UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to:
2002/00175

December 4, 2002

Mr. Fred Patron
U.S. Department of Transportation
Federal Highway Administration
The Equitable Center, Suite 100
530 Center Street NE
Salem, OR 97301

Re: Endangered Species Act Section 7 Consultation and Magnuson-Stevens Act Essential Fish Habitat Consultation for Kitson Ridge Road - West Salt Creek Tunnel Project in the Middle Fork Willamette River Watershed, Lane County, Oregon.

Dear Mr. Patron:

The National Marine Fisheries Service (NOAA Fisheries) has enclosed the biological opinion (Opinion) that addresses the proposed Kitson Ridge Road - West Salt Creek Tunnel Project in Lane County, Oregon. The biological assessment (BA) was received on March 25, 2002. Federal Highway Administration (FHWA) funds would partially finance this project and constitute the Federal nexus. The Oregon Department of Transportation (ODOT) is responsible for the project design and management.

This Opinion considers the potential effects of the project on Upper Willamette River (UWR) chinook salmon (*Oncorhynchus tshawytscha)* which occurs in the proposed project area. The UWR chinook salmon was listed as threatened under the ESA on March 24, 1999 (64 FR 14308). NOAA Fisheries issued protective regulations under section 4(d) of the ESA on July 10, 2000 (65 FR 42422). NOAA Fisheries concludes that the proposed action is not likely to jeopardize UWR chinook salmon. Included in the enclosed Opinion is an incidental take statement with terms and conditions to minimize the take of the subject species.

The proposed actions addressed in this Opinion all occur upstream from Dexter Dam on the Middle Fork Willamette River, upstream of chinook salmon essential fish habitat (EFH) (PFMC 1999). Therefore, the proposed actions would have no effect on designated chinook salmon EFH.

Questions regarding this letter should be directed to Tom Loynes of my staff in the Oregon State Branch Office at (503) 231-6892.

Sincerely,

for D. Robert Lohn
Regional Administrator

cc: Molly Cary, ODOT
Nick Testa, ODOT
Brian Bauman, ODOT
Ken Franklin, ODOT
Randy Reeve, ODFW
Zak Toledo, Mason, Bruce and Girard, Inc.
Mike Bonoff, Mason, Bruce and Girard, Inc.

Endangered Species Act - Section 7 Consultation

BIOLOGICAL OPINION

Kitson Ridge Road - West Salt Creek Tunnel Project
Willamette Highway
Lane County, Oregon

Agency:	Federal Highway Administration
Consultation Conducted By:	National Marine Fisheries Service, Northwest Region
Date Issued:	December 4, 2002
Issued by:	for D. Robert Lohn Regional Administrator
Refer to:	**2002/00175**

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1. ENDANGERED SPECIES ACT

1.1 Background

On March 25, 2002, the National Marine Fisheries Service (NOAA Fisheries) received a request from the Federal Highway Administration (FHWA) for Endangered Species Act (ESA) section 7 formal consultation for the Kitson Ridge Road - West Salt Creek Tunnel Project. Information on changes to the proposed action and design information was requested and received on August 23, 2002. FHWA funds would partially finance this project, and would constitute the Federal nexus. The Oregon Department of Transportation (ODOT) is responsible for the project design and management.

Salt Creek is a tributary of the Middle Fork of the Willamette River. The project area is located along the Willamette Highway, approximately 6.8 kilometers (km) east of Oakridge in Lane County. The western edge of the project area is along Salt Creek, approximately 4.3 km upstream of the confluence with the Middle Fork Willamette River, at river-kilometer (RKm) 370. The FHWA is proposing to add passing lanes along the Willamette Highway to improve traffic flow and motorist safety. Road widening, culvert retrofits, and stream enhancement activities are the major elements of this project.

The FHWA determined that the proposed action is likely to adversely affect the Upper Willamette (UWR) chinook salmon, which are present in the project area. The effects determination was made using the methods described in *Making ESA Determinations of Effect for Individual or Grouped Actions at the Watershed Scale* (NOAA Fisheries 1996).

This biological opinion (Opinion) is based on the information presented in the biological assessment (BA) and the result of the consultation process. The consultation process has involved correspondence and communications to obtain additional information and clarify information in the BA.

The proposed actions addressed in this Opinion all occur upstream from Dexter Dam on the Middle Fork Willamette River, upstream of chinook salmon essential fish habitat (EFH) (PFMC 1999). Therefore, the proposed actions would have no effect on designated chinook salmon EFH.

The objective of this Opinion is to determine whether the action to add passing lanes, retrofit culverts, and relocate and enhance the Warner Creek channel, is likely to jeopardize the continued existence of the UWR chinook salmon.

1.2 Proposed Actions

1.2.1 Road Widening and Impervious Surfaces

The project would widen the Willamette Highway, creating a total of approximately 5.6 km of new passing lanes, and resulting in approximately 8 hectares (ha) of new impervious surface. The resulting footprint of the proposed project is approximately 12.5 ha. Nearly all of the vegetation to be removed is mature timber on the north side of the highway opposite Salt Creek. Over time, with potential windthrow and removal of designated danger-trees, the total loss of timber may increase above the estimated project footprint.

Approximately 0.33 ha of wetland areas have been identified in the project area. The majority of the wetlands along the highway corridor are riverine drainages and associated palustrine forested wetlands.

Approximately 110,000 cubic meters (m^3) of fill material would be removed during construction. ODOT intends to place fill material at two existing waste storage locations in the watershed: approximately 30,000 m^3 at Shady Gap, and the remaining 80,000 m^3 at Larrison. Both of these sites have been used in the past and meet ODOT's erosion control requirements. These sites are disturbed and the addition of fill would not further degrade existing habitat.

The ODOT project design team envisions mobile staging at sites to be approved by the project engineer. These sites would be on existing impervious surfaces, and would utilize spill containment plans to contain potential spills of fuel, oil, and other contaminants. Additional staging areas would be limited to previously cleared, compacted, and graveled sites located throughout the project corridor. Hazardous material storage, vehicle maintenance, and refueling would be done 45 meters (m) away from any wetted channels. Some equipment staging may occur within 45 m of wetted channels, such as when the highway is in proximity to, or crosses a tributary of, Salt Creek. Equipment staging in these areas would be limited to non-hazardous materials and vehicle parking.

Quarry rock for the project would be obtained at the existing Beamer Quarry, east of the town of Oakridge. Most of the project equipment would be stockpiled at Heather Flats, slightly west of the quarry location.

1.2.2 Stream Crossings/Culverts

All of the existing culverts within the project corridor would need to be replaced because of the proposed road widening. Many of the culverts are undersized, substandard, or generally in poor condition and cannot be retrofitted to conform to the new roadway configuration.

The culvert designs are based on consultation with ODFW, and the guidelines and criteria in the current Memorandum of Understanding (MOU) between the ODOT, ODFW, and other agencies. The memorandum lists these structure types in order of preference:

1. Bridges
2. Natural streambed simulation using open-bottom arch culverts
3. Natural streambed simulation using embedded culverts
4. Non-embedded culverts placed on flat or near flat slopes
5. Non-embedded culverts with weirs or baffles

Bridges were not selected for this project due to cost considerations. All streams involved in this project are very small, and have minimal fish use, thereby not justifying the cost for bridges. Open-bottom arch culverts were also not selected because of cost and additional impacts associated with the necessary foundation work. The underlying soils are very erodible, and constructing the deep foundations needed for scour resistance would be cost prohibitive.

Due to the subgrade installation of the new culverts, the channel bottom upstream from each culvert would need to be leveled to eliminate the hydraulic jump caused by cobble/gravel bars at the upstream invert. Each culvert inlet and outlet will need to be protected from scour. Riprap will be placed on the upper and lower ends of the culverts to provide this protection.

Water diversion to isolate the work area can use existing culvert channels during construction. If a diversion pipe is used, then it would provide work area isolation and downstream passage. The work area isolation and fish removal will isolate turbidity and minimize impacts to fish.

MP 46.84 Culvert.
The proposed replacement culvert is a 195 centimeter (cm) diameter circular corrugated metal pipe (CMP) with the invert buried 90 cm below the channel bottom on an existing flat grade. This culvert would be installed on a nearly flat grade with the invert below the channel bottom. Gradually, the stream would transport gravel and sediment into the pipe. It is expected the pipe would need to be cleaned every 10 to 20 years, or after major floods.

MP 45.65 Culvert.
The proposed replacement culvert is a 180 cm by 180 cm embedded box culvert. Natural streambed simulation is the recommended design. The gradient is too high to use a pipe culvert, which would scour the bed material out of the bottom of a pipe. A box was also chosen because it is easier to add baffles in the future if needed.

This box would be installed below the channel bottom and the invert would be covered with a 60-cm thick layer of native streambed material before the diversion pipe is removed and flow is rerouted into the culvert. There is a chance that flood vents would scour out some bed material, thereby exposing the pipe.

MP 46.25 Culvert.
The proposed replacement culvert is a 165-cm diameter CMP with baffles. The baffles are designed to provide water depths adequate for large salmonids and jump heights suitable for juvenile fish. Natural streambed simulation would not be likely at this culvert because of gradient and peak flows would wash the material downstream. A jump pool is needed at the

downstream end of the in front of the weirs. This is not a problem and the gravel deposits should be left in-place. This pool would allow the fish to easily jump over the furthest downstream baffle and enter the pipe. This culvert is expected to need little maintenance after installation with the exception of cleaning debris such as branches out of the pipe. Some gravels are expected to accumulate.

MP 46.16 Culvert.
The replacement culvert is an embedded 180-cm by 180-cm box culvert. The culvert would provide a natural streambed simulation. This culvert would be installed on a nearly flat grade with the invert 60 cm below the channel bottom at the outlet. The box would likely need cleaning every 10 to 20 years, or after major flood events.

MP 46.05 Culvert.
The replacement culvert is a 180-cm wide by 90-cm high reinforced concrete box culvert (RCBC) buried 30 cm below the channel bottom. The designed culvert provides natural streambed simulation and would be installed on a nearly flat grade. This box provides the needed hydraulic capacity and it can be durable under the limited fill cover at this location. The box does not have a lot of storage volume and it may need to be cleaned every few years or after flood events.

MP 40.26 Culvert.
There are two replacement options for this site. One is a 180-cm span by 120-cm rise RCBC with the invert buried 30 cm below the channel bottom. The other is a 150-cm diameter CMP culvert with the invert buried 60 cm below the channel bottom. Either culvert can be installed under the proposed road grade. The channel bottom would need to be lowered upstream from the culvert. This culvert would be installed on a nearly flat grade with the invert below the channel bottom. It is expected that the pipe would need to be cleaned every 10 to 20 years, or after major flood events.

MP 39.88 Culvert.
The replacement culvert is a 165-cm diameter CMP with baffles. The baffles are designed to provide jump heights suitable for juvenile salmonids while having adequate pool depths. Natural streambed simulation is not possible due to gradient and peak flows would likely wash the bed material out of the culvert. The culvert type, slope, size, and use of a constructed jump pool at the outlet are based on ODFW recommendations. The downstream end of the culvert projects 2 m beyond the side of the roadway embankment. This culvert should need little maintenance after installation.

1.2.3 Warner Creek

Warner Creek is a small, first-order tributary to Salt Creek near the eastern-most end of the upper project unit. It is a high-gradient, heavily shaded stream, with substrate composed primarily of large cobble and gravels. A waterfall just upstream of the railroad tracks, above the Forest Service Road, historically prevented fish access to most (approximately 2.4 km) of the

length of this stream. The section downstream of the railroad tracks is relatively steep, although the low gradient, braided section near the confluence likely provided both rearing and spawning habitat for anadromous fish. In the mid-1900's, the lower 0.40 km of the stream (beginning just upstream of the Forest Service Road) was diverted out of its natural channel through an impassable culvert, thereby preventing access to any portion of the creek historically used by anadromous fish.

In connection with the Kitson Ridge Road project, ODOT proposes to reconnect Warner Creek to its historic channel, thereby re-establishing access for anadromous fish to approximately 0.40 km of the lower reach of Warner Creek.

1.2.4 Compensatory Mitigation

Compensatory mitigation for the potential project impacts include the lower Warner Creek channel project identified in section 3.0 of the BA, as well as the fish passage improvements on the seven identified culverts throughout the project corridor. The vegetation proposed for removal at the culvert sites provides minimal shading, and occurs at the outer-most extent of documented influence.

Additional fisheries and wetland mitigation would be conducted on the south side of the Willamette Highway by reconnecting Warner Creek with its historic channel into Salt Creek. This new channel will meander between some existing old-growth conifers and some open ground that will benefit from the riparian planting plan. None of the existing old-growth conifers will need to be removed to complete this channel. The broad, open area encompasses approximately 0.8 ha and is relatively open, with evidence of historic skid roads, and is accessed by a short gravel road that leads to Salt Creek. The existing conditions are thin to moderate amounts of sandy loams and organics, underlain by gravels and cobbles, primarily covered with grasses, snowberry, blackberry, and alders, with sparsely distributed Douglas-fir and black cottonwoods. The activities to be conducted at the site would include some grading to deepen portions alongside Warner Creek and planting dogwood, local willow species and cottonwoods, plus incense cedars.

ODOT has developed a riparian planting plan that includes a mixture of conifers, shrubs, herbaceous species, wetland plants, live stakes, and seed mixes. The conifers will be rooted 2-year old plants and in total 275 will be planted. The small wetland area will be adjacent to the new stream channel and will establish some connection with the existing forested wetland downstream near Salt Creek. Stream structure in the form of large wood with rootwads and boulders will be placed in the channel to provide complexity and hydraulic shadow.

1.3 Biological Information

The UWR chinook salmon evolutionarily significant unit (ESU) was listed as threatened under the ESA by the NOAA Fisheries on March 24, 1999 (64 CFR 14308). Biological information on

UWR chinook salmon may be found in the *Status Review of Chinook Salmon from Washington, Idaho, Oregon, and California* (Myers *et al.* 1998).

1.4 Evaluating Proposed Action

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 CFR Part 402.14 (the consultation regulations). NOAA Fisheries must determine whether the action is likely to jeopardize the listed species. The jeopardy analysis involves the initial steps of defining the biological requirements and current status of the listed species, and evaluating the relevance of the environmental baseline to the species' current status.

Subsequently, NOAA Fisheries evaluates whether the action is likely to jeopardize the listed species by determining if the species can be expected to survive with an adequate potential for recovery. In making this determination, NOAA Fisheries must consider the estimated level of mortality attributable to: (1) Collective effects of the proposed or continuing action; (2) the environmental baseline; and (3) any cumulative effects. If NOAA Fisheries finds that the action is likely to jeopardize the listed species, NOAA Fisheries must identify reasonable and prudent alternatives for the action.

For the proposed action, NOAA Fisheries' jeopardy analysis will consider direct or indirect mortality of fish attributable to the action. NOAA Fisheries also will consider the extent to which the proposed action impairs the function of essential elements necessary for migration and rearing OC coho salmon under the existing environmental baseline.

1.4.1 Biological Requirements

The first step in the methods NOAA Fisheries uses for applying the ESA to listed salmon is to define the biological requirements of the species most relevant to each consultation. NOAA Fisheries also considers the current status of the listed species taking into account population size, trends, distribution and genetic diversity. To assess the current status of the listed species, NOAA Fisheries starts with the determinations made in its decision to list salmon for ESA protection and also considers new data available that are relevant to the determination.

The relevant biological requirements are those necessary for salmon to survive and recover to naturally-reproducing population levels, at which time protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance their capacity to adapt to various environmental conditions, and allow them to become self-sustaining in the natural environment. Essential habitat features of the area for the species are substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food (juvenile only), riparian vegetation, space, and safe passage conditions.

For this consultation, the biological requirements are improved habitat characteristics that function to support successful spawning, holding, rearing and migration. The current status of

the listed species in this consultation, based upon their risk of extinction, has not significantly improved since the species was listed and may have worsened.

1.4.2 Environmental Baseline

The current range-wide status of the identified ESU's may be found in Myers *et al.* (1998) and Busby *et al.* (1996). The identified action will occur within the range of UWR chinook salmon. The defined action area is the area that is directly and indirectly affected by the action. The direct effects occur at the project site and may extend upstream or downstream based on the potential for impairing fish passage, hydraulics, sediment and pollutant discharge, and the extent of riparian habitat modifications. Indirect affects may occur throughout the watershed where actions described in this Opinion lead to additional activities or affect ecological functions contributing to stream degradation. As such, the action area for the proposed activities includes the immediate watershed where the riprap and bridge replacement will occur, and those areas upstream and downstream that may reasonably be affected, temporarily or in the long term. For the purposes of this Opinion, the action area is defined as the streambed and streambank of Salt Creek and the tributaries of Salt Creek extending upstream to the top of the project, and downstream to the extent of visible short-term turbidity increases resulting from the project work. Other areas of the Salt Creek watershed are not expected to be directly or indirectly impacted.

UWR chinook salmon occur throughout the Middle Fork of the Willamette River and its tributaries. Adult spring chinook salmon require deep pools within reasonable proximity to spawning areas where they hold and mature for several months between migration and spawning. Preferred spawning and rearing areas have a low gradient (generally less than 3%), but adults often ascend much higher gradient reaches to find desirable spawning areas.

The Salt Creek watershed is forested with the headwaters in the Willamette National Forest near the town of Oakridge. Salt Creek flows 47 km from its headwaters to its confluence with the Middle Fork of the Willamette River.

Salt Creek is not currently listed on the Oregon Department of Environmental Quality (ODEQ) 303(d) List of Water Quality Limited Water Bodies (ODEQ 1999).

Based on the best available information on the current status of UWR chinook salmon range-wide; the population status, trends, and genetics; and the "at risk" environmental baseline conditions within the action area, NOAA Fisheries concludes that the biological requirements of the identified ESUs within the action area are not currently being met. The following habitat indicators are either at risk or not properly functioning within the action area: (1) Physical barriers, (2) large woody debris, and (3) pool frequency. Actions that do not maintain or restore properly functioning aquatic habitat conditions would be likely to jeopardize the continued existence of UWR chinook salmon. This action will maintain pool frequency and LWD levels, and will restore fish passage.

1.5 Analysis of Effects

1.5.1 Effects of Proposed Action

The effects determination in this Opinion was made by evaluating current aquatic conditions, the environmental baseline, and predicting effects of actions on them.

The current status of the site is at risk because of the lack of large woody debris recruitment (LWD), the lack of pool habitat, fish passage barriers, and the proximity of the highway to the stream. All of these aquatic habitat factors will be maintained except for fish passage, which will be restored.

The proposed action has the potential to cause the following impacts to UWR chinook salmon.

In-water Work.
This section of Salt Creek is used for migration, spawning and rearing by listed fish species. Because of the proximity to Salt Creek, a variety of species and life stages may utilize the project reach. Replacement of the culverts and channel modification activities were scheduled so that they would occur during the Oregon Department of Fish and Wildlife (ODFW) defined in-water work period. Upstream fish passage would not be maintained through the water diversion. However, the area does not currently pass fish at times of low flow, so there would not be a change in current conditions during these activities. This project would establish upstream passage for both adults and juveniles. Because of the extent of in-water work and flow diversion associated with this project, the probability of direct harm to fish associated with these actions is reasonably certain to occur.

Water Quality.
As with all construction activities, accidental release of fuel, oil, and other contaminants may occur. Operation of the back-hoes, excavators, and other equipment requires the use of fuel, lubricants, *etc.*, which, if spilled into the channel of a water body or into the adjacent riparian zone, can injure or kill aquatic organisms. Petroleum-based contaminants (such as fuel, oil, and some hydraulic fluids) contain poly-cyclic aromatic hydrocarbons (PAHs), which can be acutely toxic to salmonids at high levels of exposure and can also cause chronic lethal and acute and chronic sublethal effects to aquatic organisms (Neff 1985).

Any in-water work has the potential to increase erosion from the streambank, and turbidity in the river. Possible impacts to water quality could occur from construction-related debris, chemical contamination, and increased turbidity levels. Localized increases of erosion/turbidity during in-water work will likely displace UWR chinook salmon and other fish in the project area and disrupt normal behavior. These effects are expected to be temporary and localized. Water quality impacts would be minimized or avoided through the development and implementation of a pollution control plan (PCP), an erosion and sediment control plan (ESCP), and water diversion/work area isolation measures. Both ODOT Environmental staff and the engineer would review the PCP, and ESCP prior to work commencement.

Containment of the work area and other measures would prevent construction-related debris, chemicals, and excessive turbidity from contaminating the water. The water diversion measures are intended to further minimize impacts to water quality. The removal of the structure and proposed channel modifications would be conducted in the dry, thereby minimizing turbidity and opportunities for contamination. The removed debris would be placed in an approved upland site.

Relocation of the reach of Warner Creek away from the current degraded roadside ditch reach into the mature second growth forest will result in long-term beneficial effects to Warner Creek and Salt Creek. Sanding and de-icing chemicals will not be easily introduced to the stream channel after the relocation away from the road.

Sediment.
Initial introduction of Warner Creek to the new channel and excavation of bank material in the wetted channels at the various culvert connections will temporarily increase releases of sediment. Transportation of sediments to Salt Creek from upland construction activities is also possible. Upland excavation will expose and dislodge soils, increasing erosion and stream turbidity during rainfall. An increase in turbidity from suspension of fine sediments can adversely affect fish and filter-feeding macro-invertebrates downstream of the work site. At moderate levels, turbidity has the potential to reduce primary and secondary productivity; at higher levels, turbidity may interfere with feeding and may injure and even kill both juvenile and adult fish (Spence *et al.* 1996, Berg and Northcote 1985).

To minimize the potential for increased turbidity and disturbance of fish, in-water work will occur only during the Oregon Department of Fish and Wildlife (ODFW) recommended in-water work window (July 1 through August 15) or as approved by NOAA Fisheries and ODFW biologists. During this window, creek flows are typically low, fish presence is reduced, and rainfall is minimal. In-water work area isolation will allow the work to occur in the dry, thereby reducing turbidity and disturbance of fish. During this period, rearing juveniles may be present if water temperatures remain within the tolerance range of local individuals, but adult spawning and egg incubation would not be occurring. The probability of precipitation increases greatly after August 31.

Riprap
Riprap would be installed around the ends of the culverts in the project area. Riprap is necessary to protect and reduce the scour along the west bank, however, use of riprap has the potential to change salmonid migration and rearing behavior. These effects are expected to be long-term, but localized. The riprap would also potentially hinder localized water exchange processes (*i.e.*, hyporheic-surface water exchange) and floodplain connectivity within the small areas adjavent to the culverts. Riprap reduces the complexity and function in riparian and nearshore habitats

Riprap will be placed during the low-water season. Geotextile fabric will be placed underneath the riprap. Some larger rocks may be placed into the flowing stream, however, careful placement of large, clean boulders will minimize turbidity and other impacts to fish.

Loss of Primary Productivity.
The proposed actions will likely result in a short-term reduction in primary productivity in the newly constructed channel relocation reach. As Warner Creek is introduced into the new reach, redistribution of aquatic vegetation and benthic invertebrates will result in a temporary reduction in availability of food for rearing juvenile salmonids. NOAA Fisheries expects long-term increases in the availability of benthic invertebrates as a food source for juvenile salmonids due to: (1) Increases in total channel length; (2) increased complexity of habitat in lower Warner Creek including in-channel placement of large woody debris; and (3) revegetation of the new channel with transplanted native wetland and riparian species.

Hydrology.
Because the project is located away from Salt Creek, the stormwater runoff associated with the passing lanes would have negligible impacts on the hydrology of Salt Creek. This runoff would be a component of channel interception to the stream during a precipitation event. The effects are potential degradation of water quality, and adverse effects to Salt Creek's hydrograph from storm water discharge. Stormwater would be allowed to run through a vegetated ditch prior to infiltration through the riparian zone and into the stream. Chemically contaminated stormwater runoff that flows over the edges of the roadway would then be filtered via biogeochemical processes over vegetated ground prior to entering Salt Creek. Construction of the new culverts will decrease hydraulic constriction, improve fish passage, and improve general ecological connectivity such as sediment transport within the Salt Creek watershed.

Direct Harm.
Isolation of the channel could have direct effects to ESA-listed fish during the fish removal and relocation process. Direct harm to fish species may occur during structure removal and construction activities. The probability of harm is less likely because these activities would be conducted during the ODFW defined in-water work period, when fish presence is less likely. During channel modification activities, passage would be blocked by the diversion and fish would be removed from the work area and relocated to an area with adequate cover and water quality. The resulting lack of upstream fish passage would be the same condition that currently occurs during low flow conditions.

The effects of these activities on UWR chinook salmon and aquatic habitat will be limited by implementing construction methods and approaches, included in the project design, that are intended to avoid or minimize impacts.

As a result of the Warner Creek channel relocation, a roadside reach of degraded channel will be dewatered. Rescue, salvage and relocation of fish and other aquatic species will result in the potential capture and handling of up to 75 juvenile salmonids. Assuming a 5% direct or delayed mortality rate from capture and relocation stress, up to 4 juvenile salmonids may be killed. NOAA Fisheries anticipates up to 75 listed juvenile steelhead or chinook salmon will be handled, resulting in the lethal take of up to four listed juvenile chinook salmon.

1.5.2 Cumulative Effects

"Cumulative effects" are defined in 50 CFR 402.02 as those effects of "future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." The action area for this consultation includes the streambed and streambank of Salt Creek and the tributaries of Salt Creek, extending upstream to the top of the project, and downstream to the extent of visible short-term turbidity increases resulting from the project work. NOAA Fisheries is not aware of any specific future actions which are reasonably certain to occur on non-federal lands within the Salt Creek watershed.

1.6 Conclusion

After reviewing the best available scientific and commercial information available regarding the current status of the UWR chinook salmon ESU considered in this consultation, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is NOAA Fisheries' opinion that the action, as proposed, is not likely to jeopardize the continued existence of these species.

Our conclusion is based on the following considerations: (1) adhering to in-water work timing guidelines, (2) work areas will be isolated and fish will be removed, (3) compensatory mitigation along the lower end of Warner Creek will replace lost functions. Taken together, the conservation measures applied to each part of the project will ensure that any short-term effects to water quality, habitat access, habitat elements, channel conditions and dynamics, flows, and watershed conditions will be minor and timed to occur at times that are least sensitive for the species' life-cycle; and the effects of this action 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 proper functioning condition essential to the long-term survival and recovery at the population or ESU scale.

1.7 Reinitiation of Consultation

This concludes formal consultation on the Kitson Ridge Road - West Salt Creek Tunnel Project. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) The amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species in a manner or to an extent not considered in this Opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species not considered in this Opinion; or (4) a new species is listed or critical habitat is designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

2. INCIDENTAL TAKE STATEMENT

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

2.1 Amount or Extent of Take

NOAA Fisheries anticipates that the action covered by this Opinion is reasonably certain to result in incidental take of UWR chinook salmon because of detrimental effects from increased sediment levels (non-lethal), the potential for direct incidental take during the work area isolation, and delayed mortality due to handling during the fish removal process. Effects of actions such as increased sediment levels are largely unquantifiable in the short-term, and are not expected to be measurable as long-term harm to habitat features, or by long-term harm to UWR chinook salmon behavior or population levels. Therefore, even though NOAA Fisheries expects some low level incidental take to occur due to the actions covered by this Opinion, the best scientific and commercial data available are not sufficient to enable NOAA Fisheries to estimate a specific amount of incidental take to the species itself. In instances such as these, the NOAA Fisheries designates the expected level of take as "unquantifiable." Based on the information in the BA, NOAA Fisheries anticipates that an unquantifiable amount of incidental take is reasonably certain to occur as a result of the actions covered by this Opinion. In addition, NOAA Fisheries expects the possibility exists for handling UWR chinook salmon during the work isolation process resulting in incidental take to individuals during the construction period. NOAA Fisheries anticipates that incidental take of up to 75 UWR chinook salmon (4 lethal) could occur as a result of the work isolation process due to de-watering of the old channel and watering of the new channel. The extent of the take is limited to UWR chinook salmon within the action area. The extent of the take includes the streambed and streambank of Warner Creek and the tributaries of Salt Creek, within the project footprint area of disturbance at the project site, and downstream to the extent of visible short-term turbidity increases resulting from the project work.

2.2 Reasonable and Prudent Measures

NOAA Fisheries believes that the following reasonable and prudent measures are necessary and appropriate to minimizing take of UWR chinook salmon.

1. To minimize the amount and extent of incidental take from culvert replacement and riprap activities on the streambank of Salt Creek, measures shall be taken to limit the duration and extent of rock placement in the riparian area, and to schedule such work when the fewest number of fish are expected to be present.

2. Minimize the likelihood of incidental take from activities involving box culvert removal, channel alteration, use of heavy equipment, site restoration, or that may otherwise involve in-water work or affect fish passage by directing the contractor to avoid or minimize disturbance to riparian and aquatic systems. Effective erosion and pollution control measures shall be developed and implemented to minimize the movement of soils and sediment into Salt Creek.

3. Minimize the likelihood of incidental take from in-water work activities by ensuring that the in-water work activities (culvert replacement and channel relocation) are isolated from flowing water.

4. To ensure effectiveness of implementation of the reasonable and prudent measures, all erosion control measures and plantings for site restoration, shall be monitored and evaluated both during and following construction.

2.3 Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the FHWA must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

1. To implement reasonable and prudent measure #1 (culvert replacement and riprap), the FHWA shall require completion of the following:

    a. Rock will be individually placed in a way that produces an irregularly contoured face to provide velocity disruption. No end-dumping will be allowed.
    b. Any instream large wood or riparian vegetation that is moved or altered during construction will stay on site and be replaced with a functional equivalent.
    c. Riprap will be revegetated (*e.g.* willow stakes), unless otherwise approved in writing by NOAA Fisheries.

2. To implement reasonable and prudent measure #2 (construction, culvert replacement and channel alteration), the FHWA shall ensure that:

    a. Project design. Alteration or disturbance of the stream banks and existing riparian vegetation will be minimized.

b. Timing of in-water work. Work within the active channel will be completed during the ODFW (2000) preferred in-water work period[1], as appropriate for the project area, unless otherwise concurred to in writing by NOAA Fisheries.

c. Cessation of work. Project operations will cease under high flow conditions that may result in inundation of the project area, except for efforts to avoid or minimize resource damage.

d. Fish screens. All water intakes used for a project, including pumps used to isolate an in-water work area, will have a fish screen installed, operated and maintained according to NOAA Fisheries' fish screen criteria.[2]

e. Fish passage. Passage will be provided for any adult or juvenile salmonid species present in the project area during construction, and after construction for the life of the project. Upstream passage is not required during construction if it did not previously exist.

f. Pollution and Erosion Control Plan. A pollution and erosion control plan will be prepared and carried out to prevent pollution related to construction operations. The plan must be available for inspection on request by NOAA Fisheries.

   i. Plan Contents. The pollution and erosion control plan must contain the pertinent elements listed below, and meet requirements of all applicable laws and regulations:

      (1) Practices to prevent erosion and sedimentation associated with access roads, stream crossings, construction sites, borrow pit operations, haul roads, equipment and material storage sites, fueling operations and staging areas.

      (2) Practices to confine, remove and dispose of excess concrete, cement and other mortars or bonding agents, including measures for washout facilities.

      (3) A description of any hazardous products or materials that will be used for the project, including procedures for inventory, storage, handling, and monitoring.

      (4) A spill containment and control plan with notification procedures, specific clean up and disposal instructions for different products, quick response containment and clean up measures that will be available on the site, proposed methods for disposal of spilled materials, and employee training for spill containment.

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[1] Oregon Department of Fish and Wildlife, *Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources*, 12 pp (June 2000) (identifying work periods with the least impact on fish) (http://www.dfw.state.or.us/ODFWhtml/InfoCntrHbt/0600_inwtrguide.pdf)

[2] National Marine Fisheries Service, *Juvenile Fish Screen Criteria* (revised February 16, 1995) and *Addendum: Juvenile Fish Screen Criteria for Pump Intakes* (May 9, 1996) (guidelines and criteria for migrant fish passage facilities, and new pump intakes and existing inadequate pump intake screens) (http://www.nwr.noaa.gov/1hydrop/hydroweb/ferc.htm).

(5) Practices to prevent construction debris from dropping into any stream or water body, and to remove any material that does drop with a minimum disturbance to the streambed and water quality.

ii. Inspection of erosion controls. During construction, all erosion controls must be inspected daily during the rainy season and weekly during the dry season to ensure they are working adequately.[3]

(1) If inspection shows that the erosion controls are ineffective, work crews must be mobilized immediately to make repairs, install replacements, or install additional controls as necessary.

(2) Sediment must be removed from erosion controls once it has reached 1/3 of the exposed height of the control.

g. Preconstruction activity. Before significant[4] alteration of the project area, the following actions must be completed:

i. Marking. Flag the boundaries of clearing limits associated with site access and construction to prevent ground disturbance of critical riparian vegetation, wetlands and other sensitive sites beyond the flagged boundary.

ii. Emergency erosion controls. Ensure that the following materials for emergency erosion control are onsite:

(1) A supply of sediment control materials (*e.g.*, silt fence, straw bales[5]).

(2) An oil-absorbing floating boom whenever surface water is present.

iii. Temporary erosion controls. All temporary erosion controls must be in-place and appropriately installed downslope of project activity within the riparian area until site restoration is complete.

h. Earthwork. Earthwork (including drilling, excavation, dredging, filling and compacting) will be completed as quickly as possible.

i. Site stabilization. All disturbed areas must be stabilized, including obliteration of temporary roads, within 12 hours of any break in work unless construction will resume work within 7 days between June 1 and September 30, or within 2 days between October 1 and May 31.

ii. Source of materials. Boulders, rock, woody materials and other natural construction materials used for the project must be obtained outside the riparian area.

i. Heavy Equipment. Use of heavy equipment will be restricted as follows:

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[3] "Working adequately" means no turbidity plumes are evident during any part of the year.

[4] "Significant" means an effect can be meaningfully measured, detected or evaluated.

[5] When available, certified weed-free straw or hay bales must be used to prevent introduction of noxious weeds.

i. Choice of equipment. When heavy equipment must be used, the equipment selected must have the least adverse effects on the environment (*e.g.*, minimally sized, rubber-tired).

ii. Vehicle staging. Vehicles must be fueled, operated, maintained and stored as follows:

(1) Vehicle staging, cleaning, maintenance, refueling, and fuel storage must take place in a vehicle staging area placed 150 feet or more from any stream, water body or wetland.

(2) All vehicles operated within 150 feet of any stream, water body or wetland must be inspected daily for fluid leaks before leaving the vehicle staging area. Any leaks detected must be repaired in the vehicle staging area before the vehicle resumes operation. Inspections must be documented in a record that is available for review on request or NOAA Fisheries.

(3) All equipment operated instream must be cleaned before beginning operations below the bankfull elevation to remove all external oil, grease, dirt, and mud.

iii. Stationary power equipment. Stationary power equipment (*e.g.*, generators, cranes) operated within 150 feet of any stream, water body or wetland must be diapered to prevent leaks, unless otherwise approved in writing by NOAA Fisheries.

j. Site restoration. All streambanks, soils and vegetation disturbed by the project are cleaned up and restored as follows:

i. Restoration goal. The goal of site restoration is renewal of habitat access, water quality, production of habitat elements (such as large woody debris), channel conditions, flows, watershed conditions and other ecosystem processes that form and maintain productive fish habitats.

ii. Streambank shaping. Damaged streambanks must be restored to a natural slope, pattern and profile suitable for establishment of permanent woody vegetation.

iii. Revegetation. Areas requiring revegetation must be replanted before the first April 15 following construction with a diverse assemblage of species that are native to the project area or region, including grasses, forbs, shrubs and trees. Riprap areas will be planted with willows on 3-foot centers.

iv. Pesticides. No pesticide application is allowed, although mechanical or other methods may be used to control weeds and unwanted vegetation.

v. Fertilizer. No surface application of fertilizer may occur within 50 feet of any stream channel.

k. Permanent stream crossings. Permanent stream crossings will be built as follows.

a. Design.

(1) Crossing types.[6] Design road crossings in the following priority.
   (a) Nothing – road realignment to avoid crossing the stream.
   (b) Bridge – spanning the stream to allow for long-term dynamic channel stability.
   (c) Streambed simulation – bottomless arch, embedded culvert, or ford.
   (d) No-slope design culvert[7] – sometimes referred to as hydraulic design, here limited to 0% slopes.

(2) If the crossing will occur near an active spawning area, only full span bridges or streambed simulation may be used.

(3) Fill width must be limited to the minimum necessary to complete the crossing, and must not reduce existing stream width.

3. To implement reasonable and prudent measure #3, the FHWA shall ensure that the in-water work activities (culvert replacement and stream channel relocation), are isolated from flowing water.

a. If the fish salvaging aspect of this project requires the use of seine equipment to capture fish, it must be accomplished as follows:

i Before and intermittently during pumping, attempts will be made to seine and release fish from the work isolation area as is prudent to minimize risk of injury.

ii. Seining will be conducted by, or under the supervision of a fishery biologist experienced in such efforts. Staff working with the seining operation must have the necessary knowledge, skills, and abilities to ensure the safe handling of all ESA-listed fish.

iii. ESA-listed fish must be handled with extreme care and kept in water to the maximum extent possible during seining and transfer procedures. The transfer of ESA-listed fish must be conducted using a sanctuary net that holds water during transfer, whenever necessary to prevent the added stress of an out-of-water transfer.

iv. Seined fish must be released as near as possible to capture sites.

v. If a dead, injured, or sick listed species specimen is found, initial notification must be made to the NOAA Fisheries Law Enforcement Office, in the Vancouver Field Office, 600 Maritime, Suite 130, Vancouver, Washington 98661; or call: 360.418.4246. Care should be taken in handling sick or injured specimens to ensure effective treatment

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[6] For a discussion of crossing design types, see, National Marine Fisheries Service, Southwest Region, *Guidelines for Salmonid Passage at Stream Crossings* (September 2001) (http://swr.nmfs.noaa.gov/hcd/NMFSSCG.PDF) and Washington Department fo Fish and Wildlife, *Fish Passage Design at Road Culverts: A Design Manual for Fish Passage at Road Crossings* (March 3, 1999) (http://www.wa.gov/wdfw/hab/engineer/cm/toc.htm).

[7] "No-slope design culvert" means a culvert that is sufficiently large and installed flat to allow the natural movement of bedload to form a stable bed inside the culvert.

and care. Dead specimens should be handled to preserve biological material in the best possible state for later analysis of cause of death. With the care of sick or injured listed species or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not disturbed.

vi. The FHWA shall ensure that no ESA-listed fish to are transferred to third parties other than NOAA Fisheries personnel without prior written approval from the NOAA Fisheries.

vii. The FHWA shall ensure that any other Federal, state, and local permits and authorizations necessary for the conduct of the seining activities will be obtained prior to project seining activity.

viii. The FHWA must allow the NOAA Fisheries or its designated representative to accompany field personnel during the seining activity and allow such representative to inspect the seining records and facilities.

ix. A description of any seine and release effort will be included in a post project report, including the name and address of the supervisory fish biologist, methods used to isolate the work area and minimize disturbances to ESA-listed species, stream conditions before and following placement and removal of barriers, the means of fish removal, the number of fish removed by species, the condition of all fish released, and any incidence of observed injury or mortality.

b. If the fish salvaging aspect of this project requires the use of electrofishing equipment to capture fish, it must be accomplished as follows (NOAA Fisheries 2000):

i. Electrofishing may not occur near listed adults in spawning condition or near redds containing eggs.

ii. Equipment must be in good working condition. Operators must go through the manufacturer's preseason checks, follow all provisions, and record major maintenance work in a log.

iii. A crew leader having at least 100 hours of electrofishing experience in the field using similar equipment must train the crew. The crew leader's experience must be documented and available for confirmation; such documentation may be a logbook. The training must occur before an inexperienced crew begins any electrofishing; it must also be conducted in waters that do not contain listed fish.

iv. Measure conductivity and set voltage as follows:

Conductivity (umhos/cm)	Voltage
Less than 100	900 to 1100
100 to 300	500 to 800
Greater than 300	150 to 400

v. Direct current (DC) must be used at all times.

vi. Each session must begin with pulse width and rate set to the minimum needed to capture fish. These settings should be gradually increased only to the point where fish are immobilized and captured. Start with pulse width of 500 us and do not exceed 5 milliseconds. Pulse rate should start at 30Hz and work carefully upwards. In general, pulse rate should not exceed 40 Hz, to avoid unnecessary injury to the fish.

vii. The zone of potential fish injury is 0.5 m from the anode. Care should be taken in shallow waters, undercut banks, or where fish can be concentrated because in such areas the fish are more likely to come into close contact with the anode.

viii. The monitoring area must be worked systematically, moving the anode continuously in a herringbone pattern through the water. Do not electrofish one area for an extended period.

ix. Crew members must carefully observe the condition of the sampled fish. Dark bands on the body and longer recovery times are signs of injury or handling stress. When such signs are noted, the settings for the electrofishing unit may need adjusting. Sampling must be terminated if injuries occur or abnormally long recovery times persist.

x. Whenever possible, a block net must be placed below the area being sampled to capture stunned fish that may drift downstream.

xi. The electro-fishing settings must be recorded in a logbook along with conductivity, temperature, and other variables affecting efficiency. These notes, with observations on fish condition, will improve technique and form the basis for training new operators.

c. After completion of the project the existing channel should be re-watered in a way that will not significantly impact water quality or cause fish stranding.

4. To implement reasonable and prudent measure #4 (monitoring and reporting), the FHWA shall ensure that:

a. Implementation monitoring. Ensure that ODOT submits a monitoring report to the NOAA Fisheries within 120 days of project completion describing success meeting these terms and conditions. The monitoring report will include the following information.

i. Project identification

(1) Permittee name, consultation number, and project name.

(2) Type of activity.

(3) Project location.

(4) FHWA contact person.

(5) Starting and ending dates for work completed.

ii. Narrative assessment. A narrative assessment of the project's effects on natural stream function.

iii. Photo documentation. Photo of habitat conditions at the project and any compensation site(s), before, during, and after project completion.[8]
  (1) Include general views and close-ups showing details of the project and project area, including pre and post construction.
  (2) Label each photo with date, time, project name, photographer's name, and a comment about the subject.

iv. Other data. Additional project-specific data, as appropriate for individual projects.
  (1) Work cessation. Dates work cessation was required due to high flows.
  (2) Fish screen. Compliance with NOAA Fisheries' fish screen criteria.
  (3) A summary of pollution and erosion control inspections, including any erosion control failure, hazardous material spill, and correction effort.
  (4) Site preparation.
    (a) Total cleared area – riparian and upland.
    (b) Total new impervious area.
  (5) Isolation of in-water work area, capture and release.
    (a) Supervisory fish biologist – name and address.
    (b) Methods of work area isolation and take minimization.
    (c) Stream conditions before, during and within one week after completion of work area isolation.
    (d) Means of fish capture.
    (e) Number of fish captured by species.
    (f) Location and condition of all fish released.
    (g) Any incidence of observed injury or mortality.
  (6) Site restoration.
    (a) Finished grade slopes and elevations.
    (b) Log and rock structure elevations, orientation, and anchoring (if any).
    (c) Planting composition and density.

b. On an annual basis, for 5 years after completing the project, the FHWA shall ensure submital of a monitoring report to NOAA Fisheries describing the FHWA's success in meeting their habitat restoration goals through project onsite restoration activities and through compensatory mitigation. This report will consist of the following information.

i. Project identification.
  (1) Project name,
  (2) Start and end dates of work completed for this project, and

[8] Relevant habitat conditions may include characteristics of channels, eroding and stable streambanks in the project area, riparian vegetation, water quality, flows at base, bankfull and over-bankfull stages, and other visually discernable environmental conditions at the project area, and upstream and downstream of the project.

(3) FHWA contact person.

ii. Site and channel relocation restoration. Documentation of the following conditions:
   (1) Any changes in rock structure elevations, orientation, and anchoring.
   (2) Any changes in planting composition and density.
   (3) A plan to inspect and, if necessary, replace failed plantings and structures, including the compensatory mitigation site.

iii. Photographic documentation of environmental conditions at the project site after project completion.

iv. Profile and cross sections must be surveyed annually. Bed material should be measured and compared to the design mix annually. Assessment of passage through the project should be done annually by a qualified biologist or engineer.

d. If a dead, injured, or sick endangered or threatened species specimen is located, initial notification must be made to the NOAA Fisheries Law Enforcement Office, located at Vancouver Field Office, 600 Maritime, Suite 130, Vancouver, Washington 98661; phone: 360/418-4246. Care will be taken in handling sick or injured specimens to ensure effective treatment and care or the handling of dead specimens to preserve biological material in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured endangered and threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

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