres and have 250-5,000 plants.

- The Central recovery area includes three sites in Benton County. One of the sites is located in North Corvallis (Jackson-Frazier), is approximately 15 acres in size, and has approximately 350 plants. The Muddy Creek site is roughly 5 acres in size and has approximately 50 plants. Finally, the William Finley National Wildlife Refuge site is approximately 20 acres and has about 2,500 plants.

- The Southwest recovery area (West Eugene) has six sites. The sites are identified as Long Tom ACEC, Fern Ridge Lake, West Eugene Wetlands, Veneta, Amazon Park, and Coyote Creek. These six sites range in size from approximately 2 acres to over 100 acres and have between 200 and 25,000 plants.

- The Southeast recovery area includes three small populations. The newly discovered population at the Springfield Drive Inn site is approximately 5 acres in size and has an estimated 100 plants. The Buford Park site is also 5 acres in size; however, this site has an estimated 5,000 plants. Finally, the Short Mountain-Camas Swale site is roughly 100 acres in size and has approximately 1,250 plants.

<u>Summary of Threats</u>

The most significant threat to this plant's survival has been the conversion of native prairie habitat to agricultural land. More recently, residential and industrial developments have encroached upon much of its remaining habitat. These agriculture- and development-related effects are often exacerbated by the subsequent changes in flooding patterns and water movement in nearby areas, which may be critical to the seedling establishment of Bradshaw's lomatium plants. Finally, fire suppression in some areas also appears to allow encroachment upon prairie habitat by woody vegetation, resulting in a decline of the Bradshaw's lomatium.

In light of the listed threats, the recovery plan details two goals critical for the recovery of Bradshaw's lomatium. The first is to ensure the protection of sites by acquisition, conservation easement, or management agreement to prevent their destruction from rural, urban, and industrial development. The second is management of protected sites to assure long-term survival of the known populations (USFWS 1993b).

5.5.5.2 Species-Specific Effects Pathways

Effects pathways include the media through which effects are delivered to the Bradshaw's lomatium. All effects on the Bradshaw's lomatium are delivered through the displacement, disruption, removal, or addition of one or more of the following:

Soil

Because of Bradshaw's lomatium's affinity for wetlands, it is likely that soil erosion could significantly affect the species by destroying existing habitat or limiting the potential for new functional habitat development. Within occupied or potential habitat, ground-disturbing activities that cause local hydrologic patterns to be altered or eliminated may further endanger this species. Specific ground-disturbing activities may include alterations in topography, the filling or draining of wetlands, and alterations to existing stream channels. Because Bradshaw's lomatium reproduces entirely by seed, effects on this species by means of airborne dust may also pose a significant threat to the species. Reductions in plant health, vigor, or reproductive capability may also result from airborne sediment accumulation. The Pollution & Erosion Control Environmental Performance Standard has been developed to minimize adverse effects on this species through the soil effects pathway.

Water

Bradshaw's lomatium is known to exist within vernal pool habitats that are typically fed by surface runoff, and within seasonally wet bottomland prairie habitats that are commonly near stream channels and fed by winter and spring floods. This species is specially adapted to the seasonal wet and dry cycles of its preferred wetland habitats. Consequently, any of the proposed actions that result in the alteration or elimination of existing runoff patterns or stream and floodplain connectivity could adversely effect Bradshaw's lomatium populations or limit the potential for new habitat development. Slight increases in water supply may not affect the species. The Water Quality Environmental Performance Standard and the Fluvial Environmental Performance Standard have been developed to minimize adverse effects on this species through the water effects pathway.

Chemical

As a perennial wetland species that reproduces entirely by seed, Bradshaw's lomatium may be affected by herbicide application, accidental chemical discharges, or inadvertent fuel and oil spills. These activities may result in a temporary die-back of seasonal growth (above-ground or floating vegetation) or in the death of the entire plant. Since Bradshaw's lomatium is a perennial species that reproduces exclusively by seed, effects from chemical exposure may cause seeds to become infertile, thus limiting population growth over the long term. In addition, chemical applications or accidental chemical discharges in occupied habitat may be more harmful during wet periods than during dry periods, because of the increased dispersal rate of chemicals in aquatic versus soil mediums. In some cases, chemical exposure may limit the potential for Bradshaw's lomatium to colonize potential functional habitat. Implementation of the Pollution & Erosion Control Environmental Performance Standard will minimize adverse effects on this species through the chemical effects pathway.

Vegetation

Vegetation removal associated with bridge construction may eliminate or modify the habitat elements necessary for survival of Bradshaw's lomatium. The removal or addition of vegetation within or adjacent to occupied habitat or potentially functional habitat may alter the seasonally wet and dry periods characteristic of Bradshaw's lomatium's preferred habitat to the extent that the species is unable to complete its life cycle. Implementation of the Plant Avoidance Environmental Performance Standard will minimize adverse effects on this species through the vegetation effects pathway.

Due to decades of fire suppression, the encroachment of nonnative invasive vegetation within occupied or potential habitat for this species is a major factor in the decline of Bradshaw's lomatium. The removal of invasive vegetation may benefit the recovery of this species. Recent surveys conducted for the Bridge Program identified two invasive species as potential threats to Lomatium cookii, including reed canarygrass (*Phalaris arundinacea*) and Himalayan blackberry (R*ubus discolor*) (ODOT 2003b). The Site Restoration Environmental Performance Standard has been developed to minimize the future encroachment of invasive species.

Species

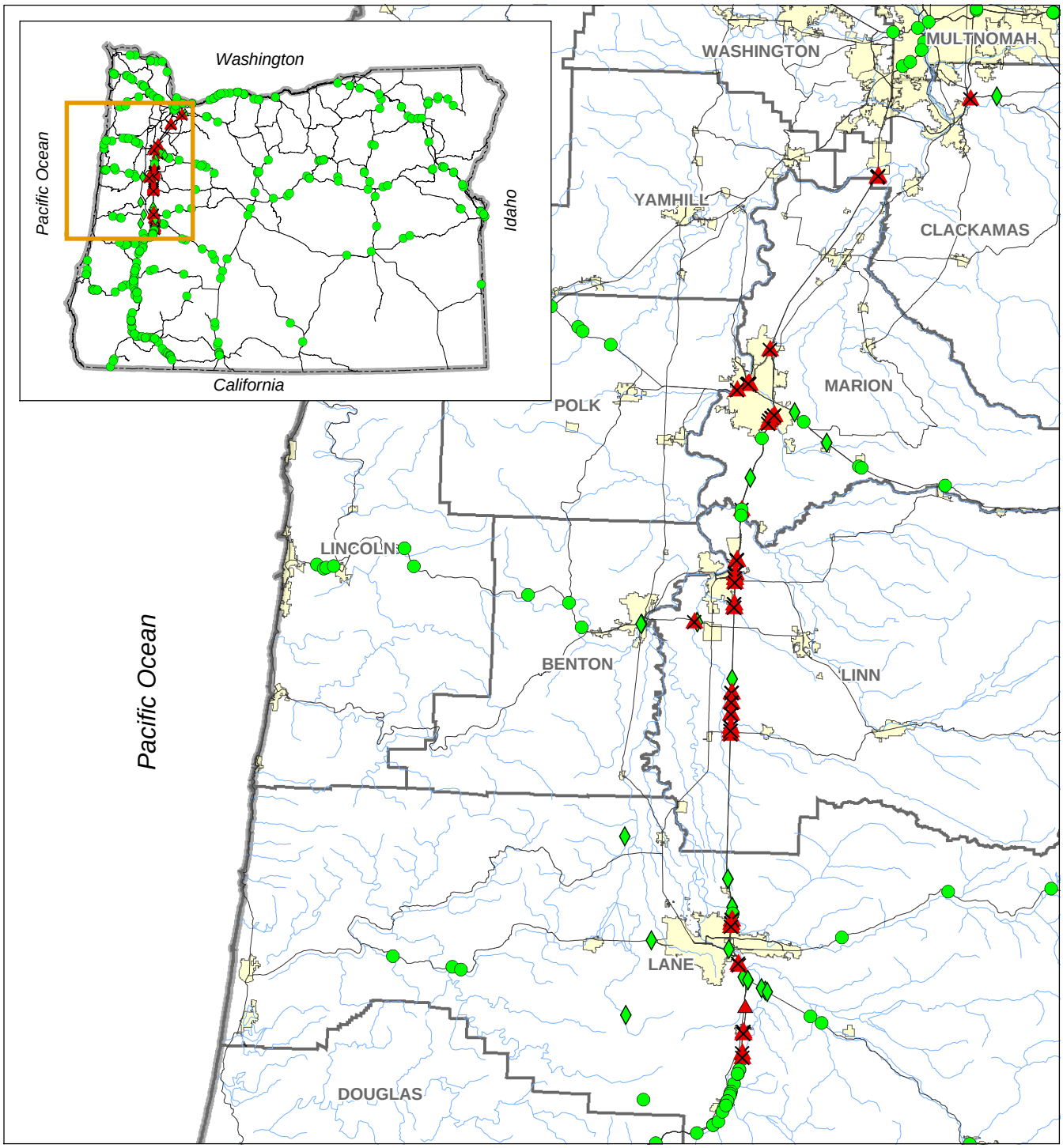
Bridge repair and replacement activities have the potential to cause Bradshaw's lomatium plants to be trampled and mowed (during dry periods), or buried (during wet or dry periods), to the extent that the species is directly affected. Loss and fragmentation of Bradshaw's lomatium populations or potential functional habitat may limit gene exchange and increase the risk of inbreeding, depending on the degree of fragmentation and the distances by which populations are separated. However, implementation of the Plant Avoidance Environmental Performance Standard will eliminate direct effects on this species.

5.5.5.3 Analysis of Effects

The results of the screening process and of the surveys conducted to date for Bradshaw's lomatium are summarized in Table 5.5.5-1 and Figure 5.5.5-1.

Table 5.5.5-1. Summary of program bridges where the proposed action may affect Bradshaw's Lomatium**.**

		Category 1	Category 2	Category 3	Category 4
Plant Species	Federal Listing Status	No Field Survey Required	Surveyed Bridges with no Rare Plant Populations	Surveyed Bridges with Rare Plant Populations	Remaining Bridges to be Surveyed
Bradshaw's Lomatium	E	348	82	2	56



OTIA III Bridges

- Remaining Survey Required (Category 4) -- 56 Bridges
- Surveyed, Presence Confirmed (Category 3) -- 2 Bridges
- Surveyed, Absence Confirmed (Category 2) -- 24 Bridges
- No Survey Required (Category 1) -- 348 Bridges
- City
- Streams and Rivers
- County
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.5.5-1

OTIA III: Statewide Bridge Delivery Program
Bradshaw's Lomatium

N W E S

0 2 4 8 12 16 20
Miles

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
plants\BA_figures\lombra.mxd. Mar 1, 2004

The likelihood of future surveys documenting additional occurrences of Bradshaw's lomatium is fairly low because the program bridge APIs with the highest potential for the occurrence of Bradshaw's lomatium (based on proximity to ORNHIC records) were surveyed by ODOT in 2003. Nonetheless, the Bridge Program has the potential to affect Bradshaw's lomatium at two documented bridge sites and at the 56 Bridge Program sites that remain to be surveyed. Direct effects of the proposed action on (i.e., incidental take of) Bradshaw's lomatium will be avoided at all bridge sites by the implementation of the Plant Avoidance Environmental Performance Standard. Indirect adverse effects of the proposed action on Bradshaw's lomatium (i.e., via the air, water, chemical, and vegetation effects pathways) will be greatly reduced by the implementation of the other referenced environmental performance standards.

5.5.5.4 Determination of Effect

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, not likely to adversely affect** for Bradshaw's lomatium. Past and future plant survey efforts, and the application of environmental performance standards at all bridge APIs (whether or not they actually contain Bradshaw's lomatium occurrences) will serve to minimize effects on Bradshaw's lomatium to the greatest extent practicable. If adherence to all of the environmental performance standards is not possible at a specific bridge site, then individual consultation with the USFWS will be necessary for this species.

5.5.6 Cook's Lomatium (*Lomatium cookii*)

5.5.6.1 Life History and Status

Listing and Critical Habitat

Cook's lomatium (*Lomatium cookii*) was Federally listed as an endangered plant on November 7, 2002 (November 7, 2002, 67 FR 68003). The species merited listing because the few remaining populations—located in the Agate Desert in Jackson County and the French Flat/Illinois Valley in Josephine County—were being threatened by the destruction of their specialized vernal pool habitat by industrial and residential development, road construction and powerline maintenance (November 7, 2002, 67 FR 68003). Agricultural conversion, certain grazing practices, off-road vehicle use, and competition with invasive plants have also contributed to population declines and local extirpations. In Josephine County, Cook's lomatium is also threatened by habitat alteration associated with gold mining and by woody species encroachment resulting from fire suppression (November 7, 2002, 67 FR 68003). Critical habitat has not been designated for this species (November 7, 2002, 67 FR 68003).

Plant Description

Cook's lomatium is a small perennial herb in the Parsley family (*Apiaceae*) that grows from 6-20 inches tall from a slender, twisted taproot. The basal leaves are smooth and finely dissected. One of four groups of pale yellow flowers produces boat-shaped fruits, 0.3-0.5 inch long, with thickened margins. The taproot often branches at ground level to produce multiple stems, and this characteristic feature is used to differentiate this species from other *Lomatium* species (November 7, 2002, 67 FR 68003, Eastman 1990).

Reproduction occurs by seed production, and Cook's lomatium generally blooms from mid-March through mid-May (NatureServe 2003). Some individuals may initiate flowering the last week of February; however, plants located in vernal pools generally flower approximately one week earlier than those on pool flanks or mounds. Those rooted in pools may flower under water (NatureServe 2003). The dispersal distance is 12-24 inches. Fruits are knocked off the plant by wind or other physical disturbance. Fruit flotation on the pools does not seem to be a dispersal mechanism (NatureServe 2003). Seeds require approximately 7 weeks to 4 months of submersion at cool temperatures to germinate. Seed germination generally begins and peaks during the first week of February, but can continue for more than a month (NatureServe 2003).

Habitat, Range, and Associated Species

Cook's lomatium may be found in and around seasonally wet habitats, known as vernal pools, within the Agate Desert, an approximately 32-square-mile landform located north of the City of Medford, in Jackson County. Cook's lomatium is also known to occur on seasonally wet soils within an approximately 4-square-mile area of the French Flat/Illinois Valley in Josephine County (November 7, 2002, 67 FR 68003).

The Agate Desert consists of a gentle mound-swale topography with a characteristic appearance in aerial photographs that is sometimes referred to as "patterned ground" (November 7, 2002, 67 FR 68003). Located on the floor of the Rogue River basin, the Agate Desert is characterized by shallow Agate-Winslow soils, a relative lack of trees, sparse prairie vegetation, and agates, which are commonly found on the soil surface. During the winter rainy season, a pattern of shallow pools develops in the frequently interconnected swales due to the shallow hardpan layer within the soil profile (November 7, 2002, 67 FR 68003). Associated plant species within the Agate Desert include bract popcornflower (*Plagiobothrys bracteatus*), inch-high rush (*Juncus uncialis*), naverretia (*Naverretia sp.*), common wooly meadowfoam (*Limnanthes floccosa* ssp. *floccosa*), large-flowered wooly meadowfoam (*Limnanthes flocossa* ssp. *grandiflora*), annual hairgrass (*Deschampsia danthanoides*), and white hyacinth (*Triteliea hyacinthina*) (November 7, 2002, 67 FR 68003). Associated invasive species that compete with Cook's lomatium include brome (*Bromus mollis*), medusahead (*Taeniatherum caput-medusae*), dogtail (*Cynosurus echinatus*), and bulbous bluegrass (*Poa bulbosa*) (November 7, 2002, 67 FR 68003).

In French Flat/Illinois Valley, Cook's lomatium grows in wet meadow areas underlain with a clay hardpan at 24-35 inches (November 7, 2002, 67 FR 68003). The clay hardpan creates seasonally wet areas similar to the vernal pools of the Agate Desert, but these areas lack the distinctive mound-swale topography unique to the Agate Desert (November 7, 2002, 67 FR 68003). Associated plant species in the French Flat/Illinois Valley include California oatgrass (*Danthonia californica*), bract popcornflower (*Plagiobothrys bracteatus*), shaggy horkelia (*Horkelia congesta*), mariposa lily (*Calochortus uniflorus*), and trout lily (*Erythronium howelii*). Shrub species such as buckbrush (*Ceanothus cuneatus*) and manzanita ssp. (*Arctostaphylos* ssp.) are also found with areas of Cook's lomatium (November 7, 2002, 67 FR 68003).

Occurrences and Population Status

There are approximately 15 occurrences of Cook's lomatium within the Agate Desert and 21 occurrences within the French Flat/Illinois Valley (November 7, 2002, 67 FR 68003). Mapped habitat compiled in 1998 within the Agate Desert totaled approximately 133 acres. However, due to the recent alteration and destruction of vernal pools, the area currently occupied by Cook's lomatium is estimated to be approximately 69 acres. Of the known occurrences, two sites occur entirely or partially within the Agate Desert Preserve owned by The Nature Conservancy. Two more sites are located within the Ken Denman Wildlife Area (November 7, 2002, 67 FR 68003). Two additional sites are located on land managed by Jackson County; however, one site has largely been extirpated by construction. Similarly, portions of two Cook's lomatium sites are on lands owned by the City of Medford within an area designated as the Whetstone Industrial Park. Of the remaining known sites, four are located in highway or powerline rights-of-way and the rest are on private land (November 7, 2002, 67 FR 68003).

The number of Cook's lomatium plants in the Agate Desert was generally stable or increased during 2000-2002; however, over 60% of the vernal pool habitat has been destroyed. In addition, none of the habitat has escaped the invasion of weedy competitor species. Limited information exists regarding the total number of individuals in each known population; however, surveys in 2000 and 2001 at one historical site on private land that was originally estimated to contain 6,000 plants indicated that there were in fact 580,000 flowering individuals (November 7, 2002, 67 FR

68003). Another population on the City of Medford airport property previously estimated at 1,000 plants was later shown to have over 5,000 flowering plants (November 7, 2002, 67 FR 68003).

Of the 21 Cook's lomatium sites in the French Flat/Illinois Valley, 15 are located partially or entirely on land managed by the BLM. The remaining six sites in this area occur on private land (November 7, 2002, 67 FR 68003). The 21 sites occupy approximately 150 acres of habitat, but many of these sites are small and have only approximately 50 plants (November 7, 2002, 67 FR 68003).

Summary of Threats

Cook's lomatium is being threatened primarily by the destruction of vernal pool habitat by industrial and residential development, road construction, and powerline maintenance. Additional factors contributing to population decline and local extirpations include agricultural conversion, certain grazing practices, off-road vehicle use, mining practices, woody species encroachment resulting from fire suppression, competition with invasive plants, and thatch buildup resulting from invasive plant growth. A recovery plan for this species has not yet been prepared.

5.5.6.2 Species-Specific Effects Pathways

Effects pathways include the media through which effects are delivered to the Cook's lomatium. All effects on the Cook's lomatium are delivered through the displacement, disruption, removal, or addition of one or more of the following:

Soil

Based on Cook's lomatium's affinity for vernal pool habitat, it is likely that soil erosion could significantly affect the species by destroying existing habitat or limiting the potential for new functional habitat development. Within occupied or potential vernal pool habitat, ground-disturbing activities that cause the filling or draining of the wetland will further threaten this rare species. Because Cook's lomatium reproduces entirely by seed, effects on this species by means of airborne dust may pose a significant threat. However, since Cook's lomatium is a perennial species, effects from ground-disturbing activities may be somewhat reduced. Reductions in plant health, vigor, or reproductive capability may also result from airborne sediment accumulation. The Pollution & Erosion Control Environmental Performance Standard has been developed to minimize adverse effects on this species through the soil effects pathway.

Water

Cook's lomatium is known to exist within vernal pool habitats in Jackson County and seasonally wet meadows in Josephine County. This species is specially adapted to the seasonal wet and dry cycles of its preferred wetland habitat. These seasonal wetlands are generally fed by surface runoff. Consequently, any of the proposed actions that result in

the alteration or elimination of existing runoff patterns, such that a decrease in available water supply results, could adversely effect Cook's lomatium populations or limit the potential for new functional habitat development. Slight increases in water supply may not affect the species. The Water Quality Environmental Performance Standard and the Fluvial Environmental Performance Standard have been developed to minimize adverse effects on this species through the water effects pathway.

Chemical

As a perennial wetland species that reproduces entirely by seed, Cook's lomatium may be affected by herbicide application, accidental chemical discharges, and inadvertent fuel or oil spills. These activities may result in a temporary die-back of seasonal growth (floating vegetation) or in the death of the entire plant. Since Cook's lomatium is a perennial species that reproduces exclusively by seed, effects from chemical exposure may cause seeds to become infertile and thus limit population growth over the long term. In addition, chemical applications or accidental chemical discharges to occupied habitat may be more harmful during wet periods than during dry periods because of the increased dispersal rate of chemicals in aquatic versus soil mediums. In some cases, chemical exposure may limit the potential for Cook's lomatium to colonize potential functional habitat. Implementation of the Pollution & Erosion Control Environmental Performance Standard will minimize adverse effects on this species through the chemical effects pathway.

Vegetation

Vegetation removal associated with bridge construction may eliminate or modify the habitat elements necessary for survival of Cook's lomatium. The removal or addition of vegetation within or adjacent to surrounding occupied habitat or potentially functional habitat may alter the seasonally wet and dry periods characteristic of Cook's lomatium's preferred habitat to the extent that the species is unable to complete its life cycle. Implementation of the Plant Avoidance Environmental Performance Standard will minimize adverse effects on this species through the vegetation effects pathway.

Due to decades of fire suppression, the encroachment of woody vegetation within occupied or functional potential habitat is a major factor in the decline of Cook's lomatium. The removal of woody vegetation may benefit the recovery of this species. For the Bridge Program, the Site Restoration Environmental Performance Standard has been developed to minimize the future encroachment of invasive species due to the proposed actions.

Species

Bridge repair and replacement activities have the potential to cause Cook's lomatium plants to be trampled and mowed (during dry periods), or buried (during wet or dry periods), or subjected to disturbance to the extent that the species is directly affected. Loss and fragmentation of Cook's lomatium populations or potential functional habitat

may limit gene exchange and increase the chances for inbreeding to occur, depending on the distances by which populations are separated. However, implementation of the Plant Avoidance Environmental Performance Standard will eliminate direct effects on this species.

5.5.6.3 Analysis of Effects

The results of the screening process (Section 5.5.1) and of the surveys conducted to date for Cook's lomatium are summarized in Table 5.5.6-1 and Figure 5.5.6-1.

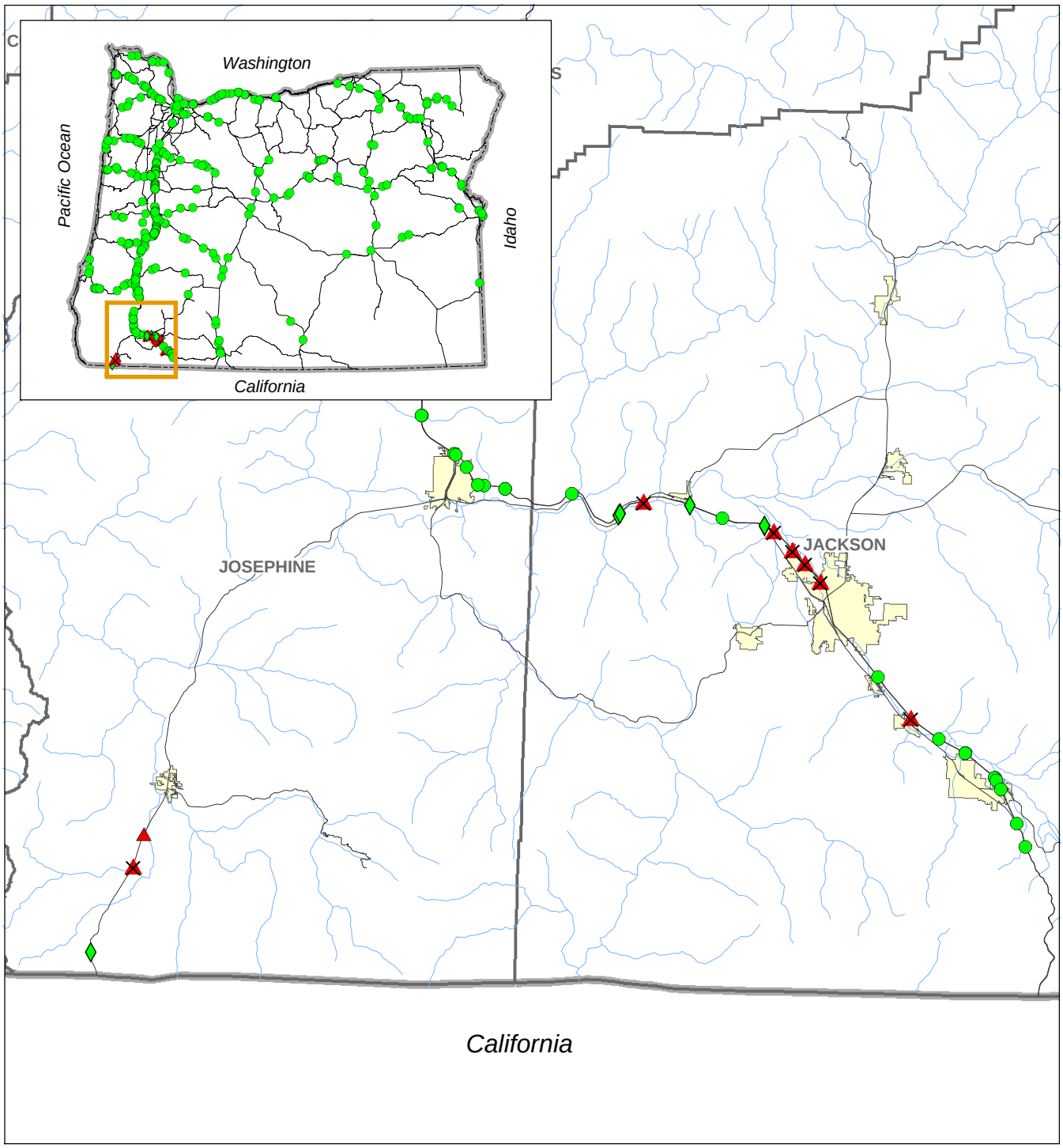
Table 5.5.6-1. Summary of program bridges where the proposed action may affect Cook's Lomatium.

		Category 1	Category 2	Category 3	Category 4
Plant Species	Federal Listing Status	No Field Survey Required	Surveyed Bridges with no Rare Plant Populations	Surveyed Bridges with Rare Plant Populations	Remaining Bridges to be Surveyed
Cook's Lomatium	E	414	8	1	7

The likelihood of future surveys documenting additional occurrences of Cook's lomatium is fairly low because the program bridge APIs with the highest potential for the occurrence of Cook's lomatium (based on proximity to ORNHIC records) were surveyed by ODOT in 2003. Nonetheless, the Bridge Program has the potential to affect Cook's lomatium at one documented bridge site and at the seven Bridge Program sites that remain to be surveyed. Direct effects of the proposed action on (i.e., incidental take of) Cook's lomatium will be avoided at all bridge sites by the implementation of the Plant Avoidance Environmental Performance Standard. Indirect adverse effects of the proposed action on Cook's lomatium (i.e., via the air, water, chemical, and vegetation effects pathways) will be greatly reduced by the implementation of the other referenced environmental performance standards.

5.5.6.4 Determination of Effect

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, but is not likely to adversely affect** for Cook's lomatium. Past and future plant survey efforts, and the application of environmental performance standards at all bridge APIs (whether or not they contain Cook's lomatium occurrences) will serve to minimize the effects on Cook's lomatium to the greatest extent practicable. If adherence to all of the environmental performance standards is not possible at a specific bridge site, then individual consultation with the USFWS will be necessary for this species.



OTIA III Bridges

- Remaining Survey Required (Category 4) -- 7 Bridges
- Surveyed, Presence Confirmed (Category 3) -- 1 Bridge
- Surveyed, Absence Confirmed (Category 2) -- 8 Bridges
- No Survey Required (Category 1) -- 414 Bridges
- City
- Streams and Rivers
- County
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.5.6-1

OTIA III: Statewide Bridge Delivery Program
Cook's Lomatium

N W E S

0 1 2 4 6 8 10
Miles

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Spatial Data Source: See Document Bibliography.
plants\BA_figures\lomcoo.mxd. Mar 1, 2004

5.5.7 Gentner's Fritillary (*Fritillaria gentneri*)

Listing and Critical Habitat

Gentner's fritillary (*Fritillaria gentneri*) was Federally listed as an endangered plant on December 10, 1999 (December 10, 1999, 64 FR 69195). The species merited listing because the few remnant populations, primarily within Jackson and Josephine Counties, Oregon, are being threatened by habitat loss as a result of residential and agricultural development, successional encroachment by trees and brush, invasive weeds, timber harvest, recreational activities, and the vulnerability associated with extremely small population sizes. Critical habitat has not been designated for this species (December 10, 1999, 64 FR 69195, USFWS 2003e).

Plant Description

Gentner's fritillary is a perennial herb in the lily family (*Liliaceae*) that grows from a fleshy bulb to a height of 2 feet with showy, deep red to maroon flowers. Non-flowering individuals outnumber flowering plants in natural populations and are recognizable only by their single basal leaves, which appear virtually identical to those of other *Fritillaria* species. Alternatively, flowering individuals lack basal leaves, but produce single, erect flowering stems 20-28 inches tall, with several groups of narrow leaves arranged in whorls around the stems.

Flowers bloom from April through June. The bell-shaped flowers are deep red to maroon and usually streaked or mottled with pale yellow. Flowers can be solitary or may occur in bracted racemes on long, slender pedicels. The fruit is a broadly winged capsule. Reproduction is by fruits and seeds from flowers in sporadic or episodic cycles. Individual plants do not flower each year and very low levels of seed production and viability have been observed (December 10, 1999, 64 FR 69195, USFWS 2003e).

Successful reproduction occurs clonally, or asexually, by means of numerous small "rice-grain" bulblets that break off from larger bulbs (USFWS 2003e). The life span and lifetime output of bulblets for a single plant is unknown, as is the number of growing seasons required for young plants to reach reproductive maturity. However, when young bulblet plants and the larger non-reproductive plants are considered, the number of individuals actually in flower generally comprises only a small fraction of the total population size at any given site (USFWS 2003e). Observations suggest that some mature plants may remain reproductive over many consecutive years, whereas others may periodically return to a vegetative condition, or a dormant state under the soil surface, producing no leaves at all.

Habitat, Range, and Associated Species

Gentner's fritillary populations exist in the rural foothills of the Rogue and Illinois River valleys in Jackson and Josephine Counties in southwestern Oregon. One small population has been recently found in northern California, close to the Oregon border (USFWS 2003e). Recent mapping of both current and historical locations indicate that this species occurs at elevations

ranging from approximately 1,000-5,000 feet above mean sea level, and that all locations are within the Klamath Mountains ecoregion (USFWS 2003e).

Gentner's fritillary is often found in very small, widely scattered patches in grassland and chaparral habitats within, or on the edge of, dry, open woodlands that are somewhat protected from wind and sun (e.g., ridgeline ecotones) (December 10, 1999, 64 FR 69195, USFWS 2003e). This species appears to have specific moisture and light requirements that may be provided by several habitat types or successional stages; however, it is only known to exist in three habitats: oak woodlands dominated by Oregon white oak (*Quercus garryana*); mixed hardwood forest dominated by California black oak (*Q. kelloggii*), Oregon white oak, and Pacific madrone (*Arbutus menziesii*); and coniferous forests dominated by Pacific madrone and Douglas-fir (*Pseudotsuga menziesii*). Associated understory shrubs may include white–leaved manzanita (*Arctostaphylos viscida*), buckbrush (*Ceanothus cuneatus*), snowbrush (*Ceanothus velutinus*), mountain mahogany (*Cercocarpus betuloides*), and poison oak (*Tocicodendron diversiloba*) (December 10, 1999, 64 FR 69195, USFWS 2003e). Herbaceous understory species may include ashy rock cress (*Arabis subpinnatifida*), Rogue River milk-vetch (*Astragalus accidens* var. *hendersoni*), fringed brome (*Bromus ciliatus*), cat's-ear (*Calochortus tolmiei*), hound's tongue (*Cynoglossum grande*), larkspur (*Delphinium decorum*), Henderson's shootingstar (*Dodecatheon hendersonii*), pink fawn lily (*Erythronium hendersonii*), California fescue (*Festuca californica*), Idaho fescue (*Festuca idahoensis*), woods strawberry (*Fragaria vesca* var. *bracteata*), fineleaf biscuit-root (*Lomatium utriculatum*), Sandberg's bluegrass (*Poa sandbergii*), western buttercup (*Ranunculus occidentalis*), checkermallow (*Sidalcea malvaeflora*), Lemmon's needle grass (*Stipa lemmonii*), tower butterweed (*Senecio integerrimus*), American vetch (*Vicia americana*), and two other fritillary species, chocolate lily (*Fritillaria affinis*) and scarlet fritillary (*Fritillaria recurva*).

Gentner's fritillary is sometimes found in areas of frequent human disturbance, including roadsides, the edges of trails, bulldozer routes, vineyards, and mounds left from past mining activities. Opinions vary on the importance of historical disturbance regimes to species dispersal, invasive species competition, and vegetative succession. These unknowns are due, in part, to the fact that Gentner's fritillary inhabits a wide range of habitats within its limited range, that it is found in various successional stages of those habitats, and that it is associated with a wide variety of plant species.

Occurrences and Population Status

Occurrences of Gentner's fritillary are highly localized within about a 30-mile radius of the Jacksonville Cemetery in Jacksonville, Oregon, and the majority of known individuals (about 73%) occur within a 7-mile radius of the cemetery (USFWS 2003e). Surveys on BLM land in 2000 and 2001 documented a total of 775 flowering plants and approximately 3,300 vegetative plants (non-flowering species). The largest known population from this survey contains 306 plants, while the smallest population has one individual. After incorporating historic data and surveys across both public and private ownership, the result is a total estimated population of 1,700 flowering plants (USFWS 2003e).

The survey results must be analyzed in light of the constraints presented by the unique life and reproductive cycles of this species. Obtaining accurate counts of the number of flowering plants is difficult, since they do not flower each year. Similarly, determining the number of non-flowering plants is difficult since many plants remain dormant for several years and do not produce above-ground stems and flowers. Additionally, the non-flowering plants have basal leaves that are indistinguishable from other non-flowering *Fritillaria* species (USFWS 2003e).

The USFWS has outlined a recovery plan for Gentner's fritillary (USFWS 2003e). The recovery plan for Gentner's fritillary is based on species conservation brought about by the protection of populations distributed in natural densities across the historical range of the species, which is divided into four designated recovery units. Prior to being down-listed to threatened, each recovery unit must maintain at least 750 flowering plants. Alternatively, each recovery unit must maintain at least 1,000 flowering plants prior to de-listing (USFWS 2003e).

Summary of Threats

The most significant threat to the survival and recovery of Gentner's fritillary is the loss of functional habitat. This species has a very narrow geographic range, and the majority of its few remaining occurrences consist of lone plants or small clusters of plants. Individual occurrences are vulnerable to extirpation from even small-scale losses of habitat. Since 1982, Gentner's fritillary has been extirpated from at least eight of its known historical locations as a result of agricultural development; the construction of homes, schools, roads, and driveways; and the recreational use of logging roads on Federal lands (USFWS 2003e). Other factors contributing to the decline of this species include recreational bulb collecting, disease, and predation (herbivory).

5.5.7.2 Species-Specific Effects Pathways

Effects pathways include the media through which effects are delivered to the Gentner's fritillary. All effects on the Gentner's fritillary are delivered through the displacement, disruption, removal, or addition of one or more of the following:

Soil

Because of the Gentner's fritillary affinity for upland habitat, it is unlikely that soil erosion would significantly affect the species by destroying existing habitat or limiting the potential for new functional habitat development. Because Gentner's fritillary reproduces asexually, effects on this species from airborne dust are expected to be minor, especially when compared to species that reproduce sexually. Reductions in plant growth and vigor resulting from airborne sediment accumulation are also expected to be minor. The Pollution & Erosion Control Environmental Performance Standard has been developed to minimize adverse effects on this species through the soil effects pathway.

Water

Because Gentner's fritillary is an upland plant, the water effects pathway should have a minor effect on it. Nonetheless, Gentner's fritillary may be affected by any of the proposed actions that alter existing runoff patterns or hydrologic regimes in upland areas with documented Gentner's fritillary populations. Such actions may also limit the potential for new functional habitat development. The Water Quality Environmental Performance Standard and the Fluvial Environmental Performance Standard have been developed to minimize adverse effects on this species through the water effects pathway.

Chemical

As a perennial upland species that reproduces vegetatively, Gentner's fritillary may be affected by herbicide application, accidental chemical spills, and inadvertent fuel or oil discharges. These activities may result in a temporary die-back of seasonal growth (above-ground foliage) or in the death of the plant. Effects from chemical exposure may cause bulbs to become infertile, thus limiting population growth over the long term. Because it is an upland plant, chemical applications or accidental chemical discharges may be less harmful to this species than to wetland species, due to the reduced dispersal rate of chemicals in soil versus aquatic mediums. However, direct chemical discharges over occupied habitat would have an adverse effect on Gentner's fritillary. Implementation of the Pollution & Erosion Control Environmental Performance Standard will minimize adverse effects on this species through the chemical effects pathway.

Vegetation

Vegetation removal associated with proposed actions may eliminate or modify the habitat elements necessary for survival of Gentner's fritillary. This upland species is typically found grasslands and does not tolerate shade. The removal of overstory trees or tall shrubs may benefit Gentner's fritillary by providing new functional habitat. Conversely, the species may be affected in the long term if trees are planted near existing plants. In addition, invasive species introduced during the proposed action may out-compete Gentner's fritillary plants. Implementation of the Plant Avoidance Environmental Performance Standard will minimize adverse effects on this species through the vegetation effects pathway.

Species

The proposed actions may cause Gentner's fritillary plants to be trampled, mowed, or buried to the extent that the species is directly affected. However, implementation of the Plant Avoidance Environmental Performance Standard will eliminate direct effects on this species.

5.5.7.3 Analysis of Effects

The results of the screening process (Section 5.5.1) and of the surveys conducted to date for Gentner's fritillary are summarized in Table 5.5.7-1 and Figure 5.5.7-1.

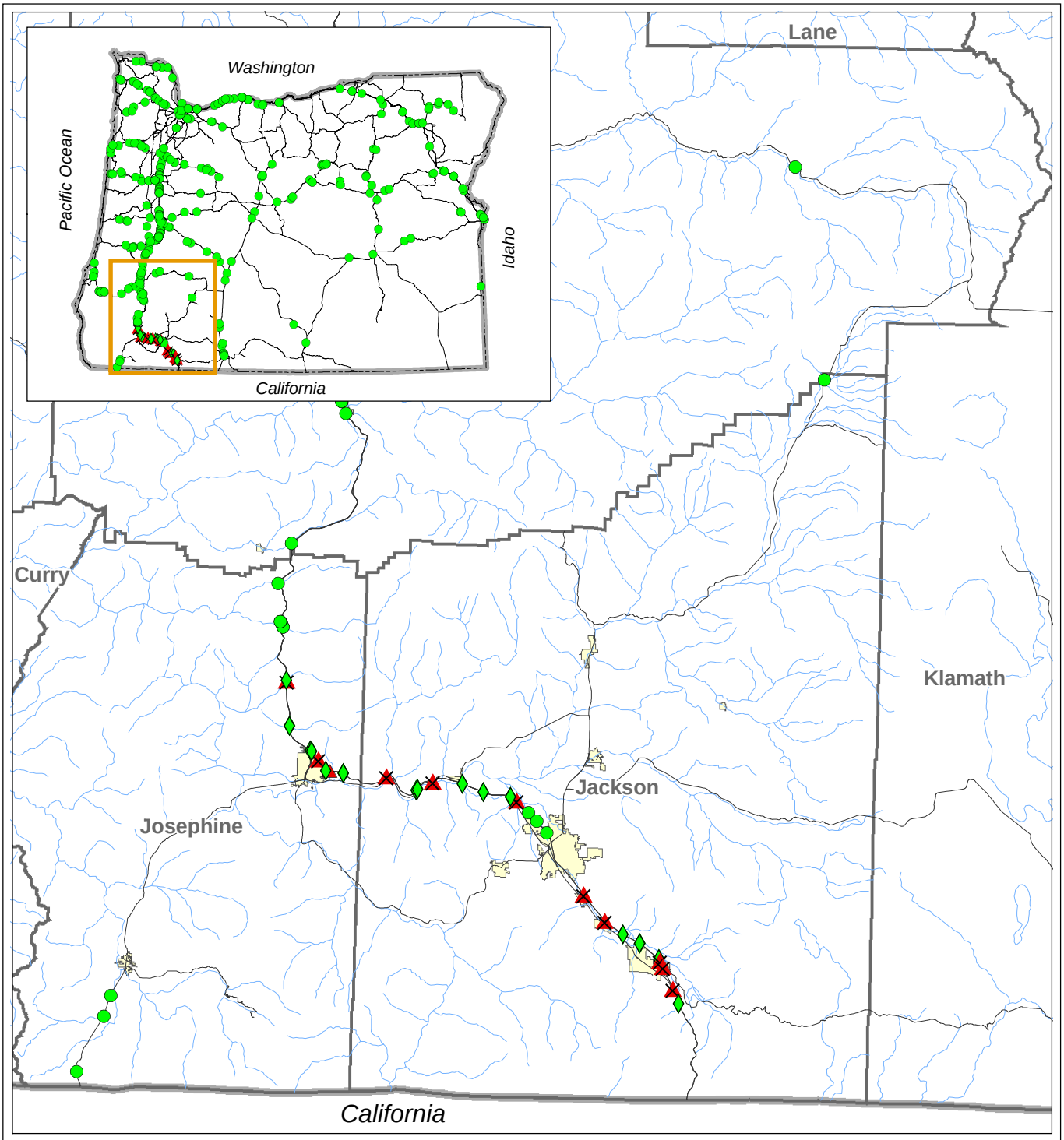
Table 5.5.7-1. Summary of program bridges where the proposed action may affect Gentner's fritillary.

		Category 1	Category 2	Category 3	Category 4
Plant Species	Federal Listing Status	No Field Survey Required	Surveyed Bridges with no Rare Plant Populations	Surveyed Bridges with Rare Plant Populations	Remaining Bridges to be Surveyed
Gentner's Fritillary	E	397	22	1	10

The likelihood of future surveys documenting additional occurrences of Gentner's fritillary is fairly low because the program bridge APIs with the highest potential for the occurrence of Gentner's fritillary (based on proximity to ORNHIC records) were surveyed by ODOT in 2003. Nonetheless, the Bridge Program has the potential to affect Gentner's fritillary at one documented bridge site and at the 10 Bridge Program sites that remain to be surveyed. Direct effects of the proposed action on (i.e., incidental take of) Gentner's fritillary will be avoided at all bridge sites by the implementation of the Plant Avoidance Environmental Performance Standard. Indirect adverse effects of the proposed action on Gentner's fritillary (i.e., via the air, water, chemical, and vegetation effects pathways) will be greatly reduced by the implementation of the other referenced environmental performance standards.

5.5.7.4 Determination of Effects

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, not likely to adversely affect** for Gentner's fritillary. Past and future plant survey efforts, and the application of environmental performance standards at all bridge APIs (whether or not they actually contain Gentner's fritillary occurrences) will serve to minimize effects on the Gentner's fritillary to the greatest extent practicable. If adherence to all of the environmental performance standards is not possible at a specific bridge site, then individual consultation with the USFWS will be necessary for this species.



OTIA III Bridges

- Remaining Survey Required (Category 4) -- 10 Bridges
- Surveyed, Presence Confirmed (Category 3) -- 1 Bridge
- Surveyed, Absence Confirmed (Category 2) -- 22 Bridges
- No Survey Required (Category 1) -- 397 Bridges
- City
- Streams and Rivers
- County
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.5.7-1

OTIA III: Statewide Bridge Delivery Program
Gentner's Fritillary

N W E S

0 2 4 8 12 16 20
Miles

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Spatial Data Source: See Document Bibliography.
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5.5.8 Golden paintbrush (*Castilleja levisecta*)

5.5.8.1 Life History and Status

Listing and Critical Habitat

Golden paintbrush (*Castilleja levisecta*) was Federally listed as a threatened species on June 11, 1997 (June 11, 1997, 62 FR 31740). The species merited listing because the few remaining known populations, located in the Puget Trough ecoregion in Washington State, are threatened by the conversion of their habitat for residential, commercial, and agricultural development, and by habitat damage associated with road maintenance. Threats also include competition with encroaching native and non-native plant species, habitat modification from fire suppression, and grazing by herbivores (June 11, 1997, 62 FR 31740). This species has not been observed in Oregon for over 50 years and is considered extinct in the State (USFWS 2000b). Critical habitat has not been designated for this species (June 11, 1997, 62 FR 31740).

Plant Description

Golden paintbrush is a small perennial herb that has one to 15 erect to spreading unbranched stems up to 12 inches tall. The erect stems are covered with soft, sticky hairs. The lower leaves are entire and narrowly pointed, while the upper leaves are broader (June 11, 1997, 62 FR 31740). The leaves are about 1-1.5 inches long and turn reddish with age (Eastman 1990). The species is distinguished from other *Castilleja* species by the brilliant golden to yellow floral bracts it produces. The plants emerge in early March, and flowering begins in the last week in April, and continues until early June. This species tends to grow in clumps; however, golden paintbrush is only known to reproduce by seed. Individual plants are short-lived, and generally do not survive longer than 5-6 years (June 11, 1997, 62 FR 31740, USFWS 2000b).

Range, Habitat, and Associated Species

Golden paintbrush historically occurred from Oregon to Vancouver Island in British Columbia, Canada. Its historic occurrences in Oregon were within the Willamette Valley ecoregion. The species presently occurs in open grasslands below 330 feet in elevation around the periphery of the Puget Trough (June 11, 1997, 62 FR 31740). Most known populations (in Washington State and Canada) occur on glacially derived soils (June 11, 1997, 62 FR 31740). The USFWS does not have any specific plant/soil associations for Oregon, as this species has not been located in the State in over 50 years. Nonetheless, the recovery plan for this species indicates that golden paintbrush historically occurred on the clayey alluvial soils in the Willamette Valley (USFWS 2000b). This species occurs on generally flat grasslands, including some that are characterized by mounded topography, and on steep coastal bluffs that are grass-dominated. Associated species include Idaho fescue *(Festuca idahoensis*), redtop *(Festuca rubra)*, camas (*Camassia quamash)*, common velvetgrass *(Holcus lanatus*), yarrow *(Achillea millefolium*), western brackenfern *(Pteridium aquilinum*), vetch (*Vicia spp.)*, and brome species (*Bromus spp.)* (June 11, 1997, 62 FR 31740). Low deciduous shrubs are commonly present as small to large thickets (USFWS 2000b).

Occurrences and Population Status

Golden paintbrush was historically reported at more than 30 sites in Washington, Oregon, and British Columbia. Currently, there are 11 known populations, of which nine are located in Washington, while the remaining two are located in British Columbia (USFWS 2000b). In Oregon, golden paintbrush historically occurred in the grasslands and prairies of the Willamette Valley; however, the species has been extirpated from all of these sites. Most of the populations in Washington and British Columbia are either stable or declining, and population sizes range from just a few plants to over 4,000 plants. Information about the remaining known populations in Washington and British Columbia is available in the recovery plan for golden paintbrush (USFWS 2000b).

Summary of Threats

In summary, golden paintbrush is presumed to be extinct in Oregon, since this species has not been observed in over 50 years. The remaining populations in Washington and British Columbia are currently threatened by the conversion of habitat for residential, commercial, and agricultural development, and by habitat damage associated with road maintenance. Additional threats include competition with encroaching native and nonnative plant species, habitat modification through succession in the absence of fire, and grazing by herbivores.

5.5.8.2 Golden Paintbrush Effect Pathways

Effects pathways include the media through which effects are delivered to the golden paintbrush. All effects on the golden paintbrush are delivered through the displacement, disruption, removal, or addition of one or more of the following:

Soil

Because of golden paintbrush's affinity for grassland habitat, it is likely that soil erosion could significantly affect the species by destroying existing habitat or limiting the potential for new functional habitat development. Because golden paintbrush reproduces entirely by seed, effects on this species by means of airborne dust may pose a significant threat to this species. Increased airborne dust during its flowering months has the potential to cover pollen and render seeds infertile. Reductions in plant health, vigor, or reproductive capability may also result from airborne sediment accumulation. The Pollution & Erosion Control Environmental Performance Standard has been developed to minimize adverse effects on this species through the soil effects pathway.

Water

Normally an upland species or transitional wetland species, golden paintbrush will be little affected by the water effects pathway. Nonetheless, any of the proposed actions that result in the alteration of existing runoff patterns or hydrologic regimes (e.g., increasing water supply) in upland areas could adversely effect golden paintbrush populations or

limit the potential for new functional habitat development. The Water Quality Environmental Performance Standard and the Fluvial Environmental Performance Standard have been developed to minimize adverse effects on this species through the water effects pathway.

Chemical

Golden paintbrush may be affected if exposed to herbicide application, accidental chemical discharges, or inadvertent fuel or oil discharges. Because golden paintbrush is an upland or transitional wetland species that reproduces by seed, chemical discharges may cause a temporary die-back of foliage, a loss of reproductive opportunity, or death of the entire plant. Because the species prefers upland habitats and is perennial, long-term effects will likely be minimal except in instances where chemicals are accidentally discharged directly into occupied habitat. Implementation of the Pollution & Erosion Control Environmental Performance Standard will minimize adverse effects on this species through the chemical effects pathway.

Vegetation

Vegetation removal associated with the proposed action may eliminate or modify the functional habitat elements necessary for survival of golden paintbrush. In addition, vegetation removal may introduce invasive species that can out-compete golden paintbrush. The removal of overstory trees and woody shrub species would benefit golden paintbrush since the species does not tolerate shade. Conversely, the planting of trees within occupied or functional habitat may adversely affect golden paintbrush over the long term. In the absence of fire, Douglas-fir, Nootka rose, and Scot's broom are known to out-compete golden paintbrush in its native grassland habitat and to reduce the potential for future functional habitat (USFWS 2000b). Implementation of the Plant Avoidance Environmental Performance Standard will minimize adverse effects on this species through the vegetation effects pathway.

Species

Bridge repair and replacement activities have the potential to cause golden paintbrush plants to be trampled, mowed, or disturbed. The loss and fragmentation of functioning habitat may decrease the chances of such habitat being occupied in the future, or for populations within occupied habitat to disperse and establish new populations. However, implementation of the Plant Avoidance Environmental Performance Standard will eliminate direct effects on this species.

5.5.8.3 Analysis of Effects

The results of the screening process (Section 5.5.1) and of the surveys conducted to date for golden paintbrush are summarized in Table 5.5.8-1. Figure 5.5.8-1 graphically depicts previous survey results and upcoming survey needs.

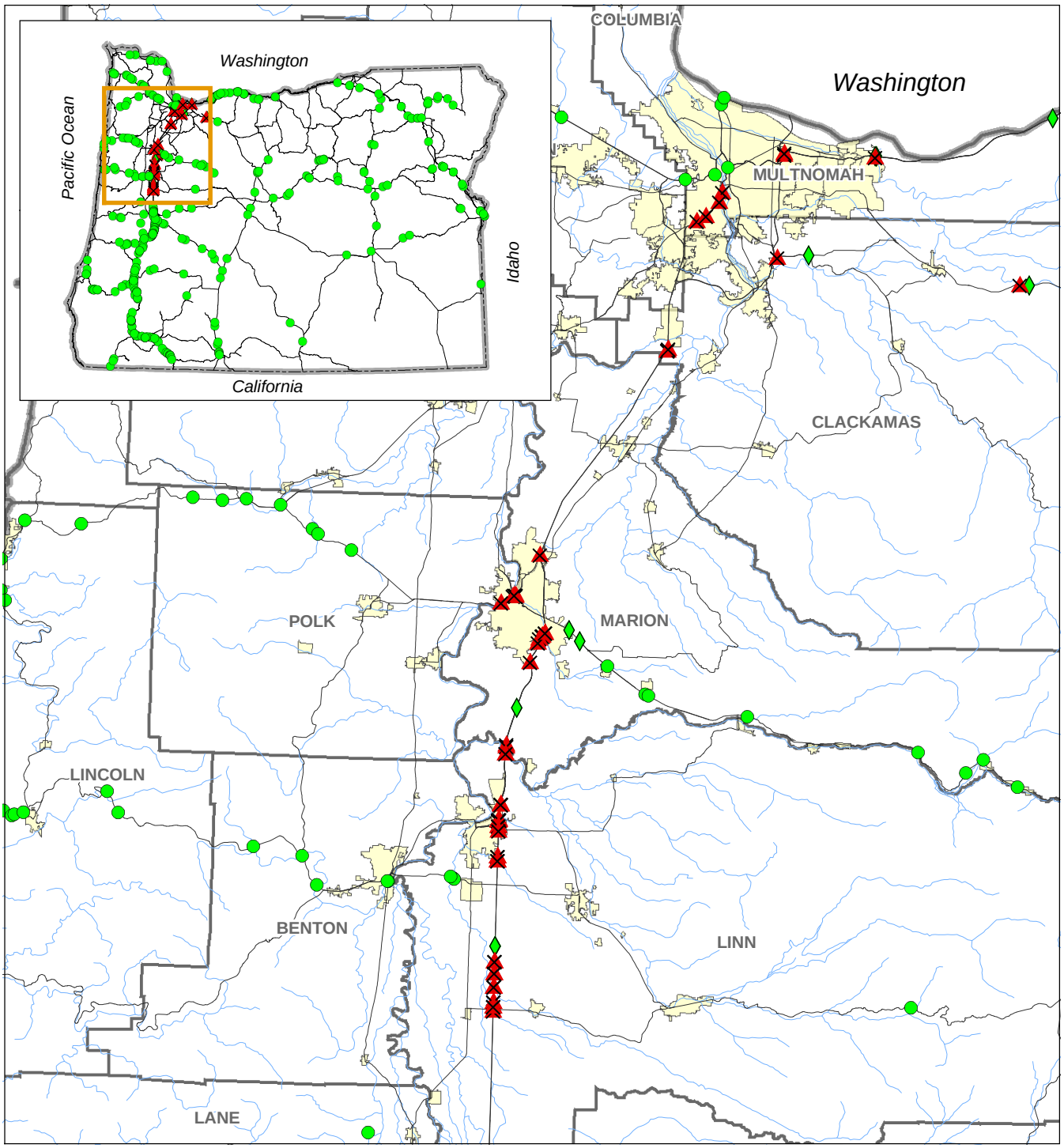
Table 5.5.8-1. Summary of program bridges where the proposed action may affect golden paintbrush.

		Category 1	Category 2	Category 3	Category 4
Plant Species	Federal Listing Status	No Field Survey Required	Surveyed Bridges with no Rare Plant Populations	Surveyed Bridges with Rare Plant Populations	Remaining Bridges to be Surveyed
Golden Paintbrush	T	361	15	0	54

According to the recovery plan for golden paintbrush, the species has not been documented in Oregon in over 50 years. The likelihood of future surveys documenting additional occurrences of golden paintbrush is fairly low because the program bridge APIs with the highest potential for the occurrence of golden paintbrush (based on proximity to ORNHIC records) were surveyed by ODOT in 2003. Nonetheless, the Bridge Program has the potential to affect golden paintbrush at the 54 Bridge Program sites that remain to be surveyed. Direct effects of the proposed action on (i.e., incidental take of) golden paintbrush will be avoided at all bridge sites by the implementation of the Plant Avoidance Environmental Performance Standard. Indirect adverse effects of the proposed action on golden paintbrush (i.e., via the air, water, chemical, and vegetation effects pathways) will be greatly reduced by the implementation of the other referenced environmental performance standards.

5.5.8.4 Determination of Effect

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, not likely to adversely affect** for golden paintbrush. Past and future plant survey efforts, and the application of environmental performance standards at all bridge APIs (whether or not they actually contain golden paintbrush occurrences) will serve to minimize effects on the golden paintbrush to the greatest extent practicable. If adherence to all of the environmental performance standards is not possible at a specific bridge site, then individual consultation with the USFWS will be necessary for this species.



OTIA III Bridges

- Remaining Survey Required (Category 4) -- 54 Bridges
- Surveyed, Presence Confirmed (Category 3) -- 0 Bridges
- Surveyed, Absence Confirmed (Category 2) -- 15 Bridges
- No Survey Required (Category 1) -- 361 Bridges
- City
- Streams and Rivers
- County
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.5.8-1

OTIA III: Statewide Bridge Delivery Program
Golden Paintbrush

N W E S

0 2 4 8 12 16 20
Miles

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Spatial Data Source: See Document Bibliography.
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5.5.9 Howell's Spectacular Thelypody (*Thelypodium howellii spectabilis*)

5.5.9.1 Life History and Status

Howell's spectacular thelypody (*Thelypodium howellii* ssp. *spectabilis*) was Federally listed as a threatened plant on May 26, 1999 (May 26, 1999, 64 FR 28393). The species occurs within the Blue Mountains and Owyhee Uplands ecoregions of northeastern Oregon (Robinson 2003). Specifically, this species occurs within the Baker-Powder River Valley in Baker and Union Counties (May 26, 1999, 64 FR 28393). Critical habitat has not been designated for this species (May 26, 1999, 64 FR 28393).

Howell's spectacular thelypody is an herbaceous biennial that grows approximately 2 feet tall and is glabrous and glaucous (Eastman 1990). The oblong and toothed or lobed leaves are arranged in a basal rosette (May 26, 1999, 64 FR 28393, Eastman 1990). Flowers are arranged in a long and loose raceme and consist of four sepals and petals that are purple or lavender in color, with wavy, white, thin, membranous margins (May 26, 1999, 64 FR 28393, Eastman 1990). Howell's spectacular thelypody blooms from late May though June, with peak flowering in mid-June (Eastman 1990).

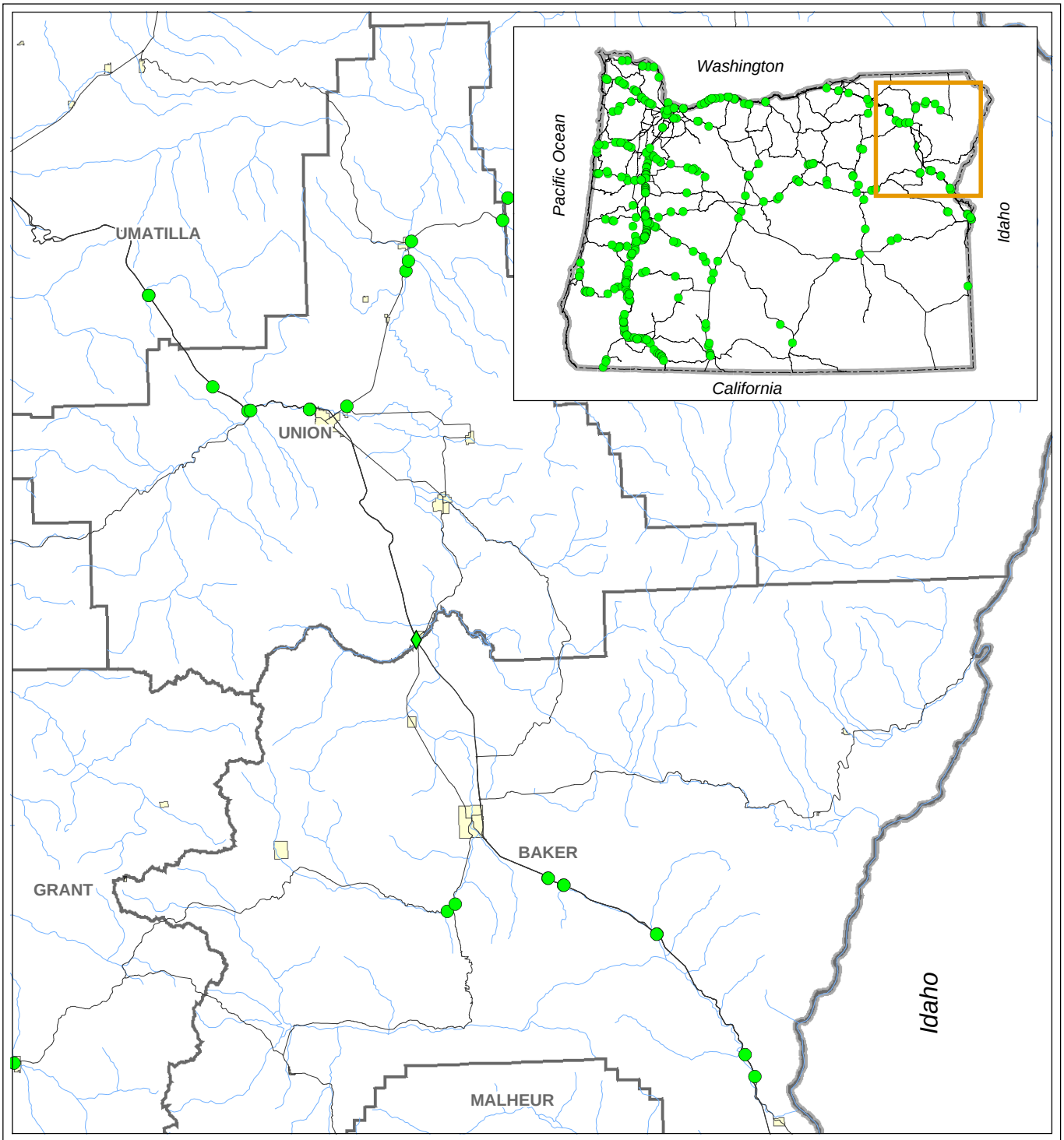
Plant species commonly associated with Howell's spectacular thelypody include greasewood (*Sarcobatus vermiculatus*), green rabbitbrush (*Chrysothamnus viscidiflorus*), Great Basin wildrye (*Elymus cinereus*), alkali saltgrass (*Distichlis stricta*), and alkali bluegrass (*Poa juncifolia*) (USFWS 2002d). Threats to the few remaining populations of Howell's spectacular thelypody include habitat destruction and fragmentation caused by agricultural and urban development, grazing by domestic livestock, competition from non-native vegetation, and alterations of wetland hydrology (May 26, 1999, 64 FR 28393).

5.5.9.2 Analysis of Effects

The USFWS screening process (Section 5.5.1) was used to determine which program bridges may affect Howell's spectacular thelypody (Robinson 2003). The results of this screening process indicated that one bridge site is located within the known range of Howell's spectacular thelypody and required a survey. ODOT surveyed this bridge in 2003 and no Howell's spectacular thelypody plants were identified (Figure 5.5.9-1).

5.5.9.3 Determination of Effects

The results of the USFWS screening process and the ODOT surveys indicated that all but one of the Bridge Program APIs are located outside the known range of Howell's spectacular thelypody. The one bridge API within the known range was surveyed, and no Howell's spectacular thelypody were found. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for Howell's spectacular thelypody.



OTIA III Bridges

- Remaining Survey Required (Category 4) -- 0 Bridges
- Surveyed, Presence Confirmed (Category 3) -- 0 Bridges
- Surveyed, Absence Confirmed (Category 2) -- 1 Bridge
- No Survey Required (Category 1) -- 429 Bridges
- City
- Streams and Rivers
- County
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

N W E S

0 2 4 8 12 16 20

Miles

Figure 5.5.9-1

OTIA III: Statewide Bridge Delivery Program
Howell's Spectacular Thelypody

MB&G

Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
plants\BA_figures\thhosp.mxd. Mar 1, 2004

5.5.10 Kincaid's Lupine (*Lupinus sulphureus* ssp. *kincaidii*)

5.5.10.1 Life History and Status

Listing and Critical Habitat

Kincaid's lupine (*Lupinus sulphureus* ssp. *kincaidii)* was Federally listed as a threatened species on January 25, 2000 (January 25, 2000, 65 FR 3875). Development, agriculture, silvicultural practices, road improvement, collection, herbicides, and naturally occurring demographic and environmental events threaten Kincaid's lupine (January 25, 2000, 65 FR 3875). Critical habitat has not been designated for Kincaid's lupine (January 25, 2000, 65 FR 3875).

Plant Description

Kincaid's lupine is a long-lived perennial species, with a maximum reported age of 25 years (January 25, 2000, 65 FR 3875). This species has unusual-appearing leaves that are glabrous on the upper surface with silvery-white hairs underneath (Eastman 1990). Kincaid's lupine is distinguished from other *Lupinus* species by its low-growing morphology and unbranched inflorescence (January 25, 2000, 65 FR 3875). Kincaid's lupine blooms from May to July (Eastman 1990).

Seed production of Kincaid's lupine is low, with small and variable numbers of flowers producing fruit from year to year (January 25, 2000, 65 FR 3875). Seeds are dispersed from fruits that open explosively upon drying. Kincaid's lupine can also spread by rhizomes producing clumps of plants more than 65 feet in diameter. However, rhizomes will not produce adventitious roots and will not separate from the parent clump. Clumps may be short-lived, regularly dying back to the crown (January 25, 2000, 65 FR 3875).

Habitat, Range and Associated Species

Kincaid's lupine was once widespread throughout the Willamette Valley ecoregion. Several isolated populations have been identified just south of the Willamette Valley in the Umpqua Valley of Douglas County, and in Lewis County in southern Washington. Kincaid's lupine is primarily associated with native upland prairie sites in the Willamette Valley in heavy soils that have mesic to slightly xeric soil moisture levels. Immediately south of the Willamette Valley, Kincaid's lupine occurs on well-developed soils adjacent to serpentine outcrops where the plant is frequently found under scattered oaks (*Quercus* spp.) (January 25, 2000, 65 FR 3875).

Associated plant species are those typically found in native upland prairie sites and include red fescue (*Festuca rubra*), Idaho fescue (*Festuca idahoensis*), Tolmie's mariposa (*Calochortus tolmiei*), Hooker's catchfly (*Silene hookeri*), broadpetal strawberry (*Fragaria virginiana*), rose check-mallow (*Sidalcea virgata*), and common lomatium (*Lomatium* spp.) (January 25, 2000, 65 FR 3875).

In the absence of fire, woody species encroach on native prairies and shade out Kincaid's lupine. Invasive woody species of concern include Himalayan blackberry (*Rubus discolor*), multiflora

rose (*Rosa multiflora*), and Scot's broom (*Cytisus scoparius*) (USFWS 2002e, Pendergrass and Hoppe 1999). The presence of fast-growing, invasive herbaceous species speeds the conversion of upland native prairie to simplified prairie and shrub lands. Invasive grass species that suppress Kincaid's lupine include velvet grass (*Holcus lanatus*), orchard grass (*Dactylis glomerata*), false-brome (*Brachypodium sylvaticum*), tall oatgrass (*Arrhenatherum elatius*), and bent grass (*Agrostis tenuis*) (USFWS 2002e).

Occurrences and Population Status

It is estimated that only 988 acres of native upland prairie remain in the Willamette Valley; this constitutes only one-tenth of one percent of the original upland prairie once available to Kincaid's lupine. As a result of this habitat loss, there are only 86 remnant Kincaid's lupine sites throughout the Willamette Valley, in addition to eight sites in the Umpqua Valley in Douglas County (January 25, 2000, 65 FR 3875, USFWS 2002e, USFWS 2001c). Three additional sites are known in Lewis County, Washington.

In Oregon, habitat at 80% of the remnant sites is rapidly disappearing (January 25, 2000, 65 FR 3875). Approximately 49 sites occupied by Kincaid's lupine occur on private lands and are expected to be lost in the near future unless conservation actions are implemented (January 25, 2000, 65 FR 3875). Three of the larger native prairie sites with Kincaid's lupine are located on undisturbed hilltops within the Baskett Slough National Wildlife Refuge (Polk County), at the Coburg Ridge site (Lane County), and McDonald State Forest (Benton County) (January 25, 2000, 65 FR 3875, USFWS 2002e). These sites contain some of the largest remaining Kincaid's lupine populations (January 25, 2000, 65 FR 3875). Only the Baskett Slough site is considered relatively protected, and invasive species remain a threat at this site (January 25, 2000, 65 FR 3875). Conservation at the larger Kincaid's lupine sites where native upland prairie still persists, including the largest known population of the species at Crabtree Hill in Lane County (approximately 6,000 plants), provides the greatest potential for long-term persistence of the species (January 25, 2000, 65 FR 3875).

The smaller Kincaid's lupine sites are confined to disturbed areas along fencerows, in pastures, and in intervening strips of land along agricultural fields and roadsides (USFWS 2001c). These smaller patches are important "stepping stones" or dispersal mechanisms for larger sites. Should these smaller sites disappear, a 74% reduction in the population would occur, and the larger sites would inevitably become genetically isolated and extinction-prone, as opportunities for re-colonization would be limited (January 25, 2000, 65 FR 3875). The smaller remnant populations are especially important for Fender's blue butterfly (*Icaricia icarioides fenderi*), which depends on Kincaid's lupine as its primary larval food source as well as for migration corridors (January 25, 2000, 65 FR 3875, USFWS 2002e, USFWS 2002f, USFWS 2001c, Pendergrass and Hoppe 1999, Schulz and Dlugosch 1998).

Summary

Kincaid's lupine is currently threatened by development, agriculture, silvicultural practices, road improvement, collection, herbicide use, and naturally occurring demographic and environmental events. A recovery plan has not been prepared for this species.

5.5.10.2 Species-Specific Effects Pathways

Effects pathways include the media through which effects are delivered to the Kincaid's lupine. All effects on the Kincaid's lupine are delivered through the displacement, disruption, removal, or addition of one or more of the following:

Soil

Because Kincaid's lupine has an affinity for upland prairie habitat, it is likely that soil erosion could significantly affect the species by destroying existing habitat or limiting the potential for new functional habitat development. Because Kincaid's lupine is capable of reproduction by seed, effects on this species by means of airborne dust may pose a significant threat to this species. Increased airborne dust during flowering months may cover pollen and render seeds infertile. Reductions in plant health, vigor, or reproductive capability may also result from airborne sediment accumulation, but will most likely be minimal. As a long-lived perennial species, Kincaid's lupine is likely to be less affected by airborne sediment than an annual species. The Pollution & Erosion Control Environmental Performance Standard has been developed to minimize adverse effects on this species through the soil effects pathway.

Water

Because it is an upland species, the potential effects on Kincaid's lupine from the water effects pathway will likely be minimal. Nonetheless, any of the proposed actions that result in the alteration of existing runoff patterns or hydrologic regimes (e.g., an increase in water supply) in upland areas could adversely effect Kincaid's lupine populations or limit the potential for new functional habitat development. There are a few examples of Kincaid's lupine growing in a wetland habitat such as the Eugene Wetland Complex. However, even in these areas, the species grows on upland hummocks within the wetland habitat. The Water Quality Environmental Performance Standard and the Fluvial Environmental Performance Standard have been developed to minimize adverse effects on this species through the water effects pathway.

Chemical

Kincaid's lupine may be affected by herbicide applications, accidental chemical discharges, or inadvertent fuel or oil spills. These activities may cause a temporary die-back of foliage, a loss of reproductive opportunity, or the death of the plant. Because the species is found in upland habitats and is a long-lived perennial species, long-term effects from chemical exposure will likely be minimal except in situations where the species is

directly exposed to the chemical. Implementation of the Pollution & Erosion Control Environmental Performance Standard will minimize adverse effects on this species through the chemical effects pathway.

Vegetation

Vegetation removals associated with the proposed action may eliminate or modify the functioning habitat elements necessary for survival of Kincaid's lupine. Normally, Kincaid's lupine exists on open native upland prairie habitat; however, decades of fire suppression and the encroachment of successional plant species has eliminated its preferred prairie habitat. Specifically, Himalayan blackberry, multiflora rose, Scot's broom, and several fast-growing herbaceous grass species such as velvet grass, orchard grass, false-brome, tall oatgrass, and bent grass are known to out-compete Kincaid's lupine (USFWS 2002e, Pendergrass and Hoppe 1999). Mitigation measures that include the removal of invasive species will benefit the long-term persistence of this species. Implementation of the Plant Avoidance Environmental Performance Standard will minimize adverse effects on this species through the vegetation effects pathway.

Species

Bridge repair and replacement activities have the potential to cause Kincaid's lupine plants to be trampled, mowed, or disturbed to the extent that the species is directly affected. Transplanting the species for mitigation purposes may be difficult as the species typically grows in clumps of plants with a rhizomatous root structure that is difficult to separate (January 25, 2000, 65 FR 3875). Loss and fragmentation of Kincaid's lupine populations or accompanying functional habitat may limit gene exchange and increase the chances for inbreeding, depending on the degree of fragmentation. The distance between populations is also important, as smaller populations serve as stepping stones between larger neighboring populations (January 25, 2000, 65 FR 3875). The loss or fragmentation of Kincaid's lupine populations or its functional habitat severely compromises the ability of the species disperse from the larger known sites (January 25, 2000, 65 FR 3875). However, implementation of the Plant Avoidance Environmental Performance Standard will eliminate direct effects on this species.

5.5.10.3 Analysis of Effects

The results of the screening process (Section 5.5.1) and of the surveys conducted to date for Kincaid's lupine are summarized in Table 5.5.10-1. Figure 5.5.10-1 graphically depicts previous survey results and upcoming survey needs.

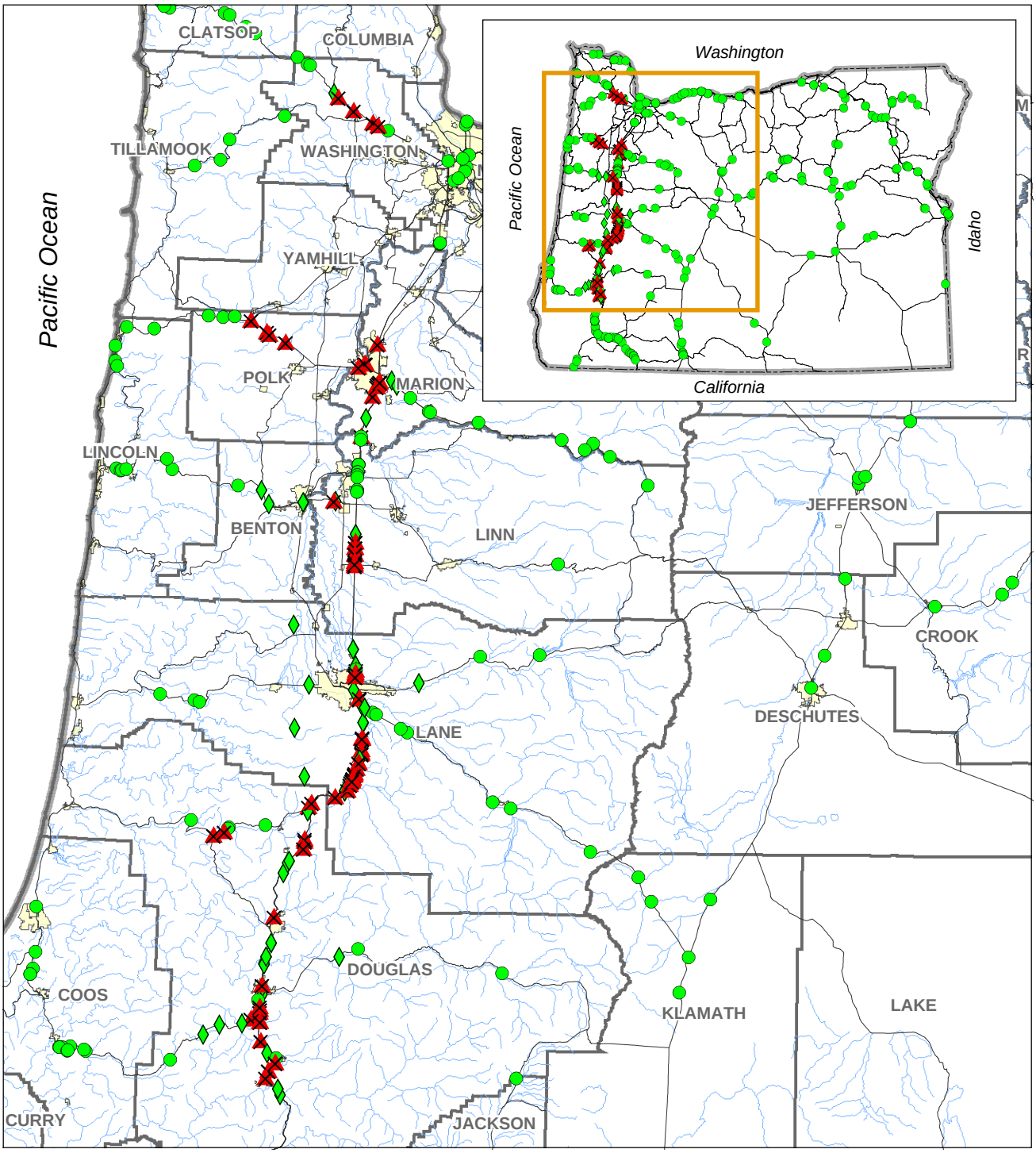
Table 5.5.10-1. Summary of program bridges where the proposed action may affect Kincaid's lupine.

		Category 1	Category 2	Category 3	Category 4
Plant Species	Federal Listing Status	No Field Survey Required	Surveyed Bridges with no Rare Plant Populations	Surveyed Bridges with Rare Plant Populations	Remaining Bridges to be Surveyed
Kincaid's Lupine	T	289	55	0	86

The likelihood of future surveys documenting additional occurrences of Kincaid's lupine is fairly low because the program bridge APIs with the highest potential for the occurrence of Kincaid's lupine (based on proximity to ORNHIC records) were surveyed by ODOT in 2003. Nonetheless, the Bridge Program has the potential to affect Kincaid's lupine at the 86 Bridge Program sites that remain to be surveyed. Direct effects of the proposed action on (i.e., incidental take of) Kincaid's lupine will be avoided at all bridge sites by the implementation of the Plant Avoidance Environmental Performance Standard. Indirect adverse effects of the proposed action on Kincaid's lupine (i.e., via the air, water, chemical, and vegetation effects pathways) will be greatly reduced by the implementation of the other referenced environmental performance standards.

5.5.10.4 Determination of Effect

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, not likely to adversely affect** for Kincaid's lupine. Past and future plant survey efforts, and the application of environmental performance standards at all bridge APIs (whether or not they actually contain Kincaid's lupine occurrences) will serve to minimize effects on Kincaid's lupine to the greatest extent practicable. If adherence to all of the environmental performance standards is not possible at a specific bridge site, then individual consultation with the USFWS will be necessary for this species.



OTIA III Bridges

- Remaining Survey Required (Category 4) -- 86 Bridges
- Surveyed, Presence Confirmed (Category 3) -- 0 Bridges
- Surveyed, Absence Confirmed (Category 2) -- 55 Bridges
- No Survey Required (Category 1) -- 289 Bridges
- City
- County
- Streams and Rivers
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.5.10-1

OTIA III: Statewide Bridge Delivery Program
Kincaid's Lupine

N W E S

0 4 8 16 24 32 40
Miles

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
plants\BA_figures\lupsulkin.mxd. Mar 1, 2004

5.5.11 Large-flowered wooly meadowfoam *(Limnanthes floccosa* ssp. *grandiflora)*

5.5.11.1 Life History and Status

Listing and Critical Habitat

Large-flowered wooly meadowfoam (*Limnanthes floccosa ssp. grandiflora*) was Federally listed as an endangered species on November 7, 2002 (November 7, 2002, 67 FR 68003). The species merited listing because its few remaining populations, located in the Agate Desert in Jackson County, are being threatened by the loss of their specialized vernal pool habitat as a result of industrial and residential development, road construction, and power-line maintenance. Agricultural conversion, certain grazing practices, and competition with invasive plants also contribute to population declines and local extirpations. Critical habitat has not been designated for this species (November 7, 2002, 67 FR 68003).

Plant Description

Large-flowered wooly meadowfoam is a low annual, growing only approximately 6 inches tall. The white flowers are large relative to the plant and are lined with green veins on the inside (Eastman 1990). The sepals and petals are approximately the same length and are densely pubescent. In addition, there are two rows of wooly pubescent hairs at the narrow base of the petals (Eastman 1990). Large-flowered wooly meadowfoam is distinguished from other species of *Limnanthes* mainly by the pubescent calyx and from other subspecies of meadowfoam (*L. floccosa*) by the two lines of hairs on the petal claws, the sparse pubescence of the stems and leaves, and the larger corolla (USFWS 2003f). Large-flowered wooly meadowfoam blooms in April and May.

Large-flowered wooly meadowfoam reproduces by seed (November 7, 2002, 67 FR 68003). In response to its unique vernal pool habitat, this species has specially adapted to grow, flower, and set seed during the short time that water is available in the spring. Individual plants finish their life cycle before the dry hot summers (November 7, 2002, 67 FR 68003).

Habitat, Range, and Associated Species

In Oregon, large-flowered wooly meadowfoam is found in and around seasonally wet habitats, known as vernal pools, in the Agate Desert, an approximately 32-square-mile landform located north of the City of Medford, in Jackson County (November 7, 2002, 67 FR 68003). Typically, the species is found at elevations of 1,230-1,310 feet above mean sea level (USFWS 2003f). The habitat of the subspecies, common wooly meadowfoam (*L. floccosa* ssp. *floccosa*), is sympatric with large-flowered wooly meadowfoam over much of its range; however, common wooly meadowfoam grows on the slightly drier outer fringes of pools, whereas large-flowered wooly meadowfoam grows on the relatively wetter, inner fringe of the pools (November 7, 2002, 67 FR 68003).

The Agate Desert is located in the Klamath Mountains ecoregion, and consists of a gentle mound-swale topography with a characteristic appearance in aerial photographs that is sometimes referred to as "patterned ground" (November 7, 2002, 67 FR 68003). Located on the floor of the Rogue River basin, the Agate Desert is characterized by shallow Agate-Winslow soils, a relative lack of trees, sparse prairie vegetation, and agates commonly found on the soil surface. During the rainy winter season, a striking pattern of shallow pools develops in the frequently interconnected swales, due to the shallow hardpan in the soil profile (November 7, 2002, 67 FR 68003).

Associated species within the Agate Desert include bract popcornflower (*Plagiobothrys bracteatus*), inch-high rush (*Juncus uncialis*), Naverretia (*Naverretia sp.*), common wooly meadowfoam (*Limnanthes floccosa* ssp. *floccosa*), Cook's lomatium (*Lomatium cookii*), annual hairgrass (*Deschampsia danthanoides*), and white hyacinth (*Triteliea hyacinthina*) (November 7, 2002, 67 FR 68003).

Occurrences and Population Status

There are approximately 15 occurrences of large-flowered wooly meadowfoam in the Agate Desert (November 7, 2002, 67 FR 68003). Mapped habitat compiled in 1998 within the Agate Desert totaled approximately 198 acres. However, due to the continued destruction of vernal pools, the areas currently occupied by large-flowered wooly meadowfoam are approximately 116 acres (November 7, 2002, 67 FR 68003). Of the known occurrences, two sites occur entirely or partially within the Agate Desert Preserve owned by The Nature Conservancy. Two sites are on State land mainly within the Ken Denman Wildlife Area, where much of the habitat has been altered and planted to grasses (November 7, 2002, 67 FR 68003). Portions of three large-flowered wooly meadowfoam sites are on lands owned by the City of Medford in an area designated as the Whetstone Industrial Park. Of the remaining known sites, two are located in highway or power-line rights-of-ways and the remainder are located on private land (November 7, 2002, 67 FR 68003).

Each year plant populations exhibit some natural variation; however, as an annual plant, large-flowered wooly meadowfoam may fluctuate in number more than perennial plants (November 7, 2002, 67 FR 68003). The numbers of large-flowered wooly meadowfoam in the Agate Desert are generally stable, but fluctuate from year to year based on temperature and rainfall conditions (November 7, 2002, 67 FR 68003). For example, in the year 2000, there was a large increase in the numbers of large-flowered wooly meadowfoam, mainly due to wet conditions. However, in 2001, dry conditions resulted in a sharp decrease in numbers. On one protected site owned by The Nature Conservancy, large-flowered wooly meadowfoam plants totaled 68,000 in the year 2000, and then plummeted to 39,000 plants in 2001, only to return to about 63,000 plants in 2002 (November 7, 2002, 67 FR 68003). Year-to-year changes of this magnitude may be within the normal range of variation for this annual species; however, it is possible that a number of consecutive drought years could eliminate some populations (November 7, 2002, 67 FR 68003). Further, this variation should be considered in light of the fact that over 60% of the Agate Desert vernal pool habitat has been modified and none of the habitat has escaped the encroachment of invasive species (November 7, 2002, 67 FR 68003).

Summary of Threats

In summary, large-flowered wooly meadowfoam is currently threatened primarily by the destruction of its specialized vernal pool habitat by industrial and residential development, road construction, and power-line maintenance (November 7, 2002, 67 FR 68003). Additional factors contributing to population declines and local extirpations include agricultural conversion, certain grazing practices, collection, and competition with non-native plants (November 7, 2002, 67 FR 68003). A recovery plan for this species has not yet been prepared.

5.5.11.2 Species-Specific Effects Pathways

Effects pathways include the media through which effects are delivered to the large-flowered wooly meadowfoam. All effects on the large-flowered wooly meadowfoam are delivered through the displacement, disruption, removal, or addition of one or more of the following media:

Soil

Because the large-flowered wooly meadowfoam prefers wetland habitats, it is likely that soil erosion could adversely affect the species by destroying existing functional habitat or limiting the potential for new functional habitat development. Within occupied or potential habitat, ground-disturbing activities that cause local hydrologic patterns to be altered or eliminated may further endanger this species. Specific ground-disturbing activities may include alterations in topography and the filing or draining of wetlands. As an annual species that reproduces entirely by seed, large-flowered wooly meadowfoam may be adversely affected by airborne dust. Reductions in plant health, vigor, or reproductive capability may result from airborne sediment accumulation. The Pollution & Erosion Control Environmental Performance Standard has been developed to minimize adverse effects on this species through the soil effects pathway.

Water

Large-flowered wooly meadowfoam is known to exist only in vernal pool habitats that are fed by surface runoff. This species is specially adapted to the seasonal wet and dry cycles of its preferred wetland habitat. Consequently, any of the proposed actions that alter existing runoff patterns or hydrologic regimes and result in a decrease in available water supply (e.g., changes in topography) could aversely affect large-flowered wooly meadowfoam. Alternatively, slight increases in water supply may not affect the species. The Water Quality Environmental Performance Standard and the Fluvial Environmental Performance Standard have been developed to minimize adverse effects on this species through the water effects pathway.

Chemical

As an annual wetland species that reproduces entirely by seed, large-flowered wooly meadowfoam may be affected by herbicide application, accidental chemical discharges, or inadvertent fuel or oil spills. These activities may result in a temporary die-back of

seasonal growth (floating vegetation) or in the death of the plant. Since large-flowered wooly meadowfoam is an annual species that reproduces exclusively by seed, effects from chemical exposure may cause seeds to become infertile and thus limit population growth over the long term. In addition, chemical applications or accidental chemical discharges to occupied habitat may be more harmful during wet periods than during dry periods, because of the increased dispersal rate of chemicals in aquatic versus dry soil mediums. In some cases, chemical exposure may limit the potential for large-flowered wooly meadowfoam to colonize potential functional habitat. Implementation of the Pollution & Erosion Control Environmental Performance Standard will minimize adverse effects on this species through the chemical effects pathway.

Vegetation

Vegetation removal associated with the proposed actions may eliminate or modify the habitat elements necessary for survival of large-flowered wooly meadowfoam. In addition, the removal or addition of vegetation within or adjacent to occupied habitat or potentially functional habitat may adversely alter the seasonally wet and dry periods characteristic of large-flowered wooly meadowfoam's preferred habitat to the extent that the species is unable to complete its life cycle. Implementation of the Plant Avoidance Environmental Performance Standard will minimize adverse effects on this species through the vegetation effects pathway.

Species

Repair and replacement of individual bridges within the Bridge Program may cause large-flowered wooly meadowfoam plants to be trampled and mowed (during dry periods), or buried (during wet or dry periods) to the extent that the species is directly affected. Because there are so few populations of this species presently known, the direct removal of any specimens would have an adverse effect on the species' overall recovery. Loss and fragmentation of large-flowered wooly meadowfoam populations or potential functional habitat may limit gene exchange and increase the risk of inbreeding, depending on the degree of fragmentation and the distances by which populations are separated. However, implementation of the Plant Avoidance Environmental Performance Standard and Vernal Pool Fairy Shrimp Avoidance Environmental Performance Standard will eliminate direct effects on this species.

5.5.11.3 Analysis of Effects

The results of the screening process (Section 5.5.1) and of the surveys conducted to date for large-flowered wooly meadowfoam are summarized in Table 5.5.11-1. Figure 5.5.11-1 graphically depicts previous survey results and upcoming survey needs.

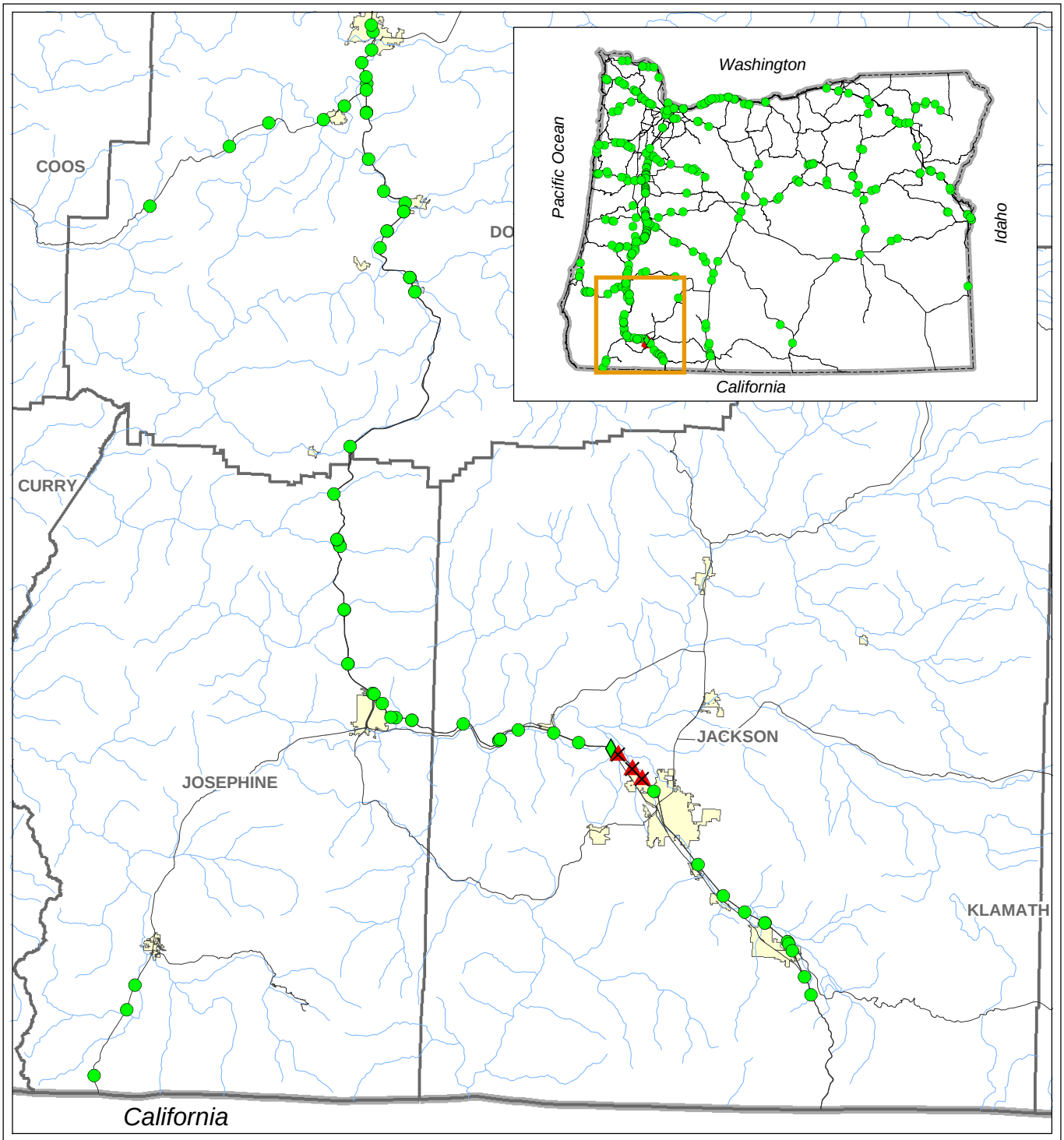
Table 5.5.11-1. Summary of program bridges where the proposed action may affect large-flowered wooly meadowfoam.

		Category 1	Category 2	Category 3	Category 4
Plant Species	Federal Listing Status	No Field Survey Required	Surveyed Bridges with no Rare Plant Populations	Surveyed Bridges with Rare Plant Populations	Remaining Bridges to be Surveyed
Large-flowered Wooly Meadowfoam	E	425	2	0	3

The likelihood of future surveys documenting additional occurrences of large-flowered wooly meadowfoam is fairly low because the program bridge APIs with the highest potential for the occurrence of large-flowered wooly meadowfoam (based on proximity to ORNHIC records) were surveyed by ODOT in 2003. Nonetheless, the Bridge Program has the potential to affect large-flowered wooly meadowfoam at the three Bridge Program sites that remain to be surveyed. Direct effects of the proposed action on (i.e., incidental take of) large-flowered wooly meadowfoam will be avoided at all bridge sites by the implementation of the Plant Avoidance Environmental Performance Standard. Indirect adverse effects of the proposed action on large-flowered wooly meadowfoam (i.e., via the air, water, chemical, and vegetation effects pathways) will be greatly reduced by the implementation of the other referenced environmental performance standards.

5.5.11.4 Determination of Effects

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, not likely to adversely affect** for large-flowered wooly meadowfoam. Past and future plant survey efforts, and the application of environmental performance standards at all bridge APIs (whether or not they actually contain large-flowered wooly meadowfoam occurrences) will serve to minimize effects on large-flowered wooly meadowfoam to the greatest extent practicable. If adherence to all of the environmental performance standards is not possible at a specific bridge site, then individual consultation with the USFWS will be necessary for this species.



OTIA III Bridges

- Remaining Survey Required (Category 4) -- 3 Bridges
- Surveyed, Presence Confirmed (Category 3) -- 0 Bridges
- Surveyed, Absence Confirmed (Category 2) -- 2 Bridges
- No Survey Required (Category 1) -- 425 Bridges
- City
- Streams and Rivers
- County
- Highway
- State Boundary

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N W E S

0 2 4 8 12 16 20

Miles

Figure 5.5.11-1

OTIA III: Statewide Bridge Delivery Program
Large-flowered Wooly Meadowfoam

MB&G

Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
plants\BA_figures\liflgr.mxd. Mar 1, 2004

5.5.12 MacFarlane's Four-o'clock (*Mirabilis macfarlanei*)

5.5.12.1 Life History and Status

MacFarlane's four-o'clock (*Mirabilis macfarlanei*) was Federally listed as an endangered species on October 26, 1979 (October 26, 1979, 44 FR 61912), and then down-listed to threatened status on March 15, 1996 (March 15, 1996, 61 FR 10693), due to both an improvement in the species status and the discovery of additional populations (March 15, 1996, 61 FR 10693). MacFarlane's four-o'clock occurs in Wallowa County, Oregon, and in Idaho County, Idaho. In Wallowa County, the species occurs in the Blue Mountains ecoregion along the banks and canyon slopes of the Imnaha River and the Snake River (in Hells Canyon). Specifically, approximately 4,750 plants occupy 25 acres of habitat along 6 miles of Hells Canyon, and approximately 800 plants occupy 70 acres of habitat along 3 miles of the Imnaha River (March 15, 1996, 61 FR 10693). The USFWS has not designated critical habitat for this species (March 15, 1996, 61 FR 10693).

MacFarlane's four-o'clock is a perennial plant that grows from a deep-seated taproot and forms clumps with many branches. The shiny succulent leaves are nearly sessile and the magenta flowers are showy, funnel-like, and arise from a colored whorl of bracts at the tip of the stem. Flowers bloom in May to early June (Eastman 1990).

Plant species associated with MacFarlane's four-o'clock include bluebunch wheatgrass (*Agropyron spicatum*), cheatgrass (*Bromus tectorum*), arrowleaf balsamroot (*Balsamorhiza sagittata*), scorpion weed (*Phacelia heterophylla*), desert parsley (*Lomatium dissectum*), sand dropseed (*Sporobolus cryptandrus*), netleaf hackberry (*Celtis reticulata*), threadleaf phacelia (*Phacelia linearis*), and cryptantha (*Cryptantha* spp.) (Meinke 1982). Potential threats to MacFarlane's four-o'clock include collection, recreational land use in its habitat, and naturally occurring disease and predation (Meinke 1982).

5.5.12.2 Analysis of Effects

The USFWS screening process (Section 5.5.1) was used to determine which program bridges may affect MacFarlane's four-o'clock (Robinson 2003). The results of this screening process indicate that no program bridges are present within the known range of MacFarlane's four-o'clock.

5.5.12.3 Determination of Effects

Results of the USFWS screening process indicate that all Bridge Program APIs are located outside the known range for MacFarlane's four-o'clock. Based on this analysis of the Bridge Program, ODOT/FHWA makes a determination of **no effect** for MacFarlane's four-o-clock.

5.5.13 Malheur Wire-lettuce (*Stephanomeria malheurensis*)

5.5.13.1 Life History and Status

Malheur wire-lettuce (*Stephanomeria malheurensis*) was Federally listed as an endangered species, and critical habitat was designated, on November 10, 1982 (November 10, 1982, 47 FR 50881). The designated critical habitat includes a 160-acre Scientific Study Area that encompasses the only known location and range of this species (November 10, 1982, 47 FR 50881). The location and range is within the Basin and Range ecoregion (Robinson 2003). The known population is located on top of a dry, broad hill near the Malheur National Wildlife Refuge in Harney County (November 10, 1982, 47 FR 50881).

Malheur wire-lettuce is a sparse plant, growing to a height of 20 inches, with wiry branching stems and leaves that are reduced to bracts. Flowering heads have 5-11 white flowers that bloom in July and August (Eastman 1990). Malheur-wire lettuce yearly plant numbers are directly correlated to precipitation during the spring growing season (November 10, 1982, 47 FR 50881).

Plant species associated with Malheur wire-lettuce include big sagebrush (*Artemisia tridentata*), rubber rabbitbrush (*Chrysothamnus nauseosus*), yellow rabbitbrush (*C. viscidiflorus*), Russian thistle (*Salsola kali*), and cheatgrass (*Bromus tectorum*) (Meinke 1982). Potential threats to Malheur wire-lettuce include mining, the introduction of non-native species including cheatgrass, and grazing by small herbivores (November 10, 1982, 47 FR 50881).

5.5.13.2 Analysis of Effects

The USFWS screening process (Section 5.5.1) was used to determine which program bridges may affect Malheur wire-lettuce (Robinson 2003). The results of this screening process indicate that no program bridges are present within the known range of Malheur wire-lettuce.

5.5.13.3 Determination of Effects

Results of the USFWS screening process indicate that all Bridge Program APIs are located outside the known range for Malheur wire-lettuce. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for Malheur wire-lettuce.

5.5.14 Marsh Sandwort (*Arenaria paludicola*)

5.5.14.1 Life History and Status

Marsh sandwort (*Arenaria paludicola*) was Federally listed as an endangered species on August 3, 1993 (August 3, 1993, 58 FR 41378). The species merited this listing due to the rapid rate at which its specialized wetland habitat is disappearing, a trend that is attributable to urbanization and the conversion of wetlands (August 3, 1993, 58 FR 41378). Critical habitat has not been designated for this species (August 3, 1993, 58 FR 41378).

The species was historically known to occur along the coastline of Washington, south to San Bernardino County, California, where it inhabited swamps and freshwater marsh habitats (August 3, 1993, 58 FR 41378). However, surveys conducted in 1988 revealed only one known extant population of 10 plants, located in a 55-square-foot marshy area of Black Lake Canyon in San Luis Obispo County, California (August 3, 1993, 58 FR 41378). In Washington, investigations conducted in the 1990s discovered that all but one historical site had been misidentified; surveys conducted in 1990 found no specimens from those historical sites (August 3, 1993, 58 FR 41378).

5.5.14.2 Analysis of Effects

There are no historic or current documented occurrences of marsh sandwort in Oregon (Andy Robinson, botanist, USFWS, pers. comm., December 5, 2003). Since there are no records showing presence in Oregon, the USFWS does not recognize this plant as endangered in the State (Andy Robinson, botanist, USFWS, pers. comm., December 5, 2003). As a result, marsh sandwort was not screened for the purposes of this Bridge Program.

5.5.14.3 Determination of Effects

Because there are no historic or current documented occurrences of marsh sandwort in Oregon, the USFWS does not recognize this plant as endangered in the State. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for marsh sandwort.

5.5.15 McDonald's Rock-Cress (*Arabis mcdonaldiana*)

5.5.15.1 Life History and Status

McDonald's rock-cress (*Arabis mcdonaldiana*) was Federally listed as an endangered plant on September 28, 1978 (September 28, 1978, 43 FR 44810). McDonald's rock-cress occurs in an extremely narrow range in northern California and southern Oregon. Specifically, the species is only known on Red Mountain (in northern Mendocino County, California) and in southern Curry County, Oregon. Occurrences have also been documented in Del Norte County, California; however, the taxonomic status of these occurrences is questionable (USFWS 1990b). McDonald's rock-cress is limited to serpentine soils rich in minerals and belonging to the Cornutt and Huse soil series (CDFG 2000, USFWS 1990b). The species occurs in open montane coniferous forests, often growing in rock crevices or on sites with naturally high soil disturbance (e.g., steep, unstable slopes). However, smaller numbers can be found on deeper soils and on fine gravel in open areas and among shrubs (USFWS 1990b). Around 1990, the BLM estimated the population of McDonald's rock-cress to be between 1,000-5,000 plants (USFWS 1990b). Critical habitat has not been designated for this species (September 28, 1978, 43 FR 44810).

McDonald's rock-cress is a perennial herb that has several simple stems that rise from a taproot to a height of 2-8 inches. The lower leaves (in rosettes) are 0.4-0.8 inch long, spatulate in shape, toothed, and glabrous, while the few leaves on the stems are smaller in size. The rose or purple flowers of this species bloom between April and June (Eastman 1990, Meinke 1982).

Associated species known to coexist with McDonald's rock-cress at the Red Mountain site include tree species such as ponderosa pine (*Pinus ponderosa*), Jeffrey pine (*P. jeffreyi*), sugar pine (*P. lambertiana*), incense cedar (*Calocedrus decurrens*), and occasionally dense stands of knobcone pine (*P. attenuata*) (USFWS 1990b). Associated shrubs include dwarf silk-tassel (*Garrya buxifolia*), huckleberry oak (*Quercus vaccinifolia*), and hoary manzanita (*Arctostaphylos canescens*) (USFWS 1990b). Several other rare plants are associated with McDonald's rock-cress, including Kellogg's buckwheat (*Eriogonum kelloggii*), Red Mountain stonecrop (*Sedum laxum* ssp. *eastwoodiae*), and Red Mountain campion (*Silene campanulata* ssp. *campanulata*) (USFWS 1990b). Potential threats to McDonald's rock-cress include habitat loss associated with mining activities (USFWS 1990b).

5.5.15.2 Analysis of Effects

The USFWS screening process (Section 5.5.1) was used to determine which program bridges may affect McDonald's rock-cress (Robinson 2003). The results of this screening process indicate that no program bridges are present within the known range of McDonald's rock-cress.

5.5.15.3 Determination of Effects

Results of the USFWS screening process indicate that all Bridge Program APIs are located outside the known range for McDonald's rock-cress. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for McDonald's rock-cress.

5.5.16 Nelson's Checker-Mallow (*Sidalcea nelsoniana*)

5.5.16.1 Life History and Status

Listing and Critical Habitat

Nelson's checker-mallow (*Sidalcea nelsoniana*) was Federally listed as a threatened species on February 12, 1993 (February 12, 1993, 58 FR 8235). Activities such as grazing, agricultural development, fire suppression, mowing, plowing, stream channel alteration, recreational activities, roadside spraying, and the introduction of invasive non-native plant species have all contributed to the decline of this species (February 12, 1993, 58 FR 8235, USFWS 1998b). Critical habitat has not been designated for Nelson's checker-mallow (February 12, 1993, 58 FR 8235).

Plant Description

Nelson's checker-mallow is a perennial herb that is differentiated from other *Sidalcea* species by its pinkish-lavender to pinkish-purple flowers, 0.25-0.5-inch long petals, an almost glabrous calyx, and simple pubescence on the stem (February 12, 1993, 58 FR 8235, Eastman 1990). Stems arise from a taproot and grow 1-2.5 feet tall. Nelson's checker-mallow normally blooms in June and July (Eastman 1990); however, the species can bloom from mid-May to late September in the Willamette Valley, depending on weather and site conditions (February 12, 1993, 58 FR 8235).

Nelson's checker-mallow is a gynodioecious species, which means the plant may have either perfect flowers (male and female) or pistillate flowers (female). The species can reproduce vegetatively by rhizomes and can produce seeds that drop near the parent plant (February 12, 1993, 58 FR 8235). In general, Coast Range populations flower later and produce seed earlier, most likely because of the shorter growing season (February 12, 1993, 58 FR 8235). Studies have shown seed loss due to predation by weevils to exceed 85% in Willamette Valley populations (USFWS 1998b).

Habitat, Range, and Associated Species

Nelson's checker-mallow is thought to have once been widespread in the Willamette Valley; however, it is currently known to exist in only a few areas in the Willamette Valley and the northern Coast Range in Oregon. This species has also been found in Cowlitz and Lewis Counties, Washington (February 12, 1993, 58 FR 8235, USFWS 1998b).

The species has no preference for a single habitat type (USFWS 1998b). Nelson's checker-mallow has been documented growing on gravelly and well-drained soils, and poorly- to well-drained clay, clay loam, and gravelly-loam soils (February 12, 1993, 58 FR 8235). Nelson's checker-mallow is most often found in open meadows, and rarely in shaded wooded areas. The species can occasionally be found in areas where wetland or upland prairie or grassland remnants persist, such as along fences, drainage swales, and at the edges of plowed fields adjacent to wooded areas (February 12, 1993, 58 FR 8235). In the Willamette Valley, the species is most often found at elevations from 140-650 feet above mean sea level. Other habitats include Oregon ash (*Fraxinus latifolia*) swales, meadows with wet depressions, and stream corridors. In the Coast Range, Nelson's checker-mallow is found in similar habitats and at the margins of coniferous forests at elevations of 1,600-1,960 feet above mean sea level. Coast Range habitats generally support higher components of native vegetation than Willamette Valley sites (USFWS 1998b).

Common associates in the Willamette Valley include yarrow (*Achillea millefolium*), Oregon ash, tall fescue (*Festuca arundinacea)*, timothy (*Phleum pretense)*, velvet grass (*Holcus lanatus*), colonial bentgrass (*Agrostis tenuis*), meadow foxtail (*Alopecurus pratensis*), reed canarygrass (*Phalaris arundinacea*), and sedge species (*Carex* spp.) (February 12, 1993, 58 FR 8235, USFWS 1998b). Common Coast Range associates are tansy ragwort (*Senecio jacobaea*), spear-head senecio (*Senecio triangularis*), strawberry (*Fragaria virginiana*), and rush spp. (*Juncus* spp.) (USFWS 1998b). Studies have documented that the presence of tall fescue may reduce the vigor of Nelson's checker-mallow seedlings as a result of tall fescue's ability to emit substances that inhibit plant growth or seed germination in other plants (USFWS 1998b).

Occurrences and Population Status

There are 51 extant Willamette Valley occurrences of Nelson's checker-mallow distributed in Benton, Linn, Marion, Polk, and Yamhill Counties, with the greatest concentrations around the Cities of Corvallis and Salem. At least 50% of the occurrences within the Willamette Valley are on public land (USFWS 1998b). In the Coast Range, there are 11 extant Nelson's checker-

mallow sites distributed in Yamhill, Washington, and Tillamook Counties. Of these Coast Range populations, land ownership is split almost evenly between private land and land owned by the City of McMinnville (USFWS 1998b). Finally, in Washington, there are two additional populations of Nelson's checker-mallow that are best compared with the Willamette Valley occurrences due to their similar valley bottom habitats (USFWS 1998b).

Small populations are more prone to a loss of genetic variation and to inbreeding due to limited gene exchange, and may subsequently become more susceptible to pressures from pests and disease. This problem may be exacerbated in many Nelson's checker-mallow populations by its extensive habitat fragmentation, specifically within the Willamette Valley (USFWS 1998b). Throughout its range, nearly 50% of the documented Nelson's checker-mallow sites contain 100 or fewer plants, and 16 contain fewer than 25 plants (USFWS 1998b). Only five populations contain more than 1,000 plants; two of these occur in the Willamette Valley and three are located in the Coast Range (USFWS 1998b).

The USFWS has outlined a recovery plan for Nelson's checker-mallow, pursuant to ESA requirements (USFWS 1998b). The recovery plan calls for the establishment of nine natural habitat reserves distributed evenly throughout the species' range via the hydrologic subbasins in which the species occurs. Different standards apply to populations in the Coast Range, as they are expected to be less stable than those in the Willamette Valley. Recovery and eventual Federal de-listing of the species is anticipated to occur when at least 0.74 acre of habitat is established within each of the nine subbasins and the required occupied habitat in each of the subbasins covers at least two reserves (USFWS 1998b).

Summary of Threats

Land use and subsequent habitat loss, competition with invasive species, woody vegetation succession due to fire suppression, reproductive limitations, and small, fragmented population sizes are the primary causes of the decline of Nelson's checker-mallow populations. However, the most serious threats are related to private land management and use, since 29 of the 62 populations of Nelson's checker-mallow occur on private land and are not subject to State and Federal laws (USFWS 1998b).

5.5.16.2 Species-Specific Effects Pathways

Effects pathways include the media through which effects are delivered to the Nelson's checker-mallow. All effects on the Nelson's checker-mallow are delivered through the displacement, disruption, removal, or addition of one or more of the following:

Soil

Since Nelson's checker-mallow can be found in a variety of upland or seasonal wetland habitats, it is likely that soil erosion could adversely affect the species by destroying habitat or limiting the potential for new functional habitat development. Airborne dust may affect Nelson's checker-mallow, as the species can reproduce sexually by seed or asexually by rhizomes; high levels of airborne dust when the species is in flower may

cover pollen and render seeds infertile. In addition, reductions in plant health or vigor may result from airborne sediment accumulation. The Pollution & Erosion Control Environmental Performance Standard has been developed to minimize adverse effects on this species through the soil effects pathway.

Water

Because Nelson's checker-mallow grows in diverse wetland and upland habitats, small changes in hydrology may not significantly affect the species. The ability of Nelson's checker-mallow to exist in both upland and seasonal wetland areas may enable the species to adapt to alterations in hydrologic regimes or runoff patterns as a result of the proposed actions. However, drastic changes in hydrology (e.g., large increases in surface runoff that result in permanent ponding) would adversely affect Nelson's checker-mallow. The Water Quality Environmental Performance Standard and the Fluvial Environmental Performance Standard have been developed to minimize adverse effects on this species through the water effects pathway.

Chemical

Anticipated effects on Nelson's checker-mallow by the chemical effects pathway will depend on the habitat the species is occupying (upland versus wetland). Chemical discharges would pose a more serious threat to populations in wetland habitats than to those in upland habitats due to the increased dispersal rate of chemicals in aquatic versus dry soil mediums. Nelson's checker-mallow is a perennial species that can reproduce by seed or rhizomes. As such, herbicide applications, accidental chemical discharges, or inadvertent fuel or oil spills may affect Nelson's checker-mallow plants, depending on their individual reproductive strategy. In general, exposure to chemical discharges may cause a temporary loss of seasonal growth (above-ground foliage) or the death of the entire plant. Individuals that reproduce by seed may experience a reduced or lost reproductive opportunity, whereas individuals reproducing vegetatively would probably experience minimal losses, unless chemical exposure occurs directly in occupied habitat. Implementation of the Pollution & Erosion Control Environmental Performance Standard will minimize adverse effects on this species through the chemical effects pathway.

Vegetation

Vegetation removal associated with the proposed actions may eliminate or modify the habitat elements necessary for survival of Nelson's checker-mallow. Vegetation removal may also result in the colonization of occupied habitat by invasive species that have the ability to out-compete Nelson's checker-mallow. Decades of fire suppression and the encroachment of invasive species have shaded out areas historically occupied by Nelson's checker-mallow. Because the species is most often found in open meadows, the removal of overstory trees and tall shrub may benefit Nelson's checker-mallow. Large shade-producing vegetation should not be planted in occupied Nelson's checker-mallow sites as part of site restoration or as a mitigation measure. In addition, the removal of tall fescue in occupied habitat or potential functional habitat may benefit Nelson's checker-

mallow due to the plant's ability inhibit the growth of other species. Implementation of the Plant Avoidance Environmental Performance Standard will minimize adverse effects on this species through the vegetation effects pathway.

Species

Repair and replacement of individual bridges within the Bridge Program may cause Nelson's checker-mallow plants to be trampled, mowed, or disturbed. Many sites occupied by Nelson's checker-mallow are small and fragmented. Further fragmentation of these smaller populations or their potential functional habitats may cause higher losses of genetic diversity, and thus increase the species' vulnerability to disease or environmental changes. Larger populations will likely be less affected by individual plant or habitat losses, and they are often important seed sources for mitigation and species propagation. Implementation of the Plant Avoidance Environmental Performance Standard will eliminate direct effects on this species.

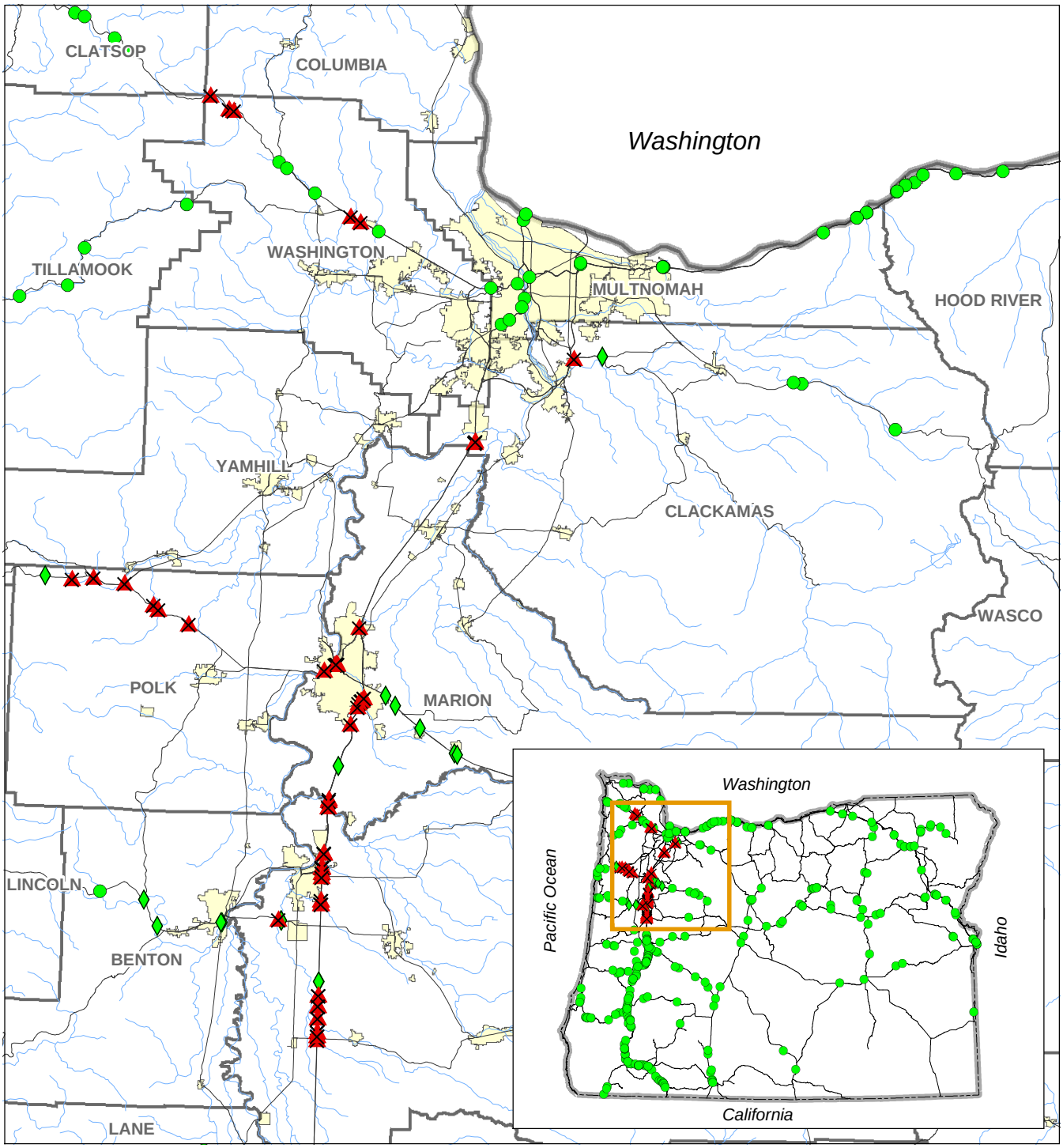
5.5.16.3 Analysis of Effects

The results of the screening process (Section 5.5.1) and of the surveys conducted to date for Nelson's checker-mallow and summarized in Table 5.5.16-1. Figure 5.5.16-1 graphically depicts previous survey results and upcoming survey needs.

Table 5.5.16-2. Summary of program bridges where the proposed action may affect Nelson's checker-mallow.

		Category 1	Category 2	Category 3	Category 4
Plant Species	Federal Listing Status	No Field Survey Required	Surveyed Bridges with no Rare Plant Populations	Surveyed Bridges with Rare Plant Populations	Remaining Bridges to be Surveyed
Nelson's Checker-mallow	T	356	16	0	58

The likelihood of future surveys documenting additional occurrences of Nelson's checker-mallow is fairly low because the program bridge APIs with the highest potential for the occurrence of Nelson's checker-mallow (based on proximity to ORNHIC records) were surveyed by ODOT in 2003. Nonetheless, the Bridge Program has the potential to affect Nelson's checker-mallow at the 58 Bridge Program sites that remain to be surveyed. Direct effects of the proposed action on (i.e., incidental take of) Nelson's checker-mallow will be avoided at all bridge sites by the implementation of the Plant Avoidance Environmental Performance Standard. Indirect adverse effects of the proposed action on Nelson's checker-mallow (i.e., via the air, water, chemical, and vegetation effects pathways) will be greatly reduced by the implementation of the other referenced environmental performance standards.



OTIA III Bridges

- Remaining Survey Required (Category 4) -- 58 Bridges
- Surveyed, Presence Confirmed (Category 3) -- 0 Bridges
- Surveyed, Absence Confirmed (Category 2) -- 16 Bridges
- No Survey Required (Category 1) -- 356 Bridges
- City
- Streams and Rivers
- County
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

N W E S

0 2 4 8 12 16 20

Miles

Figure 5.5.16-1

OTIA III: Statewide Bridge Delivery Program
Nelson's Checker-mallow

MB&G

Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
plants\BA_figures\sidnel.mxd. Mar 1, 2004

5.5.16.4 Determination of Effect

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, not likely to adversely affect** for Nelson's checker-mallow. Past and future plant survey efforts, and the application of environmental performance standards at all bridge APIs (whether or not they actually contain Nelson's checker-mallow occurrences) will serve to minimize effects on the Nelson's checker-mallow to the greatest extent practicable. If adherence to all of the environmental performance standards is not possible at a specific bridge site, then individual consultation with the USFWS will be necessary for this species.

5.5.17 Rough Popcornflower (*Plagiobothrys hirtus*)

5.5.17.1 Life History and Status

Listing and Critical Habitat

Rough popcornflower (*Plagiobothrys hirtus*) was Federally listed as an endangered species on January 25, 2000 (January 25, 2000, 65 FR 3866). The species merited listing due to habitat loss from development, the conversion of wet meadows to agricultural use, and the channelization of creeks. In addition, fire suppression and the introduction of invasive plant species such as pennyroyal (*Mentha pulegium*), teasel (*Dipsacus sylvestris*), and meadow knapweed (*Centaurea debeauxii*) are considered ongoing threats to the species (USFWS 2003d). Critical habitat has not been designated for rough popcornflower (January 25, 2000, 65 FR 3866).

Plant Description

Rough popcornflower is an annual herb on drier sites and a perennial herb on wetter sites (January 25, 2000, 65 FR 3866). The plant can have ascending or reclining stems of up to 28 inches long (Eastman 1990). Leaves are linear and paired lower on the stem; they alternate higher on the stem. The lower part of the plant is glabrous, while the upper part is pubescent, with spreading white or yellowish hairs. The flower consists of five pure white petals that are twice as long as the sepals and sometimes have a bright yellow center (Eastman 1990). Rough popcornflower blooms from mid-June into early July. Fruits are 0.08-inch long ovate nutlets (Meinke 1982) with a basal attachment scar (USFWS 2003d).

The seedlings of rough popcornflower germinate in the fall with the onset of fall rains, and overwinter as submerged rosettes in seasonally wet meadow habitats (USFWS 2003d). As waters recede in the late spring, rosettes emerge and develop flowering stems. Flowering is indeterminate and continues throughout the summer. Up to 100 flowers may bloom per flowering stem, but only three to seven flowers will open at any one time (USFWS 2003d).

Habitat, Range and Associated Species

Rough popcornflower grows in the Klamath Mountains ecoregion and is endemic to the Umpqua River drainage in Douglas County, Oregon (January 25, 2000, 65 FR 3866, Robinson 2003). The species grows in seasonally wet swale, meadow, and vernal pool habitats in poorly-drained clay or silty clay loam soils. Rough popcornflower occurs at elevations ranging from 100-900 feet above mean sea level (January 25, 2000, 65 FR 3866, USFWS 2003d). Associated herbaceous wetland species include green-sheathed sedge (*C. feta*), clustered sedge (*C. arcta*), one-sided sedge (*C. unilateralis*), common rush (*J. effusus*), pointed rush (*J. oxymeris*), tapered rush (*J. acuminatus*), and other rush (*Juncus spp*.) species. Western mannagrass (*Glyceria occidentalis*), great white camas (*Camasia leichtlinii*), and several annual species including skullcap speedwell (*Veronica scutellata*) and Douglas' meadow-foam (*Limnanthes douglasii*) may also be present.

Occurrences and Population Status

Extensive habitat fragmentation has isolated previously contiguous populations of rough popcornflower. These smaller populations are not able to interbreed and are at a greater risk of losing genetic variability and becoming susceptible to disease (USFWS 2003d). Populations below 5,000 individuals are at risk of insufficient adaptive genetic variability and those below 1,000 individuals experience population decline (USFWS 2003d).

Only 17 known rough popcornflower sites exist and most sites are composed of a few individual plants (USFWS 2003d). The known sites range in size from 0.1-17 acres and have populations ranging from one to 3,000 individuals (January 25, 2000, 65 FR 3866).

Pursuant to the Federal listing, the USFWS has developed a recovery plan for rough popcornflower (USFWS 2003d). The recovery goal is to protect a minimum of three viable populations of 5,000 individuals within each of the three recovery units. All known natural populations are included in the recovery units based on corresponding watersheds (within the North Umpqua River basin) and genetic similarity. The Yoncalla Creek recovery unit contains two extant ODOT-owned rough popcornflower sites that are maintained as a Special Management Area. These are the only two extant populations within this recovery unit and they are close enough to interbreed. There are more than 5,000 plants between the two extant populations (USFWS 2003d).

Summary of Threats

Rough popcornflower is at risk of extirpation as a result of threats including direct habitat loss, hydrological alterations, fire suppression, spring and summer livestock grazing, roadside mowing and spraying, competition with non-native vegetation, and landscaping (January 25, 2000, 65 FR 3866). Approximately five populations are under direct management, while the larger group of approximately 12 populations has no protective management and is subsequently at risk of extirpation (January 25, 2000, 65 FR 3866).

5.5.17.2 Species-Specific Effects Pathways

Effects pathways include the media through which effects are delivered to the rough popcornflower. All effects on the rough popcornflower are delivered through the displacement, disruption, removal, or addition of one or more of the following:

Soil

Because rough popcornflower has an affinity for wetland habitat, it is likely that soil erosion could significantly affect the species by destroying existing habitat or limiting the potential for new functional habitat development. Specific ground-disturbing activities that cause the filling or draining of its wetland habitat may further endanger this endemic species. Rough popcornflower is a wetland annual on drier sites and a perennial species on wetter sites. Because rough popcornflower reproduces entirely by seed, effects on this species by means of airborne dust may pose a significant threat to the species. Reductions

in plant health and vigor may also result from airborne sediment accumulation. The implementation the Pollution & Erosion Control Environmental Performance Standard will minimize adverse effects on this species through the soils effects pathways.

Water

Rough popcornflower exists in seasonably wet swale, meadow, and vernal pool habitats, which are generally fed by surface runoff. This species is specially adapted to the seasonal wet and dry cycles of its preferred wetland habitat. Consequently, any of the proposed actions that result in the alteration or elimination of existing runoff patterns such that a decrease in available water supply results could adversely affect this species. Slight increases in water supply may not affect the species. The Water Quality Environmental Performance Standard and the Fluvial Environmental Performance Standard have been developed to minimize adverse effects on this species through the water effects pathway.

As a mitigation measure, the creation of functional seasonable wetland habitat may allow rough popcornflower to colonize new areas and develop stable populations. In addition, this species has been shown to easily grow and propagate under human control (Steven Gisler, botanist, ODOT, pers. comm., January 8, 2004). Seed collection and introduction to created functional wetland habitats may help in the recovery of this species.

Chemical

Rough popcornflower may be affected by the chemical effects pathway through herbicide application, accidental chemical discharges, or inadvertent fuel or oil spills. These activities may result in a temporary die-back of seasonal growth (floating vegetation) or in the death of plant. Since rough popcornflower reproduces entirely by seed, chemical exposure may cause seeds to become infertile and thus may limit population growth over the long term. In addition, accidental chemical discharges to its habitat may be more harmful during wet periods than during dry periods because of the increased dispersal rate of chemicals in aquatic versus soil mediums. In some cases, chemical exposure may limit the potential for rough popcornflower to colonize potentially functional habitat. Implementation of the Pollution & Erosion Control Environmental Performance Standard will minimize adverse effects on this species through the chemical effects pathway.

Vegetation

Vegetation removal associated with the proposed action may eliminate or modify the habitat elements necessary for the survival of rough popcornflower. The removal or addition of vegetation within or adjacent to occupied habitat or potentially functional habitat may adversely alter the seasonal wet and dry periods of rough popcornflower's preferred habitat to the extent that the species is unable to complete its life cycle. During proposed actions, the removal of reed canarygrass (*Phalaris arundinacea*) will benefit rough popcornflower populations, as this non-native, invasive species out-competes rough popcornflower and is known to exist at most of the species' documented

occurrences (Steven Gisler, botanist, ODOT, pers. comm., January 8, 2004). Implementation of the Plant Avoidance Environmental Performance Standard will minimize adverse effects on this species through the vegetation effects pathway.

Species

Bridge repair and replacement activities have the potential to cause rough popcornflower plants to be trampled and mowed (during dry periods), or buried (during wet or dry periods), to the extent that the species is directly affected. Because there are so few populations of this rare plant, the direct removal of any specimens would have drastic effects on the species' overall recovery. Implementation of the Plant Avoidance Environmental Performance Standard will eliminate direct effects on this species.

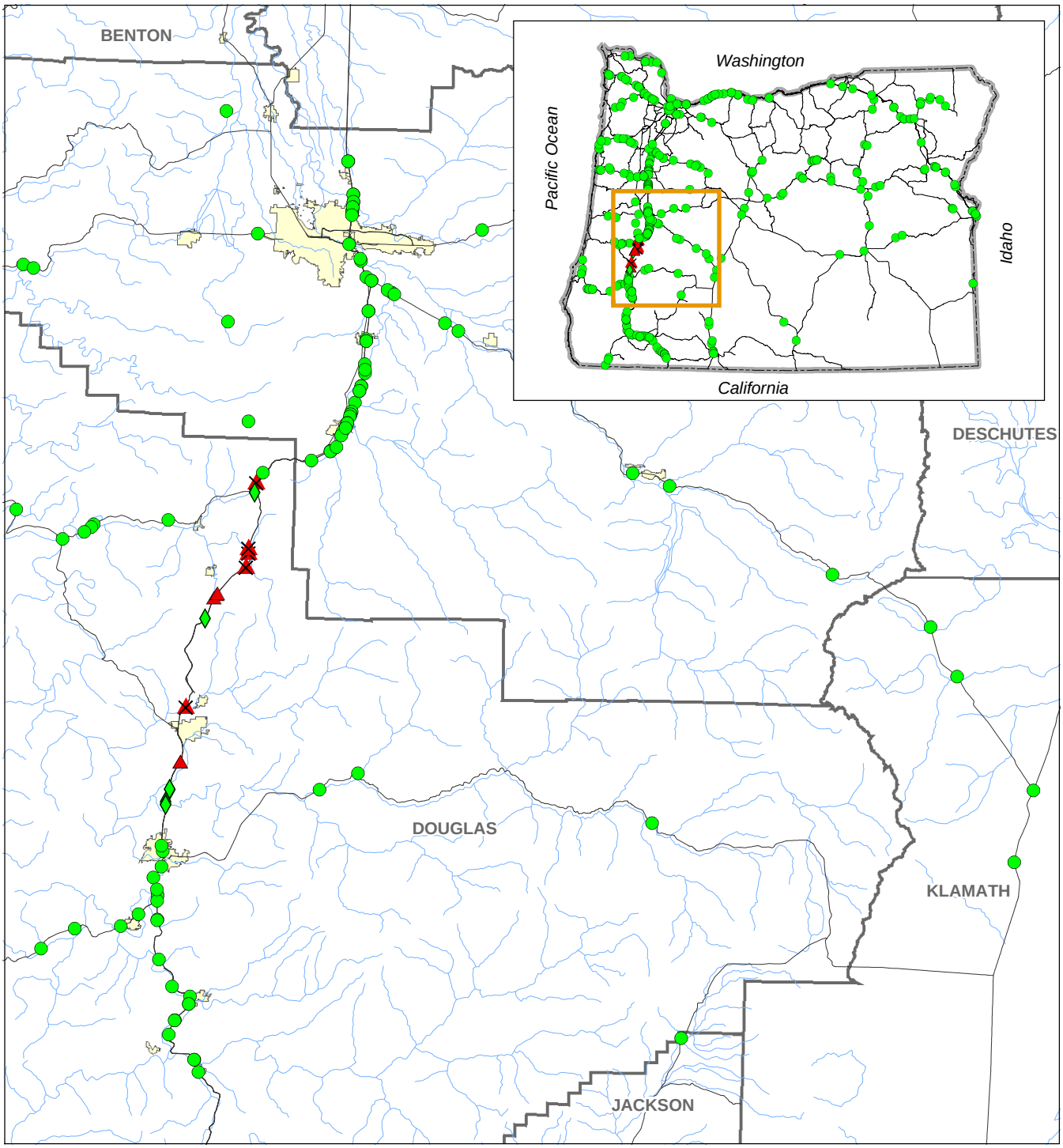
5.5.17.3 Analysis of Effects

The results of the screening process (Section 5.5.1) and of the surveys conducted to date for rough popcornflower are summarized in Table 5.5.17-1. Figure 5.5.17-1 graphically depicts previous survey results and upcoming survey needs.

Table 5.5.17-1. Summary of program bridges where the proposed action may affect rough popcornflower.

		Category 1	Category 2	Category 3	Category 4
Plant Species	Federal Listing Status	No Field Survey Required	Surveyed Bridges with no Rare Plant Populations	Surveyed Bridges with Rare Plant Populations	Remaining Bridges to be Surveyed
Rough Popcornflower	E	413	7	5	5

The likelihood of future surveys documenting additional occurrences of rough popcornflower is fairly low because the program bridge APIs with the highest potential for the occurrence of rough popcornflower (based on proximity to ORNHIC records) were surveyed by ODOT in 2003. Nonetheless, the Bridge Program has the potential to affect rough popcornflower at five documented bridge sites and at the five Bridge Program sites that remain to be surveyed. Direct effects of the proposed action on (i.e., incidental take of) rough popcornflower will be avoided at all bridge sites by the implementation of the Plant Avoidance Environmental Performance Standard. Indirect adverse effects of the proposed action on rough popcornflower (i.e., via the air, water, chemical, and vegetation effects pathways) will be greatly reduced by the implementation of the other referenced environmental performance standards.



OTIA III Bridges

- Remaining Survey Required (Category 4) -- 5 Bridges
- Surveyed, Presence Confirmed (Category 3) -- 5 Bridges
- Surveyed, Absence Confirmed (Category 2) -- 7 Bridges
- No Survey Required (Category 1) -- 413 Bridges
- City
- Streams and Rivers
- County
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.5.17-1

OTIA III: Statewide Bridge Delivery Program
Rough Popcornflower

N W E S

0 2 4 8 12 16 20
Miles

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
plants\BA_figures\plahir.mxd. Mar 1, 2004

5.5.17.4 Determination of Effect

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, not likely to adversely affect** for rough popcornflower. Past and future plant survey efforts, and the application of environmental performance standards at all bridge APIs (whether or not they actually contain rough popcornflower occurrences) will serve to minimize effects on the rough popcornflower to the greatest extent practicable. If adherence to all of the environmental performance standards is not possible at a specific bridge site, then individual consultation with the USFWS will be necessary for this species.

5.5.18 Spalding's Catchfly (*Silene Spaldingii*)

5.5.18.1 Life History and Status

Spalding's catchfly (*Silene spaldingii*) was Federally listed as a threatened species on October 10, 2001 (October 10, 2001, 66 FR 51598). Populations of Spalding's catchfly occur in the northwest United States and in British Columbia, Canada. In the U.S., the species occurs in Idaho, Montana, Washington, and Oregon. In Oregon, Spalding's catchfly occurs in the Blue Mountains ecoregion, in the mesic prairie or steppe grasslands that make up the Palouse region. There are seven populations of this species in Wallowa County, Oregon, that range in size from one to over 500 individuals (October 10, 2001, 66 FR 51598). The USFWS has not designated critical habitat for this species (October 10, 2001, 66 FR 51598).

Spalding's catchfly is a long-lived perennial with four to seven pairs of lance-shaped leaves and foliage that is lightly to densely covered with sticky hairs. The spirally arranged inflorescence consists of small greenish-white flowers that bloom from June to September (October 10, 2001, 66 FR 51598, Meinke 1982).

Grasslands dominated by native perennial grasses such as Idaho fescue (*Festuca idahoensis*) or rough fescue (*Festuca scabrella*) characterize the habitat of Spalding's catchfly (October 10, 2001, 66 FR 51598, Meinke 1982). Other associated species include bluebunch wheatgrass (*Agropyron spicatum*), prairie junegrass (*Koeleria cristata*), snowberry (*Symphoricarpos albus*), Nootka rose (*Rosa nutkana*), yarrow (*Achillea millefolium*), prairie smoke avens (*Geum triflorum*), sticky purple geranium (*Geranium viscosissimum*), and arrowleaf balsamroot (*Balsamorhiza sagittata*) (October 10, 2001, 66 FR 51598, Meinke 1982).

5.5.18.2 Analysis of Effects

The USFWS screening process (Section 5.5.1) was used to determine which program bridges may affect Spalding's catchfly (Robinson 2003). The results of this screening process indicate that no program bridges are present within the known range of Spalding's catchfly.

5.5.18.3 Determination of Effects

Results of the USFWS screening process indicate that all Bridge Program APIs are located outside the known range for Spalding's catch-fly. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for Spalding's catch-fly.

5.5.19 Water Howellia (*Howellia aquatilis*)

5.5.19.1 Life History and Status

Listing and Critical Habitat

Water howellia (*Howellia aquatilis*) was Federally listed as a threatened species on July 14, 1994 (July 14, 1994, 59 FR 35860). The species merited this listing because the few remaining populations (located in Montana, Washington, Idaho, and California) are threatened by a loss of wetland habitat and by habitat changes resulting from timber harvesting, livestock grazing, residential development, and competition by introduced plants. The species was first collected in Oregon near Sauvie Island in 1879, and was not identified again until 2001 when a specimen was identified at Finley Wildlife Refuge in Benton County. Critical habitat has not been designated for this species (July 14, 1994, 59 FR 35860).

Plant Description

Water howellia is an aquatic annual plant that grows 4-24 inches tall, is mostly submerged, and is rooted in the bottom sediments of ponds and sloughs. It has extensively branched, submerged, or floating stems with narrow leaves 0.4-2 inch long. Two types of flowers are produced—small, inconspicuous flowers beneath the water's surface, and emergent white flowers about 0.08-0.11 inch long. The plant is self-pollinating and each fruit contains up to five large brown seeds 0.08-1.6 inches long (July 14, 1994, 59 FR 35860, USFWS 2003g). Flowers bloom from May through August (Meinke 1982). All reproduction occurs by seed; however, germination only occurs when the seeds are exposed to air when the seasonal wetland habitats temporarily dry out (July 14, 1994, 59 FR 35860, USFS 1997). Seed dispersion may occur in part in the wanderings of migratory waterfowl (Meinke 1982).

Habitat, Range, and Associated Species

Water howellia historically existed in a large area of the Pacific Northwest, but the species is currently found only in specific aquatic habitats (July 14, 1994, 59 FR 35860, USFWS 2003g). It has been reported in Mendocino County, California; Clackamas, Marion, and Multnomah Counties, Oregon; Mason, Thurston, Clark, and Spokane Counties, Washington; Kootenai and Latah Counties, Idaho; and Lake and Missoula Counties, Montana (July 14, 1994, 59 FR 35860).

This aquatic plant is restricted to small pothole ponds or the quiet waters of abandoned river oxbows. These pond habitats are generally shallow (less than 3 feet deep) and typically occur in a matrix of dense forest vegetation. They are always surrounded in part by broadleaf deciduous trees. The bottom surfaces of the wetlands consist of firm, consolidated clay and organic sediments. Pond habitats are generally filled by snowmelt runoff and spring rains, and then dry out toward the end of the growing season. This species occurs at elevations from 10 feet above mean sea level in Washington to 4,500 feet above means sea level in Montana (USFS 1997).

Limited information on associated species is available; however, in Montana, associated tree species often include grand fir (*Abies grandis*), subalpine fir (*Abies lasiocarpa*), western larch

(*Larix occidentalis*), Engelmann spruce (*Picea engelmannii*), ponderosa pine (*Pinus ponderosa*), lodgepole pine (*Pinus contorta*), Western white pine (*Pinus monticola*), and Douglas-fir (*Pseudotsuga menziesii*) (USFS 1997). The broadleaf deciduous trees most frequently associated with water howellia include black cottonwood (*Populous trichocarpa*) and quaking aspen (*Populous tremuloides*), while shrub species may include mountain alder (*Alnus incana*), red-osier dogwood (*Cornus stolonifera*), common dwarf juniper (*Juniperus communis*), alder-leaved buckthorn (*Rhamnus alnifolia*), and Bebb willow (*Salix bebbiana*) (USFS 1997). Aquatic herbaceous species most commonly associated with water howellia in Montana include blister sedge (*Carex vesicaria*), twoheaded water-starwort (*Callitriche heterophylla*), water horsetail (*Equisetum fluviatile*), grass-leaved pondweed (P*otamogeton gramineus*), water buttercup (*Ranunculus aquatilis*), water parsnip (*Sium suave*), and least bur-reed (*Sparganium minimum*) (USFS 1997).

Occurrences and Population Status

There are approximately 170 known occurrences of water howellia range-wide (USFS 1997). Most of the known occurrences are on Federal lands. Its populations occur in ponds from less than 1 acre to greater than 30 acres in size, while the number of individual plants in each population is difficult to quantify due to large annual fluctuations. The populations range in size from just a few specimens to over 400 plants (July 14, 1994, 59 FR 35860, USFS 1997).

Water howellia was first collected in 1879 in a slough on Sauvie Island (along the Columbia River near Portland, Oregon), and was recently located in 2001 within the Finley Wildlife Refuge in Benton County. Historically, the four reported populations in Oregon occurred within the floodplains of the lower Columbia and Willamette Rivers (July 14, 1994, 59 FR 35860, USFS 1997).

Summary of Threats

The remaining known populations in Oregon, California, Montana, and Washington are being threatened primarily by the loss of wetland habitat and by habitat changes resulting from timber harvesting, livestock grazing, residential development, and competition by invasive weeds.

5.5.19.2 Water Howellia Effect Pathways

Effects pathways include the media through which effects are delivered to the water howellia. All effects on the water howellia are delivered through the displacement, disruption, removal, or addition of one or more of the following:

Soil

Because water howellia has an affinity for ponded wetland habitat, it is likely that soil erosion could significantly affect the species by destroying existing habitat or limiting the potential for new functional habitat development. Because water howellia only occurs in particular wetland habitats, ground-disturbing activities that cause the filling or draining of this wetland habitat may further endanger this rare species. Because water howellia

reproduces exclusively by seed, effects on this species by airborne dust may also pose a significant threat to the species. Reductions in plant health, vigor, or reproductive capability may also result from airborne sediment accumulation. The Pollution & Erosion Control Environmental Performance Standard has been developed to minimize adverse effects on this species through the soil effects pathway.

Water

Water howellia is only known to exist in seasonally wet, small, and shallow ponds or backwater sloughs that are generally fed by snowmelt or spring rains. As a result, any of the proposed actions that alter or eliminate existing runoff patterns and floodplain connectivity, such that a decrease in available water supply results, could adversely effects water howellia populations or limit the potential for new functional habitat development. Alternatively, slight increases in hydrology may not affect the species. The Water Quality Environmental Performance Standard and the Fluvial Environmental Performance Standard have been developed to minimize adverse effects on this species through the water effects pathway.

Chemical

As an annual wetland species that reproduces entirely by seed, water howellia may be affected by herbicide application, accidental chemical spills, and inadvertent fuel or oil discharges. These activities may result in a temporary die-back of seasonal growth (floating vegetation) or in the death of the entire plant. Because water howellia is an annual species that reproduces exclusively by seed, effects from chemical exposure may cause seeds to become infertile, thus limiting population growth over the long term. In addition, herbicide applications or accidental chemical discharges to functional habitat may be more harmful during wet periods than during dry periods because of the increased dispersal rate of chemicals in aquatic versus soil mediums. In some cases, chemical exposure may limit the potential for water howellia to colonize potential functional habitat. Implementation of the Pollution & Erosion Control Environmental Performance Standard will minimize adverse effects on this species through the chemical effects pathway.

Vegetation

Vegetation removal associated with the proposed action may eliminate or modify the habitat elements necessary for the survival of water howellia. A dense matrix of forest vegetation and an overstory of deciduous trees species typically surrounds occupied ponds. The removal of this forested riparian zone during the proposed action may affect the ability of water howellia to persist in or colonize these altered habitats. In addition, the removal or addition of vegetation within or adjacent to occupied habitat or potentially functional habitat may alter the seasonally wet and dry periods characteristic of water howellia's preferred habitat to the extent that the species is unable to complete its life cycle. Implementation of the Plant Avoidance Environmental Performance Standard will minimize adverse effects on this species through the vegetation effects pathway.

Species

Bridge repair and replacement activities have the potential to directly affect water howellia via wetland filling activities. Due to the rarity of this species in Oregon, any action that results in the direct removal of specimens would have an adverse effect on the species' overall recovery. However, implementation of the Plant Avoidance Environmental Performance Standard will eliminate direct effects on this species.

5.5.19.3 Analysis of Effects

The results of the screening process (Section 5.5.1) and of the surveys conducted to date for Cook's lomatium are summarized in Table 5.5.19-1. Figure 5.5.19-1 graphically depicts previous survey results and upcoming survey needs.

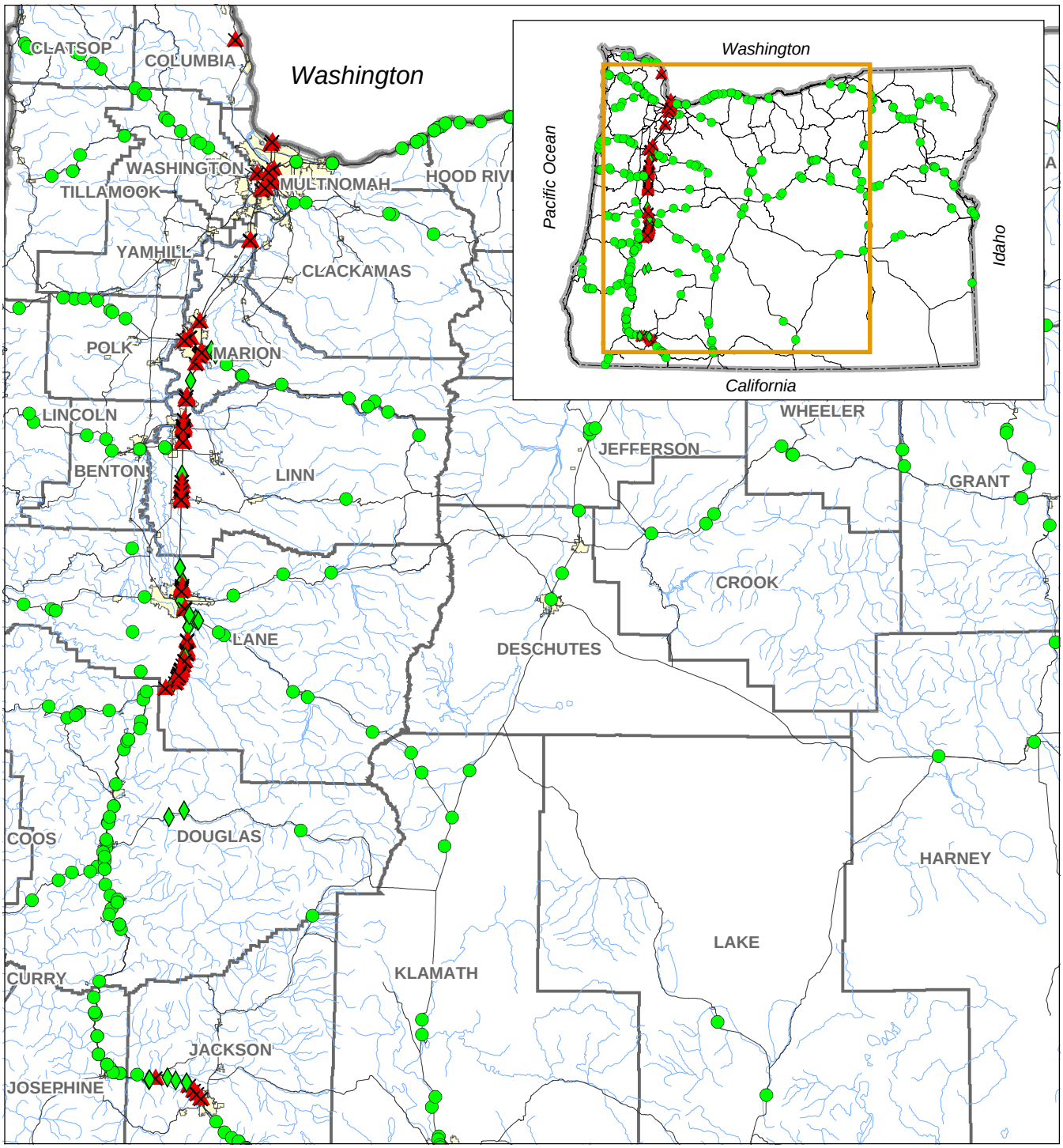
Table 5.5.19-1. Summary of program bridges where the proposed action may affect water howellia.

		Category 1	Category 2	Category 3	Category 4
Plant Species	Federal Listing Status	No Field Survey Required	Surveyed Bridges with no Rare Plant Populations	Surveyed Bridges with Rare Plant Populations	Remaining Bridges to be Surveyed
Water Howellia	T	304	34	0	92

The likelihood of future surveys documenting additional occurrences of water howellia is fairly low because the program bridge APIs with the highest potential for the occurrence of water howellia (based on proximity to ORNHIC records) were surveyed by ODOT in 2003. Nonetheless, the Bridge Program has the potential to affect water howellia at the 92 Bridge Program sites that remain to be surveyed. Direct effects of the proposed action on (i.e., incidental take of) water howellia will be avoided at all bridge sites by the implementation of the Plant Avoidance Environmental Performance Standard. Indirect adverse effects of the proposed action on water howellia (i.e., via the air, water, chemical, and vegetation effects pathways) will be greatly reduced by the implementation of the other referenced environmental performance standards.

5.5.19.4 Determination of Effect

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, not likely to adversely affect** for water howellia. Past and future plant survey efforts, and the application of environmental performance standards at all bridge APIs (whether or not they actually contain water howellia occurrences) will serve to minimize the threat to water howellia to the greatest extent practicable. If adherence to all of the environmental performance standards is not possible at a specific bridge site, then individual consultation with the USFWS will be necessary for this species.



OTIA III Bridges

- Remaining Survey Required (Category 4) -- 92 Bridges
- Surveyed, Presence Confirmed (Category 3) -- 0 Bridges
- Surveyed, Absence Confirmed (Category 2) -- 34 Bridges
- No Survey Required (Category 1) -- 304 Bridges
- City
- Streams and Rivers
- County
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.5.19-1

OTIA III: Statewide Bridge Delivery Program
Water Howellia

N W E S

0 5 10 20 30 40 50
Miles

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
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5.5.20 Western Lily (*Lilium occidentale*)

5.5.20.1 Life History and Status

The western lily (*Lilium occidentale*) was Federally listed as an endangered species on August 17, 1995 (August 17, 1994, 59 FR 42171). The range of this species is confined to the Coast Range ecoregion (Robinson 2003) (Figure 5.5.20-1), within an extremely restricted area of approximately 200 miles along the Pacific coastline—from Hauser, Coos County, Oregon, south to Humboldt Bay, California (August 17, 1994, 59 FR 42171, USFWS 1998c). Critical habitat has not been designated for this species (August 17, 1994, 59 FR 42171).

Western lily is a perennial herb that grows up to 5 feet tall and has as many as 10 nodding flowers per stem (Eastman 1990). This species can be distinguished from similar *Liliaceae* species by several features; crimson red flowers with yellow to green centers in the shape of a star; highly reflexed petals; non-spreading stamens closely surrounding the pistil; and an unbranched rhizomatous bulb (August 17, 1994, 59 FR 42171). Western lily blooms from late June through July; plants may take 4-5 years to flower for the first time and may live for more than 25 years (USFWS 1998c, Eastman 1990).

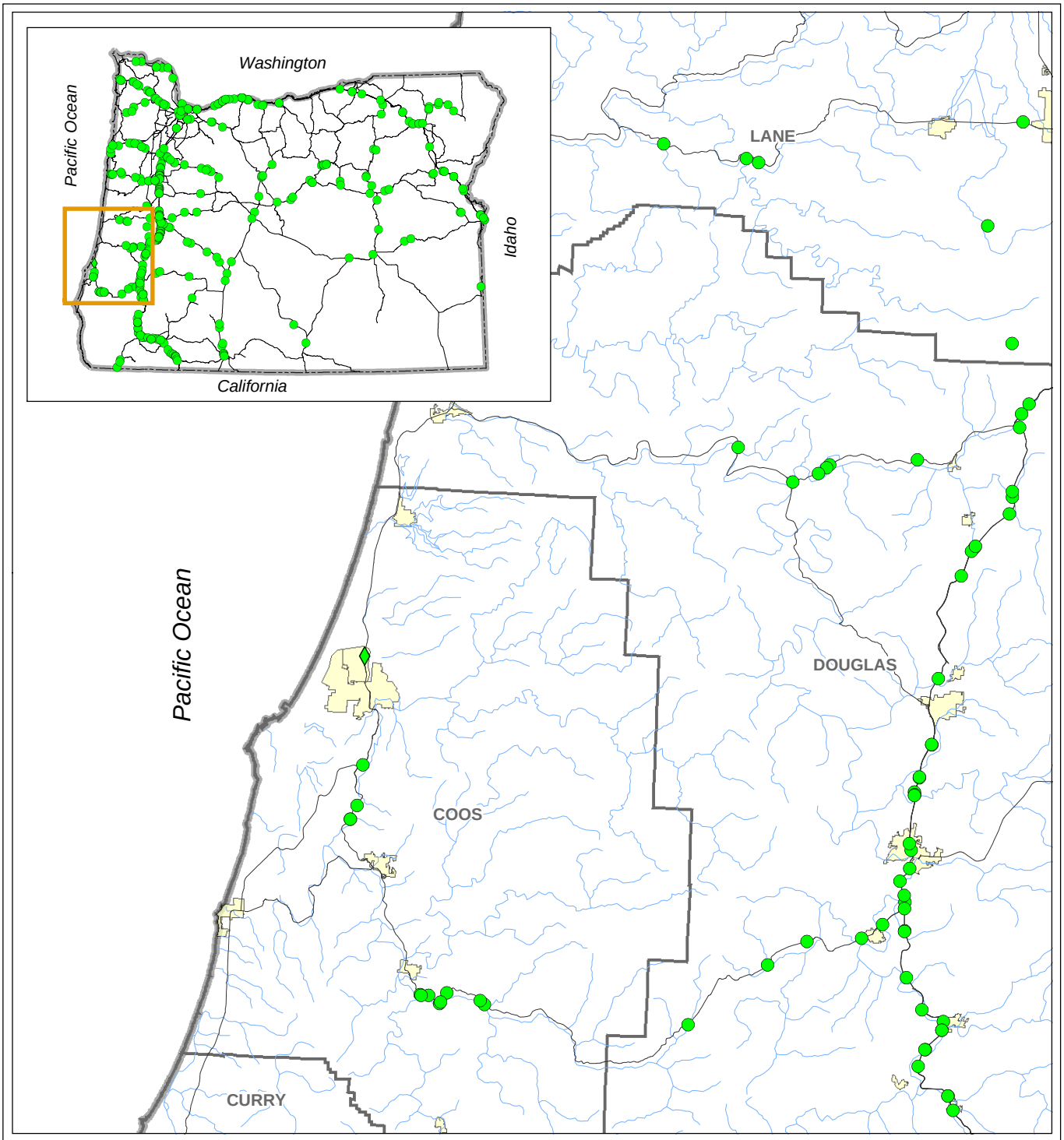
Common associates include coast pine (*Pinus contorta*), sitka spruce (*Picea sitchensis*), wax-myrtle (*Myrica californica*), Labrador tea (*Ledum glandulosum*), Douglas' spiraea (*Spiraea douglasii*), western rhododendron (*Rhododendron macrophyllum*), evergreen huckleberry (*Vaccinium ovatum*), salal (*Gaultheria shallon*), blackberry (*Rubus* spp.), Pacific reedgrass (*Calamagrostis nutkaensis*), sedge species (*Carex* spp.), sphagnum moss (*Sphagnum* spp.), California pitcher-plant (*Darlingtonia californica*), and king's scepter gentian (*Gentiana sceptrum*). Potential threats to western lily include extensive habitat destruction by cranberry farm development, livestock grazing, and highway construction. Other threats include collection and habitat loss due to decades of fire suppression (August 17, 1994, 59 FR 42171).

5.5.20.2 Analysis of Effects

The USFWS screening process (Section 5.5.1) was used to determine which program bridges may affect western lily (Robinson 2003). The results of this screening process indicated that one bridge site was located within the known range of western lily and required a survey. ODOT surveyed this bridge in 2003 and no western lily plants were identified (Figure 5.5.20-1).

5.5.20.3 Determination of Effects

Results of the USFWS screening process and the ODOT surveys indicated that all Bridge Program APIs are either located outside the known range of western lily or do not have an occurrence of this species. Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **no effect** for western lily.



OTIA III Bridges

- Remaining Survey Required (Category 4) -- 0 Bridges
- Surveyed, Presence Confirmed (Category 3) -- 0 Bridges
- Surveyed, Absence Confirmed (Category 2) -- 1 Bridge
- No Survey Required (Category 1) -- 429 Bridges
- City
- Streams and Rivers
- County
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

N W E S

0 2 4 8 12 16 20

Miles

Figure 5.5.20-1

OTIA III: Statewide Bridge Delivery Program Western Lily

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Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
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5.5.21 Willamette Daisy (*Erigeron decumbens* var. *decumbens*)

5.5.21.1 Life History and Status

Listing and Critical Habitat

The Willamette daisy (*Erigeron decumbens* var. *decumbens*) was Federally listed as an endangered plant on January 25, 2000 (January 25, 2000, 65 FR 3875). The species merited listing because the few remaining populations in the Willamette Valley are threatened by commercial and residential development, agriculture, silvicultural practices, road improvement, collection, herbicide use, and naturally occurring demographic and environmental events. Critical habitat has not been designated for Willamette Daisy (January 25, 2000, 65 FR 3875).

Plant Description

The Willamette daisy is a small perennial herb that grows from 6-28 inches tall, with erect to sometimes prostrate stems at the base. The basal leaves often wither prior to flowering, but are mostly linear, 2-5 inches long and 0.1-0.23 inch wide. Flowering stems produce two to five heads, each of which is daisy-like with pinkish to pale blue ray flowers and yellow disk flowers. The ray flowers fade to white with age. Flowering typically occurs in June and July, and seeds are released in July and August (January 25, 2000, 65 FR 3875, Eastman 1990, Meinke 1982). Although the seeds are wind-dispersed, the short stature of this species likely prevents the long-distance travel of many seeds. In addition to sexual reproduction, the Willamette daisy is also capable of vegetative spreading, and is commonly found in large clumps scattered throughout a site (January 25, 2000, 65 FR 3875).

Habitat, Range, and Associated Species

The Willamette daisy is restricted primarily to native prairie habitat in the Willamette Valley ecoregion of Oregon. Once widespread throughout the valley, the species is now limited to a few sites in Benton, Clackamas, Lane, Linn, Marion, Polk, Washington, and Yamhill Counties (January 25, 2000, 65 FR 3875, USFWS 2002f).

The Willamette daisy primarily occupies native wetland prairie grassland habitats. This habitat is characterized by the seasonally wet tufted hairgrass (*Deschampsia cespitosa)* community that occurs on low, flat regions of the valley where flooding creates anaerobic and strongly reducing soil conditions. The wetland prairie community also includes rush (*Juncus* spp.) and California oatgrass (*Danthonia californica)* as co-dominants, in addition to introduced species such as tall fescue (*Festuca arundinacea)*, Japanese brome (*Bromus japonicus)*, and sweet vernal grass (*Anthoxanthum odoratum)*. Bradshaw's lomatium (*Lomatium bradshawii)*, a Federally listed endangered species, has also been known to occur with Willamette daisy (January 25, 2000, 65 FR 3875).

Two atypical Willamette daisy populations have also been discovered on top of a dry, stony butte in an upland prairie in the Willamette Valley (January 25, 2000, 65 FR 3875). Dominant

associated species in this upland prairie habitat include red fescue (*Festuca rubra)* and Idaho fescue (*Festuca idahoensis*), while Tolmie's mariposa (*Calochortus tolmiei)*, Hooker's catchfly (*Silene hookeri*), broadpetal strawberry (*Fragaria virginiana)*, rose check-mallow (*Sidalcea virgata)*, and lomatium spp. (*Lomatium spp.)* serve as herbaceous indicator species.

Most Willamette Valley grasslands are early seral habitats, requiring natural or human-induced disturbance for their maintenance. Consequently, fire suppression and woodland succession have resulted in a reduction in the number of acres of Willamette Valley grasslands, while the conversion of this resource to agricultural and urban uses has also had drastic consequences. Of the estimated 1,010,000 acres of historic native grasslands extant prior to 1850, approximately 685,000 acres appear to have consisted of upland prairie and 325,000 acres appear to have consisted of wet prairie (January 25, 2000, 65 FR 3875). Current estimates of the remaining native upland prairie in the Willamette Valley indicate fewer than 988 acres (USFWS 2002g). Similar losses have occurred for wet prairie habitats, but estimates and current acreages are not available; however, it is estimated that over 99% of the known habitat for this species has been lost due to human alteration (January 25, 2000, 65 FR 3875, USFWS 2002g).

Occurrences and Population Status

Since 1980, the Willamette daisy has been identified at 48 remnant prairie sites in Polk, Marion, Linn, Benton, and Lane Counties, for a total of approximately 160 acres. The plant is known to have been extirpated from an additional 19 historic locations (USFWS 2002g). The largest known occurrence of Willamette daisy was approximately 6,000 plants, and this population was plowed under in 1986 prior to the development of an industrial and residential site. Many of the sites occupied by the Willamette daisy are less than 8.3 acres in size (January 25, 2000, 65 FR 3875), and these small acreage sites, often along roadside and fenceline boundaries, face an immediate threat of destruction from a variety of disturbances. These small and fragmented populations are also more vulnerable to environmental changes than relatively large and contiguous populations (USFWS 2002g).

Table 5.5.21-1 represents the current range-wide distribution of known Willamette daisy sites (USFWS 2002f). A number of these sites are relatively secure and are being managed to benefit this and other native prairie species. Approximately 59% of extant occupied habitat is currently protected at 18 sites, including lands managed by the US Army Corps of Engineers (COE), The Nature Conservancy (TNC), the BLM, and the USFWS Refuge System.

Table 5.5.21-1. Summary of current rangewide knowledge for Willamette daisy sites.

Site Name	Area (acres)	Ownership	Protected
Willow Creek Preserve 1	11.3	TNC	11.3
Willow Creek Preserve 2	0.48	TNC	0.48
Willow Creek Preserve 3	0.79	TNC	0.79

Table 5.5.21-1. (continued).

Site Name	Area (acres)	Ownership	Protected
Willow Creek Preserve 5	2.2	TNC	2.2
Bald Hill City Park 0	2.5	City of Corvallis	2.5
Bald Hill City Park 1	0.59	City of Corvallis	0.59
Green Hill Road S. of RR 1	10.9	Ownership Unknown. Possibly BLM.	10.9
Green Hill Road S. of RR 3	5.8	Ownership Unknown. Possibly Private.	0
NW of Green Hill Road & West 11th	3.8	Private	0
Green Hill Road N. of RR 5	1.1	Private	0
ODOT Right of Way	2.5	ODOT	2.5
Green Hill Road S. of RR 7	0.59	Ownership Unknown. Possibly Private.	0
Green Hill Road North of RR 9	3	Ownership Unknown. Possibly Private.	0
Fisher Butte	26.8	COE	26.8
Fisher Butte Dike	4.1	COE	4.1
East Coyote	4.9	COE	4.9
Eugene Speedway 1	7.3	Private	0
Eugene Speedway 2	4.1	Private	0
Goshen	1.7	Private/ ODOT	0
Danebo & Hwy 126	1.2	BLM (not extant)	0
West 18th Av.	3.7	Private	0
Sublimity 0	0.6	Private	0
Sublimity 1	0.63	Private	0
Kingston - Lyons Road 0	3.5	Private	0
Kingston - Lyons Road 1	1.1	Private	0
Kingston - Lyons Road 2	0.43	Private	0

Table 5.5.21-1. (continued).

Site Name	Area (acres)	Ownership	Protected
Shelburne Drive	0.16	Ownership Unknown. Possibly County.	0
Grand Ronde 1	0.39	Private	0
Grand Ronde 2	0.38	Private	0
Grand Ronde 3	0.7	Private	0
Starlight Road.	3.9	Private	0
Danebo Drag Strip 0	0.49	BLM	0.49
Danebo Drag Strip 1	0.25	BLM	0.25
Anderson Road	2.5	Ownership Unknown. Possibly BLM.	0
Baskett Butte	5.2	USFWS	5.2
Baskett Butte-N. Boundary	2.7	USFWS	2.7
McKenzie View Drive	1.5	Private	0
Sanford Road. 1	0.73	Private	0
Sanford Rd. 2	0.34	Private	0
Wallis Street	3.3	Private	0
Muddy Creek	1.1	USFWS (not extant)	0
Amazon Canal 1	4.6	BLM	4.6
Amazon Canal 2	4.6	Ownership Unknown	0
Neilson Road	1.4	Ownership Unknown	0
Belts Road	2.4	Ownership Unknown	0
Totals	158.1		93.6

Source: USFWS 2002f.

Summary of Threats

In summary, the Willamette daisy is threatened by commercial and residential development, agriculture, silvicultural practices, road improvement, collection, herbicide use, and naturally occurring demographic and environmental events (January 25, 2000, 65 FR 3875). Critical habitat has not been designated and a recovery plan for Willamette daisy has not been prepared.

5.5.21.1 Species-Specific Effects Pathways

Effects pathways include the media through which effects are delivered to the Willamette daisy. All effects on the Willamette daisy are delivered through the displacement, disruption, removal, or addition of one or more of the following:

Soil

The Willamette daisy occurs in wetland habitats and has limited occurrences in upland habitats. Because the species may be present in both wetland and upland areas, any of the ground-disturbing activities associated with the proposed actions may affect this species. Soil erosion from these activities may destroy existing Willamette daisy habitat or limit the potential for new functional habitat development. Ground disturbances within wetland habitats will likely cause more disturbances to populations or accompanying functional habitat than ground disturbances in upland areas, because these effects are compounded by the presence of water. In addition, Willamette daisies are far more common in wetland prairie habitats than in upland habitats.

The effects of airborne dust on the Willamette Daisy will vary, because it is a perennial plant species that can reproduce either sexually or vegetatively. Reductions in plant growth and vigor resulting from airborne sediment accumulation may also vary, depending on the preferred reproductive strategy of the local Willamette daisy occurrence. Overall, reductions in plant health, vigor, and reproductive capability will likely result from airborne sediment accumulation. The implementation of the Plants Environmental Performance Standard, Pollution and Erosion Control Environmental Performance Standard, Habitat Avoidance Environmental Performance Standard and Site Restoration Environmental Performance Standard (Section 3.3) will minimize adverse effects on Willamette daisy resulting from airborne dust, erosion, and ground disturbance.

Water

The Willamette daisy may be found in upland or wetland areas; occurrences in upland areas are considered atypical, since this species normally prefers native wetland prairie habitat. Consequently, any of the proposed actions that alter existing runoff patterns or hydrologic regimes could adversely effect documented Willamette daisy populations, or limit the potential for new functional habitat development. Willamette daisies in wetlands may be adversely affected if changes in hydrologic regimes cause decreases in available water supply in occupied habitat or potential functional habitat. Conversely, Willamette daisy occurrences in upland areas may also be affected should changes in hydrologic

regimes cause an increase in the local water supply. The Water Quality Environmental Performance Standard and the Fluvial Environmental Performance Standard have been developed to minimize adverse effects on this species through the water effects pathway.

Chemical

As a perennial upland or wetland species that can reproduce either by seed or vegetatively, the Willamette daisy may be affected by herbicide application, accidental chemical discharges, or inadvertent fuel and oil spills. Herbicide applications or accidental chemical discharges may cause a temporary loss of seasonal growth (above-ground foliage), or the death of the plant. For plants that reproduce by seed, effects from chemical exposure may cause seeds to become infertile, thus limiting potential population growth over the long term. Chemical applications or accidental chemical discharges in occupied wetland habitat may be more harmful than in occupied upland habitat because of the increased dispersal rate of chemicals in aquatic versus soil mediums. Implementation of the Pollution & Erosion Control Environmental Performance Standard will minimize adverse effects on this species through the chemical effects pathway.

Vegetation

Vegetation removal associated with the proposed action may eliminate or modify the habitat elements necessary for survival of Willamette daisy. The Willamette daisy is not typically found in shaded habitats. Thus, the removal of overstory trees or vegetation may benefit Willamette daisy. Willamette daisy may be adversely affected in the long-term if trees are planted near existing occurrences or if invasive species introduced as a result of vegetation removal out-compete Willamette daisy plants. Implementation of the Plant Avoidance Environmental Performance Standard will minimize adverse effects on this species through the vegetation effects pathway.

Species

Repair and replacement of the program bridges may cause Willamette daisy plants to be trampled, mowed, or disturbed to the extent that the species is directly affected. Clumps of Willamette daisy may be difficult to transplant for relocation or mitigation purposes, as the root structure of the clumps is interconnected, and clumps can be relatively large. Many sites occupied by Willamette daisy are small and fragmented. Further fragmentation of these small populations may lead to losses of genetic diversity and increased species vulnerability to disease or environmental changes. Larger populations will likely be less affected by species or habitat losses, although larger populations are often important seed sources for mitigation and propagation. Implementation of the Plant Avoidance Environmental Performance Standard will eliminate direct effects on this species.

5.5.21.3 Analysis of Effects

The results of the screening process (Section 5.5.1) and of the surveys conducted to date for Willamette daisy are summarized in Table 5.5.21-2. Figure 5.5.21-1 graphically depicts previous survey results and upcoming survey needs.

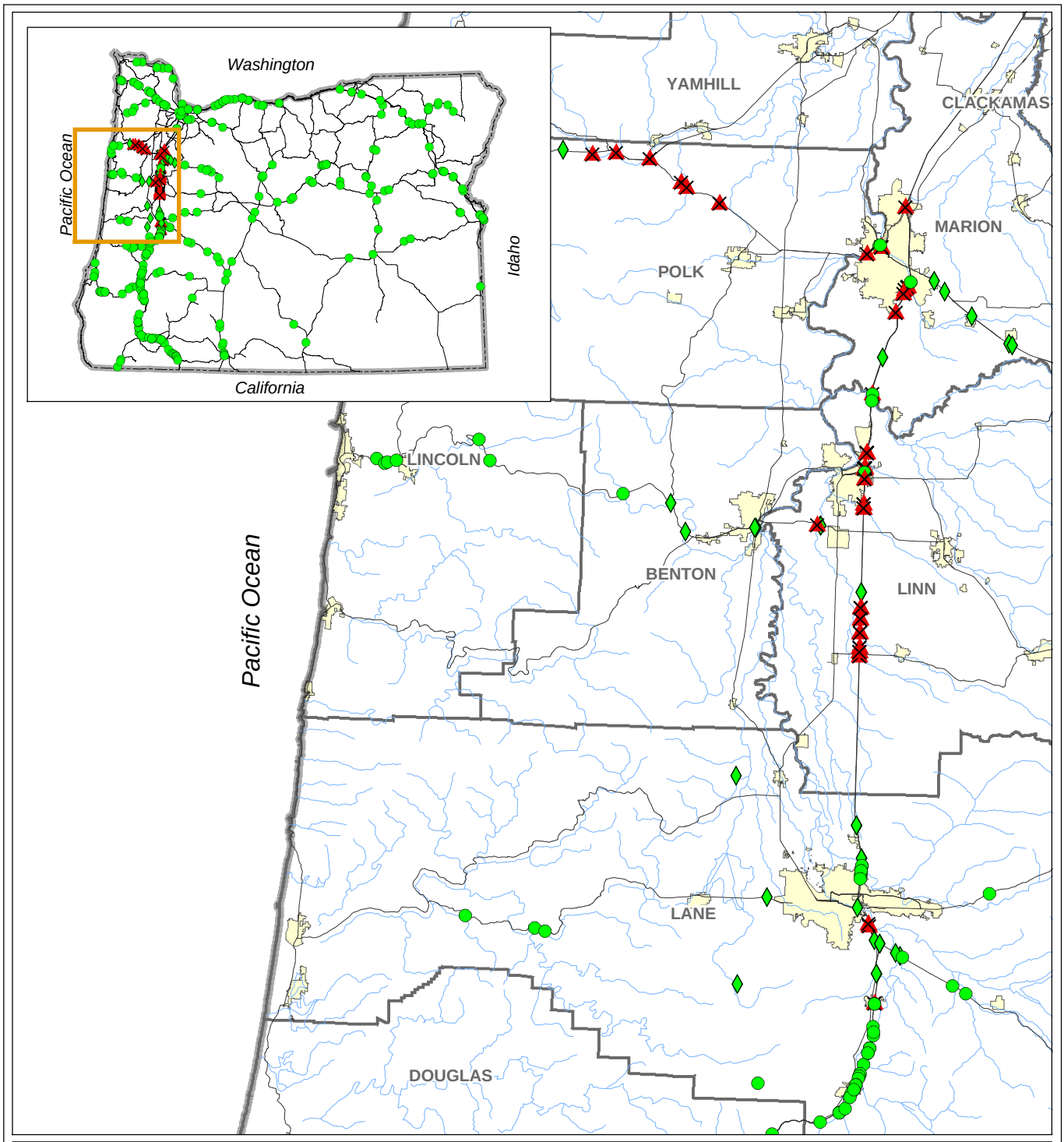
Table 5.5.21-2. Summary of program bridges where the proposed action may affect Willamette daisy.

		Category 1	Category 2	Category 3	Category 4
Plant Species	Federal Listing Status	No Field Survey Required	Surveyed Bridges with no Rare Plant Populations	Surveyed Bridges with Rare Plant Populations	Remaining Bridges to be Surveyed
Willamette Daisy	E	356	30	0	44

The likelihood of future surveys documenting additional occurrences of Willamette daisy is fairly low because the program bridge APIs with the highest potential for the occurrence of Willamette daisy (based on proximity to ORNHIC records) were surveyed by ODOT in 2003. Nonetheless, the Bridge Program has the potential to affect the Willamette daisy at the 44 Bridge Program sites that remain to be surveyed. Direct effects of the proposed action on (i.e., incidental take of) Willamette daisy will be avoided at all bridge sites by the implementation of the Plant Avoidance Environmental Performance Standard. Indirect adverse effects of the proposed action on Willamette daisy (i.e., via the air, water, chemical, and vegetation effects pathways) will be greatly reduced by the implementation of the other referenced environmental performance standards.

5.5.21.4 Determination of Effect

Based on this analysis for the Bridge Program, ODOT/FHWA makes a determination of **may affect, not likely to adversely affect** for Willamette daisy. Past and future plant survey efforts, and the application of environmental performance standards at all bridge APIs (whether or not they actually contain Willamette daisy occurrences) will serve to minimize effects on the Willamette daisy to the greatest extent practicable. If adherence to all of the environmental performance standards is not possible at a specific bridge site, then individual consultation with the USFWS will be necessary for this species.



OTIA III Bridges

- Remaining Survey Required (Category 4) -- 44 Bridges
- Surveyed, Presence Confirmed (Category 3) -- 0 Bridges
- Surveyed, Absence Confirmed (Category 2) -- 30 Bridges
- No Survey Required (Category 1) -- 356 Bridges
- City
- Streams and Rivers
- County
- Highway
- State Boundary

This product is for informational purposes, and may not be suitable for legal, engineering or surveying purposes. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user.

Figure 5.5.21-1

OTIA III: Statewide Bridge Delivery Program
Willamette Daisy

N W E S

0 2 4 8 12 16 20
Miles

MB&G
Mason, Bruce & Girard, Inc.
Natural Resource Consultants since 1921

Spatial Data Source: See Document Bibliography.
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6.0 Cumulative Effects

Cumulative effects, as defined in 50 CFR Section 402.02, include the effects of future State, Tribal, local, or private actions that are reasonably certain to occur within the action area. Future Federal actions requiring separate consultations pursuant to Section 7 of the ESA are not considered in this analysis.

The geographic scope and duration of the Bridge Program, and the multiple pathways by which it may affect listed species, make it all but certain that such non-Federal actions will occur and will cumulatively affect the Federally listed species addressed herein. A recently completed Biological Opinion addressed the cumulative effects of the Federal Columbia River Power System at spatial and temporal scales similar to those of the Bridge Program (NOAA Fisheries 2000b), providing a useful framework for assessing cumulative effects of the Bridge Program due to State, Tribal, local, and private actions that are reasonably certain to occur in the future.

Cumulative effects are possible in the short term during the construction of program bridges, as well as during the lifespan of repaired or replaced bridges (a period of approximately 50-75 years). However, the Bridge Program will adhere to the environmental performance standards detailed in Section 3 to minimize both short and long-term adverse effects on listed species; this will also help to reduce the magnitude of adverse cumulative effects resulting from future actions.

State, Tribal, and local government actions resulting in cumulative effects may be in the form of legislation, administrative rules, or policy initiatives; of actions taken to improve sustainability in forest lands or to improve aquatic habitat; or of actions taken in response to human population growth, such as changes in land and water use patterns, road density, or ownership. Any of these could affect listed species or their habitat. Though such actions are likely to occur, the uncertainty regarding the kind and scope of these actions, and the numerous government entities and jurisdictions involved, make analysis of cumulative effects speculative at best.

The actions proposed herein involve the repair or removal of 430 highway bridges throughout Oregon; these actions are linked to population growth. However, as discussed in Section 4, the Bridge Program is a response to existing—not anticipated—population growth, and the proposed actions are not expected to induce growth, or to increase the likelihood of cumulative effects over and above existing conditions.

Non-Federal actions that may cumulatively affect listed species are expected to increase in direct proportion to population. Actions tied to population growth that may affect listed species within Oregon include, but are not limited to: development associated with urban, water, flood control, highway/roadway and utility projects; the application of pesticides; the conversion of habitat to agricultural uses; and the application of seasonal water to create irrigated pastures. Urbanization is the greatest threat to watersheds from the standpoint of cumulative effects (Friedrichsen 1998 and May 1996).

The Office of Economic Analysis has projected that all counties in Oregon will experience positive population growth by the year 2015 (ODAS 1997). Central Oregon (Deschutes, Jefferson, Crook, and Wheeler Counties) is projected to be the fastest-growing region in the state. By 2010, Deschutes County is predicted to grow 48%, Jefferson County by 47%, Crook County by 28%, and Wheeler County by 24%. The counties surrounding the major urban areas of Portland (Washington, Clackamas, and Yamhill Counties), Salem (Marion, Polk, and Linn), and Medford (Jackson, Josephine, and Curry) are also predicted to have particularly significant population growth by 2015 (Table 6.0-1). On average, statewide population is expected to increase by six percent from 2000 to 2005, 12% from 2005 to 2010, and 18% from 2010 to 2015. It is likely that cumulative effects will be greatest in those locations that experience the most population growth.

Table 6.0-1. Percent change in population in the State of Oregon by county[1].

State/County	Number of Bridges	2000	2005	Percent Change	2010	Percent Change	2015	Percent Change
Baker	10	17,349	18,001	4	18,635	7	19,267	11
Benton	5	79,291	82,116	4	85,080	7	88,167	11
Clackamas	8	338,247	369,683	9	403,915	19	441,193	30
Clatsop	9	35,622	36,919	4	38,376	8	40,018	12
Columbia	6	41,780	43,722	5	45,777	10	47,954	15
Coos	13	63,612	64,950	2	66,338	4	67,870	7
Crook	3	17,168	18,662	9	20,215	18	21,892	28
Curry	0	24,699	26,643	8	28,576	16	30,541	24
Deschutes	3	112,846	132,829	18	151,230	34	167,231	48
Douglas	53	102,344	106,652	4	111,068	9	115,713	13
Gilliam	0	1,992	2,032	2	2,071	4	2,116	6
Grant	9	8,292	8,517	3	8,742	5	8,989	8
Harney	5	7,531	7,606	1	7,651	2	7,694	2
Hood River	12	20,152	21,477	7	22,804	13	24,174	20
Jackson	26	177,982	188,746	6	199,415	12	210,373	18
Jefferson	4	18,763	21,468	14	24,376	30	27,530	47
Josephine	20	76,608	81,040	6	85,319	11	89,596	17
Klamath	15	64,996	68,099	5	71,376	10	74,868	15
Lake	2	7,779	7,982	3	8,171	5	8,354	7
Lane	66	331,464	352,944	6	374,499	13	397,350	20
Lincoln	11	44,689	47,190	6	49,794	11	52,539	18
Linn	34	104,894	110,573	5	116,053	11	121,593	16
Malheur	9	31,762	32,799	3	33,793	6	34,819	10

Table 6.0-1. (continued).

State/County	Number of Bridges	2000	2005	Percent Change	2010	Percent Change	2015	Percent Change
Marion	21	285,975	308,364	8	331,025	16	354,561	24
Morrow	1	9,828	10,723	9	11,594	18	12,463	27
Multnomah	19	659,087	676,975	3	694,597	5	713,532	8
Polk	12	60,719	65,040	7	69,402	14	73,940	22
Sherman	2	1,925	1,974	3	2,020	5	2,068	7
Tillamook	4	24,761	26,143	6	27,538	11	29,030	17
Umatilla	10	69,854	72,870	4	75,869	9	78,936	13
Union	11	24,927	25,422	2	25,927	4	26,439	6
Wallowa	3	7,458	7,632	2	7,815	5	8,025	8
Wasco	7	23,198	23,713	2	24,258	5	24,867	7
Washington	9	422,886	467,233	10	510,564	21	554,945	31
Wheeler	8	1,697	1,833	8	1,966	16	2,100	24
Yamhill	0	83,826	92,429	10	101,152	21	110,253	32
Average Increase				**6**		**12**		**18**

[1] Source: County Population Forecasts. Office of Economic Analysis, Department of Administrative Services, State of Oregon. January 1997.

State and Tribal governments may take actions that serve to counter or exacerbate actions resulting from population growth. State, local, and Tribal actions that may cumulatively affect Federally listed species are described below.

6.1 State Actions

The State of Oregon administers the allocation and use of water resources within its borders. New water developments, transfers of points of diversion, inter-basin transfers, increased impervious surface, and continued use of limited groundwater may act cumulatively with the proposed action to aggravate adverse effects to listed species.

Most future State actions affecting aquatic and riparian resources are governed by the Oregon Plan for Salmon and Watershed (Oregon Plan) measures. The purpose of the Oregon Plan is to improve water quality and to restore Oregon's wild salmon and trout populations and fisheries to sustainable and productive levels that will provide substantial environmental, cultural, and economic benefits. The improvement of habitat features by State actions implemented pursuant to the Oregon Plan will benefit fish and wildlife dependent on aquatic or riparian habitat. These actions may counter some of the adverse cumulative effects of increased population.

6.2 Local Actions

As noted above, population growth is expected in all Oregon counties over the next decade, and local governments will be required to address the resulting demands for intensified development in rural areas, as well as the increased demands for water, municipal infrastructure, and other resources. Local actions are likely to involve urbanization, which has the greatest potential to cause adverse cumulative effects on Federally listed species.

Goal 5 of Oregon’s Statewide Planning Goals and Guidelines instructs local governments to “adopt programs that will protect natural resources and conserve scenic, historic, and open spaces for present and future generations.” Implementation of Goal 5 has the potential to benefit listed species at the local scale, and potentially aid in offsetting the increased pressures on natural resources caused by increased population growth and urbanization.

6.3 Tribal Actions

Tribal governments can beneficially affect listed species by applying and sustaining comprehensive natural resource programs to areas under their jurisdiction; they can also adversely affect listed species (e.g., by timber harvest). The *Wy-Kan-Ush-Mi Wa-Kish-Wit*, also known as the Spirit of the Salmon Plan, is a joint restoration plan for anadromous fish among the Nez Perce, Umatilla, Warm Springs, and Yakama Tribes through an inter-tribal government administered by the Columbia River Inter-Tribal Fish Commission (CRITFC). The plan emphasizes strategies and principles that rely on natural production and healthy river systems.

CRITFC developed a River Operations Plan (Plan) (CRITFC 2003) for the Federal Columbia River Power System (FCRPS), the Hells Canyon Complex, and mid-Columbia FERC-licensed hydro-projects including Rock Island, Rocky Reach, Wanapum and Priest Rapids. The Plan contains recommendations for water management and dam operations, including flows, reservoir elevations, spill, and fish facility operations. It also contains recommendations for water acquisition. Each of the recommended actions will contribute singularly and cumulatively to mainstem salmon protection. CRITFC believes that the actions in the Plan will likely reduce salmonid mortality rates. Implementation of both plans will likely result in benefits to salmonid species and aquatic habitats, and overall beneficial cumulative effects on listed species and their habitat.

6.4 Private Actions

Determining the effects of private actions is difficult because of the uncertainty associated with privately owned land. Landowner actions may be motivated by Federal, State, and local laws; environmental incentives; or growth and economic pressures. Additionally, changes in ownership patterns may have unknown impacts. Assessing the cumulative effects associated with private actions and land use is speculative, although such actions are a likely, and possibly significant, contributor of cumulative effects on Federally listed species.

Summary

Although State, Tribal, and local governments have developed plans and initiatives to benefit listed species, they must be applied and sustained in a comprehensive manner before the Services can consider them "reasonably foreseeable" in a cumulative effects analysis. However, in light of projected population growth, the broad geographic scope of this consultation, the duration of the proposed action, and the number of ongoing or planned actions by State, Tribal, and local governments, cumulative effects are likely to occur. However, programs identified in the Oregon Plan, and the emphasis on avoidance and minimization of adverse effects on listed species inherent in the design of bridges within the Bridge Program, may reduce or offset both short- and long-term cumulative effects.