

The Nestucca National Back Country Byway Project
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Tillamook and Yamhill Counties, Oregon*

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Table of Contents

1. INTRODUCTION AND BACKGROUND 6

1.1 Purpose and Need for Action6

1.1.1 Identified Deficiencies along the Nestucca Back Country Byway7

1.2 Findings and Decisions to be Made.....8

1.3 Scoping.....9

1.3.1 Issues Raised During Scoping..... 11

1.4 Summary of the Proposed Action and Action Area15

1.4.1 Project Area Location and Characterization 16

1.4.2 Special Designations and associated Management Direction 19

1.5 Conformance with Land Use Plan, Statutes, Regulations, and other Plans25

1.5.1 Survey and Manage Species Review26

1.5.2 Revised Recovery Plan for the Northern Spotted Owl.....26

1.5.3 Relevant Statutes/Authorities27

1.5.4 RMP Objectives27

2. ALTERNATIVES TO THE NESTUCCA BACK COUNTRY BYWAY PROJECT 28

2.1 Alternative 1: No Action32

2.2 Alternative 2: The Proposed Action33

2.2.1 Design Features of the Proposed Action46

2.2.2 Proposed Implementation Plan.....54

2.3 Alternative 3: An Action Alternative to the Proposed Action.....59

2.4 Alternatives Considered But Not Analyzed In Detail60

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS 61

3.1 Transportation and Road System Infrastructure62

3.1.1 Affected Environment62

3.1.2 Environmental Effects Alternative 1: No Action68

3.1.3 Cumulative Effects Alternative 1: No Action71

3.1.4 Environmental Effects Alternative 2: The Proposed Action.....71

3.1.5 Cumulative Effects Alternative 2: The Proposed Action74

3.1.6 Environmental Effects Alternative 374

3.1.7 Cumulative Effects Alternative 375

3.2 Recreation and Visual Resources75

3.2.1 Affected Environment75

3.2.2 Environmental Effects - Alternative 1: No Action.....88

3.2.3 Cumulative Effects - Alternative 1: No Action.....89

3.2.4 Environmental Effects - Alternative 2: The Proposed Action.....89

3.2.5 Cumulative Effects - Alternative 2: The Proposed Action.....94

3.2.6 Environmental Effects - Alternative 395

3.2.7 Cumulative Effects - Alternative 3.....96

3.3 Hydrology.....97

3.3.1 Affected Environment97

3.3.2 Environmental Effects - Alternative 1: No Action.....101

3.3.3 Cumulative Effects - Alternative 1: No Action.....102

3.3.4 Environmental Effects - Alternative 2: The Proposed Action.....103

3.3.5 Cumulative Effects - Alternative 2: The Proposed Action.....108

3.3.6 Environmental Effects - Alternative 3109

3.3.7 Cumulative Effects - Alternative 3.....111

3.4 Threatened or Endangered Fish Species or Critical Habitat, Magnuson Stevens Act Essential Fish Habitat and Fish Species with Bureau Status.....111

3.4.1 Affected Environment111

3.4.2 Environmental Effects - Alternative 1: No Action.....122

3.4.3	Cumulative Effects – Alternative 1: No Action	125
3.4.4	Environmental Effects – Alternative 2: Proposed Action	125
3.4.5	Cumulative Effects – Alternative 2: Proposed Action	131
3.4.6	Environmental Effects - Alternative 3	132
3.4.7	Cumulative Effects - Alternative 3.....	135
3.5	Threatened or Endangered Wildlife Species, Habitat and/or Designated Critical Habitat.....	135
3.5.1	Affected Environment.....	135
3.5.2	Environmental Effects - Alternative 1: No Action.....	141
3.5.3	Cumulative Effects - Alternative 1: No Action.....	141
3.5.4	Environmental Effects - Alternative 2: The Proposed Action.....	141
3.5.5	Cumulative Effects - Alternative 2: The Proposed Action.....	147
3.5.6	Environmental Effects - Alternative 3	149
3.5.7	Cumulative Effects - Alternative 3.....	150
3.6	Special Status (BLM 6840 Policy), SEIS Special Attention (Salem RMP), and Migratory Bird Treaty Act Wildlife Species and Habitat	151
3.6.1	Affected Environment.....	154
3.6.2	Environmental Effects - Alternative 1: No Action.....	159
3.6.3	Cumulative Effects - Alternative 1: No Action.....	160
3.6.4	Environmental Effects - Alternative 2: The Proposed Action.....	160
3.6.5	Cumulative Effects - Alternative 2: The Proposed Action.....	165
3.6.6	Environmental Effects - Alternative 3	165
3.6.7	Cumulative Effects - Alternative 3.....	166
3.7	Invasive, Non-native Plant Species (Executive Order 13112)	166
3.7.1	Affected Environment.....	166
3.7.2	Environmental Effects - Alternative 1: No Action.....	167
3.7.3	Cumulative Effects - Alternative 1: No Action.....	167
3.7.4	Environmental Effects - Alternative 2: The Proposed Action.....	167
3.7.5	Cumulative Effects - Alternative 2: The Proposed Action.....	168
3.7.6	Environmental Effects - Alternative 3	169
3.7.7	Cumulative Effects - Alternative 3.....	169
3.8	Review of Elements of the Environment Based On Authorities and Management Direction	169
3.9	Compliance with the Aquatic Conservation Strategy.....	172
4.	LIST OF PREPARERS.....	178
5.	CONSULTATION WITH TRIBES AND AGENCIES	178
5.1	Tribal Consultation.....	178
5.2	ESA Consultation.....	178
5.2.1	US Fish and Wildlife Service (USFWS).....	178
5.2.2	National Marine Fisheries Service (NMFS).....	179
6.	ADDITIONAL SUPPORTING DATA.....	179
6.1	BLM Best Management Practices	179
6.2	Stormwater Management Plan	185
6.3	Nestucca Back Country Byway Signage Plan.....	190
7.	Public Comments to External Scoping and BLM Responses to Comments.....	194
8.	Past, Present, Reasonably Foreseeable Future Actions used in the analysis of the Nestucca Back Country Byway Project.....	202
9.	GLOSSARY AND ACRONYMS	208
9.1	Glossary.....	208
9.2	Additional Acronyms	211
10.	LITERATURE CITED or SELECTED REFERENCES	213

Tables

Table 1. Comparison Summary of the Alternatives to the Nestucca National Back Country Byway Project	30
Table 2. Structures Proposed for Replacement on Fish-Bearing Streams (includes fish with Special Status as well as those species without Special Status)	37
Table 3. Large Road Slump Areas Proposed For Repair	39
Table 4. Travel Distance and Time from Carlton, Oregon	77
Table 5. Future 2035 Traffic Volumes of Study Corridors	80
Table 6. Stream Temperature Statistics for Streams in the Project Area in °F	100
Table 7. Special Status (SS) Fish and Fish Habitat located within the Vicinity of the Nestucca Backcountry Byway	112
Table 8. Stream Crossing Structures Proposed for Replacement on Special Status Fish Bearing Streams	118
Table 9. Project actions that <i>do not</i> have the potential to affect special status fish include:.....	120
Table 10. Project actions that <i>do</i> have the potential to affect special status fish include:.....	120
Table 11. Special Status Species (BLM 6840 Policy), Survey and Manage Species (SEIS Special Attention Species in Salem ROD/RMP) and Migratory Bird Treaty Act Wildlife Species that are suspected or documented to occur on Lands Managed by BLM's Tillamook Field Office	152
Table 12. Elements of the Environment Review based on Authorities and Management Direction	170
Table 13. List of Preparers.....	178
Table 14. Most Pertinent Best Management Practices.....	180

Figures

Figure 1. Project Location Map	17
Figure 2. Project Map.....	18
Figure 3. Nestucca Access Road Gravel-surfaced Section Map	35
Figure 4. Damaged and Failing Culvert along Bible Creek Road (MP 1.40).....	36
Figure 5. Culvert at Dovre Campground (MP 9.18) Winter 2014	36
Figure 6. Bible Creek Road (MP 2.96)	39
Figure 7. Map of Road Slump Areas, Rock Quarries and Permanent Waste Sites including potential Haul Routes	40
Figure 8. Asphalt Waste Site Proposed for Restoration and a Future Day-Use Recreation Site	43
Figure 9. Summary Map of Proposed Implementation Plan	58
Figure 10. Elk Creek Bridge.	66
Figure 11. ADT Over 10-day Period of Data Collection (DKS Associates 2015)	79
Figure 12. Nestucca Access Road Hourly Volumes During Peak Day (Saturday, July 12, 2014)	79
Figure 13. Current Recreational Sites Near and Along the Nestucca Back Country Byway	84
Figure 14. Key Observation Points used to evaluate impacts to Visual Resources	92
Figure 15. Sixth field watersheds and distribution of Special Status fish within the vicinity of the project area (excludes Pacific Lamprey, distribution data is limited)	113
Figure 16. – Upper Nestucca Stream Habitat Conditions.....	119

The Nestucca National Back Country Byway Project

ENVIRONMENTAL ASSESSMENT

1. INTRODUCTION AND BACKGROUND

This Environmental Assessment (EA) will provide the decision maker, the Bureau of Land Management (BLM) Tillamook Field Office Field Manager, with current information to aid in the decision-making process. It will also determine if there are significant impacts not already analyzed within the Environmental Impact Statement for the Salem District's Resource Management Plan (FEIS/RMP, 1994) and whether an Environmental Impact Statement is needed or if a Finding of No Significant Impact is appropriate.

Section 1 of this EA provides a context for what will be analyzed in the EA. It describes the Purpose and Need for Action; the identified deficiencies along the Nestucca Back Country Byway; the findings and decisions to be made by the Tillamook Field Manager using information from this analysis; identifies the criteria which the Decision Maker will use for choosing the alternative that will best meet the purpose and need for this proposal; describes the internal and external scoping efforts used in the development and analysis of this project; provides a summary of the proposed action including the project area location and a summary of the various Special Designations layering the project area; identifies conformance with Land Use Plans, statutes, regulations, and other plans.

1.1 Purpose and Need for Action

In recent decades, there have been increasing trends in visitation to, and recreation on, public lands, which has been encouraged by the BLM as well as other Federal agencies. The BLM began the National Back Country Byway program in 1989 to focus on enhancing recreational opportunities that are “*off the beaten path*”. The Nestucca River Access Road was designated a National Back Country Byway in 1989 specifically because of its high scenic value. In 1996, the Nestucca Back Country Byway route was expanded to form a loop road system by including the BLM's Bald Mountain and Bible Creek Access Roads. This Back Country Byway is one of 54 Byways designated and managed by the BLM nationally.

The BLM controlled roads comprising the Nestucca Back Country Byway (the Byway) were originally designed and constructed in the 1950's and 1960's almost exclusively to access and haul harvested timber, hence the road names - Nestucca Access Road, Bald Mountain Access Road and Bible Creek Access Road. These roads were constructed prior to enactment of the Clean Water Act and the Endangered Species Act and therefore were not necessarily designed to account for high floodwater passage and/or fish passage in streams over which the roads pass. Paving of these originally graveled surfaced roads was done in a piecemeal fashion as funds became available to improve road condition and safety, as well as reduce long-term maintenance costs. Paving of the Nestucca Access Road progressed from both the east end and west end with the advancing paved surfaces never meeting, hence the current 2.7 mile gravel-surfaced segment “in the middle” between mileposts (MPs) 12.76 and 15.44.

As recreation usage by the public has expanded, minor road improvements and upgrades aimed at improving visitor safety, reducing conflict between public visitation and forest management activities as well as improving conditions for Endangered Species Act (ESA) listed Oregon Coast Coho Salmon have occurred. The current condition of the Nestucca Back Country Byway is not expected to continue to provide safe public, as well as natural resource management based usage into the future based on expected trends; and still limits habitat usage by Coho salmon in some places. Recent evaluations conducted by the BLM Interdisciplinary Planning Team (IDT) as well as a Road Safety Audit prepared by the Federal Highway Administration (FHWA) identified multiple deficiencies which inhibit the road system from fully meeting Back Country Byway, natural resource management, and ESA listed fish species objectives (EA section 1.1.1).

The Nestucca National Back Country Byway Project (Byway project) would serve several purposes. It would provide visitors with a safe, scenic travelling experience while visiting the Byway. It would also provide for needed deferred road and facilities maintenance and upgrades. Finally, it would improve water quality and hydrologic function in certain locations that would, in turn, contribute to the recovery of the ESA listed Oregon Coast (OC) Coho salmon.

1.1.1 Identified Deficiencies along the Nestucca Back Country Byway

Considering all of the various layers of designations pertinent to the project area as described in EA section 1.4.2 (Back Country Byway, ACEC, SMRA, State Scenic Waterway, suitable as Wild & Scenic River, Tier 1 Key Watershed, Riparian Reserve, Designated Critical Habitat and Visual Resource Management) as well as the associated objectives of these designations and external scoping comments, a BLM Interdisciplinary Planning Team evaluated the existing condition of the Byway project areas. In addition, as requested by the BLM, the Western Federal Lands Highway Division (FHWA) conducted a formal safety examination of the Byway with an independent, experienced, and multidisciplinary team and prepared a *Road Safety Audit* (USDOT – FHWA 2014). These evaluations conducted by the BLM Interdisciplinary Planning Team as well as the *Road Safety Audit* prepared by FHWA identified the following varied deficiencies which inhibit ability of the Byway to fully meet the various objectives:

- The road surface conditions are inconsistent. The 2.7 mile gravel-surfaced section of the Nestucca Access Road produces safety concerns, and limits the appeal of the Byway to some members of the recreating public (i.e. touring bicycles and motorcycles, small passenger cars).
- The 2.7 mile gravel-surfaced section of the Nestucca Access Road limits its use as commercial haul route during the wet season, produces dust and sediment, and requires frequent maintenance.
- Safety and aesthetics could be improved in the parking area at Elk Bend Campground through redesigning and paving to a standard more consistent with the other BLM campgrounds along the Byway. A redesign of the access to the campground and the existing toilet within the campground would make it more useable to Byway visitors.
- There are numerous undersized and/or failing culverts along the Byway that pose plugging hazards and several have a history of plugging. This not only increases maintenance costs but also threatens downstream water quality and/or fisheries resources including Designated Critical Habitat for OC Coho.
- Seven of the identified undersized and/or failing culverts have been identified as barriers to Special Status Fish; two of these fish passage barriers (Ginger Creek and Fairdale Crossing) have been ranked as a high priority for replacement within *Nestucca/Neskowin Watersheds Culvert Prioritization and Action Plan for Fish Passage* (TEP, 2006). These culverts are also included in the “*Tillamook Nestucca Salmon SuperHwy*: <http://www.salmonsuperhwy.com>” a cooperative effort with numerous partners for restoring fish passage in the Tillamook Bay and Nestucca Watersheds.
- There are an insufficient number of cross-drains. This impedes proper hydrologic function and may increase sediment transport to live streams and impact water quality and fisheries resources including Designated Critical Habitat for OC Coho.
- The Elk Creek Bridge on the Nestucca Access Road impinges the width of the stream channel creating a potential catch point for large wood. Additionally, being a single-lane bridge abutting a two-lane segment of road, it currently produces minor safety concerns; given the current trends in increasing traffic volumes, as traffic increases it would be expected that safety concerns would also increase.
- There are numerous slump areas along project area roads which produce safety concerns and require periodic maintenance. Some of these areas have potential to increase sediment transport to live streams and impact fisheries resources and water quality.
- Bible Creek and Bald Mountain Roads are single-lane paved roads which would benefit from additional paved turnouts and/or strategic roadway widening to help increase sight distances and/or enhance safety.
- Several existing pull-offs along the Nestucca Access Road are located on road sections with very limited sight distances and/or unsafe river access thereby creating potential safety hazards; restricting

vehicular access to these sites would help eliminate the hazards. Other existing pull-offs are ideally located from a traffic safety perspective and also from a perspective that they offer easy, safe river access; upgrading these pull-off sites would serve to invite the public to utilize these superior pull-offs and river access points.

- Changes to the current configuration and /or geometry of several designated OHV trail intersections along the Bald Mountain Road would enhance visibility and safety.
- Changes to the geometry of the entrances to Elk Flat OHV Staging Area and Sheridan Peak Recreation Site along Bald Mountain Road would improve accessibility and help prevent low-clearance vehicles from scraping the roadway. The exits at Dovre and Alder Glen campground along the Nestucca Access Road would benefit from vertical and/or horizontal realignment, sight distance clearing and signage improvements to enhance safety and accessibility.
- Falling hazards and maintenance costs could be reduced and sight distances increased through the management of selected roadside trees (felling and/or pruning).
- The lifespan of the Byway's existing paved surfaces could be lengthened and future maintenance needs reduced by chipsealing.
- In terms of signage, the Byway currently lacks a consistent aesthetic and many existing signs are in need of maintenance or replacement. The installation of additional traffic, warning and directional or "way-finding" signs would increase safety; additional informational or interpretive signage would enhance visitors' experience.
- Roadside memorials erected by the public along the Byway are inconsistent with BLM policy and detract from the visual qualities of the area.
- Given that the Nestucca Access Road is under the jurisdiction of the BLM, connecting with roads to the east and south under the jurisdiction of Yamhill County and a road to the west under the jurisdiction of Tillamook County, the current, seemingly uncoordinated mile marking system is inconsistent, confusing and could impede emergency response.
- Existing guardrails need to be evaluated for consistency and compliance within current standards throughout the Byway and be managed accordingly. Safety could be enhanced with the repair and/or installation of additional, strategically placed guardrails or barriers.
- The vast majority of the Byway project area roadways currently do not have posted speed limits but fall under Oregon's Basic Rule for speed. This requires drivers to proceed at reasonable and safe speeds based on the existing roadway and traffic conditions. Given an expectation of future traffic volume growth, a posted speed limit on the BLM controlled portion of the Byway would enhance safety.
- Within the area between the Nestucca Access Road and the Nestucca River, across from Davidson Rock Pit, there is an old waste area containing an unknown amount of asphalt paving waste material. Restoration within this asphalt waste site would better meet the Aquatic Conservation Strategy objectives and offer improved aesthetics.

Many of the deficiencies listed above and identified by the BLM Interdisciplinary Planning Team and the Western Federal Lands Division of the Federal Highway Administration (FHWA) through their *Road Safety Audit* dated September 15, 2014 were also reiterated within the *Nestucca Transportation Study* prepared by DKS Associates dated June 2015, and within public scoping comment letters (EA section 7).

1.2 Findings and Decisions to be Made

The following findings and decisions will be made by the Tillamook Field Manager using information from this analysis:

Finding of No Significant Impact (FONSI):

To determine if a Environmental Impact Statement (EIS) should be prepared based on whether the proposed action would result in significant impacts to the human environment not already analyzed in the EIS prepared for the Salem District RMP and its amendments.

To determine that, if there are significant impacts to the human environment, whether the proposed action could be modified, or mitigation measures could be implemented that would make preparation of an EIS unnecessary. If we determine there is no need to prepare an EIS, we will document this determination in a Finding of No Significant Impacts (FONSI).

If this EA is found to adequately address the potential impacts associated with the implementation of Alternatives 2 and 3, the Decision Maker would decide and document whether to move forward with implementation of one of these Alternatives in whole or in part.

Criteria to be used for selecting an alternative:

In choosing the alternative that best meets the Purpose and Need, the Tillamook Field Office Field Manager will use the information from this analysis to consider the extent to which each alternative would meet the following objectives:

- Provides visitors a safe, scenic travelling experience on the Nestucca Back Country Byway;
- Minimizes current and potential future adverse impacts to the environment;
- Provides for needed road maintenance;
- Contributes to improved management of resources through increased flexibility in operational seasons for haul;
- Helps implement the objectives from the Salem District's RMP to protect, manage, and conserve federally listed (northern spotted owl, marbled murrelet, Oregon Coast Coho) and proposed species and their habitats to achieve their recovery in compliance with the Endangered Species Act, approved recovery plans, and BLM special status species policies;
- Addresses the deficiencies identified by the Interdisciplinary Planning Team (EA section 1.1.1) when evaluating the existing condition of the Nestucca Back Country Byway and comparing it to the objectives of the various layers of designations pertinent to the project area (EA section 1.4.2);
- Facilitates current and future visitor safety along the Byway with a more consistent road surface capable of being used by most common road vehicles; safer roadway geometry at selected locations; and adequate traffic safety features.

Decision:

The Decision would document the selected alternative and the rationale for its selection.

1.3 Scoping

Scoping is the process by which the BLM solicits internal and external input on the issues, impacts, and potential alternatives that will be addressed in an EIS or EA as well as the extent to which those issues and impacts will be analyzed in the NEPA document.

Internal Scoping:

Internal scoping (seeking input from people inside of the BLM) was conducted primarily by means of involvement in BLM's internal Activity Planning processes, field tours and project level interdisciplinary team interaction.

Activity Planning is an early stage of the Tillamook Field Office BLM planning process conducted by an interdisciplinary team to identify potential land management projects on a larger, watershed-level basis. This process generates a diverse list of potential projects that the decision maker can select for development. Should any of these identified potential projects be selected for further development and analysis, they generally progress to the project-specific NEPA stage of planning such as that conducted in an Environmental Assessment.

In the spring of 2005 an interdisciplinary planning team from the Tillamook Field Office assessed the BLM lands in the Ginger-Cedar Activity Planning Unit (APU). This Activity Planning effort identified the following transportation issue: *"Approximately 2.6 miles of the Nestucca Access road is unpaved but potentially a critical link in the haul routes required to support the proposed logging operations within the APU. Due to weather limitations and availability of road maintenance resources, we are unable to keep this road in a condition consistent with the management objectives and goals as stated within the Western Oregon Districts 2002 Transportation Management Plan."* Paving the gravel-surfaced section of the Nestucca Access Road was identified as a potential project during the Ginger-Cedar Activity Planning Process completed in April 2005. This was based on the fact that paving this section could benefit several resources by enhancing the ACEC, Back Country Byway, and allowing more flexibility in the potential hauling seasons (USDI - BLM 2005).

Several field tours of the Byway project areas were offered by BLM Interdisciplinary Planning Team (IDT) members and other BLM staff (02/19/14, 04/09/14, 12/15/14, 07/31/15 and 08/05/15); while a few of these various tours were attended only by BLM Salem District and/or Oregon State Office staff (internal scoping) some were also attended by staff from the FHWA (Federal Highway Administration), SWCA (Environmental Consultants) and NMFS (National Marine Fisheries Service) (external scoping).

External Scoping:

External scoping (seeking input from people outside of the BLM) was conducted by means of a scoping letter for the Byway project sent out on December 6, 2013 to a total of 82 municipal, county, state, tribal and federal government agencies, organizations, associations, nearby landowners, and interested parties (Project Record Documents 3 & 4). This scoping letter was also posted to the BLM's Salem District website on December 6, 2013. In addition, a description of the proposal has been included in the BLM *Salem District Project Update* since the spring/summer issue of 2014. This publication is generally updated quarterly, posted to the BLM website (<http://www.blm.gov/or/districts/salem/plans/index.php>) and mailed to more than 150 individuals and organizations.

Nine comment letters or e-mails were received as a result of this external scoping effort (Project Record Documents 8, 11 thru 17 and 21). A summary of the comments and the BLM responses are in section 7.0 of this document. The scoping comment letters or e-mails are available for review at BLM's Tillamook Field Office, 4610 Third Street, Tillamook, Oregon.

A summary of the Byway project was also included within a presentation focusing on past stream restoration projects and future plans within the Upper Nestucca River watershed given at a Nestucca, Neskowin & Sand Lake Watershed Council's public meeting in Pacific City Oregon on April 15, 2014.

Several field tours of the Byway project areas were offered by BLM IDT members and other BLM staff (02/19/14, 04/09/14, 12/15/14, 07/31/15 and 08/05/15); while a few of these various tours were attended only by BLM Salem District and/or Oregon State Office staff (internal scoping) some were also attended by staff from the

FHWA, SWCA and NMFS (external scoping). No field tours of the project areas for the general public were requested or offered.

1.3.1 Issues Raised During Scoping

An issue is a point of disagreement, debate, or dispute with a proposed action based on some anticipated environmental effect (USDI-BLM 2008). Based on input obtained through internal and external scoping, the issues listed below were identified and used to develop appropriate project design features and to focus the analysis of environmental effects to affected resources.

Identified issues provide a basis for comparing the environmental effects of the proposed project with the current condition and will aid in the decision-making process. The issues are presented in the form of questions regarding the relationship between the proposed action and specific pertinent elements of potentially affected resources. Some of the issues raised will not be considered in detail because the project would have little possibility of affecting the identified resource or are not amenable to scientific analysis. For those issues not analyzed in detail a brief explanation is included as to why further analysis is not included.

Issues Analyzed in Detail

Transportation and Road System Infrastructure Issues:

- What would be the impacts during project implementation (i.e. road closures or detours) upon use of the affected roadways as log haul routes?
- What would be the project's impacts upon the function of the road system infrastructure?
- What would be the project's impacts upon facilitating the future management of resources including the roadways function as haul routes?

Transportation and Road System Infrastructure Issues are analyzed in EA section 3.1.

Recreation and Visual Resources Issues:

- What would be the impacts during project implementation upon publics using the Byway or accessing other areas for recreation?
- What would be the project's impacts upon providing visitors a safe, scenic travelling experience on the Nestucca Back Country Byway?
- Would the project increase traffic, tourism and/or the public's general use of the area?
- Would the project meet the Visual Resource Management objectives for the area?

Recreation and Visual Resources Issues are analyzed in EA section 3.2.

Hydrology Issues:

- What would be the project's impacts upon water quality (fine sediment, turbidity, and water temperature)?
- What would be the project's impacts upon hydrologic function (i.e. water quantity, wood and sediment routing and channel morphology)?
- What would be the project's impacts upon meeting the Aquatic Conservation Strategy (ACS) objectives?

Hydrology Issues are analyzed in EA section 3.3. ACS objectives are discussed in EA section 3.9.

Fisheries Issues:

- What would be the project's impacts upon Special Status fish and their habitat within the Nestucca 5th field watershed (ESA Threatened – OC Coho; Magnuson Stevens Act – Chinook and OC Coho; BLM Bureau Sensitive – OC steelhead and Pacific lamprey)?

Fisheries Issues are analyzed in EA section 3.4. Endangered Species Act (ESA) Consultation with the National Marine Fisheries Service (NMFS) is discussed in ESA section 5.2.2.

Wildlife Issues:

- What would be the project's impacts upon wildlife species listed as threatened under the Endangered Species Act and their Designated Critical Habitat (northern spotted owl and marbled murrelet)?
- What would be the project's impacts upon Special Status (BLM 6840 Policy), SEIS Special Attention and Migratory Bird Treaty Act Wildlife Species and Habitat?

Wildlife Issues are analyzed in EA sections 3.5 and 3.6. Endangered Species Act (ESA) Consultation with the U.S. Fish and Wildlife Service is discussed in ESA section 5.2.1.

Invasive, non-native Plant Issues:

- What would be the project's impacts upon populations of invasive, non-native plant species?

Invasive, non-native Plant Issues are analyzed in EA section 3.7.

Issues Not Analyzed In Detail and Why Not:

- What would be the project's impacts upon forest resources?

The proposed action would convert approximately 3.45 acres from what is now considered to be forestland and place it into the new road prism, the area of ground containing the road surface, shoulder, roadway ditches, cut slope and fill slope. This conversion of BLM forestland to road prism would occur on lands that are revested Oregon and California Railroad Lands (O&C Lands). These 3.45 acres represent 0.0093% of the BLM's 37,136 total acres within the Nestucca 5th Field watershed. The loss of this forest growing space is considered to be negligible. No forest resources issues will be analyzed further in this EA.

- What would be the project's impacts to water quality from quarry operations and waste storage?

With use of Best Management Practices (BMPs) and the Projects Design Features (PDFs) and lack of hydrologic connections, quarry operations, and storage of waste would have no water quality impacts.

- What would be the project's impacts upon soils resources?

The proposed action would convert approximately 3.45 acres from what is considered forestland and place it into the new road prism. Soils within the areas that are converted would be heavily impacted; however, the area impacted is relatively small, and would have no effect on the surrounding soils forest productivity. Issues relating to erosion and sediment delivery would be managed by BMPs and PDFs. No soils issues will be analyzed further in this EA.

- What would be the project's impacts upon plant species listed as threatened or endangered under the Endangered Species Act, Special Status Plant species (BLM 6840 Policy), and/or Survey and Manage (SEIS Special Attention in the Salem District ROD) plant species or their habitats?

This project would be located mostly within existing road prisms with historic site disturbance from initial road construction and annual road maintenance practices. Where new bridge construction, culvert replacement and road widening/straightening are being proposed a variety of ages of red alder, big leaf maple, Douglas fir and western hemlock would be removed; surveys have been conducted by a qualified BLM botanist in these areas and no plant species of concern were identified. Disturbance to the understory shrubs and herbaceous plants would not be of concern as they are not typically a substrate that would harbor listed plants of concern. Because of the historic alteration of habitats that has occurred along the road prism, the rest of the proposed project area is not considered to have the appropriate habitat to harbor plant species of concern. No ESA, Special Status or Survey and Manage plant issues will be analyzed further in this EA.

- What would be the project's impacts upon Special Status Fish and their habitat in the North Yamhill River and Willamina Creek 5th field watersheds (ESA Threatened – Upper Willamette chinook and Upper Willamette steelhead; Magnuson Stevens Act – chinook and Coho; BLM Bureau Sensitive – Pacific lamprey)

Only a few project actions would occur within the North Yamhill River and Willamina Creek watersheds. They include the replacement of culverts on small non-fishbearing streams, the development of 10 – 15 turnouts along Bald Mountain Road, and chipsealing of asphalt surfaces. The replacements of the culverts are the only actions that have the causal capability to affect water quality and thus special status fish (UW steelhead, UW chinook and Pacific lamprey). The nearest proximity of UW steelhead in the North Yamhill Watershed to culvert replacement is approximately three miles downstream; Carlton reservoir formed by a dam which is a barrier to fish including Pacific lamprey and steelhead, is located between their distribution and the project construction sites. The closest that UW chinook get to the project is approximately 15 miles downstream at the confluence of Panther Creek and the North Yamhill river. Pacific lamprey and UW steelhead do inhabit the Willamina Creek watershed but there are no culvert projects proposed closer than 0.6 miles. Based on analysis in the Hydrology section the replacement of the culverts in the upper reaches of the North Yamhill and Willamina Creek watersheds would only result in small, localized, short duration increases in sediment that have no possibility of being detectable at the upper extent of UW steelhead or UW chinook distribution. For these reasons, UW steelhead and UW chinook will not be analyzed further.

- What would be the project's impacts upon carbon storage, carbon emissions and by extension climate change?

Growing trees sequester and store carbon; machines harvesting trees and doing road work emit carbon, as does decaying dead trees and wood, and the burning of fossil fuels and forest products. Analysis of timber sales building similar amounts of road (comparable to the 3.45 acres of forestland which would be converted to road prism by the proposed action) and producing many more total board feet of timber than what this proposal estimates, have shown that there is no meaningful effect on carbon storage at the regional, national and global scales. The regional scale is the smallest scale available. The carbon storage changes associated with the Byway project would be so small relative to regional, national, and global carbon stores as to be practically imperceptible. While recognizing carbon's role in climate change, we do not have the ability to determine what, if any, affect the Byway project's release of carbon from the removal of road side trees as described in EA section 2.2 (Manage roadside trees along the Byway) would have on global climate change. Traffic volumes along the Byway are expected to increase by 2% per year regardless of whether or not this project is implemented (EA section 3.2.1). The increase in traffic, and thus carbon emission is not a result of this project and was not considered further. Climate change is inherently a global issue involving all activities taking place around the globe, and our temporary, relatively small, contribution is not practically measurable on the global scale. Attempting to scientifically analyze the impact of this project on climate change in a meaningful capacity is not possible and therefore no further analysis will be conducted in this EA.

- What would be the project's impacts upon air quality?

Those portions of the project with the highest likelihood of impacting air quality include activities which create dust – specifically road building and the haul of material on gravel-surfaced roads. The relative size of this impact upon air quality is related to the amount and the duration of the dust produced, which is largely based on the number of vehicles and/or the type of road work being done. Most of the Byway project area is located on paved roadways except for some of the identified haul routes to rock quarries and/or permanent waste sites as shown on Figure 7 and construction activities on the 2.7 miles of the Nestucca Access Road that is currently gravel-surfaced (see Figures 2 and 3). Under the Proposed Action, it is estimated that 35,000 cubic yards (3,500 truckloads) of crushed rock or other rock material would be needed for the project. Commercial rock sources would be utilized to supply the bulk of the project needs however, for the purposes of analysis it is assumed that 10,000 cubic yards (1,000 truckloads) of rock material, would be removed from the BLM rock quarries as identified on Figure 7. The majority of the rock used out of BLM quarries would most likely be mined from the Cedar Creek quarry and the Dovre Peak quarry. Permanent waste material sites also identified on Figure 7, include Dovre Peak waste site, Clarence Creek waste site, Grassy Flat Quarry and Eastline Quarry. Under the Proposed Action it is estimated that approximately 50,000 cubic yards (5,000 truckloads) of waste material would be generated from construction activities. All identified permanent waste sites would likely be used to some degree to store generated waste material, however, the majority of this material would be expected to be hauled to the Dovre Peak waste site. Haul routes to rock quarries and/or permanent waste sites anticipated to have the heaviest haul are Elk Creek Road and Cedar Creek Road. The dust created by the estimated 6,000 truckloads hauling on gravel-surfaced roads would be created over the eight year span of implementation (see Implementation Plan - EA section 2.2.2). Wind and humidity would affect the distance the dust travels but under normal weather conditions the dust from the estimated 6,000 truckloads would be expected to fall out of the air within 50 to 250 feet of the road(s). As the paving of that portion of the Nestucca Access Road that is currently gravel-surfaced progresses, the amount of dust generated along that segment of road would be expected to be greatly decreased or eliminated entirely. The overall effects of dust on air quality as a result of the project are predicted to be very localized, of short duration and not affect populated areas or contribute negatively to human health and safety. Due to the short duration and localized effects of the generated dust, air quality will not be analyzed in this EA.

- What would be the project's impacts upon fire risk and fuels management?

Due to the nature of the work being proposed, the proximity to the Nestucca River, and the incorporated PDFs, the fire risk expected to result from the project is considered to be low. When construction is occurring during fire season, fire suppression equipment would be required to be on site. Due to the fire suppression equipment being required by the permitting process with the Oregon Department of Forestry and the low risk, fire risk will not be analyzed within this EA.

Most of the work being proposed in this project would occur within or very near the road prism. Up to an estimated 1800 trees would need to be cut and brush cleared in order to widen the gravel-surfaced portion of the Nestucca Access Road, replace culverts and improve safety. The fuels that would be generated by the felling of trees and brush clearing would be relatively light and is proposed to be managed in such a way as to not increase the risk of fire. Trees needing to be felled for project implementation would be disposed of in a number of ways consistent with the RMP. They may be removed as firewood, commercial logs, woodchips, and/or left on site as chipped material or Coarse Woody Debris (CWD). Slash generated from tree removal would generally be lopped and scattered down slope of the road and/or placed over disturbed areas. If there is too much for concerns of Visual Resources Management (VRM), fuels management or other concerns, slash could also be hauled away for disposal. Slash also may be chipped and removed for disposal or dispersed on site so as not to detract from visual characteristics or create a fuels hazard.

The bulk of the potential fuel load increase would be expected to be dispersed in a very narrow long strip and would not be enough to warrant any additional fuels management activities. Therefore fuels management will not be analyzed in this EA.

- How would project activities affect cultural resources?

The BLM conducted background research and field reconnaissance for the Byway project. There are no previously recorded sites within the project's Area of Potential Effect (APE). There are ten sites and two isolated finds recorded within a ½ mile of the project APE. In addition, there are 13 documented previous cultural resource inventories which have been conducted within the project APE and 27 documented previous cultural resource inventories within ½ mile of the APE. Based on the nature and scope of the proposed project none of the known sites within ½ mile of the project APE would be impacted.

Two BLM archaeologists conducted field reconnaissance to identify areas of medium and high probability for finding cultural resources where ground-disturbing activities are planned within the APE. A survey design will be created based on the results of these investigations in concurrence with Federal Highways and the Oregon State Historic Preservation Office (SHPO). The survey design and results of the cultural resource inventory would be retained by the Salem BLM. Survey techniques for cultural resources are based on those described in the 2015 State Protocol between the Oregon-Washington State Director of the Bureau of Land Management (BLM) and the Oregon State Historic Preservation Officer (SHPO) regarding the manner in which the BLM will meet its' responsibilities under the National Historic Preservation Act and the National Programmatic Agreement among the BLM, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers, referred hereafter as the "State Protocol".

In the event of an inadvertent cultural resource discovery during implementation, work would stop and Salem District Archeologist would be notified. Avoidance or mitigation measures would be employed in order to protect and preserve significant cultural resource values. Such measures would be recommended by the District Archeologist in consultation with the SHPO and local federally recognized Tribes.

Based on the factors and PDFs outlined above, it is anticipated no historic properties would be adversely affected; therefore impacts of the proposed project upon cultural resources will not be analyzed within this EA.

1.4 Summary of the Proposed Action and Action Area

The Tillamook Field Office, Salem District Bureau of Land Management (BLM), proposes to implement the Nestucca National Back Country Byway Project. The Project is located on a total of approximately 41 miles of BLM controlled roads in Tillamook and Yamhill Counties, Oregon; most of these roads are designated as a Back Country Byway including the Nestucca, Bald Mountain and Bible Creek Access Roads.

The proposed action (Alternative 2) includes paving the 2.7 miles of the Nestucca Access Road that is currently gravel-surfaced; this would involve some minor road realignment and road prism widening to make this segment of road a two-lane road and accommodate ditches as proposed with the Storm Water Management Plan. The Elk Bend Campground parking lot would be redesigned, paved and generally upgraded to enhance safety, address parking lot, campground and toilet accessibility and user needs. The project would also involve replacing undersized and/or failing culverts along the Nestucca, Bible Creek, and Bald Mountain Access Roads; installing additional cross-drain culverts; installing a two-lane bridge on the Nestucca Access Road at Elk Creek; chipsealing currently and newly paved road segments; repainting fog lines and centerlines; repairing multiple road slump areas; paving and/or restricting vehicular access to several existing pull-offs along the Nestucca Access Road; constructing additional paved turnouts or strategically widening identified stretches along Bible Creek and Bald Mountain Access Roads; managing roadside trees; installing traffic signs, informational signs and additional guard rails; and establishing a posted speed limit. The project also includes the restoration of an old asphalt waste site adjacent to Nestucca River and the development of a day-use area within the site to help provide recreational

opportunities displaced by the vehicle restrictions proposed at some of the existing pull-offs along the Nestucca Access Road.

Connected actions include activities such as realty actions; the development and use of end-haul waste areas; utilization of temporary storage areas, rock quarries and rock crushing sites; maintenance activities on roads being used to haul rock or waste material or to be used as alternate routes or detours; and the exploration of the subsurface conditions.

The proposed action is described in greater detail in EA section 2.2 with specific project design features listed in section 2.2.1 and the Proposed Implementation Plan in section 2.2.2.

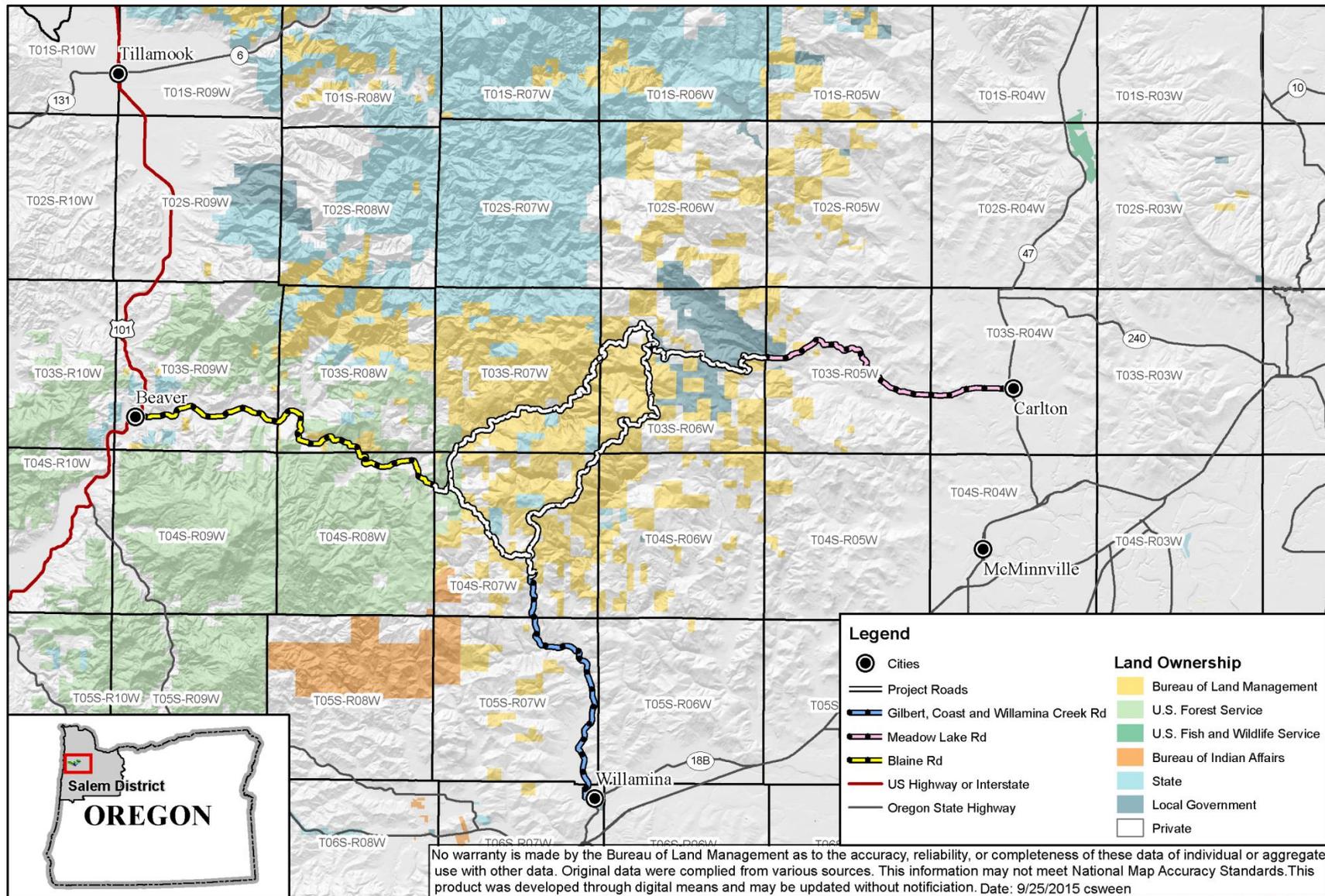
1.4.1 Project Area Location and Characterization

The Byway project is located on a total of approximately 41 miles of BLM controlled roads in Tillamook and Yamhill Counties, Oregon; most of these roads are designated as a Back Country Byway including the Nestucca, Bald Mountain and Bible Creek Access Roads. These road segments form a loop and are located approximately 14 miles east of Beaver, Oregon (U.S. Highway 101) to approximately 10 miles west of Carlton, Oregon (Oregon Route 47). The approximate 14 mile road segment located west of the project area (from the project area to Hwy 101 at Beaver) is commonly referred to as Blaine Road with the eastern-most portion of Blaine Road sometimes referred to as Upper Nestucca Road; it is under the jurisdiction of Tillamook County. The 10 mile road segment located east of the project area (from the project area to Oregon Route 47 at Carlton) is commonly referred to as Meadow Lake Road; it is under the jurisdiction of Yamhill County. In addition to roads contained within the designated Back Country Byway, the project area also includes 1.2 miles of Bald Mountain Road located in T.4S, R.7W sections 22 and 27 which is not designated as Back Country Byway (see Figures 1 & 2). This portion of Bald Mountain Road within the project area heads 1.2 miles south of the designated Byway loop and ends approximately 10.5 miles north of Willamina, Oregon via what are commonly referred to as Gilbert Creek, Coast Creek and Willamina Creek Roads which are also under the jurisdiction of Yamhill County.

The Byway project is located within T.3S, R.7W sections 13, 23, 24, 26, 27, 28, 31, 32, and 33; T.4S, R.7W sections 1, 6, 7, 8, 11, 12, 14, 15, 16, 17, 21, 22 and 27; T.3S, R.6W sections 7, 8, 13, 14, 15, 16, 17, 18, 20, 28, 29, 30, and 31; Willamette Meridian (WM). The majority (approximately 66%) of the roads to be impacted by the proposed project are located within the Nestucca River 5th field watershed, however, approximately 2.9 miles of the eastern end of the Nestucca Access Road are in the North Yamhill River 5th field watershed, and approximately 9.9 miles of Bald Mountain Road and 1.1 miles of Bible Creek Road are located within the upper reaches of the Willamina Creek 5th field watershed. Elevations of the project area roads range from about 600 feet above sea level at the westernmost end of the project on the Nestucca Access Road to 2,860 feet above sea level on Bald Mountain Road near Sheridan Peak.

The vast majority of the proposed project roads are located on BLM land which is revested Oregon and California Railroad Lands (O&C Lands) within the Late Successional Reserve (LSR), Adaptive Management Area (AMA) and/or Riparian Reserve (RR) Land Use Allocations (LUAs) as identified within the Salem District ROD/RMP (May 1995).

Figure 1. Project Location Map



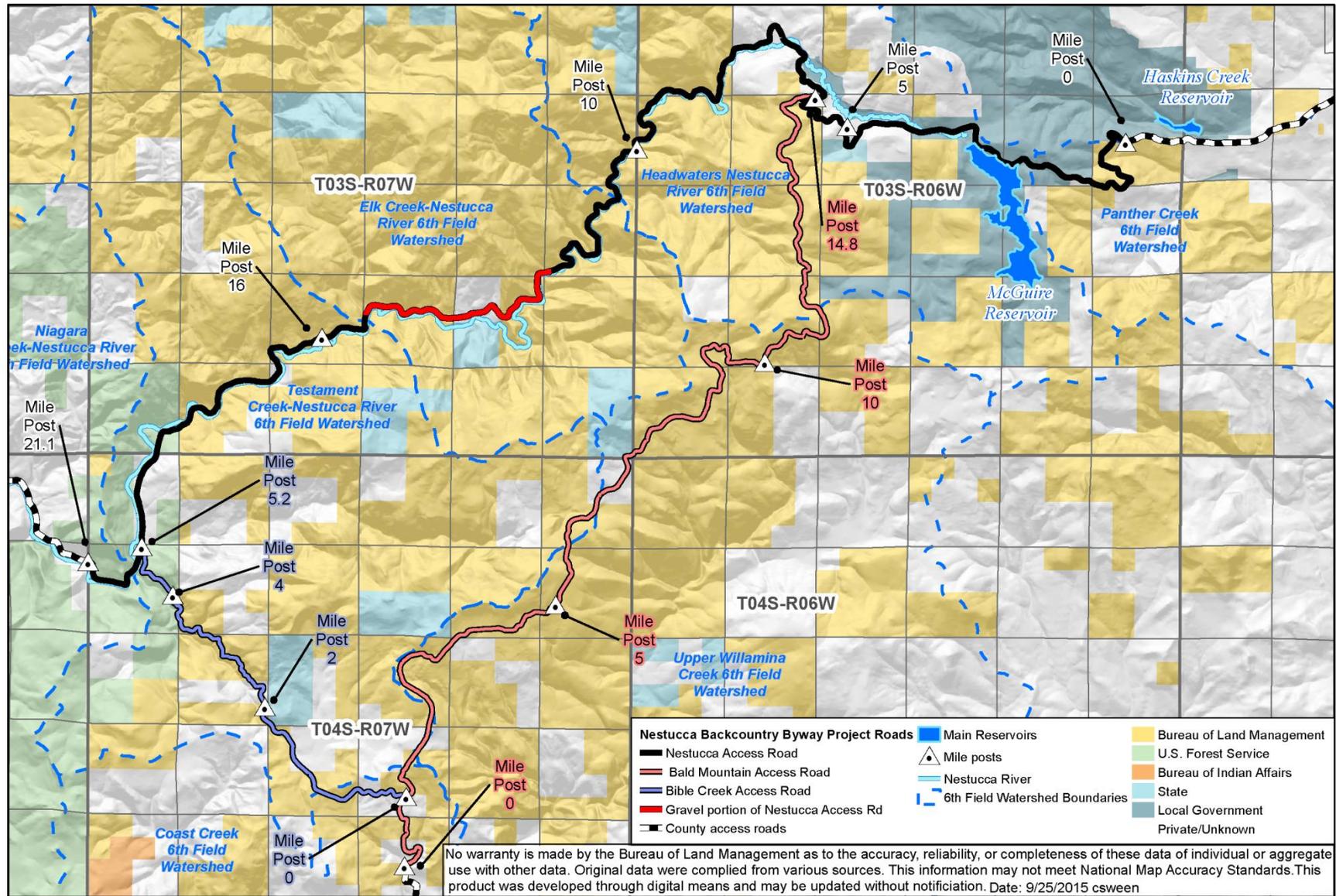
U.S. Department of Interior
Bureau of Land Management
Salem District: Tillamook Resource Area

1:300,000

0 2 4 8 Miles



Figure 2. Project Map



U.S. Department of Interior
Bureau of Land Management
Salem District: Tillamook Resource Area

1:90,000

0 0.5 1 2 Miles



Road Use

The project's roads serve a variety of users including the general public, log trucks, dump trucks, commuters, and emergency responders. In addition to being major timber haul routes, the general public's use of project area roads vary with the seasons and support a variety of recreational activities including camping, hunting, fishing, pleasure driving, riding off-highway vehicles (OHVs) and harvesting Special Forest Products such as firewood and mushrooms. Camp Cooper Boy Scout Camp which serves 2,000 campers and staff during the summer months is located on a parcel of private land accessed by the roads of the Back Country Byway. Bible Creek Road provides access to the USFS Siuslaw National Forest's Niagara Falls hiking trail. Occasionally there are special recreation events that include the Byway such as road rallies, and organized bicycle or motorcycle events; organizations sponsoring these recreational events are required to obtain a BLM special recreational permit. Commercial users such as logging companies are required to obtain BLM commercial haul permits.

The Nestucca Access Road, running in an east to west direction over the coast range summit connecting with county roads on each end makes it a through-route between the Oregon Coast and the Willamette Valley. Similarly, the Nestucca Access Road to Bible Creek Road and on to Willamina via Gilbert Creek Road represents another option between coastal communities and the Willamette Valley. However, because of their winding nature necessitating one drive at moderate speeds, quicker options in traversing the coast range are available and more heavily used despite the fact that they may not necessarily be the shortest routes (e.g. OR18 – the Salmon River Highway, and OR6 – the Wilson River Highway) see section 3.2.1. In their capacities to act as through-routes between the Coast and the Willamette Valley, the Byway project's roadways function more as scenic alternate routes "*off the beaten path*" (aka Back Country Byways). The Byway currently does not have a posted speed limit but falls under Oregon's Basic Rule for speed, which requires drivers to proceed at reasonable and safe speeds based on the existing roadway and traffic conditions; the only exception to this is the 2.7 miles gravel-surfaced portion of the Nestucca Access Road which is currently posted with a 25 mile per hour speed limit.

Traffic Volumes

Traffic counts along the Byway vary with seasonal changes. The route is most heavily used for recreational purposes in the summer months, June through September, with average daily counts ranging from 140 to 340 vehicles. Traffic volumes drop significantly in the winter months as the roadway is not snow-plowed or de-iced and may not be safely or predictably passable with accumulating snow levels or icy conditions. Traffic volumes vary during the spring and fall, with between 10 and 50 vehicles per day and vehicles supporting commercial logging activities being the primary source of use (also see section 3.2.1).

1.4.2 Special Designations and associated Management Direction

Portions of the Byway project and surrounding lands are covered with multiple layers of special designations which guide management (Back Country Byway, ACEC, SRMA, State Scenic Waterway, suitable as Wild & Scenic River, Tier 1 Key Watershed, Riparian Reserve, Designated Critical Habitat(s), and concerns for Visual Resource Management). Each of these special designations has separate objectives which apply to and must be balanced with the broader objectives of the Byway project. The following summary provides background information and a brief description of the objectives of the special designations applicable to the Byway project.

National Back Country Byway

The BLM began a Back Country Byway program in 1989 to focus on enhancing recreational opportunities. Two years later, Section 1047 of the Intermodal Surface Transportation Efficiency Act of 1991 established the National Scenic Byway System. Section 1032 of the Act recognized the BLM's Back Country and Scenic Byways program as a component of the National Scenic Byway System. The objectives of the BLM's National Back Country and Scenic Byways program include the following:

- Enhance opportunities for the American public to see and enjoy the unique scenic and historical opportunities on public lands.
- Foster partnerships at local, state, and national levels.
- Contribute to local economies.
- Enhance visitors' recreation experiences and communicate the multiuse management message through effective interpretative programs.
- Manage visitor use along the National Back Country Byway to minimize impacts to the environment and to protect visitors.
- Contribute to the National Scenic Byway System in a way that is uniquely suited to BLM-administered national public lands.

The Nestucca Access Road was designated a National Back Country Byway in 1989 because of its high scenic value. In 1995, Tillamook County submitted a letter of support for the National Back Country Byway program and identified the Blaine Road as an inclusion to the existing Byway. In 1996, the National Back Country Byway route was expanded to include BLM's Bald Mountain and Bible Creek Access Roads. The Nestucca River National Back Country Byway is one of 14 BLM designated Byways in Oregon; it is one of the three designated Byways in the Salem District. A Nestucca River National Back Country Byway brochure can be found at: <http://www.blm.gov/or/resources/recreation/files/brochures/Nestucca%20River.pdf>

Salem District RMP objectives for the recreation program include enhancing recreational opportunities provided by National Back Country Byways (ROD/RMP p. 41). The Salem District RMP also provides the specific management direction to continue to facilitate, manage, and promote public use of the Nestucca River National Back Country Byway (ROD/RMP p. 44).

Nestucca River Area of Critical Environmental Concern

An Area of Critical Environmental Concern (ACEC) is a BLM designation that highlights areas where special management attention is needed to protect and prevent irreparable damage to important historic, cultural and/or scenic values; fish, wildlife resources or other natural systems or processes; or to protect human life and safety from natural hazards. ACECs are an administrative designation made by the BLM through a Land Use Plan (LUP). It is unique to BLM in that no other agency uses this form of designation. BLM establishes special management measures for these areas through land use planning. The designation is a record of significant values that must be accommodated when BLM considers future management actions and land use proposals. Congress mandated the designation of ACECs through the Federal Land Policy and Management Act (FLPMA) to manage areas containing truly unique and significant resource values.

The Nestucca River Area of Critical Environmental Concern (ACEC) was first designated in 1983 in recognition of its important scenic, fisheries and wildlife values. The ACEC contains 1,182 acres and extends from approximately Testament Creek Road on its western end (T.3S, R.7W section 32) upstream approximately 11.4 river miles to approximately Ginger Creek Road (T.3S, R.6W section 7) on its eastern end. Approximately 26% of the Byway project's 41 miles of roadways (10.6 miles) are located within the Nestucca River ACEC. Management objectives within the ACEC include the maintenance, protection and restoration of identified relevant and important values (ROD/RMP p 33).

Located within the Coast Range Mountains, the Nestucca River is one of Oregon's major free-flowing coastal rivers and one that has long been respected for its scenic value. Popular with recreation enthusiasts and sightseers, the narrow upper Nestucca River rushes over an almost continuous bed of rock to create riffles, numerous white water cascades and occasionally clear pools. The Nestucca River is recognized as a high quality anadromous fish stream and contributes significantly to wild fish production on the northern Oregon Coast. Oregon Coastal Coho - Federally listed as Threatened under the Endangered Species Act, chinook and Coho habitat listed as Essential Fish Habitat (Magnuson Stevens Act, 1996), summer and winter steelhead list as Bureau Sensitive (BS) under BLM's Special Status Species Policy, sea-run and resident cutthroat trout and Pacific lamprey (BS) are all present in the Nestucca River. Because of the abundant fisheries resources, the

Nestucca River provides important foraging habitat for bald eagles (BS). In addition to containing several known sites for the red tree vole (BS) a species determined by US Fish and Wildlife Service (USFWS) to be warranted but precluded for ESA listing, the harlequin duck (BS), a small sea duck that more commonly breeds along rocky, swift flowing rivers as far east as the Rocky Mountains is known to breed in the Nestucca River ACEC. The ACEC also contains suitable and Designated Critical Habitat for both the spotted owl (FT) and marbled murrelet (FT); murrelets are known to use the river corridor to access other suitable habitat within the drainage. Habitats along the Nestucca River provide important connectivity to other high quality habitat areas, most notably the Elk Creek drainage and the Elk Creek ACEC.

Nestucca River Special Recreation Management Area

Recognizing the special recreation features and providing excellent recreational opportunities, a total of 1,080 acres of BLM managed land including the portions of the Nestucca River and the Nestucca Access Road have been designated as a Special Recreation Management Area (SRMA). The purpose of the Nestucca Special Recreation Management Area is to manage recreation opportunities to provide a desired recreation experience for users of the area while protecting and enhancing the resources which are present to accommodate the ever increasing number of visitors. SRMAs recognize unique and distinctive recreation values and are managed to enhance a targeted set of activities, experiences, benefits and recreation setting characteristics, which becomes the priority management focus. Within an SRMA, recreation and visitor services management is recognized as the predominant Land Use Plan (LUP) focus, where specific recreation opportunities and recreation setting characteristics are managed and protected on a long-term basis.

Oregon Scenic Waterways System

The Oregon Scenic Waterways program exists “to protect the natural, free-flowing qualities of designated rivers, and associated ecological and social values, while allowing for responsible use and development of neighboring lands.” Designations are given only to “outstanding scenic, fish, wildlife, geological, botanical, historic, archaeologic, and outdoor recreation values of present and future benefit to the public.” The highest and best uses of designated waterways are recreation, fish, and wildlife uses. These waterways are highly protected by a host of state agencies to:

- Maintain the free flowing waters in their natural state.
- Protect water quality and quantity at a level that is necessary for recreation, fish, and wildlife uses.
- Preserve scenic and aesthetic qualities of the river.

The Nestucca River within the project area is designated as an Oregon Scenic Waterway under the Oregon Scenic Waterways Act of 1969. The Nestucca River was included in the program by voter initiative Ballot Measure 7 in 1988. Although Federal agencies managing the Federal lands are not legally compelled to comply with the State's administrative rules, BLM routinely confers with the State on projects to ensure the agency's actions are compatible with the State's objectives, if at all possible.

The Oregon Parks and Recreation Department (OPRD) is charged with the overall administrative responsibility for Scenic Waterways. A primary part of their mission is to invite the public to visit and enjoy Oregon's Scenic Waterways. The Nestucca River, from immediately below the McGuire Dam downstream to its confluence with Moon Creek (near the community of Blaine), is designated as the Nestucca Scenic Waterway.

National Wild and Scenic Rivers System

The National Wild and Scenic Rivers System was created by Congress in 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.). The Wild and Scenic Rivers Act provides for protection of selected rivers of the Nation which possess outstandingly remarkable values. These sections of rivers and their immediate environments shall be protected and preserved in a free-flowing condition for the benefit and enjoyment of future generations.

Management principles shall place emphasis on protecting the outstandingly remarkable values, to include both protection and enhancement of these values while maintaining these waterways for public use and enjoyment.

A 15.3-mile segment of the Nestucca River from Ginger Creek down to the western boundary of T.4S, R.7W, W.M. (about a mile west of the confluence with Bible Creek) was found to be suitable for designation as a component of the National Wild and Scenic River System. Its tentative classification is as a recreational river area. Recreational rivers are: “(T)hose rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past” (BLM Manual 8351, page 32).

BLM is committed to carrying out the provisions of the Wild and Scenic Rivers Act and related laws and policies through land use planning that would protect and/or enhance the free-flowing condition, water quality, and outstandingly remarkable values of suitable rivers until Congress designates the river as a component of the National System or releases the river for other uses (BLM Manual 6400, page 1-7). The BLM management objectives for river segments found to be suitable for designation as a component of the National Wild and Scenic River System consists of protection of the values which make it outstandingly remarkable while also providing river related outdoor recreation opportunities. There are three identified values that make the Nestucca River remarkable; those are the scenic qualities, recreational potential, and fisheries resources. The scenic values include the steep, thickly vegetated Coast Range canyon with its mix of vegetation. Recognized recreational values include camping, picnicking, and enjoying nature. The fisheries values are considered one of the best in the region. The Nestucca River ranks among the highest in the region for the production of spring and fall chinook salmon and summer and winter steelhead. There are a number of other fish species also found in the upper reaches of the Nestucca River making the overall fish habitat within this segment very good.

Tier I Key Watershed

The Aquatic Conservation Strategy (ACS) contained within the Northwest Forest Plan (NWFP) and Salem District ROD/RMP was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands. The concept of Key Watersheds is a component of the ACS. A system of Key Watersheds that serve as refugia is crucial for maintaining and recovering habitat for at-risk stocks of anadromous salmonids and resident fish species. These refugia include areas of high quality habitat and areas of degraded habitat. Key Watersheds with high quality conditions will serve as anchors for the potential recovery of depressed stocks. Those of lower quality habitat have high potential for restoration and will become future sources of high quality habitat with the implementation of a comprehensive restoration program. There are two types of Key Watersheds - Tier 1 and Tier 2. Tier 1 watersheds contribute directly to conservation of at-risk anadromous salmonids, bull trout, and resident fish species. They also have a high potential of being restored as part of a watershed restoration program.

The Upper Nestucca Watershed is identified in the NWFP and Salem ROD/RMP as a Tier I Key Watershed. The Salem District RMP provides the following direction: Give highest priority to watershed restoration in Key Watersheds (ROD/RMP p. 7). The majority (approximately 66%) of the roads to be impacted by the proposed project are located within the Nestucca River 5th field watershed.

NWFP and Salem District ROD/RMP Land Use Allocations

The Byway project is within the Late Successional Reserve (LSR), Adaptive Management Area (AMA) and Riparian Reserve Land Use Allocations (LUAs) as defined with the Salem District ROD/RMP and NWFP. Given the nature of the proposed action as well as the resources potentially impacted, the objectives of the Riparian Reserve LUA have the most bearing upon the project.

Within the Riparian Reserve Land Use Allocations:

The objectives and concept of Riparian Reserves are a key component of the Aquatic Conservation Strategy (ACS) contained within the NWFP and Salem District ROD/RMP. For the Byway project, the Riparian Reserve LUA includes the area streams and the area extending from the edges of the stream channels (each side) to a distance equal to the following:

- For fish-bearing streams - a slope distance equal to the height of two site-potential trees. For this project this is an average of approximately 480 feet each side of the stream channel.
- For non-fish-bearing streams - a slope distance equal to the height of one site-potential tree. For this project this is an average of approximately 240 feet each side of the stream channel.

An estimated 28.3 miles of the 41 miles of road within the project area (69%) are within the Riparian Reserve Land Use Allocation. There are additional miles of road which while not within the project area per se, would be used in implementing the project (e.g. roads accessing rock quarries or end-haul waste areas, or used as detours); many of these additional road miles are also located within Riparian Reserves.

Riparian Reserves are portions of watersheds where riparian-dependent resources receive primary emphasis and where special standards and guidelines apply. As a general rule, management action/direction for Riparian Reserves prohibit or regulate activities that retard or prevent the attainment of Aquatic Conservation Strategy Objectives (ROD/RMP p. 10). Riparian Reserves are used to maintain and restore riparian structures and functions of intermittent streams, confer benefits to riparian-dependent and associated species other than fish, enhance habitat conservation for organisms that are dependent on the transition zone between upslope and riparian areas, improve travel and dispersal corridors for many terrestrial animals and plants, and provide for greater connectivity of the watershed (NWFP ROD/S&G's p. B-13).

The Byway project addresses the following road management direction as it pertains to Riparian Reserves (ROD/RMP p. 11):

Cooperate with federal, state, and county agencies and work with private parties with road use agreements to achieve consistency in road design, operation, and maintenance necessary to attain Aquatic Conservation Strategy objectives.

For each existing or planned road, meet Aquatic Conservation Strategy objectives by:

- completing watershed analyses including appropriate geotechnical analyses (i.e., examining soil and rock conditions in riparian and stream crossings) prior to construction of new roads or landings in Riparian Reserves;
- minimizing road and landing locations in Riparian Reserves;
- preparing road design criteria, elements, and standards that govern construction and reconstruction;
- preparing operation and maintenance criteria that govern road operation, maintenance, and management; minimizing disruption of natural hydrologic flow paths, including diversion of streamflow and interception of surface and subsurface flow;
- restricting sidecasting as necessary to prevent the introduction of sediment to streams; and
- avoiding wetlands entirely when constructing new roads. (Note: Temporary roads used only during the period of project implementation to assist in permanent road construction activities or to maintain a temporary means of access for existing rights-of-way or safety reasons would by definition be “temporary” and are not considered new roads.)

Determine the influence of each road on the Aquatic Conservation Strategy objectives through watershed analysis. Meet Aquatic Conservation Strategy objectives by:

- reconstructing roads and associated drainage features that pose a substantial risk;
- prioritizing reconstruction based on current and potential impact to riparian resources and the ecological value of the riparian resources affected; and
- closing and stabilizing, or obliterating and stabilizing roads based on the ongoing and potential effects

to Aquatic Conservation Strategy objectives and considering short-term and long-term transportation needs.

Design and construct new culverts, bridges and other stream crossings and improve existing culverts, bridges and other stream crossings determined to pose a substantial risk to riparian conditions. New structures and improvements will be designed to accommodate at least the 100-year flood, including associated bedload and debris. Priority for upgrading will be based on the potential impact and the ecological value of the riparian resources affected. Crossings will be constructed and maintained to prevent diversion of streamflow out of the channel and down the road in the event of crossing failure.

Minimize sediment delivery to streams from roads. Outsloping of the roadway surface is preferred, except in cases where outsloping would increase sediment delivery to streams or where outsloping is infeasible or unsafe. Route road drainage away from potentially unstable channels, fills, and hillslopes.

Provide and maintain fish passage at all road crossings of existing and potential fish-bearing streams (e.g., streams which can be made available to anadromous fish by removing obstacles to passage).

Within all Land Use Allocations

Protect, manage, and conserve federal listed and proposed species and their habitats to achieve their recovery in compliance with the Endangered Species Act, approved recovery plans, and Bureau special status species policies (ROD/RMP p. 28).

Develop and maintain a transportation system that serves the needs of users in an environmentally sound manner (ROD/RMP p. 62).

Designated Critical Habitat

Critical Habitat is a term defined in the Endangered Species Act (ESA) identifying specific geographic areas containing features essential to the conservation of a threatened or endangered species. It is designated by U.S. Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS) to provide for the conservation and eventual recovery of listed species and may require special management considerations or protection. Actions that may affect Critical Habitat require consultation with USFWS and/or NMFS under section 7 of the Endangered Species Act. Direction in the ROD/RMP states that BLM should carry out programs for the conservation and recovery of listed species and to ensure that management will not likely result in the destruction or adverse modification of Critical Habitat (ROD/RMP pg. 2).

The majority of the Byway project areas are within or directly adjacent to Designated Critical Habitat for Oregon Coast Coho salmon, northern spotted owl and the marbled murrelet. Given the nature of the proposed action as well as the habitat elements most potentially impacted, the Critical Habitat designations for spotted owl, marbled murrelet and Oregon Coast Coho salmon have had bearing upon project development.

Designated Critical Habitat for Oregon Coast Coho salmon within the Nestucca watershed extends from its confluence with the Pacific Ocean upstream to the base of McGuire Dam in the headwaters of the Nestucca River; multiple tributaries are also designated up to waterfalls or other natural barriers. Multiple components of this project are located on or adjacent to Coho Critical Habitat.

The majority of the project roadways are within the boundaries of Designated Critical Habitat for the northern spotted owl and marbled murrelet. Approximately 35.4 miles (86%) of the Byway project's 41 miles of roadways are located within a spotted owl Critical Habitat Unit (CHU) while approximately 36.2 miles (88%) of project area roadways are located within the boundaries of a marbled murrelet CHU.

Visual Resource Management

The 1976 Federal Land Policy and Management Act identified scenic (visual) resources as one of the resources for which public lands are to be managed. Visual Resource Management (VRM) classes are assigned by the BLM during the development of its Resource Management Plan (RMP) and are determined through the evaluation of Visual Resource Inventory (VRI) Class, land use and demands, and resource allocations and/or management decisions. VRM establishes the parameters of viewshed management through managing the integrity of the visual environment.

Visual Resource Inventory is categorized into four VRI Classes (I to IV) with Class I having the highest value and Class IV the lowest. The VRI Classification within the Byway consists of VRI II following the river corridor and VRI III for the remainder of the area. Although the VRI is classified as II the VRM classification along the Nestucca River consists of approximately 1,151 acres of VRM Class I. The objective for this VRM classification is to preserve the existing character of the landscape. It provides for natural ecological changes and does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention. The Nestucca River corridor has been considered an area of high scenic value promoting the designation of the Area of Critical Environmental Concern and classified as VRM Class 1 based on the importance of those visual values.

1.5 Conformance with Land Use Plan, Statutes, Regulations, and other Plans

The following documents direct and provide the legal framework for management of BLM lands within the Salem District and for this project:

Salem District Record of Decision and Resource Management Plan, May 1995 (ROD/RMP): The ROD/RMP has been reviewed and it has been determined that the proposed Byway project conforms to the land use plan terms and conditions (e.g. complies with management goals, objectives, direction, standards and guidelines) as required by 43 CFR 1610.5 (BLM Handbook H1790-1). Implementing the ROD/RMP is the reason for doing these activities (ROD/RMP p.1-3).

The Salem 1995 RMP is the plan of record for the Salem District. The 1995 RMP incorporated land use allocations and standards and guidelines from the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl and Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl*, April 1994 (the Northwest Forest Plan, or NWFP).

Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines, January 2001. Consistency with this Record of Decision includes the incorporation of the Annual Species Reviews from 2001 – 2003, except where they pertain to the red tree vole, which maintain its status as of 2001.

Revised Recovery Plan for the Northern Spotted Owl, (*Strix occidentalis caurina*). U. S. Fish and Wildlife Service, 2011.

The analysis in The Nestucca National Back Country Byway Project EA is site-specific and tiers to analyses found in the *Salem District Proposed Resource Management Plan/Final Environmental Impact Statement*, September 1994 (RMP/FEIS). The RMP/FEIS includes the analysis from the *Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl*, February 1994 (NWFP/FSEIS). The RMP/FEIS is amended by the *Final Supplemental Environmental Impact Statement for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines*, November 2000.

Applicable information from the *Nestucca Watershed Analysis*, (USDA/USFS and USDI/BLM – October 1994), *Deer Creek, Panther Creek, Willamina Creek and South Yamhill Watershed Analysis* (USDI/BLM – May 1998); and the *North Yamhill Watershed Analysis* (USDI/BLM – January 1997) has been incorporated into the development of the proposed activities (EA section 2) and into the description of the Byway project EA's affected environment and environmental effects (EA section 3) and is incorporated by reference.

The documents above are available for review in the BLM Tillamook Field Office, 4610 3rd Street, Tillamook Oregon.

1.5.1 Survey and Manage Species Review

The Byway project is consistent with the 2001 *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines*, as incorporated into the District Resource Management Plan.

This project utilizes the December 2003 species list. This list incorporates species changes and removals made as a result of the 2001, 2002, and 2003 Annual Species Reviews (ASR) with the exception of the red tree vole. For the red tree vole, the Ninth Circuit Court of Appeals in *KSWC et al. v. Boody et al.*, 468 F3d 549 (9th Cir. 2006) vacated the category change and removal of the red tree vole in the mesic zone, and returned the red tree vole to its status as defined in the 2001 ROD Standards and Guidelines, which makes the species Category C throughout its range; Category C species require pre-disturbance surveys, strategic surveys and the management of high-priority sites.

Portions of the Byway Project are considered to be Pechman Exempt from the Survey and Manage mitigation measures (i.e. culvert replacements); parts of the project which are not exempt include the replacement of the existing single-lane Elk Creek Bridge with a two-lane bridge; minor road realignment and road prism widening involved in paving the gravel-surfaced section on the Nestucca Access Road; installation of additional cross-drain culverts; construction of additional paved turnouts along Bible Creek and Bald Mountain Access Roads; realignment of the OHV trail intersections with Bald Mountain Road and managing roadside trees for the purpose of increasing sight distances for safety. These portions of the project that are not exempt are consistent with the 2001 *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines*, as incorporated into the Salem District Resource Management Plan either because they were evaluated and found not to contain habitat for any Survey and Manage species, considered to be routine maintenance of improvements and existing structures and therefore not considered to be a habitat-disturbing activity (USDA and USDI 2001:S&G 22), or surveys for potentially affected Survey and Manage species were completed to protocol (terrestrial mollusks, botanical species, and/or red tree voles). No Survey and Manage terrestrial mollusks or botanical species were discovered. Several trees containing red tree vole nests were discovered during surveys and would be protected (EA section 3.6).

1.5.2 Revised Recovery Plan for the Northern Spotted Owl

The Byway project is consistent with the objectives of the 2011 *Revised Recovery Plan for the Northern Spotted Owl* (USDI-USFWS 2011). The BLM has not identified any issues that would suggest otherwise. EA section 3.5 addresses the impacts to the spotted owl and its designated Critical Habitat.

Many of the project's proposed activities are considered to be non-habitat altering. Exceptions include some minor road realignment and road prism widening that would be needed to make the currently graveled surface of the 2.7 mile section of the Nestucca Access Road a two-lane, paved road (Alternative 2); removing roadside trees in order to implement maintenance and project construction activities such as culvert replacement; trees identified as a hazard of falling onto the roadway or a hazard to adjacent equipment operations would be removed; in selected areas, individual trees or small clumps of trees may be felled, topped or pruned for the purpose increasing sight distances for safety. A portion of the felled trees would be retained as down woody debris.

A portion of the identified trees to be felled are located within stands identified as being more structurally complex multi-layered conifer forests and, as such, they have been identified as high-value spotted owl habitat as described in Recovery Action 32 (RA32) of the *Revised Recovery Plan for the Northern Spotted Owl* (USDI - USFWS 2011). Despite the felling of roadside trees within or along the edges of these stands, post-implementation, the stands would continue to function as spotted owl suitable habitat and still represent some of the best habitat within the area; the project is consistent with the *Revised Recovery Plan for the Northern Spotted Owl*.

There are no known currently active spotted owl sites near any of the project area roads.

1.5.3 Relevant Statutes/Authorities

This section provides a summary of the relevant statutes/authorities that apply to this project. Additional authorities and management direction are described in Table 10 – Elements of the Environment.

- Oregon and California Act (O&C) 1937 – Requires the BLM to manage O&C lands for permanent forest production, in accord with sustained-yield principles. Management of O&C lands must also protect watersheds, regulate streamflow, provide for recreational facilities, and contribute to the economic stability of local communities and industries.
- National Historic Preservation Act of 1966, as amended (section 106) - Directs federal agencies to take into account the effect of any undertaking (a federally funded or assisted project) on historic properties.
- Wild and Scenic Rivers Act of 1968, as amended (16 USC 1271) – Provides for protection of selected rivers of the Nation which possess outstandingly remarkable values.
- National Environmental Policy Act (NEPA) 1969 – Requires Federal agencies to analyze their actions in a decision-making process that is open to public review and where responsible officials determine whether the actions will have potential environmental effects.
- Coastal Zone Management Act of 1972 - National policy to preserve, protect, develop, and where possible, restore or enhance, the resources of the Nation's coastal zone for this and succeeding generations.
- Endangered Species Act (ESA) 1973 – Directs Federal agencies to conserve and recover federally-listed species and their habitat on public lands.
- Federal Land Policy and Management Act (FLPMA) 1976 – Defines BLM's organization and provides the basic policy guidance for BLM's management of public lands. FLPMA requires the BLM to develop, maintain, and revise land use plans.
- Archaeological Resources Protection Act (ARPA) 1979 – Protects archeological resources and sites on federally-administered lands. Imposes criminal and civil penalties for removing archeological items from federal lands without a permit.
- Clean Water Act (CWA) 1987 – Establishes objectives to restore and maintain the chemical, physical, and biological integrity of the nation's water.
- Clean Air Act (CAA) 1990 – Provides the principal framework for national, state, and local efforts to protect air quality.
- The Migratory Bird Treaty Act of 1918 (MBTA), Executive Order 13186, and Migratory Bird Treaty Reform Act of 2004.
- Magnuson-Stevens Fishery Conservation and Management Act of 1996, (P.L. 94-265) as amended and reauthorized by (P.L. 109-479)(2007).

1.5.4 RMP Objectives

This project has been designed to implement and conform to the Salem District Record of Decision and Resource Management Plan, May 1995 (ROD/RMP) and related documents which direct and provide the legal framework for management of BLM lands within the Salem District. The following information about the RMP provides context for understanding the Purpose and Need for this project as well as for how the project has been designed.

Portions of the Byway project area and surrounding lands are covered with multiple layers of special designations which guide management (Back Country Byway, ACEC, SRMA, State Scenic Waterway, suitable as Wild & Scenic River, Tier 1 Key Watershed, Riparian Reserve, Designated Critical Habitat(s), and concerns for Visual Resource Management). Each of these special designations has separate objectives which apply to and must be balanced with the broader objectives of the Byway project. A summary of these layers of special designations, including background information and a brief description of the objectives of the special designations are contained within EA section 1.4.2.

Salem District RMP objectives for recreation include the following: *Enhance recreation opportunities provided by existing and proposed . . . national back country byways* (ROD/RMP p. 41). The Salem District RMP also directs the following: *Continue to facilitate, manage, and promote public use of the Nestucca River . . . National Back Country Byway* (Salem District ROD/RMP p. 44).

Salem District RMP objectives for roads include the following: *Develop and maintain a transportation system that serves the needs of users in an environmentally sound manner* (ROD/RMP p. 62).

Salem District RMP Management Direction for roads includes the following: *Design and construct new culverts, bridges and other stream crossings and improve existing culverts, bridges and other stream crossings determined to pose a substantial risk to riparian conditions. New structures and improvements will be designed to accommodate at least the 100-year flood, including associated bedload and debris. Priority for upgrading will be based on the potential impact and the ecological value of the riparian resources affected. Crossings will be constructed and maintained to prevent diversion of streamflow out of the channel and down the road in the event of crossing failure. Provide and maintain fish passage at all road crossings of existing and potential fish-bearing streams (e.g., streams which can be made available to anadromous fish by removing obstacles to passage)* (ROD/RMP p. 11).

Coastal Coho salmon are also listed under the ESA as threatened and Critical Habitat for Coho includes the Nestucca River and portions of many of the major tributaries within the proposed project area. This Byway project proposal would help implement the objective from the Salem District's RMP to: *Protect, manage, and conserve federally listed and proposed species and their habitats to achieve their recovery in compliance with the Endangered Species Act, approved recovery plans, and BLM special status species policies* (Salem District ROD/RMP, P.28).

Portions of the Byway project are located within the Upper Nestucca River Tier 1 Key Watershed (ROD/RMP p. 6). The Salem District RMP provides the following direction: *Give highest priority to watershed restoration in Key Watersheds* (ROD/RMP p. 7).

2. ALTERNATIVES TO THE NESTUCCA BACK COUNTRY BYWAY PROJECT

Section 2 of this EA contains an explanation of the process used to develop project alternatives. It also includes a description of the No Action Alternative (Alternative 1); the proposed Action (Alternative 2) including detailed project design features; and one action alternative to the proposed action (Alternative 3). Finally, this section of the EA contains a narrative describing several additional project design features or alternative design options considered by the IDT but not analyzed in detail.

Pursuant to Section 102 (2)(E) of the National Environmental Policy Act (NEPA) of 1969, as amended, Federal agencies shall "...study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources."

Based primarily upon public scoping comments one action alternative (in addition to the proposed action) was developed which would meet the purpose and need of the project, may have meaningful differences in environmental effects, and address the major issue(s) raised by the public during scoping. The finalized list of

alternatives includes a “No Action” Alternative, the Proposed Action, and one alternative that addresses the major issue(s) and fulfills the purpose of and need for action (EA Section 1.1). See Table 1 for a comparison summary table of the three alternatives analyzed within this EA. A more complete description of the alternatives is located within EA sections 2.1, 2.2 and 2.3.

There were several additional project design features or alternative design options considered by the IDT in developing the Byway project, but ultimately it was decided they would not be included or pursued. The description of these alternative or additional design features is followed by a summary explanation of why they were not carried forward into the analysis (EA section 2.4).

Table 1. Comparison Summary of the Alternatives to the Nestucca National Back Country Byway Project

More complete descriptions of the alternatives are located within EA sections 2.1, 2.2 and 2.3.

Project Component	(Alternative 1) No Action Alternative	(Alternative 2) The Proposed Action	(Alternative 3) An Action Alternative to the Proposed Action
Paving of the gravel-surfaced section of the Nestucca Access Road	No widening or paving of the gravel-surfaced section of Nestucca Access Road. No parking lot upgrades. Only continued maintenance such as grading would occur.	Widen road prism to accommodate Stormwater Management Plan recommendations and a two-lane paved roadway. Construct retaining walls, coarse rock fills or Reinforced Soil Slopes (RSS) as needed in areas of road prism widening. Upgrades to Elk Bend Campground parking lot. Approximately 3.45 acres of forestland converted to road prism and a total of approximately 8 acres of new pavement.	Widen road prism only to accommodate Stormwater Management Plan recommendations and pave the roadway to current width (single-lane road with turnouts). Need for retaining walls, coarse rock fills or Reinforced Soil Slopes (RSS) reduced from those in Alternative 2. Upgrades to Elk Bend Campground parking lot. Approximately 2.95 acres of forestland converted to road prism and a total of approximately 7.5 acres of new pavement.
Culvert replacements, new cross-drains and Elk Creek Bridge replacement	No culvert or bridge replacements or new cross-drain culverts. Minor maintenance such as cleaning and unplugging culverts would continue.	Replace approximately 130 existing undersized and/or failing culverts and replace the single-lane Elk Creek Bridge with a two-lane bridge. Install approximately 100 additional new cross-drain culverts.	Same as Alt. 2 except 3 culverts on fish-bearing streams (Bear Creek Culvert, Quad Pipes and Fairdale Crossing) and the Elk Creek Bridge would not be replaced.
Repair road slump areas	No slump repair; continued temporary patching would continue as needed.	Repair of four identified large slump areas.	Same as Alt. 2
Construct additional paved turnouts, strategic roadway widening, intersection safety improvements, and manage existing pull-offs	No additional turnouts, roadway widening or intersection safety improvements. No management of existing pull-offs. Only routine maintenance	Construct additional paved turnouts and strategic roadway widening on Bible Creek and Bald Mtn Access Roads; intersection safety improvements at Elk Flat OHV Staging Area, Sheridan Peak Recreation Site, Dovre and Alder Glen campgrounds. Manage existing pull-offs along Nestucca Access Road.	Same as Alt. 2

Project Component	(Alternative 1) No Action Alternative	(Alternative 2) The Proposed Action	(Alternative 3) An Action Alternative to the Proposed Action
Manage roadside trees	Only routine maintenance of trees including addressing safety hazards	Remove trees along Byway roads to implement maintenance and project construction activities and to enhance safety. It is estimated that a total of approximately 1800 trees greater than 6 inches DBH would be removed.	Due to the scaling back of other portions of the project (road widening and bridge/culvert replacement) fewer trees would be felled. It is estimated that a total of approximately 1550 trees greater than 6 inches DBH would be removed.
Chipsealing	No chipsealing	Chipseal all the currently or newly paved roads of the Byway	Same as Alt. 2
Install signage (traffic, interpretive, informational, portal) and other safety features (fences, barriers, guardrails, designated speed limits)	Maintenance of existing signage and other safety features	Fully implement the Nestucca Back Country Byway Signage Plan (EA section 6.3) to include Identification, Guide, Information, Regulatory/Warning/Safety, and Stewardship signage.	Only those signs specifically tied to safety or considered to be the maintenance of existing signage would be installed.
Restoration of an asphalt waste area and development of a day-use area	No work at this site	Restoration of the asphalt waste site and development of a day-use site in the area.	No work at this site
Connected actions - realty actions; development and use of permanent waste material disposal sites; use of temporary storage sites; rock quarry work; alternate routes and public detours; exploration of the subsurface conditions	No connected actions including increased maintenance on alternative routes and detours.	Development and use of permanent waste material disposal sites, use of temporary storage sites, rock quarry work to support project implementation; maintenance and use of alternate routes and public detours; exploration of the subsurface conditions.	Effectively the same as Alt. 2 although a proportional reduction (approximately 25%) in use of waste sites and rock quarries, and maintenance and use of haul routes to reflect the scaling back of other portions of the project (road prism widening and culvert replacement).

2.1 Alternative 1: No Action

The No Action Alternative describes the baseline, against which the effects of the proposed action can be compared, i.e. the existing conditions in the project area and the continuing trends in those conditions if the BLM does not implement either of the action alternatives. Consideration of this alternative also answers the question: “What would it mean for the objectives to not be achieved?”

Selection of the No Action Alternative would mean that the 2.7 mile section of the Nestucca Access Road that is currently gravel-surfaced would not be widened or paved and the Elk Bend campground parking lot would not be redesigned; culverts along the Byway, including those on fish-bearing streams, would not be replaced and additional cross-drains would not be installed; the current single-lane Elk Creek Bridge would not be replaced with a two-lane bridge; road slump areas would not be repaired; additional paved turnouts would not be constructed; entrances or exits to Elk Flat OHV Staging area, Sheridan Peak, and Dovre and Alder Glen Campgrounds would not be improved; OHV trail crossings along Bald Mountain Road would not be improved to enhance safety; existing pull-offs along the Nestucca Access Road would not be managed (closed to vehicular access or improved through rocking or paving); beyond routine maintenance including addressing safety hazards, roadside trees would not be managed; chipsealing would not occur; traffic signs, informational signs, additional guard rails and portal signs would not be installed along the Byway; and a speed limit would not be posted as the vast majority of the Byway would continue to fall under Oregon’s Basic Rule for speed. Finally, under the No Action alternative, restoration of the asphalt waste area across from Davidson Rock Pit would not occur and a day-use area would not be developed at the site. Under the No Action Alternative, those actions described as Connected Actions would not occur and include the development and use of permanent waste material disposal sites, use of temporary storage sites, rock quarry work and increased maintenance on alternative routes and detours.

Selection of the No Action Alternative would mean that only normal administrative activities such as minor maintenance would continue on BLM controlled roads within the project areas. Depending upon future funding, work priorities, and usage, minor maintenance would include cleaning culvert inlets, brushing roads, spot rocking as well as periodic grading of the 2.7 mile gravel-surfaced section of the Nestucca Access Road; in the past grading has been done two or three times per year. Along with this continuous minor maintenance, emergency storm damage such as slides onto the roadway, culvert failures, road fill washouts and down trees would continue to be addressed as future funding allows. Based on past experiences, over the eight to ten year analysis period for this EA it is quite probable that as many as four culverts would plug in any given year. Work to fix culvert failures, or at least emergency maintenance actions (unplugging the currently undersized culverts) would need to occur outside of the instream work window; much of this work would likely be associated with larger storm events (floods).

It is difficult to predict when or where culvert failures may occur. Most culvert plugging occurs during major flood events usually associated with rain-on-snow events. Although culverts would continue to receive frequent maintenance, large flood events elevate the risk of plugging and failure, which could result in floodwaters overtopping the roadway and washing out the road surface and fill material. It is assumed at least one flood event would be expected to occur within the analysis period of this project (eight to ten years). Because undersized and/or culverts in poor condition that have been identified for replacement would not be replaced under the No Action Alternative, it is assumed that up to two of the culverts on the Byway would fail within the analysis period of this project (eight to ten years). This assumption is based on professional judgment, past experience and the fact that many of these culverts have exceeded their design life span and would continue to degrade.

Under the No Action Alternative, the four large road slump locations identified for repair would continue to get worse, resulting in uneven road surfaces and/or abrupt vertical breaks. Continued temporary patching of these slump areas would be required. It is assumed that under the No Action Alternative, none of the large slump areas on the Byway would catastrophically fail, causing the whole road way to be washed away, within the analysis period of this project (eight to ten years).

On public and privately controlled roadways adjacent to the BLM project areas, road management activities would be expected to continue to occur. Selection of the No Action Alternative would not constitute a decision to change the designation of Nestucca National Back Country Byway or set a precedent for consideration of future action proposals.

2.2 Alternative 2: The Proposed Action

For the purposes of describing the various components of the Byway project it has been divided into ten parts summarized and presented below. These ten parts of the project are grouped based on the characteristics of the work being proposed rather than the expected schedule of implementation; implementation would be dependent upon funding and would occur in phases over a number of years described in EA section 2.2.2. The more detailed Project Design Features of the various parts of the proposed action described below are described in EA section 2.2.1.

1. Nestucca Access Road gravel-surfaced section widening and paving

This portion of the project includes paving the 2.7 mile section on the Nestucca Access Road that is currently gravel-surfaced (MP 12.76 to 15.44) (see Figures 2 & 3). Some minor horizontal and vertical road realignment and road prism (the area of ground containing the road surface, shoulder, roadway ditches, cut slope and fill slope) widening would need to be completed prior to paving in order to make it a two-lane paved road at least 22 feet wide and accommodate ditch widths per the Storm Water Management Plan. The Storm Water Management Plan is a detailed design plan to address water running off the road and sediment sources (EA section 6.2). In order to enhance safety additional pavement width may be needed to accommodate tracking of larger vehicles within curves. It has been calculated that the project's proposed road prism widening along segments of the currently gravel-surfaced road would result in approximately 3.45 acres of current forestland being permanently converted to road prism.

In order to limit the amount of cutbank excavation, erosion and disturbance, retaining walls, coarse rock fill or Reinforced Soil Slopes (RSS) would be constructed in road prism widening areas where beneficial. The project would include approximately 19 sites with two types of stabilization occurring on the gravel-surfaced portion of the Nestucca Access Road. Sizes of walls or Reinforced Soil Slopes would vary between a minimum of approximately 50-feet-long-by-3-foot-high and a maximum of approximately 550-feet-long-by-10-feet-high. Materials would generally consist of two basic types, either a layered, Reinforced Soil Slope (RSS) covered with appropriate native vegetation, or coarse rock fill.

To prepare the current road subgrade for paving with asphalt, the road surface would be reconditioned which would include augmenting the current aggregate with additional material. Selected pull-offs and road junctions would also be paved with asphalt. The newly paved road would be striped with a centerline and fog lines. The Elk Bend Campground parking lot would be redesigned, paved and generally upgraded to enhance safety, address parking lot, campground and toilet accessibility and user needs. Under Alternative 2 it is estimated that a total of approximately 8 acres of subgrade would be paved (including pull-offs, road approaches at intersections, day-use area and Elk Bend parking lot).

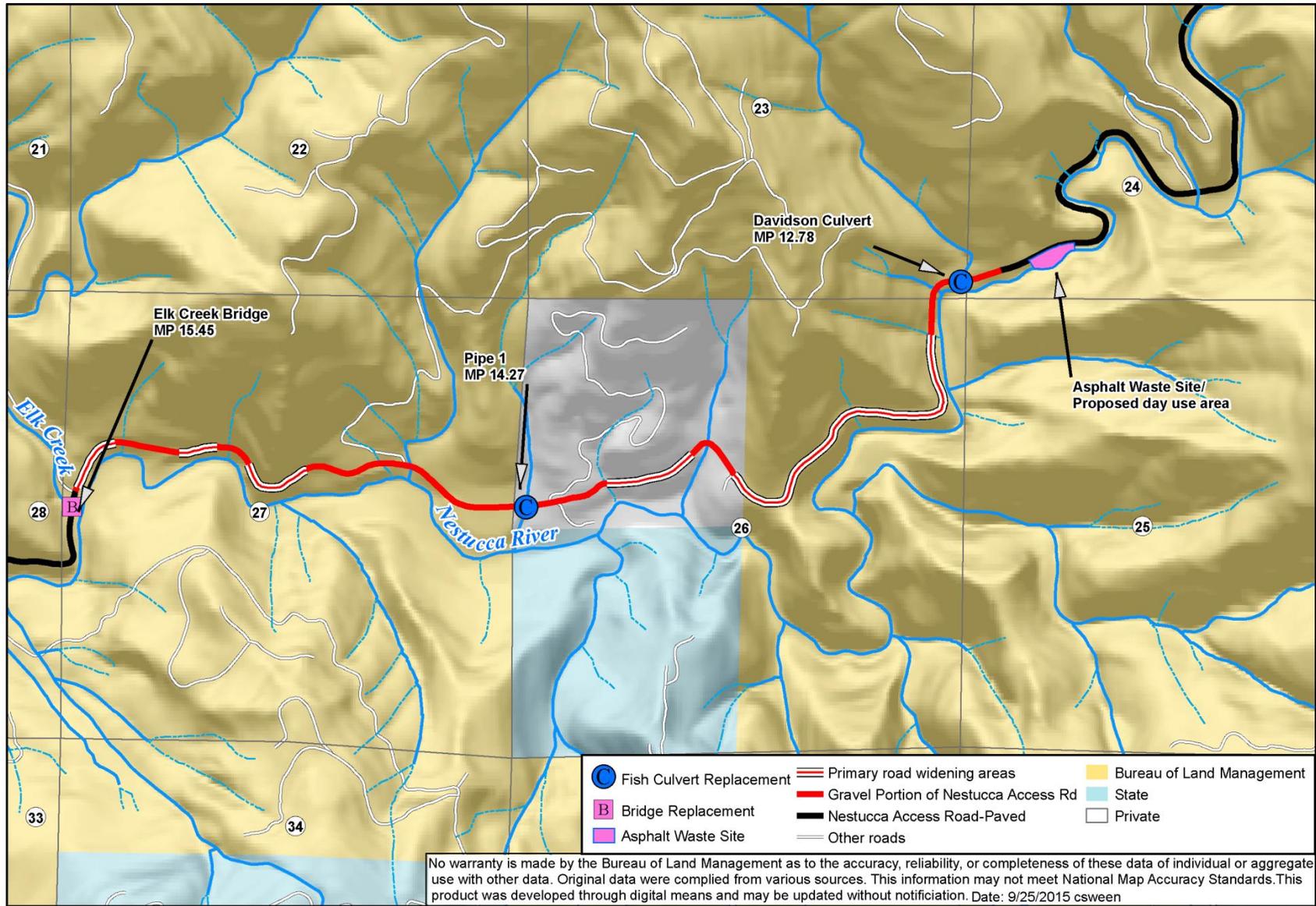
2. Byway culvert replacements, new cross-drains and Elk Creek Bridge replacement

This portion of the project includes replacement of approximately **130** existing undersized and/or failing culverts (including cross-drain culverts) along the Byway and replacing the single-lane bridge at Elk Creek with a two-lane bridge. A total of approximately **76** of the culverts to be replaced are located along the Nestucca Access Road and a total of approximately **54** of the culverts are along Bible Creek or Bald Mountain Roads. It also includes the installation of approximately **100** additional new cross-drain culverts along the Byway to disconnect road drainage from streams, as necessary. The amount of fill material to be removed and the extent of general disturbance which can be expected at any given culvert site is generally correlated with the depth of the fill; for this reason, the culverts have been categorized below to those with 20 feet average fill depth or less and those

with more than 20 feet average fill depth. The proposed estimated numbers of culverts and structures can be described as follows:

- **Culverts - non-fish bearing streams or cross-drains – 20 feet average fill depth or less**
There are a total of approximately **98** culverts on non-fish bearing streams (or cross-drains) with an average of less than 20 feet fill depth proposed for replacement. Of these culverts, 57 of the culverts are on intermittent or perennial stream crossings and 41 are existing cross-drain culverts to be replaced. In addition to the 98 existing culverts proposed for replacement, approximately 100 new cross-drains are also proposed to be installed in areas with 20 feet average fill depth or less.
- **Culverts - non-fish bearing streams – more than 20 feet average fill depth**
There are a total of approximately **16** non-fish bearing culverts with an average fill depth of over 20 feet proposed for replacement. Of the 16 culverts, 15 are culverts on intermittent or perennial stream crossings and one is an existing cross-drain culvert. A portion of these deep fill culverts identified for replacement may be repaired by installation of a slip-liner pipe or another method rather than complete fill excavation and replacement. Installation of deep culverts could include adding overflow culverts.
- **Structures on fish-bearing streams – (also see Figure 4, 5 and Table 2 below)**
There are a total of **16** structures (1 bridge and 15 culverts), proposed for replacement that are located on fish-bearing streams; Oregon Coast Coho are known to be present in eight of these streams and suspected to occur in one other. The new structures (various culvert designs or bridges) would be designed to pass fish and meet RMP and regulatory guidelines. Given the current trends of increasing traffic on the Byway roads, the current, single-lane bridge at Elk Creek would be replaced with a two-lane bridge to make it more consistent with a two-lane, paved roadway.

Figure 3. Nestucca Access Road Gravel-surfaced Section Map This map depicts where most of the road prism widening would occur within the gravel-surfaced section of the Nestucca Access Road (Alternative 2) and the location of the Asphalt Waste site.



U.S. Department of Interior
Bureau of Land Management
Salem District: Tillamook Resource Area

1:18,000

0 0.1 0.2 0.4 Miles



Figure 4. Damaged and Failing Culvert along Bible Creek Road (MP 1.40)



Figure 5. Culvert at Dovre Campground (MP 9.18) Winter 2014 In addition to being a fish barrier, this culvert is at risk of failure because it is currently sized only to accommodate ~46% of 100-year flood flow capacity and there is a history of catching debris and plugging.



Table 2. Structures Proposed for Replacement on Fish-Bearing Streams (includes fish with Special Status as well as those species without Special Status)

(Unless otherwise noted, all structures are located on the Nestucca Access Road)

Name and Location	Existing Structure and Size	Bankfull Channel Width	Proposed Structure and Size	Primary Logic for Replacement
Testament Creek MP 20.02	15' wide x 7' high OBA	26'	34' wide x 13' high LPOBA or 46' long x 28' wide bridge	Estimated remaining lifespan is less than 10 years.
Bear Creek MP 17.46	15' wide X 7' high OBA	22'	29' wide x 8' high LSCBC or 30' long x 28' wide bridge	Because this culvert is sized only to accommodate ~50% of 100-year flood flow capacity ²⁻³ and there is a large landmass creep (350 acres in size) located approximately 0.8 miles upstream, there is potential for the current culvert to plug and/or fail especially with landslide activity.
Elk Creek Bridge MP 15.45	72' long x 14.5' wide, single-lane, 3-span bridge	35'	100' long x 28' wide, double lane, single-span bridge	The single-lane bridge is inconsistent with a two-lane paved Byway. The current bridge impinges the width of the stream channel and has caught large debris in the past.
Pipe 1 (No name Creek) MP 14.28	36-inch CMP culvert	5'	10' round culvert	This culvert is in poor condition. Because it is sized only to accommodate ~44% of 100-year flood flow capacity ¹⁻³ it is at risk of failure.
Davidson Culvert MP 12.79	60-inch CMP culvert	10'	14' wide x 7' high OBA	Estimated remaining lifespan is 10 to 15 years.
Quad Pipes MP 10.21	62x42-inch CMP double culverts	10'	16' round culvert	Although these double culverts exceed 100% of 100-year flood flow capacity, ¹⁻³ they are a plugging risk due to the current design of two culverts rather than one large structure and their location within a past debris torrent channel.
Pipe 4 MP 9.38	36-inch CMP culvert	5'	8' round culvert	Estimated remaining lifespan is 10 to 15 years.
Dovre Creek MP 9.18	78-inch CMP culvert	24'	34' wide x 13' high LPOBA	Because this culvert is sized only to accommodate ~46% of 100-year flood flow capacity ²⁻³ and there is a history of catching debris and plugging, it is at risk of failure.
Ginger Creek MP 7.60	54-inch CMP culvert	12'	18' round culvert	Because this culvert is sized only to accommodate ~35% of 100-year flood flow capacity ²⁻³ and it has plugged multiple times in the past, it is at a risk of failure. High priority for fish passage improvement. *
Cedar Creek MP 7.21	54-inch CMP culvert	14'	19' round culvert	Because this culvert is sized only to accommodate ~16% of 100-year flood flow capacity ²⁻³ and it has plugged multiple times in the past, it is at risk of failure.
Pipe 5 MP 5.76	18-inch CMP culvert	3'	6' round culvert	Because this culvert is in poor condition and currently sized only at ~22% of 100-year flood flow capacity ¹⁻³ it is at risk of failure.
Pipe 6 MP 5.49	36-inch CMP culvert	8'	11' round culvert	Estimated remaining lifespan is 10 to 15 years.
Pipe 7 MP 4.89	54x48-inch CMP culvert	8'	11' round culvert	Estimated remaining lifespan is less than 10 years.
Fairdale Crossing MP 3.84	10'x10' concrete box Culvert	30'	39' wide x 16' high LPOBA	Fish barrier to all fish at some flows. Approximately 2.3 miles of OC Coho Critical Habitat upstream of this structure. High priority for fish passage improvement. *
Bible Creek Road Pipe 1 MP 1.40	36x36-inch CMP culvert	8'	8' or 11' round culvert	Culvert is in poor condition and has a history of plugging; it is at risk of failure.
Bible Creek Road Pipe 2 MP 1.70	96x106-inch CMP culvert	14'	18' round culvert or 14' OBA	Estimated remaining lifespan is less than 10 years.

Definitions of Acronyms used in Table 2:

MP = Milepost (location); OBA = Open Bottom Arch; LPOBA = Low Profile Open Bottom Arch; LSCBC = Long Span Precast Concrete Box Culvert; CMP = Corrugated Metal Pipe

Definitions of Symbols used in Table 2:

* These two culverts (Ginger Creek and Fairdale Crossing) were identified as high priorities for fish passage within the *Nestucca/Neskowin Watersheds Culvert Prioritization and Action Plan for Fish Passage* (TEP 2006). They were also included in the “*Tillamook Nestucca Salmon SuperHwy*: <http://www.salmonsuperhwy.com>” a cooperative effort with numerous partners, for restoring fish passage in the Tillamook Bay and Nestucca Watersheds.

Citations for References used in Table 2:

(See also EA Section 10)

¹Castro and Jackson, 2001

²Oregon Water Resources Department- Peak Flow

http://www.oregon.gov/owrd/pages/sw/peak_flow.aspx

³Robison *et al.* 1999

3. Repair road slump areas

This portion of the project includes repairing approximately four large slump areas along the Byway. Three of these areas are located on the Nestucca Access Road and one is on Bible Creek Road (see Figures 6 and 7). The slumps' locations, approximate size and proposed repair are shown on Table 3.

In general, the proposed slump repairs would include two types of repairs; deep patching and roadway realignment. A deep patch repair would consist of excavating the existing road subgrade down approximately 4 to 6 feet below the pavement surface and rebuilding it with a reinforced subgrade. Roadway realignment would consist of moving the roadway, typically uphill or away from the unstable slope. Both repairs may require the installation of drainage improvements.

4. Construct additional paved turnouts, strategic roadway widening, intersection safety improvements, and manage existing pull-offs

Bible Creek and Bald Mountain Roads are single-lane paved roads with turnouts; constructing additional paved turnouts and strategically increasing roadway widths would provide road users improved sight distance and road surface to allow for safer passage of oncoming traffic. Approximately 20 turnouts, totaling up to 0.5 acres would be constructed by paving existing shoulders where beneficial, excavating into the cut bank and/or by placing fill material on the fill slope side of the road. Where feasible and cost effective, roadway widening would be completed to allow for the passage of two-way traffic, including locations lacking proper site distance.

Additionally, changes to the geometry of the entrances to Elk Flat OHV Staging Area and Sheridan Peak Recreation Site along Bald Mountain Road and the exits at Dovre and Alder Glen campground along the Nestucca Access Road would improve safety and accessibility and/or help prevent low-clearance vehicles from scraping the roadway. Where beneficial, OHV trail crossings would be improved to enhance safety along Bald Mountain Road.

Existing pull-offs along the Nestucca Access Road have been evaluated based upon concerns for enhancing safety, minimizing environmental damage and maintenance requirements, and providing recreational opportunity. Existing pull-offs would be managed by maintaining their current condition, adding enhancements such as gravel or asphalt surfacing, restricting vehicular access, and/or improving river access. In order to help meet the recreational demand displaced by restricting vehicular access at some of the existing pull-offs, a small day-use

recreation site would be constructed within the area currently containing the asphalt waste site as discussed in #8 below.

Table 3. Large Road Slump Areas Proposed For Repair

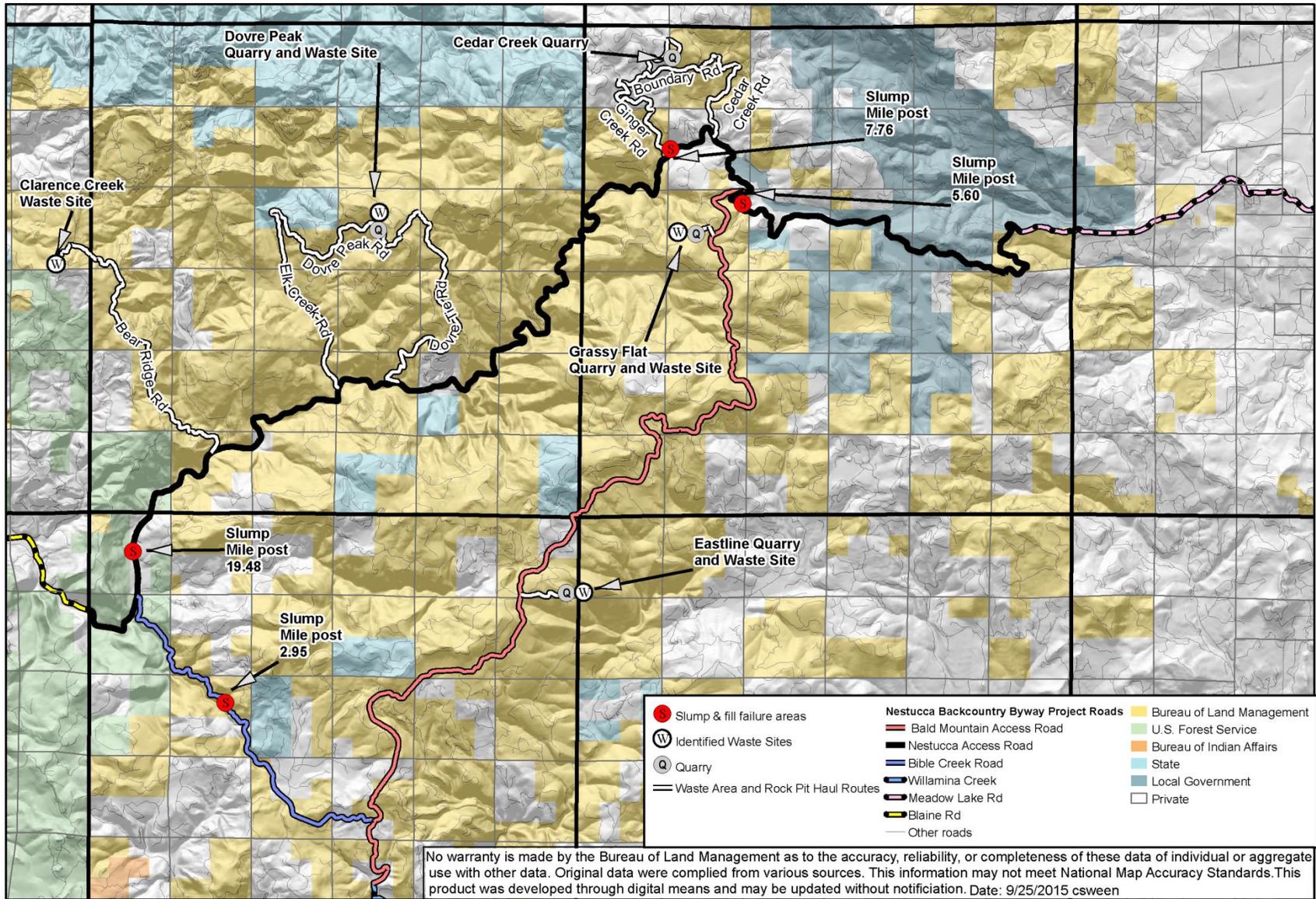
Road	Milepost Marker	Approximate Size	Proposed Repair
Nestucca Access Road	5.60	150' L x 10' W	Deep patch
Nestucca Access Road	7.76	380' L x 12' to 25' W	Deep patch
Nestucca Access Road	19.48	200' L x 24' W	Deep patch & additional horizontal drains
Bible Creek Road (see Figure 6)	2.96	150' L x 5' W	Roadway realignment & potential construction of a fill-side wall

Figure 6. Bible Creek Road (MP 2.96)

Slump area proposed for roadway realignment and potential construction of a fill-side wall



Figure 7. Map of Road Slump Areas, Rock Quarries and Permanent Waste Sites including potential Haul Routes



U.S. Department of Interior
Bureau of Land Management
Salem District: Tillamook Resource Area

1:100,000

0 0.5 1 2 Miles



5. Manage roadside trees along the Byway

This portion of the project includes removing select trees along the project roads to implement maintenance and project construction activities and to enhance safety. The majority of these trees would be associated with the proposed road prism widening of a portion of the Nestucca Access Road that is currently gravel-surfaced and/or the replacement of culverts. Additional trees identified as hazards of falling onto the roadway or a hazard to adjacent equipment operations would also be removed. In selected areas, individual trees or small clumps of trees may be felled or pruned for the purpose of increasing sight distances. Increased sight distance would provide additional safety to both the recreation public and forest operators, including log trucks, while traveling the Byway.

Based primarily on tree data gathered at a sampling of 32 individual construction sites that would be impacted and estimations (including the use of Lidar) along the gravel-surfaced section of the Nestucca Access Road it is estimated that project implementation would result in up to a total of approximately 1800 trees greater than 6 inches DBH (Diameter at Breast Height) needing to be felled. Approximately 77% of these trees are red alders, 10% are big-leaf maple and 13% are conifers. Approximately 53% are 6-12 inches DBH; 40% are 12-18 inches DBH; and 7% are 18-36 inches DBH. Although none are currently known, up to five conifer trees greater than 36 inches DBH may be identified along the Byway which need to be felled in order to implement the proposed action; during the final design phase of the project, reasonable attempts would be made to accommodate these larger trees and avoid the need to fell.

Trees needing to be felled for project implementation would be disposed of in a number of ways consistent with the RMP. They may be removed as firewood, commercial logs, woodchips, and/or left on site as chipped material or Coarse Woody Debris (CWD). Where beneficial and appropriate, some of the felled trees may be incorporated into use during project implementation (i.e. used in the development of the day-use area, or placed in stream channels to help stabilize headwall migration after culvert replacement).

6. Chipseal all the segments of the Byway

In order to reduce the need for future maintenance and increase the life expectancy of asphalt surfaces, Byway roads that are currently paved would be chipsealed over their current asphalt surface. The project would also include chipsealing the new pavement on that portion of the Nestucca Access Road that is currently gravel-surfaced. As appropriate, centerlines and/or fog lines would be repainted following the chipsealing process.

- Nestucca Access Road (21.1 miles)
- Bible Creek Road (5.2 miles)
- Bald Mountain Road (14.8 miles)

7. Install signage (traffic, interpretive, informational, portal) and other safety features (fences, barriers, guardrails, designated speed limits)

This portion of the project would include installing traffic, interpretive and informational signs along and leading to the Byway consistent with the Nestucca Back Country Byway Signage Plan (see EA section 6.3). Portal signs would be placed (or replaced) at the three entrances to the Byway to welcome and inform visitors of entry onto public, BLM managed lands. Kiosks would be placed to provide information to visitors regarding sites of interest, important natural processes, and information to enhance their experience while visiting the Byway. An engineering study would be completed to determine appropriate speed limits for the various segments of the BLM controlled Byway. Speed limit signs and associated curve and intersection warning signs would be posted. Additional fences and barriers would be installed where appropriate.

Existing guardrails would be evaluated for consistency and compliance within current standards throughout the Byway; if needed, guardrails would be repaired, removed, or installed.

8. Restoration of an asphalt waste area and development of a day-use area

Within the area between the Nestucca Access Road and the Nestucca River, across from Davidson Rock Pit (T.3S, R.7W, section 24 at MP 12.60) there is an old asphalt waste area containing an unknown amount of asphalt, other waste material believed to be primarily generated from cleaning ditches and slides, and numerous non-native plant species. This site may have been the location of an asphalt batch plant or similar staging area during the paving of the Nestucca Access Road in the 1970s and/or 1980s which could have contaminated the site with an assortment of undetermined chemicals. Features reflecting this site's history of high disturbance such as piled material, uneven topography and weedy vegetation also present a general disruption to the visual characteristics along this stretch of roadway. Portions of the site have been planted with red alder which, currently, are approximately 15-years-old or less.

Depending upon the results of further testing and investigation of this site (conducted under Categorical Exclusion DOI-BLM-ORWA-S060-2016-0001-CX - see EA section 8.0), restoration would be conducted to remove contaminants, better meet the Aquatic Conservation Strategy and improve the area's general aesthetics. The scope of the restoration work at this site is dependent upon the results of further exploration at the site and may include simply grading or re-contouring the site. Alternatively, work could involve capping portions of the site with an impermeable layer, and/or excavating waste materials and replacing with appropriate fill material. For the purposes of analysis, it is assumed that 2,000 cubic yards of contaminated soil and waste material would be removed. Most of the planted red alders less than 15-years-old would likely need to be removed to gain access, however, an existing strip of the older, taller alders adjacent to the Nestucca River would be maintained if possible to help provide stream shade and a visual buffer from the river.

A small day-use recreation site would be constructed within the area currently containing the asphalt waste site. This is being proposed in order to help meet the recreational demand displaced by the proposed management of existing pull-offs where vehicular access is being restricted for reasons of safety and/or environmental protection as discussed in #4 above. For the purposes of analysis, it is assumed the site would include paved parking for approximately 5 vehicles, two picnic tables and fire pits, interpretive signs, a vaulted toilet and a short hardened trail allowing for river access. Where appropriate, a mix of native plant species would be planted.

Figure 8. Asphalt Waste Site Proposed for Restoration and a Future Day-Use Recreation Site



9. Connected Actions

Connected actions include those portions of the project that depend on the “proposal” for their justification (43 CFR 1508.23). These actions support the proposal and would not occur without implementation of the action.

Realty Actions

Several project areas and Byway road segments are located on an underlying land ownership of non-BLM land where BLM has an easement. In order to facilitate project work on non-BLM lands beyond the current easement, realty actions such as the acquisition of temporary construction easements and/or new additional permanent easements would be required.

Development and Use of Permanent Waste Material Disposal Sites

It is estimated that implementation of this Byway project would generate approximately 50,000 cubic yards of waste material. All waste material would be hauled to permanent BLM waste material disposal sites listed

in section 2.2.1 and identified on Figure 7 and/or to additional waste sites yet to be determined. Selection of these additional waste sites would follow BMPs as identified in EA sections 6.1. Amounts of waste material being hauled to each waste site are not known at this time. Potential haul routes for identified waste material sites are also shown on Figure 7. All haul routes would receive continued maintenance during use which would include surface rocking, surface blading, roadside brushing, ditch cleaning and culvert cleaning commensurate with the amount of use.

Use of Temporary Storage Sites

Excavated construction material may be temporarily stored adjacent to the project site on the road prism or within cleared areas adjacent to the project site during project activities. Temporary storage allows for ease of access to materials during construction. In some situations where space is limited or other concerns are involved, material may be hauled to other locations for temporary storage. Temporary storage sites would also be used for the staging of equipment and various construction materials. Several sites have been identified as locations that would likely be used as temporary storage sites; they are listed in section 2.2.1.

Rock Quarry Work

It is estimated that approximately 35,000 cubic yards of crushed rock or other rock material would be needed for the project. Commercial rock sources would be utilized to supply the bulk of the project needs however, for the purposes of analysis it is assumed that 10,000 cubic yards of rock material would be removed from the BLM rock quarries as identified on Figure 7. Additional rock quarries may be identified and used for crushing or removing rock if the quality is determined to be sufficient for use. Potential haul routes for the identified BLM rock quarry sites are also outlined on Figure 7. All haul routes would receive continued maintenance during use which would likely include surface rocking, surface blading, roadside brushing, ditch cleaning and culvert cleaning. Clearing, grubbing and blasting may be included in development and use of rock quarries.

Alternate Routes and Public Detours

Project implementation would require a number of seasonal road closures along extensive stretches of the Byway which could impact commercial users and the general public (see Implementation Plan - Section 2.2.2). For commercial use of this area such as log haul, potential alternative routes would be identified. BLM would coordinate with adjacent landowners as the proposed construction schedule and planned road closures are finalized to help minimize impacts to timber haul. All gravel-surfaced detour roads used for commercial hauling activities would receive continued maintenance as necessary which would include surface rocking, surface blading, roadside brushing, ditch cleaning and/or culvert cleaning commensurate to the amount of use.

Primarily for reasons of safety, temporary detours identified and posted for use by the general public are expected to be the main roadways of the Byway (Nestucca, Bald Mountain and Bible Creek Access Roads). However, based on site-specific needs, situations and road conditions, existing gravel-surfaced roads may occasionally be identified as detours for public use, but it is expected that this would be the exception rather than the rule. All roadways used as public detours would be adequately posted and maintained as necessary to accommodate use by the general public.

Exploration of the subsurface conditions

This includes exploration of the subsurface conditions at various construction sites by test pit excavations and/or drilling. Gathered subsurface condition information would be used for project design development for various portions of the Byway project. Due to the design needs for project planning, some of this work was conducted during the winter of 2015 (see EA section 8 - Past, Present, and Reasonably Foreseeable Actions).

10. **Monitoring**

Monitoring is an essential component of natural resource management because it provides information on the relative success of management strategies. Given the fact that portions of the Byway project area are covered with multiple layers of special designations, monitoring is a critical component of the Byway project's design (Back Country Byway, ACEC, SRMA, State Scenic Waterway, suitable as Wild & Scenic River, Tier 1 Key Watershed, Riparian Reserve, Designated Critical Habitat(s), and concerns for Visual Resource Management). Proposed monitoring includes the following:

Invasive or non-native plants:

- BLM would monitor for new infestations of invasive or non-native plant species in all disturbed and freshly graveled areas for a minimum of three years after implementation.

Establishment of native plants:

- BLM would monitor the establishment of seedings or manual plantings (grasses, forbs, shrubs and/or trees) planted on disturbed areas including exposed soils on cut banks and fill slopes to help stabilize soils and minimize impacts to visual resources.

Water quality and fish passage:

- Monitor turbidity and fish passage during project implementation and post project to ensure fish passage and turbidity standards meet NMFS' standards for ESA compliance; and Army Corps of Engineers and Oregon Department of Environmental Quality 401 Certification provisions of the Federal Clean Water Act. Regulatory agencies would be contacted as appropriate if problems arise which move these monitoring items outside the regulatory standards.
- A post-project review of fish passage sites would be conducted by BLM after winter high flows. Fish passage project inspections should note any problems with channel scour or bedload deposition, substrate, or discontinuous flows. If problems occur, a plan to remedy the issues would be developed and implemented.

Recreation use:

- BLM would continue to monitor traffic volumes to produce annual and daily traffic counts on the Byway to establish and/or validate estimated or predicted visitor trends, and report on visitor use.
- BLM would continue to monitor condition of trees and groundcover vegetation within and near campgrounds, pull-offs, and river access paths to identify problems and damage that may occur over time from recreation use.

Road conditions:

- During project implementation, BLM would monitor road conditions, including gravel-surfaced roads used as haul routes, alternative routes and/or public detours, to determine maintenance needs.

Areas of Critical Environmental Concern:

- Portions of the Byway project are located within the Nestucca River Area of Critical Environmental Concern (ACEC) which was designated in recognition of its important scenic,

fisheries and wildlife values. BLM would continue annual monitoring of the ACEC to evaluate the impacts of the proposed action upon the pertinent values to assure compliance with special management needs.

2.2.1 Design Features of the Proposed Action

The following is a summary of the project design features (PDFs) that reduce the risk of adverse effects to the affected elements of the environment. Similar to the project description in section 2.2, the PDFs for the various components of the Byway project are numbered the same as the proposed action. However the first section describes those design features that apply to all (or several) of the activity types making up the proposed action, followed by those PDFs which generally apply to specific activity types of the proposed action as described within section 2.2.

The work proposed for the Byway project would likely require up to eight construction seasons to complete. For the purposes of impact analysis, a proposed Implementation Plan is outlined in section 2.2.2.

General Design Features that apply to multiple activity types of the proposed action

- The proposed action would be implemented consistent with applicable Salem District ROD/RMP Best Management Practices (BMPs). BMPs that are most pertinent to this project have been selected by the IDT and are contained in EA section 6.1. Some of these BMPs are reiterated below for emphasis.
- Containment measures would be implemented to prevent pollutants or construction and demolition materials, such as waste spoils, fuel or petroleum products, concrete cured less than 72 hours, concrete cure water, silt, welding slag and grindings, concrete saw cutting by-products and sandblasting abrasives, from entering waterways.
- Absorbent material would be secured around all stationary power equipment (for example: generators, cranes, drilling equipment) operated within 150 feet of wetlands, waterways, drainage ditches, or water quality facilities to prevent leaks, unless suitable containment is provided to prevent spills from entering waterways.
- Fuel storage and equipment maintenance would occur in staging areas that are at least 150 feet away from any waterways, storm inlet or on an impervious surface that is isolated from any waters, or storm inlet.
- If required, Standards outlined in the applicable Letters of Concurrence or Biological Opinions from USFWS and/or NMFS would be followed to assure ESA compliance and to help prevent or minimize adverse effects to ESA listed species.
- The BLM Field Office biologists or botanist would be immediately notified if any federally-listed or Survey and Manage species are encountered while implementing proposed project activities so timely protection measures can be incorporated, as deemed feasible.
- Ground disturbing work would be suspended if cultural material (as defined by the Archeological Resources Protection Act of 1979) is discovered during project work until an archaeologist can assess the significance of the discovery. If appropriate, the District Archaeologist would subsequently redesign the project or develop mitigation procedures to protect the cultural resource values present.
- Any activity implemented between April 1 and September 15, that would generate noise above the ambient level (use of chainsaws; heavy equipment for road construction, road repairs, bridge construction, culvert replacements; pile-driving; use of rock crushing and screening equipment) would include daily time restrictions if unsurveyed potential or suitable habitat for marbled murrelets is located within the disruption distance (generally 110 to 120 yards) (i.e. noise generating activities would not begin until two hours after sunrise and would end two hours before sunset). This daily time restriction does not apply to hauling. When the Industrial Fire Precaution

Level is 2 or above, the time-of-day restriction may be waived during the late breeding period (August 6 to September 15).

- If a new bald eagle nest or roost is discovered, any project activity within 0.25 mile or 0.5-mile sight distance would immediately be evaluated by the unit wildlife biologist for potential effects on bald eagles, and mitigated to help prevent or reduce disturbances.
- Public outreach would be conducted to inform potential visitors of scheduled road, campground and OHV trail closures. Means of notification would include press releases, newspaper announcements, website updates and as deemed necessary, information would be posted to BLM's social media sites.
- BLM would coordinate with adjacent landowners as the proposed construction schedule and planned road closures are finalized to help minimize impacts to scheduled timber haul.
- BLM would coordinate with annual Special Recreation Permit applicants as the proposed construction schedule and planned road closures are finalized to help minimize impacts to routinely permitted events. During some construction seasons we may not be able to accommodate requested Special Recreation Permits.
- The proposed action would be implemented consistent with the Storm Water Management Plan. (See EA section 6.2)
- Where appropriate, erosion control plans and spill prevention plans would be developed and implemented. (See EA section 6.1 and 6.2)
- All disturbed areas including exposed soils on cut banks and fill slopes would have soils stabilized and appropriate native vegetation (grasses, forbs, shrubs and/or trees) established by seeding or manual planting.
- Where beneficial to visual resources, structures such as retaining rock or concrete walls, gabion walls, wing-walls, coarse rock fill or Reinforced Soil Slopes (RSS) or other constructions would incorporate native vegetative screening where appropriate.
- Ground disturbance in association with culvert, wall, bridge replacement, and landscape alterations which are viewable from the river center should be adequately screened by topography or vegetation to protect visual resources.
- Where beneficial, a colorant would be added to concrete (retaining walls, culverts, bridges) to help minimize adverse impacts to visual resources. Colorant would be of a muted tone to limit contrasting colors with the surrounding environment. Where beneficial to minimizing adverse impacts to visual resources, texture may also be added to concrete structures.
- All construction equipment used would be cleaned of dirt, grease, vegetation or any other material and have leaks repaired prior to entering the proposed project area. Cleaning would be done with a high pressure hose and would be inspected prior to entering the project area. For project work adjacent to streams or where in water work occurs, equipment would be inspected daily for leaks or accumulations of grease, and any identified problems would be fixed before entering water. All subsequent move-ins of equipment as described above would be treated the same as the initial move-in.
- BLM would ensure that any water withdrawal would not reduce flow at the time of withdrawal by more than 10% in stream reaches inhabited by ESA-listed species, or by more than 50% in other streams.
- On fish-bearing streams, water withdrawal sites would be isolated with nets and/ or sandbags and fish would be removed from site.
- Work would adhere to the in-water work windows as defined by the Oregon Department of Fish and Wildlife (ODFW) when working within stream channels (Nestucca Watershed July 1- September 15; Yamhill Watershed July 15 –September 30). Projects outside of these work windows would require waivers from ODFW and National Marine Fisheries Service (NMFS), as appropriate.
- Road construction, reconstruction, or renovation activities would generally be limited to the dry season. The dry season is generally from June 1 to October 31, but may start or end earlier depending on seasonal precipitation influences. Given the location of some project areas (those that are not hydrologically connected to waterways) and type of activity, the period of work for some

construction activities may be extended beyond the dry season. Working outside of the dry season may require additional erosion control methods.

- Erosion control measures would be concurrent with ground disturbance to allow immediate storm-proofing.
- Where used, dust-abatement would be accomplished with water only.
- When construction is occurring during fire season, fire suppression equipment would be required to be on site.
- Access to Camp Cooper (T.4S, R.7W, section 2) would be maintained during construction activities in order to provide for emergency vehicles, staff and visitors.
- The existing CoastCom underground fiber-optic cable located under existing ditches for the full length of the Nestucca Access Road would be protected and may require temporary relocation during construction. Protection of line and relocation would be coordinated with CoastCom to prevent any disruption of service.
- Construction productivity would be maximized with the use of multiple crews when possible.
- Safety improvements on Bald Mountain Road and Bible Creek Road would be implemented prior to using both roads as detours during construction of Nestucca Access Road improvements.

Design Features that apply to specific activity types of the proposed action

In addition to the general design features above that apply to multiple activity types of the proposed action, the project design features below are specific to the various activity types of the proposed action described in section 2.2 above.

1. Nestucca Access Road gravel-surfaced section widening and paving

- Additional design features for this activity type are covered in the General PDFs section above, in EA sections 6.1 and the Stormwater Management Plan (EA section 6.2).
- Within the 2.7 mile gravel-surfaced section (Figure 2 and 3), road prism widening would occur to accommodate a double lane paved road at least 22 feet wide and ditch widths per the Storm Water Management Plan. In curves, additional pavement width may be needed to accommodate tracking of larger vehicles.
- The road subgrade would be prepared by adding additional aggregate and then paved with a lift of asphalt. The total area of new asphalt placed would be approximately 8 acres (including pull-offs, road approaches at intersections, day-use area and Elk Bend parking lot).
- It is anticipated that excavation needed for road prism widening would be accomplished with heavy machinery. Blasting for cut bank excavation during widening along the Nestucca Access Road would not be utilized.
- When cutting into rock, attempts would be made to minimize the linear forms and strong edges left by drilling and heavy machinery and to emulate natural forming basalt cliffs found in other areas of the Byway.
- Cutslopes, ditches and shoulders would be designed to match the rest of the Nestucca Access Road that is currently paved. Ditch widths may vary to be consistent with the Storm Water Management Plan.
- In order to limit the amount of cutbank excavation, erosion and disturbance, retaining walls, coarse rock fill or Reinforced Soil Slopes (RSS) would be constructed in road prism widening areas where beneficial.
- All geotextiles, etc., used for RSS's would be colored so as to blend with native soils; all coarse rock fill would be of native type/color.
- The Elk Bend Campground parking lot would be designed and upgraded to enhance safety; address parking lot, campground and toilet accessibility and user needs; and better reflect the overall

character of the Byway. The Elk Bend Campground parking lot would be paved and provide approximately eight to ten delineated parking spaces. To enhance safety, the parking lot would be defined from the roadway and campground. Parking lot and toilet access would be designed to meet the Architectural Barriers Act (ABA) guidelines and would be consistent with the Storm Water Management Plan.

- A short asphalt apron, less than 100' in length, would be constructed on all roads that intersect the Nestucca Access Road within that segment of road which is currently gravel-surfaced.
- Pavement markings would be placed on the road surface. This would include painting centerlines and fog lines.

2. **Byway culvert replacements, new cross-drains and Elk Creek Bridge replacement**

- Additional design features for this activity type are covered in the General PDFs section above and EA section 6.1.
- All stream culverts would be sized to adequately accommodate a 100-year flood event including allowance for bed load and small floatable debris without exceeding capacity or diversion (RMP pg 11).
- Stream crossing structures constructed to pass fish would generally be designed to be 1.3 times the bankfull channel width on streams on or within a mile of OC Coho. Fish streams above natural barriers (waterfalls) to anadromous fish, or specific site conditions such as narrow bedrock channels may be designed to bankfull width while meeting the 100-year flood event or a minimum of 6 feet in diameter. General assumptions of design sizes are included in Table 2.
- It is not anticipated that blasting would be utilized for culvert or bridge installation. Should blasting be needed, between April 1 and September 15, it would include daily time restrictions if unsurveyed potential or suitable habitat for marbled murrelets is located within one mile (i.e. blasting activities would not begin until two hours after sunrise and would end two hours before sunset).
- Minimize fill volumes at permanent and temporary stream crossings by restricting width and height of fill to amounts needed for safe travel and adequate cover for culverts. As needed, at each crossing replacement, incorporate additional design criteria (e.g., rock blankets, buttressing, bioengineering techniques) to reduce the susceptibility of fill failures.
- In order to avoid removal of some deep fills (over 20 feet) on existing culverts, some of the existing culverts would be slip-lined. Slip-lining is completed by pushing a smaller diameter plastic pipe through the existing culvert, grouting the space between the two pipes and sealing the ends. Overflow pipes that meet 100-year flow requirements would also be installed at these sites. This would require additional clearing and the construction of a temporary equipment access trail on the inlet side of the culvert.
- Access trails developed for slip-liner installation would be recontoured and replanted after use.
- When installing stream culverts, the stream would be diverted around the work area with coffer dams, pumping, etc. Diversions would be maintained until all instream work is completed. Seepage water that may escape the containment would be pumped to an off-stream filtration area.
- Fish passage would be provided for adult or juvenile fish during construction, unless passage did not exist before construction.
- When dewatering is necessary to protect water quality, fish or their critical habitat, flow around the construction site would be diverted; downstream channels (outside construction zone) would not be dewatered.
- Upon project completion, the construction site would be slowly re-watered to prevent a sudden release of suspended sediment. During re-watering, downstream segments would be monitored to prevent stranding of aquatic organisms below the construction site.
- The suitable removed culvert fill material would be stored on the adjacent road prism until reused for backfill. At locations where there is not sufficient space to temporarily store excavated fill

material, fill would be hauled to a temporary suitable storage site.

- To provide additional roosting opportunities for bats, structures such as bat boxes or other bat-friendly design features would be installed under new bridges and/or within larger concrete culverts where beneficial.
- The extent of rip rap around bridge footings would be minimized. Where feasible, planting pockets in the rip rap to break up texture and color would be included.
- If feasible, design bridge railings to be visually permeable to better blend into the environment. If bridge railing is non-permeable, (not allowing for views of river), soften lines with the addition of texture to bridge structure.
- All culvert flumes would incorporate vegetative screening where visible from the river or roadway.
- During the construction of the Testament Creek Culvert, a road bypass would be maintained to allow for local vehicle passage. Maintenance or construction of temporary road bypasses would be considered to allow for vehicle passage during construction at other major culverts.
- Fresh concrete (cured less than 72 hours), concrete-contaminated wastewater, welding slag and grindings, concrete saw cutting by-products, and sandblasting abrasives would be isolated so that they do not come in contact with water bodies or wetlands.
- Site-specific planting plans would be developed and submitted to DSL and/or ACOE as needed when final construction plans are available (i.e. larger culvert and bridge sites).
- If monitoring results in identified needs to help minimize head cutting of stream channel substrates or maintenance of fish passage at new structures, regulatory agencies would be informed and maintenance actions would be implemented as necessary.

3. **Repair of road slump areas.**

- Design features for this activity type are covered in the General PDFs section above and EA section 6.1.

4. **Construct additional paved turnouts, strategic roadway widening, intersection safety improvements, and manage existing pull-offs.**

- Additional design features for this activity type are covered in the General PDFs section above and EA section 6.1.
- On Bible Creek and Bald Mountain Roads, turnouts would be constructed by paving existing shoulders where possible, excavating into the cut bank and/or by placing fill material on the fill slope side of the road to provide road users improved sight distance and road surface to allow for passage of oncoming traffic.
- Changes to the geometry of the entrances to Elk Flat OHV Staging Area and Sheridan Peak Recreation Site along Bald Mountain Road would improve accessibility and help prevent low-clearance vehicles from scraping the roadway.
- Several OHV trail crossings would be improved to enhance safety along Bald Mountain Road including the installation of trail crossing signs, pavement markings and rumble strips. One trail crossing (Trail 91) is currently on a sharp curve; this trail crossing would be redesigned to provide a safe crossing with the ability to check for traffic prior to crossing.
- On Nestucca Access Road, existing pull-offs would be managed by maintaining their current condition, restricting vehicular access, or through enhancements including asphalt paving. Approximately 30 to 36 existing pull-offs which have adequate space, sight distance on roadway, and vegetated buffers from waterways would be improved. Improvements would include surfacing approximately 5 existing pull-offs with asphalt, totaling approximately 0.16 acres; these pull-offs are located between MP 17.25 and 18.69. Additionally, as needed some pull-offs would be enhanced by developing sheet flow drainage into vegetated buffer areas, applying additional gravel, and/or adding masonry or timber vehicle barriers to minimize impacts of vehicles to

vegetation, soils and water quality. Short paths, stairways and/or ramps would be built at approximately 13 points to allow safe access to the rivers and streams and help prevent erosion. Approximately two to five existing pull-offs without adequate sight distance and/or stream buffers would be closed to vehicle use and revegetated.

- The exits at Dovre and Alder Glen campgrounds along the Nestucca Access Road would be re-designed for improvements to enhance safety and accessibility and/or help prevent low-clearance vehicles from scraping the roadway. Improvements may involve vertical and/or horizontal realignment of the roadway(s), sight distance clearing and signage.

5. Manage roadside trees along the Byway.

- Additional design features for this activity type are covered in the General PDFs section above and EA section 6.1.
- Trees along project roads would be felled to implement maintenance and project construction activities and/or to reduce safety hazards. Trees identified as a hazard of falling onto the roadway or a hazard to adjacent equipment operations would also be felled. In selected areas, individual trees or small clumps of trees may be felled, topped or pruned for the purpose of increasing sight distances for safety.
- Trees needing to be felled for project implementation would be disposed of in a number of ways consistent with the RMP. They may be removed as firewood, commercial logs, woodchips, and/or left on site as chipped material or Coarse Woody Debris (CWD). Chipped materials and CWD left on site would be dispersed so as not to detract from visual characteristics. Where beneficial and appropriate, some of the felled trees may be incorporated into use during project implementation (i.e. used in the development of the day-use area, or placed in stream channels to help stabilize headwall migration after culvert replacement).
- Slash generated from tree removal would generally be lopped and scattered down slope of the road and/or placed over disturbed areas. If there is too much for VRM, fuels management or other concerns it could be hauled away for disposal. Slash also may be chipped and removed for disposal or dispersed on site so as not to detract from visual characteristics or create a fuels hazard.
- Stumps created from tree removal that are visible from the Nestucca Access Road or Nestucca River would be cut as close to the ground surface as saws or equipment allow.
- Felling of trees would be conducted in such a way as to assure no damage to adjacent trees including potentially suitable spotted owl or marbled murrelet nest trees or trees potentially being used by red tree voles.
- Up to five conifer trees greater than 36 inches DBH may be identified along the Byway which may need to be felled in order to implement the proposed action. During the final design phase of the project, reasonable attempts would be made to accommodate these trees and avoid the need to fell.
- If a tree needing to be felled contains marbled murrelet suitable nesting structure, it would be felled outside of the murrelet nesting season (April 1 to September 15).
- Work placing or felling trees into the stream channel would need to occur within the in-stream work window (July 1 to September 15) unless a waiver is obtained from ODFW and NMFS.
- When trimming trees and shrubs within the Nestucca River corridor for general maintenance and to open site distances for safety measures, protection of visual resources would be considered. This is in recognition of designations of ACEC, State Scenic Waterway, VRI Class I, and the Nestucca River's suitability as a Wild and Scenic River.
- For reasons of safety, when roadside tree removal is occurring within the Upper Nestucca OHV riding area, portions of the project area may be posted as "Closed" to OHV use during felling and/or log hauling activities.

6. Chipsealing asphalt surfaces of the Byway.

- Additional design features for this activity type are covered in the General PDFs section above and

EA section 6.1.

- Chipsealing would occur on all Byway roads that are currently or newly paved.
- Chipsealing on roads that may deliver application materials or leachates to streams, or on bridges over streams, would be completed during the instream work period.
- Chipsealing of road surfaces that are hydrological disconnected from streams or drain to streams with adequate filtration may occur at any time of the year except within 48 hours of predicted rain.
- After chipsealing is completed, the road pavement markings would be repainted. Where appropriate this would include centerlines, fog lines and any other pavement markings.

7. Install signage (traffic, interpretive, informational, portal) and other safety features (guardrails, barriers, designated speed limits)

- Additional design features for this activity type are covered in the General PDFs section above and EA section 6.3 – The Nestucca Back Country Byway Signage Plan.
- Traffic signs would be designed to meet public safety and regulatory requirements.
- Signs would be installed according to “Manual on Uniform Traffic Control Devices” (MUTCD) standards where appropriate (FHWA 2001).
- Signs, other than traffic, would follow the guidance of BLM’s “Sign Guidebook”. (USDI-BLM 2004)
- Coordination with Yamhill and Tillamook Counties would be conducted to arrange for consistent mileposts across jurisdictional boundaries along the Byway and county roads accessing the Byway.
- Existing guardrails would be evaluated for consistency and compliance within current standards throughout the Byway. If needed guardrails would be repaired, removed, or installed.
- Newly installed guard rails would be in muted colors so as to not detract from surrounding viewshed.
- An engineering study would be completed to determine appropriate speed limits for the various segments of the BLM controlled Byway. Speed limit signs and associated curve and intersection warning signs would be posted.
- The current policy would be followed to manage spontaneous roadside memorials erected by the public; this policy is described within the Nestucca Back Country Byway Signage Plan (see EA section 6.3).

8. Restoration of an asphalt waste area and development of a day-use area at the site (T.3S, R.7W, section 24 at MP 12.60)

- Additional design features for this activity type are covered in the General PDFs section above and EA sections 6.1.
- Testing would be completed to determine the type and concentration of materials present at the site. This information would be used to inform the remediation necessary.
- The scope of work at this site may include excavation of waste materials, replacement with fill material, capping with an impermeable layer, grading and planting with appropriate native plant species. For the purposes of analysis, it is assumed that 2,000 cubic yards of contaminated soil and waste material would be removed.
- If the site is found to contain hazardous waste material, it would be disposed of at an appropriate hazardous waste facility. If the waste material at the site is found not to be hazardous, it would be disposed of at an appropriate BLM permanent waste material disposal site(s) or may be left in place and capped with an impermeable layer of material if necessary.
- The site would be re-contoured to reflect a more natural topography.
- An existing strip of older, taller red alders adjacent to the Nestucca River would be maintained if possible to help provide stream shade and a visual buffer from the river.
- A day-use recreation site yet to be designed, would be constructed within the site currently containing the asphalt waste material. For the sake of analysis, it is assumed the site would include

paved parking for approximately five vehicles, two picnic tables and fire pits, a vaulted toilet and a short pathway or trail hardened with a rock surface allowing for river access. Interpretive signs and/or a kiosk would be strategically placed to provide visitors information regarding the surrounding landscape, forest practices, and ecological communities.

9. Design Features that apply to “Connected Actions” of the proposed action

Permanent Waste Material Disposal Sites

- Additional design features for this activity type are covered in the General PDFs section above and EA sections 6.1.
- All waste material generated by project implementation would be hauled to permanent waste sites identified below and mapped on Figure 7. Some material (most likely asphalt) could be hauled to an appropriate recycling facility. Additional permanent waste sites may be identified and utilized; selection of additional waste sites would follow BMPs as identified in EA sections 6.1. Currently identified permanent waste material disposal sites include the following:
 - Dovre Peak Quarry (T3S,R7W, section 16)
 - Grassy Flat Quarry (T3S,R6W, section 17)
 - Eastline Quarry (T4S,R7W, section 1)
 - Clarence Creek Waste Site (T3S,R8W, section 13)
- Potential haul routes for identified waste material sites are shown on Figure 7. All haul routes would receive continued maintenance during use which would include surface rocking, surface blading, roadside brushing, ditch cleaning and culvert cleaning commensurate to the amount of use.
- Site-specific plans would be designed at each disposal site prior to implementation. Plans would address erosion control, contouring, and other resource values.

Temporary Storage Sites

- After use of temporary storage sites, all stored material would be removed as appropriate and the site would be returned to a similar condition as prior to use. Stored material would be removed at the end of the construction season.
- Several sites have been identified as locations that would likely be used as a temporary storage sites. Additional temporary storage sites may be identified and utilized. Currently identified temporary storage sites include the following:
 - The US Forest Service storage site located along the Nestucca Access Road, near the intersection with Bible Creek Road (T4S,R7W, section 7)
 - The existing storage site located at the intersection of Bear Creek Road and the Nestucca Access Road (T3S,R7W, section 32)
 - Davidson Pit located along the Nestucca Access Road (T3S,R7W, section 24)
 - The Asphalt Waste Site located across from Davidson Pit, along the Nestucca Access Road (T3S,R7W, section 24)
 - The existing storage site located at the intersection of the AB Road and the Nestucca Access Road (T3S,R6W, section 15)
 - The existing storage site located along Bible Creek Road, east of the intersection with US Forest Service Road #14 (T4S,R7W, section 21)
 - The existing storage site referred to as Skidder Flat, located at the intersection of the Bald Mountain Road and Homestead Road (T4S,R7W, section 15)

- Eastline Quarry located off Bald Mountain Road on BLM Road 4-7-1.4 (T4S,R7W, section 1)
- Grassy Flat and Elk Flat OHV Staging Areas located along Bald Mountain Road (T3S,R6W, sections 17 and 31)
- Sheridan Peak Recreation Site located along Bald Mountain Road (T3S,R6W, section 28)

Aggregate Sources/Rock Quarry Use

- Rock Quarry development and use would follow BMPs as identified in EA sections 6.1.
- Any blasting needed for the preparation of BLM rock quarries between April 1 and September 15 would include daily time restrictions if unsurveyed potential or suitable habitat for marbled murrelets is located within one mile (i.e. blasting activities would not begin until two hours after sunrise and would end two hours before sunset).
- All BLM rock quarries used for sources of gravel extraction and temporary storage areas on BLM land would be surveyed for invasive and non-native plant species prior to project implementation. Based on the presence of invasive and non-native species identified, an appropriate eradication treatment method would be developed and implemented and/or a determination would be made as to if the use of the source would be acceptable for the proposed project.
- Site specific plans would be designed at each quarry site prior to use. Plans would address safety, erosion control, blasting, clearing and grubbing, daily time restrictions, and concerns for other resource values.

Alternate routes and public detours

- Project implementation would require a number of seasonal road closures along extensive stretches of the Byway which could impact commercial users and the general public (EA section 2.2.2). Consistent with the Proposed Implementation Plan alternate routes and public detours would be identified to accommodate road users.
- All gravel-surfaced roads identified for use as alternate routes for commercial hauling activities would receive continued maintenance as necessary, which would include surface rocking, surface blading, roadside brushing, ditch cleaning and/or culvert cleaning commensurate to the amount of use.
- Temporary detours identified and posted for use by the general public are expected to be the main roadways of the Byway (Nestucca Access, Bald Mountain and Bible Creek Roads). However, based on site-specific needs, situations and road conditions, existing gravel-surfaced roads may occasionally be identified as detours for public use. These gravel-surfaced roadways would be adequately posted and maintained as necessary to accommodate use by the general public.

2.2.2 Proposed Implementation Plan

In contrast to the description of the proposed action in EA section 2.2 or the description of the PDFs in EA section 2.2.1 which are generally organized into the ten types of work making up the proposed action, for the purposes of describing the staging or implementation of the Byway project, it has been divided into seven “phases” presented below and depicted spatially in a map on Figure 9. These phases are based on year(s) of implementation and largely stem from the various components having similar locations rather than just being similar types of work, as all of the proposed work would generally be completed within a particular segment of roadway during the same construction season in order to help minimize disruption.

The work proposed for the Byway project would likely require up to eight construction seasons to complete (David Evans and Associates, 2014). For the purposes of impact analysis, a proposed Implementation Plan is

outlined below; the actual Implementation Plan may be periodically updated or vary depending upon available funding, construction productivity, unforeseeable changes in BLM priorities, and/or unseasonable weather patterns. In addition to the proposed year of implementation for a given project, the planned road closures, recreation site closures, and/or traffic delays are also noted below.

The proposed implementation plan for the Byway project is broken down into the following Constructions Seasons and Phases:

2017 and 2018 Construction Seasons

Phase No. 1 – Safety Improvements on Bald Mountain and Bible Creek Roads; Widening and Paving of the 2.7 Mile Gravel-surfaced Section of Nestucca Access Road; and Replacement of Elk Creek Bridge.

Safety Audit Recommendations (short-term road closures and/or delays along the entire Byway, short-term closure of individual OHV trails and OHV staging areas, Spring to Fall 2017)

- Sight line improvements and hazard tree removal
- Safety signage
- Guardrail repairs on Nestucca Access Road
- Off Highway Vehicle (OHV) crossing improvements on Bald Mountain Road
- Construction of additional turn-outs on Bible Creek Road and Bald Mountain Road

Widening and Paving of the Gravel-surfaced Section of Nestucca Access Road (Nestucca Access Road Closed from Hoag Pass Road to Fan Creek Road, Elk Bend Campground Closed, Spring to Fall 2017 and 2018)

- Widening and paving of the 2.7 mile gravel-surfaced section of Nestucca Access Road (MP 12.76 to 15.44)
- Replace No Name 1 Culvert (MP 14.28) and Davidson Culvert (MP 12.79)
- Replace or repair 5 deep fill culverts
- Pave Elk Bend Campground Parking Lot
- Improve access from Elk Bend parking lot to the campground and toilet
- Replace various minor culverts
- Replace Elk Creek Bridge (MP 15.45)

2019 Construction Season

Phase No. 2 - Bible Creek Culverts, Slump Repair, Chip Seal and Striping (Bible Creek Road Closed from the Nestucca Access Road to the Junction with Bald Mountain Road, Spring to Fall 2019)

- Replace Bible Creek Pipe 1 (MP 1.40)
- Repair Bible Creek Road fill slope failure - asphalt undermined (MP 2.96)
- Replace Bible Creek 3 stream culverts in poor condition
- Replace Bible Creek Pipe 2 (MP 1.70)
- Replace various Bible Creek minor culverts (poor condition culverts)
- Chip seal and striping

2020 Construction Season

Phase No. 3 - Nestucca Access Road (MP 7.02 – MP 11.85) Fish Passage and Minor Culverts, Chip Seal,

Striping (Nestucca Access Road Closed from Fan Creek Road to Cedar Creek Road, Dovre Campground Closed, Spring to Fall 2020)

- Replace various minor culverts
- Replace Cedar Creek Culvert (MP 7.21)
- Replace Ginger Creek Culvert (MP 7.60)
- Replace Dovre Creek Culvert (MP 9.18)
- Chip seal and striping

2021 Construction Season

Phase No. 4 - Nestucca Access Road (MP 0.00 to 7.02) Fish Passage and Minor Culverts, Chip Seal, Striping (Nestucca Access Road Closed from AB Road Junction to Bald Mountain Road Junction, Spring to Fall 2021, Old Bald Mountain Road is available as a detour option to reroute log haul traffic; Nestucca Access Road Open from Bald Mountain Junction to Cedar Creek Road Junction with short-term closures and/or delays, Spring to Fall 2021; Nestucca Access Road Open from MP 0.00 to AB Road Junction with short-term closures and/or delays, Spring to Fall 2021)

- Replace Nestucca Pipe 5 (MP 5.76)
- Replace Nestucca Pipe 6 (MP 5.49)
- Replace Nestucca Pipe 7 (MP 5.49)
- Replace Fairdale Crossing (MP 3.84)
- Replace various minor culverts
- Chip seal and striping

2022 Construction Season

Phase No. 5 - Nestucca Access Road (MP 15.44 to 21.08) Fish Passage and Minor Culverts, Pave Existing Pull-offs, Chip Seal, Striping (only short-term closures and/or delays; construction would occur under traffic)

- Replace Bear Creek Culvert (MP 17.46)
- Replace Testament Creek Culvert (MP 20.02)
- Repair Nestucca slump failure (MP 19.48)
- Pave existing pull-offs
- Chip seal and striping

2023 Construction Season

Phase No. 6 - Nestucca Access Road Fish Passage Culverts, Repair of Slump Failures and Miscellaneous Spot Improvements (some construction would occur with only short-term closures and/or delays; slump repair at MP 7.76 would require closure of Nestucca Access Road for approximately 8 weeks from Dovre Campground to Cedar Creek Road)

- Replace Nestucca Pipe 4 (MP 9.38)
- Replace Quad Pipes (MP 10.21)
- Repair Nestucca slump failure (MP 7.76)
- Repair Nestucca slump failure (MP 5.60)

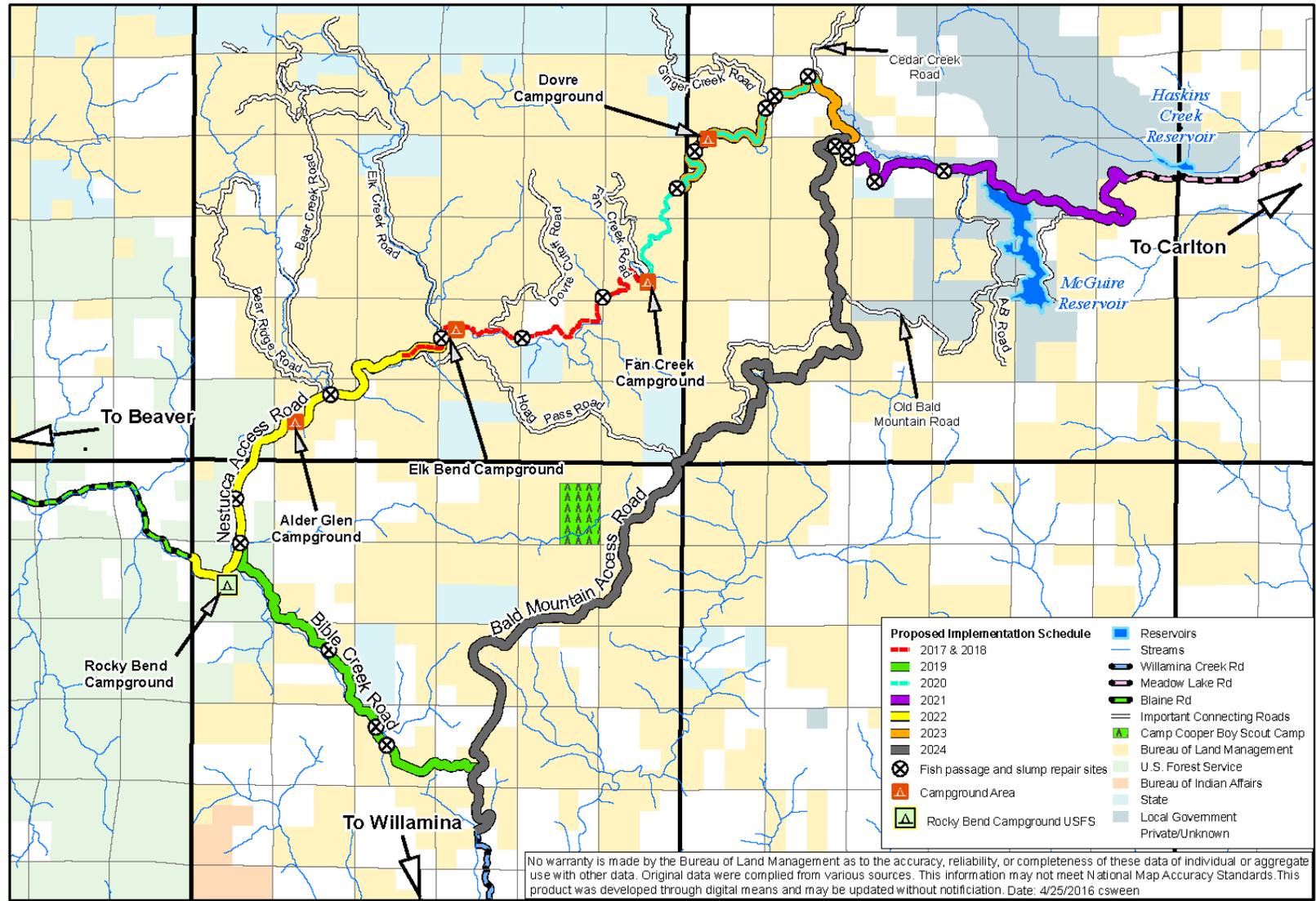
2024 Construction Season

Phase No. 7 - Bald Mountain Road Culvert Replacements, Intersection Improvements, Chip Seal,

Striping) Restoration of Asphalt Waste Site and Construction of Day-Use Area (construction would occur with only short-term road closures and/or delays; potential short-term closure of individual OHV trails and/or OHV staging areas)

- Bald Mountain Road Culvert Replacements
- Bald Mountain Road - Chip seal and striping
- Restoration of Asphalt Waste Site along Nestucca Access Road (MP 12.60)
- Construction of Day-Use Area in a portion of Asphalt Waste Site (MP 12.60)
- Changes to the geometry of the entrances to Elk Flat OHV Staging Area and Sheridan Peak Recreation Site

Figure 9. Summary Map of Proposed Implementation Plan



U.S. Department of Interior
Bureau of Land Management
Salem District: Tillamook Resource Area

1:100,000

0 0.5 1 2 Miles



2.3 Alternative 3: An Action Alternative to the Proposed Action

Based on public scoping comments, the IDT agreed that the analysis of an additional action alternative would be appropriate – an additional alternative which would both meet the purpose and need of the project, but have meaningful differences in environmental effects. Based on IDT discussions and public comments, the team developed this additional action alternative that would scale-back the proposed up-grading of the gravel-surfaced section of the Nestucca Access Road and not replace the single-lane Elk Creek Bridge with a two-lane bridge. This alternative would generally also exclude those other portions of the proposed action that could not be considered infrastructure maintenance and/or address identified safety issues. The IDT thought that this alternative captured the spirit of the public comment letters.

Alternative 3 is characterized by the following:

Under Alternative 3, the current 2.7 mile gravel-surfaced section of the Nestucca Access Road would be paved but there would be no widening of the current sub-grade (the prepared earth surface on which the road foundation is placed); the road would be paved to its existing width. This would result in a 2.7 mile section of single-lane paved road with turnouts, flanked by the existing road segments on either end that are two-lane paved roads. This 2.7 mile section would basically be similar to the current condition of Bible Creek Road; it would vary between being a single-lane paved road with turnouts and being the width of a two-lane paved road, depending upon the current sub-grade width. Although the current road's sub-grade would not be widened under Alternative 3, in places the current road prism would be widened to accommodate ditch widths per the Storm Water Management Plan. Like Alternative 2, under Alternative 3 the Storm Water Management Plan would be included within the project but relatively minor adjustments in the specifics of the plan to reflect no subgrade widening could be expected. Because there would be no widening of the current road sub-grade under Alternative 3 and road prism widening would only be needed to accommodate the Stormwater Management Plan recommendations, the need for additional retaining walls, coarse rock fill or Reinforced Soil Slopes (RSS) would be reduced from those constructed under Alternative 2.

It has been calculated that under Alternative 2 the project's proposed road prism widening along segments of the currently gravel-surfaced 2.7 mile long section of the Nestucca Access Road would result in approximately 3.45 acres of forestland being permanently converted to road prism; under Alternative 3 this acreage figure would be reduced possibly by as much as 0.5 acres. Under Alternative 2 it is estimated that a total of approximately 8 acres of subgrade would be paved (including pull-offs, road approaches at intersections, day-use area and Elk Bend parking lot) and under Alternative 3 it is estimated that approximately 7.5 acres of current subgrade would be paved.

Similar to Bible Creek Road, this portion of the Nestucca Access Road would likely not have a center line but would include signage informing users to "Drive with Caution" and information stating that the 2.7 mile section is a single-lane road with turnouts. Under Alternative 3, the single-lane Elk Creek Bridge would not be replaced as it is not a maintenance need (20 years of remaining lifespan) and it would not be inconsistent with the adjacent 2.7 miles of single-lane paved road with turnouts which would continue to the east.

Under Alternative 3, three culverts on fish-bearing streams proposed for replacement under Alternative 2 including the Bear Creek Culvert, Quad Pipes and Fairdale Crossing would not be replaced because they have not been identified for replacement as a maintenance need. Only structures expected to reach the end of their design life during the analysis period of this project (eight to ten years) or evaluated to have a 100-year flood flow capacity of less than 50% and therefore being "dramatically undersized" are recommended to be replaced for "maintenance reasons"; these culverts are not expected to reach the end of their design life during the analysis period of this project and have a 100-year flood flow capacity of approximately 50% or more. They are proposed for replacement under Alternative 2 largely because of the benefits to fish and fish habitat and/or they present particular concerns in the event of landslide or debris torrent activity (See Table 2). Because the remaining

culvert replacements and slump repair work proposed under Alternative 2 are considered to be infrastructure maintenance they are included in Alternative 3.

The construction of additional paved turnouts and strategic roadway widening along Bible Creek and Bald Mountain Roads, intersection safety improvements, and management of existing pull-offs proposed under Alternative 2 were also included in Alternative 3 because most of this work is considered to be safety improvements. Under Alternative 3 the management of roadside trees would be similar to Alternative 2 although about 250 fewer trees would be removed due to the scaling back of other portions of the project (road widening and culvert replacement). It is estimated that under Alternative 3 a total of approximately 1550 trees greater than 6 inches DBH would be removed. The chipsealing of existing pavement was included in Alternative 3 as it is being proposed for infrastructure maintenance needs to extend the life of the paved surfaces. Under Alternative 3 only those signs specifically tied to safety or considered to be the maintenance of existing signage would be installed. The “Willamina” portal sign would be eliminated from the alternative based on the fact that there currently is not a portal sign on the roadway when one enters the Byway from Willamina via Gilbert Creek, Coast Creek and Willamina Creek Roads. Similarly, new “informational” signs proposed under Alternative 2 that cannot be specifically tied to safety would not be installed under Alternative 3. Finally, the proposed restoration of the asphalt waste site and construction of a day-use area was not included within Alternative 3 because it is being proposed largely to better meet the Aquatic Conservation Strategy objectives, provide for recreational opportunity, and improve the general aesthetics of the area and rather than being considered maintenance of existing infrastructure or specifically, directly related to safety.

Under Alternative 3, there would be a proportional reduction (approximately 25%) in use of waste sites and rock quarries, and maintenance and use of haul routes to reflect the scaling back of portions of the project (road prism widening, retaining wall construction and culvert replacement) relative to Alternative 2. Because four major drainage structures would not be replaced under Alternative 3, including Elk Creek Bridge Bear Creek Culvert, Quad Pipes and Fairdale Crossing, the total amount of construction needed to be completed and the resultant inconvenience to users of the Byway would be reduced. Although the total amount of construction would be reduced, the number of construction seasons (years) needed for project implementation, as described in the Proposed Action Implementation Plan (section 2.2.2), would likely remain the same. However, the intensity of construction occurring within the implementation segments would be reduced. This may also reduce the length of time needed for road closures on any of the implementation segments.

2.4 Alternatives Considered But Not Analyzed In Detail

The BLM is required to include a discussion of a range of reasonable alternatives to the proposed action, alternatives which are technically and economically feasible and which meet the purpose and need, and which have a lesser environmental impact.

In addition to the two action alternatives, based on internal and/or external scoping comments the IDT considered several other potential actions or project design features for analysis during the interdisciplinary process. A brief explanation of why these other potential actions or project design features were not carried forward into analysis follows.

- The IDT considered a proposal for reconstructing Bible Creek and Bald Mountain roads to make them two-lane roads. This potential proposal was not carried forward into the analysis as it was believed that it would be cost prohibitive and that the current traffic volumes do not warrant such an expenditure.
- The IDT considered a proposal for making the entire BLM controlled portion of the Nestucca Access Road more “bicycle-friendly” by including a bicycle lane or wider-than-standard, paved shoulders; not chipsealing the paved road surfaces as chipsealing is generally not preferred by bicyclists; or using a finer grade aggregate during the chipsealing process to make the route more bike-friendly. The IDT did not include a project design feature of incorporating a bicycle lane or wider than standard, paved shoulders based on the *Road Safety Audit: Nestucca Back Country Byway* (FHWA 2014) which

concluded the following: “Given the low traffic volume on the Byway and in order to be consistent with adjacent county road sections, the Road Safety Audit Team recommends bicycle treatments be limited to providing information through signs and kiosks, rather than widening the Byway to provide a dedicated bike lane.” While the project IDT considered not including chipsealing, it was ultimately included as it was determined that the benefits of chipsealing in lengthening the life expectancy of the asphalt surfaces outweighed the adverse impacts to bicyclists especially given the fact that the temporary inconvenience of the chipsealed surface would be expected to improve over time with the most notable adverse impacts generally lasting no longer than a few months as the surface hardens and the excess material is removed (swept) from the roadway. Using a finer grade aggregate during chip sealing to make route more bike-friendly was not carried forward as it was determined this would make the chipsealing less durable and less effective.

- The IDT considered a proposal for eliminating road closures from the project proposal and conducting all construction activities with the use of temporary traffic delays and/or constructed by-passes at construction sites. While the IDT was able to minimize the use of road closures, a total elimination was not carried forward into the analysis as it was believed that it would be cost prohibitive and would create more, larger disturbance areas. In order to keep the entire Byway open during construction at the larger construction sites, numerous by-passes would need to be constructed around the sites. This would result in additional costs since the bypass would need to be constructed and then removed, and the area disturbed at each of the construction sites would be much greater.
- The IDT initially considered a proposal for much more extensive tree removal, primarily red alder, along the Byway roads to help reduce the need for removing fallen trees and branches from the roadway after winter storms. Tree removal was scaled back to include only those trees along project roads needing to be felled to implement maintenance and project construction activities and/or to reduce safety hazards. This was done primarily in recognition of Visual Resources Management (VRM) and wildlife resource concerns as well as public comments, primarily Doug Heikin of Oregon Wild who provided the following scoping comment: “Please recognize that the alder trees that line the road are an important part of the scenic driving experience. It is fine to remove trees when they present a real and imminent hazard, but please do not remove roadside trees pre-emptively just because they might someday fall” (Project Record Document #13).

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

Section 3 of this EA describes the current condition and trend of the affected resources and the environmental effects of the analyzed alternatives upon those resources. The interdisciplinary team of resource specialists (IDT) reviewed the elements of the human environment, required by law, regulation, Executive Order and policy, to determine if they would be affected by the proposed action (BLM Handbook H-1790-1: p. 137), [40 CFR 1508.27(b)(3)], [40 CFR 1508.27(b)(8)] (EA section 3.13), as well as the issues raised during scoping (EA section 1.3).

The resources potentially affected by the proposed Byway project are described in the following sections: Transportation and Road System Infrastructure; Recreation and Visual Resources; Hydrology; Threatened or Endangered Fish Species or Habitat, Magnuson Stevens Act-Essential Fish Habitat, and Fish Species with Bureau Status; Threatened or Endangered Wildlife Species, Habitat and/or Critical Habitat; Special Status (BLM 6840 Policy), SEIS Special Attention (Salem RMP), and Migratory Bird Treaty Act Wildlife Species and Habitat; and Invasive, Nonnative Plant Species (Executive Order 13112).

For the sake of analysis, unless otherwise noted, the time-scale or analysis period for anticipated effects of this project was considered to be eight to ten years. This is largely based on the fact that per the proposed implementation plan, work proposed for the Byway project would likely require up to eight construction seasons to complete (EA section 2.2.2) and it was recognized that many of the identifiable impacts to some resources

would continue to be most detectible for a couple of years post-implementation. Ten years was also the time-scale used for determining or defining a “maintenance need” for some aspects of the project such as the need for culvert replacement; if a culvert was expected to reach the end of its design life within 10 years, replacement for reasons of maintenance was proposed.

3.1 Transportation and Road System Infrastructure

3.1.1 Affected Environment

The Nestucca, Bible Creek and Bald Mountain Access Roads are classified as collector roads by the *Western Oregon Transportation Management Plan* (USDI-BLM, 1996 as revised in 2010), as they provide access to large blocks of public land, connect with county road systems, accommodate multiple uses and generally receive the highest volume of traffic of all roads in the BLM road system. The Nestucca Access Road is a total of 21.1 miles long. Approximately 18.4 miles of the Nestucca Access Road is a two-lane asphalt surfaced road with painted centerlines and fog lines; the remaining 2.7 miles is a gravel-surfaced single-lane road with turnouts. The gravel-surfaced segment of the Nestucca Access Road fluctuates in width from approximately 15 to 26 feet wide. Bible Creek Road is 5.2 miles long and is a single-lane asphalt surfaced road with turnouts; its widths vary from 13 to 23.5 feet. Bible Creek Road has no centerline although painted fog lines are present. Bald Mountain Road is 14.8 miles long and is a narrow single-lane asphalt surfaced road with turnouts; its widths vary from 13.5 to 20 feet. Bald Mountain Road also has no centerline; it is painted with fog lines only (also see EA section 1.4.1 and Figures 1 and 2).

Road Use

In addition to the use of the project’s roads by the recreating public as discussed in EA section 3.2 (Recreation and Visual Resources), one of the major functions of the areas roadways is to provide access for all traffic associated with resource management, which is most commonly associated with commercial logging activities. The project area is a major focus for recreational opportunity within BLM’s Salem District as well as being a collector road system providing access to a working forest. As such, recreational users may routinely encounter log trucks, trucks with wide loads in the process of moving equipment, and other truck traffic associated with resource management operations.

Any commercial use over the Byway roads requires a road use permit. Commercial permits range from short term duration with short segments of road to perpetual right-of-way agreements which include many miles of road.

The project’s roads serve a variety of users, which utilize many different types of vehicles on these roads. Vehicles that the recreating public typically uses include: bicycles, motorcycles, cars, pickups and recreational vehicles (motorhomes and travel trailers). Bald Mountain Road and the southern portion of Bible Creek Road pass through an area containing the Upper Nestucca OHV trail area; OHVs which are not street legal are relatively common and permitted to drive on BLM gravel-surfaced forest roads as well as the single-lane, paved Bald Mountain Road and the southern portion of Bible Creek Road. Other vehicles that use the project area roads are usually associated with resource management and include pickups, log trucks, dump trucks and trucks hauling heavy equipment. Resource management and the public’s use of project area roads vary with the seasons. Additional information regarding traffic volume on the Byway is discussed in Section 3.2.

A Coast Com underground fiber-optic cable is located under the existing ditchline on the north side of the road for the full length of the Nestucca Access Road. Coast Com has a Federal Land Policy and Management Act (FLPMA) right-of-way for the use of the fiber-optic line.

Road Surface Condition

The Nestucca Access Road was constructed in the 1950's and 60's. To reduce the costs of maintaining its gravel surface, it was asphalted in stages in the 1970's to early 80's. Except for the current 2.7 mile gravel-surfaced section (MP 12.76 to 15.44) the roadway is a two-lane asphalt surfaced road with painted centerlines and fog lines. Bible Creek Access Road was constructed in the 1970's with an asphalt surface. Bald Mountain Road was constructed in the 1960s and was rebuilt in 1997 when an additional aggregate lift and a new asphalt surface was placed on the road.

With a continuous maintenance program, life expectancy of asphalt is approximately 20 years. At this time, all of the asphalt surfacing on the Byway roads has exceeded or is near to exceed the 20 year life span. In the past, a chipseal surface has been placed on all asphalt surfaced roads to help extend the life expectancy of the asphalt by sealing the asphalt underneath from infiltration of water. The chipseal surface has a life expectancy of approximately 10 years. All of the currently chipsealed surfaces have exceeded the life expectancy.

Since both the asphalt and chipseal surfacing have exceeded their estimated life expectancies, the road surfaces are starting to deteriorate. With deteriorating asphalt and portions of the road segments being constructed across unstable ground, there are several places where the ground is slowly sliding out from under the road. This causes the road surfaces to crack, and at some locations, to have dropped several inches. These slumps or cracking in the road surface require periodic maintenance and makes for erratic driving conditions. Some of these areas have potential to increase sediment transport to live streams and impact fisheries resources and water quality if not repaired (see Figure 7).

Along the Nestucca Access Road there are multiple locations adjacent to the travel lanes that are used as vehicle pull-offs. Some of the pull-offs being used were not constructed as pull-offs, but provide enough level area for a vehicle to get off of the roadway and park. None of the pull-offs along the Nestucca Access Road are paved and the surface conditions are generally in poor shape. Several existing pull-offs along the Nestucca Access Road are located on road sections with very limited sight distances and/or unsafe river access thereby creating potential safety hazards. Other existing pull-offs are ideally located from a traffic safety perspective and also from a perspective that they offer easy, safe river access.

Along Bible Creek Road and Bald Mountain Road, multiple paved turnouts have been constructed in various locations to help provide additional width for safe passage of two-way traffic where sight distance of oncoming traffic is not available. Although there are multiple turnouts along these roads, there are still locations where restricted site distance limits the amount of time oncoming traffic is visible. Also, there are a few narrow segments on these roads that do not allow for two vehicles to pass each other, resulting in one of the vehicles needing to stop and, on occasion, back up to allow the other vehicle to pass.

The travel surface of that portion of the Nestucca Access Road which is currently gravel-surfaced fluctuates in width from approximately 15 to 26 feet wide. Because of the varying widths and the road being especially narrow in places, drivers often monopolize the entire road by straddling the center. The road has many sharp curves and blind corners. The gravel-surfaced section of road is currently surfaced with a poor quality, soft aggregate rock which with use and weathering, decomposes at a faster rate than gravel roads surfaced with a higher quality of rock. This road segment is therefore a chronic source of sediment which limits its availability for year round commercial use. Commercial use primarily includes hauling of logs, equipment and rock to and from BLM timber sales, restoration and road projects, and also for similar projects conducted and directed by adjacent landowners. It also produces large quantities of dust during the dry season, requires frequent maintenance, produces safety concerns, and limits the appeal of the Byway to some members of the recreating public (see Figures 2 & 3).

Minor road maintenance is completed annually on the Byway roads. Minor road maintenance includes roadside brushing, culvert cleaning, ditch cleaning, asphalt surface sweeping and minor asphalt patching on the paved portions of the roads. The 2.7 mile gravel-surfaced section of the Nestucca Access Road normally requires

surface blading and spot rocking two or three times per year when the road surface becomes potholed and wash boarded. Multiple potholes and wash boarding creates an uncomfortable ride for the occupants of traveling vehicles and hazardous driving conditions for vehicles that travel too fast to maintain traction and control. Along with this continuous minor maintenance, emergency storm damage such as slides onto the roadway, culvert failures, road fill washouts and down trees are addressed as funding allows.

Because the Byway roads were constructed 50 plus years ago, there are a large number of trees growing on the cut banks and fill slopes. These trees lean over the road surface and are typically hardwoods, with the majority of them being less than 18" DBH. Heavy snow or ice events cause trees or portions of the trees to fall onto the road surface. This results in safety hazards and additional maintenance needs to make the roads passible. Also, roadside trees in some locations have reduced sight distance in curves and at road intersections.

The Byway roads are not normally snow plowed or maintained for vehicle passage during the winter. Occasionally, if roads are being used for timber haul during the winter, Byway roads and other associated haul routes are snow plowed and maintained. At times when roads are not snow plowed it creates segments of road, especially at higher elevations, that are impassable to all vehicles. Normally, when snow remains on the road surfaces for an extended amount of time, adventurous road users create their own tracks through the deep snow. This results in a single set of tire tracks that do not accommodate two-way traffic. Typically when vehicles traveling via these tracks meet, one vehicle will need to back up for long distances to find a location wide enough for the other vehicle to safely pass.

Culverts

Many of the existing culverts along the Byway are beyond or are expected to reach the end of their design life within the next 10 years, and the majority of culverts on live streams are undersized for the 100-year flood flow capacity, with some of the structures having a history of plugging. Culverts that are currently in poor condition have rusted out bottoms, which cause embankment erosion and also have damaged culvert ends which captures debris and limit flow. Also, undersized culverts are more likely to collect debris at the inlets, resulting in less capacity and more frequent cleaning needed. These deficiencies result in an increased risk of culverts plugging, which could result in road failures and associated increased sediment discharge into the adjacent streams.

In the past, overflow culverts have been installed at some of the stream crossing to help prevent road washouts. Overflow culverts are installed in the road fill and are placed at a higher elevation than the stream culvert. This allows water to flow through the over flow culvert if the stream culvert plugs and reduces the risk of the whole road fill washing out.

Currently there are an insufficient number of cross-drain culverts along the Byway which impedes proper hydrologic function and may increase sediment transport to live streams, and impact water quality and fisheries resources. Cross-drain culverts are installed to strategically pass road and ditch runoff, drain seeps and springs and disconnect ditch lines from streams safely under the road prism.

There are culverts on the Nestucca Access Road and Bible Creek Road which restrict fish passage (see Table 2 and EA section 3.4). When the roads were constructed, fish passage was not considered at all of the culvert sites.

All drainage structures on the Byway roads have been assessed by BLM and/or Federal Highways staff. These assessments identified **130** culverts to be replaced, with **84** culverts that are currently in poor condition and **46** culverts that are currently in fair or good condition that are recommended for replacement in Alternative 2. In addition to replacing existing culverts, approximately **100** additional new cross-drain culverts are proposed to be installed to disconnect road drainage system(s) from streams.

The remaining lifespan of all culverts was a part of the condition assessment and was used to determine if they should be replaced. Culverts evaluated as being in poor condition have exceeded their lifespan and should be replaced for maintenance reasons. For the culverts that were assessed to be fair condition, they have not yet

exceeded their lifespan, but are anticipated to do so within the analysis period of this project (eight to ten years). Three culverts have been assessed to be in relatively good condition, but are recommended to be replaced in Alternative 2; the lifespan of these structures (Bear Creek Culvert, Quad Pipes and Fairdale Crossing) is expected to exceed the eight to ten year analysis period of this project, instead they have other logics for replacing, such as being fish barriers or plugging risks. Replacement of these three culverts has been removed from Alternative 3 (See EA section 2.3).

The current drainage structures flow capacity was also used to determine if they should be replaced. Structures evaluated to have a 100-year flood flow capacity of less than 50% are recommended to be replaced for maintenance reasons because they are dramatically undersized. Especially given the fact that these structures, which include three major stream crossings on fish-bearing streams (Dovre Creek, Ginger Creek and Cedar Creek), have a history of catching debris, plugging and are at risk of failure.

While culvert failures are not common, they tend to be associated with storm events that either overwhelm the capacity of culverts or saturate the road fills due to compromised structures. Major storms and flooding have occurred periodically within the project area (1945, 1950, 1955, 1964-65, 1972, 1996, 1999, and 2007). These events caused numerous landslides, culvert failures, road damage, increased sediment loads, and altered channel morphologies. Major flood events are often associated with rain-on-snow events, and although these events are not frequent, they change the stream character when they occur. The anticipated recurrence interval of rain-on-snow events is six years; at least one of these rain-on-snow events would be expected to occur within the analysis period of this project (eight to ten years) (personal communication with Steve Wegner, Salem District Hydrologist).

Culverts and bridges on the Byway roads receive the highest level of maintenance of all BLM controlled roads managed by the Tillamook Field Office; however, these culverts do not always get cleaned on an annual basis. During the 1996 flood event, which was a 100-year event, multiple culverts on the Nestucca Access Road collected debris at the inlets and some of them became plugged. During large rain events that exceed three inches in 24 hours, BLM generally implements a storm patrol to check the major road systems that have culverts with a history of plugging. Culverts and bridges needing maintenance during storm events have been identified during storm patrol and have been responded to by our BLM maintenance crew with heavy equipment.

Elk Creek Bridge

All BLM bridges, including Elk Creek Bridge on the Nestucca Access Road (see Figure 10), are inspected by Federal Highways every two years. The most recent bridge inspection completed on Elk Creek Bridge was done on March 3, 2014 (USDOT - Federal Highway Administration, March 2014). The bridge inspection identifies Elk Creek Bridge as being 72 feet long, 48 feet maximum span, single-lane concrete bridge, with a current operating load rating of 59 tons for trucks with typical axle configurations. The bridge can accommodate a legal load limit and is sufficient for use by vehicles that normally use the roadway. According to this most recent inspection, the bridge was found to be in good overall condition and with routine maintenance, a useful life of approximately 20 years can be expected of this structure.

Even though Elk Creek Bridge is in good condition, it currently impinges the width of the stream channel creating a potential catch point for large wood. During the 1996 flood, which was a 100-year event, Elk Creek Bridge collected large wood behind it; this had potential to damage the structure.

Being the only single-lane bridge on the Nestucca Access Road and abutting a two-lane segment of road, the Elk Creek Bridge is inconsistent with the majority of the Nestucca Access Road and the other roadways between Beaver and Carlton. Despite the Elk Creek Bridge being in a stretch of road with good sight distance, it produces minor safety concerns as oncoming traffic must yield to a vehicle that is crossing the single-lane bridge.

Figure 10. Elk Creek Bridge. The single-lane Elk Creek Bridge is located on west end of the gravel-surfaced segment of the Nestucca Access Road.



Safety Issues

In addition to safety issues or minor concerns identified above, including the gravel-surfaced section of the Nestucca Access Road and Elk Creek Bridge, the following safety issues have also been identified. Also see EA sections 1.3.1 and 3.2.

Currently there are six designated OHV trail crossing that intersect Bald Mountain Road, some of which are located in horizontal curves. These crossings have faded pavement warning markings and due to vandalism, missing OHV crossing warning signs.

There are a few intersecting side roads along the Byway that have approaches that are on steep grades where sight distance or maneuverability may be impaired by the road profiles. Road scraping is evident at the Elk Flat and Sheridan Peak Recreation Site road intersection on the Bald Mountain Road, where the side road was on a very steep up or down grade.

In terms of signage, many existing signs along the Byway are in need of maintenance or replacement, due to vandalism and normal deterioration. Some of the signs (advance curve and turn symbols) have not been installed in the proper locations. In addition, other signs including warning and milepost signs are missing.

The Byway project roads under the control of the BLM are posted with mileposts (also called mile markers); these mileposts (MPs) are referenced throughout this EA to identify specific locations. They are vital in efficiently providing needed services when responding to vehicle accidents or roadway incidents and provide important reference for road engineers and maintenance workers. They also serve motorists by offering a location reference. Given that the project area roads are under the jurisdiction of the BLM, connecting with roads to the east and south under the jurisdiction of Yamhill County and a road to the west under the jurisdiction of Tillamook County, the current seemingly uncoordinated mile marking system is inconsistent and confusing. On Bald Mountain Road they are posted from 0 to 14 in a south to north numbering system. On Bible Creek Road they are posted from 0 to 5 in a south to north numbering system. On the Nestucca Access Road they are posted from 0 to 21 in an east to west numbering system (see Figure 2). The approximate 14 mile road segment located west of the project area (from Hwy 101 at Beaver to the project area) is commonly referred to as Blaine Road; it is under the jurisdiction of Tillamook County. Mileposts along this county roadway contrast BLMs numbering system in that they are posted in a west to east numbering system beginning at Highway 101 in Beaver and ending at mile marker 15, just west of the intersection with Bible Creek Road where it meets up with the BLM mile marking system running in the opposite direction at BLM milepost 21. The 10 mile road segment located east of the project area (from the project area to Oregon Route 47 at Carlton) is commonly referred to as Meadow Lake Road; it is under the jurisdiction of Yamhill County and currently has no posted mileposts. It is approximately 10.5 miles to Willamina, Oregon via various road segments heading to the south of the project area roads; these roads to Willamina are commonly referred to as Gilbert Creek, Coast Creek and Willamina Creek Roads which are also under the jurisdiction of Yamhill County. There currently are no posted mileposts along these roadways.

Currently there are portions of the Nestucca Access Road that have guardrails. However, the placement of the existing guardrails is not consistent, as there is not guardrail in other locations on the Byway where there are similar steep slopes and cross-sections. Also, there are sections of the guardrails that have been damaged and are in need of repair. There are also missing delineators at the ends of the guardrails which are installed to enhance the guardrails visibility at night. Bible Creek Road and Bald Mountain Road do not currently have guardrails.

The vast majority of the BLM controlled Byway roads currently do not have posted speed limits but fall under Oregon's Basic Rule for speed; this is consistent with county controlled roadways for all access routes to the Byway. The basic rule (law) states that a driver must proceed at a speed that is reasonable and cautious for the existing conditions as related to other traffic (including pedestrians and bicycles), surface width, potential hazards, weather, visibility, and any other conditions that could impact safety. Driving at unsafe speeds relative to the existing conditions is a violation of the basic rule. The 2.7 miles gravel-surfaced portion of the Nestucca Access Road is currently posted with a 25 mile per hour speed limit.

Pavement markings are present on the paved portions of the Nestucca Access Road for both centerline and fog lines, while only fog lines are present on Bible Creek and Bald Mountain Roads. However, the markings have become faded making them difficult to see in some locations during the day and all of the markings very difficult to see at night.

Waste sites, rock quarries and associated haul routes

Permanent waste material sites which have been identified for use include Dovre Peak waste site, Clarence Creek waste site, Grassy Flat Quarry and Eastline Quarry (see Figure 7). These waste sites are located in stable locations away from streams.

There are multiple temporary storage sites, listed in section 2.2.1 – Design Features of the Proposed Action, which have been identified for use to temporarily store waste material and construction materials.

BLM rock quarries that could be used as construction material sources have also been identified (see Figure 7). The quality of rock in these sites is not of a sufficient quality to produce crushed rock material, however other rock materials such as riprap or pit-run may be used from these locations.

Roads accessing BLM rock quarries and waste sites were designed to handle heavy truck traffic and for the most part are in good condition at this time. These haul routes would require maintenance such as roadside brushing, surface grading, spot rock, culvert cleaning and ditch cleaning prior to use and would continue during use as needed.

3.1.2 Environmental Effects Alternative 1: No Action

Under a No Action Alternative, none of the proposed actions would occur at this time on or near the Nestucca Byway. However, routine road maintenance would continue to be completed, as well as emergency repairs to roads.

Road Use

Under the No Action Alternative there would be no need to temporarily close the Byway roads during periods of construction. Byway users would not be inconvenienced with construction delays or detours. Although planned delays or temporary road closures would not occur, unplanned closures due to culvert or slump failures, which would cause the road to be impassable, could result in a longer duration of road closure and the need to use other roads for detours if available.

Under the No Action Alternative, the road uses and trends identified in the affected environment (EA section 3.1.1) would be expected to continue.

Road Surface Condition

Under the No Action Alternative that segment of the Nestucca Access Road which is currently gravel-surfaced would not be widened or paved. Road users would continue to face unsafe driving conditions while using the gravel-surfaced section, which would include dust in the summer and uneven surface conditions due to potholes and wash boarding in the winter. This would also result in the need to continue maintaining the gravel-surfaced section multiple times per year. For the most part annual maintenance required on this segment of road would remain the same; however it is expected that the need to place road surface spot rock will increase as the existing surface deteriorates. For purposes of analysis it is expected that the Nestucca Access Road which is currently gravel-surfaced would need a whole new lift of surface rock, but this is not expected to occur within the analysis period of this project (eight to ten years).

By not paving the gravel-surfaced segment of the Nestucca Access Road it would continue to be unavailable for year round commercial use. Commercial use primarily includes hauling of logs, equipment and rock to and from BLM timber sales, restoration and road projects, and also for similar projects conducted and directed by adjacent landowners. During the wet season, generally mid-October through the end of May, commercial use of the gravel-surfaced section of the Nestucca Access Road is not permitted due to resource concerns, mainly sediment runoff. Commercial use that occurs on either side of the gravel-surfaced section during the wet season would continue to need to travel a considerable distance to reach destinations relatively close, if not for the seasonal restriction.

Commercial timber haul associated with BLM timber sales performed during the wet season would continue to be affected by seasonal haul restrictions (no haul during the wet seasons). Manufacturing facilities that process timber generally utilize specific species of trees. During the wet season under the No Action Alternative and given the location of the gravel-surfaced section relative to utilization centers for timber products, each load of western Hemlock harvested on the east side of the gravel-surfaced section would require the use of other roads suitable for use in the wet season adding up to two hours of additional haul time. Douglas fir trees harvested on the west side of the gravel-surfaced section would require approximately one additional hour of haul time. Because of the additional haul time which results in additional costs, BLM timber sales become less valuable to potential purchasers and produce less economic gain to local communities.

Under the No Action Alternative, road slump locations identified for repair would continue to get worse, resulting in uneven road surfaces and/or abrupt vertical breaks in the road surface. Continued temporary patching of these slump areas would be required.

Under the No Action Alternative, none of the existing paved roads would be chipsealed. Chipseals are placed to add a new surface layer and to seal the existing asphalt from water infiltration. Water infiltration is the most frequent cause of pavement failure. By not placing a chipseal, the existing asphalt surfacing would remain unsealed and the deterioration of the asphalt surface would be expected to continue. This would result in an increasingly uneven driving surface. It is anticipated that asphalt patching maintenance would need to continue. Overtime as the surface deteriorates; the need and cost of maintenance would be expected to increase.

Under the No Action Alternative pull-offs along the Byway would not be managed, but would continue to be used in their current condition. By not managing the pull-offs along the Nestucca Access Road, existing pull-offs with very limited sight distance would continue to be used, resulting in potential safety hazards. Turnouts along the Bible Creek and Bald Mountain Roads would not be added under the No Action Alternative and the current conditions described under the Affected Environment would continue to persist.

Under the No Action Alternative current management of roadside trees would continue under the BLM's road maintenance program. This would include the periodic removal of trees that are identified as hazards of falling onto the road surface, limbing trees along the road through roadside brushing, and removing down trees and limbs from the road surface after winter storms. Under the No Action Alternative, roadside trees would not need to be removed for construction projects such as culvert replacement or widening of the gravel-surfaced section of the Nestucca Access Road.

Culverts

Culverts that have been identified for replacement would not be replaced under the No Action Alternative. As described in the affected environment above, the majority of culverts identified for replacement on the Byway are undersized, which makes them at risk of plugging. Most culverts do not meet the 100-year flood flow capacity as many of the large stream culverts are greatly undersized (less than 50% of 100-year flood flow capacity) thereby elevating the risk of plugging. Most plugging occurs during flood events usually associated with rain-on-snow events; at least one of these events would be expected to occur within the analysis period of this project (eight to

ten years). Although culverts would continue to receive frequent maintenance, large flood events elevate the risk of plugging.

Given the factors discussed above and for analysis purposes, it is estimated that up to four culverts on the Byway would plug annually. Plugged culverts are normally identified by organized Storm Patrol Teams which conduct inspections during and/or immediately after storms while damage to roads may be occurring, as required by the Western Oregon Transportation Management Plan (USDI 2010). Unplugging these culverts often requires the use of heavy equipment during the flood event outside of the in-stream work period which results in a large pulse of released debris and sediment into the active stream channel. Plugged culverts not identified and unplugged in a timely manner may lead to failure of the road and culvert at the plugging site.

In addition to culverts plugging being a factor that could lead to failure, another factor is the condition of the culvert. Culverts in poor condition are typically rusted and contain holes, which weakens the culvert and allows the surrounding fill material to become saturated. Overtime saturated fill material will erode away leaving voids in the fill. This could cause the weakened culvert or fill to collapse leaving a sinkhole or slump on the road surface. In some cases, usually during flood events, a collapse of the culvert or fill could lead to failure of the road fill and culvert.

Although it is difficult to predict when or where culvert failures may occur, given the factors described above, there is a chance that a small number of culverts on the Byway may fail. For analysis purposes, it is assumed that up to two culverts on the Byway would fail within the analysis period of this project (eight to ten years). This assumption is based on professional judgment, past experience and the fact that many of these culverts have exceeded their design life span and would continue to degrade. Culvert failures would likely cause the road surface and road fill to be washed out. This would result in the necessity for emergency repairs and maintenance that may need to occur during the wet season, outside of the in-stream work period. This may also close the road to through traffic for up to nine months or more until repairs can be funded and implemented. Additionally, a failure of a larger culvert, especially at night, could create a traffic safety hazard until the area is identified and properly closed to traffic.

Elk Creek Bridge

Under the No Action Alternative Elk Creek Bridge would not be replaced with a two-lane bridge and would continue to be the only single-lane bridge on the Nestucca Access Road and roadways between Beaver and Carlton. It would continue to produce minor safety concerns as oncoming traffic must yield to a vehicle that is crossing the single-lane bridge; as road use increases the safety concern would be expected to increase. Elk Creek Bridge would continue to impinge the width of the stream channel creating a potential catch point for large wood during large flood events requiring additional maintenance.

Safety Issues

Under the No Action Alternative, OHV crossings on Bald Mountain Road and intersections with identified issues along the Byway would not be improved; traffic and information signs, milepost markers and guardrails would not be installed or repaired; a speed limit would not be posted and pavement markings would not be update. Current safety concerns identified in the Road Safety Audit (USDOT – FHWA, 2014) would not be addressed. With the exception of the 2.7 miles gravel-surfaced portion of the Nestucca Access Road which is currently posted with a 25 mile per hour speed limit, Oregon’s basic rule for driving a reasonable and prudent speed for the road and weather conditions would continue to be the standard along the Byway. Given the expectation of future traffic growth (DKS Associates, 2015) shown in Table 5, risks associated with the current safety concerns would be expected to grow at a similar rate.

Waste sites, rock quarries and associated haul routes

Identified waste sites and rock quarries would not be used under the No Action Alternative. This would result in not needing to use or maintain the associated haul routes to these sites to the degree described. Although the waste sites and rock quarries would not be used for this project, routine road maintenance would continue on the Byway and, over time, could be expected to increase as the condition of the Byway's roads continue to decline. This would require relatively small quantities of waste material to periodically, be permanently stored at the waste sites, and small quantities of rock materials to be periodically excavated from the rock quarries. The haul associated with continued maintenance of the Byway to these sites would be expected to be minimal and would still require the roads to be maintained during use.

3.1.3 Cumulative Effects Alternative 1: No Action

The geographical scope for consideration of road system infrastructure and transportation within this alternative consists of all Byway roads and the three connecting county routes. The connecting county road routes include the Blaine Road which starts at Highway 101 in the town of Beaver and connects to the west end of the Nestucca Access Road, Meadow Lake County Road starting in the town of Carlton and connecting to the east end of the Nestucca Access Road and Gilbert Creek, Coast Creek and Willamina Creek County Roads that start in the town of Willamina and connect to the south end of Bald Mountain Road.

No past, present or reasonably foreseeable future actions have been identified that are expected to cumulatively affect road system infrastructure and transportation under the No Action Alternative.

3.1.4 Environmental Effects Alternative 2: The Proposed Action

Road Use

During construction, the proposed action would have direct effects to recreational, administrative and commercial use of the Byway roads. Per EA section 2.2.2, the proposed action is expected to be accomplished in approximately seven phases over a number of years. Each phase would pose an inconvenience to users of the Byway at a variety of levels. Depending on construction project specifics, travelers may encounter inconveniences ranging from 20-minute delays to complete road closures for extended time periods. Extended road closures would include closing segments of road for the entire summer construction period (generally from approximately June through October). Any extended road closures would require designated detour routes, both for the public and commercial operations.

Primarily for reasons of safety, temporary detours identified and posted for use by the general public are expected to be the main roadways of the Byway (Nestucca, Bald Mountain and Bible Creek Access Roads). However based on site-specific needs, situations and road conditions, existing gravel-surfaced roads may be identified as detours for public use, but it is expected that this would be the exception rather than the rule. These gravel-surfaced roadways would be adequately posted and maintained as necessary to accommodate use by the general public.

To help minimize or avoid the potential for impacts to scheduled timber haul on project area roadways, BLM would coordinate with adjacent landowners as the proposed construction schedule and planned road closures are finalized.

Road Surface Condition

Under the Proposed Action widening and paving the existing gravel-surfaced section on the Nestucca Access Road would make the entire Nestucca Access Road a consistent two-lane paved road. This would also make the entire 46 mile route from Carlton to Beaver including Meadow Lake Road, Nestucca Access Road and Blaine Road, much more consistent as all the road segments, regardless of jurisdiction would be two-lane paved roads rather than having 2.7 miles of gravel-surfaced, segment in the middle be single-lane road with turnouts. Widening and paving the gravel-surfaced section would also result in less road maintenance needed for this segment of road. There would not be a need to grade the surface and add surface rocking multiple times per year.

Paving the gravel-surfaced section would make the entire Byway system, which includes the Nestucca, Bible Creek and Bald Mountain Access Roads, available for year-round commercial use. Commercial use primarily includes hauling of logs, equipment and rock to and from BLM timber sales, restoration and road projects, and also for similar projects conducted and directed by adjacent landowners. During the wet season, generally mid-October through the end of May, commercial use of the gravel-surfaced section of the Nestucca Access Road is not permitted due to resource concerns, mainly sediment runoff. Often, commercial use that occurs on either side of the gravel-surfaced section during the wet season must travel a considerable distance on other paved roads around the gravel-surfaced section to reach destinations actually located relatively close if not for the restriction. The BLM has recently, is currently and would be planning habitat improvement projects facilitated through timber harvest that would include wet season commercial use of the Nestucca Access Road. Although, we have planned and allowed some wet season commercial use, purchasers have not fully executed this ability because of the significant economic cost to travel around the gravel-surfaced section. It is not anticipated that the average commercial use of these roads would appreciably increase, it would just be distributed over more months of the year. The results would be more operational flexibility of commercial use, higher market values, and increased interest in BLM timber sales by potential purchasers. Our local communities would benefit with year round employment opportunities that till now have been restricted to the dry season only.

Along with providing the proper roadway width needed for two-way traffic, widening and paving the gravel-surfaced section of the Nestucca Access Road would also result in a safe and much more consistent driving surface for road users. It is anticipated that by paving the gravel-surfaced section the road would become more appealing to some members of the public that do not currently use the Nestucca Access Road because of the current gravel-surfaced section. However, as discussed by DKS Associates within the *Nestucca Transportation Study* (DKS Associates, 2015), travel time is the main factor drivers consider when choosing a route. It is expected that the proposed action would not improve travel times enough between origin and destination east and west of the study area to attract new trips. Therefore, other than the future travel growth that would include increases in recreational traffic and added through traffic, no further transportation impacts or growth is estimated.

Under the proposed action, four slump areas would be repaired. Three of these slump repairs are on the Nestucca Access Road and the other is on Bible Creek Road. Repair of these sites would result in a more consistent driving surface throughout the Byway and would eliminate the need to continually patch the slump areas with asphalt.

Pull-offs along the Byway, under the proposed action, would be managed along the Nestucca Access Road by maintaining their current condition, enhancement through paving or by restricting vehicular access. By managing these pull-offs, existing pull-offs with very limited sight distance would be blocked to vehicular traffic, which would eliminate the safety concern described in the affected environment. Pull-offs that are ideally located from a traffic safety perspective, provide the driver proper sight distance for returning back onto roadway and adequate space to pull off of the roadway, would be maintained as pull-offs. Pull-offs would be maintained by surfacing them with asphalt and others would be maintained as they currently are with a gravel surface.

Turnouts along Bible Creek and Bald Mountain Roads would be added under the proposed action. Additional turnouts would provide roads users paved road surface width adequate to allow for the safe passage of two-way traffic. These additional turnouts would be constructed in areas where sight distance to oncoming traffic is limited. This would reduce the risk of vehicles hitting each other and would eliminate the need for vehicles to have to back up to allow the other vehicle to pass.

Under the proposed action roadside trees would continue to be maintained as they currently are, as described in the affected environment. In addition to the continued maintenance, roadside trees would need to be removed at project construction sites that would include trees on fill slopes of culvert replacements sites, slump repair sites, within the widening areas of the gravel-surfaced section and in location of site distance clearing.

All existing paved roads and the proposed new paved surface on the current gravel-surfaced section would have a new chipsealed surfacing placed under the proposed action. Placing a new chipsealed surface over the paved

surface would seal the existing asphalt reducing its rate of deterioration and reduce the amount of asphalt patching maintenance needed.

Culverts

Under the proposed action all culverts that have been identified for replacement would be replaced. This would result in a reduced risk of culverts plugging on the Byway because the majority of the culverts would be sized properly to the 100-year flood flow event. Although the majority of the culverts would be sized properly, frequent maintenance of culverts would still need to occur, along with storm patrol inspection during flood events. The chance of culvert failures that could cause the road surface and road fill to be washed out would be reduced, since the new structures would be designed to handle 100-year flood flow. By installing new stream crossing structures, the need to repair or perform maintenance outside of the in-stream work window would also be reduced. By reducing the risk of culvert failures, emergency road closures on the Byway would be reduced, making the roads more reliable routes.

Elk Creek Bridge

The proposed action would replace the existing single-lane Elk Creek Bridge with a new two-lane bridge. This would result in a consistent two-lane paved road on the Nestucca Access Road along with the connecting county roads from Carlton to Beaver. The new bridge would be designed to not impinge the stream channel and therefore reduce the risk of catching debris during large storm events. The replacement of the bridge would require the closure of the road for multiple months during the summer of construction. If funding allows, the bridge could be replaced while the gravel-surfaced section is being widened and paved, which would result in the gravel-surfaced section and Elk Creek Bridge segment of road being closed for only one construction season.

Safety Issues

Under the proposed action, interpretive and information signs, and guardrails would be repaired or installed. This would resolve the current safety risks identified in the Road Safety Audit (USDOT – FWHA, 2014). Also under the proposed action a speed limit would be posted on the BLM controlled portion of the Byway. Posted speed limits would increase safety given an expectation of future traffic volume growth, (DKS Associates, 2015) shown in Table 5.

Waste sites, rock quarries and associated haul routes

Permanent waste material sites identified on Figure 7 include Dovre Peak waste site, Clarence Creek waste site, Grassy Flat Quarry and Eastline Quarry. Under the Proposed Action it is estimated that approximately 50,000 cubic yards (5,000 truckloads) of waste material would be generated from construction activities. Waste material would most likely be hauled to all identified permanent waste sites, but the majority of the waste material would be expected to be hauled to the Dovre Peak site.

Under the Proposed Action, it is estimated that 35,000 cubic yards (3,500 truckloads) of crushed rock or other rock material would be needed for the project. Commercial rock sources would be utilized to supply the bulk of the project needs, however, for the purposes of analysis it is assumed that 10,000 cubic yards (1,000 truckloads) of rock material, would be removed from the BLM rock quarries as identified on Figure 7. The majority of the rock used out of BLM quarries would most likely be mined from the Cedar Creek quarry and the Dovre Peak quarry.

Roads accessing BLM rock quarries and waste sites were designed to handle heavy truck traffic and, for the most part, are in good condition at this time. These haul routes would require maintenance such as roadside brushing, surface grading, spot rocking, culvert cleaning and ditch cleaning prior to use and would continue during use as needed. The roads anticipated to have the heaviest haul are Elk Creek Road and Cedar Creek Road.

3.1.5 Cumulative Effects Alternative 2: The Proposed Action

As mentioned above, the proposed sub-grade widening and paving of the existing 2.7 mile gravel-surfaced section on the Nestucca Access Road along with the replacement of the Elk Creek Bridge would make the whole Nestucca Access Road a more consistent two-lane, paved road. The proposed culvert and bridge replacements, as well as the slump repairs, would serve to make the route much more resilient and dependable during and after large storm events requiring less maintenance.

Cumulatively, these improvements to the Nestucca Access Road, along with projects listed and described in EA section 8 (Past, Present, Reasonably Foreseeable Actions) including Blaine Phase I and II, Tillamook County's various bridge replacements along Blaine Road, BLM's Nestucca Access Road east end road re-alignment, Nestucca Access Road rerouting to raise McGuire Reservoir, Fan Creek Culvert replacement and Alder Glen Bridge replacement would result in beneficial effects. Cumulatively, implementing the Proposed Action would make the entire route from Carlton to Beaver much more consistent, as all portions of the roads (Blaine, Nestucca Access and Meadow Lake Roads) would consistently be two-lane paved roads. With culverts and bridges brought up to a higher standard the entire route would be more resistant to large flood events, be a more dependable route between the coast and valley during or after flood events, and be more capable of safely accommodating future traffic volumes given the estimated 20-year traffic growth rates for the Nestucca Access Road.

3.1.6 Environmental Effects Alternative 3

Relative to the impacts to the Road System Infrastructure and Transportation Resource, the impacts under Alternative 3 would be similar to Alternative 2 with the exception of those impacts discussed below.

Road Use

Because four major drainage structures would not be replaced under Alternative 3, including Elk Creek Bridge Bear Creek Culvert, Quad Pipes and Fairdale Crossing, the total amount of construction needed to be completed on the Byway would be reduced. This would result in a proportional reduction of inconvenience to road users. Although the total amount of construction would be reduced under Alternative 3, the number of years the construction is planned to occur for, as described in the Proposed Action Implementation Plan (EA section 2.2.2), would be expected to remain the same; there would however be less work, and resultant inconvenience, occurring during some of the construction seasons. The intensity of construction occurring within some of the implementation segments would be reduced which would likely reduce the length of road closure on some of the implementation segments.

Road Surface Condition

Under Alternative 3, the current 2.7 mile gravel-surfaced section of the Nestucca Access Road would be paved but there would be no widening of the current sub-grade; the gravel-surfaced portion of the road would be paved to its existing width, flanked by the existing road segments on either end that are two-lane paved roads. The 2.7 mile section of road would basically be similar to the current condition of Bible Creek Road – it would waver back and forth between being a single-lane paved road with turnouts and a paved road effectively as wide as a two-lane road, depending upon the current sub-grade width. Similar to Bible Creek Road, this portion of the Nestucca Access Road would likely not have a center line but would include signage informing users to “Drive with Caution” and information stating that the 2.7 mile section is a single-lane road with turnouts.

Alternative 3 would enhance safety along the portion of the Nestucca Access Road that is currently gravel-surfaced by removing some of the identified safety issues (dust obscuring traffic, potholes and washboard which makes some drivers move out of “their lane”) (FHWA, 2014). However, paving that portion of the Nestucca Access Road that is currently gravel-surfaced without widening the sub-grade would maintain a situation of inconsistent road conditions when comparing it to the rest of the BLM's two-lane paved Nestucca Access Road, as well as with the adjacent county roads. While Alternative 3 would enhance safety in some regards, it would not

fully resolve the safety issues associated with inconsistent road conditions. Additionally, a single-lane paved road with turnouts can lead to unsafe conditions when drivers are not cognizant of the road conditions and/or limited sight distance and fail to use the turnouts; meeting another vehicle on the roadway where there is insufficient space for passing each other can raise concerns for collisions. Additional safety signage would be needed to inform travelers of the narrower road surface and help further alleviate safety concerns in the stretch of roadway.

Culverts

Under Alternative 3, three culverts on fish-bearing streams proposed for replacement under Alternative 2 including the Bear Creek Culvert, Quad Pipes and Fairdale Crossing would not be replaced because they have not been identified for replacement as a maintenance need, as they are not expected to reach the end of their design life during the analysis period of this project (eight to ten years) and they are not dramatically undersized (i.e., sized to pass less than 50% of the 100-year flow).

Bear Creek Culvert is currently functioning as designed, however there is a large landmass creep 0.8 miles above the culvert. With the potential of landslide activity the Bear Creek Culvert is at risk of plugging and potentially failing. Being adequately sized to meet the 100-year flow, Quad Pipes is also functioning as designed; however it is considered to be a plugging risk because it is located on a past debris torrent channel and its current design of two side by side culverts create a catch point for debris despite its adequate size. By not replacing Bear Creek Culvert and Quad Pipes they would continue to be at risk of plugging and potentially failing in the event of landslide or debris torrent activity.

By not replacing the Fairdale Crossing, it would continue to function as designed and would not be considered at major risk of plugging, however, it is a high priority for replacing for fish passage reasons (EA section 3.4).

Elk Creek Bridge

In addition to not widening the current sub-grade of the gravel-surfaced section of the Nestucca Access Road, under Alternative 3 the Elk Creek Bridge would remain a single-lane bridge. Although the bridge would cause a pinch point in traffic, maintaining a minor safety concern, the landscape in the area of the bridge allows for good sight distance for travelers to see on-coming traffic; as road use increases the safety concern at this site would be expected to also increase. Additional safety signage would be needed to inform travelers of the narrower road surface and help alleviate the minor safety concern at the bridge.

Waste sites, rock quarries and associated haul routes

Under Alternative 3, the sub-grade of the gravel-surfaced section of the Nestucca Access Road would not be widened, Elk Creek Bridge would not be replaced, and the three fish-bearing stream crossings described above would not be replaced. This would result in a proportional reduction (approximately 25%) in the total amount of permanent waste material produced from construction and the total amount of crushed rock and other rock material needed for construction. Because less material would need to be hauled over roads accessing rock quarries and waste sites, these haul routes would require a similar proportional amount of less road maintenance.

3.1.7 Cumulative Effects Alternative 3

Cumulative impacts for Alternative 3 would be similar to Alternative 2. However, the whole route from Carlton to Beaver would not be consistent, as that portion of the Nestucca Access Road which is currently gravel-surfaced would remain a single-lane road with turnouts.

3.2 Recreation and Visual Resources

3.2.1 Affected Environment

The area used for the analysis of impacts to recreational opportunity within this EA consists of that portion of the Northern Oregon Coast Range located in the area of the Nestucca, Willamina and North Yamhill 5th field watersheds. The majority (approximately 66%) of the roads to be impacted by the proposed project are located within the Nestucca River 5th field watershed, however, approximately 2.9 miles of the eastern end of the Nestucca Access Road are in the North Yamhill 5th field watershed, and approximately 9.9 miles of Bald Mountain Road and 1.1 miles of Bible Creek Road are located within the upper reaches of the Willamina Creek 5th field watershed. Additionally, to provide context and information regarding bicycle use, a larger area incorporating routes highly used and proposed for bicyclists were also included. The analysis area used for bicycle use encompasses the majority of northwest Oregon from the Columbia River to Highway 18, between the Willamette Valley and US Highway 101.

The Nestucca Back Country Byway

The Nestucca, Bald Mountain and Bible Creek Access Roads are designated as a National Back Country Byway to promote public access, casual recreational driving and *“to showcase the variety and richness of the Northwest’s public lands off-the-beaten track”* (<http://www.blm.gov/or/resources/recreation/byways.php>). Also see Special Designations in EA Section 1.4.2. The Nestucca Back Country Byway provides a leisurely route between the Oregon Coast at U.S. Highway 101 in Beaver, OR and the Willamette Valley. The 41-mile Byway including the Nestucca, Bible Creek and Bald Mountain Access Roads provides users the opportunity to travel a large loop. The Byway is accessed from Blaine Road if traveling from Highway 101 in Beaver, Meadow Lake Road if approaching from the Carlton or McMinnville area and Gilbert Creek Road if approaching from Willamina. Both Blaine Road and Meadow Lake Road are two-lane paved routes with minimal road shoulders, see Figure 1.

Each portion of the loop provides a different aspect of the Coast Range. The Nestucca Access Road provides travelers the opportunity to travel through a river corridor that has cut through 40-million-year-old formations of basalt, siltstone, and sandstone providing scenic views of the Nestucca River, steep canyon walls, vibrant wildflowers and a lush coastal forest. With the exception of the single-lane, Elk Creek Bridge and the 2.7 miles of gravel-surfaced road in the middle of the route, this is a two-lane paved roadway. Bible Creek Road connects the Nestucca Access Road to Bald Mountain Road. While traveling along Bible Creek Road, visitors travel by sheer rock bluffs, a steep canyon created by Bible Creek, and various stages of forest management areas. Bald Mountain Road traverses the crest of the Coast Range. Traveling along this stretch of roadway, visitors see various stages of forest management practices, wildlife, wildflowers and an occasional glimpse of the Willamette Valley. On a clear day, snow-capped mountains in the Cascade Range are visible. Bald Mountain and Bible Creek Access Roads are single-lane roads with limited paved turnouts to accommodate two-way traffic.

The 2.7 mile gravel-surfaced portion of the Byway on the Nestucca Access Road imposes concerns to some travelers. It is an unexpected unpaved road segment on an otherwise paved automotive touring loop with weather dependent dusty or muddy conditions, and despite annual maintenance, potholes and a “washboard” surface. These road surface conditions often cause drivers to utilize the entire width of the roadway as opposed to maintaining travel exclusively on the right-hand side of the road. Dusty conditions during the driest months will raise enough dust to temporarily limit visibility, amplifying concerns considering these surface conditions.

Throughout the Byway, there are a number of existing pull-offs with the majority (36) located along the Nestucca Access Road. Pull-offs, also referred to as pullouts, are wide shoulder areas either designed for, or in use as, locations providing opportunity for vehicles to pull-off of the roadway or park. The pull-offs located along the Nestucca Access Road are primarily used by visitors in support of recreational activities including swimming, water play, fishing, river viewing and photography. In conjunction with these pull-offs, approximately 13 narrow, user created trails provide access to the river for fishing and water related activities. The majority of these user created trails are associated with existing pull-offs and are characterized by poor slope alignment leading to soil erosion and loss of riparian vegetation. Bald Mountain and Bible Creek Access Roads are paved single-lane roads with turnouts. Turnouts are primarily used to provide safe accommodation of two-way traffic, with larger turnouts also used for parking, especially in association with hunting activities.

Signage throughout the Byway lacks a consistent aesthetic with many existing signs in need of maintenance or replacement. Sign posts vary between fiberglass, metal and wood. Some of the signs, such as “curve ahead”, have been poorly located. Other signs including warning and milepost signs are missing. Very few informational or directional (navigation) signs are available to assist visitors in traversing the Byway; missing road names and numbers, inconsistent mile marking throughout the route and extremely limited cell phone coverage further hinder the casual travelers’ progress when traveling through the Byway. Nearby communities also lack consistent signage to direct visitors to the Byway.

Although the Byway provides an alternate route between the Oregon Coast and the Willamette Valley, the route has many curves, promoting a leisurely driving experience and dramatically increasing the amount of time necessary to reach a destination. Travel distances and drive times between Carlton and various locations on the coast using State Highway Routes 22 and 18 are outlined in Table 4 below. Carlton was used as it being located on State Highway 47 at the east end of Meadow Lake Road, is the obvious “jumping off point” to other destinations in the Willamette Valley.

Travel time is typically the main factor when choosing between routes to reach a destination. As shown in Table 4, the Nestucca Byway is not a quick route between the Willamette Valley and the Oregon coast when compared to alternative routes (DKS Associates, 2015). Depending upon the specific destinations, using the roadways of the Nestucca Byway may be the shortest route in terms of mileage, but rarely is it the quickest route.

Table 4. Travel Distance and Time from Carlton, Oregon

	From Carlton			
	Travel Distance (Miles)		Travel Time (Minutes)	
To:	State Highway	Nestucca Byway	State Highway	Nestucca Byway
Sheridan	20	45	28	96
Willamina	25	40	36	89
Hebo	55	51	70	84
Beaver	60	45	78	86
Pacific City	64	57	82	105
Lincoln City	59	74	73	126
Tillamook	70	59	86	104

Winter road closure due to persistent deep snow also precludes the roadways ability to serve as predictable alternate passage during winter months between Carlton in the Willamette Valley and coastal communities. Higher elevations of the project area roads, primarily nearer the eastern end of the Nestucca Access Road and northern portions of the Bald Mountain Access Road, can receive considerable snow accumulations and are generally not snowplowed in the winter. Depending upon snowfall amounts, vehicle access to these higher elevations of the project area’s roadways can be very limited for most vehicle types for several months of the winter. Winter traffic tends to be weighted towards OHV use, hunters and fishers.

Traffic

Primary uses of Byway roads consist of sightseeing, leisurely driving, accessing recreational opportunities throughout the route and travel associated with commercial logging activities. The project area is a major recreation destination within the BLM Salem District, as well as an arterial road network providing access to a working forest. Recreational drivers routinely encounter log trucks, trucks with wide loads moving equipment, and other traffic associated with logging operations. The majority of the Byway does not have a posted speed limit and is guided by Oregon's Basic Speed Rule. The only portion of the Byway that currently has a posted speed limit is the 2.7 miles of gravel-surface. This section of the Byway's posted speed is 25 miles per hour and was implemented to provide additional safety on the mixed gravel surface.

Recreational traffic on the Byway is primarily May through October and on weekends. Summer traffic also includes Camp Cooper Boy Scout Camp (T.4S, R.7W, section 2)(Figure 13), a private inholding accessed from the Byway along Bald Mountain Road serving approximately 2,000 individuals. The Byway is also utilized for access to the USFS' Rocky Bend campground and Niagara Falls hiking trail.

BLM recently contracted with DKS Associates of Salem, Oregon to have a Transportation Study conducted on the Nestucca Back Country Byway. This study included 24-hour traffic counts, along with vehicle classifications and corridor speeds; data for this study was collected for a ten-day period between July 3, 2014 and July 12, 2014 at six study locations – two each on Nestucca, Bald Mountain and Bible Creek Access Roads. The time period, which included the busy 4th of July weekend, represents one of the annual peak periods of visitation along the Byway.

The DKS Associates traffic study found the percentages of heavy vehicle traffic, such as log trucks and recreational vehicles, ranged from 22.4% on the Nestucca Access Road (at Bible Creek Road) to 32.4% on Nestucca Access Road (at Bald Mountain Road)(DKS Associates, 2015). The projected log truck traffic on the Nestucca, Bald Mountain and/or Bible Creek Access Roads resulting from planned BLM timber sales expected to be harvested between 2015 and 2018, total up to an estimated maximum of 24 log truck round trips per day, peaking during the dry months. Additional information regarding use of the Byway by commercial traffic is discussed in EA Section 3.1.

During the study period, Average Daily Traffic (ADT) volumes along the Byway ranged between 140 and 340 vehicles per day, with the greatest volumes occurring on Nestucca Access Road. Traffic volumes more than doubled during the weekends when compared with weekday daily traffic. During the 10-day study period, Saturday, July 12, 2014 was found to have received the highest amount of traffic, see Figure 11: ADT Over 10-day Period of Data Collection. The study found that traffic volumes on the Byway peak during the day between 11:00 a.m. and 5:00 p.m. with a maximum of 23 vehicles per hour travelling in either direction, see Figure 12: Nestucca Access Road Hourly Volumes During Peak Day (DKS Associates, 2015).

Figure 11. ADT Over 10-day Period of Data Collection (DKS Associates 2015)

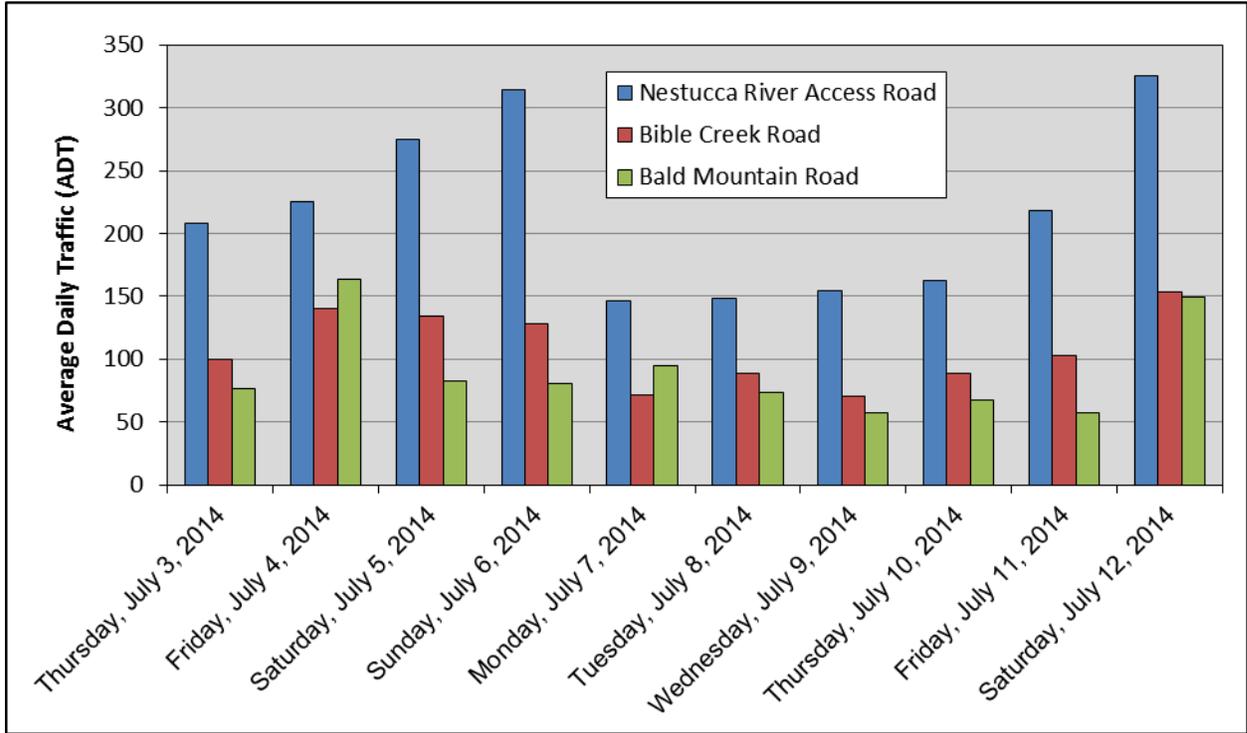
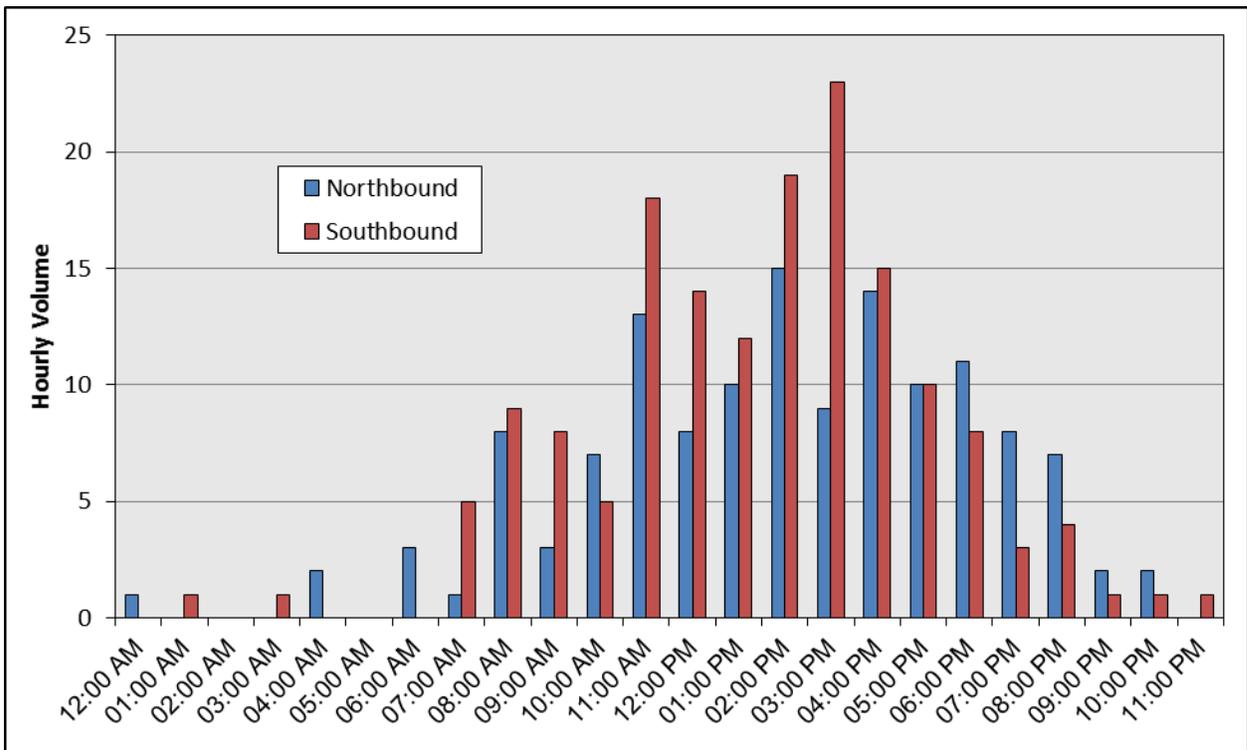


Figure 12. Nestucca Access Road Hourly Volumes During Peak Day (Saturday, July 12, 2014) (DKS Associates 2015)



Existing Trends in Traffic Volume

Traffic along the Byway has increased since its designation with the primary users coming from the Willamette Valley. As would be expected, use of the Byway has grown with the population in the Valley. The Byway and associated recreation opportunities are within a short commute of the Willamette Valley and provide easy access for day use or camping.

Using the Oregon Department of Transportation’s Future Highway Volume Tables (Table 5), DKS Associates estimated the 20-year growth rate expected along the Nestucca Access Road. Using a 2% traffic increase growth rate, the traffic volume along the Nestucca Access Road is expected to increase traffic from the current high use of 334 vehicles on a busy summer day to 480 vehicles traveling the route by the year 2035 (DKS Associates, 2015).

Table 5. Future 2035 Traffic Volumes of Study Corridors

Count Locations	Existing Peak Day (July 22, 2014)			Future 2035 (with Annual Growth Rate)		
	NB	SB	Total	NB	SB	Total
Nestucca River Access Road						
North of Bald Mountain Road	181	153	334	260	220	480
North of Bible Creek Road	151	166	317	220	240	450
Bible Creek Access Road	WB	EB	Total	WB	EB	Total
East of Nestucca River Road	63	74	137	90	110	200
West of Bald Mountain Road	93	71	150	130	110	240
Bald Mountain Access Road	NB	SB	Total	NB	SB	Total
North of Bible Creek Road	71	79	150	100	110	210
West of Nestucca River Road	72	76	148	100	110	210

Traffic Travel Directions: North Bound (NB), South Bound (SB), West Bound (WB), East Bound (EB)

Bicycle Volumes

The Nestucca Access Road is one of three bicycle routes Portland Bureau of Transportation advertises for travel between the Willamette Valley and the north Oregon Coast. The other two routes incorporate the use of state highways (<http://www.portlandoregon.gov/transportation/article/301633>). The northern-most route travels from the Banks area along the Banks-Vernonia linear trail to intersect with Oregon State Highway 202. State Highway 202 is predominately a two-lane paved roadway with limited or no road shoulder through the length of the route between Astoria and Mist, Oregon. The central route travels Oregon’s Highway 6, referred to as the Wilson River Highway. This is a heavily used route for vehicles traveling between Portland and Tillamook. A paved shoulder is available throughout the route. At least one other route between the Willamette Valley and the north Oregon Coast is used by bicyclists - US Route 26 which has a terminus at an interchange with US Route 101 between Seaside and Cannon Beach Oregon.

Bicycle traffic along the Nestucca Byway is sporadic and light. The 2.7 mile unpaved segment of the Nestucca Access Road is not a surface typical road cyclists prefer with the potential for mechanical issues, such as flat tires being very high. The lack of road shoulders along paved sections of the Byway also likely limits the appeal for most bicyclists. Despite these deficiencies, bicycle use has increased over the last 5 years. This use is primarily along the Nestucca Access Road rather than Bald Mountain and Bible Creek Roads, and predominately consists of single riders or small groups, less than 15 people on weekends with occasional use on weekdays.

There are occasional organized bicycle events along the Nestucca Back Country Byway permitted by the BLM. A recent, representative permit for bicycle use consisted of five guided trips along the Byway between the months of May and September, 2015. Each trip was comprised of a guide, approximately 15 cyclists and two support vehicles.

Bicycle traffic was noted in the recent DKS Associates' *Nestucca Transportation Study* (DKS Associates, 2015). Findings from field observations on July 11, 2014 and July 12, 2014, stated bicycle traffic was limited; a per-day maximum of five bicyclers traveled along the Nestucca Access Road. No bicycles were observed on Bible Creek Road or Bald Mountain Road.

Motorcycle Use (Touring/Street)

While no motorcycle-specific data is available for the Byway, it is referred to on various enthusiast websites, including motorcycleroads.com, coyote.com and roadsnw.com. Each of these sites feature ride reports and route characterization from a motorcyclists' perspective. The roads and area are described as beautiful and fun, but with safety issues. Roads nw.com specifically refers to the safety concerns of the gravel section and lack of signage or recommended speeds. The Byway is identified as "NOT a road for beginners or recently-returning riders" (roadsnw/rnw/39.com). Motorcycleroads.com even spells out how to bypass the gravel section of Byway, listing Bald Mountain and Bible Creek Roads by name as safe alternatives and citing the lack of signing at intersections.

Pedestrian Use

Pedestrian traffic along the Nestucca Access Road is typically very light and limited to areas near campgrounds, hunting and fishing sites. There currently are no BLM developed hiking trails accessed from the Byway. Individuals using the campgrounds occasionally walk along the roadway to access side roads. Fishers and hunters often park along the Byway and walk short distances to points providing river or forest access.

Bald Mountain Road sees a modest increase in pedestrian traffic near the Camp Cooper Boy Scout Camp during camp weeks when they utilize it for access to adjacent roads and forest (see Figure 13).

Accident History

Historical accident data along the Byway is extremely limited. Otak Inc. completed a traffic study along the Nestucca Access Road in 2005 (Otak, 2005). Findings from this report identified 14 crashes along this route between the years of 2000 and 2004; prior to the completion of the study, limited information was provided as to actual dates, location or time of day. Twelve single-vehicle crashes were shown to be in direct relation to speed, alcohol consumption, and/or failure to negotiate a curve. Two crashes were classified as head-on, possibly due to vehicles meeting in a curve or turn.

Additional crash data was provided in the *Road Safety Audit: Nestucca Back Country Byway*, prepared by Western Federal Lands Highway Division, FHWA in September, 2014 (FHWA, 2014). This study identified two fatal traffic accidents occurring in 2006, one on Bible Creek Road and the other on Nestucca Access Road. The fatal crash on Bible Creek Road was due to cardiac arrest while the vehicle was in motion. The fatal collision on Nestucca Access Road was a collision between an ATV and a pick-up truck travelling in opposite directions on the gravel-surfaced portion of the roadway. Two additional accidents took place summer, 2014; both single vehicle crashes shown to be in relation to speed, alcohol consumption, or failure to negotiate a curve. A single vehicle accident occurred along Bald Mountain Road in June of 2015 consisting of a loaded log truck leaving the roadway with no injuries reported. A fatality accident occurred the weekend of August 15-16, 2015 along the Nestucca Access Road with the cause yet to be determined.

Recreation

Recreation along the Byway primarily consists of camping, fishing, hunting, target shooting, swimming, geocaching, mushroom collection, sightseeing, OHV use, wildlife viewing, leisure driving and touring with vintage cars and motorcycles as well as modern vehicles. The three main access points to the Byway are located in or near the communities of Carlton, Beaver, and Willamina, Oregon. Byway recreational visitation is approximately 50,000 visitors annually. Annual visitation was calculated as a five year average from data

reported on the BLM's Recreation Management Information System. The Byway is also the primary access to two USFS Siuslaw National Forest year-round recreational sites, Niagara Falls hiking trail and Rocky Bend campground, as well as Camp Cooper, as discussed in the Traffic section above.

Recreation sites along the Byway include four BLM campgrounds along the Nestucca River (Alder Glen, Elk Bend, Fan Creek, and Dovre), the Sheridan Peak Recreation Site, the Upper Nestucca Off-Highway Vehicle (OHV) Trail System located along Bald Mountain Road and the three supporting OHV staging areas of Whipup Flat, Elk Flat and Grassy Flat (see Figure 13). Based upon fee station data, the four BLM campgrounds provide an average of approximately 10,000 individual overnight stays or visitor\nights per year. Sheridan Peak Recreation Site is located along Bald Mountain Road and receives approximately 500 visitors annually. The Upper Nestucca OHV Trail System is estimated at approximately 5,700 visitors annually.

Except for the Nestucca River ACEC, BLM lands in the area are generally open to the public for dispersed camping which is most prevalent within the Upper Nestucca OHV area from June through September and throughout the entire project area during the fall rifle hunting seasons for deer and elk. Dispersed camping usually occurs in areas which can accommodate travel trailers such as old landings, stock-pile sites, larger remote road junctions and dead-end logging spurs. Stay limits for camping is 14 days in a 28-day period, at which time the campers must move at least 25 air miles from the previously occupied site.

The Nestucca River is known for its high quality fishing opportunities and is well known for steelhead production. Anglers fish the Nestucca River for spring chinook salmon, Coho salmon, fall chinook, cutthroat trout, and steelhead. Salmon angling is not allowed above Moon Creek. The upper Nestucca River between Moon Creek and Elk Creek is fished mainly for summer and winter steelhead; no fishing is allowed upstream of Elk Creek. The portions of the river open to fishing receive hundreds of enthusiasts enjoying their sport along the banks during allowable fishing seasons.

The Bald Mountain Road portion of the Back Country Byway passes through an area containing the popular Upper Nestucca OHV Trail System. The area containing this trail system including a 0.25 mile buffer zone is approximately 13,500 acres in size. The riding area contains three official trail heads, two locations heavily used as staging areas, numerous (6) locations where designated OHV trails cross Bald Mountain Road, approximately 35 miles of trail opportunity and 140 miles of gravel-surfaced roadway on federal and state lands for motorcycles and small All-Terrain Vehicles (ATVs). Bald Mountain Road is the primary connector between trail locations; OHVs which are not street legal are permitted to drive on gravel-surfaced forest roads as well as the single-lane, paved Bald Mountain Road. In order for OHV riders to access some of the designated OHV trails, it is in fact necessary to drive on Bald Mountain Road.

The bulk of the OHV ridership within the Upper Nestucca OHV riding area occurs during the months of June through September. In general, the heaviest usage occurs on weekend days with an average high ridership of about 70 riders per day. In addition to the general public use of the trail system, there are up to two permitted special OHV events per year; these generally are one or two-day long riding events that utilize both trails and roadways within the boundaries of the riding area. Special OHV events are usually scheduled for weekend days and use numbers limited to 75 event participants.

Occasionally, there are special recreation events that include the Byway such as road rallies, and organized bicycle or motorcycle events; organizations sponsoring these recreational events are required to obtain a BLM special recreational permit. The permit outlines the authorized use, the number of participants and event locations.

General Safety Issues

As mentioned above, current conditions along the Byway present multiple safety concerns: Vehicles unable to pull completely off the road to either park or avoid oncoming traffic, poorly located and missing signage, the unexpected and variable road surface of the 2.7 mile gravel-surfaced section, the potential for slumps and slides to remove sections of roadway, and the narrow campground entries with poor geometry in relation to the Byway.

These deficiencies, coupled with driving at excessive speed for the conditions, OHVs on the roadway, narrow, unmarked blind corners, narrow roadways and OHV trail crossings have the potential to cause automotive collisions.

Signs Placed by Public

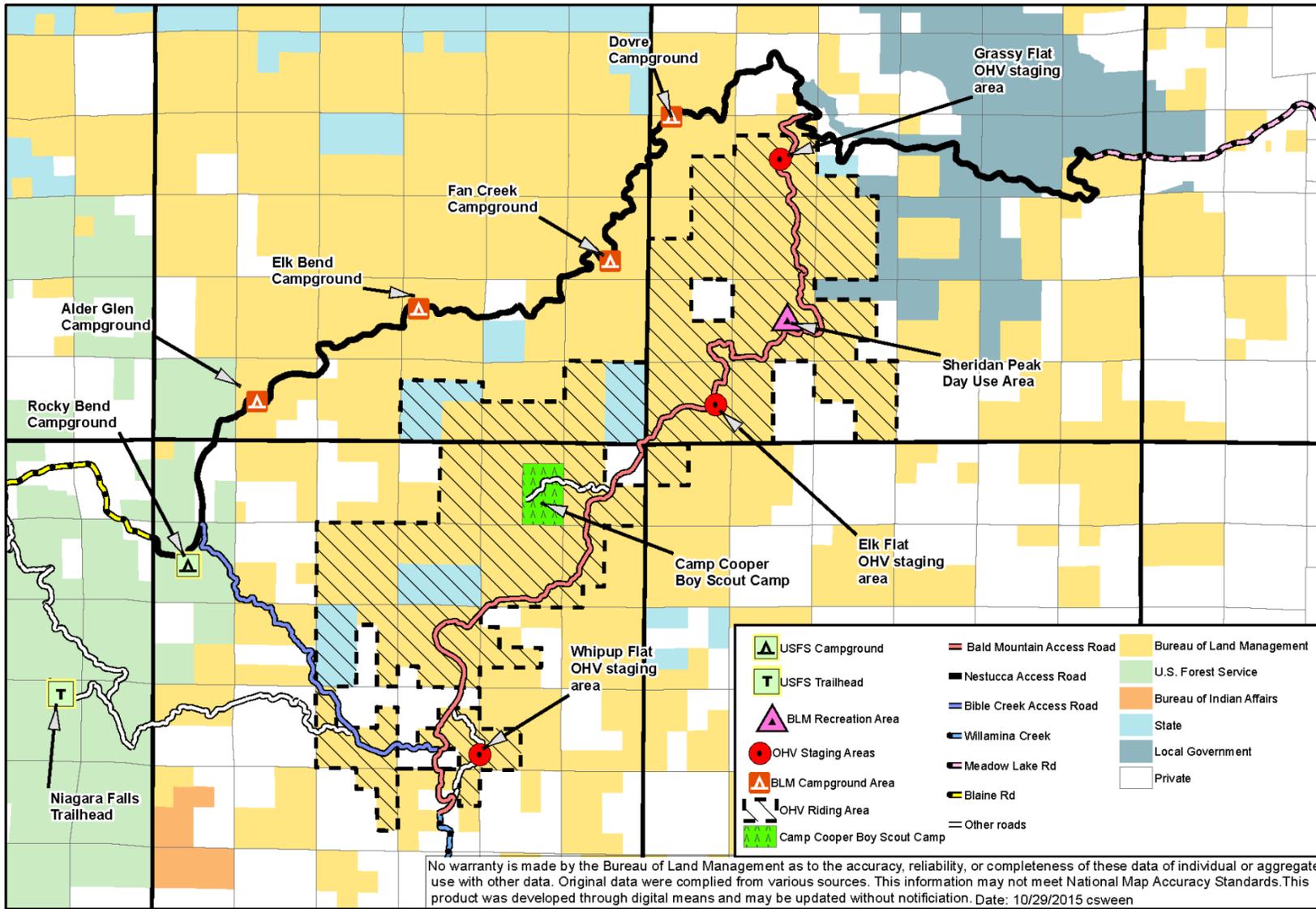
Roadside Memorials - Following fatal accidents along the Byway, the public occasionally erect and maintain roadside memorials at or near accident sites. Roadside memorials erected by the public are inconsistent with BLM policy and detract from the visual character of the Byway.

Currently, these memorials are considered abandoned or disposed of property and would fall under the guidance of 43 CFR 8365.1-2 which states, no person shall leave personal property unattended longer than 10 days. Following the 10 day period property is subject to disposition under Federal Property and Administrative Services Act of 1949, as amended (40 U.S.C. 484(m)).

Public placed minor signs - including paper plates and posters of missing persons or lost pets.

Minor signs are commonly placed by the public to direct additional members of the party to a site. These are scattered throughout the route and routinely consist of a paper plate or other material that is attached to a tree or sign with an arrow or name to direct party members to the chosen location. These minor signs should be removed the first Monday following each weekend and as located thereafter.

Figure 13. Current Recreational Sites Near and Along the Nestucca Back Country Byway



U.S. Department of Interior
Bureau of Land Management
Salem District: Tillamook Resource Area

1:100,000

0 0.5 1 2 Miles



Visual Resource Management

Visual resources consist of the land, water, vegetation, structures and other features that make up the scenery and physical features visible on a landscape. All Salem District BLM-administered lands have been classified under a Visual Resource Management (VRM) class system that was established by BLM during the last planning effort in the early 1990s. In 2014 the BLM Salem District re-inventoried for current scenic values and categorized BLM lands into Visual Resource Inventory (VRI) classes derived from individual visual resource components. A VRI class is determined by overlaying the ratings of scenic quality (A, B or C), public sensitivity to changes in visual character (H, M or L), and distance zones as seen from major viewing platforms or travel routes (foreground-middle ground, background, or seldom-seen). The foreground-middle ground zone includes areas seen from less than three miles away. Visible areas beyond three miles, but usually less than 15 miles away, are in the background zone. Areas either hidden from view or beyond 15 miles are in the seldom-seen zone (BLM Handbook H-8410).

Pacific Border Province: The Nestucca River Backcountry Byway is located in northwestern Oregon, within the BLM's Salem District. The project is located within the Northern Oregon Coast Range section of the Pacific Border physiographic province of the United States (BLM, 1986). This area is characterized by densely forested hills and mountains reaching upward of 3000 feet in elevation. The range was formed by volcanic action and it is common to see exposed basaltic flows along the mountain roads. The coastal range catches much of the moisture coming in from the Pacific Ocean, as a direct result there are many streams and rivers on the western slope (Corvus, 2015).

The majority of the project is within the *Tillamook Forest Scenic Quality Rating Unit* (SQRU 01) which “is on the west side of the coastal range and is similar to other units but has a denser and lusher understory. Industrial timber harvesting is present but less noticeable than in other areas. Landform is overall smoother from the Pacific exposure but still has steep-sloped hills. Larger rivers run through the unit” (Otak, 2014, p21).

The eastern limit of the project area is located in the *Willamette Valley Foothills Rating Unit* (SQRU 02) which “is comprised of the east slope of the Coast Range running down the Willamette Valley. Timber and agriculture uses present. BLM trees are older and often distinct compared to younger plantation/reforestation of clear cut areas. Roads and other structures are evident but not distracting” (Otak, 2014, p21).

Project Site: The Project is located on the Nestucca River Backcountry Byway to the east of Beaver, OR off Highway 101 along the Nestucca River. The corridor is a loop route and includes access roads at the west (Nestucca River Access Road) and southwest (Bible Creek Road) portions of the loop. The length of the entire Byway is 51.6 miles with the loop covering 32.0 miles of this distance. (Corvus, 2015)

For purpose of this visual analysis, the Byway is divided into four visually distinctive landscapes (Corvus, 2015):

- **Western segment:** The Byway begins at Highway 101 in Beaver, OR and follows the Nestucca River to the east 15 miles upstream to the junction of the Nestucca River Access Road and Bible Creek Road. This segment is largely within private landownership and USDA Forest Service (USFS) lands with the corridor intersecting two small BLM parcels. The landscape is comprised of rolling agricultural pasture lands dotted with farms, houses, and managed and unmanaged woodlands.
- **Northern segment:** From the intersection of the Nestucca River Access Road and Bible Creek Road, the northern segment includes the Nestucca River Access Road as it follows the Nestucca River to the northeast and forms the northern portion of the loop for a distance of 14 miles and ends at the intersection of Bald Mountain Road. This segment is along the Nestucca River and has

numerous BLM recreation facilities (campgrounds, river/angling access, recreation areas) within a heavily forested river valley. A majority of land along this segment is under BLM management and includes large scale timber harvests in seldom-seen landscapes from the Byway.

- **Eastern segment:** The Nestucca River Access Road leaves the loop at Bald Mountain Road and travels east for a distance of 4.6 miles before exiting the Byway. This segment follows the Nestucca River before connecting to the McGuire Reservoir within a heavily forested river valley. Land is in private ownership and includes timber harvests within the seen landscape once outside the river valley.
- **Southern segment:** Includes Bald Mountain Road linking to the eastern segment and Bible Creek Road connecting to the western and northern segments to form the southern 18 mile portion of the loop. This segment is within BLM managed lands and includes several BLM recreation facilities with a focus on facilities and trails for Off Highway Vehicles (OHV) use. This segment follows the forested ridgeline of Bald Mountain with expansive views along the northern portion of this segment and returns to a heavily forested landscape as the road drops in elevation before nearing Bible Creek Road and following Bible Creek. This segment includes large scale timber harvests in seldom seen landscapes from the Byway.

The Proposed Action is located along the entirety of the Byway, with various improvements occurring throughout. The Proposed Action is within the Nestucca River Area of Critical Environmental Concern (for fisheries and visual resource values, plus recreation experiences). The Nestucca River is also a designated State Scenic Waterway and is suitable for inclusion in National Wild and Scenic River system as a Recreational river.

State Scenic Waterways

Within the State Scenic Waterway the Nestucca River has designated Recreational River Areas (from just below McGuire Dam to Ginger Creek and from the lower end of Alder Glen Campground to Moon Creek) and a designated Scenic River Area (from Ginger Creek to the lower end of Alder Glen Campground). Oregon Parks and Recreation Department must be notified of actions along these designated Waterways and BLM would make every attempt to conform to the rules established for the Nestucca River Scenic Waterway and the state scenic waterways program. Recreation areas require partial screening of new structures and improvements with a mix of native evergreen and deciduous vegetation, obscuring 50% of the proposed action within 4 to 5 years. However, development necessary for public recreation, as provided by public agencies, and resource protection or enhancement may be visible from the river but must blend into the natural scene.” (OAR 736-040-0041 Nestucca River Scenic Waterway). The culverts, retaining walls and bridge(s) visible from the Nestucca River are installed by a public agency for the purpose of resource protection and enhancement. Therefore, the proposed structures may be visible but must blend in to the natural scene.

Visual Resource Inventory

In 2014, Otak completed the Visual Resource Inventory for the Salem Office of the BLM including the Nestucca Byway. The following summarizes key inventory elements from the report:

Scenic Quality: The measure of the visual appeal of the natural landscape in relationship to the larger context of the surrounding physiographic province landscape. Both the Tillamook Forest and Willamette Valley Foothills units have an overall Class rating of B.

Sensitivity Level: Measures the level of public concern for scenic quality and is based on social and/or physical characteristics of the landscape. The Sensitivity Level for the entire loop is High (SLRU 010) – maintenance of visual quality has high value.

Distance Zones: The project is located wholly within the foreground to middle ground distance zone (0-5 miles from the viewer), so the degree of contrast is potentially greater than if it were further away from the viewer. A majority of the northern segment has very limited viewing distances due to the steepness of the surrounding river valley slopes and dense understory.

The Visual Resource Inventory Class: Defines the existing relative quality and quantity of the land and establishes the visual value of the landscape for subsequent land use planning analysis. The Visual Resource Inventory Class for the Nestucca River Backcountry Byway is Class II, High Scenic Quality, with a brief patch of Class III, Lower Scenic Quality, on the Nestucca River Access Road, just east of Bald Mountain Road as the road transitions from BLM managed lands to lands managed by others. Further east on the Backcountry Byway, beyond the extents of this project, the road passes through Class IV (Lowest Scenic Quality).

Visual Resource Management Classes and Objectives

Visual Resource Management (VRM) classes are assigned by the BLM during the development of its Resource Management Plan (RMP) and are determined through the evaluation of VRI Class, land use and demands, and resource allocations and/or management decisions. VRM establishes the parameters of viewshed management through managing the integrity of the visual environment (Corvus, 2015).

The VRM Classes associated with the project are largely delineated by what portion of the landscape is visible by a typical user from the Byway and what lands are seldom seen from the Byway. Those that are seen have a higher VRM Class while those outside the seen landscape of the Byway allow a greater degree of management activity.

The Byway corridor is comprised of three VRM Classes; Class I and II within the seen landscape and VRM Class IV in the unseen landscape. The Proposed Action on BLM managed lands is located within VRM Class I and II. The objective for VRM Class I is to preserve the existing character of the landscape. The level of change to the characteristic landscape should be very low and must not attract attention. The Salem District RMP, Visual Resources Management Actions/Direction, pg. 37 states the following related to VRM Class I:

“Provide for natural ecological changes in visual resource management class I area. Some very limited management activities may occur in these areas. The level of change to the characteristic landscape should be very low and will not attract attention. Changes should repeat the basic elements of form, line, color, texture, and scale found in the predominant natural features of the characteristic landscape.”

And the following related to VRM Class II:

“Manage visual resource management class II lands for low levels of change to the characteristic landscape. Management activities may be seen but should not attract the attention of the casual observer. Changes should repeat the basic elements of form, line, color, texture, and scale found in the predominant natural features of the characteristic landscape.”

The remainder of the Byway loop, Bald Mountain and Bible Creek Roads, have been inventoried as Class II within the seen landscape and Class III & IV in the seldom seen landscape. A small segment on the northern portion of Bald Mountain Road transects a Class I at Sheridan. (Corvus, 2015).

- **VRM Class I Objective:** Preserve the existing character of the landscape. This provides for

natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

- **VRM Class II Objective:** Retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
- **VRM Class III Objective:** Partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
- **VRM Class IV Objective:** Provided for management activities which require major modification of the existing character of the landscape. The level of change to the character of the landscape can be high.

3.2.2 Environmental Effects - Alternative 1: No Action

Recreation

Under the No Action Alternative none of the management activities proposed under Alternative 2 or 3 would occur at this time or within the foreseeable future. Selection of the No Action Alternative would mean that only normal administrative activities such as minor maintenance would continue on BLM controlled roads within the project area.

Pleasure driving, sightseeing, fishing, camping, bicycling, water activities, camping, geocaching, mushroom collection and access to recreational activities, including OHV use and target shooting are the primary recreational activities found within or near the project area. Under the No Action Alternative, these activities would persist and identified safety concerns would not be addressed. Travelers would continue to face uncertain driving conditions when travelling along the 2.7 miles of gravel-surfaced road and across the single-lane Elk Creek Bridge crossing. There are minor safety concerns with the single-lane Elk Creek Bridge given the expected traffic volume increases (Table 5). The day-use area would not be constructed and would not provide parking alternatives to road-side parking for river recreationists; realignment of unsafe trail crossings within the OHV riding area would not be addressed, continuing the potential for OHV/vehicle collisions; pull-offs would not be upgraded or removed, continuing the unsafe parking and passing along road shoulders. The entrances to Sheridan Peak and Elk Flat Staging Area would not be upgraded, potentially allowing for further resource and property damage. Exits at Alder Glen and Dovre Campgrounds would not be corrected to provide safe ingress and egress angles. In addition, the area would not have informational signs placed to direct travelers to recreational opportunities and neighboring communities, likely resulting in occasional lost visitors.

The No Action Alternative would also exclude the replacement of culverts that are currently at risk of failure or do not meet the needs of high water flows including 100-year flood events, as well the repair of the identified large slump areas. In the event of a culvert or slump failure there is a probability that recreational opportunities and travel through the area would be limited for up to nine months or more due to loss of the immediate road surface until repairs can be funded and implemented. Additionally, the failure of larger culvert or road slump, especially at night, could create a traffic safety hazard until the area is identified and properly closed to traffic.

When comparing the 2005 Otak *Nestucca River Access Road Traffic Study* with the 2015 DKS *Nestucca Transportation Study*, use of the Byway shows two trends. Weekend peak Average Daily Traffic (ADT) has

The Nestucca National Back Country Byway Project EA EA # DOI-BLM-ORWA-S060-2014-0001-EA May 2016

risen from 231 vehicles in June, 2005 to 340 vehicles per day in June, 2014, showing a 29% growth rate over the last 10 years (Otak pg. 6 and DKS pg. 8). The DKS study shows the 29% jump in weekend traffic while the weekday numbers growth at only about 2-3%. On average the roadway maintains less than 250 vehicles per weekday and approximately 340 vehicles daily on busy weekends. This is an estimated growth of 10 vehicles per day since the 2005 Otak study. Use is expected to continue growing by 2% per annum and, given this expected growth (Table 5), not implementing a posted speed limit would continue to contribute to unsafe speeds for the existing driving conditions.

Visual Resource Management

Under the No Action Alternative, no BLM modifications to the landscape proposed under Alternative 2 or 3 would occur within the foreseeable future. BLM would follow current policy to remove public placed signs and memorials.

3.2.3 Cumulative Effects - Alternative 1: No Action

No past, present or reasonably foreseeable future actions have been identified that are expected to cumulatively affect recreational travel, visual qualities, access to recreation sites or the use of the OHV riding area under the No Action Alternative.

3.2.4 Environmental Effects - Alternative 2: The Proposed Action

Recreation – Impacts during Implementation

Implementation periods of the proposed action would have direct, adverse effects to recreational use of the Byway and areas accessed from the Byway. However, these adverse impacts would be considered temporary, with full opportunities available once a given phase is complete. The proposed action would be expected to be completed in seven phases requiring up to eight construction seasons (EA Section 2.2.2). Each phase of the project would pose an inconvenience to users with the potential of interruptions in traffic flows and access to some recreation sites and activities. Depending on project specifics, travelers may encounter 20-minute delays for very short term closures to complete road closures for extended time periods for construction purposes. Anticipated closures include Dovre and Elk Bend campgrounds for a minimum of one use season. There is also high probability that the Nestucca OHV riding area would be closed weekdays during the timeframe activities are taking place along Bald Mountain Road. During certain implementation phases, BLM may not issue special recreation permits, or may require a change in date or location, if the permit incorporated portions of the Byway are undergoing construction or maintenance. Camping would see the greatest impacts during implementation phases with the developed campgrounds closed and access to dispersed sites potentially restricted. Truck and heavy equipment would also have adverse impacts throughout the entire Byway during each phase, depending on material and equipment haul routes, with elevated traffic and noise. Additional truck traffic in association with the proposed action would be expected to occur primarily on weekdays, Monday through Friday.

These impacts would not be considered significant with BLM implemented mitigation strategies. During construction, notifications of closures would be dispersed and regularly updated on BLM websites and through press releases. Providing continued up-to-date information regarding activities, closures, and progress of the project would greatly reduce impacts to public use. On-site safety signage would be placed to inform users of additional truck traffic, potential closures and activities associated with the project to ensure most up to date information is available regarding recreational and travel opportunities. Defined detour routes would aid in alleviating impacts to users traveling the Byway. Primary use of the Upper Nestucca OHV trail system takes place on weekend days (Saturday and Sunday); during construction, short term closures of Bald Mountain Road are expected to take place on weekdays (Monday through Friday). BLM

would coordinate with annual Special Recreation Permit applicants as the proposed construction schedule and planned road closures are finalized to minimize impacts to routinely permitted events.

Recreation – Impacts post-Implementation

The paving project would widen the Nestucca Access Road through the gravel-surfaced section to provide a two-lane roadway and eliminate the safety concerns currently present while traveling on dusty/muddy road surface with numerous potholes and areas with a “washboard” surface. Road striping and fog lines would provide additional traveler safety. In-short, travel surfaces would become more homogenous and predictable for users along the entire Nestucca Access Road. Elk Bend campground parking would be paved and campground access upgraded to better accommodate campground use with a parking area and trail providing improved access to the toilet and campground designed to meet ABA (Architectural Barriers Act) standards. The existing stairs would be relocated and redesigned to permit direct access to the campground and limit visitors from climbing the bank thereby improving access and reducing erosion. The new Elk Creek Bridge would allow for traffic to continue without stopping, however, current site-lines leading up to the bridge allow for safe passage as it currently exists. Roadside pull-offs would be designed to focus users in areas allowing for parking completely off the roadway.

Changes to the current configuration and /or geometry of six designated OHV trail intersections along the Bald Mountain Road would enhance visibility and safety. Changes to the geometry of the entrances to Elk Flat OHV Staging Area and Sheridan Peak Recreation Site along Bald Mountain Road would improve accessibility and help prevent low-clearance vehicles from scraping the roadway. The exits at Dovre and Alder Glen campground along the Nestucca Access Road would benefit from vertical and/or horizontal realignment, sight distance clearing and signage improvements to enhance safety through visibility and accessibility.

New signs (See Section 6.3 for Signage Plan) would provide visitors with information regarding the area, potential driving conditions, a well-marked route for navigation to the general area and access to recreational opportunities. New signs along major highways may attract additional visitors by making incidental detours to visit the Byway, though the remoteness of the area predisposes it to more planned visitation. Placement-of and consistency-in mile markers and identification of distances to recreation sites would also help provide emergency responders accurate information and thereby improve safety. Implementation of a posted speed limit would be expected to increase safety by providing travelers acceptable speeds for negotiating the numerous curves.

Traffic Volumes

As identified in Table 5 (2035 Traffic Volumes of Study Corridors), traffic volumes along the Byway are expected to increase approximately 2% annually. In addition to the 2% volume increases tied to population growth, improved road surface conditions, and parking and access to recreation sites would be expected to draw a minor, unquantifiable increase in traffic due to more desirable travel and recreation conditions along the Byway.

Bicycle/Motorcycle Use

Initially, following the proposed chip-sealing, the treated roadways would be less desirable for some cyclists due to the loose surface. This would be expected to improve over time with the effects generally lasting no longer than a few months as the surface hardens and the excess material is removed (swept) from the roadway.

Individual bicycle use, bicycle tourism and motorcycle touring would be expected to increase moderately over time with the improved surface and shoulder conditions. Opportunities for loop and point-to-point rides and events would become available to those previously unsure of road conditions along the gravel segment.

The paved section of the Nestucca Access Road which is currently gravel-surfaced, improved pull-offs, additional turnouts and signage, would provide for a safer and more predictable cycling experience. Potential injuries, due to crashes from tire punctures and lack of mechanical grip on the gravel segment, would become a minor concern with the paving, reduced to such uncontrollable factors such as weather and unrelated mechanical failures.

Roadside Pull-Offs and Turnouts

Existing pull-offs along the Nestucca Access Road have been evaluated based upon concerns for enhancing safety, minimizing environmental damage and maintenance requirements, and providing recreational opportunity. Existing pull-offs would be managed by maintaining their current condition, adding enhancements such as gravel or asphalt surfacing, restricting vehicular access, and/or improving river access. Management of existing pull-offs would provide travelers the opportunity to have a safe area to stop and enjoy the view or access the river, and safely get back on the Nestucca Access Road.

Bible Creek and Bald Mountain Roads are single-lane paved roads with turnouts; constructing additional paved turnouts and strategically increasing roadway widths would provide road users improved sight distance and road surface to allow for safer passage of oncoming traffic.

Development of a Day-use Site

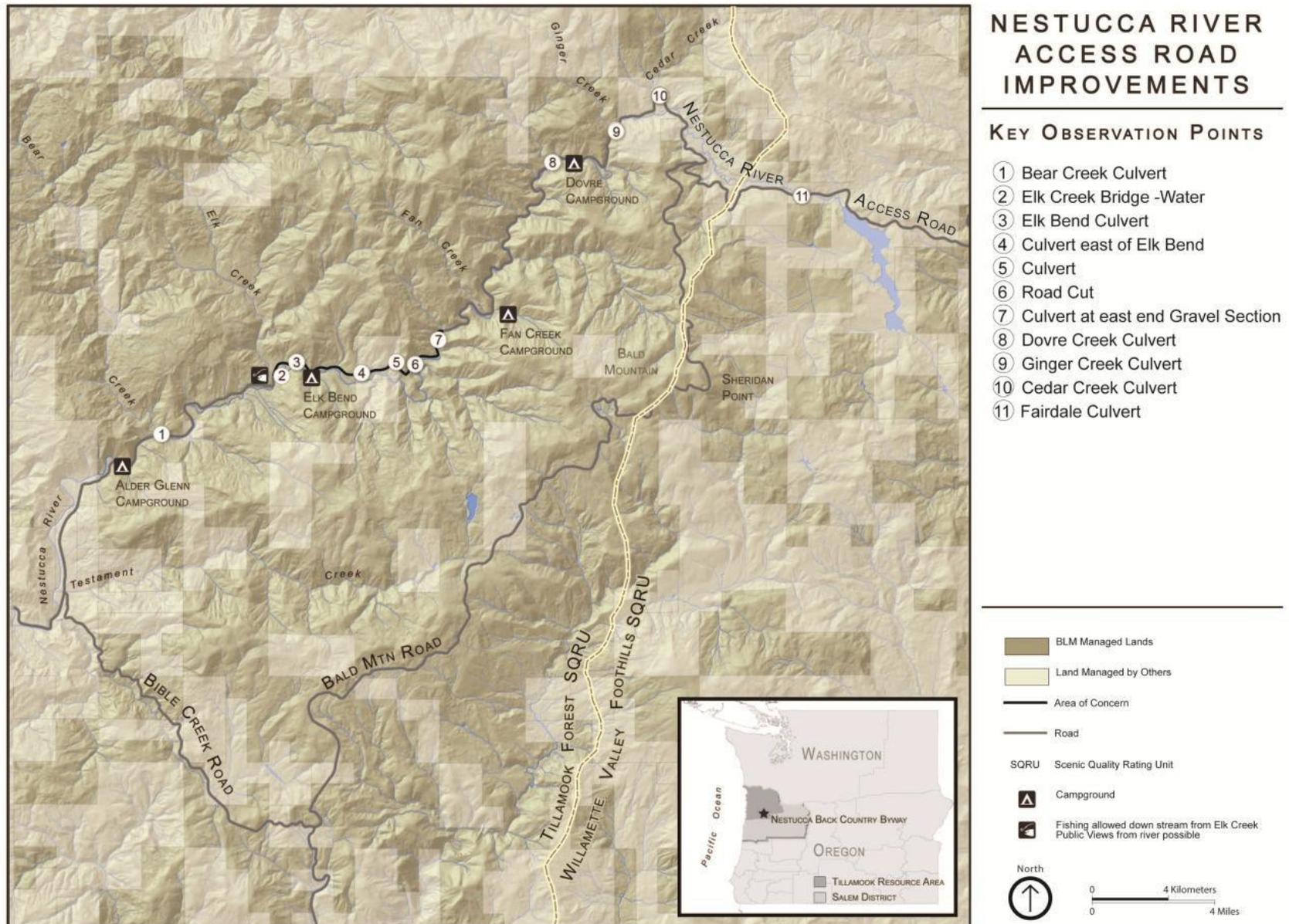
By developing a day-use site in a portion of the asphalt waste site, existing unsafe and environmentally undesirable pullouts with poor site-lines would be closed and having a developed, safely engineered and planned site to park and access the river would serve as an alternative to the user created pull-offs and steep trails cutting down the bank to the river. It would also provide a place for people to obtain area and environmental information along with restroom facilities; something not available at the informal pull-offs. By providing this opportunity, members of the public would be less tempted to simply pull off on the shoulder of the road and park for river access. The only other official day-use site along the Nestucca Byway is at Sheridan Peak along Bald Mountain Road. This site would continue to give those traveling only along Bald Mountain Road and Bible Creek Road a place to stop along their route as well.

Visual Resource Management

Methods

In order to evaluate the visual impact of the Proposed Action, eleven Key Observation Points (KOPs) were established that represent observation points by a casual user of the Byway to view the Proposed Action. These KOPs were selected to show a majority representation of the new structures or modifications associated with the Proposed Action including bridges, culverts, retaining walls and typical road widening and paving. These KOPs form the basis of evaluating the visual impact to the character landscape. The locations of the KOPs are shown below in Figure 14. (Corvus, pg. 12, 2015)

Figure 14. Key Observation Points used to evaluate impacts to Visual Resources (Corvus, 2015)



Road Widening, Paving and Striping

Initially there would be minor contrast in color and texture where the new paving and striping adjoins the existing paving at either end. The paving of the gravel-surfaced road would improve the color of surrounding vegetation by greatly reducing roadway dust. Immediately upon completion of construction, it is expected that the roadway would have weak visual impacts and meet VRM Class II. It would be expected that after 2-3 years the road surface meets VRM Class I by matching the color and character of the existing road (Corvus, 2015, p.15).

The fresh grade cuts along the hillside would be visually prominent while they are in view and are not expected to blend in with the surrounding vegetation immediately after construction. There are existing cuts into rock and re-vegetated soil slopes along the northern segment of the Byway, so the disturbance has visual precedent along the corridor. Mitigation techniques used in the Proposed Action attempt to limit visual impact by over-steepening slope where there is solid rock, rather than chasing the grade up the slope and disturbing more surface area than necessary and by building up the road bed so the initial cut starts farther up the hillside and does not need to be cut as deeply. In KOP 6 the use of both of these techniques minimized cut slope height and eliminated the need to cut the slope on the outside edge of the turn. The visual contrast of the road cuts would be perceived by the casual observer, but not attract attention. They would be equal to a VRM Class III in the short term and in the long term would be expected to meet the VRM Class I with revegetation and soil oxidation.

Development of a Day-Use Area at the Asphalt Waste Site

It would be expected that after construction the parking surface of the day-use site would meet VRM Class I by matching the color and character of the newly constructed road.

As part of river access trail construction, woody vegetation and plants would be removed along the corridor and the immediate vicinity of the corridor. This would have a short-term visual impact, however, it would be short-lived due to the vigor of the native plants. The visual contrast of the cut bank and trail tread would be perceived by the casual observer and be VRM Class III in the short term and expected to meet VRM Class I in the long term with revegetation and soil oxidation.

The structures, vault toilet and informational kiosk, would provide the visual contrasts with the greatest potential for visual impacts and would need careful placement and vegetative screening to meet VRM Class I, however, the existing campgrounds and structures along the Byway provide visual precedent for these new structures and they would be expected to continue those visual qualities repeated along the Byway at the other developed sites.

Elk Bend Campground Parking

It would be expected that after construction the new paved surfaces would continue to meet VRM Class I by matching the color and character of the newly paved Nestucca Access Road.

Elk Creek Bridge

It would be expected that with the implementation of the design features (including a visually permeable rail), the new bridge at Elk Creek would retain the existing character of the landscape and meet VRM Class I. To meet VRM Class I, the bridge would need to preserve or improve the existing character of the landscape and the level of change to the landscape should be very low; and must not attract visual attention. Once the vegetation grows in, the rip-rap and bridge would be seen, but would not attract more attention than the existing bridge. The existing bridge and others along this travel corridor set visual precedent. Contrast effect

of the Proposed Action attracts attention but does not dominate view. The new bridge would be similar in shape, form and color and would be expected to meet VRM Class I short and long term.

Culvert Upgrades

From the road, the new culverts would be obscured from view by landform and vegetation so the structures would have no visual contrast for the casual observer. However, construction activities required to replace the existing culverts would result in removal of trees near the road, opening up the enclosed canopy at the construction sites. In places where the corridor has a thick canopy, removal of trees at the culvert locations would add visual variety along the road edge, and possibly open up views to the river. For KOPs 1 and 8-11 along existing paved road, a contrasting band of paving would mark the location of the culverts as drivers approach and pass over the culverts. In the short term, the greatest contrast would be in line and texture between the remaining vegetation and the disturbed landscape. In the long term this contrast would fade as new vegetation establishes and fills in cut slopes and disturbed areas. In the short term, the culvert sites would fail to meet VRM Class I and meet VRM Class II. In the long term, the culvert sites would meet VRM Class I (Corvus, 2015, pp.16-17).

Wild and Scenic Rivers and Oregon State Scenic Waterway corridors are assessed and designated from the river center channel, as are all visual impacts to these corridors. From the Nestucca River center of channel the culverts would increase in size throughout the project area. Existing culverts range in diameter from 18 inches at Pipe 5, to 96 inches at Bible Creek Pipe 2. While these would be replaced with structures two to five times wider, some of the culverts are set back from the river far enough where they can easily be screened by vegetation and existing landform. In other areas, like Bear Creek, the culvert opens directly into the Upper Nestucca River where it would be difficult to screen with vegetation. There is, however, the visual precedent for culverts and there would be no landscape-level changes to visual impacts.

Cut and Fill Bank Stabilization

The project would include approximately 19 sites with two types of stabilization occurring on the gravel-surfaced portion of the Nestucca Access Road. Sizes of walls or Reinforced Soil Slopes (RSS) would vary between a minimum of approximately 50-foot-long-by-3-foot-high and a maximum of approximately 550-foot-long-by-10-foot-high. Materials would generally consist of two basic types, either a layered, Reinforced Soil Slope (RSS) covered with vegetation, or coarse rock fill. Sites would be planted with site-appropriate native plants, rock would be matched to native types and colors and any geotextile cloths used for the RSS would be colored so as to blend with native soils. Given these design features, short-term effects would meet VRM Class III and long term would meet Class I.

3.2.5 Cumulative Effects - Alternative 2: The Proposed Action

Recreation

There are no past actions that are expected to cumulatively affect recreational travel, visual qualities, access to recreation sites or other recreational opportunities.

The BLM's Night Walker (See EA section 8) and Testament Creek timber sales would potentially impact OHV riding, dispersed camping, hunting and other recreation activities with temporary closures and increased traffic. When combined with the closures and traffic of the Proposed Action, more time and a greater area with road and trail closures would be expected. The proposed action is expected to close Bald Mountain Road for short-term closures during weekdays for at least portions of two different construction seasons (EA section 2.2.2), limiting access to the OHV riding area to weekend days. In the instance that these activities (Night Walker Timber Sale, Testament Creek Sales, and proposed action) do not coincide, it is expected OHV enthusiasts would potentially lose access to segments of the trail system during portions of

two construction seasons or more. If these projects coincide, cumulative effects to recreational opportunities would increase, with more trail closures and limiting access to weekends, however the duration of closures would be shortened with consecutive project implementation reducing the amount of time the public would be affected by the project. The East Line Quarry (an unofficial OHV staging area) may be closed for the duration of the proposed action dependent on the site being used as a waste storage area, impacting other staging areas with heavier usage.

Truck traffic associated with the identified timber sales is expected to increase truck traffic by approximately 20 passes per day while the sales are active. The timber haul route and truck traffic associated with the proposed action would increase the potential of travelers meeting a large truck while traveling the Byway.

Visual Resource Management

The area analyzed for cumulative effects includes BLM managed lands viewable from the Nestucca River National Back Country Byway and those lands visible from Nestucca River center.

There are no past, present or reasonably foreseeable future actions that are expected to cumulatively affect visual qualities within the analysis area. Identified timber sales would not compound with the Proposed Action. None of the timber sales are similar to the Proposed Action in impact to the viewshed. While they have physical interface with the Proposed Action, particularly Testament Creek Timber Sale along Bald Mountain Road, the changes to form, color and texture of logging are significantly different compared to turn out paving and signing, resulting in an entirely different visual impact.

3.2.6 Environmental Effects - Alternative 3

Recreation

The effects within Alternative 3 would be similar to those outlined in Alternative 2 with a major difference being the construction of a narrower roadway within the current 2.7 miles gravel-surfaced portion of the Nestucca Access Road. The 2.7 mile section of roadway would be paved to its existing width; any road prism widening would be in association with meeting the guidance of the Storm Water Management Plan as outlined in EA section 6.2. Alternative 3 would enhance safety along the portion of the Nestucca Access Road that is currently gravel-surfaced by removing some of the identified safety issues (dust obscuring traffic, potholes and washboard which makes some drivers move out of their “lane”) (FHWA, 2014). However, paving that portion of the Nestucca Access Road that is currently gravel-surfaced without widening the sub-grade would maintain a situation of inconsistent road conditions when comparing it to the rest of the BLM’s two-lane paved Nestucca Access Road, as well as with the adjacent county roads. While Alternative 3 would enhance safety, it would not fully resolve the safety issues associated with inconsistent road conditions. Additional signage (Narrow Roadway, etc.) would be placed to inform travelers of the narrower road surface, helping to minimize identified safety concerns in this stretch of roadway.

Under Alternative 3, the single-lane bridge located at Elk Creek would be maintained including the current pinch-point in traffic movement. Although the location of the bridge allows for good sight distance for travelers to see on-coming traffic, given the expectation of growing traffic volumes on project area roads (Table 5) the current minor safety concerns would be expected to increase with the future expected increases in traffic volumes. Appropriate signage would help minimize this safety concern.

As identified in the No Action Alternative and Alternative 2, vehicle use on the Byway is expected to increase approximately 2% annually. This increase is considered to reflect the growing population and recreation use demands associated with the growing population. In addition to the 2% volume increases tied to population growth, improved road surface conditions, and parking and access to recreation sites would be expected to draw a minor, unquantifiable increase in traffic due to more desirable travel and recreation

conditions along the Byway. Motorcycle and bicycle use, including organized events, would expect a moderate increase as the paved route would be more appealing to cyclists. A lack of developed shoulder, when compared to Alternative 2's two-lane roadway with shoulders, would continue to be a safety concern for this segment of road, though concerns would be limited to automotive interface issues, rather than including the mechanical issues associated with the gravel surface under the No Action Alternative. Appropriate signage (Narrow Road, etc.) would help minimize safety concerns associated with increased bicycle use.

Under Alternative 3, there would be no new signage except that which would be considered maintenance such as replacement of a missing sign, or signs addressing a safety concern. The proposed new portal sign, when accessing the Byway from Willamina, would not be placed. This lack of new signs outside the immediate Byway area would keep visitation limited to the 2% growth discussed above, with no incidental traffic directed to the area from main arterials, as with the No Action Alternative. Additionally, new interpretive signage would also be eliminated, leaving the only information site along the Byway at Sheridan Peak. Visitors traveling along the Nestucca Access Road and Bible Creek Road would continue to have no on-site information source.

Under Alternative 3, there would be no restoration at the asphalt waste site and a day-use area would not be constructed. Not constructing the day-use area and removal of pull-offs that were considered safety hazards would promote the potential of unwanted and unsafe pull-offs being developed by the public to gain river access. Additional concerns with public created river access points include unsafe parking, loss of vegetation in the creation and expansion of user created trails, stream bank erosion associated with the creation of poorly designed unstable trails, and public safety while climbing steep slopes to gain river access.

Visual Resource Management

Alternative 3 would have similar impacts Visual Resources as Alternative 2 with the major exceptions resulting from the paving of a single lane rather than two lanes on the gravel-surfaced portion of the Nestucca Access Road (including a reduced need for felling of roadside trees and construction of retaining walls), no replacement of the Elk Creek Bridge and three larger culverts, no day-use site development at the asphalt waste site and a reduced amount of new signage, as mentioned in the Recreation section above.

As under Alternative 2, the culvert upgrades would be expected to meet the current VRM I rating within 2-3 years following project implementation with revegetation and soil oxidation. Paving the current gravel-surfaced portion and painting fog lines would immediately meet VRM Class I since adjacent portions of the existing pavement will be chip sealed at the same time and will match the new surface in color and texture, weathering together and creating a seamless transition. The existing Elk Creek Bridge would continue to maintain the current VRM Class I as designated. It is expected that all Alternative 3 projects, as Alternative 2, would meet VRM I classification within 2-3 years as vegetation regrows and soil oxidizes near disturbed areas.

3.2.7 Cumulative Effects - Alternative 3

Recreation

Cumulative impacts for Alternative 3 would be similar to Alternative 2, however there would be reduced potential impacts from interrupted public access at the time of implementation due to reduced work proposed. With no bridge replacement, fewer culvert replacements, no asphalt waste site work and reduced footprint for the paving of the 2.7 mile gravel-surfaced segment, there would be less opportunity for the timber sale activities and road use to overlap with the disturbance resulting from project implementation.

Visual Resource Management

There are no past, present or reasonably foreseeable future actions that are expected to cumulatively affect visual qualities within the analysis area. Identified timber sales would not compound with the Proposed Action. None of the timber sales are similar to the Proposed Action in impact to the viewshed. While they have physical interface with the Proposed Action, particularly Testament Creek Timber Sale along Bald Mountain Road, the changes to form, color and texture of logging are significantly different compared to turn out paving and signing, resulting in an entirely different visual impact.

3.3 Hydrology

3.3.1 Affected Environment

The project area lies within eight sixth-field watersheds including Headwaters Nestucca River (HUC #171002030201), Elk Creek-Nestucca River (HUC #171002030202), Testament Creek-Nestucca River (HUC #171002030203), Niagara Creek-Nestucca River (HUC #171002030206), Upper Willamina Creek (HUC #170900080101), Coast Creek (HUC #170900080103), Haskins Creek (HUC #170900080601), and Panther Creek (HUC #170900080607). Tributaries in the western section of the project area discharge to the Nestucca River, while tributaries in the eastern section drain either to Willamina Creek in the southeast or to the North Yamhill River in the northeast.

The project area intersects over 250 second- through seventh-order streams as determined by the LIDAR-derived stream network. Second-order streams are often non-fish-bearing and are typically Rosgen type-A, perennial and intermittent channels with bankfull widths varying from 1 to 5 feet and up to 30 percent gradient. These channels are narrow with moderate to steep side slopes. Third- to seventh-order streams are often fish-bearing and are typically Rosgen type-B, perennial channels with bankfull widths varying from 3 to 35 feet, 2 to 10 percent gradient, and low sinuosity. Boulders, cobbles, and large gravels are the dominant channel bed material for all stream types.

Streams in the project area are affected by historic and current management actions. Constructed in 1958 to 1960, the Nestucca Access Road constricts the stream channel of the Nestucca River and removed much of its riparian vegetation. Road construction also caused accelerated erosion, landsliding, and slumping in places. Concern over logjam barriers in the 1960s and 1970s prompted extensive removal of large woody material from the stream channel. Further simplification of the Nestucca River's channel occurred when the Meadow Lake Dam failed in 1962, causing channel scouring down to bedrock. Since the 1980s, many fish habitat improvement projects have been completed in the watershed to enhance stream habitat complexity through the placement of log and boulder structures.

Many stream crossing culverts in the project area are undersized. See EA Section 3.1.1 for a discussion of culvert conditions. Up to an estimated four culverts plug annually within the project area. Plugging is most often due to sediment slugs and woody debris blockages following heavy rain events, and unplugging these culverts often requires the use of heavy equipment during the flood event. If not unplugged in a timely manner, the culvert could fail. The work to unplug culverts outside of the in-stream work period often results in a large pulse of released debris and sediment into the active stream channel. An inventory of stream-crossing culverts in the BLM Salem District following flooding in 1996 found that during this large flood event, the majority of culvert failures were due to sediment accumulation caused by upstream landslides or the failure of cutbanks, streambanks, or hillslopes (Furniss *et al.* 1998). Approximately a third of failures were caused, at least in part, by lodgement of woody material at the culvert inlet. Undersized stream-crossing culverts reduce stream connectivity and result in the upstream storage of sediment, organic material, and wood. We have estimated that approximately 1,000 cubic yards of sediment are stored upstream of the culverts recommended for replacement in the Proposed Action. Channel incision due to flow constriction and high water velocity has occurred downstream of many of these culverts. Numerous failing and/or undersized

culverts have already been replaced within the project area in order to improve the passage of peak flows, reduce plugging, and improve fish passage.

The bridge over Elk Creek was built during construction of the Nestucca Access Road, and was built with its footings within the active channel of Elk Creek. During the floods of 1996, several pieces of large woody material became lodged against the footings and required removal by maintenance crews. We are not aware of any other flood events that have required removal of lodged material from the bridge.

Project area roads have an insufficient number of cross-drains, which increases the concentration of flow in ditches and causes erosion of the ditch. This concentration of water impedes proper hydrologic function and may impact water quality through increased sediment transport to streams.

Water Quantity

The study area has mild, wet winters and cool, relatively dry summers. Mean annual precipitation varies from 84 to 128 inches, with 80 percent occurring October through March. The mean 2-year precipitation event in a 24-hour period is 4.5 to 6 inches (Miller *et al.* 1973). Most runoff is associated with winter storm events that result from low pressure fronts moving inland from the southwest off the Pacific Ocean. Peak stream flow events are concentrated in the months of November through March when Pacific storm fronts are strongest. The study area tends to be outside the coastal fog zone, and fog and fog drip are not major contributors to watershed hydrology. The majority of the project area is located within the rain-dominated hydroregion, with a fraction of it located above the 2,000 foot elevation, which is considered the transient snow zone in the Oregon Coast Range (USDI BLM 1995). As a result of little or no snowpack accumulation and infrequent rainfall, stream flow in the summer is typically a fraction of winter levels and many headwater channels retreat to subsurface flow.

The project area is located in rugged, densely vegetated, mountainous terrain. The geology is characterized by intermixed layers of volcanic and sedimentary rock on upper slopes, sedimentary rock with scattered intrusions on middle slopes, and volcanic and baked sedimentary rock on lower slopes. Elevation in the study area ranges from approximately 550 to 3,100 feet. Some areas of the Nestucca River-Frontal Pacific Ocean fifth-field watershed are susceptible to landslides and soil creep, and landslide debris is common in the basin. Debris slides are the most common type of active landslides and occur on steep slopes covered with thin, granular soils, usually during heavy rainfall (Barczak 1998).

Water Quality

Within the analysis area, several waterbodies are listed by the Oregon Department of Environmental Quality (ODEQ) as water quality limited in Oregon's 2012 Integrated Report Assessment Database and 303(d) List (ODEQ 2014). Parts of the Nestucca River are listed as water quality limited for dissolved oxygen, sedimentation, temperature, habitat modification, and flow modification. Willamina Creek is listed as water quality limited for phosphorus. Haskins Creek is listed as water quality limited for flow modification.

In 1989, the ODEQ completed the Total Maximum Daily Loads (TMDLs) for the Yamhill River, which was approved by the U.S. Environmental Protection Agency (EPA) in March 1992 and placed on the 319 List of completed TMDLs. In 2002, the ODEQ completed the Nestucca Bay Watershed TMDL, which was approved by the EPA in May 2002. Under this TMDL, temperature and sedimentation targets are to be achieved through establishment of system potential riparian vegetation and channel morphology. An endpoint measure of ≤ 20 percent in-stream fines (grain size of ≤ 6.4 mm) is included as a surrogate load allocation for the sedimentation TMDL.

The most sensitive beneficial uses that could potentially be affected by project activities are private and public domestic water supplies, cold water aquatic life (including salmonid habitat), and contact recreation.

The City of McMinnville draws part of its municipal water from McGuire Reservoir, an impoundment on the Nestucca River and also has municipal water rights on Walker Creek. The other known public and private domestic water users are located downstream of Bible Creek and outside the study area.

The majority of the study area is within a BLM Tier 1 Key Watershed (i.e., Nestucca River). Tier 1 Key Watersheds contribute directly to the conservation of at-risk anadromous salmonids and are believed to have high potential for restoration. The management actions and direction for these watersheds include control and prevention of road related runoff and sediment production and implementation of watershed restoration (USDI BLM 1995).

Fine Sediment, Turbidity, and Channel Morphology

Monitoring of third- to sixth-order streams in the Nestucca River fifth-field watershed in 2004 to 2005 indicates that perennial channels are mostly stable with sediment supplied in the range expected for their stream type. The average percentage of in-stream fines throughout all streams was 9.2 percent, and the average percentage when considering only riffle and glide features was 8.2 percent. When only the mainstem Nestucca River was considered, the average percentage of sand and fines was 8.1 percent. ODEQ believes that the upper Nestucca River watershed has “recovered substantially [from past sedimentation] . . . and targets for in-stream fine sediments are currently met” (ODEQ 2002). Field review of streams in the project area continues to support these findings. Channel substrates are typically cobbles and large gravels. No sediment data is available for streams in the Panther Creek, Upper Willamina, Coast Creek, or Haskins Creek sixth-field subwatersheds.

The gravel-surfaced haul routes identified in the Proposed Action deliver approximately 2 to 8 yd³ of fine sediment per year to first- and second- order streams and 9 to 39 yd³ to higher-order streams including Elk Creek, Cedar Creek, and the Nestucca River. This includes an estimated 0.8 to 3 yd³ of sand-sized particles and 9 to 36 yd³ silt- and clay-sized particles. The 2.7-mile gravel-surfaced section of the Nestucca Access Road delivers approximately 3 to 12 yd³ of fine sediment per year to first- and second-order streams and 6 to 27 yd³ to higher-order streams including the Nestucca River. These conclusions are based on modeling that used research by Duncan *et al.* (1987) and Bilby (1985) to quantify sediment generation and delivery from forest roads. Road maintenance activities such as rock placement, grading, and ditch cleaning and shaping occur on an as-needed basis. Rock placement and grading occur infrequently on the haul routes and about 3 times per year on the Nestucca Access Route, with ditch cleaning occurring on a limited basis at locations where a cut slope has failed and slid into the ditch. The grading of gravel-surfaced roads de-armors the road surface and potentially releases fine sediment embedded in the road surface. Most of the released sediment becomes re-embedded in the road surface or runs off into the roadside vegetation during storm events (Luce and Black 1999). Fine sediment can be transported directly to streams where higher gradient segments of the road with defined ditchlines are hydrologically connected to the stream network. However, Luce and Black (1999) found that newly graded gravel-surfaced roads did not produce more sediment than untreated roads unless their ditchlines were also cleaned and shaped. For those segments where spot-cleaning of ditches is necessary, sediment production following road maintenance activities dramatically increases in the short-term, declines by nearly 75 percent in the year following treatment, and returns to background levels after three years (Luce and Black 2001).

Stream Temperature

Oregon’s Water Quality Standards state that water temperature in the Nestucca River may not exceed 55.4°F from September 15 to June 15 below Fan Creek or from October 15 to June 15 above Fan Creek, or 60.8°F during the remainder of the year. Walker Creek may not exceed 55.4°F from November 1 to June 15 or 60.8°F during the remainder of the year. Other streams in the Nestucca River watershed may not exceed 55.4°F from October 15 to June 15 or 60.8°F during the remainder of the year. Willamina Creek and Haskins Creek may not exceed 55.4°F from January 1 to May 15 or 64.4°F during the remainder of the year. Panther

Creek may not exceed 55.4°F from October 15 to May 15 or 64.4°F during the remainder of the year. Monitoring in the study area from 2012 to 2015 indicated that many streams (e.g., Fan, Panther, Elk Creeks) met Oregon’s temperature standard frequently, while some streams (e.g., Nestucca River, Bear Creek, Walker Creek) frequently exceeded the standard. Table 6 summarizes observed temperatures for streams across the analysis area.

Data collected from 2004 to 2005 in the Nestucca River watershed indicates that current streamside vegetation and valley topography provide an average of 86 percent effective shade to surface waters during summer base flow. Measured shade is approximately 10 percent below the modelled system potential effective shade. However, the modelled targets fail to incorporate the effects of a disturbance regime, which more recent TMDLs for other watersheds take into account. It is therefore likely that the actual effective shade is very close to system potential (Mico & Mico 2007). Channel widths in the project area are farther from meeting system potential conditions than effective shade is. We suspect that overly wide channels are the largest contributor to the high maximum 7-day rolling maximum temperatures shown in Table 6.

Table 6. Stream Temperature Statistics for Streams in the Project Area in °F (2012 to 2015).

Stream Name	Average temperature	July average temperature	August average temperature	September average temperature	Maximum 7-day rolling average temperature	Maximum 7-day rolling maximum temperature	Maximum daily difference ¹
Bear Creek	56.8	57.0	58.1	55.0	60.6	67.3	14.9
Elk Creek	55.0	54.7	56.1	54.5	57.6	59.9	7.2
Fan Creek	52.7	51.6	54.0	52.2	56.3	58.1	4.7
Nestucca River (at Elk Creek)	58.5	59.2	59.9	56.3	63.1	66.4	8.5
Walker Creek	57.6	60.4	59.2	53.6	62.8	66.7	9.9
Panther Creek	57.2	58.1	59.0	55.0	60.6	62.4	4.9

¹ The daily difference is the daily maximum temperature minus the daily minimum temperature; the maximum daily difference is the highest value from this dataset.

The Northwest Forest Plan Temperature TMDL Implementation Strategy as amended in 2012 defines the widths of the primary and secondary shade zones in the Riparian Reserve needed to maintain effective shade (USFS & USDI BLM 2012). The recommended widths are based on slope and average height of the stand and may overestimate the width of the primary shade zone for some stream orientations. According to the 2012 Strategy, one site potential tree height (approximately 240 feet) is sufficient for protecting and maintaining effective shade and stream temperature within the project area. However, the Nestucca Bay Watershed TMDL analysis (ODEQ 2002) is based upon a site potential tree height of 175 feet in upland areas and 125 feet in lowland areas. The primary shade zone is critical for maintaining stream temperature and typically extends from 70 to 85 feet from the stream. The secondary shade zone extends from the edge of the primary shade zone to one site potential tree height – a range of 155 to 170 feet under the Northwest Forest Plan or 90 to 105 feet under the Nestucca Bay Watershed TMDL.

Wetlands

There are a few small (less than ¼ acre) forested wetlands and seasonal wet areas adjacent to the Nestucca Access Road and several larger wetland areas and ponds located along the Bald Mountain Road in the Upper

Willamina Creek subwatershed. There are also wetlands associated with Bible Creek culverts #1 and 2. Wetlands associated with Bible Creek culvert #2 are largely artificial and created by the impoundment of water behind an improperly sized and sited culvert.

Asphalt Waste Site

An asphalt waste site is located at the east end of the gravel-surfaced portion of the Nestucca Access Road. This area contains chunks of consolidated asphalt pavement and evidence of a perched water table with an oily sheen present on its surface. There is no definitive information on the composition or source of this material. This waste is possibly left over from the operation of an asphalt batch plant that operated during the paving of the Nestucca Access Road. Although there are no historical records tied specifically to this facility, one was probably present to facilitate initial paving operations at some period from the early 1970s to the mid-1980s. The primary chemicals of concern associated with asphalt pavement production include volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), and heavy metals. These pollutants undergo various chemical, physical, and biological processes dependent on environmental conditions that affect their transport and fate in the environment. For this reason, it is not possible to further discuss their continued presence at the site before laboratory testing of soil and water samples. The Nestucca River is approximately 100 feet from these materials, and it is unclear if they were previously or are currently being transported to surface water through direct contact or groundwater inputs to the river.

3.3.2 Environmental Effects - Alternative 1: No Action

Water Quantity

The No Action alternative would result in a continuation of the condition and trends of water resources as described under the Affected Environment section of this report. No changes to peak flows would occur.

Water Quality

Short-term effects to turbidity and suspended sediment concentration (SSC) persist for less than 24 hours, and long-term effects persist for greater than 24 hours. Short-term effects to in-stream fine sediment persist for 1 to 3 years, and long-term effects persist for more than 3 years.

Fine Sediment, Turbidity, and Channel Morphology

The replacement of undersized stream crossing culverts and the Elk Creek Bridge would not occur under the No Action alternative. As the culverts in fair and poor condition continue to age, the risk of plugging and culvert failure would increase. Although sufficient data does not exist to quantify the amount of sediment generated by emergency maintenance activities outside of the in-stream work period, we expect that there would be a long-term increase in sediment delivery to streams as the number of culverts susceptible to plugging and the frequency at which they would plug increase. We expect that up to two culverts could fail within the analysis period of the project (eight to ten years). The sediment generated by a culvert failure is dependent on the volume of fill material at the stream crossing, with the failure of shallow-fill culverts resulting in the delivery of several cubic yards of sediment and deep-fill culverts resulting in the delivery of over 1,000 yd³ of material. The transport and fate of this sediment through the stream network would be dependent on the fraction of each sediment size class present in the road fill, the stream flow, and the presence of woody material in receiving stream channels. Culvert failures would likely result in the short-term deposition of sand-sized particles along the margins of the active channel and in pools, with some deposition occurring within riffles. Much of this material would be transported downstream during subsequent storm events. Gravel-sized material would be deposited throughout the downstream channel. Turbidity levels would be expected to increase from several hundred yards to a mile below the culvert site

but would return to near-background levels within approximately 24 to 48 hours. Channel incision would continue to occur downstream of undersized stream-crossing culverts at current rates.

Truck traffic on gravel-surfaced roads identified as potential haul routes under the Proposed Action would not increase under the No Action alternative. The 2.7-mile gravel-surfaced section of the Nestucca Access Road would not be widened or paved and would not have additional cross-drains installed. Gravel-surfaced roads would continue delivering sediment to streams as described under the Affected Environment. Road maintenance activities such as rock placement, grading, and ditch cleaning and shaping would continue to occur on an as-needed basis.

Sediment generated under the No Action alternative would maintain current conditions as described in the Affected Environment. Most of the fine sediment discussed previously would remain suspended within the water column in the high gradient stream reaches present in the project area (Bilby *et al.* 1989). Some deposition of the sand-size sediment would likely occur during the low-flow season along the margins of the active channel and in pools, but this material would be remobilized and flushed from the system during the first few fall and winter flows. The percentage of in-stream fines in the study area would remain well below the 20 percent threshold established by the Nestucca Bay Watershed TMDL. High flows during the first few fall and early winter storm events would likely flush the stored sediment downstream, when the majority of natural sediment transport occurs.

Stream Temperature

The No Action alternative would result in a continuation of the condition and trends of water resources as described under the Affected Environment section of this report. No changes to effective shade or stream temperature would occur.

Wetlands

The No Action alternative would result in a continuation of the condition of wetlands as described under the Affected Environment section of this report. No changes to wetlands would occur.

Asphalt Waste Site

The No Action alternative would maintain the asphalt waste site in its current condition. The presence of VOCs, PAHs, and heavy metals are suspected in soil and water but cannot currently be confirmed. If elevated concentrations of these pollutants are located at the site, they would continue to contaminate soil and water resources. The effects of contamination on water quality would be dependent on the specific pollutants present and their concentrations.

3.3.3 Cumulative Effects - Alternative 1: No Action

The analysis area for cumulative effects is comprised of the eight sixth-field subwatersheds described in the Affected Environment and includes those past, present and foreseeable future actions described in EA Section 8 that are likely to occur over the next 11 years. This is the likely temporal extent of effects under the Proposed Action (the duration of the Proposed Action [8 years] plus the anticipated duration of effects [3 years for sediment conditions to return to background levels]).

It is unlikely that the No Action alternative would have direct or indirect effects to peak flows, effective shade or stream temperature; therefore, no cumulative effects have been identified.

Past and present actions in the analysis area include timber sales that occurred or are continuing to occur at multiple locations throughout these subwatersheds. Timber sales result in ground disturbance from harvest

activities; temporary and/or permanent road construction; maintenance of existing roads including rock placement, grading, ditch cleaning and shaping, culvert replacement at stream crossings, and cross-drain installation; and timber and rock hauling on gravel-surfaced roads. With the implementation of BMPs and PDFs, these activities are likely to result in short-term, localized increases in turbidity, SSC, and in-stream fine sediment, but are not likely to result in a long-term, measurable difference in these parameters at the reach or subwatershed scale. Past actions also include the replacement of undersized culverts in order to restore access to historic fish habitat, restore sediment regimes, and improve the movement of coarse wood through the stream network.

Reasonably foreseeable future actions in the analysis area include timber sales involving activities similar to those described for past and present actions. Future timber sales in the analysis area will continue to occur at approximately the same rate and scale as in the past, leading to similar amounts of ground-disturbance, culvert replacement, and haul on gravel-surfaced roads. The effects of future actions would be similar to those caused by past and present actions.

The No Action alternative would likely result in short-term, localized increases in turbidity, SSC, and in-stream fine sediment caused by an increased number and frequency of plugged culverts during heavy rain events. Increased turbidity would persist for up to 24 hours, and in-stream fine sediment would return to background levels within days to months. The failure of up to two culverts would result in short-term, localized (< 1 mile) effects to turbidity and in-stream fine sediment.

The short-term, localized nature of effects to sediment from past, present, and reasonably foreseeable future actions makes it highly unlikely that cumulative effects would exist when combined with the No Action alternative. The spatial and temporal distribution of culvert plugging events would render it unlikely that the effects of a plugged or failed culvert would overlap with the effects of the past, present, and reasonably foreseeable actions described above and cause a cumulative effect to water quality.

3.3.4 Environmental Effects - Alternative 2: The Proposed Action

Water Quantity

There would be no direct effects to peak flows. Indirect effects to peak flows would be unlikely to result from increases in impervious area within the affected subwatersheds. The percentage of roaded area within each sixth-field subwatershed ranges from 2.1 to 3.4 percent and would not increase by more than 0.1 percent. Subwatersheds with less than 4 percent roaded area are considered to be at low risk for peak flow enhancement based upon research presented in the Oregon Watershed Assessment Manual (Watershed Professionals Network 1999). See the Hydrology Specialist Report (Robinson, C.W. 2016) for more detailed information on the peak flow analysis. The installation of additional cross-drains throughout the project area and implementation of the Stormwater Management Plan on the Nestucca Access Road would hydrologically disconnect existing portions of the road system from the stream network and further attenuate any potential increases to peak flows. The Proposed Action is unlikely to result in a measurable increase in peak flows in any subwatershed.

Water Quality

Short-term effects to turbidity and SSC persist for < 24 hours, and long-term effects persist for > 24 hours. Short-term effects to in-stream fine sediment persist for 1 to 3 years, and long-term effects persist for > 3 years.

Fine Sediment, Turbidity, and Channel Morphology

The Proposed Action would result in both short- and long-term direct and indirect effects to turbidity and in-stream fine sediment. Direct effects would occur in the short-term as a result of the replacement of stream-crossing culverts and bridges, the mobilization of stored sediment behind undersized culverts, increased truck traffic and road maintenance activities on gravel-surfaced haul routes, and other ground-disturbing activities (e.g., road widening, subgrade preparation, etc.). Indirect effects would occur in the long-term as a result of paving the gravel-surfaced section of the Nestucca Access Road and installation of additional cross-drains throughout the project area and replacement of undersized stream-crossing culverts. The following analysis details the direct and indirect effects of the Proposed Action to turbidity and fine sediment. It would be infeasible and unrealistic to accurately predict or monitor how much fine sediment is actually delivered to streams from activities under the Proposed Action. Consequently, this analysis provides a modeled estimate of sediment production and delivery to streams using assumptions deemed to be reasonable by the interdisciplinary team and the best available science. See the Hydrology Specialist Report (Robinson, C.W. 2016) for detailed information on the sediment analysis.

The replacement of undersized stream crossing culverts and the Elk Creek Bridge would result in short-term increases in turbidity, SSC, and in-stream fine sediment but would maintain water quality under Oregon's Water Quality Standard for turbidity and the Nestucca Bay Sedimentation TMDL. The operation of equipment within stream channels, streamflow over loose sediment following completion of construction activities, and disturbance of stream banks would increase turbidity, SSC, and in-stream fine sediment. The use of BMPs and PDFs would minimize effects to water quality through restricting work to the ODFW-defined in-water work window, diverting streamflow around work areas, slowly rewatering work areas, and stabilizing and seeding disturbed soils. Turbidity and SSC could increase for short periods of time immediately following in-channel project activities but would be expected to return to background levels over a period of a few hours to a day (Foltz *et al.* 2013; Foltz *et al.* 2008). BMPs and PDFs would be designed to minimize increases in turbidity outside of mixing zones typically 50 feet for small streams and 100 feet for large streams. Any exceedance outside this range would result in an immediate stop of all work at the site for the remainder of the work day and the implementation of additional BMPs to maintain turbidity within the permitted range. Turbidity would likely decrease by an order of magnitude within several hundred feet of the stream crossing and return to background levels within a half mile. For perennial streams, the bulk of the anticipated increases in turbidity and SSC would occur immediately after rewatering. Some sediment deposition would likely occur along the margins of the active channel and in pools, but this material would be remobilized and flushed from the system during the first few fall and winter storm events. For intermittent streams, the sediment generated by culvert replacement activities would be stored in the channel near the crossing until the wet season, when the majority of natural sediment transport occurs.

Few studies have documented the effects of culvert *replacement* rather than culvert *removal* on sediment yield in streams, and we are unaware of any that have taken place in a geomorphic or hydrologic setting identical to that found in the Oregon Coast Range. Foltz *et al.* (2008) found that less than 0.1 yd³ of sediment was generated by the removal of culverts in Idaho and Washington. However, given the difference in streamflow and geology between the study areas and our project area and the difference in the nature of projects (i.e., culvert replacement vs. removal), our best professional judgment is that culvert replacements on smaller, non-fish-bearing streams would likely produce up to 0.25 yd³ of sediment per culvert. Culvert replacements on fish-bearing streams and replacement of the Elk Creek bridge would produce between 0.5 and 2.5 yd³ of sediment per crossing. For reference, this would equate to approximately 2 to 10 wheelbarrows of sediment. Culvert replacements in individual sixth-level subwatersheds would produce sediment in quantities ranging from 0.3 to 37 yd³ per subwatershed, with a total estimated sediment yield of 30 to 62 yd³ across all subwatersheds affected by the Proposed Action. This equates to an average of 4 to 8 yd³ per year over the implementation period of the Proposed Action. By comparison, a recent USGS study (Sobieszczyk *et al.* 2015) found that suspended sediment loads for the Trask River and Wilson River watersheds (watersheds to the north) varied from approximately 20,000 to 49,000 and 56,000 to 170,000 cubic yards per year, respectively, during 2012 to 2014. This data is representative of the lower range of suspended sediment loads for these watersheds. The Trask, Wilson, and Nestucca River watersheds share

very similar physiographic, geologic, and climatic settings, and we believe that their sediment regimes can be reasonably compared. If so, the estimated sediment yield from the Proposed Action would increase the sediment yield of the Nestucca River by less than 0.1 percent during project implementation. Approximately 70 percent of the culverts would be replaced on first- and second-order streams with the remainder being replaced on higher-order streams. Research suggests that first- and second-order streams and their tributary ditches would act as sediment sinks during average flow conditions, especially in systems heavily loaded with woody material (Bilby *et al.* 1989). Much of the coarse, medium, and fine sand-sized particles (2.0 to 0.063 mm) would be stored in these channels throughout the low-flow season. High flows during the first few fall and winter storm events would likely flush the stored sediment downstream, when the majority of natural sediment transport occurs. Turbidity, SSC, and in-stream fine sediment would likely increase above background levels immediately downstream of the stream crossings but would decrease by an order of magnitude and return to within the natural range of variability within several hundred feet of the crossing (Foltz *et al.* 2008). Due to the implementation of BMPs and PDFs, the dispersed nature of culverts across multiple watersheds, and their gradual replacement over an 8-year period, the replacement of stream-crossing culverts under the Proposed Action would likely result in short-term, localized increases in turbidity, SSC, and in-stream fine sediment but would be unlikely to result in a long-term measurable increase in turbidity or in-stream fine sediment at the reach scale within areas designated for salmon and steelhead spawning use.

Altering the hydraulic capacity, orientation, or gradient of culverts could result in short-term increases in turbidity, SSC, and in-stream fine sediment by leading to regrading of the stream channel including channel bed degradation, lateral erosion, and delivery of fine sediment to downstream locations. If these effects were to occur, it would most likely be on channels with existing vertical instabilities and would occur within the first year following culvert replacement. However, these effects would be very unlikely under the Proposed Action due to the use of in-stream grade control structures and bioengineering measures (BMP R016), placement of culverts parallel to streamflow and at the natural stream grade, and use of inlet and outlet protection structures where necessary. Rather than increasing the amount of fine sediment deposited in streams through regrading, we believe that installing properly sized and sited culverts would improve transport of bedload material such as gravel- and cobble-size material. We estimate that approximately 1,000 yd³ of this material is stored behind culverts, with the Davidson Pit Culvert and Pipe #1 (No Name) Culvert storing roughly half this material and most other culverts storing only 0.25 to 2 yd³ each. This material would remain within close proximity to the stream crossing following the culvert replacement, with transport occurring during larger storm events (>20 year recurrence interval). A small amount of fine sediment would likely be released and transported downstream during the first few fall and winter flows, when the majority of natural sediment transport occurs.

Increasing the hydraulic capacity of undersized culverts would also result in long-term decreases in turbidity, SSC, and in-stream fine sediment by reducing water pressure at the culvert during high flows, reducing the velocity of water exiting the culvert, and reducing the frequency of culvert plugging and likelihood of culvert failure during storm events. This reduction in velocity would lead to decreased scour and erosion of the stream bed and banks downstream of the culvert. Sufficient data does not exist to quantify the resulting reductions in sediment yield. Sizing culverts to accommodate the 100-year flow would reduce the incidence of plugging caused by woody debris lodgement below that of the No Action alternative, with most reductions occurring at culverts that are dramatically undersized (i.e., sized to pass less than 50% of the 100-year flow). Less plugging and emergency cleaning would result in a reduction in sediment delivered to streams. Reducing the frequency of plugging would also lead to a reduction in the likelihood of a culvert failure. Fewer culverts (< 2) would be expected to fail under the Proposed Action than under the No Action alternative. Replacing undersized culverts with culverts designed to pass the 100-year flow under the Proposed Action could result in an indirect short-term increase but long-term decrease in in-stream fine sediment within areas designated for salmon and steelhead spawning use.

Increased truck traffic on gravel-surfaced haul routes would result in short-term increases in turbidity, SSC, and in-stream fine sediment. Increased truck traffic would stem from end-hauling of waste material to the

identified permanent waste disposal sites and transportation of crushed rock or other rock material from commercial rock sources and the identified BLM rock quarries to the project sites. Increased daily traffic rates on gravel-surfaced roads are one of the most important factors affecting sediment concentrations in ditchflow. Heavy hauling has been shown to wear and displace surface rock at a rate of two inches per 2,800 truckloads. This rock wear causes fine sediment to accumulate on road surfaces between storm events, and it is flushed from the road surface to the ditch at the onset of the next event. On low volume roads, this flushing occurs rapidly, with sediment concentrations in ditchflow rising rapidly and dropping over a period of several hours. With the addition of 6,000 truck trips under the Proposed Action, gravel-surfaced haul routes would be expected to deliver an additional 0.6 to 2 yd³ of fine sediment per year to first- and second-order streams during the implementation period, an increase of about 28 percent over the No Action alternative. 80 percent of sand-sized particles and 50 percent of silt- and clay-sized particles would be stored in the channel substrate (Duncan *et al.* 1987). The Proposed Action would deliver 3 to 14 yd³ of fine sediment per year to higher-order streams during the implementation period, an increase of about 31 percent over the No Action alternative. This would include an estimated 0.3 to 1 yd³ of sand-sized particles and 3 to 13 yd³ of silt- and clay-sized particles.

The finest particle sizes would remain suspended within the water column in the high gradient stream reaches present in the project area (Bilby *et al.* 1989). Some deposition of the coarser sediment would likely occur during the low-flow season along the margins of the active channel and in pools, but this material would be remobilized and flushed from the system during the first few fall and winter flows. For these reasons, we expect that very little fine sediment would contribute to in-stream fines in areas designated for salmon and steelhead spawning use. The percentage of in-stream fines in the study area would remain well below the 20 percent threshold established by the Nestucca Bay Watershed TMDL. Therefore, due to the limited amount of new fine sediment generation from gravel-surfaced haul routes, the existing discharge of ditchflow to the forest floor, and the capability of streams to transport fine sediment downstream during flow events, increased truck traffic on gravel-surfaced haul routes under the Proposed Action would result in short-term, localized increases in turbidity, SSC, and in-stream fine sediment but would be unlikely to result in a long-term measurable increase in in-stream fine sediment at the reach scale within areas designated for salmon and steelhead spawning use.

Road maintenance activities associated with increased truck traffic on the gravel-surfaced haul routes would result in short-term indirect effects to turbidity, SSC, and in-stream fine sediment. Under the Proposed Action, road maintenance would likely occur on portions of about 15 miles of gravel-surfaced roads. Maintenance work would be similar to that described under the No Action alternative but would occur more frequently. Rock placement and grading would be likely to occur one to two times during the implementation period of the Proposed Action, with ditch cleaning continuing to occur on a limited basis. We do not anticipate the need for large-scale ditch cleaning and shaping on these roads. For these reasons, road maintenance under the Proposed Action is unlikely to result in a measurable increase in turbidity, SSC, or in-stream fine sediment within areas designated for salmon and steelhead spawning use.

Other ground-disturbing activities such as road widening, subgrade preparation, repairing slump areas, and restoration of the asphalt waste site could result in short-term increases in turbidity, SSC, and in-stream fine sediment. However, the majority of these activities would occur more than 100 feet from streams. Rashin *et al.* (2006) found that 33-foot riparian buffers were effective at preventing delivery of sediment to streams from ground-disturbing activities unless concentrated drainage was present. Other research demonstrates that riparian buffer widths of 100 feet are capable of trapping 84 to 100 percent of the sediment transported in overland flow (Sweeney and Newbold 2014; Liu *et al.* 2008). Thus, most of the fine sediment generated by these activities would settle out in vegetated buffers. BMPs (e.g., use of temporary erosion and sediment control measures, limiting construction to the dry season, application of seed and mulch to disturbed soils, and suspension of ground-disturbing activities when there is potential for movement of sediment to streams [See EA Section 6.1]) would reduce the volume of stormwater and associated sediment potentially delivered to area streams. Due to the widths of existing riparian buffers and use of BMPs, other ground-disturbing

activities under the Proposed Action are unlikely to result in a measurable long-term increase in in-stream fine sediment within areas designated for salmon and steelhead spawning use or a short-term increase in turbidity or SSC downstream of project activities.

Paving the gravel-surfaced section of the Nestucca Access Road and installation of additional cross-drains throughout the project area would result in long-term decreases in turbidity, SSC, and in-stream fine sediment. Erosion of the road bed would stop contributing fine sediment to streams that cross this section of road. The installation of new cross-drains would disconnect many road segments from the stream system, thereby eliminating those road segments as sources of fine sediment. Decreased distances between cross-drains would reduce ditch erosion and potential delivery of fine sediment to streams. We estimate that paving the gravel-surfaced section of the Nestucca Access Road would reduce the sediment load delivered to first- and second-order streams by 3 to 12 yd³ per year and higher-order streams by 6 to 27 yd³ per year. These conclusions are based on the research and data cited above in the discussion on the effects of increased haul on gravel-surfaced roads. In addition, road maintenance activities such as rock placement and grading would no longer be needed. Ditch cleaning and shaping would still occur on an as-needed basis but would occur less frequently and would deliver sediment to fewer streams after implementation of the Stormwater Management Plan. Paving the gravel-surfaced section of the Nestucca Access Road under the Proposed Action would decrease the generation of fine sediment from rockwear and maintenance activities, likely resulting in a long-term decrease in turbidity levels, SSC, and in-stream fine sediment within areas designated for salmon and steelhead spawning use, although this decrease would not likely be measurable.

The use of waste storage sites and quarries would not have an effect on water quality due to the implementation of BMPs and PDFs and their distance from waterbodies. Site visits did not reveal any evidence that sediment from these sites is transported and delivered to waterbodies.

Stream Temperature

It is estimated that implementation of the Proposed Action would result in up to a total of approximately 1800 trees greater than six inches DBH needing to be felled. Widening of the gravel-surfaced section of the Nestucca Access Road would remove approximately 80 trees greater than 6 inches DBH in the primary shade zone and 270 trees in the secondary shade zone of the Nestucca River. Most of these trees are located north of the river and provide a minimal amount of effective shade (DeWalle 2010). Due to the fact that most of the trees that would be removed are on the north side and more than 70 feet from the river, tree removals associated with widening of the Nestucca Access Road under the Proposed Action would not be likely to reduce effective shade or result in a measurable increase in stream temperature.

Culvert replacements at stream crossings would occur within the primary shade zone and would result in the removal of approximately 1,000 trees greater than 6 inches DBH from the road prism. This would result in a decrease in canopy cover of up to 0.2 acre at some stream crossings, with canopy cover being reduced by less than 0.1 acre at most stream crossings. Due to their location in the road prism, part of the shade cast by these trees falls on the existing road bed and does not provide effective shade to the associated stream. Effective shade would be slightly reduced for the first few years at specific sites where the shade of roadside trees extends beyond the road prism. Any minor losses in effective shade would be mitigated by post-project plantings and offset as shade conditions and channel widths in the Riparian Reserve continue their trend toward system potential condition. Riparian shrubs such as salmonberry and vine maple would begin shading the channel margins within two years, with red alder shading larger portions of the stream channel within 5 years. Due to the small amount of effective shade being provided by trees that would be removed, the dispersed nature of the culvert replacement locations, and the staggering of culvert replacements over an 8-year period, average effective shade at the reach-scale would be maintained, and tree removals associated with culvert replacements under the Proposed Action would not be likely to result in a measurable increase in stream temperature. See the Hydrology Specialist Report (Robinson, C.W. 2016) for more detailed information on the effective shade and stream temperature analysis.

Wetlands

The replacement of Bible Creek #2 culvert could eliminate a small (<1/4 acre), artificial freshwater pond on Bible Creek. However, since the wetland is caused by the impoundment of water on the upstream side of the improperly functioning culvert, this change would beneficially restore the natural flow and sediment regimes of the stream reach.

Asphalt Waste Site

Restoration of the asphalt waste site could have slightly beneficial effects to water quality. The effects to fine sediment and turbidity would be similar to those described above for “other ground-disturbing activities”. If pollutants such as VOCs, PAHs, or heavy metals are present in the soils at the asphalt waste site, then restoration activities would occur to control the continued dispersal of these pollutants. Isolation of the contaminated material by capping or removal of most of the material would reduce the likelihood of these pollutants being transported downstream via groundwater inputs to the Nestucca River or through movement of contaminated soil during flood events. Without further information on what pollutants are present, their concentrations at the site, and their background concentrations in the Nestucca River, it would be extremely speculative to assess whether there would be effects to water quality from restoration of the asphalt waste site beyond those described for fine sediment and turbidity.

Creation of a day-use area at the asphalt waste site would likely have indirect effects on a very localized section of the Nestucca River, including soil compaction and a slight reduction in the cover and vigor of riparian vegetation in areas of concentrated use. User trails leading to the river would result in new erosion pathways that could transport a small amount of sediment to the river. Closing 2 to 5 vehicle pull-offs along the Nestucca Access Road and their associated user-created trails and improving river access trails at 13 other points would improve the condition of riparian vegetation at these locations and result in a slight reduction in erosion and sediment delivery. Use of the day-use area, closure of vehicle pull-offs, and improvement of river access trails would not be likely to result in a measurable change in water quality at the reach scale.

3.3.5 Cumulative Effects - Alternative 2: The Proposed Action

The analysis area for cumulative effects is the same as was analyzed for the No Action Alternative.

It is unlikely that the Proposed Action would have direct or indirect effects to peak flows, effective shade or stream temperature; therefore, no cumulative effects have been identified.

Past, present, and reasonably foreseeable actions in the watershed are the same under the Proposed Action as discussed under the No Action alternative.

The Proposed Action would likely result in short-term, localized increases in turbidity, SSC, and in-stream fine sediment caused by culvert replacement and by sediment delivery at stream crossings on gravel-surfaced haul routes where increased traffic is anticipated. However, it would likely result in a long-term reduction in these parameters due to a reduction in chronic sources of erosion and sediment delivery at stream crossings. The Proposed Action would improve fish access, passage of flood flows, and the movement of sediment and coarse wood through the stream network.

The short-term, localized nature of effects to sediment from past, present, and reasonably foreseeable future actions makes it highly unlikely that cumulative effects would exist when combined with the Proposed Action. The culverts that have recently been, would be, or will be replaced are dispersed across multiple watersheds and are being replaced over an estimated 8-year period. It is unlikely that the effects of two

culvert replacements would overlap and cause a cumulative effect to water quality when 1) the majority of turbidity effects occur within several hundred feet of the crossing and lasts less than 24 hours and 2) increases in coarser-sized particles would be not be detectable at the reach scale after the first few fall and winter storm events. Reasonably foreseeable private timber harvest and haul would be expected to follow the pattern of past and current harvest and haul within the analysis area and is included in the sediment baseline as described in the Affected Environment. As such, it is unlikely that there would be cumulative effects to sediment due to haul on gravel-surfaced haul routes. Other reasonably foreseeable ground-disturbing activities (e.g., ground-based yarding) would occur outside of riparian buffers and utilize BMPs to maintain water quality; therefore, these activities would not result in cumulative effects. Culvert replacements under the Proposed Action, along with past fish passage improvement projects and past and reasonably foreseeable culvert replacements associated with timber sales would have a beneficial cumulative effect on the passage of flood flows and the movement of sediment and coarse wood through the stream network.

3.3.6 Environmental Effects - Alternative 3

Water Quantity

There would be no direct effects to peak flows. Indirect effects to peak flows would be similar, but slightly less in magnitude, to those analyzed under the Proposed Action. The magnitude of effects would be slightly less since increases to impervious area would be less than under the Proposed Action. Since project activities would not increase the percentage of roaded area above four percent within the affected subwatersheds and would disconnect existing portions of the road network from streams, paving activities under Alternative 3 are unlikely to result in a measurable increase in peak flows.

Water Quality

Short-term effects to turbidity and SSC persist for < 24 hours, and long-term effects persist for > 24 hours. Short-term effects to in-stream fine sediment persist for 1 to 3 years, and long-term effects persist for > 3 years.

Fine Sediment, Turbidity, and Channel Morphology

Alternative 3 would result in both short- and long-term direct and indirect effects to turbidity and fine sediment similar to, but slightly less in magnitude, to those analyzed under the Proposed Action. As under the Proposed Action, it would be infeasible and unrealistic to accurately predict or monitor how much fine sediment is actually delivered to streams from activities under Alternative 3. Consequently, this analysis provides a modeled estimate of sediment production and delivery to streams using assumptions deemed to be reasonable by the interdisciplinary team and the best available science.

Three fewer stream crossing culverts would be replaced under Alternative 3 than under the Proposed Action. Elk Creek Bridge would not be replaced. Culvert replacements in individual 6th-level subwatersheds would produce sediment in quantities ranging from less than 0.1 to 3 yd³ per subwatershed, with a total estimated sediment yield of less than 0.1 to 6 yd³ across all subwatersheds affected by Alternative 3. This is a decrease from the Proposed Action of approximately 0.3 yd³. This equates to an average of less than 0.1 to 0.8 yd³ per year over the implementation period of Alternative 3 – similar to the Proposed Action. Alternative 3 could result in short-term, localized increases in turbidity, SSC, and in-stream fine sediment but would be unlikely to result in a long-term measurable increase in in-stream fine sediment at the reach scale within areas designated for salmon and steelhead spawning use.

Altering the hydraulic capacity, orientation, or gradient of culverts could still result in short-term increases in turbidity, SSC, and in-stream fine sediment similar to the Proposed Action. The approximately 1,000 yd³ of material stored behind culverts would likely be released and transported downstream in the same way as

under the Proposed Action. Long-term decreases in turbidity, SSC, and in-stream fine sediment due to reduced stream velocities exiting culverts would be slightly less due to the retention of the existing undersized Bear Creek, Quad Pipes, and Fairdale Crossing culverts. Similar to the Proposed Action, replacing undersized culverts with culverts designed to pass the 100-year flow under Alternative 3 could result in an indirect short-term increase but long-term decrease in in-stream fine sediment within areas designated for salmon and steelhead spawning use, although these changes would not likely be measurable.

Increased truck traffic on gravel-surfaced haul routes would still result in short-term increases in turbidity, SSC, and in-stream fine sediment. Activities under Alternative 3 would add 4,500 truck trips. We estimate that increased truck traffic under Alternative 3 would add an additional 0.4 to 2 yd³ of fine sediment per year to first- and second-order streams during the implementation period, an increase of about 21 percent over the No Action alternative and a decrease of 6 percent from the Proposed Action. Alternative 3 would add an additional 3 to 10 yd³ of fine sediment per year to higher-order streams during the implementation period, an increase of about 23 percent over the No Action alternative and a decrease of 6 percent from the Proposed Action. This would include an estimated 0.2 to 0.8 yd³ of sand-sized particles and 2 to 9 yd³ of silt- and clay-sized particles. The transport and fate of fine sediment under Alternative 3 would be the same as analyzed under the Proposed Action. Increased truck traffic on gravel-surfaced haul routes under Alternative 3 could result in short-term, localized increases in turbidity, SSC, and in-stream fine sediment but would be unlikely to result in a long-term measurable increase in in-stream fine sediment at the reach scale within areas designated for salmon and steelhead spawning use.

Road maintenance activities associated with increased truck traffic on the gravel-surfaced haul routes would result in short-term indirect effects to turbidity, SSC, and in-stream fine sediment under Alternative 3 similar to those analyzed under the Proposed Action. Road maintenance under Alternative 3 is unlikely to result in a measurable increase in turbidity, SSC, or in-stream fine sediment within areas designated for salmon and steelhead spawning use.

Other ground-disturbing activities such as repairing slump areas could result in short-term increases in turbidity, SSC, and in-stream fine sediment under Alternative 3 slightly less in magnitude than those analyzed under the Proposed Action. Since road widening would not be done under Alternative 3, other ground-disturbing activities would occur over a more limited area and would generate less fine sediment than under the Proposed Action. Other ground-disturbing activities under Alternative 3 are unlikely to result in a measurable long-term increase in in-stream fine sediment within areas designated for salmon and steelhead spawning use or a short-term increase in turbidity or SSC downstream of project activities.

Paving the gravel-surfaced section of the Nestucca Access Road and installation of additional cross-drains throughout the project area would result in a long-term decrease in turbidity, SSC, and in-stream fine sediment under Alternative 3 similar to those analyzed under the Proposed Action.

Alternative 3 would result in long-term indirect effects to turbidity, SSC, and in-stream fine sediment by reducing the frequency of culvert plugging and failure during storm events similar to those analyzed under the Proposed Action.

Stream Temperature

Widening of the road prism to accommodate mitigation measures under the Stormwater Management Plan would result in approximately 18 percent fewer tree removals (greater than 6 inch DBH) along the gravel-surfaced section of the Nestucca Access Road than under the Proposed Action. However, the effects of tree removals to effective shade and stream temperature would be similar to those analyzed under the Proposed Action. Average effective shade at the reach-scale would be maintained, and tree removals associated with road prism widening under Alternative 3 would not be likely to result in a measurable increase in stream temperature.

Culvert replacements at stream crossings under Alternative 3 would occur within the primary shade zone and would result in the removal of approximately 900 trees greater than 6 inches DBH from the road prism. This is a decrease of 10 percent from the Proposed Action. However, the effects of tree removals to effective shade and stream temperature would be similar to those analyzed under the Proposed Action. Average effective shade at the reach-scale would be maintained, and tree removals associated with culvert replacements under Alternative 3 would not be likely to result in a measurable increase in stream temperature.

Wetlands

The potential effects to wetlands under Alternative 3 would be the same as that analyzed under the Proposed Action.

Asphalt Waste Site

Alternative 3 would maintain the asphalt waste site in its current condition. Effects would be the same as under the No Action Alternative.

3.3.7 Cumulative Effects - Alternative 3

Potential cumulative effects under Alternative 3 would be substantially the same as those analyzed for the Proposed Action.

3.4 Threatened or Endangered Fish Species or Critical Habitat, Magnuson Stevens Act Essential Fish Habitat and Fish Species with Bureau Status.

3.4.1 Affected Environment

The proposed Nestucca Backcountry Byway Project includes actions that would occur within the Nestucca River, Willamina Creek, and North Yamhill River 5th Field Watersheds. Willamina Creek and North Yamhill River are on the east side of the Coast Range in the Willamette River drainage; the Nestucca River is on the west side of the Coast Range.

Fish species and/or fish habitat with special status that occur within the vicinity of the proposed Nestucca Backcountry Byway project are shown in Table 7 below.

Table 7. Special Status (SS) Fish and Fish Habitat located within the Vicinity of the Nestucca Backcountry Byway.

Species or Habitat	Status	Critical Habitat in Project Area	Magnuson-Stevens Act (MSA) Essential Fish Habitat (EFH) in Project Area
Oregon Coast Coho salmon (OC Coho)	ESA – Threatened, MSA	Yes Designated	Yes-Designated
Upper Willamette Steelhead Trout (UW Steelhead)	ESA - Threatened	No	No
Upper Willamette chinook Salmon (UW chinook)	ESA - Threatened	No	Yes-Designated
Chinook salmon (coastal)	MSA	No	Yes-Designated
Oregon Coast steelhead Trout (OC steelhead)	Bureau Sensitive	No	No
Pacific lamprey	Bureau Sensitive	No	No

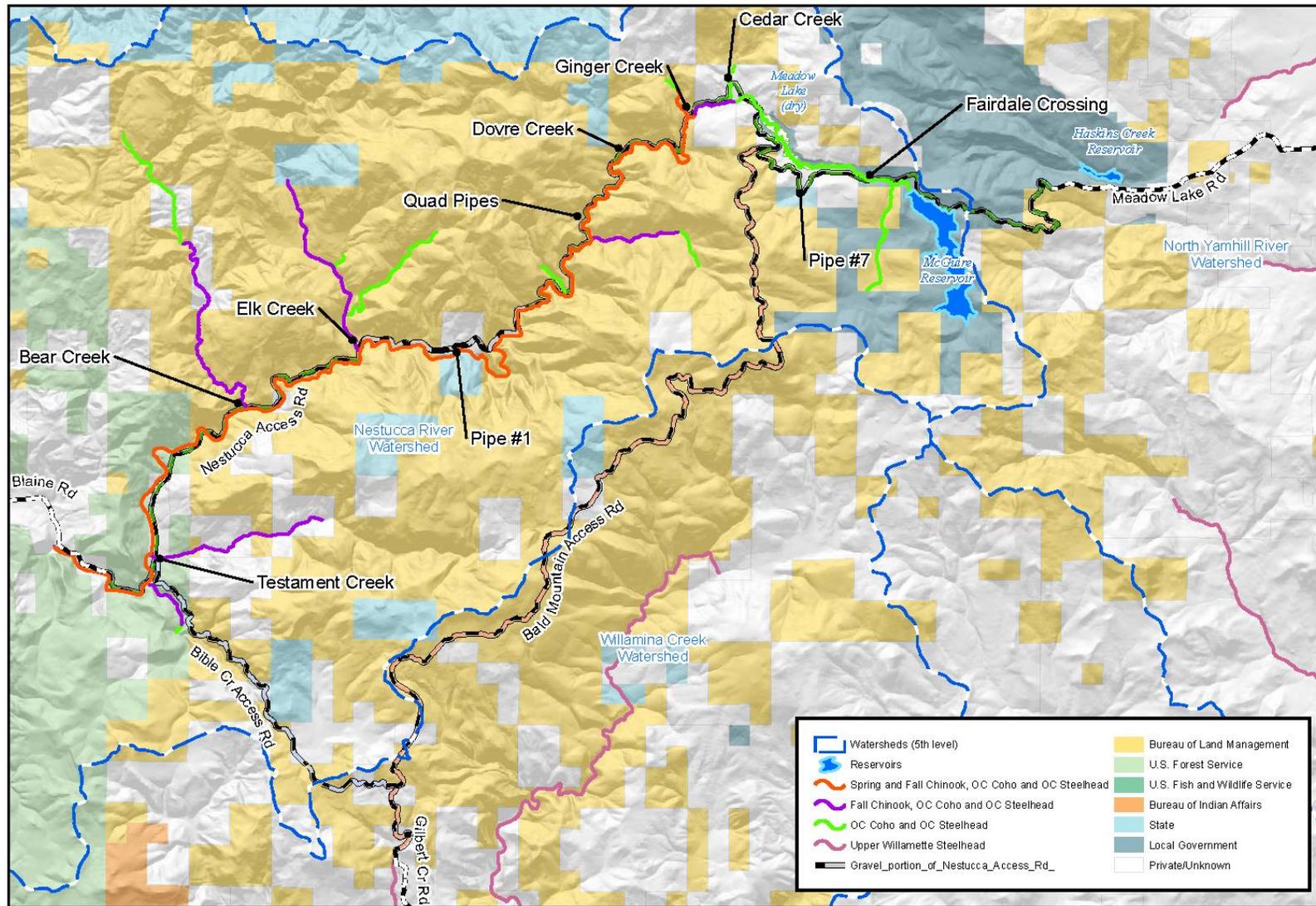
The objectives for management of special status fish depends on which policy or Act they are managed under.

Endangered Species Act - To conserve and/or recover ESA-listed species and the ecosystems on which they depend so that ESA protections are no longer needed for these species.

Bureau Sensitive - To initiate proactive conservation measures that reduce or eliminate threats to Bureau sensitive species to minimize the likelihood of and need for listing of these species under the ESA.

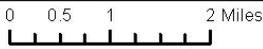
Magnuson-Stevens Act (MSA) Essential Fish Habitat (EFH) - Each Federal agency shall consult with the Secretary with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any essential fish habitat identified under this Act. Essential Fish Habitat only relates to habitat and not to the species of fish dependent on the habitat.

Figure 15. Sixth field watersheds and distribution of Special Status fish within the vicinity of the project area (excludes Pacific Lamprey, distribution data is limited)



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Salem District: Tillamook Field Office

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Willamina Creek and North Yamhill River 5th Field Watersheds

Only a few project actions would occur within the North Yamhill River and Willamina Creek watersheds. They include the replacement of culverts on small non-fishbearing streams, the development of 10 – 15 turnouts along Bald Mountain Road, and chipsealing of asphalt surfaces. The replacements of the culverts are the only actions that have the causal capability to affect water quality and thus special status fish (UW steelhead, UW chinook and Pacific lamprey). The nearest proximity of UW steelhead in the North Yamhill Watershed to culvert replacement is approximately three miles downstream; Carlton reservoir formed by a dam which is a barrier to fish including Pacific lamprey and steelhead, is located between their distribution and the project construction sites. The closest that UW chinook get to the project is approximately 15 miles downstream at the confluence of Panther Creek and the North Yamhill river. Pacific lamprey and UW steelhead do inhabit the Willamina Creek watershed but there are no culvert projects proposed closer than 0.6 miles. Based on analysis in the Hydrology section the replacement of the culverts in the upper reaches of the North Yamhill and Willamina Creek watersheds would only result in small, localized, short duration increases in sediment that have no possibility of being detectable at the upper extent of UW steelhead or UW chinook distribution. For these reasons, UW steelhead and UW chinook will not be analyzed further.

Nestucca River 5th Field Watershed

Within the Nestucca River 5th field watershed numerous project actions would occur that could affect special status fish. The species that may be affected are Oregon Coast Coho salmon, chinook salmon (coastal, both spring and fall), Oregon Coast steelhead trout, and Pacific lamprey.

The analysis area for describing effects to special status fish and their habitat is the 5th field Nestucca River Watershed, with emphasis on the three uppermost 6th field watersheds (Headwaters of the Nestucca, Testament Creek (which includes Bear Creek), and Elk Creek). While a small number of project actions would also occur within the Niagara Creek 6th field watershed of the Nestucca, these actions are limited to a few cross drain installations and chip sealing ~3000 feet of existing asphalt road and would not have any causal connection to special status fish.

Due to its Endangered Species Act status, OC Coho warrants the most in-depth analysis of all of the special status species presented here. Coho also occupy and use all of the habitats that are occupied and used by the other species, with the exception of the stable fine silt substrates needed by juvenile lamprey. For these reasons the affects analysis will focus on OC Coho but will also serve as effects analysis for the other species. In any cases where the effects are specific to a species other than Coho, such as pacific lamprey, the discussions will note the difference. Chinook salmon are considered here due to their status as a commercially important fish species that is covered by the Magnuson-Stevens Fishery Conservation and Management Act (MSA 1996). The Act requires that federal agencies undertaking actions that could adversely affect Essential Fish Habitat consult with National Marine Fisheries Service. The analysis here will document effects to chinook habitat, not the species itself, and determine if adverse effects are likely to occur.

Chinook Salmon (spring and fall)

As shown in Figure 15 above, the upper extent of chinook salmon distribution is limited to the mainstem of the Nestucca river below the confluence with Cedar creek. Lower flows and higher stream gradient above Cedar Creek are believed to exclude chinook salmon from moving further upstream. In addition to the mainstem of the Nestucca River, fall chinook also use the lower gradient reaches of the major tributary streams.

Spring chinook arrive in the upper Nestucca River from about May to July and fall chinook arrive after the onset of fall rains, generally mid to late October.

Project actions that would occur in direct proximity to spring chinook habitat include the replacement of crossing structures at Bear Creek and Elk Creek (work areas for these structures may include the Nestucca River), replacement of other culverts along the Nestucca Access Road, the paving of the 2.7 mile gravel section and chip sealing of asphalt surfaces along the Nestucca Access Road are in the vicinity of spring chinook (Figure 15) but not in direct proximity to their habitat. Actions that would occur near fall chinook habitat are the same as for spring chinook but also include the stretch of the Nestucca Access Road between Ginger Creek and Cedar Creek as well as waste hauling along Elk Creek Road.

Oregon Coast Steelhead Trout (OC steelhead)

Oregon Coast steelhead are present in the Nestucca River and its tributaries in essentially the same spatial distribution as OC Coho, and occupy similar habitats. OC steelhead is a NOAA Fisheries Species of Concern, and is a Sensitive Species in Oregon under BLM's Special Status Species policy. Actions that could affect OC steelhead would be the same as those that could affect OC Coho (see below).

Pacific Lamprey

Pacific lamprey are listed as a Sensitive Species in Oregon under BLM's Special Status Species policy. Little population data is available for lamprey in the Nestucca River watershed. Lamprey are anadromous fish that are thought to share a similar stream habitat distribution as salmon. Adult lamprey enter freshwater habitat in late winter to early summer and overwinter before spawning the following spring. Lamprey spawn in gravels similar to salmon. Newly hatched lamprey drift downstream and settle into fine silty substrates in stable low velocity stream reaches. Juvenile lampreys remain in streams for 3-7 years filter feeding on algae and diatoms before emerging from the streambed and slowly migrating out to the marine environment. Suitable lamprey habitat is available within the Nestucca River and its tributaries, especially alongside channels, beaver ponds, and in areas of pools where sediment collects. Lampreys have unique suction type mouths, which they use to help move upstream in swift currents and up steep gradients, including some waterfalls.

Oregon Coast Coho Salmon (OC Coho)

OC Coho use a variety of habitats throughout the analysis area during their life stages. Coho prefer to spawn in small to medium size streams with moderate gradients ranging from one to five percent, gravel substrates 1.3 to 10.2 cm in diameter, and cold, oxygenated water. After emergence in the spring, Coho fry typically remain in the stream for a full year. During that year, young Coho prefer complex pool, edge cover and backwater habitats over faster water habitats. These habitat types are particularly important to the survival of fry (earliest stage of juvenile fish) during heavy winter and spring flows because they provide low velocity refugia. These complex habitat types are also used by adult Coho for cover and resting during their return to spawning areas.

Within the analysis area, there are approximately 34.5 miles of suitable stream habitat that are currently accessible to all life stages of Coho at all times. Bear Creek, which includes 4.9 miles of stream habitat suitable for Coho, is available to all life stages of Coho except during very low or very high flows, which can then result in a barrier for juvenile Coho at the confluence with the Nestucca River. There are also approximately 2.3 miles of Coho habitat that are not currently available to the juvenile life stage (upstream of Fairdale culvert, on the mainstem Nestucca River and Walker Creek) (see Table 8 and Figure 15). Lastly, there is about one mile of potential Coho habitat where culverts on the Nestucca Access Road are causing barriers to all life stages (Ginger Creek, Cedar Creek, Quad pipes, and Pipe 7 at milepost 4.89). All told, there are 37.6 miles of OC Coho Critical Habitat, which includes three miles of stream that are inaccessible to some age classes of Coho.

Within the Nestucca River upstream of Elk Creek, there are very high rearing densities of juvenile Coho salmon. The highest densities of rearing Coho, measured in fish per square meter of pool surface area, within the analysis area are located from Elk Creek to Cedar Creek. Many of the pools exceed the “fully seeded” density of 1.5 Coho per square meter, including a peak density of 2.14 Coho per square meter occurring just below Cedar Creek (Bio-Surveys, LLC 2004). Full seeding represents a density of juvenile salmonids (salmon species and specifically Coho in this area) that are rearing near the habitats capacity. The portion of the mainstem Nestucca River from Boulder Creek (approximately 15 miles below the project area) to Walker Creek (at the upper end of the project area) is considered the single most productive segment for juvenile Coho rearing in the entire Nestucca Watershed. This segment averaged 120,000 juvenile Coho annually from 2002-2004 and had an average rearing density of 0.4 Coho per square meter in 2004. (Bio-Surveys, LLC 2004). Overwinter survival of juvenile Coho vary between 5 and 35% depending on habitat quality and the number and intensity of winter storms, based on survey data from the Trask and Nestucca Watersheds. Considering the 2004 data, overwinter survival could vary between 6,000 to 42,000 juvenile Coho that could be available to move to the marine environment.

Landscape Setting

The Nestucca River and its tributaries in the vicinity of the proposed action has a long history of disturbance. Two large stand replacing fires occurred in the mid to late 1800's. The first fire in about 1860 burned through the entire project area leaving small islands of original forest. The second fire reburned through the area in about 1890 and was most intense on the south side of the river. Homesteading and its associated land clearing fires and stock grazing occurred along the flatter areas generally in the south and east portion of the project area, closer to the Willamette Valley. By about 1930, most homesteads had been abandoned and Douglas fir forests had replaced the grazed lands. In the late 1950's road access allowed for timber harvest to begin in earnest. Road development increased throughout the analysis area until the early 1990's. The road construction included the installation of many stream crossing structures that caused barriers to fish passage. Since the mid-1990s, the BLM has replaced six major fish passage barrier culverts, five on streams inhabited by Coho salmon that have reestablished access to habitat for anadromous fish. In 1962, the Meadow Lake dam failed causing severe scouring of the mainstem of the Nestucca River. Stream cleaning, which removed wood and boulders, was also practiced in the watershed up until the late 1970's to early 1980's. The combination of these historical events has had serious negative impacts to habitat for special status fish species. In 1997, the National Marine Fisheries Service and the State of Oregon identified simplified channel morphology, lack of in-stream roughness, and substrate changes as “factors for decline” related to in-stream physical habitat conditions that potentially reduce or limit populations of Oregon Coast Coho salmon (OCSRI 1997). These factors equate to having inadequate in-stream wood, deficiencies in the amount of complex pool habitat, and the disconnection of the stream channel from the floodplains (OCSRI 1997).

Existing Stream Habitat Conditions

The Nestucca River stream banks, downstream of the confluence with Cedar Creek, are dominated by alternating hillslopes and terraces. Stream gradients of the Nestucca River in the vicinity of the proposed action range from 0.9 % to 2% with the dominant stream features being rapids, riffles and scour pools. From the late 1980's to present federal land management practices have positively contributed to the extent of productive special status fish habitat throughout the Nestucca Watershed, these improvements have included in-stream placement of large wood and boulders, retention of riparian trees, management of road-related sediment runoff, and removal of fish barriers. Large wood volume in the Nestucca watershed is thought to be substantially lower than under historical conditions, however compared to current large wood volumes in other Coast Range watersheds, the Nestucca watershed has moderate to high volumes of large wood (24" x 50' long). However, these levels are still below Oregon Department of Fish and Wildlife (ODFW) desirable standards of approximately 48 pieces per mile (ODFW AQI 2006). The most recent in-stream restoration

work occurred in 2011-12 and included the placement of 120 logs in the Nestucca River along a three-mile reach between Bald Mountain Fork and Ginger Creek. This restoration work nearly meets the ODFW benchmark for large wood.

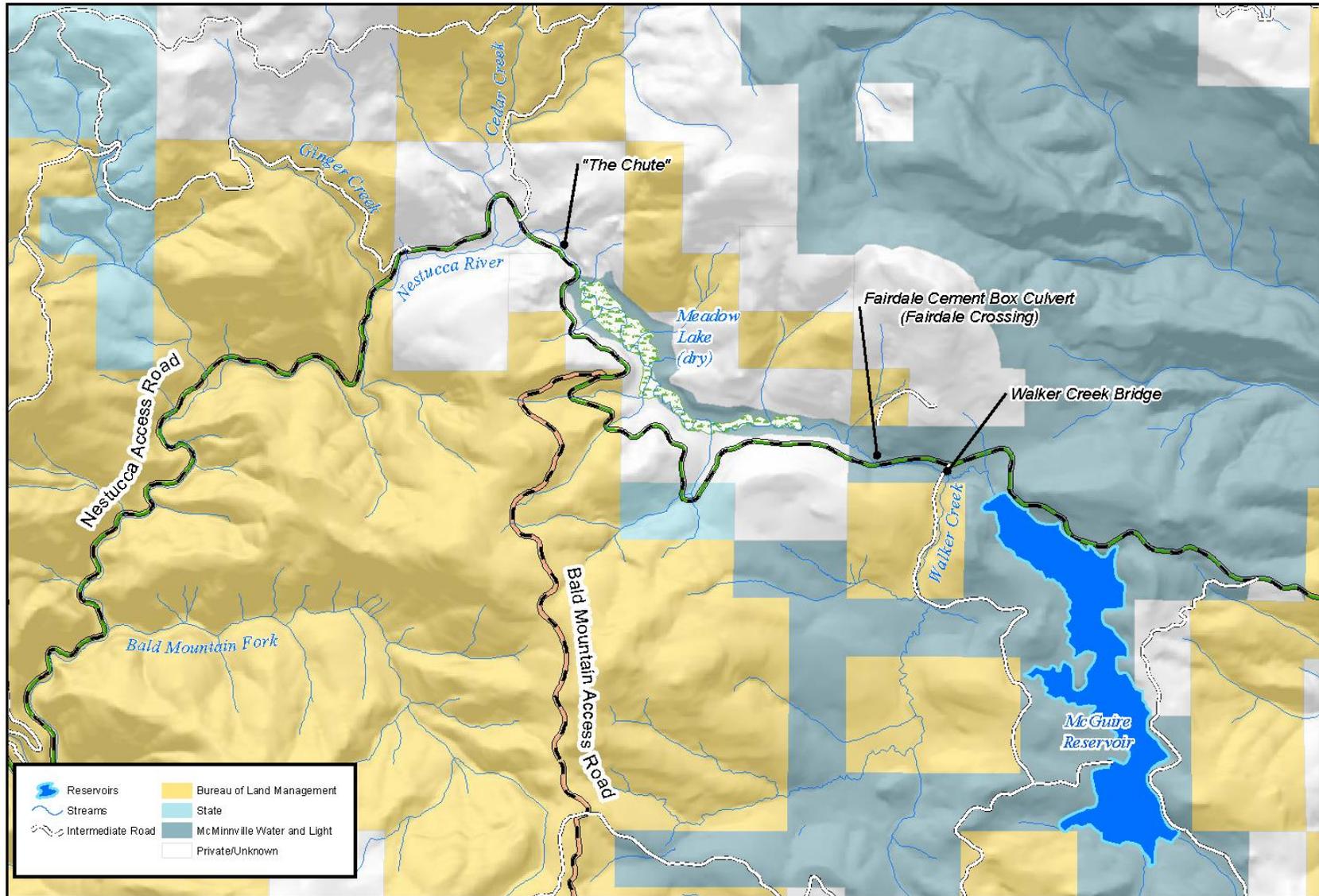
Upstream of Cedar Creek, a 0.36-mile long chute with an 8.4% slope gradient separates two distinct habitats for Coho and other special status fish species on the mainstem Nestucca (see Figure 16). Coho, steelhead and lamprey can negotiate the chute, but chinook salmon are unable to move beyond this area; therefore the lower end of the chute represents the upper extent of chinook habitat in the analysis area. In the early 2000's, cement step pools were created in the chute to improve fish passage to the upper-most Nestucca mainstem and Walker Creek, which it did to some extent (however it still excludes chinook). These modifications were completed by McMinnville Water and Light as one of the stipulations of a waiver of fish passage requirements for the raising of McGuire Dam in 2003-2004. Above the chute, the Nestucca River meanders for about two miles through the historic Meadow Lake bed. Meadow Lake was a relatively shallow reservoir until the failure of the dam in 1962. The river flowing through the old lakebed alternates between gravel-dominated reaches and frequent beaver ponds with substrates comprised of fine silts and organics (leaves, needles, rotten wood, etc.). These low gradient stream segments (<1% slope) provide excellent rearing potential for OC coho and Lamprey. About a half mile above the upper end of the lake bed is the confluence with Walker Creek, and another one-third of a mile above Walker Creek is the base of the dam on McGuire Reservoir, which is a barrier to all fish.

In 2004, Rapid Bio-Assessment (RBA; Bio-Surveys, LLC 2004) sampling using snorkel surveys was conducted in the Nestucca mainstem and Walker Creek. Juvenile Coho were observed in the Nestucca up to approximately the Fairdale cement box culvert but no Coho were observed above there at that time. In 2006, a bridge was replaced on the main stem Nestucca River immediately downstream of the mouth of Walker Creek, but above the Fairdale culvert (see Figure 16). During the bridge installation project, juvenile Coho were observed at that site indicating that some Coho reproduction had occurred in Walker Creek or just downstream. This is an indication that adults moving upstream can negotiate the Fairdale crossing at some flows but that juveniles below the culvert cannot move upstream of the culvert. This effectively cuts off several miles of high quality low velocity habitat to rearing juvenile fish as they move about the stream network over the course of the year.

Table 8. Stream Crossing Structures Proposed for Replacement on Special Status Fish Bearing Streams.

Name and/or Location	Miles of Habitat Accessed above Structure	Benefiting Special Status Fish	Barrier
Testament Creek MP 20.02	2.3 miles	Coho Steelhead Lamprey Chinook	NO - Not barrier but access to upstream habitat would be improved.
Bear Creek MP 17.46	4.9 miles	Coho Steelhead Lamprey Chinook	NO/Partial -Not barrier at most flows, however low flows and high flows would stop juveniles and may impede adults at some flows.
Elk Creek Bridge MP 15.45	4.5 miles	Coho Steelhead Lamprey Chinook	NO - Not barrier but access to upstream habitat would be improved.
Pipe 1 (No Name Creek) MP 14.28	0.2	Lamprey	YES - Adult and juvenile barrier due to vertical disconnect.
Quad Pipes MP 10.21	0.1	Coho	YES - Adult and juvenile barrier due to vertical disconnect.
Dovre Creek MP 9.18	0.1 miles (Coho Steelhead) 2.0 miles (Lamprey)	Coho Steelhead Lamprey	YES - Adult and juvenile barrier due to vertical disconnect.
Ginger Creek MP 7.60	0.5 miles	Coho Steelhead Lamprey Chinook	YES - Adult barrier due to water velocities and juvenile barrier due to velocities and vertical disconnect.
Cedar Creek MP 7.21	0.1 miles (Coho Steelhead) 3.0 miles (Lamprey)	Coho Steelhead Lamprey	YES - Adult and juvenile barrier due to vertical disconnect.
Pipe 7 MP 4.89	0.25 miles	<i>Possible:</i> Coho Steelhead Lamprey	YES - Juvenile barrier due to high water velocity.
Fairdale Crossing MP 3.84	2.3 miles	Coho Steelhead Lamprey	YES - Adult barrier at high or low flows and juvenile barrier due to high velocities and vertical disconnect.

Figure 16. – Upper Nestucca Stream Habitat Conditions.



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0 0.25 0.5 1 Miles



The Nestucca Back Country Byway Project is composed of multiple actions, some of which do not have the potential to affect special status fish species (see Table 9) and some that do (see Table 10). Only those project actions that could affect special status fish will be analyzed below.

Table 9. Project actions that <u>do not</u> have the potential to affect special status fish include:	
Project Action #	
3.	<u>Repair road slump areas</u> – Given the use of BMPs, none of the road slump repair areas have causal connection to waterways that could result in water quality degradation and thus affect special status fish.
6.	<u>Chipseal all the segments of the Byway</u> – Chipsealing would be restricted to asphalt surfaces only and only occur during dry periods. Best Management Practices that limit actions to dry periods with no forecasted rain would allow for the complete drying and evaporation of application materials or leachates. Once the application material is dry, there would not be any causal mechanism for the project action to affect special status fish by way of affecting water quality.
7.	<u>Install signage (traffic, interpretive, informational, portal) and other safety features (fences, barriers, guardrails, designated speed limits).</u> – The installation of signs, guardrails and fences would entail little more than minor soil disturbance, well away from water sources and therefore have no potential to affect special status fish species.

Table 10. Project actions that <u>do</u> have the potential to affect special status fish include:	
Project Action #	
1.	<u>Nestucca Access Road gravel-surfaced section widening and paving</u> – The road widening and paving project action would have a small, short-term <i>negative effect</i> to special status fish due to the road preparation actions that would <i>generate dust and fine sediment</i> which could eventually find its way to ditchlines and runoff during the first fall rains. A greater <i>positive effect</i> is expected by paving which would greatly <i>reduce sediment runoff</i> from the current road surface due to use and require considerably less maintenance, which in turn reduces ditchline disturbance associated sediment generation.
2.	<u>Byway culvert replacements, new cross-drains and Elk Creek Bridge replacement</u> – This project action would replace approximately 88 existing culverts/bridges (87 culverts and Elk Creek Bridge), 42 existing cross drains, and install approximately 100 new cross drains. Cross drain replacement and installation would only have a <i>positive effect</i> to special status fish by assuring that <i>less road related sediment runoff</i> enters the stream network. Culvert and bridge replacement can result in <i>sediment entering the stream</i> , which can have direct, short-term <i>negative effects</i> to special status fish species. The process of replacing the structures on streams that have special status fish in them would result in a direct <i>negative effect</i> through the

	<p>mortality to a small fraction of the juvenile fish that are in the stream at the time and location of the work. Replacement of culverts/bridge that would assure passage of stream bedload and 100-year event water flows would have the indirect positive effect of reducing stream velocity and streambed scour as well as returning sediment regimes to a more natural condition, which would result in improved fish habitat conditions. Of the 88 existing culverts/bridge to be replaced, 48 would be replaced along the Nestucca Access Road between the west end of the project area below Testament Creek and the base of McGuire Reservoir at the east end. Of the 48 culverts along the Nestucca Access Road below McGuire Reservoir, 32 are within 100 meters of water where Coho could reside. Studies (Foltz <i>et al.</i> 2013) have found that sediment generated by culvert removal is reduced by an order of magnitude within 100 meters of the culvert site. Of the 32 culverts/bridge, ten are on tributary streams with special status fish, eight of which are known Coho streams. Of the ten culverts/bridge structures, seven are barriers to special status fish and one is a partial barrier at certain very high or low flows. The replacement of these structures would have a direct positive effect of providing access to more habitat for special status fish.</p>
4.	<p><u>Construct additional paved turnouts, strategic roadway widening, intersection safety improvements, and manage existing pull-offs</u> – The construction of additional paved turnouts, strategic roadway widening and intersection safety improvements would all occur on road surfaces away from water and would not affect special status fish species. The management of existing pull-offs would include restricting vehicle access to some pull-offs and improving river access for pedestrians at other pull-offs. The construction and management of pull-offs would not have a causal mechanism to affect special status fish. Improving river access for pedestrians at existing pull-offs could affect special status fish by making it easier for visitors to access the river and thus cause disturbance to rearing fish. This would be a small indirect negative effect; on the other hand, trail improvement would result in less erosion from the trail and less damage to riparian vegetation, which would have a small indirect positive effect.</p>
5.	<p><u>Manage roadside trees along the Byway</u> – The removal of roadside trees near streams has the causal potential to affect special status fish in two ways: removing shade over water resulting in increased stream temperature, and reducing the potential for wood to enter the stream. In-stream wood is an important element of stream structure and fish habitat. Tree removal would occur in a dispersed fashion and would only occur near streams at culvert replacement sites. The hydrology analyses determined that little or no streamside shade would be reduced by the action and therefore not have any potential to increase stream temperature. The proposed action could result in a reduced potential for some trees to fall into the stream, particularly at the culvert replacement sites on streams containing special status fish. Because in-stream wood is an important element of special status fish habitat, this potential reduction would be considered an indirect negative effect.</p>
8.	<p><u>Restoration of an asphalt waste area and development of a day-use area</u> – The asphalt waste area does not appear to be affecting water quality in the river and therefore is not affecting fish. Likewise, the restoration of this area would not be expected to affect special status fish. The construction of a Day-Use Recreation Area at the site would not be expected to affect fish but the use of the site by visitors does have the potential for indirect effects to special status fish. Encouraging visitors to stop at this location and providing access to a high quality stream pool has the potential to cause indirect negative effects to rearing fish through disturbance caused by visitors in the water or at the water’s edge. There could also be a small indirect negative effect through the creation of user trails, which would result in slightly more erosion from trails and more damage to riparian vegetation.</p>

9.	<p><u>Connected Actions</u> – The proposed action involves several connected actions but only the hauling of waste material and rock has the potential to affect special status fish. The only aspect of the quarry work expected to affect fish would be the hauling of material to and from the quarries and the maintenance of the roads specifically for that hauling. This haul would occur along Elk Creek Road and potentially Cedar Creek Road. Both of these roads run alongside of creeks that provide high quality special status fish habitat. The indirect <i>negative effect</i> would be associated with <i>sediment run-off</i> associated with both the hauling and maintenance of the roads.</p>
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To summarize, six project related actions have the potential to affect special status fish, some positively, some negatively, and some both. The aspects of the project actions that have the potential to affect fish are:

- *Sediment generation and reduction* (negative and positive effects)
- *Direct mortality of juvenile fish during culvert replacement* (negative effect)
- *Decreased potential for in-stream wood* (negative effect)
- *Disturbance to fish by river visitors* (negative effect)
- *Increase in access to habitat for special status fish* (positive effect)
- *Improvement of stream habitat condition related to improved bedload transport and reduced streambed scour* (positive effect)

The analysis of the action alternatives will focus on these aspects of the project actions.

3.4.2 Environmental Effects - Alternative 1: No Action

The No Action alternative discussion will be used to compare effects between the current condition and expected trends, and those that could occur if either of the action alternatives were implemented. To that end, the No Action analysis will be organized around those elements of the action alternatives with potential to be impactful to special status fish. In the section above, we identified sediment, direct mortality of juvenile fish, in-stream wood potential, disturbance to fish, fish access to habitat, and stream function and habitat condition as factors that could affect special status fish. These factors will be discussed separately below.

If the No Action alternative were selected none of the proposed project actions would occur. Regular maintenance activities would continue to occur such as occasional spot rocking, grading, and ditch cleaning of the gravel section of the Nestucca Access Road. Culverts in current need of replacement would be replaced as funding becomes available (separate analysis would occur). No actions would occur at the asphalt waste site, the material would remain in place and no Day-Use Area would be constructed. Roadside trees would be managed only as they become imminently problematic and are an immediate hazard to infrastructure or the public. No new turn-outs or pull-offs would be constructed or improved, nor would any be closed. User-created trails to the Nestucca River would not be improved or managed.

Sediment

Because none of the proposed project actions would occur there would not be any generation of sediment from activities associated with sub-grade preparation, road widening, paving, or from hauling waste and rock material. There may be a few stream culverts replaced in the next 8 to 10 years, which would generate small amounts of sediment, but it would not be nearly the scale of the 87 culverts to be replaced under the proposed action, and would not likely involve any of the large culverts on the special status fish streams.

Currently, the 2.7-mile gravel-surfaced section of the Nestucca Access Road delivers approximately 3 to 12 yd³ of fine sediment per year to first- and second-order streams and 6 to 27 yd³ to higher-order streams including the Nestucca River. We would expect that these sediment inputs would continue into the future under the No Action alternative. The effects to special status fish from the current condition are more acute near sites where road generated sediment enters ditchlines that are connected to stream culverts emptying into the Nestucca River. Special status fish are more likely to avoid those locations during high flow events when higher quantities of sediment are moving.

We expect that plugging of undersized culverts would continue at current rates of about four annually. Most of these are small culverts that can be unplugged by hand. Occasionally some of the larger culverts plug and use of machinery is necessary to unplug them. This use of machinery during the wet season can generate sediment that could negatively affect special status fish.

Because none of the culverts would be replaced in the near future, the current failure risk would increase over time. Plugging of the undersized culverts would continue and we expect that one or possibly two of the smaller culverts could fail in the next 8-10 years. If one of these culverts were to fail it could generate anywhere from a few cubic yards of sediment for a small culverts with a shallow fill to over 1000 yd³ from culverts with deeper fills. The larger grained materials would settle out quickly near the failure site burying stream substrates, which could potentially affect special status fish use of the stream for weeks by limiting feeding, sheltering or spawning. A plume of suspended sediments may be measurable for up to a mile downstream and last for one or two days (EA section 3.3). If a failure were to occur, we could expect that there may be adult and juvenile special status fish in the stream as well as eggs in spawning gravels at that time. The potential effects to fish would vary by the size, location, timing and number of culverts failing. Adult fish can move away from failure sites, therefore the primary adverse effect to adult fish would be displacement caused by high suspended sediment, which may cause loss of spawning opportunity and physical harm (fine sediment in gills); however in severe cases death could result. Juvenile fish, especially immediately downstream of the failure site could experience a high mortality rate because they have limited ability to escape a large sediment plume. Any eggs in gravels near a failure site would likely be covered and smothered as sediment settles into the interstitial spaces between the gravel. Because suspended sediments could affect up to a mile of the river, potentially thousands of juvenile fish and eggs could be affected, especially if the failure occurred in the upper reaches of the Nestucca River where habitat is better and more fish overwinter. Recent population inventories found rearing populations of Coho between Bald Mountain Fork and Ginger Creek to be between 3,300 and 7,700 fish per mile (Bio-Surveys, LLC 2015). These population numbers are from summer counts before winter storms inflict natural mortality. Depending on the severity of winters, we have found that overwinter survival of juvenile Coho to vary widely between approximately 5% and 35%. For analysis purposes, if we consider an average pre-winter population of 5,500 fish per mile with an average overwinter survival of 20%, we can speculate that a culvert failure affecting a mile of good habitat may remove 1,100 juvenile fish from the population that otherwise would have migrated to the ocean. Using these estimates, the potential effect of a deep fill culvert failure to the total population of OC Coho in the mainstem Nestucca River (above Boulder Creek – see affected environment section) would be about 4.6% of the mainstem population. Considering that the mainstem Nestucca River population above Boulder Creek comprises approximately 52% of the total Nestucca 5th field population, the loss of 1,100 from the total Nestucca River population would reduce the population by about 0.5%. The foregoing analysis would be a worst-case scenario. The potential 0.5% reduction in one year's juvenile population, as well as the potential reduction in the next year's population due to the loss of eggs would be well within the current range of population variability and would not likely result in a noticeable loss of population at the scale of the Nestucca Watershed for OC Coho. OC steelhead production within the Nestucca River 5th field watershed is about 9% that of Coho so these effects would also apply to OC steelhead although to a lesser degree due to their relative lower abundance.

Direct Fish Mortality

Because no culverts would be replaced under the No Action alternative, there would not be any mortality to fish resulting from stream channel de-watering and fish salvage activities.

In-Stream Wood

Because there would not be any trees removed if the No Action alternative were selected, there would not be any loss of potential for in-stream wood.

Disturbance

Under the No Action alternative the Day-Use recreation area would not be constructed and none of the user-made trails at pull-offs would be improved or closed. We would expect that visitor access to the waters of the Nestucca River would continue in similar fashion as currently. Over time we expect that there will be greater numbers of people traveling along the Nestucca Access Road, which would likely mean more people would use trails to get to the water. We could expect that trail erosion could continue or increase and that riparian vegetation would be maintained in a degraded condition near those trail locations.

Habitat Access

There are seven culverts that are proposed to be replaced under the Proposed Action that are barriers to special status fish, and one that is a barrier to juveniles at very high and very low flows. Some of these culverts are barriers to all fish of all ages and others are barriers to just juvenile fish. Juvenile fish often move upstream while feeding and in search of high quality rearing habitat. Barriers that restrict upstream movement of juvenile fish are important to population dynamics and therefore considered barriers to the species even if adults can pass upstream.

Because none of the barrier culverts would be replaced, access and usage of available special status fish habitat would continue as it is currently. Oregon Coast Coho and steelhead would continue to be excluded from 3.35 miles of suitable stream habitat, and be partially limited at very high and low flows to another 4.9 miles of suitable habitat. Pacific lamprey would continue to be excluded from approximately 8.5 miles of suitable habitat.

Habitat Improvement (natural sediment routing, reduced stream velocity/streambed scour)

No habitat improvement would occur under the No Action alternative. Undersized culverts would continue to cause degraded stream conditions by continuing to store stream substrate bedload above the culvert, cause increased flow velocity, and contribute to streambed scour and downcutting near the outflow of the culvert. Because undersized culverts are more likely to fail during high flow events, the risk of habitat degradation caused by culvert failure would continue or increase for at least the next 8-10 years.

Summary

Small, site scale level, adverse effects to special status fish and their habitat would continue with selection of the No Action alternative. Opportunities to improve habitat and increase access to suitable habitat for special status fish would be forgone. However, despite the current deficiencies, the Nestucca River and its tributaries within the proposed project area would continue to provide good quality habitat for special status fish. Conditions for Oregon Coast Coho would continue to provide for conservation and recovery. Conditions for Oregon Coast steelhead and Pacific lamprey would still be good enough to support and conserve these species and not contribute to the need to elevate the level of concern for them. No actions would affect chinook habitat therefore there would not be any effect caused by federal action to Essential Fish Habitat.

3.4.3 Cumulative Effects – Alternative 1: No Action

As shown above, not taking action could result in some continued adverse effects to special status fish that would be averted under the Proposed Action alternative. However, this situation is really the current condition (also known as the affected environment). Therefore, other actions that may occur within the analysis area over the next 8-10 years, either through BLM or non-BLM decisions, would be occurring within the context of the current condition and not relative to selecting the No Action alternative for the Nestucca Backcountry Byway Project. Therefore, there would not be any cumulative effects to special status fish associated with the No Action alternative.

3.4.4 Environmental Effects – Alternative 2: Proposed Action

The discussion below is intended to disclose environmental impacts, both positive and negative, to special status fish and their habitat directly, indirectly and cumulatively, resulting from the Nestucca Backcountry Byway Project proposed action. The analysis is organized by effects to special status fish and their habitat with subheadings of the project component causing the effect.

Sediment

Nestucca Access Road Widening and Paving

The widening and paving of the gravel-surfaced portion of the Nestucca Byway is expected to have a short-term negative and long-term positive impact on special status fish. In preparation for paving, excavation of cut-slopes, construction of storm-water treatment ditches, construction of retaining walls in select locations and hauling and placement of subgrade rock would occur. These actions would expose soils and generate dust. With the onset of fall rains, most of the dust or sediment from exposed soil areas would be transported short distances and trapped in adjacent gravel or vegetation. We expect that only a small portion may escape to adjacent streams, mostly in the form of dust being washed off of vegetation overhanging streams and runoff from exposed soils prior to revegetation. Best Management Practices and design features such as using sediment fences, temporary sediment check dams in ditches and planting or seeding exposed soils with native vegetation would minimize the transport of sediment. This negative effect would only occur for the first few rain events during a time when other natural sediment in the watershed is mobilizing. It is unlikely that sediment caused by the project would be detectable against the elevated background levels but it could cause temporary avoidance behavior primarily by juvenile fish if they happen to be in close proximity of project area streams moving sediment. This effect would only persist for a week or two as the fall rainy season intensifies.

After the immediate effects of the widening and paving, the new condition of the Nestucca Access Road would benefit special status fish because there would no longer be a chronic source of sediment from the road. The stormwater treatment ditches would filter sediment before water reaches ditch relief cross drains which in turn would divert sediment laden water over the forest floor rather than into streams. The effects to Coho and the other special status fish would be improved water quality caused by the near elimination of sediment reaching the Nestucca River relative to the current condition (3 to 12 yd³ per year on first- and second-order streams and by 6 to 27 yd³ per year on higher-order streams, including the Nestucca River).

Byway culvert replacements, new cross-drains and Elk Creek Bridge replacement

Adverse effects to Coho and other special status fish could result from sediment generated during replacement of culverts. Dewatering and replacement of existing culverts may generate suspended sediment that could affect the immediate channel conditions for a distance of about 330 feet (100 meters) below each culvert replacement work site and return to background levels within a half mile (Foltz *et al.* 2013). The concentration of suspended sediment could increase for short periods of time immediately following in-

channel project activities associated with culvert replacement but would be expected to return to background levels over a period of a few hours to a day (Foltz *et al.* 2013; Foltz *et al.* 2008). Of the 87 culverts and 1 bridge proposed for replacement, 10 would be directly over tributary streams that support special status fish (includes Elk Creek Bridge)(see Table 8) and 22 would be culverts on small second and third order streams that are within 330 feet of the Nestucca River where special status fish reside. While Foltz found that sediment concentration did not return to background levels until about one-half mile downstream, it is important to note that the actions Foltz studied did not include any measures to prevent or minimize sediment transport. Foltz's measurements also occurred within the same channel and did not account for the influence of small streams mixing with the much larger river at the confluence. Consequently, we expect that for those 22 streams where the culverts to be replaced are within 100 meters of the Nestucca River, that the sediment plumes would dissipate to background level within a few feet of mixing with the river. Based on that assessment we expect that those culvert replacement actions would not result in any adverse effects to special status fish or their habitat outside those limited mixing zones. For the remaining nine culverts and Elk Creek Bridge, we expect that despite implementing BMPs and Project Design Features aimed at minimizing sediment generation and transport there would be some sub-lethal adverse effects to juvenile special status fish. Because special status fish may reside in the stream near the construction site, we expect that sediment may cause fish to experience gill irritation, which may effect changes in fish behavior by causing fish to suspend feeding and in some cases move out of the area altogether until the suspended sediment dissipates after a few hours.

The positive effects of culvert replacement actions would be that the larger structures would pass 100-year flow events. Increasing the hydraulic capacity of undersized culverts would also result in long-term decreases in suspended sediment by reducing water pressure at the culvert during high flows, reducing the velocity of water exiting the culvert, which in turn would reduce scouring and resultant transport of streambed sediments. These larger culverts would also reduce the frequency of culvert plugging and likelihood of culvert failure during storm events. Failed culverts would wash out the fill material and result in large amounts of sediment released into the stream network. Overall, these larger culverts would decrease sediment loading resulting in improved stream conditions for special status fish.

The project would also replace 42 ditch-relief cross drains and install up to 100 new ones. The purpose of these small culverts is to route water running in roadside ditches under the road and out onto the forest floor. Historically, roadside ditches would be routed to the nearest stream channel, which would preserve the road integrity but would route considerable amounts of road sediment into the stream network. Cross drains are designed to disconnect the ditch line from the stream network and to route sediment to the forest floor and thus keep it out of the stream network. These actions would assuredly keep considerable amounts of sediment out streams but the quantities are not likely measurable. Because road related sediment could have a detrimental effect to special status fish, and the replacement and addition of cross drains is specifically designed to reduce ditch connections to stream, we can conclude that this action would have a wholly positive effect on special status fish and their habitat.

Hauling of Waste Material and Rock

The one aspect of the rock quarry work connected action that has the potential to affect special status fish would be the hauling of waste or excess materials to permanent waste sites, and hauling rock from quarries. As much as 50,000 cubic yards of waste and excess material may be hauled from construction sites along the Nestucca Access Road to a storage site at the quarry located in the headwaters of Elk Creek. In addition, approximately 10,000 cubic yards of rock may be mined and hauled from the Cedar Creek quarry to locations along the Nestucca Access Road. Hauling this material would require using Elk Creek Road and Cedar Creek Road; gravel roads that traverse in close proximity to streams inhabited by special status fish (see Figure 7). In total, the amount of material to be hauled would equate to approximately 6000 truckloads over the eight-year implementation period of the project. Heavy hauling has been shown to wear and displace road surface rock, as dust or sediment, at a rate of two inches of surface thickness per approximately 2800

truckloads (Luce and Black 2001). BMPs and PDFs, such as suspension of haul during intense rainfall, weekly inspections, adding rock to degraded spots, sediment traps, and use of high quality basalt aggregate would be incorporated to reduce both the potential of sediment production and to minimize its transmission to streams. Nonetheless, hauling and necessary road maintenance within close proximity to streams with special status fish still has the potential to generate sediment that could affect fish. Sediment could occur in the form of dust settling on vegetation adjacent to watercourses or accumulating in ditchlines at roads edge and later flushed into small tributary streams, which in turn could route sediment to the larger streams where special status fish reside. As discussed in the hydrology section (see EA section 3.3) an increase of 31% of road related fine sediment may be delivered to higher order streams per year as compared to the No Action alternative. However, this material would be delivered during the first few fall and winter rain events when sediment from other sources is also being mobilized. At the point that the haul related sediment reaches the larger streams it would quickly dissipate in a mixing zone within a few feet or yards from the tributary source. We expect that the finest particle sizes would remain suspended within the water column and move through the system without becoming embedded in stream substrates (Bilby *et al.* 1989). Some deposition of the coarser sediment could occur during the low-flow season along the margins of the active channel and in pools, but this material would be remobilized and flushed from the system during the first few fall and winter flows, which is prior to the arrival Coho and fall chinook which generally arrive in the project area 4-6 weeks after fall rains begin. Considering the use of BMPs and PDFs, and the relative disconnect of the sediment sources from special status fish habitat, we expect little increase in fine sediment in areas used by special status fish with the possible exception of those very localized mixing zones where flows from small tributary streams or roadside cross drains intersect the larger fishbearing streams. If that were to occur it would most likely only affect a few juvenile fish by causing temporary avoidance or possible suspension of feeding for a short period of time which would not likely have any affect to special status fish populations.

Direct Fish Mortality

Byway culvert replacements, new cross-drains and Elk Creek Bridge replacement

Prior to the replacement of the of the nine culverts and one bridge on streams with special status fish it would be necessary to capture as many fish as possible and relocate them away from the construction site. This capturing and relocating (salvaging) of fish has a high probability of both injuring and killing a small percentage of juvenile fish. To accomplish this task prior to dewatering the construction zone, block nets are placed upstream and downstream to preclude additional fish moving into the area. An electrofishing tool is used to capture fish in the blocked off channel prior to construction. Capturing these juvenile fish involves stunning them with electric current and then moving them to cool calm water to recover prior to being released outside the construction zone. Inevitably, a few fish die because they are either not detected and therefore shocked more than once, or are in a weakened condition prior to the salvage effort and cannot withstand the initial shocking. In order to salvage ESA listed fish (Coho) a permit from NMFS and ODFW is required which limits mortality from the operations to 3% of fish at the site. The BLM has considerable experience with fish salvaging and based on that experience we estimate no more than 1 to 2% of the total fish trapped in the enclosures would be killed during salvage operations. However, for analysis on the conservative side, 3% will be used as the benchmark. Based on average expected fish numbers, fish salvage is expected to result in the harm as defined by the Endangered Species Act (such actions as shocking, holding, and removing, etc.) of approximately 1,130 juvenile Coho from the nine culvert and bridge replacements on Coho habitat streams. Considering a 3% mortality level, the maximum number of Coho mortalities expected (up to $\leq 3\%$ of 1130) would be 34 fish. Based on experience, we have found that salvaged steelhead occur at a rate of approximately 5% that of Coho, and that a similar percentage are killed by salvage actions. This would equate to about 57 steelhead affected with between 1 and 2 killed. Lamprey juveniles tend not to experience mortality from electrofishing based on prior experience. Relative to the estimated 120,000 juvenile Coho that may be rearing in the mainstem Nestucca River, the death of 34 individuals would not have any consequential effect on the population of Coho in the mainstem Nestucca River above Boulder Creek.

In-Stream Wood

Nestucca Access Road Widening and Paving

In-stream wood is an important element of high quality special status fish habitat. Actions that remove trees that have high potential to be recruited to stream habitat could negatively affect fish habitat. Using LiDAR, and the preliminary construction drawings (dated July 14, 2015) we determined that approximately 870 trees would be targeted for cutting along the 2.7-mile gravel section proposed for widening and paving and also includes the trees that would be removed to replace culverts along the gravel section. This estimate assumed an additional 10 feet for clearing and grubbing outside of the construction limits on cut slopes (uphill side), and an additional five feet on fill slopes (downhill side)(per the preliminary construction drawings). Of the 870 trees, 124 of them are between the road and river. Included in the 870-tree estimate are 22 large Douglas-fir trees that are tall enough and located such that if they were to fall toward the river their tops could hit the river, of these, five are between the Nestucca Access Road and the river. There are no other trees proposed to be cut that are tall enough or near enough to reach the river.

All of the large trees have been evaluated and substantial portions of them are marbled murrelet habitat and/or contain active red tree vole sites. Large trees (greater than 36 inches DBH) within potential area of disturbance have been located and avoided to maximum extent possible through adjustment in the road alignment and incorporation of walls and retaining structures to minimize the limits of the work. The intention is to reserve all of these large trees, but for analysis purposes, we assume that up to five trees over 36" in diameter may be felled for construction. If this were to occur, all of the large trees felled would be on the uphill side of the road away from the river. None of the trees above the road are within 100 feet of the Nestucca River, a distance from streams where approximately 92% of in-stream wood originates (McDade *et al*, 1990).

The potential loss of these trees would have an inconsequential effect on in stream wood levels or habitat for special status fish. First, it is important to distinguish between the loss of in-stream wood *potential* and the actual loss of in-stream wood. These large trees are healthy, dominate their site, and generally are not in imminent danger of falling. Secondly, if these trees were to fall, they would need to fall more or less directly toward the river in order for them to input wood to the stream. Many factors influence tree fall and often trees fall across the slope rather than directly down slope. Third, if a tree dies from an agent other than wind-throw or debris slide, they remain standing, sometimes for extended periods. It is not a given that if a tree dies standing that it will fall in the foreseeable future, and if and when it does fall, they are often rotten to the point where they fracture into small pieces upon impact with the ground. Lastly, because these trees are above the road, if they were to fall across the road they would shatter upon contact with the opposite road edge due to the fulcrum effect, likely resulting in smaller fractured pieces entering the river. Consequently, even if these trees were to fall toward the river, none of the wood entering the stream would likely meet the definition of "large" wood as defined by Oregon Department of Fish and Wildlife (ODFW) (24" diameter x 50' long). Therefore, the result of removing up to 5 Douglas-fir trees over 36" in diameter from the uphill side of the Nestucca Access Road would be an inconsequential reduction in potential for a small amount of small sized wood to enter the stream.

Byway culvert replacements, new cross-drains and Elk Creek Bridge replacement

In addition to the trees being proposed for removal along the gravel section of the Nestucca Access Road, trees would also be removed at culvert replacement locations not associated with the gravel section. Of the 39 stream culverts proposed to be replaced along the Nestucca Access Road below McGuire Reservoir that are not along the gravel section, nine would be on streams inhabited by special status fish. Inventory of trees growing on or near the fill over the culverts indicates that an estimated 213 trees ≥ 6 inches would be removed for culvert replacement. All but 18 of the trees would be hardwoods, mostly red alders. Most of the

trees proposed for removal are in the 6-12" size class with 18 trees in the largest size class of 18-26"; two of the 18 would be conifers.

Because most of the trees proposed for cutting for culvert replacement are growing on the fill slopes overlooking the streams, these trees have a better than average chance of entering the creek were they to fall. Practically speaking, there is little possibility of any trees meeting the ODFW large wood criteria being removed due to the small size of the trees. The trees removed would be overwhelmingly hardwoods, which do provide stream structure but are relatively short-lived in the stream network. Those trees that are on the upstream side of the road have little potential to provide stream structure even if they did enter the stream because they would likely cause a plugging hazard for the culvert and have to be removed. For these reasons, the removal of the trees associated with culvert replacement would have a small but inconsequential negative effect on potential in-stream wood dynamics and its ability to provide habitat for special status fish.

Disturbance

Construct additional paved turnouts, strategic roadway widening, intersection safety improvements, and manage existing pull-offs

The current condition of the Nestucca Access Road within the proposed action area includes approximately 36 graveled, or in some cases, paved pull-offs, that allow visitors to park along the road without obstructing traffic. Approximately 13 of these pull-offs have user-created trails accessing the water, mostly downstream of Elk Creek where fishing is allowed. Visitors at the river's edge or in the water could cause rearing juvenile special status fish, particularly Coho, to avoid the area while the disturbance is occurring. By avoiding the area these fish may be expending additional energy and/or suspending feeding which could temporarily reduce their vigor. Depending on the habitat type (pools vs. riffles or glides) at the location and relative numbers of juvenile fish in the system, these effects could be occurring to anywhere from no fish along riffle sections, up to several hundred in a quiet pool location. While we do not have specific data, we can expect that at least a few of these pull-offs are used to access the river on most days during the summer, generally late June to early October. During the winter, visitation to the river's edge would be much less.

Many of the user created trails are on steep slopes where water can channel causing erosion, which inputs sediment to the river. Because these trails are not actively maintained, users often create alternate trails nearby resulting in loss of additional riparian vegetation, which can further increase the erosion hazard. The Byway project proposes to improve and in some cases pave many of the pull-offs and to close and revegetate two to five pull-offs that pose safety hazards due to poor sight distance. At the approximately 13 user-created trail locations, the project proposes to construct and manage short paths, stairways, or ramps to provide safe access to the river. These trail improvements would reduce sediment caused by erosion and should reduce or eliminate the pioneering of new trails and its associated reduction in riparian vegetation.

Overall, we expect this aspect of the proposed action would have a neutral effect on disturbance to rearing juvenile special status fish because people would still visit the river regardless of the action. However, we expect a small positive effect to special status fish habitat by reducing sedimentation and damage to riparian vegetation through the improvement and management of the user-created trails.

Development of a Day-use Recreation Site

As mentioned above, development of a day-use only recreation site is proposed at the asphalt waste site. The construction of the site would not be expected to cause adverse effect to special status fish directly. However, use of the site by the public may have a small adverse effect to juvenile special status fish. Currently there are no developed day-use areas along the Nestucca Access Road. By providing easy access to parking, a rest room, picnic tables and the river, we expect that the day-use area would encourage visitors to stop at this location at a considerably higher rate than currently. Encouraging visitors to stop, and by

extension, visit the river may cause disturbances (e.g. wading and swimming, and other play activities in the water) that may be great enough to cause Coho and steelhead to move away, hide, or suspend feeding. These localized adverse impacts could affect an estimated 200 – 300 rearing Coho, as well as a few steelhead juveniles (>10). The population of lamprey is not known, however impacts to lamprey would not be expected based on the lack of lamprey rearing habitat at this location. The concentrated use by visitors would likely cause some degradation of riparian vegetation and stream banks, which could cause low level of sediment input.

One of the pull-offs and associated user-created trails is approximately 450 feet downstream from the proposed day-use area. Several trails at this location are on steep slopes leading to the river. If the trails were closed or managed in conjunction with the development and management of the day-use area, there would be a benefit to special status fish habitat due to a reduction in sediment input and riparian vegetation degradation from the poorly located unmanaged trails. Because the trail access downstream of the proposed day-use site is used quite often, we expect trail closure or management there would partially, but not completely, offset visitor disturbance to fish caused by the visitors at the day-use area. Overall, effects to special status fish would be quite low. Mostly, habitat would be maintained, and fish would only be disturbed during times when people are at the river. We could expect that use would be somewhat consistent during the summer months but considerably less during the later fall through winter into early spring.

Habitat Access

Byway culvert replacements, new cross-drains and Elk Creek Bridge replacement

One of the larger aspects of the proposed action includes replacement of culverts or a bridge on/over streams that can or do provide habitat for special status fish species. Of the 87 culverts and 1 bridge proposed for replacement, 10 would occur on streams that provide habitat for special status fish species (see Table 8); of these, eight positively provide habitat (including Critical Habitat) for OC Coho and an additional one probably provides habitat for Coho, although it is not documented. Four of the culverts are complete barriers to all life stages of all special status fish, which blocks access to 0.8 miles of habitat for Coho and steelhead and five miles of habitat for lamprey. Two other culverts are barriers to juvenile Coho (as well as juveniles of other special status fish) and adults at certain high or low flows. These two culverts limit access to 2.55 miles of high quality Coho habitat (Fairdale – 2.3 miles, Pipe #7 – 0.25 miles). One culvert, on Bear Creek, which accesses 4.9 miles of Coho habitat, is a barrier to juvenile fish at high or low flows. One culvert limits access to 0.2 miles of lamprey habitat only because no other special status fish are able to pass a waterfall low on that stream. The culvert on Testament Creek and the Bridge over Elk Creek are not barriers, but access to habitat could be improved somewhat by upgrading the Testament Creek culvert and replacing Elk Creek Bridge with one that did not have footings within the active channel.

The effects to habitat access from replacing these culverts and bridge are wholly positive. Coho would directly benefit from having access to an additional 3.35 miles of habitat that is currently unavailable, and have improved access to another 4.9 miles of habitat for juvenile fish, an overall improvement to habitat access in the analysis area of approximately 22%. Steelhead would benefit similarly to Coho. Lamprey would benefit more so because they can traverse the waterfalls on Cedar Creek, Ginger Creek, and Dove Creek that the other fish cannot, which provides access to five more miles of lamprey habitat. Additionally, replacing Pipe 1 would only benefit lamprey because the gradient of the stream is too steep for the other species. The Fairdale cement box culvert located just below Walker Creek near the east end of the proposed project area is the last remaining barrier to Coho salmon on the mainstem Nestucca River (Tillamook-Nestucca Fish Passage Partnership).

Habitat Improvement (natural sediment routing, reduced stream velocity/streambed scour, improved channel morphology)

Byway culvert replacements, new cross-drains and Elk Creek Bridge replacement

As mentioned earlier, the proposed action would replace 32 culverts in stream channels either directly on waters inhabited by special status fish or within a distance where effects to special status fish could occur. While these actions have the potential direct effect of inputting sediment into the stream during replacement, they also have the positive indirect effect of improving hydraulic capacity and function. All of the proposed replacement culverts would be sized sufficiently to pass 100-year storm event flows, including the moving stream substrate associated with such events. They would also be placed in proper orientation with the natural stream grade. These properly sized and placed culverts would allow the streams to flow at consistent velocity rather than increasing velocity as they pass through a restricted pipe. This reduction in velocity during high flow events would reduce streambed scouring at the outflow, which in turn prevents additional sediment production and down-cutting of the channel that can lead to barriers to special status fish, adverse reaction from fish caused by sediment as well as degradation of spawning habitat. We estimate that there is a combined total of approximately 1000 yd³ of streambed material stored above the current culverts. After replacement, we expect that this stored material would begin to move through the stream network during the first winter, with the fine materials combining with the natural sediment flushing through the system. The larger gravel and cobble sized material would likely remain in close proximity to the new culverts until larger storm events (>20 year event) cause this material to move and settle out in larger pools or other slow water areas thus improving spawning habitat. With the larger, properly sized culverts in place, we expect that there would be far fewer occasions when any of these culverts would plug with debris and require clearing during winter flood events, which would indirectly reduce potential sediment release.

What these effects mean to special status fish are (1) the initial flush of suspended sediment with the first winter storms may cause temporary avoidance behavior (up to a day) if fish are present in the immediate vicinity of the new culvert, (2) potential covering of fish eggs near culvert replacement locations, particularly at those culverts with larger stored streambed material, as the stored material reorganizes during larger storm events. This would be a temporary effect until the stored material is completely resettled, (3) reduction in stream velocity and scouring at the culvert sites which would allow for easier transit for fish through the culverts and access to habitat, (4) a return to natural sediment and substrate transport regime would allow natural movement of substrate and wood to be deposited in areas that could improve stream habitat for special status fish, and (5) reduced potential exposure to sediment plumes generated by culvert clearing activities after plugging.

Summary of Effects

Overall, the Proposed Action would have minor short-term negative effects while having substantial positive effects to special status fish in the long term (beyond 8-10 years). Habitat conditions would be improved and access to suitable habitat would be increased. Improved stream hydraulics around culverts would result in improved sediment routing and stream function. Less sediment would be entering the stream network through time contributing to improved stream conditions. The Proposed action would positively contribute to the conservation of Oregon Coast steelhead and Pacific lamprey by reducing threats to individuals and their habitat as well as improving habitat and access to habitat, which would minimize the likelihood and need for listing them under the Endangered Species Act. The Proposed Action would also conserve Oregon Coast Coho and their Critical Habitat and positively contribute to the recovery of this threatened species. There would be small, localized adverse effects to Essential fish Habitat that would last for a few hours to days depending on the action, but in the long term would result in improved Essential Fish Habitat.

3.4.5 Cumulative Effects – Alternative 2: Proposed Action

The analysis area considered for cumulative effects includes the three 6th field subwatersheds that encompass the Nestucca River upstream of the gateway sign at the western end of the project area. These include Testament Creek, Elk Creek, and Headwaters-Nestucca subwatersheds.

Most of the direct effects caused by the proposed action would be localized in nature (sediment entering the stream, direct mortality from fish salvage, disturbance by visitors, etc.). We are not aware of any other actions that have or may yet occur that would contribute cumulatively to the Proposed Action to result in cumulative adverse effects to special status fish, with the possible exception of hauling of timber or rock associated with private or State timber management activities. These other hauling actions would have the possibility to generate sediment that could route to streams however; we expect that these actions would occur regardless of whether we implement our proposed action or not and thus consider these hauling actions to be a part of the existing environment that could be affected by our action. In other words, the sediment generated by these other actions are considered to be part of the overall background level of sediment. Therefore, our project would only contribute direct and indirect effects (additions to the background level) and not cumulative effects.

3.4.6 Environmental Effects - Alternative 3

Alternative 3 would be similar to the Proposed Action in terms of project actions that would affect special status fish except: The Fairdale, Bear Creek and Quad Pipes culverts and Elk Creek Bridge would not be replaced; the gravel section of the Nestucca Access Road would be paved, but without the widening as planned under the Proposed Action; and the Day-Use Recreation site would not be constructed. The storm-water management plan would still be implemented but at a lesser scale reflective of the reduced subgrade widening compared to the Proposed Action.

Sediment

Nestucca Access Road Paving

Compared to the Proposed Action, the effect to special status fish from sediment generated by alternative 3 would be less. There would still be direct adverse effects caused by dust and sediment generated by actions to prepare the road for paving although these actions would be occurring on approximately 7.5 acres instead of 8 acres. There would still be exposed cut and fill-slopes that would likely generate sediment early in the first rainy season until seeding germinates. The storm-water treatment ditches would still be constructed which would trap much of the sediment generated from the edges of the road. Once the paving is complete, we would expect that there would be little or no road related sediment generated going forward, much the same as for the Proposed Action.

Byway culvert replacements and new cross-drain installations

As would occur under the Proposed Action, alternative 3 would also result in short-term direct sediment generation associated with culvert replacements. There would be 84 culverts replaced including 29 along the Nestucca Access Road that are within a distance to special status fish where short-term sediment inputs could cause avoidance behavior at the mixing zone with the Nestucca River. These effects would be less than those for the Proposed Action because the three culverts and one bridge that would not be replaced are large structures on special status fish streams that would likely generate more sediment during replacement than smaller culverts (see EA section 2.3). The three culverts that would not be replaced under alternative 3 are considerably undersized and/or are high plugging risks in the event of landslide or debris torrent activity. By being undersized or a plugging risk, these culverts retain higher levels of risk for failure which, if it were to occur, would have adverse effects like those described under the No Action alternative. Under alternative 3, the benefits of improved hydraulic capacity would not be realized on these three stream sections of the analysis area that are important to special status fish, especially at Bear Creek and Fairdale. Streambed scour and erosion would still occur, exacerbating sediment production near special status fish.

The effects of replacing old and installing new cross drains would be the same under Alternative 3 as they would be for the Proposed Action.

Hauling of Waste Material and Rock

We estimate that, under Alternative 3, the waste material and rock hauling would be approximately 25% less than under the Proposed Action. Consequently, we can expect a commensurate reduction in the production of dust and sediment related to hauling activities. Under the Proposed Action, we determined that this action would have little effect to special status fish; therefore, we can conclude that a 25% reduction in dust and sediment would have even less effect to special status fish.

Direct Fish Mortality

Byway culvert replacements and new cross-drain installations

Under the Proposed Action, we estimated that about 1,130 juvenile Coho and 57 steelhead would be harmed, and up to 34 Coho and one or two steelhead would be killed by dewatering and salvage actions related to culvert replacements. Under Alternative 3, three fewer culverts and Elk Creek Bridge would not be replaced which would then require less dewatering and salvaging of juvenile fish. We estimate of the 1,130 juvenile Coho that may be affected by the Proposed Action about 700 of them would occur at Elk Creek and Bear Creek alone. Only a few would occur at the Fairdale culvert and not likely any at the Quad Pipes culverts. For these reasons, we estimate that about 420 Coho and about 20 steelhead would be affected by Alternative 3, with about 13 Coho and one or fewer steelhead killed. Some lamprey may be salvaged but we do not expect any mortality. While these effects would warrant consultation with National Marine Fisheries Service, they would not result in any consequential effect to any of the populations of special status fish.

In-Stream Wood

The analysis for the Proposed Action found that the small reduction in the potential production of in-stream wood would have an inconsequential effect on special status fish. Because the running surface of the gravel section of the Nestucca Access Road would not be widened under alternative 3, there would be an estimated 160 fewer trees removed compared to the Proposed Action. In addition, by not replacing the culvert over Bear Creek, Quad Pipes culverts, the Fairdale box culvert, or the Elk Creek Bridge, there would be approximately 92 fewer trees removed from the fill slopes of these structures. While the overall effect of Alternative 3 would be smaller than the inconsequential effect caused by the Proposed Action, there would still be a possibility that some small hardwood trees that could potentially fall into the stream environment occupied by special status fish could be removed. Therefore, Alternative 3 may affect in-stream wood potential but not have a consequential effect on special status fish or their habitat.

Disturbance

Under Alternative 3 the Day-Use Recreation Area would not be constructed but pull-offs and associated user-created trails to the river would be improved and managed as described under the Proposed Action. The effects of improving and managing user-created trails would be the same as for the Proposed Action alternative. Because the Day-Use area would not be constructed, there would not be additional concentrated visitor use in that geographic area or its associated increased disturbance to rearing special status fish. Without construction of the Day-Use area, trails associated with use of the pull-off 450 feet downstream of the proposed Day-Use area construction site would be improved to reduce sediment input and riparian vegetation degradation. For the most part, disturbance to fish resulting from people accessing the waters of the river is a function of numbers of visitors to the Nestucca Backcountry Byway rather than the specific condition of the trails. In other words, it is not likely that more people would visit the Byway, and thus

disturb fish, because we improved the short trails to the river. Therefore, we expect that disturbance effects to special status fish would be similar under Alternative 3 as they are under the Proposed Action alternative.

Habitat Access

Under Alternative 3 three culverts and one bridge on streams containing habitat for special status fish would not be replaced (Table 1). Two of the culverts (Fairdale box culvert and Quad Pipes) are barriers to special status fish, one a complete barrier to all life stages and one a complete barrier to juveniles and a partial barrier to adults. The other culvert (Bear Creek) is a barrier to juveniles at very high and low flows. The Elk Creek Bridge is not a barrier. By implementing Alternative 3, 2.4 miles of suitable habitat (2.3 miles of which is Critical Habitat) would be unavailable to rearing Coho, and another 4.9 miles would be unavailable at some flows. For OC steelhead and Pacific lamprey, 2.3 miles would be unavailable compared to the Proposed Action, and 4.9 miles would remain restricted at high and low flows. Compared to the Proposed Action, Alternative 3 would not contribute to recovery of OC Coho as well because various barriers to 7.3 miles of habitat, or about 20% of the available habitat in the analysis area, would remain. Alternative 3 would not conserve OC steelhead and Pacific lamprey or the habitat they depend on as well as the Proposed Action but would not likely result in any high likelihood of needing to list these species under the Endangered Species Act.

Habitat Improvement (natural sediment routing, reduced stream velocity/streambed scour, improved channel morphology)

Under Alternative 3, 84 stream culverts would be replaced with properly sited culverts that would pass 100-year storm event flows. The effects of these culvert replacements would be same as analyzed under the Proposed Action except that three fewer culverts would be replaced (Bear Creek, Quad Pipes, and Fairdale) and the Elk Creek Bridge would not be replaced. For the three culverts that would not be replaced, the effects would be the same as the No Action alternative. Currently, the Bear Creek culvert passes approximately 50% of the 100-year event flow and, considering the large landmass creep 0.8 miles upstream (Table 2), would remain a considerable plugging and failure hazard into the future. Impacts to special status fish caused by failure of the Bear Creek culvert would be similar to those described in the *Sediment* section of the No Action alternative analysis. The Quad Pipes culverts currently pass 100-year event flows, but because there are multiple pipes at that location and they are located in a past debris torrent channel, they remain a plugging hazard, which could cause a failure with the attendant effects to special status fish.

Because Bear Creek and the upper reaches of the Nestucca River are important rearing streams for special status fish, having constricted flows that cause higher water velocity and streambed scour would affect stream morphology and reduce habitat quality for special status fish. Not replacing Elk Creek Bridge would have little effect on special status fish. Currently, the bridge is not a barrier to special status fish although its footings are located within the active stream channel, which could cause large wood moving down the channel to become lodged and therefore requiring removal. If this were to happen, there could be some disturbance to special status fish occupying the stream at the time of removal.

Summary

Overall, Alternative 3 would cause small short-term effects to special status fish while having some positive long-term effects. In the short-term, less project related sediment would be generated compared to the Proposed Action, which would mean less sediment available to cause adverse effects to special status fish. There would also be less direct mortality to juvenile fish from culvert replacement actions but the relative reduction would be small and inconsequential to the population in the Nestucca 5th field watershed. The reduction in trees being cut relative to the Proposed Action would mean that there would be a few more small hardwood trees available to fall into streams in or near special status fish habitat but the difference in potential would be imperceptible. Not building the Day-Use Area *may* result in slightly less disturbance to

juvenile fish, but that reduction in disturbance relative to the Proposed Action is not likely to change the effects to the populations of special status fish. The largest effects that would result from Alternative 3 would be the forgoing of expanding access to special status fish habitat by about 20%, and maintaining two large culverts with plugging hazards that have potential to cause negative impacts to special status fish if they were to fail. In conclusion, Alternative 3 would still positively contribute to the conservation of Oregon Coast steelhead and Pacific lamprey but less so than the Proposed Action. Alternative 3 would also contribute slightly to the conservation of Oregon Coast Coho through the moderate reduction of threats to habitat but because much less habitat would be available compared to the Proposed Action, contribution toward recovery would be considerably less. Also, Essential Fish Habitat would experience some small short term negative effects while realizing long-term improvement, but less so than the Proposed action.

3.4.7 Cumulative Effects - Alternative 3

There would not likely to be any cumulative effects to special status fish or their habitat caused by implementing Alternative 3. As with the Proposed Action, any sediment generated by the project would be localized and short-lived, and since other sediment generating actions would be either later in time or in different locations they would not interact cumulatively to affect special status fish. There are no other actions that we would expect to occur in or around the project that may affect the potential for wood to enter the stream network. We are not aware of any other projects that the BLM or any other entity may be undertaking that would cause direct mortality to fish, nor are we aware of any actions that may disturb special status fish beyond what is expected in the affected environment. Lastly, we are not aware of any projects that would either improve or degrade stream habitat or access to suitable habitat that would cumulatively affect special status fish.

3.5 Threatened or Endangered Wildlife Species, Habitat and/or Designated Critical Habitat

The Nestucca Back Country Byway is within the range of two terrestrial wildlife species listed as threatened under the Endangered Species Act of 1973, as amended (ESA), the northern spotted owl (*Strix occidentalis caurina*) and the marbled murrelet (*Brachyramphus marmoratus*). Portions of the project area are also within designated Critical Habitat for these species. Critical Habitat is a term defined in the ESA identifying specific geographic areas containing features essential to the conservation of a threatened or endangered species. It is designated by the U.S. Fish and Wildlife Service (USFWS) to provide for the conservation and eventual recovery of listed species and may require special management considerations or protection.

The project area does not contain suitable habitat and/or is out of the expected range of the Columbia white tailed deer (*Odocoileus virginianus leucurus*), western snowy plover (*Charadrius alexandrinus nivosus*), Oregon silverspot butterfly (*Speyeria zerene hippolyta*) and Fender's blue butterfly (*Icaricia icarioides fenderi*). These ESA listed wildlife species will receive no further discussion or analysis as they would not be impacted by the proposed project.

3.5.1 Affected Environment

The area used for analysis of potential impacts to spotted owls and marbled murrelets (the Wildlife Analysis Area) encompasses 17,050 acres. It includes those lands within 0.25 miles of the 41 miles of project area roads designated as the Nestucca Back Country Byway (including the 1.2 miles of Bald Mountain Road which is not designated as Byway). It also includes lands within 0.25 miles of the haul routes to Dovre Peak and Cedar Creek rock pits and Eastline Quarry as there is potential for these haul routes and areas to be heavily used and maintained during project implementation. In addition, the Analysis Area also includes all the lands within 1.0 miles of Dovre Peak and Cedar Creek rock pits because of the potential that blasting may need to be utilized within these rock pits. This Analysis Area represents the majority of the stands within the area with a potential for being disturbed through implementation of the proposed action. This is according to the North Coast Planning Province's interagency Level 1 Team's disturbance distance of 0.25 miles for most

activities that generate noise above the ambient noise level (use of chainsaws; heavy equipment for road construction, road repairs, bridge construction, culvert replacements; pile-driving) as well as a disturbance distance of 1.0 miles for blasting (USDI and USDA 2014)¹. The disturbance distance is the distance from the project boundary outward within which the action is likely to cause a listed species (spotted owl or murrelet), if present, to be distracted from its normal activity.

Approximately 68% of the lands within this Analysis Area (11,535 acres) are managed by the BLM; 19% (3,318 acres) are privately owned; local government (City of McMinnville) manages approximately 5% (828 acres); and the State of Oregon and Siuslaw National Forest each manage approximately 4% (612 and 757 acres respectively).

Northern Spotted Owl

Prior to the ESA listing of the northern spotted owl, timber harvesting and land conversions resulted in the loss of owl habitat. Forests with the late-successional and old-growth characteristics preferred by spotted owls are also preferred for timber harvesting to meet the demand for all types of forest products. As the amount of suitable habitat declines, so does the number of spotted owls. When spotted owls are forced to live in small patches of forest they become more susceptible to starvation, predation, or further loss of habitat due to natural destruction such as windstorms. More recently, competition from encroaching barred owls also has caused an apparent decline in spotted owls across most of their range. Barred owls are larger than spotted owls, more aggressive and have a broader diet which makes them more resilient to declines in habitat quality.

Like British Columbia, the Cascade Mountains of northern Washington, and the Coast Range of southwest Washington, spotted owls are particularly rare in the Coast Range of northwest Oregon (from USFWS Species Fact Sheet at <http://www.fws.gov/oregonfwo/species/data/northernspottedowl>). This includes the area containing the Byway project.

Spotted Owl Habitat Near Proposed Project Roadways

As a result of ownership, past management practices and fire history the project area roadways run through and near a fragmented mosaic of forested stands made up of non-habitat, spotted owl dispersal habitat and spotted owl suitable habitat. There are adequate amounts of habitat in condition to facilitate spotted owl dispersal throughout the Analysis Area and the larger surrounding landscapes, however the current marginal quality of the vast majority of suitable habitat present, including a general lack of structural diversity, snags and woody debris, is a concern that potentially limits the ability of the area to support an adequate prey base necessary to support spotted owls.

The majority of the lands within the Wildlife Analysis Area (68% or 11,535 acres) are managed by the BLM. According to BLM's Forest Operations Inventory (FOI) database, approximately 66.5% (7,677 acres) of the BLM forested stands within the Analysis Area are forested with stands older than or equal to 40 years old. That is to say they are in condition to facilitate spotted owl dispersal being considered to be either spotted owl dispersal habitat or suitable habitat. Approximately 29.8% (3,438 acres) of the BLM forested stands within the Analysis Area are forested with stands less than 40 years old; stands less than 40 years old are considered to be non-habitat for spotted owls in that they function neither as dispersal or suitable habitat. An

¹ These disturbance distances are reported within the recent Biological Assessment prepared for USFWS by the interagency Level 1 Team (terrestrial subgroup) for the North Coast Planning Province dated August 7, 2014 - *Biological Assessment of habitat modification projects proposed during fiscal years 2015 and 2016 in the North Coast Planning Province, Oregon, that are Not Likely to Adversely Affect (NLAA) northern spotted owls or marbled murrelets and their critical habitats* (USDI and USDA 2014).

additional 3.7% (420 acres) of the Analysis Area is also non-habitat for spotted owls in that it is classified as non-forested habitats (e.g. river, road, rock quarries or brush patches).

A large subset of the acres in a condition to facilitate spotted owl dispersal described above, or 26.7% of the total BLM forested stands within the Wildlife Analysis Area (3,077 acres) contains at least a component of overstory trees older than or equal to 125-years-old; it is assumed that most of these acres are in a condition to function as spotted owl suitable habitat. It is possible and probable that a portion of the forested stands younger than 125-years-old are also in a condition to be considered spotted owl suitable habitat but without site-specific data and field verification, and given the known variability of stands within the area, it is difficult to determine with any confidence the habitat quality on such a large project area and analysis area. As being more structurally complex multi-layered conifer forests, 1,386 BLM acres of high-value spotted owl habitat as described in Recovery Action 32 (RA32) of the *Revised Recovery Plan for the Northern Spotted Owl* (USDI - USFWS 2011) have been identified and mapped within the Wildlife Analysis Area; this represents approximately 8% of the Wildlife Analysis Area. A portion of these stands are directly adjacent to project area roadways.

The vast majority of the forest within the Analysis Area on non-BLM land is assumed to be spotted owl non-habitat or dispersal habitat. With the possible exception of a small portion of the forest within the analysis area managed by Siuslaw National Forest and the City of McMinnville that may be considered suitable habitat, it is assumed there is no suitable owl habitat on non-BLM managed lands.

Designated Critical Habitat

Portions of the project area are within a Designated Critical Habitat Unit (CHU) for the spotted owl (CHU #1, subunit NCO 5)(USFWS 2012). The Byway project is located on a total of approximately 41 miles of BLM controlled roads; additional areas to be utilized by the project such as BLM rock quarries and end-haul waste sites have also been identified. Approximately 35.4 miles of road or 86% of the 41 mile project area roadways and all of the other areas to be impacted by the project such as BLM rock quarries and end-haul waste sites that have been identified are located within Spotted Owl Designated Critical Habitat (USFWS 2012). Approximately 10,585 acres of the 17,050 acre Wildlife Analysis Area (62%) as described above are contained within Spotted Owl Designated Critical Habitat.

Proximity to Spotted Owl Known Sites

The Haskins Creek owl site (also called Kutch-Panther) is the nearest known owl site to any of the roadways proposed to be impacted by the Byway project; although the last known owl site center (nest tree) of this site is about 0.1 mile from the Byway, it actually is approximately 2.5 miles from any segment of the roadway where major construction activities such as the replacement of a large culvert or roadway widening are proposed (i.e. areas where the potential for disturbance in the form of construction activities would be expected to be greatest). Historically the Haskins Creek owl site was in the Panther Creek drainage on BLM land (and was named as such) but after a change in pairing, the activity center was relocated in the Haskins Creek drainage on McMinnville Water and Light land.

The last known owl activity at the Haskins Creek site was in 2006 with visual and auditory detections of a single female spotted owl but no nesting was verified. Protocol owl surveys conducted annually from 2007 through 2015 did not detect any spotted owls. This site, the only known spotted owl site within the 0.25 miles USFWS disturbance distance of the Byway project roadways and the only spotted owl site within the Wildlife Analysis Area, is considered to be historic in nature.

Spotted Owl Surveys

The vast majority of the forestland near the project area has been surveyed to protocol numerous times for spotted owls over the years. Although per the spotted owl survey protocol, the majority of these surveys have long expired, they have resulted in a great deal of information concerning the status and trends of the spotted owl population within the portion of the Northern Oregon Coast Range containing the Byway. There is no requirement to conduct spotted owl surveys for the type of project proposed.

From 1991 to 1993, an extensive Spotted Owl Density Study was conducted within a Density Study Area (DSA) which included the majority of the lands within and near the project area roadways. This study was conducted on 74,000 acres or an approximated 134 square miles of BLM, private, state and USFS (Siuslaw National Forest) land. Specifically, the DSA was located within Township 2 South, Range 8 West; Township 3 South, Ranges 6, 7 and 8 West; and Township 4 South, Ranges 6, 7 and 8 West, Willamette Meridian (W.M.). The study involved 80% of the 512 survey stations being surveyed three times each year of the three year study, for a total of over 4,000 survey visits. During the 1991-93 density study there were seven spotted owl responses in 1991, and one spotted owl response in both 1992 and 1993. Not a single barred owl was detected in any survey year during the Nestucca Spotted Owl Density Study conducted in this area in the early 1990s.

In 2006 and 2007 the Nestucca Block Owl Surveys were completed within a large portion of the BLM ownership within the Nestucca Watershed. This survey effort resurveyed a large portion of the area surveyed during the 1991 to 1993 Spotted Owl Density Study. The 2006/2007 Nestucca Block Owl Surveys were located primarily within the Nestucca Watershed in Township 3 South, Range 7 West and Township 4 South, Range 7 West (W.M.). A total of 185 calling stations were surveyed three times each per year for a total of 555 survey visits per year. No spotted owls were detected during the three visits to the study area in 2006. At least ten barred owls were detected throughout the survey area including a pair of barred owls with a juvenile near one of the survey stations. During the first survey visit of 2007, a pair of spotted owls was detected within the upper Elk Creek drainage. Numerous follow-up day and night-time surveys by were not able to relocate the pair. During the second visit, there were two detections of female spotted owls in relatively close proximity to each other also within the Elk Creek drainage. Numerous follow-up day and night-time surveys were not able to relocate this female spotted owl. During the third visit, no spotted owls were detected. During each visit in 2007, numerous barred owls were detected; during the first survey visit, barred owls were detected 11 times at a number of locations throughout the Nestucca watershed. By the third visit, a juvenile (young-of-the-year) barred owl was detected.

Interestingly, during the 1991-93 density study which covered a much larger area, not a single barred owl was detected. By the time the Nestucca Block Owl Surveys were completed (2006 and 2007) detections demonstrated that barred owls had moved into the Nestucca Drainage with what can only be interpreted as a very healthy, robust population. The U.S. Fish and Wildlife Service has identified competition from barred owls as one of the main threats to the northern spotted owl's continued survival (<http://www.fws.gov/oregonfwo/species/Data/NorthernSpottedOwl/BarredOwl/>).

In addition to the Spotted Owl Density Study and the Nestucca Block Owl Surveys outlined above, numerous other spotted owl surveys have been conducted by the BLM or our cooperators within stands of suitable owl habitat near the project roadways. These surveys generally were conducted in support of specific timber sale projects (such as most recently, the Walker Creek Density Management Project) or monitoring of a known or historic owl site (such as annual monitoring of the Kutch-Panther spotted owl site).

The spotted owl surveys outlined above and general lack of known, currently occupied spotted owl sites within the area serve to confirm that spotted owls are rare in the portion of the Coast Range of northwest Oregon which includes the Byway project area. While individual spotted owls may periodically disperse through the area or an occasional pair may even set up a territory, the general trends for the spotted owl population within the project area is one of decreasing size coupled with increasing competition from barred owls.

Marbled Murrelet

Marbled murrelets are seabirds that nest on-shore in large conifers with adequate platform structures; these nesting platforms are at least 4.0 inches in diameter and contain a nesting substrate (e.g., moss, epiphytes, duff) on the platform (USDA and USDI, 2011). Located in a band of land that ranges from approximately 17 to 29 miles from the ocean, the Byway project area is located within the outer portion of marbled murrelet Zone 1. In Oregon, Zone 1 is located in a band of land extending up to 35 miles inland and Zone 2 is located 35 to 50 miles from the sea (NWFP C-10). Increasing distance from the ocean becomes a negative factor in marbled murrelet inland site selection; Zone 1 holds a higher likelihood for murrelet occupancy than Zone 2.

Murrelet Habitat Near Proposed Project Roadways

As a result of ownership, past management practices and fire history there are relatively few stands within the area of the Byway containing scattered individual or small clumps of residual old-growth trees and/or large trees with potential murrelet nesting structure(s). According to BLM's Forest Operations Inventory (FOI) database, approximately 26.7% (3,077 acres) of the BLM forested stands within the Wildlife Analysis Area is forested with stands containing at least a component greater than or equal to 125-years-old; while a portion of these stands are known to contain trees within platforms suitable for murrelet nesting, it is assumed that only a small percentage of these acres actually contain trees with potentially suitable murrelet nesting platforms. To help further refine this estimation of murrelet habitat and also according to BLM's FOI database, a subset of these acres, approximately 1.0% of the BLM forested stands within the Wildlife Analysis Area (119 acres) was found to be forested with stands containing a component of scattered or clumped old-growth residual trees that are reflected within the stands FOI timber-typing; it is assumed that these stands likely contain at least a few trees within platforms suitable for murrelet nesting.

There are scattered patches as well as isolated individual trees with potentially suitable murrelet nesting platforms directly adjacent to or near some project area roadways. The bulk of these trees are located within the Nestucca River corridor including scattered along the gravel-surfaced portion of the Nestucca Access Road, most notably within and near the northeastern quarter of T3S, R7W section 26 (approximately MP 13.3 to MP 12.8) and just east of Elk Creek Bridge in the northwestern quarter of T3S, R7W section 27 (approximately MP 15.4 to MP 15.2). The bulk of these stands containing trees with potentially suitable nesting platforms have developed under conditions with adequate growing space; they are located along the Nestucca River and Access Road rather than being evenly distributed throughout the stands near project roadways. Additionally, large old trees with potentially suitable murrelet nesting platforms are located within a 14 acre remnant patch of older forest including scattered old-growth trees located across the Nestucca River from the Nestucca Access Road in the southeastern quarter of T3S, R6W section 7 and within older forest stands within the Elk Creek drainage. The Elk Creek drainage is included within the Wildlife Analysis Area because it includes the haul route which would be used to access the Dovre Peak rock pit and there is potential for this haul route to be heavily used and maintained during project implementation.

Note: Per the survey protocol for red tree voles (Huff et al, 2012), 18 large Douglas firs between 28 and 63 inches DBH were identified for further inspection though climbing; the vast majority of these trees contained potentially suitable murrelet nesting platforms. All of these trees were located along that portion of the Nestucca Access Road which is currently gravel-surfaced. Of the 18 trees climbed and inspected for red tree vole nests (October 2015) none were found to contain fecal rings which would indicate use by murrelets within the last few breeding seasons. Subsequent to climbing these larger trees the project was altered to help assure these trees would be protected.

There are relatively few trees with potential murrelet nesting platforms are located along the Bible Creek or Bald Mountain Roads. It is assumed that there are very few (if any) trees on non-federal land within the Analysis Area containing platforms potentially suitable for murrelet nesting.

Although none are currently anticipated, up to five conifer trees greater than 36 inches DBH may be identified along the Byway which may need to be felled in order to implement the proposed project. It is possible that a portion of these five trees could contain potentially suitable murrelet nesting platforms. During the final design phase of the project, reasonable attempts would be made to accommodate these larger trees and avoid the need to fell.

Marbled Murrelet Surveys

The vast majority of the areas containing murrelet habitat described above have not been surveyed for marbled murrelets; there is no requirement to conduct murrelet surveys for the type of project proposed. The few historic surveys which have been conducted with or near these areas did not detect murrelet presence; these historic surveys do not fulfill current survey protocols.

Designated Critical Habitat

Within the general area of the Byway project's roadways, the boundaries for designated Critical Habitat for the marbled murrelet coincide with that of the LSR Land Use Allocation. Approximately 36.2 miles (88%) of the Byway project's 41 miles of roadways are located with the boundaries of a marbled murrelet Critical Habitat Unit (CHU #OR-02-e)(USDI-USFWS 2011). Approximately 10,621 acres of the 17,050 acre Wildlife Analysis Area (62%) as described above are contained within the boundaries of murrelet Designated Critical Habitat.

The primary constituent elements (PCEs) of murrelet Critical Habitat are (1) individual trees with potential nesting platforms and (2) forested areas within 0.5 mile of individual trees with potential nesting platforms with a canopy height of at least one-half the site-potential tree height (USDI 1996). Within the mapped boundaries of the CHU, only those areas that contain one or more primary constituent element are, by definition, Critical Habitat.

As stated above, there are scattered patches as well as isolated individual trees with potentially suitable murrelet nesting platforms (PCE 1) adjacent to or near some project area roadways. These trees with potential murrelet nesting platforms near the project areas are very clumpy in their distribution rather than evenly distributed throughout the stands adjacent to project roadways. The majority of the identified trees with potential murrelet nesting platforms are located along the Nestucca Access Road and river rather than Bible Creek or Bald Mountain Roads. Also stated above, although none are currently anticipated, up to five trees greater than 36 inches DBH may be identified along the Byway which may need to be felled in order to implement the proposed project. Should they be located within the mapped boundaries of the CHU, these trees would be Critical Habitat Primary Constituent Element 1. If a tree needing to be felled contains marbled murrelet suitable nesting structure, it would be felled outside of the murrelet nesting season (April 1 to September 15).

Additionally, those forested stands at least one-half the site-potential tree height (approximately 120 feet) and within 0.5 mile of an individual tree with potential nesting platforms are also by definition, marbled murrelet Critical Habitat (PCE 2). As stated above, approximately 10,621 acres of the 17,050 acre Wildlife Analysis Area (62%) as described above are contained within the boundaries of murrelet Designated Critical Habitat. Based on estimates generated by using a GIS coverage of LiDAR remote sensing technology, approximately 6,378 acres (60%) of the 10,621 acres within the boundaries of murrelet Designated Critical Habitat are forested with stands greater than one-half site potential tree tall. An unknown portion of these acres actually contain trees with potentially suitable murrelet nesting platforms (PCE 1) and/or are within 0.5 mile of a tree with potential nesting platforms and therefore are by definition, marbled murrelet Critical Habitat (PCE 2).

Proximity to Known Murrelet Sites

The nearest known occupied marbled murrelet sites to any portion of the roadways impacted or utilized by the Byway project are two sites located within the Elk Creek drainage. These sites are located approximately 0.1 to 0.5 miles from Elk Creek Road which is an identified haul route for use to access the Dovre Peak Rock Quarry. The Dovre Peak Rock Quarry is about two miles from the Elk Creek Murrelet sites.

3.5.2 Environmental Effects - Alternative 1: No Action

Northern Spotted Owl and Marbled Murrelet

Under the No Action Alternative none of the management activities proposed under Alternative 2 or 3 would occur at this time or within the foreseeable future. Selection of the No Action Alternative would mean that, only normal administrative activities such as minor maintenance would continue on BLM controlled roads within the project areas. Under the No Action Alternative none of the identified impacts which would occur under Alternative 2 or 3 would occur at this time or within the foreseeable future.

No impacts to the spotted owl or marbled murrelet or their Critical Habitats resulting from the No Action Alternative have been identified.

3.5.3 Cumulative Effects - Alternative 1: No Action

Because no impacts to the spotted owl or marbled murrelet or their Critical Habitats resulting from the No Action Alternative have been identified, no Cumulative Effects have been identified.

3.5.4 Environmental Effects - Alternative 2: The Proposed Action

Northern Spotted Owl

Potential for Disturbance

Implementation of the project would generate noises above the ambient noise level. The interagency Level 1 Team (terrestrial subgroup) for the North Coast Planning Province has determined that some of the proposed activities have a potential disturbance distance of 0.25 miles (use of chainsaws; heavy equipment for road construction, road repairs, bridge construction, culvert replacements; pile-driving). Other proposed activities such as the blasting of rock quarries which would create louder noise, have a reported disturbance distance of 1.0 miles (USDI and USDA 2014). The disturbance distance is the distance from the project boundary outward within which the action is likely to cause a listed species such as the spotted owl, if present to be distracted from its normal activity. As discussed above, the Analysis Area used to analyze the impacts of the proposed action includes the majority of the stands within the area with a potential for being disturbed through implementation of the proposed action.

A spotted owl disturbed at a roost site is presumably capable of moving away from the source of disturbance without a significant disruption of its behavior. Since spotted owls forage primarily at night, projects that occur during the day are not likely to disrupt foraging behavior. The potential for disruption is mainly associated with breeding behavior at an active nest site (USDI and USDA 2014). There are no known active spotted owl nest sites within the 17,050 acre Wildlife Analysis Area used to analyze the impacts of the proposed Byway project upon spotted owls. The only known spotted owl site within the Analysis Area, the Haskins Creek spotted owl site (also called Kutch-Panther) is historic in nature. Given the survey history of the area, the habitat conditions within the area as well as the population trends within the northern Oregon Coast, it is possible although unlikely that there are any unknown spotted owl nest sites within the Analysis Area. Given these factors, there are no anticipated impacts to the spotted owl from the proposed action as a result of disturbance.

Impacts to Spotted Owl Habitat

The vast majority of the project area roads pass through forested stands considered to be dispersal or suitable habitat for the spotted owl. Due to the nature of the proposed action and habitats impacted, no tree which is currently, potentially suitable as a spotted owl nest tree nor any tree adjacent to a potentially suitable nest tree, are expected to be impacted.

Those portions of the Byway project with the potential of impacting spotted owl habitat include removing trees along the project roads to implement maintenance and construction activities, hazard tree removal and clearing of trees to improve sight distances. The majority of these trees would be associated with the proposed road prism widening of a portion of the Nestucca Access Road that is currently gravel-surfaced and/or the replacement of culverts.

Based primarily on tree data gathered at a sampling of 32 individual construction sites that would be impacted, it is estimated that project implementation would result in up to a total of approximately 1800 trees greater than six inches DBH needing to be felled. Approximately 77% of these trees are red alders, 10% are big-leaf maple and 13% are conifers. Approximately 53% are 6-12 inches DBH; 40% are 12-18 inches DBH; and 7% are 18-36 inches DBH. Up to five conifer trees greater than 36 inches DBH may be identified along the Byway which may need to be felled in order to implement the proposed project. During the final design phase of the project, reasonable attempts would be made to accommodate conifer trees greater than 36 inches DBH and avoid the need to fell, however in a worst case scenario up to five could be felled. These 1800 trees would largely be concentrated at culvert or bridge construction sites and/or in areas where the road prism is proposed for widening along the current gravel-surfaced section. Tree removal at culvert or bridge construction sites would result in the creation of small gaps in the canopy (generally up to 0.2 acres, with most being less than 0.1 acres) which at the site scale, would increase fragmentation of forested areas. It has been calculated that the project's proposed road prism widening along segments of the currently gravel-surfaced 2.7 mile long section of the Nestucca Access Road would result in approximately 3.45 acres of forestland being permanently converted to road prism. Given the general linear nature of the construction sites associated with road prism widening, this habitat removal is believed to be relatively inconsequential to the ability of the area to provide for dispersing or resident spotted owls. These 3.45 acres of forestland represent 0.020% of the 17,050 acre Wildlife Analysis Area.

While project implementation would remove roadside trees as a result of road prism widening of the current gravel-surfaced section of Nestucca Access Road and create small forest gaps around construction sites such as culvert or bridge replacement locations which at the site scale, would increase fragmentation of forested areas, it would not be expected to create barriers to owl dispersal or impact the suitability of the adjacent habitat. The current functionality of these habitats at the stand level to provide nesting, roosting, foraging, and/or dispersal for spotted owls would be maintained. This is largely based upon the dispersed nature of the proposed action, habitats impacted, as well as the quantities of habitats available within Wildlife Analysis Area described above. A portion of the trees to be felled are located within stands identified as being more structurally complex multi-layered conifer forests; 1,386 BLM acres of high-value spotted owl habitat as described in Recovery Action 32 (RA32) of the *Revised Recovery Plan for the Northern Spotted Owl* (USDI - USFWS 2011) have been identified and mapped within the Wildlife Analysis Area. Despite the felling of roadside trees within or along the edges of these stands, post-implementation the stands would continue to function as spotted owl suitable habitat and still represent some of the best habitat within the area; the project is consistent with the *Revised Recovery Plan for the Northern Spotted Owl* (USDI – USFWS 2011).

All disturbed areas including exposed soils on cut banks and fill slopes would have soils stabilized and appropriate native vegetation (examples grasses, forbs, shrubs and/or trees) established by seeding or manual planting. A portion of the felled trees would be retained as CWD within riparian forest habitats. These design features would benefit the quality of the owl habitat within the area and help mitigate some of the minor adverse impacts associated with tree removal.

Impacts to Spotted Owl Designated Critical Habitat

Approximately 35.4 miles of road or 86% of the 41 mile project area roadways and all of the other areas to be impacted by the project such as BLM rock quarries, end-haul waste sites and asphalt waste site that have been identified are located within Spotted Owl Designated Critical Habitat (CHU #1, subunit NCO 5)(USFWS 2012).

Impacts to Spotted Owl Designated Critical Habitat are similar to those described above under the Impacts to Spotted Owl Habitat above. Although roadside spotted owl suitable and dispersal habitat which is designated as Critical Habitat would be impacted, the functionality of these habitats at the stand level to provide nesting, roosting, foraging, and/or dispersal for spotted owls would be maintained.

Marbled Murrelet

Potential for Disturbance

Implementation of the Byway project would generate noises above the ambient noise level. The interagency Level 1 Team (terrestrial subgroup) for the North Coast Planning Province has determined that some of the proposed activities have a potential disturbance distance of 0.25 miles (use of chainsaws; heavy equipment for road construction, road repairs, bridge construction, culvert replacements; pile-driving). Other proposed activities such as the blasting of rock quarries which would create louder noise, have a reported disturbance distance of 1.0 miles (USDI and USDA 2014). The disturbance distance is the distance from the project boundary outward within which the action is likely to cause a listed species such as the marbled murrelet, if present to be distracted from its normal activity. As discussed above, the Analysis Area used to analyze the impacts of the proposed action includes the majority of the stands within the area with a potential for being disturbed through implementation of the proposed action.

The potential for disturbance impacts to murrelets exist where activities that generate noise above the ambient forest level occur near breeding murrelets during the murrelet nesting season (April 1 to September 15). Site-specific information (e.g. topographic features, project length or frequency of disturbance to an area) could factor into effects. The potential for noise or human intrusion-producing activities to create the likelihood of injury to murrelets is also dependent on the background or baseline levels in the environment. In areas that are continually exposed to higher ambient noise or human presence levels (e.g. areas near well-traveled roads and campgrounds), murrelets are probably less susceptible to small increases in disturbance because they are accustomed to such activities. Murrelets do occur in areas near human activities and may habituate to certain levels of noise (USDI and USDA 2013).

The nearest known occupied marbled murrelet sites to the roadways impacted or utilized by the Byway project are located within the Elk Creek drainage. These sites are located approximately 0.1 to 0.5 miles from Elk Creek Road which is an identified haul route for use to access the Dovre Peak Rock Quarry. In the event that murrelets are present, disruption of nesting behavior would likely not occur because hauling and light road maintenance are activities that are not disruptive to murrelets (USFWS 2014). Additionally, Elk Creek Road is a routinely used haul route for the transport of Douglas fir logs harvested on the Tillamook State Forest to the Hampton Mill at Willamina, Oregon. In areas that are continually exposed to higher ambient noise or human presence levels (e.g. areas near well-traveled roads and campgrounds), murrelets are probably less susceptible to small increases in disturbance because they are accustomed to such activities.

In addition to the known occupied marbled murrelet sites located within the Elk Creek drainage noted above, there is unsurveyed murrelet habitat within 0.25 miles of project area roadways. As stated within the affected environment section above, approximately 26.7% (3,077 acres) of the BLM forested stands within the Wildlife Analysis Area is forested with stands containing at least a component greater than or equal to 125-

years-old; while a portion of these stands contain trees within platforms suitable for murrelet nesting, it is assumed that only a small percentage of these acres actually contain trees with potentially suitable murrelet nesting platforms. The bulk of those stands containing trees with potentially suitable nesting platforms have developed under conditions with adequate growing space located along the Nestucca River and Access Road rather than being evenly distributed throughout the stands near project roadways. To help further refine this estimation of murrelet habitat, a subset of these acres, approximately 1.0% of the BLM forested stands within the Wildlife Analysis Area (119 acres) was found to be forested with stands containing a component of scattered or clumped old-growth residual trees that are reflected within the stands FOI timber-typing; it is assumed that these stands likely contain at least a few trees within platforms suitable for murrelet nesting.

There are identified scattered patches as well as isolated individual trees with potentially suitable murrelet nesting platforms directly adjacent to or near some project area roadways. The bulk of these trees are located within the Nestucca River corridor including scattered along the gravel-surfaced portion of the Nestucca Access Road (most notably within and near the northeastern quarter of T3S, R7W section 26) (approximately MP 13.3 to MP 12.8) and just east of Elk Creek Bridge in the northwestern quarter of T3S, R7W section 27 (approximately MP 15.4 to MP 15.2). Potentially suitable murrelet nest trees have also been identified within a 14 acre remnant patch of older forest including scattered old-growth trees located across the Nestucca River from the Nestucca Access Road in the southeastern quarter of T3S, R6W section 7 (approximately MP 8.3 to MP 7.8). With the bulk of the murrelet habitat within the Wildlife Analysis Area being located along the Nestucca River corridor rather than being evenly distributed throughout the stands near project roadways, it is possible that should they be present, they may be somewhat habituated to certain levels of human activities and noise. With the presence of the Nestucca River, the Byway and five federal campgrounds, the Nestucca River corridor is a focal point for recreation and associated noise and general human presence within the area. Estimated use of the Byway to access recreational activities is approximately 50,000 visitors annually with the Nestucca Access Road being the most visited section of the Byway (see EA section 3.2.1).

The project includes design features to help minimize the potential for disturbance impacts to marbled murrelets which may be nesting within unsurveyed murrelet habitat near the Byway project. These design features include any activity implemented between April 1 and September 15, that would generate noise above the ambient level (use of chainsaws; heavy equipment for road construction, road repairs, bridge construction, culvert replacements; pile-driving; use of rock crushing and screening equipment) would include daily time restrictions if unsurveyed potential or suitable habitat for marbled murrelets is located within the disruption distance (generally 110 to 120 yards)(i.e. noise generating activities would not begin until two hours after sunrise and would end two hours before sunset). The time-of-day restriction does not apply to hauling. When the Industrial Fire Precaution Level is 2 or above, the time-of-day restriction may be waived during the late breeding period (August 6 to September 15). Project Design features also require that if a tree needing to be felled contains marbled murrelet suitable nesting structure, it would be felled outside of the murrelet nesting season (April 1 to September 15).

Impacts to Murrelet Habitat

Although none are currently anticipated, up to five conifer trees greater than 36 inches DBH may be identified along the Byway which may need to be felled in order to implement the proposed project. It is possible that a portion of these five trees could contain potentially suitable murrelet nesting platforms. During the final design phase of the project, reasonable attempts would be made to accommodate these large conifer trees and avoid the need to fell however in a worst case scenario they all would be felled. If any of these trees would in fact, need to be removed, per the project's design features, they would be felled outside of the murrelet nesting season (April 1 to September 15). Given the clumpy distribution of trees containing potentially suitable murrelet nesting platforms near the project area, the loss of some or all of these tree would not limit nesting structure availability within the area as there would be numerous other trees with

potentially suitable nesting platforms within their general location especially downslope of the Nestucca Access Road.

Additionally, the project proposes to remove an estimated, additional 1800 trees largely concentrated at culvert or bridge construction sites or in areas where the road prism is proposed for widening along the current gravel-surfaced section. This would result in the creation of small gaps in the canopy (generally up to 0.2 acres, within most being less than 0.1 acres) and a linear widening of the clearing over segments of the roadway which at the site scale, would increase fragmentation of forested areas (potentially resulting in increased predation) potentially modify microclimate characteristics, and/or increase potential windthrow of adjacent trees. Impacts resulting from fragmentation of the landscape are related to higher levels of Steller's jays, a known predator of murrelets. Locally, openings attract Steller's jays. Increases in murrelet nest predation have been documented when openings are supporting berry production. The increase time Steller's jays spend foraging for berries and insects in open stands may also result in more time for location of a murrelet nest site in an adjacent stand (USDI and USDA 2012).

The project's proposed road prism widening along the currently gravel-surfaced section of the Nestucca Access Road would result in approximately 3.45 acres of forestland being permanently converted to road prism, creating a wider gap in the forest canopy. In addition to the possible impacts of fragmentation noted above, this would result in the future development of murrelet habitat being precluded on these acres; at the stand scale this impact to murrelet habitat would be considered negligible given the fact that these 3.45 acres are distributed linearly along 2.7 miles of road set in the context of a heavily forested landscape. These 3.45 acres of forestland represent 0.020% of the 17,050 acre Wildlife Analysis Area.

The development of a day-use recreation site in the area which is currently an asphalt waste site could have adverse impacts upon murrelets should its use attract corvids (jays, crows and ravens) which are known predators of murrelets; these impacts would be expected be minor or unlikely. Visitor use at this site would be expected to be relatively light and vary with the seasons and with the weather, however it is difficult to predict the actual impacts of the site on corvids. The day-use site would be developed to provide additional river access, help lessen the impacts associated with restricting vehicle access at the pull-offs closed for reasons of safety, provide safe parking and allow Byway visitors to walk around and stretch their legs. It would provide bathroom facilities, and informative educational interpretation of the Byway and surrounding environment. Given the nature of the day-use site, its impacts upon attracting corvids would be expected to be less than some recreation sites such as campgrounds where visitor use is relatively consistent and food which attracts corvids more available. An additional factor which would result in the expectation that impacts from corvid predators would be minor is that there are very few trees with suitable murrelet nest platforms within 300 feet of the site proposed for development of the new day-use area; according to the *Marbled Murrelet Recovery Plan* (USDI-USFWS 1997, p. 140) a buffer of 300 to 600 feet around occupied habitat would mediate the effects of edge including helping to reduce predation at a nest site.

Given all of the identified impacts of the proposed project upon murrelet habitat, the function of the suitable stands of murrelet habitat within the vicinity of the Byway project are highly unlikely to be altered by this activity. Post project the surrounding stands of suitable habitat would be expected to continue to function as suitable marbled murrelet habitat.

Impacts to Murrelet Designated Critical Habitat

Portions of the proposed Byway project are located within marbled murrelet Critical Habitat. Approximately 36.2 miles (88%) of the Byway project's 41 miles of roadways are located within the boundaries of a murrelet Critical Habitat Unit (CHU #OR-02-e)(USDI-USFWS 2011).

Critical Habitat is designated to provide for the conservation and eventual recovery of the species. The primary constituent elements (PCE) of murrelet critical habitat are (1) individual trees with potential nesting

platforms and (2) forested areas within 0.5 mile of individual trees with potential nesting platforms with a canopy height of at least one-half the site-potential tree height.

As stated above, up to five trees greater than 36 inches DBH may be identified which need to be felled during project implementation; some or all of these trees may contain potentially suitable murrelet nesting platforms. Should these trees be located within the boundaries of marbled murrelet Critical Habitat (CHU #OR-02-e) they would be PCE 1. During the final design phase of the project, reasonable attempts would be made to accommodate conifer trees greater than 36 inches DBH and avoid the need to fell however in a worst case scenario up to five would be felled.

In addition to these trees with potentially suitable murrelet nesting platforms, it is estimated that project implementation would result in up to a total of approximately 1800 trees greater than 6 inches DBH needing to be felled. Approximately 77% of these trees are red alders, 10% are big-leaf maple and 13% are conifers. Approximately 53% are 6-12 inches DBH; 40% are 12-18 inches DBH; and 7% are 18-36 inches DBH. Up to five conifer trees greater than 36 inches DBH may be identified along the Byway which may need to be felled in order to implement the proposed project. Any of these trees that are located within the boundaries of marbled murrelet Critical Habitat and located within a forested stand at least one-half the site-potential tree height (approximately 120 feet) and within 0.5 mile of an individual tree with potential nesting platforms are also by definition, marbled murrelet Critical Habitat (PCE 2).

As stated above, approximately 10,621 acres of the 17,050 acre Wildlife Analysis Area (62%) as described above are contained within the boundaries of murrelet Designated Critical Habitat. Based on estimates generated by using a GIS coverage of LiDAR remote sensing technology, approximately 6,378 acres (60%) of the 10,621 acres within the boundaries of murrelet Designated Critical Habitat are forested with stands greater than one-half site potential tree tall. An unknown portion of these acres actually contain trees with potentially suitable murrelet nesting platforms (PCE 1) and/or are within 0.5 mile of a tree with potential nesting platforms and therefore are by definition, marbled murrelet Critical Habitat (PCE 2).

With the majority of these estimated additional 1800 trees needing to be removed being less than 18 inches DBH (93%) and/or being red alder (approximately 77%) located within roadside stands of pure alder or mixed hardwoods, it is assumed that the majority of the additional trees proposed for removal would not be considered marbled murrelet Critical Habitat (PCE 2). Depending upon site conditions, 18 inch DBH conifers are generally just approaching 120 feet in height and the mature height of red alder trees is typically 70 to 120 feet (130 feet maximum). Again, PCE 2 includes trees with a canopy height of at least one-half the site-potential tree height – in this area, one-half site-potential tree height is 120 feet.

Any activity occurring within designated critical habitat that alters PCEs may affect murrelet critical habitat or would appreciably slow or preclude the development of any PCE, at the stand scale, may affect marbled murrelet critical habitat. The Byway project may remove up to five trees with potentially suitable murrelet nesting platforms (PCE 1). Additionally, a minor portion of the 1800 trees needing to be felled, those greater than 120 feet in height, are considered to be PCE 2 of murrelet Critical Habitat. The removal of many of these trees would be concentrated at culvert or bridge construction sites and result in the creation in small gaps in the canopy (up to approximately 0.2 acres although most would be less than 0.1 acres) which at the site scale, would increase fragmentation of forested areas (potentially resulting in increased predation) potentially modify microclimate characteristics, and/or increase potential windthrow of adjacent trees. Finally, the project's proposed road prism widening along the currently gravel-surfaced section of the Nestucca Access Road (within the boundaries of marbled murrelet Critical Habitat) would result in approximately 3.45 acres of forestland being permanently converted to road prism; this would result in the future development of all PCEs being precluded on these acres; at the stand scale this impact to Critical Habitat would be considered minor given the fact that these 3.45 acres are distributed linearly along 2.7 miles of road set in the context of a heavily forested landscape. Since the function of the suitable stands within the

vicinity of the Byway project is highly unlikely to be altered by this activity, impacts to the functioning of the critical habitat unit (CHU #OR-02-e) are expected to be relatively minor.

3.5.5 Cumulative Effects - Alternative 2: The Proposed Action

Spotted Owl

Cumulative effects to spotted owls as a result of implementing the Proposed Action have been identified when combined with effects from projects listed in EA Section 8; these identified cumulative effects are considered to be minor. Identified direct and indirect impacts to spotted owls with the potential for adding cumulative effects include increasing forest fragmentation through tree removal largely concentrated at culvert or bridge construction sites and where the road prism has been widened.

Cumulative Effects to Habitat

All timber management projects (timber sales) implemented or planned on BLM land within the Wildlife Analysis Area since 1995, and per the NWFP and Salem District RMP, have been designed to promote the development of late-seral habitat including habitat for the spotted owl. This includes a total of approximately 654 acres of conifer dominated forest within the Wildlife Analysis Area; these acres are the result of the past, present or reasonably foreseeable future BLM timber sale (Density Management) projects including Fan Creek, Phoenix, Southern Flame, Super Snap, Willy's Elk, Day Walker, Night Walker and Testament Creek. However, past management, conducted prior to the NWFP and current Salem District RMP, has contributed to today's habitat conditions present within the Wildlife Analysis Area and larger landscape.

As a result of ownership, past management practices and fire history there are relatively few stands within the area of the Byway containing the high quality late-seral habitats preferred by spotted owls. Approximately 8% of the Wildlife Analysis Area has been identified as being high-value spotted owl habitat as described in Recovery Action 32 (RA32) of the *Revised Recovery Plan for the Northern Spotted Owl* (USDI - USFWS 2011). Stands within the Wildlife Analysis Area more commonly exhibit a general lack of structural diversity, including snags and woody debris, which is a concern that potentially limits the ability of the area to support an adequate prey base necessary to support spotted owls. Historic BLM forest management practices in the area have had results which are still being realized today. Thousands of acres of mid-seral stands were commercially thinned in the late 1960s, 1970s and 1980s. Most of this thinning was light and uniform; most of the snags, green trees with defect, and old-growth remnants which were present at the time of the thinnings within or near the thinning units, were felled and/or harvested. Clearcut harvesting removed nearly all of the remaining patches of old-growth forest, fragmented much of the existing mid-seral to early mature forest habitat, and reduced patch sizes and the amount of interior forest habitat.

The removal of trees along the project roads to implement maintenance and construction activities, hazard tree removal and clearing of trees to improve sight distances would add adverse cumulative impacts to the current habitat conditions within the Analysis Area of which is largely a result of past management activities. The majority of these trees would be associated with the proposed road prism widening of a portion of the Nestucca Access Road that is currently gravel-surfaced and/or the replacement of culverts. Since the functionality of the impacted habitats at the stand level to provide nesting, roosting, foraging, and/or dispersal for spotted owls would be maintained, the identified cumulative impacts to spotted owl habitat are expected to be relatively minor. Design Features retaining a portion of the felled trees as CWD in riparian forest habitats which would benefit the quality of the owl habitat within the area, would help mitigate some of the adverse impacts associated with tree removal. Additionally, 654 acres of past, present or reasonably foreseeable future density management projects within the Wildlife Analysis Area designed to promote the development of late-seral habitat including habitat for the spotted owl would, in the long-term, help offset at least of portion of the impacts of increasing forest fragmentation through roadside tree removal.

Marbled Murrelet

Cumulative effects to marbled murrelets as a result of implementing the Proposed Action have been identified when combined with effects from projects listed in EA Section 8; these identified cumulative effects are considered to be minor. Identified direct and indirect impacts to marbled murrelets with the potential for adding cumulative impacts include the potential for disturbance during the murrelet breeding season, and impacts to habitat including up to approximately 5 unidentified trees with potentially suitable murrelet nesting platforms adjacent to the Nestucca Access Road which may need to be felled during project implementation. Additional identified impacts are associated with increasing forest fragmentation through tree removal largely concentrated at culvert or bridge construction sites and where the road prism has been widened.

Cumulative Effects from Disturbance

Impacts of the Byway project to marbled murrelets resulting from the potential for disturbance during the murrelet breeding season have been identified. As discussed above, the project includes design features to help minimize these potential disturbance impacts such as daily time restrictions and seasonal restrictions on the felling of trees which contain marbled murrelet suitable nesting structure.

Since it is assumed there are very few (if any) trees on non-federal land within the Wildlife Analysis Area containing platforms potentially suitable for murrelet nesting, other projects and activities with potential for also impacting nesting murrelets through disturbance would likely be occurring on BLM or USFS land. The bulk of the murrelet habitat within the Wildlife Analysis Area is located along the Nestucca River and Access Road or within Elk Creek drainage rather than being evenly distributed throughout the stands near project roadways. There are relatively few trees with potential murrelet nesting platforms located along the Bible Creek or Bald Mountain Roads. BLM and USFS projects with the potential to disturb murrelets during the breeding season routinely incorporate design features to help minimize the potential disturbance impacts such as daily time restrictions and/or seasonal restrictions.

The potential for disturbance impacts to murrelets exist where activities that generate noise above the ambient forest level occur near breeding murrelets during the murrelet nesting season (April 1 to September 15). Site-specific information (e.g. topographic features, project length or frequency of disturbance to an area) could factor into effects. The potential for noise or human intrusion-producing activities to create the likelihood of injury to murrelets is also dependent on the background or baseline levels in the environment. In areas that are continually exposed to higher ambient noise or human presence levels (e.g. areas near well-traveled roads and campgrounds), murrelets are probably less susceptible to small increases in disturbance because they are accustomed to such activities. Murrelets do occur in areas near human activities and may habituate to certain levels of noise (USDI and USDA 2013). As noted above, with the bulk of the murrelet habitat within the Wildlife Analysis Area being located along the Nestucca River corridor or within the Elk Creek drainage rather than being evenly distributed throughout the stands near project roadways, and the only known sites being located within the Elk Creek drainage; should murrelets be present, they may be somewhat habituated to certain levels of human activities and noise given the amount of human activities within these areas.

Given the facts that most if not all of the murrelet habitat within the Analysis Area is located on federal land and federal projects, including the Byway project, routinely incorporate design features to help minimize the potential disturbance impacts, and the fact that most of the murrelet habitat within the Analysis Area is located within the Nestucca Corridor and Elk Creek drainage in areas where individual murrelets, should they be present, may be expected to be somewhat habituated to certain levels of human activities and noise, the identified cumulative impacts resulting from the potential for disturbance during the murrelet breeding season are considered to be minor.

Cumulative Effects to Habitat

All timber management projects (timber sales) implemented or planned on BLM land within the Wildlife Analysis Area since 1995, and per the NWFP and Salem District RMP, have been designed to promote the development of late-seral habitat including habitat for the marbled murrelet. This includes a total of approximately 654 acres of conifer dominated forest within the Wildlife Analysis Area; these acres are the result of the past, present or reasonably foreseeable future BLM timber sale (Density Management) projects including Fan Creek, Phoenix, Southern Flame, Super Snap, Willy's Elk, Day Walker, Night Walker and Testament Creek. Although the proposed Byway project could result in up to approximately 5 identified trees with potentially suitable murrelet nesting platforms adjacent to the Nestucca Access Road which may need to be felled during project implementation, no other identified ongoing and/or present or reasonably foreseeable future BLM projects located within the Wildlife Analysis Area have resulted in trees with potentially suitable murrelet nesting platforms being removed. However, past BLM management, conducted prior to the NWFP and current Salem District RMP, has contributed to today's habitat conditions present within the Wildlife Analysis Area and larger landscape.

As a result of ownership, past management practices and fire history there are relatively few stands within the area of the Byway containing scattered individual or small clumps of residual old-growth trees and/or large trees with potential murrelet nesting structure(s). Historic BLM forest management practices in the area have had results which are still being realized today. Thousands of acres of mid-seral stands were commercially thinned in the late 1960s, 1970s and 1980s. Most of this thinning was light and uniform; most of the snags, green trees with defect, and old-growth remnants which were present at the time of the thinnings within or near the thinning units, were felled and/or harvested. Clearcut harvesting removed nearly all of the remaining patches of old-growth forest, fragmented much of the existing mid-seral to early mature forest habitat, and reduced patch sizes and the amount of interior forest habitat.

In addition to the timber sales noted above, there have been several phases of fish habitat enhancement work implemented within the Nestucca Watershed. A number of the projects involved extensive large wood placement to enhance fish habitat including the felling large streamside conifers. None of these trees felled into the river included trees containing platforms potentially suitable for murrelet nesting. These projects included numerous design features such as tree spacing requirements and upper size limits in tree selection to help minimize and disperse the potentially adverse impacts to current and future murrelet habitat resulting from felling of trees for fish habitat enhancement.

The possible felling of approximately five trees with potentially suitable murrelet nesting platforms adjacent to the Nestucca Access Road would add cumulative impacts to the current habitat conditions of which is largely a result of past management activities including the removal of murrelet nest trees. Since the function of the suitable stands within the vicinity of the Byway project is highly unlikely to be altered by this activity, the identified cumulative impacts to murrelet habitat are expected to be relatively minor. Additionally, 654 acres of density management projects within the Wildlife Analysis Area designed to promote the development of late-seral habitat including habitat for the marbled murrelet would, in the long-term, help offset the impacts of felling up to approximately five trees with potentially suitable murrelet nesting platforms and increasing forest fragmentation through tree removal concentrated at culvert or bridge construction sites and where the road prism has been widened.

3.5.6 Environmental Effects - Alternative 3

The effects to spotted owls and marbled murrelets from Alternative 3 would largely be the same as Alternative 2; all the same applicable BMPs and PDCs would be followed. One notable difference would result from the fact that under Alternative 3, the current sub-grade of the gravel-surfaced section of the Nestucca Access Road would not be widened. While in places the current road prism would be widened to accommodate ditch widths per the Storm Water Management Plan, under Alternative 3 we would expect that with no widening of the sub-grade there would be in places where fewer trees would need to be removed. It would be expected that the project footprint would be reduced under Alternative 3 and therefore fewer trees,

including a portion of the potentially suitable murrelet nest trees which could be identified, would ultimately need to be removed.

It has been calculated that under Alternative 2 the project's proposed road prism widening along segments of the currently gravel-surfaced 2.7 mile long section of the Nestucca Access Road would result in approximately 3.45 acres of forestland being permanently converted to road prism; under Alternative 3 this acreage figure would be reduced possibly by as much as 0.5 acres. Although relatively minor, especially given the linear nature of forestlands impacted set in the context of a heavily forested landscape, this difference would proportionally reduce the impacts associated with forest conversion from what was described in Alternative 2.

An additional difference between Alternative 2 and 3 is that under Alternative 3, the single-lane Elk Creek Bridge and three culverts on fish-bearing streams proposed for replacement under Alternative 2 including the Bear Creek Culvert, Quad Pipes and Fairdale Crossing would not be replaced. This would eliminate the need for tree removal at these sites; the resultant impacts from gap creation and habitat fragmentation as described under Alternative 2 would not occur at these sites under Alternative 3.

3.5.7 Cumulative Effects - Alternative 3

The cumulative effects to spotted owls and marbled murrelets from Alternative 3 would largely be the same as Alternative 2 with the exceptions of the proportional reduction of impacts associated with the current sub-grade of the gravel-surfaced section of the Nestucca Access Road not being widened and the single-lane Elk Creek Bridge not being replaced. These identified cumulative effects are considered to be minor.

3.6 Special Status (BLM 6840 Policy), SEIS Special Attention (Salem RMP), and Migratory Bird Treaty Act Wildlife Species and Habitat

The analysis below includes species that could occur on lands managed by the BLM's Tillamook Field Office; have potential to be impacted by the Byway project; and are on the BLM State Director's Special Status Species List (per Instruction Memorandum No. OR-2012-018), Survey and Manage Species (SEIS Special Attention Species within the ROD/RMP) as identified within the 2001 S&M ROD (with Annual Species Review), the USFWS's 2008 "Birds of Conservation Concern" list for the U.S. portions of the Northern Pacific Forest Bird Conservation Region, or are included in the Salem District's ROD/RMP. Table 11 below contains the complete list of species and a brief impact synopsis which shows which species may be impacted and are thus carried forward into the analysis contained within EA section 3.6.1 through 3.6.7 below.

BLM's Special Status Species policy objectives are to initiate proactive conservation measures that reduce or eliminate threats to Bureau Sensitive (BS) species to minimize the likelihood of and need for listing of these species under the Endangered Species Act.

Survey Requirements

Special Status Species (BLM 6840 Policy) – BLM's Special Status Species Program is designed to meet national policies adopted in the 1980s to ensure that projects are designed such that they will not contribute to the need to list species under the Endangered Species Act. While there is policy direction to assess a project's impacts upon species listed as "Bureau Sensitive" (BS) on the OR/WA State Director Special Status Species List, there is no policy requiring pre-project surveys to be conducted. OR/WA BLM SSS policy, as clarified in IM No. OR-2003-054 by the State Director, directs districts to assess species' effects by various tools including, but not limited to: habitat examination; habitat evaluation; evaluation of species-habitat associations and presence of suitable or potential habitat; review of existing survey records, inventories, and spatial data; utilization of professional research, literature and other technology transfer sources; or use of expertise, both internal and external, that is based on documented, substantiated professional rationale; or project survey and monitoring based on technically sound and logistically feasible methods. Each field unit will need to assess the degree and effort needed to provide information to conduct an informed evaluation of a project impact upon a species, including what tools are needed. Field managers, with input from technical staff, will make this determination.

Survey and Manage Species (SEIS Special Attention Species in Salem ROD/RMP) - The Survey and Manage (S&M) Species Program is a mitigation measure of the Northwest Forest Plan (SEIS Special Attention Species in Salem ROD/RMP) which involves management of known sites, site-specific pre-habitat disturbing surveys, and/or landscape scale surveys for certain rare and/or isolated species. These are species that, either because of genuine rarity or because of a lack of information about them, the Agencies did not know whether they would adequately be protected by other elements of the Northwest Forest Plan. For species listed as Survey Strategy 2 Survey and Manage Species, policy directs that pre-project surveys be conducted prior to management activities if the project is determined to be "habitat altering" and manage sites.

Table 11. Special Status Species (BLM 6840 Policy), Survey and Manage Species (SEIS Special Attention Species in Salem ROD/RMP) and Migratory Bird Treaty Act Wildlife Species that are suspected or documented to occur on Lands Managed by BLM's Tillamook Field Office

The Nestucca National Back Country Byway Project		
Common Name	Status*	Impact Synopsis
Mammals:		
Fringed Myotis	Salem ROD/RMP	Minor impact – Roadside tree felling in areas of suitable foraging habitat. Some of the larger trees which could potentially be removed could be functioning as suitable roosting or resting habitat. It is expected that few large trees would be felled and other similar habitat trees are present and unaffected. To provide additional roosting opportunities for bats, structures such as bat boxes would be installed within new bridges and/or larger concrete culverts where beneficial.
Long-eared Myotis	Salem ROD/RMP	
Long-legged Myotis	Salem ROD/RMP	
Silver-haired Bat	Salem ROD/RMP	
Townsend's Big-eared Bat	BS, Salem ROD/RMP	
Red Tree Vole (North Oregon Coast DPS)	BS, S&M	Negligible impact – Roadside tree removal in areas of suitable habitat. Surveys conducted; all trees containing red tree vole active or inactive nests protected.
Birds:		
Bald Eagle	BS	Minor impact – No nest or roost sites near the project area. Project could result in minor disturbance if an individual should be foraging or resting within the area.
Black Swift	MBTA	Not affected – No known nesting habitat within project areas.
Harlequin Duck	BS	Minor impact – Project could result in disturbance if individuals should be located within the Nestucca River during periods of construction.
Horned Lark	MBTA	Not affected – Project not within suitable habitat.
Lewis' Woodpecker	BS	Not affected – No habitat present; not within expected range.
Olive-sided Flycatcher	MBTA	Minor impact – Minor potential for disturbance impacts and/or destruction of roadside nests if present.
Oregon Vesper Sparrow	MBTA, BS	Not affected – Project not in suitable habitat.
Peregrine Falcon	MBTA, BS	Not affected – No habitat present.
Purple Finch	MBTA	Minor impact – Minor potential for disturbance impacts and/or destruction of roadside nests if present.
Purple Martin	BS	Not affected – No habitat present.

Table 11. Special Status Species (BLM 6840 Policy), Survey and Manage Species (SEIS Special Attention Species in Salem ROD/RMP) and Migratory Bird Treaty Act Wildlife Species that are suspected or documented to occur on Lands Managed by BLM's Tillamook Field Office

The Nestucca National Back Country Byway Project		
Common Name	Status*	Impact Synopsis
Rufous Hummingbird	MBTA	Minor impact – Minor potential for disturbance impacts and/or destruction of roadside nests if present.
Willow Flycatcher	MBTA	Minor impact – Minor potential for disturbance impacts and/or destruction of roadside nests if present.
Reptiles and Amphibians:		
Cope's Giant Salamander	BS	Not affected – Not within range
Pacific Pond Turtle	BS	Not affected – No habitat present; not within expected range.
Painted Turtle	BS	Not affected – No habitat present; not within expected range.
Invertebrates (Mollusks):		
Columbia Sideband (snail)	BS	Minor impact – Species not located during surveys. Impacts to potential habitat.
Crowned Tightcoil (snail)	BS	Minor impact – Species not located during surveys. Impacts to potential habitat.
Evening Field Slug	S&M	Minor impact – Species not located during surveys. Impacts to potential habitat.
Olympia Pebblesnail (aquatic snail)	BS	Minor impact – Impacts to this species or its habitat considered very minor or unlikely.
Pacific Walker (snail)	BS	Not affected – Species not located during surveys. Not in expected range.
Puget Oregonian (snail)	BS, S&M	Minor impact – Species not located during surveys. Impacts to potential habitat.
Shiny Tightcoil (snail)	BS	Not affected – Species not located during surveys. Not in expected range.
Invertebrates (Arthropods):		
Johnson's Hairstreak (butterfly)	BS	Minor impact – Minor impact to hemlock habitat. Suitability of habitats maintained.
Siuslaw Sand Tiger Beetle	BS	Not affected – Outside of expected range.
<p>* BS = Species listed as Sensitive under the BLM's 6840 Special Status Species Policy (per BLM IM No. OR-2012-018) Salem ROD/RMP = Species included in the Salem District ROD/RMP for special consideration MBTA = Species covered by the Migratory Bird Treaty Act of 1918 S&M = Survey and Manage Species (SEIS Special Attention Species) as identified within the 2001 S&M ROD with Annual Species Review.</p>		

3.6.1 Affected Environment

Special Status Species (BLM 6840 Policy) and/or Survey and Manage Species (SEIS Special Attention Species in Salem ROD/RMP)

Red Tree Vole (RTV) - Bureau Sensitive (BS) and Survey and Manage (S&M)

USFWS has determined the North Coast Distinct Population Segment (DSP) of red tree voles (*Arborimus longicaudus*) to be warranted but currently precluded from listing under the Endangered Species Act by higher priority actions (USDI-USFWS 2011). As such the North Oregon Coast DPS of the red tree vole was added to the USFWS list of candidate species meaning the USFWS may propose to list this population under the Endangered Species Act at a later date. This population segment includes red tree voles located in the vicinity of the Byway project area. The North Coast population of red tree voles is managed as Bureau Sensitive under the BLM's Manual 6840 Special Status Species Policy as well as Survey and Manage Species (SEIS Special Attention Species) as identified within the 2001 S&M ROD (with Annual Species Review). As a Survey and Manage Species it is managed as a Category C Species which requires pre-disturbance surveys, strategic surveys and the management of high-priority sites. Those portions of the Byway project involving the replacement of undersized or failing existing culverts with new culverts are considered to be Pechman Exempt from the Survey and Manage mitigation measure of the Northwest Forest Plan, as incorporated into the Salem District Resource Management Plan (see EA section 1.5.1).

The red tree vole is an arboreal rodent that rarely comes to the ground and may live its entire life on a few acres. It is thought to be strongly associated with mature and late-successional Douglas fir forest with optimal habitat being old-growth forests. Some recent studies have shown that red tree voles are also sometimes found in younger forests, especially if they contain a component of older trees or are located near stands of mature forest. At this time it is uncertain what role younger forests play in the general health of the red tree vole populations, especially in the northern mesic zone where the Byway project area is located.

Red tree voles are uncommon in the Northern Coast Range with few known sites north of the Nestucca River basin. Those sites that are north of the Nestucca River basin are along the western edge of the historic Tillamook Burn areas on Oregon Department of Forestry or Oregon State Park lands. In the last ten years of red tree vole surveys covering about 5,500 acres of lands managed by the Tillamook Field Office, BLM has located approximately 118 red tree vole nests of which about 48 were active. Nearly all of these sites have been found in stands at least 110-years-old with considerable structural diversity and/or old-growth remnants.

Project roadways run through a fragmented mosaic of forested stands; many of the mature and late-successional Douglas fir forests adjacent to project roads are considered to be suitable habitat for red tree voles. Although all of the trees with potential of being impacted by the Byway project are roadside trees; many are located within or near mature Douglas fir stands which are considered to be suitable red tree vole habitat. Many of these roadside trees exhibit extensive crown development, epicormic branching and thick accumulations of moss, habitat features commonly used by red tree voles. Trees with potential of being impacted by the Byway project were inspected for sign of red tree vole activity. Per the survey protocol (Huff et al, 2012), these inspections resulted in 18 trees between 28 and 63 inches DBH, being identified for further inspection though climbing; all of these trees are located along that portion of the Nestucca Access Road which is currently gravel-surfaced. Of the 18 trees climbed and inspected for red tree vole nests, eight were found to contain active red tree vole nests, six contained inactive nests and four contained no evidence of red tree vole occupancy. Subsequent to determining these trees contain active and inactive red tree vole nests the project was altered to assure these larger trees would be protected.

Mollusks - (S&M and/or BS)

The Byway project is within the range and/or contains habitat for six terrestrial mollusk species and one aquatic (freshwater) species that are on BLM's Special Status Species list as Bureau Sensitive and/or are

Survey and Manage (S&M) Species (SEIS Special Attention Species) as identified within the 2001 S&M ROD (with Annual Species Review). Those portions of the Byway project involving the replacement of undersized or failing existing culverts with new culverts are considered to be Pechman Exempt from the Survey and Manage mitigation measure of the Northwest Forest Plan, as incorporated into the Salem District Resource Management Plan (see EA section 1.5.1).

The terrestrial mollusk species considered in this analysis are generally associated with the organic duff layer and moss on the floor of cool forested areas containing coarse woody debris, sword ferns, woody shrub species and for some species, hardwood trees, especially big-leafed maple. Additionally, a few species seem to be associated with areas where humidity remains high such as seeps and riparian areas. In general, most of the areas to be impacted by the Byway project contain relatively poor terrestrial mollusk habitat. Being roadside, much of the habitat is located on previously disturbed ground, contains little organic duff or later decay stage coarse wood, and/or with the exception of many of the culvert sites, tends to be drier due to the influence of the adjacent road and gap in the canopy. The majority of the trees proposed for removal as a result of the road prism widening of the currently gravel-surfaced portion of the Nestucca Access Road are located above the road on the south-facing slope, a relatively dry site containing poor quality mollusk habitat.

All of the terrestrial mollusk species being analyzed either have never been found on lands managed by the BLM Tillamook Field Office after approximately 10,000 acres of survey effort or have only been encountered a very few times. There are only three known sites of the Puget Oregonian (*Cryptomastix devia*) (S&M and BS) in the area managed by the BLM's Tillamook Field Office. These sites are located on the east side of the Coast Range summit approximately one and five miles southwest of the project areas; discovery of these sites represented a range extension of what was thought to be a Washington Cascades and Columbia gorge species. These sites are the only records in the Oregon Coast Range. The crowned tightcoil (*Pristiloma pilsbryi*) (BS) is a very small terrestrial snail that is most abundant under the dense thickets of salal near the coast. Forested sites are associated with abundant, persistent moisture. According to the BLM's regional database (GeoBOB) there are only two crowned tightcoil known sites on lands managed by the Tillamook Field Office; these two sites represent the only sites for this species currently within the BLM database in Oregon. Both are located within the Nestucca drainage about a mile from the project's roadways. There are three known sites of the Columbia sideband (*Monadenia fidelis Columbianana*) (BS) within the area managed by the Tillamook Field Office. These sites are located on the east side of the Coast Range summit approximately one to two miles southwest of the project area; discovery of these sites represented a range extension of what was thought to be an Oregon Cascades and Columbia gorge species.

The evening field slug (*Deroceras hesperium*) (S&M) is associated with perennially wet meadows in forested habitats. Due to the limited number of verified sites, little detail is known about exact habitat requirements for the species. However, it appears to have high moisture requirements and is almost always found in or near herbaceous vegetation at the interface between soil and water, or under litter and other cover in wet situations where the soil and vegetation remain constantly saturated. Areas with coastal fog may allow the species to occupy habitats farther from open water. This species has been located only once on lands managed by BLM's Tillamook Field Office; the site was incidentally located near a riparian area directly adjacent to the Blaine Road approximately 4 miles west of the project area roadways. Scattered sites have been documented for this species in several provinces in Oregon, including both sides of the Oregon Cascades from Hood River to the Klamath River basin in Jackson County; and from the Elliot State Forest north into the northern Coast Range. The majority of currently documented sites occur on the eastern slopes of the Oregon Cascades.

The Pacific walker (*Pomatiopsis californica*) (BS) is a riparian associate semi-aquatic snail with very specialized habitat. It is characteristically found among wet leaf litter and vegetation, beside flowing or standing water in shaded situations where humidity remains high. This species has not been located on BLM lands managed by the Tillamook Field Office. With its range believed to include the narrow coastal fog belt of the Pacific Coast it is very unlikely to inhabit the Byway project area.

The shiny tightcoil (*Pristiloma wascoense*) (BS) is a very small terrestrial snail. This species is known from the Washington and Oregon Cascades. It is also reported from the Blue Mountains in Oregon and from several counties in Idaho. A historic record from Marion County, near Salem, suggests possible Coast Range occurrence. This species has not been located on lands managed by BLM's Tillamook Field Office.

As of July 2015, the Olympia pebblesnail (*Fluminicola virens*) (BS) is a new species added to the BLM State Director's Special Status Species List. It is a freshwater snail usually found in clear cold streams with a high dissolved oxygen content and a coarse but stable substrate. In Oregon, it is limited in distribution to the Willamette and lower Columbia River basins where it occurs in the lower Columbia River below Portland, the upper Deschutes River, the Umpqua River, the Willamette River from Corvallis to its mouth, and large tributary streams of the Willamette River including the Tualatin and Clackamas Rivers. One historic (pre-1928) record exists of the Olympia pebblesnail from the Nestucca River; it was located just a couple of miles upstream from Cloverdale Oregon, approximately 20 miles downstream from the western most portion of the project area. This species has not yet been located in streams on or near BLM lands managed by the Tillamook Field Office.

Mollusk Surveys

Two rounds of terrestrial mollusk protocol surveys were completed in support of the Byway project in the fall of 2014 and the spring of 2015 in areas which it was determined would be the most impacted and/or contain the best mollusk habitat. No Survey and Manage or Bureau Sensitive terrestrial mollusk species were located during these surveys.

Being a freshwater snail, potential habitats for the Olympia pebblesnail were not surveyed during terrestrial mollusk survey efforts conducted for the Byway project. In 2012, BLM conducted aquatic invertebrate surveys at 35 sites throughout the Nestucca watershed above, or east of, the Bear Creek confluence as well as within the East Creek and East Beaver Creek drainages; no Olympia pebblesnails were located during these aquatic invertebrate surveys. No pre-project surveys for this species are required or were conducted in support of the Byway project.

Bald Eagle - (BS)

The final rule delisting the bald eagle (*Haliaeetus leucocephalus*) from the Endangered Species Act was effective August 8, 2007 (USDI 2007). The bald eagle is still classified as Threatened under the Oregon ESA and provided protection under federal law (e.g., Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act). It is currently managed as "Bureau Sensitive" (BS) under the Bureau's Special Status Species Policy.

Bald eagles generally nest and/or roost within one mile of a large major river or lake, or within 0.5 mile of a major tributary. They prefer large, older trees that have an open branching pattern in the top half of the tree. Dispersed eagle usage may occur throughout the general area containing the Byway project wherever suitable eagle habitat is present; eagle usage of the area most commonly occurs during the late fall or winter months when steelhead, chinook salmon, and Oregon Coast Coho are spawning. Bald eagles are occasionally seen foraging along stretches of the Nestucca River; these eagle sightings are much more common along stretches of the river located at points west of the Elk Creek/Nestucca River confluence where the river classification changes from a 5th to 6th order stream.

There are no known bald eagle communal winter roosts within or near the Byway project area. The nearest known bald eagle nest is historic in nature and located along Elk Creek about 2.5 miles north of the Nestucca Access Road. Because of the high visibility of bald eagles and bald eagle nests, it is unlikely that undiscovered bald eagle nests or roosts are located within or near the project areas.

Harlequin Duck – (BS)

The harlequin duck (*Histrionicus histrionicus*) is a small sea duck that breeds along rocky, swift flowing rivers from the Rocky Mountains to the Coast Range of Oregon. They typically nest on the ground in well-concealed locations along fast-moving rivers and mountain streams. Nests are typically located close to water and may be situated at the base of trees, on piles of woody debris, under fallen logs, or on sheltered stream banks. While in streams, harlequins spend much of their time in riffles and glides except when rearing very young ducklings, when they often spend time in the slower pool water. The female is the only brooding parent as the male leaves for the Pacific coast soon after nest initiation. The female begins moving the young downriver within a few weeks after hatching in late May to mid-June. It is estimated that by late August the female and the brood are in the vicinity of the coastal estuary.

The harlequin duck was not known to breed in the Oregon Coast Range until a female with young was identified in the Nestucca River in July of 1994. Since then, there has been documented breeding behavior (females with young) during a few breeding seasons; BLM conducts an informal, annual monitoring survey effort for this species along the Nestucca River/Access Road. Observations have occurred within the mainstem of the Nestucca River up to approximately the Fan Creek confluence – Nestucca Access Road MP 12.

Bats - (BS and/or ROD/RMP Species)

Five bat species which may be within or near the project area are either Bureau Sensitive (BS) and/or listed as a species with specific management direction in the ROD/RMP (Salem RMP). Townsend's big-eared bat (*Corynorhinus townsendii*)(BS/Salem RMP), long-eared myotis (*Myotis evotis*)(Salem RMP), long-legged myotis (*Myotis volans*)(Salem RMP), silver-haired bat (*Lasiorycteris noctivagans*)(Salem RMP), and fringed myotis (*Myotis thysanodes*)(BS/Salem RMP), are known to inhabit mature and immature coniferous forest, and they may forage near riparian areas, open areas, and along forest edges and roads. They can utilize large hollow trees for roosting, hibernating, and maternity colonies. Accumulations of large logs, snags or live trees with defect such as loose bark and cavities may function as additional day or night roosts. BLM has installed a number of bat boxes under bridges within the Nestucca watershed.

There are no known bat roosting or hibernaculum sites within the project area, nor are there any caves, mines, abandoned wooden bridges and buildings which are commonly used by bats and may require additional protection per direction in the NWFP (C-43). Some of the more open forested and riparian habitats and roadways within and near the proposed project area function as bat foraging habitat. Suitable bat habitat, especially higher quality large snags, is currently lacking within and near most of the project areas; this likely limits the overall value of bat habitat within the area. Some of the roadside trees along project area roads could function as night roosts or resting sites; no trees (living or dead) containing cavities preferred by bats have been identified along project area roads. No pre-project surveys for bats are required or were conducted in support of the Byway project.

Johnson's Hairstreak - (BS)

Johnson's hairstreak (*Callophrys johnsoni*) is a small butterfly that is dependent on coniferous forests that contain mistletoes of the genus *Arceuthobium*. It is the only Bureau Sensitive insect that may be affected by the proposed action. Mistletoes used by this species occur mainly on western hemlock and occasionally true firs. The eggs of this butterfly are laid in mistletoe masses and the chrysalids (pupa) overwinter there. The larvae (caterpillars) feed on the leaves of the host plant from April to October. Historically the Johnson's hairstreak was thought to occur throughout the Pacific Northwest in old-growth forests. Some of the stands adjacent to the Byway contain hemlocks and although not observed, there may be mistletoe within these stands that could support this butterfly. Of the Johnson's hairstreak records in Oregon, most are from above 2,000 feet elevation, with the majority from the 3,500 (+/-) foot elevation, and a few from as high as 5,000 and 6,000 feet. Elevations of the project area roads range from about 600 feet above sea level at the westernmost end of the project on the Nestucca Access Road to 2,860 feet above sea level on Bald Mountain Road near Sheridan Peak.

The current range of Johnson's hairstreak is uncertain however, recent survey efforts have resulted in an additional five records in Oregon with the nearest sighting being approximately 22 miles south of the Byway project area. No pre-project surveys for this species are required or were conducted in support of the Byway project.

Migratory Bird Treaty Act

Executive Order (EO) 13186, issued Jan. 17, 2001 directs federal agencies to enter into a Memorandum of Understanding (MOU) with the U.S. Fish and Wildlife Service to further the goals of the Migratory Bird Treaty Act of 1918 (MBTA). The pertinent goals of the EO are to "support the conservation intent of the migratory bird conventions by integrating bird conservation principles, measures and practices into agency activities and by avoiding or minimizing to the extent practicable adverse impacts on migratory bird resources when conducting agency actions"; and to "ensure that environmental analyses for Federal actions required by the NEPA or other established environmental review processes evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern". On April 12, 2010 the Director of the BLM signed a Memorandum of Understanding with the USFWS which outlines a collaborative approach to promote the conservation of migratory bird populations. The portion of the MOU that is most applicable to the Byway project follows: "*At the project level, evaluate the effects of the BLM's actions on migratory birds during the NEPA process, if any, and identify where take reasonably attributable to agency actions may have a measurable negative effect on migratory bird populations, focusing first on species of concern, priority habitats, and key risk factors. In such situations, BLM will implement approaches lessening such take . . .*"

Of the bird species that are included in the USFWS's 2008 "Birds of Conservation Concern" list for the U.S. portions of the Northern Pacific Forest Bird Conservation Region only the olive-sided and willow flycatchers, purple finch and the rufous hummingbird occur within the analysis area and have the potential, either negatively, positively or both, to be impacted by the Byway project. Those portions of the Byway project with the potential of impacting these species' habitat include removing trees along the project roads to implement maintenance and construction activities, hazard tree removal and clearing of trees to improve sight distances. The majority of these trees would be associated with the proposed road prism widening of a portion of the Nestucca Access Road that is currently gravel-surfaced and/or the replacement of culverts. No pre-project surveys for migratory bird species are required or were conducted in support of the Byway project.

Olive-sided Flycatcher (MBTA)

In the Coast Range, the olive-sided flycatcher (*Contopus cooperi*) builds nests in mature conifer stands, preferring western hemlock and Douglas fir, with openings nearby such as early seral forest stands, marshes, ponds, etc., over which they forage. They are most abundant in landscapes containing late-seral forests highly fragmented by early-seral habitats - a landscape rich in high contrast edges. Olive-sided flycatchers are conspicuous when singing and fly catching from high perches on snags or tall trees adjacent to openings.

Although many of the older stands within the area are still somewhat younger than those preferred by olive-sided flycatchers, the Byway project area contains some flycatcher habitat. This habitat is located along forest edges containing relatively larger trees particularly along forest gaps such as *Phellinus weirii* root rot patches or adjacent to non-federal clearcuts.

Willow Flycatcher (MBTA)

In northwest Oregon's conifer-dominated landscapes, the willow flycatcher (*Empidonax traillii*) nests within a few feet of the ground in brushy, early-seral habitats. Non-federal and industrial timber company land within the area of the proposed project are currently providing a great deal of early-seral habitats, however

many recent clearcut units are treated with herbicides and then replanted exclusively with Douglas fir seedlings. Under this management scenario, brushy thickets are usually totally lacking, rare or short-lived. These sites generally do not have time to develop complex early-seral conditions before the site is completely occupied by a monoculture of fully-stocked Douglas fir seedlings.

Non-federal habitats near the Byway project currently do provide some habitat for the willow flycatcher. Additionally, small BLM forest openings that may be located directly adjacent to private clearcuts or old rock quarries could provide some willow flycatcher habitat.

Purple Finch (MBTA)

Purple finches (*Haemorhous purpureus*) are breeding residents of low to mid elevation, open to semi-open conifer forests in western Oregon and parts of the Blue Mountains of eastern Oregon. Winter residency in Oregon is erratic, varying from year to year with most individuals migrating south for the winter. While purple finches are still somewhat common, their numbers have been declining in recent years. The reasons for the perceived decline are unclear but loss of habitat from conversion of forestland to urban or agricultural uses and competition from the house finch are thought to be contributors (M. Patterson, 2003).

Purple finches undoubtedly breed in the vicinity of the Byway project on federal and non-federal land along riparian corridors, at the edges of *Phellinus weirii* root-rot patches, along edges of old clearcuts and in other areas of reduced canopy cover. Their preferred habitats include open to semi-open conifer and mixed-conifer forests with a well-defined shrub layer including berry-producing trees and shrubs.

Rufous Hummingbird (MBTA)

Rufous hummingbirds (*Selasphorus rufus*) can be found in a variety of habitats as long as a well-developed flowering shrub layer is present. Foraging consists of feeding on nectar from flowering shrubs such as red-flowering current, Oregon grape, twin berry and red elderberry, as well as on tiny insects, spiders and mites that are gleaned from plants. Nests are generally found between ground level and about 16 feet (D. Vroman, 2003). This hummingbird is the most common hummingbird in Oregon and is the only breeding hummingbird in the Byway project area.

While many of the private lands near the project area are strongly dominated by early seral habitat, management strategies on most of these acres keep competing vegetation including flowering shrubs suppressed. Thus, while there is a large quantity of early seral habitat in portions of the Analysis Area, much of it may not be suitable habitat or quality habitat for rufous hummingbirds. In general, many of the roadside edges adjacent to the proposed project roadways, forested gaps and shrub dominated areas near rock quarries proposed to be used, currently contain hummingbird habitat if suitable flowering shrubs are present to provide foraging opportunity.

3.6.2 Environmental Effects - Alternative 1: No Action

Special Status Species (BLM 6840 Policy) and/or Survey and Manage Species (SEIS Special Attention Species in Salem ROD/RMP)

Under the No Action Alternative none of the management activities proposed under Alternative 2 or 3 would occur at this time or within the foreseeable future. None of the identified impacts resulting from implementation of Alternative 2 or 3 would occur and the current habitat conditions for Special Status Species and S&M would be unaffected now and into the foreseeable future.

The No Action Alternative would not lead to the elevation of the status of any Special Status Species, including the need to list under the ESA.

Migratory Bird Treaty Act

Under the No Action Alternative the current habitat conditions for the MBTA listed Species of Concern would be unaffected now and in the near future. Not implementing the Byway project would have no impact upon any of the species of concern analyzed.

Due to the limited scale of the project area and the fact that no indirect or direct impacts were identified, the No Action Alternative would not be expected to affect the population viability or population trends for the purple finch, rufous hummingbird or the olive-sided and willow flycatchers.

3.6.3 Cumulative Effects - Alternative 1: No Action

Special Status Species (BLM 6840 Policy) and/or Survey and Manage Species (SEIS Special Attention Species in Salem ROD/RMP)

Based upon the fact that no impacts have been identified from the No Action Alternative, the Special Status Species analyzed with this EA would not experience any cumulative effects under the No Action Alternative. The No Action Alternative would not be expected to change the level of population viability for any Special Status Species.

Migratory Bird Treaty Act

Because the No Action Alternative would have no indirect or direct effects upon any of the species of concern analyzed there would be no cumulative effects.

3.6.4 Environmental Effects - Alternative 2: The Proposed Action

Special Status Species (BLM 6840 Policy) and/or Survey and Manage Species (SEIS Special Attention Species in Salem ROD/RMP)

Red Tree Vole - Survey and Manage (S&M) and Bureau Sensitive (BS)

Project roadways run through a fragmented mosaic of forested stands; many of the mature and late-successional Douglas fir forests adjacent to project roads are considered to be suitable habitat for red tree voles. None of these adjacent stands are considered to be their optimal habitat - old-growth forests. Although all of the trees with potential of being impacted by the Byway project are roadside trees, many are located within or near mature Douglas fir stands which are considered to be suitable red tree vole habitat. Roadside trees frequently exhibit epicormic branching, a habitat feature commonly used by red tree voles.

Trees with potential of being impacted by the Byway project were inspected for sign of red tree vole activity. Per the survey protocol, these inspections conducted from the ground resulted in 18 trees between 28 and 63 inches DBH, being identified for climbing to further explore the potential for red tree vole use; all of these trees are located along that portion of the Nestucca Access Road which is currently gravel-surfaced. Subsequent climbing resulted in 14 of these trees being identified as containing red tree vole nests; 8 of these trees contained at least one active red tree vole nest while the other 4 trees contained at least one inactive nest. Subsequent to determining these trees contain active and inactive red tree vole nests the project was altered to assure these larger trees would be protected.

Although none are currently expected, up to five trees greater than 36 inches DBH may be identified for possible felling during project implementation. In order to consider these trees for felling and assure consistency with the Salem District ROD/RMP these trees would not contain red tree vole nests.

The overall impact of the Byway project upon red tree vole habitat or its life's requirements is considered to be minor. It is estimated that implementation of the Byway project would result in up to a total of approximately 1800 roadside trees greater than 6 inches DBH needing to be felled. Approximately 13% of these trees are estimated to be conifers and approximately 7% are estimated to be greater than 18 inches DBH. Up to five conifer trees greater than 36 inches DBH may be identified along the Byway which may need to be felled in order to implement the proposed project. During the final design phase of the project, reasonable attempts would be made to accommodate these five conifer trees greater than 36 inches DBH and avoid the need to fell however in a worst case scenario they all would be felled. Based upon the context of the heavily forested landscape containing the project and nature of the proposal resulting in trees which are impacted being spread out in a linear fashion along the project area roadways, the adverse effect on red tree vole habitat is considered to be minor.

Given the facts that the trees with potential to be impacted by the project have been surveyed and all trees containing red tree vole nests would be protected, the overall impact of the project upon red tree vole habitat or its life's requirements is considered to be minor. The project would have a negligible potential for adverse impacts to the red tree vole populations within the area.

Mollusks - Survey and Manage (S&M) and/or Bureau Sensitive (BS)

Road construction activities can have direct adverse impacts upon mollusks and mollusk habitat by crushing individuals, breaking apart later decay stage coarse wood and/or disrupting the duff layer on the forest floor. Two rounds of terrestrial mollusk protocol surveys were completed in support of the Byway project in areas which it was determined would be the most impacted and/or contained the best mollusk habitat; no Survey and Manage or Bureau Sensitive terrestrial mollusk species were located during these surveys. In general, most of the areas to be impacted by the Byway project contain relatively poor terrestrial mollusk habitat. Being roadside, much of the habitat is located on previously disturbed ground, contains little organic duff or later decay stage coarse wood, and/or with the exception of many of the culvert sites, tends to be drier due to the influence of the adjacent road and gap in the canopy.

Although relatively limited in nature, project activities would be expected to have several indirect impacts upon mollusk habitat. Roadside tree removal would result in localized minor changes in the microclimate at the ground level.

At some localized points near construction sites where tree cover is removed and the ground is highly disturbed, ground conditions could be changed to a point where they are unfavorable to terrestrial mollusks for several years or more until the area begins to recover, rebuild a duff layer and revegetate. Even after several years, some sites would likely still be unfavorable to terrestrial mollusks for a longer portion of a given year, perhaps by as much as 6-8 weeks as the hottest, most inhospitable portion of a summer is effectively extended due to a lacking well established duff layer and mix of native vegetation. Project design features would help minimize the adverse impacts and promote mollusk habitat recovery. Within some areas the project could result in additional cover at the ground level provided by felled trees retained as Coarse Woody Debris (CWD) within riparian stands; this would benefit mollusk habitat and help mitigate some of the adverse impacts from project implementation. Per the project design features, some of the slash generated from tree removal would be lopped and scattered down slope of the road, placed over disturbed areas and/or chipped and dispersed on site so as not to detract from visual characteristics. Additionally, all disturbed areas including exposed soils on cut banks and fill slopes would have soils stabilized and appropriate native vegetation (examples grasses, forbs, shrubs and/or trees) established by seeding or manual planting.

Based on the facts that mollusk surveys were completed and no Survey and Manage or Bureau Sensitive terrestrial mollusk species were located; the general scope and nature of the proposed project; incorporated

design features; and the types of habitats impacted, the expected level of direct and indirect impacts to terrestrial Special Status mollusk species populations are considered to be minor.

The Olympia pebblesnail (*Fluminicola virens*) (BS) is a new species added to the BLM State Director's Special Status Species List. It is a freshwater snail usually found in clear cold streams with a high dissolved oxygen content and a coarse but stable substrate. One historic (pre-1928) record exists of the Olympia pebblesnail from the Nestucca River; it was located just a couple of miles upstream from Cloverdale, Oregon, approximately 20 miles downstream from the western most portion of the project area. The potential habitats for the Olympia pebblesnail were not surveyed during terrestrial mollusk surveys conducted for the Byway project; per BLM Policy, pre-project surveys for species with only a BLM Special Status species designation of Bureau Sensitive (BS) are not required. In 2012, BLM conducted aquatic invertebrate surveys at 35 sites throughout the Nestucca Watershed east of the Bear Creek confluence as well as within the East Creek and East Beaver Creek drainages; no Olympia pebblesnails were located during these surveys and this species has not yet been located in streams located on BLM lands managed by the Tillamook Field Office. Given the general scope and nature of the proposed project; incorporated design features to protect water quality and minimize sediment delivered to stream channels; potential impacts to the Olympia pebblesnail would be considered to be very minor or unlikely.

Bald Eagle - (BS)

Bald eagles generally nest and/or roost within one mile of a large major river or lake, or within 0.5 mile of a major tributary. They prefer large, older trees that have an open branching pattern in the top half of the tree.

There are no known bald eagle communal winter roosts within or near the Byway project area. The nearest known bald eagle nest is historic in nature and located along Elk Creek about 2.5 miles north of the Nestucca Access Road. Because of the high visibility of bald eagles and bald eagle nests, it is unlikely that undiscovered bald eagle nests or roosts are located within or near the project areas. If a new bald eagle nest or roost is discovered, any project activity within 0.25 mile or 0.5-mile sight distance would immediately be evaluated by the unit wildlife biologist for potential effects on bald eagles, and mitigated to help prevent or reduce disturbances.

Bald Eagle Habitat Modification

Those portions of the Byway project with the potential of impacting bald eagle habitat include removing trees along the project roads to implement maintenance and construction activities, hazard tree removal and clearing of trees to improve sight distances. The majority of these trees would be associated with the proposed road prism widening of a portion of the Nestucca Access Road that is currently gravel-surfaced and/or the replacement of culverts. A portion of the trees to be removed could be suitable for eagles to use for resting, roosting or foraging habitat. None of the trees to be removed are suitable eagle nest trees.

The potential impacts to eagle habitat resulting from the Byway project are considered to be minor largely based on the facts that the current functionality of the habitats to be impacted by tree felling at the stand level to provide resting, roosting or foraging habitat would be maintained. This is largely based upon the dispersed nature of the proposed action, habitats impacted, as well as the quantities of habitats available within the heavily forested landscape of the Wildlife Analysis Area as described above. Other suitable trees are present within the project area.

Potential for Disturbance

There are no known eagle nests or communal roost sites within 0.25 miles of the project area. Dispersed eagle usage may occur throughout the general area containing the Byway project wherever suitable eagle habitat is present; eagle usage of the area most commonly occurs during the late fall or winter months when steelhead, chinook salmon, and Oregon Coast Coho are spawning. Bald eagles are occasionally seen

foraging along stretches of the Nestucca River; these eagle sightings are much more common along stretches of the river located at points west of the Elk Creek/Nestucca River confluence where the river classification changes from a 5th to 6th order stream.

If a new bald eagle nest or roost is discovered, any project activity within 0.25 mile or 0.5-mile sight distance would immediately be evaluated by the unit wildlife biologist for potential effects on bald eagles, and mitigated to help prevent or reduce disturbances.

As a result of project implementation, the project may generate noise above the ambient level and/or create a general disturbance which could displace individual resting, roosting or foraging bald eagles if they were to be in the area. This impact is considered to be minor as eagle usage of the area most commonly occurs during the late fall or winter months, and should they be present during project implementation, it would be expected that displaced birds would simply, temporarily relocate to other areas containing suitable habitat and lower levels of disturbance activity.

Harlequin Duck - (BS)

The harlequin ducks typically nest on the ground in well-concealed locations along fast-moving rivers and mountain streams. Nests are typically located close to water and may be situated at the base of trees, on piles of woody debris, under fallen logs, or on sheltered stream banks. The female begins moving the young downriver within a few weeks after hatching in late May to mid-June. It is estimated that by late August the female and the brood are in the vicinity of the coastal estuary.

Based on the fact that all of the habitats to be impacted are roadside, there is little potential that the project would have any impact upon harlequin duck nesting habitat.

It is possible that breeding harlequin ducks could be within the forest along the Nestucca River or within the river itself while the project is being implemented. The few past observations have occurred within the mainstem of the Nestucca River up to approximately the Fan Creek confluence – Nestucca Access Road MP 12. They would likely be most vulnerable during the period of nest incubation, since after hatching, the ducks are highly mobile and would be able to avoid disturbance simply by moving away from the site during other phases of the breeding season. Although it is unknown exactly where in the past, harlequin ducks have nested within the Nestucca River drainage, it has been assumed that the nest site(s) have been located south of the river, an area less vulnerable to disturbance from this project. This is based on the accessibility of the riparian forests from the southern side of the river and the fact the road runs along the northern side of the river; the topography on the north side of the river is also often steeper and less accessible. Whether this assumption is correct is unknown although it seems very plausible. One fact is rather certain however, given harlequin ducks have nested successfully in the area in the past, and that the Nestucca Corridor is the focal point for recreation within the area, they must be fairly capable of locating adequately remote nest sites within an area subject to human disturbances.

The proposed action could potentially cause some disturbance to harlequin ducks including incubating females and/or females with young. While much of the project work would occur higher in the Nestucca watershed than the confluence with Fan Creek, the highest point where harlequins have been observed, or at locations where the road deviates an appreciable distance away from and/or above the river channel, there would be times when potentially disturbing activities would occur in proximity to areas where ducks could be located. Given the relative rarity of sightings of harlequin ducks along the Nestucca River, chances of harlequin ducks nesting near the project areas where disturbances would occur are relatively small; there is also a good chance that if they are nesting in the area, the nest site would be located south of the river in a location less likely to be disturbed by project activities. Should a female with young be in the river during project implementation, it would be expected that the birds would simply, temporarily relocate to other stream reaches containing suitable habitat and lower levels of disturbance activity. Some harlequins appear

to tolerate adjacent human activities although the best habitat is located away from human disturbance (Wallen and Groves, 1989).

Overall, for the reasons outlined above, the identified potential disturbance impacts are considered to be minor and the action would not be expected to result in any loss of population viability or contribute to the need to list under the ESA.

Bats - (BS and/or Salem ROD/RMP Species)

All of these bat species are known to inhabit mature and immature coniferous forest and may forage near riparian areas, open areas, and along forest edges and roads while utilizing large hollow trees for roosting, hibernating, and maternity colonies. While the noted bat species of concern may forage within or near the proposed project areas, there are no negative impacts expected to result from the proposed action which would lead to the elevation of their status, including the need to list under the ESA. This is based upon the nature and scope of the proposed actions. While some of the roadside trees along project area roads needing to be cut could function as night roosts or resting sites, given the heavily forested nature of the surrounding landscape, other suitable trees are present within the immediate area. No trees (living or dead) containing cavities preferred by bats have been identified along project area roads.

There are some potentially beneficial impacts to bats associated with the implementation of the proposed action. The project has incorporated a design feature to provide additional roosting opportunities for bats; structures such as bat boxes or other bat-friendly design features would be installed under new bridges and/or within larger concrete culverts where beneficial. Given there is a general lack of higher quality large snags, within and near most of the project areas, likely limiting the overall value of bat habitat within the area, the addition of structures such as bat boxes would be very beneficial to bats within the area.

Johnson's Hairstreak - (BS)

Johnson's hairstreak is a small butterfly that is dependent on coniferous forests that contain mistletoes of the genus *Arceuthobium*. These mistletoes occur mainly on western hemlock and occasionally true firs. The eggs of this butterfly are laid in mistletoe masses and the larvae (caterpillars) feed on the leaves of the host plant. Some of the stands adjacent to the Byway contain hemlocks and although not observed, there may be mistletoe within these stands that could support this butterfly.

The current range of Johnson's hairstreak is uncertain however, recent efforts have resulted in an additional five records in Oregon with the nearest sighting being approximately 22 miles south of the Byway project area. No pre-project surveys for this species are required or were conducted in support of the Byway project.

Of the records in Oregon, most are from above 2,000 feet, with the majority from the 3500 +/- foot elevation, and a few from as high as 5,000 and 6,000 feet. Elevations of the project area roads range from about 600 feet above sea level at the westernmost end of the project on the Nestucca Access Road to 2,860 feet above sea level on Bald Mountain Road near Sheridan Peak. Approximately 11.6 miles of the 41 miles of project area roads (28%) are above 2,000 feet elevation; the gravel-surfaced section of the Nestucca Access Road, that portion of the project area roads to be most impacted, ranges in elevation from 920 feet to 1,130 feet.

It is estimated that project implementation would result in up to a total of approximately 1,800 trees greater than 6 inches DBH needing to be felled. Approximately 77% of these trees are red alders, 10% are big-leaf maple and 13% are conifers. Although not specifically reported, the vast majority of the conifers needing to be felled, and all of the larger conifers, would be Douglas fir rather than hemlock.

Overall, the identified potential impacts to the Johnson's hairstreak are considered to be minor. The project is expected to impact relatively few hemlock trees and certainly, given the nature and scope on the project, a

miniscule proportion of the available hemlocks within the area would be impacted. The suitability of any potential habitat near the project area roadways would be expected to be maintained.

Migratory Bird Treaty Act (MBTA)

As described in EA section 3.6.1, the project area contains or is near suitable habitat for the olive-sided flycatcher, willow flycatcher, purple finch and rufous hummingbird.

There is a small possibility that the proposed project could, through increased human activity and the creation of noise, disturb nesting birds and/or destroy individual nests for these species and thus result in the loss of breeding potential for the season. This potential impact is however, considered to be minor based on the fact that most of the habitats disturbed or impacted are located directly adjacent to currently open roads and either do not contain the specific habitat features needed for nesting such as a well-defined shrub layer, or are less likely to be inhabited based on the proximity to the open roadways. One possible exception are those habitats in the vicinity of the few rock quarries proposed to be used; receiving only periodic use, unlike the roadside habitats discussed, some of these quarries are not highly disturbed and likely contain or are directly adjacent to suitable habitats for these species.

The identified impacts would not be expected to have a measurable negative effect upon migratory bird populations as there is relatively low probability for direct impacts to nesting birds and the impacts would occur within and near a very minor proportion of the suitable habitats available to the species of concern being analyzed. Given the fact that the project is set in the context of a heavily forested landscape, the scale of the impacts are considered to be negligible relative to the amount of undisturbed suitable habitat within the area.

3.6.5 Cumulative Effects - Alternative 2: The Proposed Action

Special Status Species (BLM 6840 Policy) and/or Survey and Manage Species (SEIS Special Attention Species in Salem ROD/RMP)

Based upon the limited impacts identified, the Special Status and Survey and Manage species analyzed here would not experience any cumulative effects under the Proposed Action. None of the identified, adverse impacts, if realized, would be expected to change the level of population viability for any of the Special Status Species.

Migratory Bird Treaty Act

Because the indirect or direct effects described under the proposed action alternative are minor and would not be expected to have a measurable negative effect upon migratory bird populations, there would be no cumulative effects.

3.6.6 Environmental Effects - Alternative 3

Special Status Species (BLM 6840 Policy) and/or Survey and Manage Species (SEIS Special Attention Species in Salem ROD/RMP) and Migratory Bird Treaty Act

The effects to BLM Special Status wildlife species, Survey and Manage species, and Migratory Bird Treaty Act species of concern from Alternative 3 would largely be the same as Alternative 2; all the same applicable BMPs and PDCs would be followed.

Given the fact that under Alternative 3, there would be no sub-grade widening associated with the paving of the gravel-surfaced section of Nestucca Access Road, and the single-lane Elk Creek Bridge and three culverts

on fish-bearing streams proposed for replacement under Alternative 2 including the Bear Creek Culvert, Quad Pipes and Fairdale Crossing would not be replaced, the identified adverse impacts from disturbance and/or habitat modification would be reduced or would not occur at these sites.

It has been calculated that under Alternative 2 the project's proposed road prism widening along segments of the currently gravel-surfaced 2.7 mile long section of the Nestucca Access Road would result in approximately 3.45 acres of forestland being permanently converted to road prism; under Alternative 3 this acreage figure would be reduced possibly by as much as 0.5 acres. Although relatively minor, especially given the linear nature of forestlands impacted set in the context of a heavily forested landscape, this difference would proportionally reduce the impacts associated with forest conversion from what was described in Alternative 2.

3.6.7 Cumulative Effects - Alternative 3

Special Status Species (BLM 6840 Policy) and/or Survey and Manage Species (SEIS Special Attention Species in Salem ROD/RMP)

Based upon the limited impacts identified, the Special Status and Survey and Manage species analyzed here would not experience any cumulative effects under Alternative 3. None of the identified, adverse impacts, if realized, would be expected to change the level of population viability for any of the Special Status Species.

Migratory Bird Treaty Act

Because the indirect or direct effects expected under Alternative 3 are minor and would not be expected to have a measurable negative effect upon migratory bird populations, there would be no cumulative effects.

3.7 Invasive, Non-native Plant Species (Executive Order 13112)

Executive Order 13112 was issued by President Clinton on February 3, 1999, to prevent the introduction of invasive species; provide for their control; and minimize the economic, ecological, and human health impacts that invasive species cause. This order defines invasive species, requires federal agencies to address invasive species concerns and to not authorize or carry out new actions that would cause or promote the introduction of invasive species, and established the Invasive Species Council.

3.7.1 Affected Environment

Invasive plants are non-native plant species whose introduction causes economic or environmental harm or harm to human health. Noxious weeds are a subset of invasive plants with formal federal or state designations. More than 100 invasive and 25 listed noxious weed species have been documented on lands administered by the Salem District BLM. Invasive plant species' have a wide variety of distribution patterns, spread strategies, and responses to integrated pest management strategies. Invasive species which currently do not occur within the Salem District, but which have the potential to invade are considered "Early Detection Rapid Response (EDRR) Species" and there are over a hundred known species that fit this category.

Management activities, particularly those which are ground disturbing like heavy equipment operation can facilitate the spread of invasive plants. Prevention practices are normally included in management actions to help limit the introduction and spread of invasive plants.

Existing roadside vegetation along the Byway project area consists of red alder, Douglas fir, western hemlock and bigleaf maple. Individual tree age and plant associations vary throughout the 41 miles of road from mature conifer overstory, to scattered pockets of hardwoods with under-story of common shrubs and

scattered populations of grasses and forbs. Varieties of habitats are represented throughout the project area (substrates, rock, features, elevations, slopes, aspects, water, and topography). Examples of management activities associated with the Byway project that could cause soil disturbance and influence the spread of invasive/non-native plant species are: culvert replacement, new bridge construction, construction of new turnouts, road re-alignment, roadside tree removal and road maintenance. Activities that do not necessarily create disturbance but influence the spread of weed seeds are vehicle traffic, recreational hiking, biking, horseback riding, fishing, and hunting. Other examples of seed dispersal are from wildlife that are either passing through or frequent the area, water movement, and wind. Adjacent to the project area are many past and present management activities that tend to open dense forest settings and disturb soils therefore providing opportunities for widespread weed infestations to occur. Many, if not all of the weed species designated as category B on the Oregon Department of Agriculture's (ODA) noxious weed list are present throughout the area; category B weeds are regionally abundant (ODA, 2015) Because they are present in and adjacent to the project area, newly formed seed and vegetative propagules are readily available and/or an established seed bank is present.

Botanical surveys for invasive, non-native plant species within the project area were conducted in April 2015. Areas targeted for surveys were potential new bridge or culvert construction sites (Elk Creek, Testament Creek and Bear Creek) and where the roadsides would be widened along the main Nestucca Access Road. Completed surveys indicate that where mature native plant communities were established, non-native species were not dominant or were non-existent. Because the majority of the survey area was within or adjacent to the road prism where more light is available and disturbance from road maintenance occurs annually many non-native invasive species are present. Invasive, non-native plant species identified were bull thistle (*Cirsium vulgare*), Canada thistle (*Cirsium arvense*), Scotch broom (*Cytisus scoparius*), tansy ragwort (*Senecio jacobaea*), St. Johns-wort (*Hypericum perforatum*), oxeye daisy (*Leucanthemum vulgare*), Shining geranium (*Geranium lucidum*), buttercup (*Ranunculus repens*), horsetail (*Equisetum telmateia*), perennial pea (*Lathyrus latifolius*) and Herb Robert Geranium (*Geranium robertianum*). These aggressive weed species are prevalent throughout western Oregon and proliferate easily through vectors such as human traffic, animal movement, wind, and water.

3.7.2 Environmental Effects - Alternative 1: No Action

Surveys completed show that most invasive/non-native species found were located along existing roadways. For all invasive weed species identified no appreciable increase in populations would be expected to occur if the No Action Alternative is selected. Plant communities within the project area would continue to be dependent on ecological processes currently in place. Based on the lack of shade tolerance no appreciable increase in the non-native or invasive plant species populations identified during the field surveys would be expected to occur within the interior of existing forested stands. However, as routine roadside maintenance activities (culvert cleaning, brushing) and/or hazard tree removal occur, a very minor increase or spread of existing non-native invasive plant species could be expected as these species continue to invade the areas that have soil disturbance and/or are exposed to higher intensities of light. This minor increase in non-native or invasive plant species populations would be expected to decrease over time as native species re-vegetate and/or the recovery of canopy closure occurs.

3.7.3 Cumulative Effects - Alternative 1: No Action

Because the No Action Alternative would have only very minor indirect or direct effects upon any of the invasive/non-native plant species analyzed, there would be no cumulative effects.

3.7.4 Environmental Effects - Alternative 2: The Proposed Action

All species identified during surveys were category B on the Oregon Department of Agriculture and are common throughout northwest Oregon. These species are basically everywhere and have already spread

beyond the level for full eradication treatments to be successful. The species that are considered EDRR are the plants that are a concern as these are newly introduced, high priority invasive plant species that if caught at an early stage can be controlled and/or eradicated. No EDRR species were located during surveys.

Most non-native weed species are not shade-tolerant and would not persist in a forest setting as they compete for light when tree canopies close and light to the understory is reduced. Based on what is known about invasive plant distribution, dispersal mechanisms and their ability to establish in newly disturbed sites we can expect new and old populations to fluctuate over time within the analysis area based on these factors as described.

The invasive non-native weed species found during surveys were located along existing roadways; identified species are relatively common throughout the region. We would expect an initial increase in population size and new establishments to be confined to disturbance areas where seed banks are exposed, light exposure is increased, soil temperatures rise, and other vegetative competition is reduced. Any potential increase of invasive species would be expected to decrease over time as native species re-vegetate and the recovery of canopy closure occurs. After the initial increase in weed populations and the subsequent reduction, it would be expected that populations of non-native weed species would again reach a level more similar to the current “background” populations. All invasive/non-native plant species identified throughout the project area do not tolerate overtopping and can be negatively affected by competition for light, although because of the road prism, 100% canopy closure is not expected and some degree of spread due to activities as described in “affected environment” would continue to occur. Design features incorporated into this project such as washing equipment prior to entering the project area, introducing native plant species on disturbed sites and monitoring for new invasive non-native plant populations would reduce impacts if the proposed action is implemented.

Restoration of the asphalt waste area across from the Davidson rock pit would result in site disturbance. Where site disturbance occurs and/or replacement soil is incorporated at the site, native plants would be planted or seeded to mitigate the development of new introduction of invasive non-native plant species. The proposed restoration activities at this site would help diminish the current non-native, invasive weed component which dominates portions of this site. Design features such as monitoring of this site would assure new high priority weed species would be targeted for treatment. The portion of the site where a day-use area would be developed would be monitored for weeds annually along with the rest of the recreation sites such as the campgrounds along the Nestucca Access Road based on their high use by the public.

All BLM rock quarries used for sources of gravel extraction and temporary storage areas on BLM land would be surveyed for invasive and non-native plant species prior to project implementation. Based on the presence of invasive and non-native species identified, an appropriate eradication treatment method would be developed and implemented and/or a determination would be made as to if the use of the source would be acceptable for the proposed project. This would help minimize the impacts of project implementation upon the spread of invasive, non-native plant species.

3.7.5 Cumulative Effects - Alternative 2: The Proposed Action

Considering the project design features to wash equipment and monitor for the introduction of new high priority weed species, the Proposed Action Alternative is expected to have only minor indirect or direct effects upon any of the invasive/non-native plant species analyzed. A combination of Federal, State and private timber lands are found within the project area. Examples of forest management activities within the analysis area that will create soil disturbance and influence the spread of noxious/non-native invasive plant species are regeneration harvest, commercial and pre-commercial density management thinning, young stand maintenance, new road construction, road decommissioning, road maintenance, culvert replacements, helicopter landing zones, and motorcycle trails. Activities that do not necessarily create disturbance but influence the spread of weed seeds are recreational camping, hiking, biking, horseback riding, fishing, and

hunting. Other sources of seed dispersal are from wildlife that are either passing through or frequent the area, water movement, and wind. Many past and present management activities tend to open dense forest settings and disturb soils therefore provide opportunities for widespread weed infestations to occur. Timber management, illegal garbage dumping, OHV use and other recreation activities that occur independent of the Nestucca Back Country Byway Project will contribute to the pulse of common weed species already found throughout the analysis area. The concern is not these common weed species but the potential for new EDRR (early detection rapid response) invasive non-native species that would be considered high priority to control new populations especially if they were to appear on BLM managed land or road accesses. Because of these other identified activities that could introduce new infestations of invasive species may occur without the implementation of the Nestucca Back Country Byway Project, implementation of the proposed action would not result in cumulative effects in the analysis area.

3.7.6 Environmental Effects - Alternative 3

The environmental effects of Alternative 3 would largely be the same as the environmental effects for Alternative 2. Although, under Alternative 3, there would be a proportional reduction (approximately 25%) in use of waste sites and rock quarries, and maintenance and use of haul routes to reflect the scaling back of portions of the project (road prism widening, retaining wall construction and culvert replacement) relative to Alternative 2. One notable exception would result from the fact that under Alternative 3, there would be no restoration activities at the current asphalt waste area across from the Davidson rock pit. Native plants would not be planted or seeded at this site to help diminish the current non-native, invasive weed component which dominates portions of this site. A day-use area would not be developed and therefore would not be monitored for weeds annually along with the rest of the recreation sites.

3.7.7 Cumulative Effects - Alternative 3

Considering the project design features to wash equipment and monitor for the introduction of new high priority EDRR weed species, Alternative 3 is expected to have only minor indirect or direct effects upon any of the invasive/non-native plant species analyzed. A combination of Federal, State and private timber lands are found within the project area. Examples of forest management activities within the analysis area that will create soil disturbance and influence the spread of noxious/non-native invasive plant species are regeneration harvest, commercial and pre-commercial density management thinning, young stand maintenance, new road construction, road decommissioning, road maintenance, culvert replacements, helicopter landing zones, and motorcycle trails. Activities that do not necessarily create disturbance but influence the spread of weed seeds are recreational camping, hiking, biking, horseback riding, fishing, and hunting. Other sources of seed dispersal are from wildlife that are either passing through or frequent the area, water movement, and wind. Many past and present management activities tend to open dense forest settings and disturb soils therefore provide opportunities for widespread weed infestations to occur. Timber management, illegal garbage dumping, OHV use and other recreation activities that occur independent of the Nestucca Back Country Byway Project will contribute to the pulse of common weed species already found throughout the analysis area. The concern is not these common weed species but the potential for new EDRR (early detection rapid response) invasive non-native species that would be considered high priority to control new populations especially if they were to appear on BLM managed land or road accesses. Because of these other identified activities that could introduce new infestations of invasive species may occur without the implementation of the Nestucca Back Country Byway Project, implementation of Alternative 3 would not result in cumulative effects in the analysis area.

3.8 Review of Elements of the Environment Based On Authorities and Management Direction

Table 12. Elements of the Environment Review based on Authorities and Management Direction

Element of the Environment /Authority	Remarks/Effects
Aquatic Conservation Strategy	This project complies with the Aquatic Conservation Strategy described in the Northwest Forest Plan and Salem District ROD/RMP (EA section 3.9).
Air Quality (Clean Air Act as amended (42 USC 7401 et seq.))	This project is in compliance with this direction because air quality impacts would be of short duration and localized effects (EA section 1.3.1).
Cultural Resources (National Historic Preservation Act, as amended (16 USC 470) [40 CFR 1508.27(b)(3)], [40 CFR 1508.27(b)(8)])	This project is in compliance with this direction and it would have no effect on cultural resources because of project design to avoid known historic properties as a result of cultural resource surveys. There are no previously recorded sites within the area of potential effect and a survey of high and medium probability ground would occur prior to the Decision(s). Discovery of any cultural resources during implementation would require avoidance or mitigation measures. Ground disturbing work would be suspended if cultural material is discovered during project work until an archaeologist can assess the significance of the discovery. The District Archaeologist may subsequently redesign the project or develop mitigation procedures to protect the cultural resource values present.
Ecologically critical areas [40 CFR 1508.27(b)(3)]	Portions of the Byway project are located within the Nestucca River Area of Critical Environmental Concern (ACEC) which was designated in recognition of its important scenic, fisheries and wildlife values (EA section 1.4.2). The project design contains BMPs and PDFs which would minimize impacts to important ACEC values. Continued monitoring of the ACEC is incorporated into the design features for the Proposed Action (EA section 2.2).
Energy Policy (Executive Order 13212)	This project is in compliance with this direction because it would not interfere with the Energy Policy (Executive Order 13212).
Environmental Justice (E.O. 12898, "Environmental Justice" February 11, 1994)	This project is in compliance with this direction because it would have no effect on low income populations.
Fish Habitat, Essential (Magnuson-Stevens Act Provision: Essential Fish Habitat (EFH): Final Rule (50 CFR Part 600; 67 FR 2376, January 17, 2002)	This project is in compliance with this direction and consultation for anticipated adverse effects to EFH would be completed with NMFS by way of a Biological Opinion for the Nestucca Back Country Byway Project and Essential Fish Habitat (EA section 3.4).
Farm Lands, Prime [40 CFR 1508.27(b)(3)]	The project would have no effect on this element because no prime farm lands are present in the project area.
Floodplains (E.O. 11988, as amended, Floodplain Management, 5/24/77)	This project is in compliance with this direction because the proposed treatments would not affect flood plains except at major culvert replacement sites and any affects to floodplain function from those actions would be beneficial (i.e. providing additional floodplain area) (EA section 3.3).

Element of the Environment /Authority	Remarks/Effects
Hazardous or Solid Wastes (Resource Conservation and Recovery Act of 1976 (43 USC 6901 et seq.) Comprehensive Environmental Repose Compensation, and Liability Act of 1980, as amended (43 USC 9615)	This project is in compliance with this direction because solid waste material generated by project implementation such as unsuitable back-fill material from excavations would be permanently stored at appropriate BLM permanent waste sites consistent with the Salem ROD/RMP and PDFs and BMPs. The project also addresses the restoration of an identified asphalt waste site located within a riparian area on BLM land with excavated material being stored at an appropriate site.
Healthy Forests Restoration Act (Healthy Forests Restoration Act of 2003 (P.L. 108-148))	This project is in compliance with this direction because the project would not hinder the restoration of forests to healthy functioning condition and contains PDFs to not increase the risk of fire.
Migratory Birds (Migratory Bird Act of 1918, as amended (16 USC 703 et seq))	This project is in compliance with this direction because the project would have only minor impacts upon migratory birds with no measurable negative effect upon migratory bird populations (EA section 3.6).
Native American Religious Concerns (American Indian Religious Freedom Act of 1978 (42 USC 1996))	This project is in compliance with this direction because no Native American religious concerns were identified during the scoping and/or consultation periods (EA sections 1.3 and 5.1).
Noxious Weed or non-Invasive, Species (Federal Noxious Weed Control Act and Executive Order 13112)	This project is in compliance with this direction because Project Design Features would minimize the potential establishment of new populations of invasive plant species. The PDFs also include monitoring of disturbed sites for weed infestations (EA section 3.7).
Park Lands [40 CFR 1508.27(b)(3)]	The project would have no adverse effect on parks, park lands or recreation management areas beyond the project operations. Project would enhance safety while traveling to parks, provide safer river access points, improve parking and access to Elk Bend Recreation Site, improve access for day-use and improve safety at Off-Highway Vehicle staging areas and trail crossings along Bald Mountain Road (EA sections 3.2).
Public Health and Safety [40 CFR 1508.27(b)(2)]	The project would have no adverse effect on this element because public access would be controlled within the project area during construction activities and the project would not create hazards lasting beyond project operations. Project would benefit public safety (EA section 3.1 and 3.2).
Threatened or Endangered Species (Endangered Species Act of 1983, as amended (16 USC 1531))	The project may affect spotted owls, marbled murrelets and OC Coho and their critical habitat(s). This project is in compliance with this direction because BMPs and PDFs have been included to minimize these impacts and because Section 7 Endangered Species Act Consultation would be completed (EA sections 3.4, 3.5 and 5.2).
Water Quality – Drinking, Ground (Safe Drinking Water Act, as amended (43 USC 300f et seq.) Clean Water Act of 1977 (33 USC 1251 et seq.)	This project is in compliance with this direction because Oregon State water quality standards would be adhered to and water quality would be maintained or improved (EA section 3.3).

Element of the Environment /Authority	Remarks/Effects
Wetlands (E.O. 11990 Protection of Wetlands 5/24/77) [40 CFR 1508.27(b)(3)]	This project is in compliance with this direction. While there are wetlands within the project area, no adverse impacts are anticipated (EA section 3.3).
Wild and Scenic Rivers (Wild and Scenic Rivers Act, as amended (16 USC 1271) [40 CFR 1508.27(b)(3)])	This project is in compliance with this direction. The Nestucca River has been determined as suitable for recreational river listing under the Wild and Scenic River Act with scenic qualities, recreational potential, and fisheries resources being identified as outstandingly remarkable values. BLM's responsibility for management of river segments found to be suitable for designation as a component of the National Wild and Scenic River System consists of protecting and/or enhancing the free-flowing condition, water quality, and values which make it outstandingly remarkable while also providing river related outdoor recreation opportunities (BLM Manual 6400, page 1-7). Scenic values would experience short-term adverse impacts as a result of the Byway project however these impacts would diminish over a 4 to 5-year period to provide neutral effects on the outstandingly remarkable scenic values. Adverse impacts to recreational resources have been minimized and the project would enhance long-term recreational potential of the area. After some very short-term adverse impacts to fisheries resources, there would be long-term benefits to fisheries. (EA sections 3.2 and 3.4).
Wilderness (Federal Land Policy and Management Act of 1976 (43 USC 1701 et seq.); Wilderness Act of 1964 (16 USC 1131 et seq.))	This project is in compliance with this direction because there are no Wilderness Areas or areas being considered for Wilderness Area status within or adjacent to the project area.

3.9 Compliance with the Aquatic Conservation Strategy

Based on the analysis described within previous sections of this EA, Tillamook Field Office staff have determined that both Action Alternatives comply with the Aquatic Conservation Strategy (ACS) at the 5th field watershed scale (the Nestucca River, Willamina and North Yamhill watersheds) and at the project (site) scales by seeking to maintain and enhance the processes that promote and maintain dynamic aquatic ecosystems. The project complies with the four components of the Aquatic Conservation Strategy, as follows:

ACS Component 1 - Riparian Reserves: An estimated 28.3 miles of the 41 miles of road within the Byway project area (approximately 69%) are within the Riparian Reserve Land Use Allocation (EA section 1.4.2). The Action Alternatives would comply with this ACS component because project actions would improve LWD movement, water quality, sediment regimes and habitat connectivity. All project components include specific project design features that are intended to avoid or minimize adverse impacts to important Riparian Reserve and aquatic functions. The replacement of multiple culverts would improve physical integrity of aquatic habitat and floodplain functioning, and reduce the risk of culvert failure. Treatments of roads and replacement of culverts would decrease sediment input to streams, improve aquatic connectivity and improve floodplain function.

ACS Component 2 - Key Watershed: The majority of the roads to be impacted by the proposed project (approximately 66%) are located within the Upper Nestucca River Tier 1 Key Watershed (EA section 1.4.2).

The action alternatives would meet the objectives of Key Watersheds by: minimizing sediment delivery to streams from roads by paving the gravel section of the Nestucca Access Road, improving stream crossing structures to include passage of 100 year flows and associated bedload and debris, and maintaining and providing additional fish passage at all crossings on fish-bearing streams where work is planned

ACS Component 3 - Watershed Analysis: Based upon its location on the landscape, three Watershed Analyses apply to this project; they include the following: *Nestucca Watershed Analysis* (USDA-USFS and USDI-BLM et al, October 1994), *North Yamhill Watershed Analysis* (USDI-BLM, January 1997) and *Deer Creek, Panther Creek, Willamina Creek and South Yamhill Watershed Analysis* (USDI-BLM, May 1998). The project would comply with ACS Component 3 because these three Watershed Analyses have been used to evaluate existing conditions, establish desired future conditions, and assist in the formulation of appropriate project designs. The project incorporates the following recommendations from these watershed assessments:

- Maintain or improve road drainage by cleaning culverts, replacing decaying culverts and bridges, and installing downspouts on “shotgun” culverts. Replace culverts that inhibit fish passage or are unable to accommodate a 100-year flood event.
- Implement riparian underplanting in the Upper Nestucca Key Watershed which presently has the best riparian conditions in regards to the amount of conifer in the riparian zones but which has site-specific needs throughout the area.
- Existing recreation sites should be evaluated for compliance with the Aquatic Conservation Strategy in the ROD. Identify and implement restoration actions which are needed to maintain compliance.
- Activities that have the potential to increase sediment concentrations or turbidity should examine the impacts on water quality and fish habitat both on-site and downstream.
- Identify road-related sediment problems, such as older roads with inadequate or failing water crossing structures or failing sidecast. Evaluate the potential for sediment delivery from these sources to determine whether it is appropriate to fix the problems.

ACS Component 4 - Watershed Restoration: The proposed project is in large part, a restoration project. The project would comply with ACS Component 4 by improving riparian conditions intended to improve long-term riparian and aquatic conditions. The restoration objectives of the project are described in the proposed action and further defined in design features.

Summary

Tillamook Field Office staff has reviewed this project relative to the ACS objectives at the project or site scale (IM-OR-2007-60) with the following results:

The No Action alternative would not prevent the attainment of ACS objectives because it would maintain current riparian conditions and prevent further degradation. Riparian conditions within the Nestucca River Tier 1 Key Watershed have improved in the last 20 years under management of the Northwest Forest Plan and would be expected to continue to slowly improve under current management strategies. Some of the natural disturbance processes remain adversely affected under the No Action alternative such as streambed downcutting and altered sediment regimes caused by restricted flows through undersized culverts, and roadside ditchlines connected to the stream network causing unnatural sediment inputs.

The Proposed Action and Alternative 3 would not retard or prevent the attainment of any of the nine ACS objectives for the reasons outlined below; many of the actions at the site scale would provide site scale benefits as described below. The main difference between the Proposed Action (Alternative 2) and

Alternative 3 is approximately 0.5 acres of new asphalt pavement on the current gravel-surfaced section (8.0 acres versus 7.5 acres respectively), forgoing replacement of Elk Creek Bridge and culverts at Fairdale Crossing, Quad Pipes, and Bear Creek, and the commensurate reduction in tree removal associated with these projects. Under Alternative 3, restoration of the Asphalt Waste Site would not occur and a day-use recreation site would not be developed. Neither of the action alternatives would prevent the attainment of ACS objective and both would, to varying degrees, improve elements of the watershed. Both alternatives would replace many undersized and/or failing culverts with culverts that would allow unimpeded flows of water and stream bed materials. Both alternatives would pave the gravel section of the Nestucca Access Road and manage stormwater runoff more effectively resulting in less sediment delivery to streams. One of the primary differences between the two action alternatives is that Alternative 3 would not replace three culverts that are partial or total barriers to special status fish species, particularly the ESA listed Oregon Coast Coho salmon. The Proposed Action would provide additional access to 2.4 miles of Coho habitat and improve access to another 4.9 miles of habitat in Bear Creek that are currently restricted during very low and very high flows.

ACSO 1: Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.

No Action Alternative: The No Action Alternative would maintain the access to aquatic habitat that currently exists. Replacement of currently undersized or failing culverts, several of which are barriers for many aquatic species including fish, would not occur. If natural events lead to site scale culvert failures, they would be addressed through maintenance actions as needed. The current distribution, diversity and complexity of watershed and landscape-scale features would be maintained.

Action Alternatives: The Proposed Action and Action Alternative were designed with restoration of riparian and aquatic function in mind. The diversity and complexity of aquatic habitat would be enhanced. The aquatic system would be improved to a condition that more closely resembles that to which the species, communities and populations are adapted. At the landscape scale, diversity and complexity would be maintained.

ACSO 2: Maintain and restore spatial and temporal connectivity within and between watersheds.

No Action Alternative: Albeit somewhat impaired, the current connectivity within and between watersheds would be maintained under the No Action Alternative. There are 16 culverts that are partial or total barriers to fish passage, eight of which on streams inhabited by special status fish. These culverts would not be replaced and would continue to restrict fish use of available habitat. Many other culverts in the watershed are undersized and would continue to prevent effective movement of sediment, bedload, coarse wood and flood flows.

Action Alternatives: Connectivity within the watershed would be improved through the removal of several fish barriers. The primary differences between the two action alternatives is that Alternative 3 would not replace three culverts that are partial or total barriers to special status fish species, particularly the ESA listed Oregon Coast Coho salmon. The Proposed Action would provide additional access to 2.4 miles of Coho habitat and improve access to another 4.9 miles of habitat in Bear Creek that are currently restricted during very low and very high flows.

The replacement of other culverts would improve the movement of sediment, bedload, coarse wood, and flood flows throughout the affected subwatersheds. Therefore, these actions would restore aquatic connectivity at the site and landscape scales.

ACSO 3: Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

No Action Alternative: The current physical integrity of the aquatic system would be maintained or may degrade at the site scale. If undersized culverts and/or those at the end of their functional life fail, adverse impacts to banks and bottom configurations would occur.

Action Alternatives: The physical integrity of shorelines, banks and bottom configurations would be restored by means of installing numerous properly sized culverts. Over time, these properly sized culverts would increase channel stability and physical integrity of the aquatic system. Short-term adverse and beneficial impacts to banks and bottom configurations are anticipated; this action returns the affected sites to a more natural condition. Upgrading culvert sizes would reduce stress on streambanks, a beneficial effect. Alternative 3 would not replace three major culverts or Elk Creek Bridge as proposed for replacement under Alternative 2.

ACSO 4: Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems.

No Action Alternative: The current condition of the water quality would be maintained, however an increased risk of culvert plugging or failure, likely associated with storm events, would be anticipated to have site-specific adverse impacts if they occur. As most of the 130 culverts and cross-drains analyzed in this project are undersized and at a higher risk of plugging during winter storm events, periodic cleaning of several plugged culverts during annual winter storm events through normal maintenance procedures is assumed over the 8 to 10 year period covered by this analysis. This would negatively impact water quality at the site scale as stored sediments are released. The 2.7-mile gravel-surfaced section of the Nestucca Access Road would continue to contribute fine sediment to the Nestucca River and its tributaries.

Action Alternatives: Project design features would ensure that water quality would not be adversely impacted by the proposed actions outside of defined standards. BMPs and PDFs (including the Storm Water Management Plan) would minimize disturbance to stream channels, prevent and/or minimize project-related sediment from reaching the aquatic system, and minimize the duration and extent of potential elevated turbidities. Therefore, protective BMPs and PDFs coupled with the short duration of any potential impacts are expected to maintain the existing water quality at the site scale in the short-term. Water quality would also be improved by paving a currently gravel-surfaced portion of road, adding cross-drains, and thereby reducing sediment transport to streams. Road improvements would reduce erosion and sediment delivery associated with roads by disconnecting them from the stream network. The difference between building a new day-use area and closing other dispersed recreation sites (pull-offs along the Nestucca Access Road) would effectively move some of the site scale water quality impacts from multiple areas to one. Alternative 3 would not develop a day-use site, but is addressing the dispersed recreation sites at pull-offs (i.e. closing some pull-off sites, creating trails to reduce erosion at others).

ACSO 5: Maintain and restore the sediment regime under which aquatic ecosystems evolved.

No Action Alternative: It is assumed that the current levels of sediment moving into streams would be maintained, however as most culverts analyzed in this project are undersized and at risk of plugging, they disrupt natural sediment transport processes. Undersized and/or improperly sited culverts would continue causing downstream scour and erosion of channel bed and banks. They would continue to require frequent unplugging during flood events, which would cause localized spikes in turbidity levels. The No Action Alternative would maintain current sediment contributions from roads and stream crossings, which could slow progress toward a reduction in turbidity and in-stream fine sediment in streams within the project area.

Action Alternatives: The use of BMPs and PDFs would minimize disturbance to stream channels and stream banks, prevent and/or minimize project-related sediment from reaching the aquatic system, and minimize the duration and extent of potential elevated turbidities. Therefore, protective BMPs and PDFs coupled with the short duration of any potential impacts are expected to maintain the existing sediment regime at the site scale in the short-term. In the long-term, replacement of existing undersized culverts would restore the sediment regime to a condition that more approximates a natural condition. Cross-drains and paving would reduce erosion and sediment delivery associated with roads by disconnecting hydrologic connectivity. Throughout the project area the sediment regime would be restored to one more closely resembling that under which the aquatic ecosystems evolved.

ACSO 6: Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing.

No Action Alternative: No change in in-streams flows would be anticipated. As discussed in ACSO 5 episodic larger flows would continue to be disrupted (culverts plugged) changing the timing and amounts of sediment, nutrient and wood routing.

Action Alternatives: The project is not expected to change instream flows, however, it would result in localized reductions in the velocities of high flows, and would restore patterns of sediment, nutrient and wood routing. Project components would increase compacted surfaces to an extent that could potentially influence instream flows at the site scale; the Storm Water Management Plan would address these potential changes. Therefore, this treatment would maintain stream flows within the range of natural variability at the site scale.

ACSO 7: Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.

No Action Alternative: The current degree of connectivity between streams and floodplains in the project area and water table elevations in meadows and wetlands would be expected to be maintained

Action Alternatives: The Proposed Action would not be expected to have any effect on the timing, variability, or duration of floodplain inundation or water table elevation in meadows and wetlands. The replacement of Bible Creek #2 culvert could reduce inundation of a small, artificial wetland. However, since the wetland is caused by an impoundment of water by the culvert, this change would restore the flow and sediment regimes of the stream. Floodplain inundation and water table elevations would not otherwise be affected by the Action Alternatives. For these reasons, we expect that the Action alternatives would meet the objectives of ACSO 7.

ACSO 8: Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

No Action Alternative: The current species composition and structural diversity of riparian and wetland plant communities would continue. Development of physical complexity and stability may be adversely affected at the site scale should plugging or failure of undersized culverts occur.

Action Alternatives: The Action Alternatives include BMPs and PDFs that would maintain or minimize rates of surface erosion, bank erosion, and channel migration. Riparian plantings at sites that are disturbed would help restore the species composition and structural diversity of riparian plant communities. Restoration of plant composition at disturbed sites including culvert replacement sites would as a part of

project design. The proposed project includes the use of BMPs and PDFs that would minimize the potential for the introduction and spread of invasive plant species.

The new day-use area proposed for development at the asphalt waste site (Alternative 2) would have increased human traffic and associated bank and surface erosion. Visitors at this site would include those displaced by the closure of some to the pull-offs along the Nestucca Access Road. This would effectively move some of the current impacts being realized at the pull-offs to one developed day-use area. The addition of hardened trails and maintenance of the new recreation site would minimize disturbance to riparian areas. Restoration of the asphalt waste site would address the current weeds and potentially remove hazardous materials. Native plant materials used for replanting would benefit the ACS objectives for this site.

Treatment of the asphalt waste site and creation of a new day-use site would not occur with Alternative 3, however all pull-offs proposed for improvement or removal would be completed. The beneficial effects of asphalt removal and planting of native vegetation would not occur at the asphalt waste site.

ACSO 9: Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.

No Action Alternative: The aquatic habitats within many project areas would remain in a simplified state (not completely connected) and less capable of supporting well-distributed populations of native invertebrate and vertebrate populations. For fish species alone, the No Action Alternative maintains no access or restricted access for multiple fish species to over 8 miles of habitat.

Action Alternatives: Habitat functionality for aquatic and riparian habitats would be maintained in the short-term through the use of protective BMPs and PDFs. Many project area streams and riparian areas would be more capable of supporting well-distributed populations of native invertebrate and vertebrate populations due to increased habitat complexity and diversity. The Proposed Action would provide new access or improve access to about 8.5 miles of special status fish habitat. Under Alternative 3, access to special status fish habitat would only be added or improved on about 2 miles of stream.

4. LIST OF PREPARERS

The Byway project contained within this Environmental Assessment was developed and/or analyzed by the Interdisciplinary Team (IDT) of specialists listed in Table 13. Project development work was completed by working in close collaboration with James Elvin (BLM Salem District Engineer) and staff from Western Federal Lands Division of the Federal Highway Administration, Vancouver Washington.

Table 13. List of Preparers

IDT Role or Resource	Name
IDT Leader / Wildlife	Steve Bahe
Forestry	Brian Christensen
Engineering	Joel Churchill
Recreation / Visual Resources	Debra Drake David Moore
Fire, Fuels, Climate Change, Air Quality	Clint Gregory
Botany and Weeds	Kurt Heckerth
NEPA Support	Andy Pampush
Soils / GIS Support	Chris Sween
Cultural Resources	Heather Ulrich
Fisheries	Matt Walker Andy Pampush
Hydrology	Chris Robinson

5. CONSULTATION WITH TRIBES AND AGENCIES

5.1 Tribal Consultation

Tribal consultation has been on-going with the Confederated Tribes of Grand Ronde and the Confederated Tribes of Siletz Indians. No concerns have been expressed to date with regards to the proposed project.

5.2 ESA Consultation

5.2.1 US Fish and Wildlife Service (USFWS)

The spotted owl and marbled murrelet would be affected by this project through the modification of habitat (including Critical Habitat) and through the potential for disturbance. Due to these identified impacts described in EA section 3.5, formal consultation with the U.S. Fish and Wildlife Service is warranted.

Endangered Species Act consultation with USFWS on the Byway project would occur programmatically in a batched Biological Assessment (BA). Batched Biological Assessments are routinely prepared by the interagency Level 1 Team (terrestrial subgroup) for the North Coast Planning Province and contain projects batched by their level of potential impact - *May Affect, Not Likely to Adversely Affect* (NLAA) or *May Affect, Likely to Adversely Affect* (LAA). These batched Biological Assessments contain Design Standards which serve to assure that expected impacts of the batched projects do not exceed those analyzed within the specific assessment(s). Where appropriate, the Byway Project's Project Design Features (PDFs) coincide with the applicable Biological Assessment's Design Standards to assure a seamless ESA consultation process.

The Nestucca Back Country Byway Project has been included within an appropriate batched BA - the *Biological Assessment of Habitat Modification and Disruption Projects Proposed During Fiscal Years 2016 And 2017 in the North Coast Planning Province, Oregon, that are Likely To Adversely Affect (LAA) Northern Spotted Owls or Marbled Murrelets and their Critical Habitats* (dated September 24, 2015) prepared by the interagency Level 1 Team (terrestrial subgroup) and the corresponding Biological Opinion from USFWS dated February 29, 2016.

5.2.2 National Marine Fisheries Service (NMFS)

Based on the analysis presented within this EA, the BLM has determined that the potential impacts to ESA listed fish warrant formal consultation with NMFS for the following reasons:

- 1) Potential inputs of sediment to Coho habitat streams associated with rock and waste material hauling, culvert replacement (including fish passage improvements), and road widening and paving;
- 2) The small reduction in the potential for recruitment of large wood into streams that contribute to Coho habitat suitability both from permanent loss and from construction activities;
- 3) Creation of a new day-use recreation site and its subsequent use by the public.

On June 10, 2014, the Byway project was discussed at a meeting of the Level 1 Team (aquatics subgroup) for the North Coast Planning Province to confirm the preferred ESA consultation process. Two field tours of the Byway project were offered by BLM to the staff from NMFS to discuss consultation items (12/15/14 and 08/05/15).

A project-specific Biological Assessment “*Nestucca Back Country Byway*” is being prepared. Section 7 Endangered Species Act Consultation would be completed prior to any decision authorizing an action.

6. ADDITIONAL SUPPORTING DATA

6.1 BLM Best Management Practices

Best Management Practices are required by the federal Clean Water Act as amended to mitigate the potential for non-point source pollution. Non-point source pollution is from pollutants detected in concentrated water (e.g. stream or lake) from a wide range of activities on federal lands administered by the Bureau of Land Management (BLM). BMPs are considered the primary methods for achieving Oregon’s water quality standards.

The Salem District RMP supplies the following direction: “Follow best management practices for water quality and soil productivity to mitigate adverse effects on soils, water quality, fish, and riparian habitat during road construction and maintenance” (ROD/RMP p. 64).

In 2008 during the Western Oregon Plan Revision process, the BLM reviewed and updated existing BMPs based on implementation and effectiveness monitoring, field experience, and new science. These revised BMPs represent the BLM’s most current set of BMPs. The revised BMPs as contained in Appendix I of the Final Environmental Impact Statement for the Revision of the Resource Management Plans of the Western Oregon Bureau of Land Management, (USDI-BLM 2008) are available for use when designing individual projects and for water quality restoration planning activities. Use of the revised BMPs is considered a plan maintenance action of the 1995 Salem District ROD. Plan maintenance actions occur continuously but must be documented so that the change and field manager concurrence are evident. The 2009 Salem District Annual Program Summary was used to communicate this plan maintenance action to the public. The 2009 Salem District Annual Program Summary is available for review at: <http://www.blm.gov/or/districts/salem/plans/salemrmp.php>.

In 2011, BLM’s Oregon/Washington State Director issued Instruction Memorandum No. OR-2011-074 which directs the incorporation of updated BMPs to reduce sediment delivery from BLM roads in Oregon as a RMP Plan Maintenance action. The list of most pertinent BMPs in Table 14 reflects these Plan Maintenance changes.

BMPs are site specific and the implementation of the BMP is tailored to “on the ground” conditions. The overall goal is not to strictly adhere to the wording of the BMP, but rather to implement the intent of the prescribed BMP. Table 14 includes a list of BMPs that are applicable to the Nestucca National Back Country Byway Project.

Table 14. Most Pertinent Best Management Practices

The Best Management Practices selected for applicable elements and action areas of the proposed action fall into the following categories: R = Roads and Landings; RST = Restoration; SW = Surface Source Water/Drinking Water; and SP = Spill Prevention and Abatement.

BMP Number	Practice Technique
R 007	Design roads to the minimum width needed for the intended use as referenced in BLM Manual 9113.
R 008	End-haul material excavated during construction, renovation, and/or maintenance where side slopes generally exceed 60 percent, and regardless of slope where side-cast material may enter wetlands, floodplains and waters of the state.
R 009	Construct road fills to prevent fill failure using inorganic material, compaction, buttressing, sub- surface drainage, rock facing or other effective means.
R 011	Design culverts, bridges, and other stream crossings for the 100-year flood event including allowance for bed load and anticipated floatable debris.
R 014	On new construction, install culverts at the natural stream grade.
R 022	Install underdrain structures when roads cross or expose springs, seeps, or wet areas rather than allowing intercepted water to flow down gradient in ditchlines.

R 031	Disconnect the road runoff to the stream channel by outsloping the road approach. If outsloping is not possible, use runoff control, erosion control and sediment containment measures. These may include using additional cross-drain culverts, ditch lining, and catchment basins. Minimize ditch flow conveyance to stream through cross-drain placement above stream crossing.
R 032	Locate cross-drains to prevent or minimize runoff and sediment conveyance to wetlands, riparian management areas, floodplains and waters of the state. Implement sediment reduction techniques such as settling basins, brush filters, sediment fences and check dams to prevent or minimize sediment conveyance.
R 033	Space cross-drain culverts at intervals sufficient to prevent water volume concentration and accelerated ditch erosion. At a minimum, space cross-drains at intervals referred to in the BLM Road Design Handbook 9113-1, Illustration 11 - "Spacing for Drainage Laterals". Increase cross-drain frequency through erodible soils, steep grades, and unstable areas.
R 039	Skew cross-drain culverts 45 to 60 degrees from the ditchline as referenced in BLM Road Design Handbook 9113-1 and provide pipe gradient slightly greater than ditch gradient to reduce erosion at cross-drain inlet.
R 041	Locate waste disposal areas outside wetlands, riparian management areas, floodplains and unstable areas to minimize risk of sediment deliver to waters of the state. Apply surface erosion control prior to the wet season. Prevent overloading areas which may become unstable.
R 045	Use temporary sediment control measures (e.g., check dams, silt fencing, bark bags, filter strips and mulch) to slow runoff and contain sediment from road construction areas. Remove any accumulated sediment and the control measures when work or haul is complete. When long term structural sediment control measures are incorporated into the final erosion control plan, remove any accumulated sediment to retain capacity of the control measure.
R 046	Conduct all non-emergency in-water work during the ODFW instream work window.
R 047	Utilize stream diversion and isolation techniques when installing stream crossings. Evaluate the physical characteristics of the site, volume of water flowing through the project area and the risk of erosion and sedimentation when selecting the proper techniques.
R 062	Apply native seed and certified weed free mulch to cut and fill slopes, ditchlines, and waste disposal sites with the potential for sediment delivery to wetlands, riparian management areas, floodplains and waters of the state. Apply upon completion of construction and as early as possible to increase germination and growth. Reseed if necessary to accomplish erosion control. Select seed species that are fast growing, [and] provide ample ground cover and soil-binding properties. Apply mulch that will stay in place and at site specific rates to prevent erosion.

R 063	Place sediment-trapping materials or structures such as straw bales, jute netting, or sediment basins at the base of newly constructed fill or side slopes where sediment could be transported to waters of the state. Keep materials away from culvert outlets.
R 065	Suspend ground-disturbing activity if projected forecasted rain will saturate soils to the extent that there is potential for movement of sediment from the road to wetlands, floodplains and waters of the state. Cover or temporarily stabilize exposed soils during work suspension. Upon completion of ground disturbing activities, immediately stabilize fill material over stream crossing structures. Measures could include but not limited to erosion control blankets and mats, soil binders, soil tackifiers, slash placement.
R 070	Apply water or approved road surface stabilizers/dust control additives to reduce surfacing material loss and buildup of fine sediment that can enter into wetlands, floodplains and waters of the state. Prevent entry of road surface stabilizers/dust control additives into waters of the state during application.
R 091	Following culvert removal and prior to the wet season, apply erosion control and sediment trapping measures (e.g., seeding, mulching, straw bales, jute netting, native vegetative cuttings) where sediment can be delivered into wetlands, riparian management areas, floodplains and waters of the state.
RST 1	Confine work in the stream channels to the low flow period unless a waiver is obtained from the permitting agencies.
RST 7	Inspect all mechanized equipment daily for leaks and clean as necessary to help ensure that toxic materials, such as fuel and hydraulic fluid, do not enter the stream.
RST 10	Refuel equipment, including chainsaws and other hand power tools, at least 150 feet from water bodies (or as far as possible from the water body where local site conditions do not allow a 150-foot setback) to prevent direct delivery of contaminants into a water body.
RST 12	Rehabilitate and stabilize disturbed areas where soil will support seed growth by seeding and planting with native seed mixes or plants, or using erosion control matting.
RST 13	When replacing culverts, install grade control structures (e.g., boulder vortex weirs or boulder step weirs) where excessive scour would occur.
RST 15	Install turbidity control structures (e.g., isolation, diversion, or silt curtains) immediately downstream of in-stream restoration work areas. Remove these structures following completion of turbidity generating activities.
SW 1	Sanitary facilities would be planned, located, designed, constructed, operated, inspected, and maintained to minimize possibilities of water contamination.

SW 9	Conduct equipment maintenance outside site-specific sensitive zones in surface source water watersheds.
SP 1	<p>Inspect and clean heavy equipment as necessary prior to moving on to the project site, in order to remove oil and grease, noxious weeds, and excessive soil.</p> <p>Inspect hydraulic fluid and fuel lines on heavy-mechanized equipment for proper working condition.</p> <p>Where possible, maintain and refuel equipment a minimum of 150 feet away from streams and other waterbodies.</p> <p>In the event of a spill or release, all reasonable and safe actions to contain the material will be taken. Specific actions are dependent on the nature of the material spilled.</p> <p>Use spill containment booms or as required by DEQ. Have access to booms and other absorbent containment materials.</p> <p>Immediately remove waste or spilled hazardous materials (including but not limited to diesel, oil, hydraulic fluid) and contaminated soils near any stream or other waterbody, and dispose of it/them in accordance with the applicable regulatory standard. Notify Oregon Emergency Response System of any spill over the material reportable quantity, and any spill not totally cleaned up after 24 hours.</p> <p>Store equipment containing reportable quantities of toxic fluids outside of riparian management areas.</p>
SP 2	<p>If more than 42 gallons of fuel or combined quantity of petroleum product and chemical substances, as project materials, would be transported to a project site, the following precautions will be implemented:</p> <ol style="list-style-type: none"> 1. Plan a safe route and material transfer sites so that all spilled material will be contained easily at that designated location. 2. Plan an active dispatch system that can relay the information to appropriate resources. 3. Ensure a spill containment kit that can adsorb and contain 55 gallons of petroleum product and chemical substances is readily available. 4. Provide for immediate notification to OERS in the event of a spill. Have a radio-equipped vehicle lead the chemical or fuel truck to the project site. 5. Assemble a spill notification list that includes the district hazardous materials coordinator, DEQ, and spill clean-up contractors. 6. Construct a downstream water user contact list with addresses and phone numbers. 7. When operating within Source Water watersheds, pre-estimate water flow travel times through the watershed to predict downstream arrival times. 8. Be prepared to sample water and carry sample containers. 9. Be prepared to assist OSP and ODFW assess wildlife impacts of any material spilled.

SP 3	Spill Prevention, Control, and Countermeasure Plan (SPCC): All operators shall develop a modified SPCC plan prior to initiating project work if there is a potential risk of chemical or petroleum spills near water bodies. The SPCC plan will include the appropriate containers to be used and design of the material transfer locations. No interim fuel depot or storage location other than a manned transport vehicle.
SP 4	Spill Containment Kit (SCK): All operators shall have a SCK as described in the SPCC plan on-site during any operation with potential for run-off to adjacent water bodies. The SCK will be appropriate in size and type for the oil or hazardous material carried by the operator.
SP 5	Operators shall be responsible for the clean-up, removal, and proper disposal of contaminated materials from the site.

6.2 Stormwater Management Plan

For presentation within this EA, the information below characterizes the Stormwater Management Plan prepared by Federal Highways to address the stormwater runoff from the 2.7 miles of gravel-surfaced road to be paved in the Byway project. The Stormwater Management Plan was developed to accommodate the Proposed Action (Alternative 2); should Alternative 3 be selected, relatively minor adjustments in the specifics of the plan to reflect no subgrade widening could be expected. The entire unaltered stormwater management plan with attachments and drawings is available for review at the BLM Tillamook Field Office and is incorporated in its entirety into the project proposal.

Nestucca River Back Country Byway **STORMWATER MANAGEMENT PLAN**

Prepared by: Sven Leon, P.E., WFLHD Hydraulics Engineer
Date: June 12, 2015

Introduction

The Bureau of Land Management (BLM) is improving approximately 2.7 miles of the Nestucca Access Road. Western Federal Lands Highway Division (WFLHD) will prepare designs, contact documents, and assist with construction oversight for the proposed road improvements. Potential pollutants, proposed stormwater treatment best management practices (BMPs), and expected level of treatment are presented.

Project Description

The project proposes to pave a 2.7-mile gravel-surfaced section on the Nestucca Access Road. Minor road realignment and occasional subgrade widening would be completed prior to paving. Current surface would be reconditioned to prepare for paving and include additional aggregate placement. The segment will be paved with asphalt and chip sealed. Selected turnouts, road junctions, and parking areas would also be paved with asphalt and chip sealed. The road would be striped with centerline and fog lines. The improvements also include replacing the Elk Creek Bridge and installing new fish passage culverts at No Name Creek and Davidson Pit. A number of minor culverts (36-inch or less in diameter) are located throughout the project corridor and serve as ditch relief cross-drains or provide crossings for minor drainage areas. These minor culverts would be replaced during project construction with equivalent diameter culverts (using 24-inches as a minimum diameter). Much of the roadway surface throughout the project corridor is outsloped and directs runoff as sheet flow onto adjacent vegetated areas where it infiltrates. Portions of the roadway surface are insloped and direct runoff into ditches which flow through culverts and onto forested slopes. The majority of these flows do not reach surface waters as direct overland flow. The ditches absorb some of these flows and the rest is dispersed and infiltrated into the undisturbed forested soils. Signs of erosion such as rills and gullies indicate that surface runoff water does not make it very far from the roadway or culvert outlets. Direct discharge from the road surface into surface waters does not occur within the project corridor. A wooded, heavily vegetated buffer at least 80 feet wide exists throughout the project between the south road edge and the Nestucca River bank. Three perennial streams (Elk Creek, No Name Creek, and Davidson Pit Creek) and twelve intermittent streams are found along the road corridor. Existing north-side ditches allow runoff from the roadway to enter these tributary streams. The tributary streams then discharge directly into the Nestucca River. Stream segments downstream of the road are 70 to 400 feet long and have 2 to 50 percent slopes.

Potential Pollutants

The primary potential pollutant in stormwater runoff, caused by the proposed roadway improvements is sediment and total suspended solids originating from soils exposed onsite during and immediately following

the construction process. Sediment may be entrained in stormwater runoff from erosion of cut and fill slope areas excavated and graded for roadway widening.

Sediment may also be entrained in stormwater runoff from erosion of the road ditches and shoulders. Low concentrations of petroleum products, suspended and dissolved metals, and other pollutants normally found in runoff from roadways may be expected. Because of the low ADT (less than 200 vehicles per day) and assuming the recommended stormwater best management practices (BMPs) are implemented, the pollutant concentrations are not expected to exceed those already generated by the existing roadway.

Receiving Waters

The direct receiving water for this project is the Nestucca River. The road segment being improved extends between river mile (RM) 38.6 and 41.6. The Nestucca River supports Coho salmon, which is listed as threatened under ESA. The Coho presence extends through the project reach to the headwaters. Oregon Department of State Lands (DSL) lists the Nestucca River as essential Coho salmon habitat. Oregon Department of Environmental Quality (DEQ) identifies the Nestucca River as being water quality limited. Sedimentation is the primary Water Quality Limited (WQL) parameter affected by the project. The proposed stormwater treatment BMPs are expected to reduce the pollutant levels in the stormwater runoff discharged from the project area to levels below existing conditions.

Contributing Impervious Areas

The proposed project would create an impervious surface area of approximately 7.2 acres. The existing road segment has a compacted gravel surface and is unpaved. The proposed 7.2 acres is considered the contributing impervious area requiring water quality treatment. The lands adjacent to the roadway that are primarily forested are considered to be noncontributing and therefore do not require peak flow reduction or water quality treatment. The increase in stormwater runoff is expected to be mitigated by the increased storage, infiltration, and residency time achieved by the stormwater treatment BMPs implemented for reducing sedimentation.

Stormwater Treatment Best Management Practices (BMPs)

The project would employ stormwater treatment for reducing pollutants within runoff discharging from new cut slopes, new fill slopes, road pavement, and road shoulders. The proposed BMPs are intended to provide some level of treatment before the stormwater discharge enters the Nestucca River or tributary streams. Selections of engineered and non-engineered treatment methods identified in this report are primarily based on the Oregon Department of Transportation's (ODOT) Standard Local Operating Procedures for Endangered Species (SLOPES) IV Handbook (2008).

Treatment methods proposed for the project include natural dispersion, optimizing ditch relief culvert location, treatment ditches, check dams, riprap erosion control, and dewatering areas. The proposed treatment methods utilize available soil infiltration, wooded areas, ditches, natural topographic depressions, and existing swales. Constructing engineered stormwater facilities or conventional bio-filtration swales along the steep terrain located throughout much of the project would require extensive cut and fill construction. This would also require additional clearing of forest which would result in creation of high sediment producing cut and fill slopes.

Natural Dispersion

Utilizing the natural dispersion areas within the project corridor is considered the primary method for providing stormwater runoff treatment. This method of treatment is appropriate for the majority of the project where roadway runoff flows onto adjacent forested areas. The natural undisturbed forest soil/duff layer and vegetation within the project corridor provide an important stormwater function by providing infiltration; nutrient, sediment, and pollutant adsorption; sediment and pollutant biofiltration; water interflow storage and transmission; and pollutant decomposition. Natural sheet flow dispersion onto undisturbed vegetated slopes

provides the simplest and most effective method for attenuation and treatment of runoff. This project proposes to maintain forested dispersion areas wherever possible.

Washington Department of Ecology's Stormwater Management Manual for Western Washington (SMMWW) was used to evaluate the dispersed treatment provided within the project corridor. Soils within the area are classified as hydraulic soil groups B and C, and are heavily forested with significant ground cover. This indicates that moderate to slow infiltration rates, needed for effective dispersion, can be expected throughout the project area. For treatment utilizing dispersion through a naturally vegetated area, the SMMWW requires that 0.5 feet of vegetated buffer (or natural dispersion area) be provided for every 1 foot of paved surface width. For vegetated buffer areas steeper than 8%, the length of treatment needs to be increased by 1.5 feet for every percent increase in slope above 8%. Using the 21 foot paved width and a natural forested slope of up to 50 percent, the minimum buffer width required to provide adequate treatment of sheet flow runoff is approximately 74 feet.

Impervious areas which directly discharge into ditches and storm pipes or sheet flow over short distances (less than 74 feet) require treatment. Impervious areas in which flows are dispersed through at least 74 feet of forested areas are considered treated through dispersion and would not need additional engineered treatment systems. Adequate dispersion is provided by the wooded area between the road and the Nestucca River.

Optimizing Ditch Relief Culverts

Ditch relief culverts are located, where possible, to avoid direct discharge to the river. They are also located away from new hillside excavations, allowing stormwater in the ditch to flow over a longer distance and time, increasing infiltration, sedimentation, and filtration. Ditch widths and depths are adjusted to maintain needed flow capacity. Nine new ditch relief culverts are proposed.

Treatment Ditches

Treatment ditches are installed where dispersion cannot be used for adequately treating the stormwater runoff such as along the toe of new hillside excavations and within roadside ditches. Treatment ditches are grass-lined channels designed to convey and treat water through infiltration, filtration, sorption, hydraulic attenuation, and density separation. Treatment ditches are designed to allow water to flow evenly across their surface. Treatment ditches have a high capacity to remove suspended solids and a moderate capacity to remove nutrients, oil and grease, hydrocarbons, and metals.

Treatment ditches have a bottom width ranging from 4 to 12 feet wide and a minimum length of 100 feet. Treatment ditches are designed to provide water quality treatment for up to 50 percent of the 2-year event peak flow rate. Water quality design depth for these ditches is 4 inches or less, with flow velocities less than 3 feet per second during the 25-year design storm. Longitudinal slope is less than 4 percent with residence times of over 9 minutes. Treatment ditches convey the 25-year design flow while providing a minimum freeboard of 1 foot. Where needed for reducing the energy grade line, flow spreaders installed at maximum 50-foot intervals would dissipate energy and evenly spread flow in the ditches. An amended soil mix, designed with characteristics ideal for water quality treatment and long term hydraulic conductivity, would be tilled into the top 6-inches of native soil just below the ditch for promoting infiltration.

Proper vegetation in the ditches is essential for promoting water infiltration into the soil and removal of sediment. The BLM re-vegetation plan provides specific information on plant species, quantities, and planting techniques. Plant species to be used would be selected based on projected site hydrology, their ability to filter sediment, as well as their ability to uptake metals, nutrients, and other pollutants that may be found in stormwater runoff from the project.

Proposed treatment ditches total 1,800 feet of treatment ditch which is proposed in twelve locations with each ranging in length between 100 and 200 feet. The water quality and peak 25-year event flows used to design the swales was estimated using the Rational Method as outlined under ODOT's Hydraulic Manual. Federal

Highway's Hydraulic Toolbox software was used to size the swales to meet the requirements outlined above. An existing ditch segment approximately 1,200 feet long would be widened for increasing flow capacity. It would not be constructed as a treatment ditch, but widening the ditch would encourage infiltration and increase the residency time of the stormwater conveyed in the ditch.

Check Dams

Check dams are proposed for reducing the energy grade line and slowing the water flowing in the ditches. Slow flowing water reduces ditch and shoulder erosion and encourages infiltration and sediment deposition. Check dams are located at existing drainage swales immediately adjacent to the roadway and at roadside ditches with moderately steep slopes. There are six check dams proposed in this segment of the Nestucca Byway.

Riprap Erosion Control

Controlling erosion at culvert outlets, culvert inlets, and roadside ditches is essential for reducing the amount of sediment released with the stormwater discharge. Two culvert with outlets observed to be experiencing erosion would receive riprap splash pads. Two locations that have high embankments with deeply buried culverts would receive overflow culverts. The culvert outlets would be installed with elbows and down drains extending to the embankment toe. Riprap splash pads are proposed for the down drain outlets. Culverts with diameters equal to and larger than 36 inches also receive riprap headwalls at the inlet for controlling road shoulder erosion. Culverts smaller than 36 inches typically do not have frequent and sustained flows needed for causing significant erosion. Riprap headwalls are also proposed for the two Aquatic Organism Fish Passage (AOP) culverts. One riprap aprons is proposed for immediately downstream of a check dam that discharges on to a steeply sloping embankments. Ditches with slopes greater than 4 percent and where installing additional cross-drainage culverts for reducing the amount of ditch flow is not possible would be lined with riprap. Two lined ditches are proposed, each approximately 350 feet. Two small riprap discharge aprons would be placed at the west end of the new Elk Creek Bridge for controlling road embankment erosion from bridge deck runoff.

Dewatering Areas

Groundwater may be encountered while excavating and installing the AOP culverts. Groundwater removed from the excavation cannot be discharged directly to wetlands, tributary streams, or the Nestucca River. Topographically low areas or areas in nearly flat roadside ditches near the AOP culvert sites can be used to detain and infiltrate the water removed from the excavations. Water discharged from the dewatering areas would not be allowed to flow directly into wetlands, tributary streams, or the Nestucca River. It would be encouraged to flow through wooded areas for natural dispersion. Sediment deposited in the dewatering areas would be removed and the areas regraded and replanted to approximately existing conditions. The forested soils would continue to provide additional infiltration, attenuation, and treatment of the runoff.

Maintenance

Maintenance would be conducted on all BMPs by the BLM to insure their effective operation and would generally follow the guidelines found in the ODOT's Road Maintenance Guide (ODOT 2004). Maintenance of vegetation in ODOT's Road Maintenance Guide is generally described as "Activities designed to restore sight distance, minimize or remove shading that may cause icy road conditions, and control or prevent slope failure. These activities are also designed to control unwanted vegetation, control noxious weeds, comply with city, county or local ordinances, reduce fire danger, reduce snowdrift accumulation near roadways, and to maintain a clear zone along the roadway. These actions involve mechanical mowing, trimming, removal of brush and cleanup."

Conclusion

The stormwater treatment proposed for this project provides pollutant removal to the maximum extent practicable while minimizing disturbance of forested areas. Promoting the use of the natural forested areas

for dispersion helps to reduce the removal of trees and native soils which would be required to construct additional stormwater treatment facilities.

6.3 Nestucca Back Country Byway Signage Plan

This signage plan is intended to communicate and guide the management of signage along the Nestucca Back Country Byway. Other than as described below, new signing supporting the Upper Nestucca OHV Area would be done in a separate planning process.

Area Description

The physical scope of this plan includes the entire Byway and its portals in Willamina, Carlton and Beaver as well as the approach roads mentioned below and intersections associated with them.

The Byway is located on approximately 41 miles of BLM controlled roads in Tillamook and Yamhill Counties, Oregon; three roads are designated as a Back Country Byway: the Nestucca Access, Bald Mountain and Bible Creek Access Roads. These road segments form a loop and are located between approximately 14 miles east of Beaver, Oregon (U.S. Highway 101) to approximately 10 miles west of Carlton, Oregon (Oregon Route 47). In addition to roads contained within the designated Back Country Byway, this sign plan applies to the 1.2 miles of Bald Mountain Road located in T4S, R7W sections 22 and 27 which is not designated as Back Country Byway.

The approximate 14 mile road segment located west of the BLM controlled roadway to Hwy 101 in Beaver is commonly referred to as Blaine Road; it is under the jurisdiction of Tillamook County. The 10 mile road segment located to the east of the Byway to Oregon Route 47 at Carlton is commonly referred to as Meadow Lake Road; it is under the jurisdiction of Yamhill County. The portion of Bald Mountain Road within the project area heads 1.2 miles south of the designated Back Country Byway loop and ends approximately 10.5 miles north of Willamina, Oregon via what are commonly referred to as Gilbert Creek, Coast Creek and Willamina Creek Roads which are also under the jurisdiction of Yamhill County. Bald Mountain Road also bisects the Upper Nestucca Off Highway Vehicle (OHV) Area, sharing five trail intersections with the OHV trail network as well as being a designated OHV travel pathway itself.

Objectives

This sign plan would provide information, improve safety through improved navigation and regulation and identify the Byway and its features to the public. This plan will deal only with traffic and interface issues directly associated with the Byway. The greater BLM managed route network will not be affected by this plan, except where it intersects the Byway.

Sign Categories

The following sign categories represent the categories as defined by the BLM *Sign Guidebook* (USDI-BLM, 2004) and how they relate to signing the byway.

Identification Signs

Identification Signs are also known as Gateway, Portal, or Area signs. Identification signs help to orient the visitor, project the presence and image of the BLM to the visitor, and identify important areas, facilities, and visitor amenities. These signs also provide visitors with a ready recognition of BLM facilities, projects, and services. These signs designate the primary entrances to a land area, campground, facility, or group of facilities.

Portal signs would be placed (or replaced) at the three entrances to the Byway to inform visitors of entry onto BLM managed lands. These signs would welcome all travelers to the Byway and inform the traveler that they have entered public lands. Placing signs along major thoroughfares and gateway communities would raise traveler's awareness of the Byway and aid navigation at appropriate intersections.

Area signs would be placed at the entrance of each of the four BLM campgrounds, the proposed day-use site at the asphalt waste area and current site at Sheridan Peak, OHV area boundaries and OHV staging areas. Area signs help the user easily identify sites; examples include “Alder Glen Campground” and “Sheridan Peak Picnic Area”.

Guide Signs

Guide Signs direct the visitor to a specific destination, such as communities, towns, facilities, projects, features, or points of interest. These signs typically use arrows and distance indicators.

Directional signs would be placed throughout the route, to include neighboring communities or access points. These signs would provide directional arrows and mileage to points of interest, day-use sites, staging areas, campgrounds, and communities. Signs would be placed at intersections and major access routes, aiding travelers’ navigation along the rural roads.

Guide signs would also include signs that identify road names and numbers and consecutive mile markers throughout the entirety of each road. An example of a road name and number would be a sign at each end of Bible Creek Road identifying the name of the road and the coinciding road number, “Bible Creek Road, 4-7-22.0”. Mile markers would follow standard designs as those found on highways. These signs would begin at mile marker 00 where the roadway begins at the north or west end of the route and numbered consecutively throughout the length of the road. The mile markers would progress as the road travels west or east from the start point. Using the Nestucca Access Road as an example, mile marker 00 would be located at the intersection of Blaine Road and US Highway 101, in Tillamook County, progressively getting larger through BLM managed lands and ending in Yamhill County at the end of Meadow Lake Road, potentially at the intersection with Oregon Route 47. Coordination with Yamhill and Tillamook Counties would be required to arrange for consistent mileposts across jurisdictional boundaries along the Byway and county roads accessing the Byway. Guidance outlining placement of mile markers can be found on Oregon Department of Transportation’s website (<http://www.oregon.gov/odot/comm/docs/highwayexitsmileposts1012.pdf>).

Informational Signs

These are located in key areas throughout an area and provide important information to visitors. The message should be conveyed in a brief, clear manner and be conveniently located to provide information to the visitor. Included in informational signs is the interpretive sign. These are placed in specific locations around a project area to provide information/interpretation about the resources of the area.

Informational signs would include kiosks. These signs would be designed to convey messages to the traveler. These messages may include maps showing the location of the kiosk and travel directions to points of interest. They would also include information regarding the general area, road conditions, and use types, such as bicycles or OHVs on the roadway, and identification of recreation sites and trail opportunities. Kiosks may also include interpretation or educational materials describing a site or natural process. An example would be the importance of the river ecosystem and the fish and wildlife species reliant on a healthy ecosystem.

There are currently three large kiosks placed along the Byway providing a large overview of the area. There are also a number of small kiosks associated with the campgrounds and picnic site identifying the site rules and notices to the public of road closures, changes in fire levels, and other pertinent information that could likely affect the planned activities during a site visit. Small kiosks may also be developed to provide both educational and interpretive information to visitors at roadside pull-offs describing the character of the landscape, river morphology, and salmonid life-cycles. Potential development of the day-use site, the current asphalt waste site, would also include a kiosk designed to educate users through an interpretive panel.

Traffic Control Devices

These signs have very stringent requirements and must be designed and installed in accordance with the Manual on Uniform Traffic Control Devices (MUTCD). These signs include any type of vehicular-related traffic control messages, to include speed limits, curves, and other types of regulatory. Traffic control devices must be justified by legal warrants signed by a professionally registered engineer as specified in MUTCD.

Traffic control sign placement would follow the recommendations of an engineering study. These signs would be placed to promote traveler safety. An updated study would be completed following the Byway improvement project.

Regulatory/Warning/Safety

These signs should be used for the protection of visitors and resources. Signs should identify hazards or other situations such as seasonal closures and caution the visitor or employee regarding the condition.

Regulatory, warning and safety signs would inform the traveler of road conditions, i.e., "Roadway not maintained for winter travel". These signs would also include signs informing travelers of potential bicycle use on the byway, "Bicycles on the roadway, share the road" and entry into the OHV riding area and to expect OHV use on the roadway. Signs would also be placed to identify OHV crossings and identify areas of congestion such as campgrounds and day-use sites.

The Nestucca Access Road also has fiber optic cable running along the upslope shoulder. This cable would be marked with the owner's (CoastCom) standard signs as is already done along the county roads approaching the Byway.

Stewardship Messages

These signs are used to convey a message. Stewardship signs are relatively small and inconspicuous. Examples include: *Thank You for Visiting the Nestucca Back Country Byway*, *No Littering* or *Leave No Trace (LNT)*.

Signs Placed by Public

Roadside Memorials - Following fatal accidents along the Byway, the public occasionally erect and maintain roadside memorials at or near accident sites. Roadside memorials erected by the public are inconsistent with BLM policy and detract from the visual character of the Byway.

Currently, these memorials are considered abandoned or disposed of property and would fall under the guidance of 43 CFR 8365.1-2 which states, no person shall leave personal property unattended longer than 10 days. Following the 10 day period property is subject to disposition under Federal Property and Administrative Services Act of 1949, as amended (40 U.S.C. 484(m)).

Public placed minor signs - include paper plates and posters of missing persons or lost pets.

Minor signs are commonly placed by the public to direct additional members of the party to a site. These are scattered throughout the route and routinely consist of a paper plate or other material that is attached to a tree or sign with an arrow or name to direct party members to the chosen location. These minor signs should be removed the first Monday following each weekend and as located thereafter.

Sign Placement

At the time of final design, a Sign List and Placement Map would be developed that lists all signs and markers needed. Once the signs are installed, GPS coordinates can be added so the Sign List can serve as a complete sign inventory and maintenance tool.

Signing situations related to vehicular and pedestrian traffic should follow the specifications established in the *Manual on Uniform Traffic Control Devices* (MUTCD), published by the Federal Highway Administration (see www.mutcd.fhwa.dot.gov). The standards and guidelines in the *National Sign Guidebook* (Bureau of Land Management, 2004, Sign Guidebook) must be applied consistently to ensure that areas are safe and to enhance visitors' experiences on the BLM's public lands and waters. The *National Sign Guidebook* is currently under revision. The sign plan would be adapted to reflect any changes that ensue with the new guidance.

Permanent signs would be placed on wood posts. Posts size would be appropriate for sign, i.e., stop sign would be placed on a 4x4 while a portal sign would be better suited placed on 6X6 lumber. Sign posts would be drilled to ensure "break-away" design. Temporary signs for project and safety notifications would be placed on metal sign posts.

Inventory

An inventory of all signs throughout the Byway would be maintained following the recommendations of an engineering study, once received. The inventory would include size, design, type and GPS coordinates of each sign. The inventory of non-regulatory signs will be updated following the new guidance provided in the *National Sign Guidebook*, once it is made available.

Other Considerations

When signs are ordered, duplicates should be ordered as ready replacements due to the high vandalism in the area. Due to expected increase in visitation, the plan would be re-evaluated two years following project completion. Traffic control signs and signs that promote safety would be placed in accordance with associated standards. Interpretive, informational, and educational signs would be placed to promote and preserve scenic values.

7. Public Comments to External Scoping and BLM Responses to Comments

External scoping (seeking input from people outside of the BLM) was conducted by means of a scoping letter for the Byway project sent out to a total of 82 municipal, county, state and federal government agencies, organizations, associations, nearby landowners, and interested parties on December 6, 2013 (Project Record Documents 3 & 4). This scoping letter was also posted to the BLM's Salem District website on December 6, 2013. In addition, since the winter of 2014 a description of the project proposal has been consistently included within the *Salem Bureau of Land Management Project Update* which is generally updated quarterly; this Project Update is mailed to more than 150 individuals and organizations and is posted to the Salem District website (<http://www.blm.gov/or/districts/salem/plans/plans.php>).

Nine comment letters or e-mails were received as a result of these public scoping efforts. A summary of the comments and the BLM responses are documented below. The scoping comment letters or e-mails in their entirety are available for review at the BLM Tillamook Field Office, 4610 Third Street, Tillamook, Oregon.

Project Record Document 8

Dale and Jenni Thornton

Via e-mail

Summary of Dale and Jenni Thornton Comments:

- General support of the project: *"We welcome the widening and paving to make it a 2 lane road on the remaining 2.6 miles. Which we feel should have been done years ago."*
- *"... we do have concerns about making it more tourist friendly which [sic] brings the increased traffic. We wish to ask who will be responsible for the up keep and maintenance of county roads leading up to the point of your project, also the policing and fire control."*

BLM Response:

As described in EA section 3.2.4, while the project would be expected to make the Byway more attractive to some recreational users such as those participating in weekend touring events such as the type hosted by vintage car or motorcycle clubs, or bicyclists in route between the Willamette Valley and the Coast, it would likely not substantially increase traffic. Travel speeds along the route would continue to remain low and time necessary to reach destinations would continue to be longer than the more heavily used state highway routes. The project would not be expected to transform the Byway into another Highway 6 or 22 but rather the route would continue to provide a scenic, leisurely travel route.

Road maintenance and law enforcement of the county roads leading up to the point of the Byway project would continue to be the responsibility of the respective county – Yamhill or Tillamook. BLM lands and roads would continue to be patrolled by the BLM Tillamook Field Office law enforcement officer with support via contract provided by Yamhill and Tillamook Counties' Sheriff's Departments. Additionally, Oregon State Police conduct patrols within the area. Wildfire suppression on BLM lands would continue to be provided via a contract with the Oregon Department of Forestry. Wildfire suppression on private land would continue to be the responsibility of the landowner with some landowners also contracting with the Oregon Department of Forestry for fire protection. Where appropriate, Nestucca Rural Fire Department responds as needed in emergencies.

- *"These same county roads were built and maintained for the timber industry and the transportation of timber products from the forest to the mills. Log trucks, pole trucks and heavy equipment are a way of life on these roads and we feel that should still be the priority even though you are promoting tourism."*

BLM Response:

BLM recognizes that in addition to the use of the project area roads by the recreating public, one of the major functions of the areas roadways is to provide access for all traffic associated with resource management, including that associated with commercial logging activities (EA section 3.1.1). The project area's roads would continue to accommodate multiple uses.

Currently the haul of timber during the wet season is restricted on the gravel-surfaced section of the Nestucca Access Road to protect resources; paving the gravel-surfaced section would provide an increased opportunity to haul timber during the wet season throughout the Byway (EA section 3.1.4).

Project Record Document 11

Gary Humbard

Via e-mail

Summary of Gary Humbard Comments:

- *"I do not know where this project lies in the priority list of projects on the Tillamook Resource Area, however I would prefer to have the Tillamook RA invest the publics' resources on forest restoration projects rather than infrastructure improvement projects. There are thousands of acres in need of restoration activities that include the following: commercial and non-commercial thinnings in LSR and RR land use allocations, CWD and snag creation within the LSR LUA, conifer release adjacent to fish and non-fish bearing streams, LWD creation within fish bearing streams, gap creations and understory development within LSR and the establishment of conifers adjacent to fish bearing streams."*
- *"I realize the Tillamook RA has restored lands to benefit listed species since 1995, but I also know there are stands that are in need of restoration now and if not completed, opportunities will be lost."*

BLM Response:

The majority of the Byway project would be funded by Western Oregon Transportation & Facilities: Operation & Annual Maintenance Program Fund; Western Oregon Recreation Management Program Fund; Western Oregon Forest Management Program Fund; BLM's Deferred Maintenance and Capital Improvement Funding Source; The Federal Lands Transportation Program (FLTP); the vast majority of these sources of funding would not be appropriately used on the types of projects mentioned.

As noted within EA section 1.4.2, lands within and near the Byway project area are covered with multiple layers of special designations in addition to the designation as a Back Country Byway. Recognizing the objectives of some of these layers, most notably ACEC, SRMA, suitable as Wild & Scenic River, Tier 1 Key Watershed, Late Successional Reserve, Riparian Reserve, Designated Critical Habitat(s), BLM's Tillamook Field Office has active management programs which include designing, analyzing and implementing all of the types of restoration activities you mentioned within the areas containing the Byway project; many of these restoration projects are noted within EA section 8.

The Byway project would not inhibit our ability to address restoration opportunities.

- *"If possible, I would like to see an alternative that includes only improvements to infrastructure that directly benefit aquatic resources (ie. replacement of failing fish-bearing stream culvert) and improves safe travel."*

BLM Response:

The IDT agreed that the analysis of an additional action alternative would be appropriate – an additional alternative which would both meet the Purpose and Need of the project, but have meaningful differences in environmental effects. Based on IDT discussions and public comments, the team developed an additional action alternative (Alternative 3); it would scale-back the proposed up-grading of the gravel-surfaced section of the Nestucca Access Road, not replace the current single-lane Elk Creek Bridge with a two-lane bridge, as well as exclude those other portions of the proposed action that are not addressing identified safety issues or could not be considered infrastructure maintenance (i.e. replacement of culverts not nearing the end of their design lifespan, failing and/or not being dramatically undersized) including replacement of the Bear Creek Culvert, Quad Pipes and Fairdale Crossing (see EA section 2.3).

Both Alternative 2 (the Proposed Action) and Alternative 3 have been determined to meet the Purpose and Need of the Byway Project to “*provide visitors with a safe, scenic travelling experience while visiting the Byway. [They] would also provide for needed deferred road and facilities maintenance and upgrades. Finally, [they] would improve water quality and hydrologic function in certain locations that would, in turn, contribute to the recovery of the ESA listed Oregon Coast (OC) Coho salmon*” (see EA section 1.1).

While the IDT thought Alternative 3 captured the general spirit of the comment letters, it appeared that the Alternative you suggest “. . . *an alternative that includes only improvements to infrastructure that directly benefit aquatic resources (ie. replacement of failing fish-bearing stream culvert) and improves safe travel*” would fail to meet critical elements of the project’s Purpose and Need. Specifically, by eliminating those numerous portions of the Proposed Action including improvements to infrastructure that have only **indirect** benefits to aquatic resources as you suggest would fail to “*provide for needed deferred road and facilities maintenance and upgrades*” as well as compromise improvements to “*water quality and hydrologic function in certain locations that would, in turn, contribute to the recovery of the ESA listed Oregon Coast (OC) Coho salmon.*” Examples of project components with only **indirect** benefits to water resources you suggest eliminating and some of their benefits to meeting the project’s Purpose and Need include the following:

- Paving the gravel-surfaced section of the Nestucca Access Road (improved water quality through decreased generation and delivery of fine sediment)
- Installation of new cross-drains (improved water quality through decreased delivery of fine sediment)
- Replacement of under-sized stream crossing culverts (improved bedload transport and improved water quality through decreased generation of fine sediment)

Project Record Document 12

Les Helgeson

Beaver Oregon 97108

Summary of Les Helgeson Comments:

- *While I am supportive of most of the proposed actions I have specific concerns as follows. Unfortunately, the project proposes identical road improvements that were subject to an appeal that was resolved through a mediated agreement in 2001. BLM once again proposes to replace the Elk Creek Bridge and realign/widen portions of the 2.6 mile gravel segment to make it a double lane roadway. I remain opposed to the proposed actions.*

BLM Response:

Per the language of the mediated agreement between the BLM and the Coast Range Association which you reference in your comment: “*Any future decision to replace the Elk Creek Bridge and/or pave the 2.6 mile gravel section would undergo a new decision making process. Such a decision would be based upon an adequate cumulative effects analysis as required by NEPA, including an independent transportation study designed to*

provide objective information as a basis for making a decision. The Coast Range Association would be given an opportunity to suggest criteria for selecting the consultant and elements for inclusion in the study.”

This Nestucca National Back Country Byway Project Environmental Assessment, including an adequate cumulative effects analysis as required by NEPA, represents a new decision making process per the mediated agreement. BLM has contracted four independent transportation studies designed to provide objective information as a basis for making a decision; these include the following:

1. Otak Incorporated, October 18, 2005, *Nestucca River Access Road Traffic Study*, Lake Oswego, OR. 22 pages + Appendices
2. Otak Incorporated, December 22, 2006, *Bible Creek Road / Bald Mountain Road Traffic Study*, Lake Oswego, OR. 29 pages + Appendices
3. US Department of Transportation - Federal High Administration, Western Federal Lands Highway Division, September 2014, *Road Safety Audit: Nestucca Back Country Byway*. WFL, Vancouver, WA, 17 pgs + Attachments
4. DKS Associates, June 2015, *Nestucca Transportation Study*, Prepared for the Bureau of Land Management, Salem OR., 29 pgs + Appendices

Finally, just prior to commencing public scoping for the Byway project, the BLM met with Chuck Willer, Administrative Director of the Coast Range Association on November 12, 2013 at the BLM office in Tillamook to discuss the project. He did not express any specific concerns about the project. A scoping letter was mailed to Mr. Willer on December 5, 2013 and he did not supply any written comments.

- *“Ultimately, improving the road to a two lane through route would create a substantial safety hazard for many users of the river corridor with substantial environmental impacts.”*

BLM Response:

We disagree with your assertion that improving the road to a two-lane road would create a substantial safety hazard with substantial environmental impacts. We have determined that widening and paving the gravel-surfaced section to accommodate a two-lane road would enhance safety removing some of the identified safety issues (inconsistent road surface, dust obscuring traffic, potholes and washboard which makes some drivers move out of their “lane”) and have beneficial environmental impacts (water quality, improved fish passage) (See EA sections 3.1, 3.2, 3.3, 3.4).

- *“ . . . I am concerned about how current funding was obtained. . . . ”*

BLM Response:

Because this project would be implemented in phases over a period of up to 8 construction seasons (see Implementation Plan EA section 2.2.2) funding to implement all phases of the proposed project has not yet been secured. It is expected that the majority of the Byway project would be funded by a combination of five appropriate funding sources including the following:

1. Western Oregon Transportation & Facilities: Operation & Annual Maintenance Program Fund

Funding for both BLM’s preventive and cyclic maintenance needed to keep the site/facility in good functioning condition. In addition - annual maintenance work, condition assessments, professional engineering services, program and data base management, and program oversight. Also includes maintenance that was not performed when it should have been or when it was scheduled and was therefore put off or delayed for a future period. Includes all costs associated with project planning, survey, design, contract development and administration.

2. Western Oregon Recreation Management Program Fund

Intended to promote and expand outdoor recreation opportunities; Engage and support the Secretary's Youth Great Outdoors Initiative; Improve public access and protect resources through Comprehensive Travel and Transportation Management; Manage facilities, rivers and trails to protect their special values and minimize user conflicts. Promote a quality recreational experience in a preferred setting and promote public safety.

3. Western Oregon Forest Management Program Fund

Includes all costs associated with management, maintenance, and enhancement of forest and woodland ecosystems on the Public Lands (O&C, CBWR, and PD) in Western Oregon, except for activities directly related to reforestation and forest development. It includes forest planning, inventory, trespass, maintenance and enhancement of the forest ecosystem and all aspects of the sale of timber and other forest and vegetative products, including such products as fuel wood, ferns, etc..

4. BLM's Deferred Maintenance and Capital Improvement Funding Source

Maintenance that was not performed when it should have been or when it was scheduled and was therefore put off or delayed for a future period. Includes all costs associated with project planning, survey, design, contract development and administration.

5. The Federal Lands Transportation Program (FLTP)

Established under the Moving Ahead for Progress in the 21st Century Act (MAP-21), (23 U.S.C. § 203) to improve transportation facilities for the following Federal Land Management Agency (FLMA) partners: National Park Service (NPS), Fish and Wildlife Service (FWS), USDA Forest Service (Forest Service), Bureau of Land Management (BLM), and US Army Corps of Engineers (USACE).

- *"I would therefore suggest BLM consider alternatives to the widening/paving and bridge replacement aspect of the proposed project. BLM should consider simply paving the existing single lane portion of the Back Country Byway thus making it consistent with most of the remainder of the loop."*

BLM Response:

The IDT agreed that the analysis of an additional action alternative would be appropriate – an additional alternative which would both meet the Purpose and Need of the project, but have meaningful differences in environmental effects. Based on IDT discussions and public comments, the team developed an additional action alternative (Alternative 3); it would scale-back the proposed up-grading the gravel-surfaced section of the Nestucca Access Road, not replace the current single-lane Elk Creek Bridge with a two-lane bridge, as well as exclude those other portions of the proposed action that are not addressing identified safety issues or could not be considered infrastructure maintenance. Under Alternative 3, the 2.7 mile section of the Nestucca Access Road that is currently gravel-surfaced would basically be similar to the current condition of Bible Creek Road – it would waver back and forth and between being a single-lane paved road with turnouts and being the width of a two-lane paved road, depending upon the current sub-grade width (EA section 2.3).

Project Record Document 13

Doug Heiken, Oregon Wild

Eugene, Oregon 97440

Via e-mail

Summary of Doug Heiken Comments:

- *"Please recognize that the alder trees that line the road are an important part of the scenic driving*

experience. It is fine to remove trees when they present a real and imminent hazard, but please do not remove roadside trees pre-emptively just because they might someday fall.”

BLM Response:

The project does not include removing roadside trees pre-emptively just because they might someday fall. This portion of the project only includes removing trees along the project roads to implement maintenance and project construction activities and/or to enhance safety. The majority of these trees would be associated with the proposed road prism widening of a portion of the Nestucca Access Road that is currently gravel-surfaced and/or the replacement of culverts. Additional trees identified as hazards of falling onto the roadway or a hazard to adjacent equipment operations would also be removed. In selected areas, individual trees or small clumps of trees may be felled or pruned for the purpose of increasing sight distances. Increased sight distance would provide additional safety to both the recreation public and forest operators including log trucks while traveling the Byway.

- *“We support the work on road surface and culverts that will improve water quality and improve the hydrological function of the road system.”*

Project Record Document 14
Nels Gappert, President, Cycle Oregon
Portland, Oregon 97227

Summary of Nels Gappert, Cycle Oregon Comments:

- *“There are few paved roads that lead from the Willamette Valley to the Oregon Coast that do not require use of a state highway, with their attendant traffic volumes. The Nestucca River route to the coast meets nearly every criteria we look for when designing [an organized bicycle event] route, especially the unparalleled scenic value coupled with low traffic volumes. However, we have never used this roadway in its entirety because of the gravel section, which is not conducive to travel by road bikes. If the gravel section of the Nestucca River Road was paved it would offer opportunities for not only our event, but other bicycle events and general bicycle-related tourism to experience this area of the state.”*
- *“Cycle Oregon whole-heartedly supports the Nestucca Back Country Byway Project.”*

BLM Response:

Both Alternative 2 and 3 propose to pave the current gravel-surfaced section of the Nestucca River Road. Alternative 2 would widen the section of road to be more consistent with the rest of the Nestucca Access Road – a paved, two-lane roadway. Under Alternative 3, the current 2.7 mile gravel-surfaced section of the Nestucca Access Road would be paved but there would be no widening of the current sub-grade; the road would be paved to its existing width. This would result in a 2.7 mile section of single-lane paved road with turnouts, flanked by the existing road segments on either end that are two-lane paved roads. This 2.7 mile section would basically be similar to the current condition of Bible Creek Road – it would waver back and forth and between being a single-lane paved road with turnouts and being the width of a two-lane paved road, depending upon the current sub-grade width.

Project Record Document 15
Alex Sifford, Coordinator - Nestucca, Neskowin & Sand Lake Watershed Council
Pacific City, Oregon, 97135
Via e-mail

Summary of Alex Sifford - Nestucca, Neskowin & Sand Lake Watershed Council Comments:

- *“The Council generally supports the proposed actions for potential water quality and fish passage benefits and looks forward to reviewing the subsequent Environmental Assessment.”* Mr Sifford also extended an invitation for BLM staff to speak on the project proposal at one of the Watershed Council meetings in early 2014.

BLM Response:

Per Mr. Sifford’s request, a summary of the Byway project was included within a presentation focusing on past stream restoration projects and future plans within the Upper Nestucca River watershed given at a Nestucca, Neskowin & Sand Lake Watershed Council’s public meeting in Pacific City Oregon on April 15, 2014.

Project Record Document 16

Scott E Marlega, Land Use Manager – Weyerhaeuser

Lebanon, Or 97355

Via e-mail

Summary of Scott E Marlega, Weyerhaeuser Comments:

- *“Weyerhaeuser supports all the proposed projects. Our only concern is these projects might occur at the same time we will have an active haul on the Nestucca Access Road. . . . Weyerhaeuser would like to see no full road closures and with only short delays.”*

BLM Response:

The IDT was able to minimize the need for full road closures, however per the proposed implementation Plan (EA section 2.2.2) full road closures are planned. Recognizing the potential for full road closures to be problematic, Project Design Features (PDFs) have been included to help minimize the disruption to log haul activities. These PDFs include the identification of possible detours to facilitate log haul and coordination with adjacent landowners as the proposed construction schedule and road closures are finalized.

Project Record Document 17

Carole Astley, Industry & Visitor Services Senior Manager, Travel Oregon/Oregon Tourism Commission

Salem, Oregon 97301

Via e-mail

Summary of Carole Astley, Travel Oregon Comments:

- General support of the project. Offered contact information for interested colleagues and future assistance on the project.

Project Record Document 21

David Mickey

McMinnville, Oregon 97128-9100

Summary of David Mickey Comments:

- *“Over the years we have seen less & less maintenance of the existing road. It used to be snow plowed and damage repaired regularly. . . . Where is all the money coming from to do what you speak of?”*

BLM Response:

Because this project would be planned to be implemented in phases over a period of up to 8 construction seasons (see Implementation Plan EA section 2.2.2) funding to implement all phase of proposed project have not yet been secured. It is expected that the majority of the Byway project would be funded by a combination of five appropriate funding sources. See response to Project Record Document 12 comment above.

- *“Some of us have mixed feelings about paving the 2.6 miles. I would be in favor of it if done with minimum impact. Elk Creek Bridge should be replaced. Bald Mt Access road isn’t used much these days but it should be maintained. More and better signs are needed! Bible Creek and especially the main river road are very much in need of work. If the work can be done professionally and not pittled around at like we have been seeing, I would be in favor of most of the proposed work.”*

BLM Response:

It is not clear what you mean by “minimum impact”. We have attempted to design the project to minimize inconvenience to the travelling public by assuring detours will be available. Additionally, public outreach would be conducted to inform potential visitors of scheduled road, campground and OHV trail closures. Means of notification would include press releases, newspaper announcements, website updates and as deemed necessary, information would be posted to BLM’s social media sites. The project also has incorporated project design features to minimize environmental impacts.

Alternative 2 includes the replacement of the Elk Creek Bridge. The project includes the installation of more and better signs; Alternative 2 would represent a more comprehensive approach to signage installation, while Alternative 3 would only install new signs that would be considered maintenance such as the replacement of outdated signs or existing signs damaged by vandalism, and signs that are related to safety.

8. Past, Present, Reasonably Foreseeable Future Actions used in the analysis of the Nestucca Back Country Byway Project

This list contains a number of identified ongoing and/or past, present or reasonably foreseeable future projects, events, activities or programs of work located within or near the proposed project area. It serves as a source or pool of activities that various specialists may have considered while describing affected environments and/or conducting impacts analysis (especially cumulative effects analysis) for the Byway project. Depending upon the resource and/or temporal or spatial scale of the analysis, projects to be considered include those projects which may continue to impact or are expected to impact the same resource at the same time and place as the proposed action, and/or have contributed to the current condition in a manner that still has impacts upon the same resources. Where appropriate, the BLM project-specific Activity Planning documents and/or supporting NEPA documents are referenced.

ACTIVITY PLANNING - IDENTIFICATION OF POTENTIAL FUTURE PROJECTS

One of the first steps in the BLM Tillamook Field Office's internal planning processes is referred to as "Activity Planning". During this process an interdisciplinary team evaluates the "Activity Planning Unit" (APU), generally a subwatershed basin (6th field) and identifies a number of various potential projects which if implemented, would move the resources within the area toward a desired future condition, and/or would help better meet RMP objectives. The decision maker then selects which of the identified potential projects he/she would like to have developed into a proposal and analyzed. The Tillamook Field Office has completed Activity Planning in several Activity Planning Units including four near the Nestucca Back Country Byway project areas. Completed Activity Planning efforts in APUs near the Byway project include the following:

- The Hoag Pass Planning Unit (Hoag Pass Activity Planning Report dated February 2, 2004). Several of the potential projects identified during this planning process have already been selected, developed, analyzed and/or implemented including Commercial Density Management Thinning, Fish and Wildlife Habitat Enhancement, and Roadside Hardwood Removal for Road Maintenance (The Hoag Pass Projects, BLM EA #OR-086-06-05). There were three density management thinning timber sales identified during this planning process (Jane's Remains, Hoag Heaven and Fan Creek) which have been or are currently being conducted. Additional potential projects were identified within the Activity Planning process which could be selected at some point in the future for development and eventual implementation.
- The Ginger/Cedar Creek Planning Unit (Ginger/Cedar Creek Activity Planning Report dated April 7, 2005). Aside from identifying paving of the gravel-surfaced section of the Nestucca Access Road being analyzed in this Nestucca National Back Country Byway EA, this planning process identified a number of potential projects which could be selected for development. Some of the identified projects include in-stream fish habitat enhancement projects; culvert replacement; density management through the commercial harvest of timber; and snag and down wood creation for wildlife habitat enhancement. Several of these projects have been or are being implemented including in-stream wood placement on the Nestucca River in 2012 and wildlife structure and coarse wood creation in 2013. One density management thinning timber sale which was identified during this planning process, (Super Snap) sold in 2013 (The Cedar Creek Projects EA, BLM EA # DOI-BLM-OR-S060-2010-0010-EA).
- The Walker Creek Planning Unit (Walker Creek Activity Planning Report dated December 1, 2006). This planning process identified a number of additional, varied potential projects addressing a several resource concerns or opportunities which could be selected for development and eventual implementation. Projects included: In-stream large wood placement in Walker Creek (summer 2013); replacement of two large fish passage culverts (summer 2013) on Walker Creek; meadow restoration at Bald Mountain and Walker Flat areas; wildlife habitat enhancement through coarse wood structure creation; replacement of multiple failing and undersized culverts - not fish passage (summer 2013). One density management thinning timber sale which was identified during this planning process, (Day Walker) was sold in 2014 with a second sale (Night Walker) currently scheduled to be sold in 2016 (The Walker Creek Terrestrial Restoration Project, BLM EA # DOI-BLM-OR-S060-2011-0012-EA)
- The Panther Creek Planning Unit (Panther Creek Activity Planning Report dated April 16, 2014). This

planning process identified a number of additional, varied potential projects addressing a several resource concerns or opportunities which could be selected for development and eventual implementation. Projects include: Decommissioning four old skid roads to eliminate surface runoff and sediment sources; replacing and upgrading two undersized fish passage culverts; underplanting two riparian hardwood stands; road maintenance; management of OHV trails that are causing resource damage; cleanup of illegal dump sites; commercial thinning (density management); wildlife habitat enhancement through young stand management; and fuels treatments.

- The Testament Creek Planning Unit (Testament Creek Activity Planning Report dated August 28, 2015). This planning process identified a number of additional, varied potential projects addressing several resources concerns or opportunities which could be selected for development and eventual implementation. Projects include: In-stream large wood placement in Bear Creek and Nestucca River; conifer underplanting of hardwood dominated riparian stands along fish-bearing streams; PCT of young, dense conifer stands within 1st site potential tree height of fish-bearing streams; density management through the commercial harvest of timber; replacement of multiple failing and undersized culverts, including some fish-passage culverts; road treatments including renovation, stabilization, obliteration and construction; wildlife habitat enhancement through coarse wood structure creation; non-motorized trail system; maintenance and construction of roadside drafting sites; and post-harvest fuels treatments.

ROADS and TRANSPORTATION MANAGEMENT - The Nestucca Back Country Byway serves a range of users and is a crucial part of the area's transportation system. The current conditions of the Byway roads and connecting roads of the same system have been influenced by several projects.

- BLM issues an occasional discretionary O&C Road Use Permit to haul timber or rock on BLM-controlled roads.
- Occasional road use and new road construction via non-discretionary right-of-way agreements with Weyerhaeuser, Oregon Department of Forestry and McMinnville Water and Light.
- Continuing maintenance activities conducted by Tillamook County on the Blaine Road (west of the project area roads), and on Meadow Lake and Gilbert Creek Roads (east and south of the project area roads respectively) conducted by Yamhill County.
- Coastal Road Stabilization and Watershed Restoration and Storm-Damage Road Repair Projects (BLM EA# OR-086-00-04)
- Continuing road maintenance (rock replacement, grading, ditch maintenance, clearing brush, drainage structure maintenance and replacement, landslide repairs) on private, state and BLM roads (DNA OR-086-06-01).
- Culvert Removal or Replacement for Fish Passage (BLM EA# OR-086-03-04). This included the removal of a fish barrier culvert and placement of a bridge on the AB Road at the confluence of Walker Creek and the Nestucca River (T3S, R6W section 15) in 2006.
- Continued, periodic use of the Cedar Creek Rock Quarry (NW of T3S, R6W section 5). This quarry was proposed and analyzed for development and use within the Cedar Creek Projects EA dated December 10, 2010 (EA# OR-S060-2010-0010).
- Emergency Flood Repair Activities, 1996 (Tillamook Resource Area; EA# OR-086-96-02 EA) Debris jams were removed at Alder Glen and Elk Creek Bridges on the Nestucca Access Road; numerous slides, slumps and road washouts were repaired throughout the Nestucca and Yamhill watershed; numerous culverts were cleaned or replaced including the Quad Pipes being installed on the Nestucca Access Road (MP 10.21).
- Bald Mountain Road Resurfacing Project. In summer of 1997, an additional aggregate lift and new asphalt surface was placed on Bald Mountain Road. (EA# OR-086-97-07)
- BLM's Nestucca Access Road Bridge Replacement Project. BLM Tillamook Resource Area replaced Alder Glen Bridge in 2001 (MP 18.2) (EA# OR-086-97-11).
- Emergency Relief Fund Nestucca Access Road East End Realignment Project. Because of its placement in an area of chronic road slumps, approximately 0.6 miles of the east end of the Nestucca Access Road (T3S, R6W section 13) was realigned upslope to a more stable location (EA# OR-86-98-03). This work occurred in approximately 1999.
- Upper Fan Creek culvert and the Fan Creek culvert on Nestucca Access Road (T3S, R7W section 24) were replaced to allow for fish passage in 2012. Removal of two culverts and replacement with a bridge on the AB Road and a properly sized culvert on BLM 3-6-2.4 road (T.3S, R.6W, sections 15 and 22) Work was completed in 2013. (Salem District Aquatic and Riparian Habitat Restoration Environmental Assessment (DOI-BLM-OR-S0000-2012-0001-EA).
- Raising of McGuire Reservoir including rerouting of a portion of the Nestucca Access Road (T3S, R6W section 15) 2003-2004.
- Tillamook County's bridge replacements and upgrades along Blaine Road. Most recently three bridges have been constructed to replace older bridges or failing undersized culverts: 1st bridge (MP 0.35), Sorensen bridge (MP 2.6) and Boulder Creek bridge (MP 4.1).
- Tillamook County's Blaine Road Project Phase I (MP 10.8 to 14.1) and Blaine Road Project Phase II (MP 6.7 to 10.8). Addressed road surface deterioration and irregularities, absent or inadequate drainage facilities, and slope failures. Projects were designed to improve traffic safety, reduce ongoing maintenance efforts and cost, and improve slope stability at various locations. Administrated by the Federal Highway Administration. Phase I work was completed in 1994 and Phase II work was completed in 2008 and 2009. (<http://www.co.tillamook.or.us/GOV/pw/BlaineProject.htm>)
- Nestucca Access Road Subsurface Exploration. (DOI-BLM-ORWA-S060-2016-0001-CX) Exploration of the subsurface conditions along the gravel-surfaced section of the Nestucca Access Road by test pit excavations and drilling. Gathered subsurface condition information to be used for road designs associated with the Byway project (DOI-BLM-OR-S060-2014-0001-EA). Project also included exploration of the subsurface conditions at an asphalt waste site (T3S., R7W., section 24) including some minor grading and removal of some small diameter trees for purposes of gaining access. Work

was accomplished in the winter of 2015.

AQUATIC RESOURCES - Projects, events and processes have had and continue to have impacts upon Aquatic Resources within and near the Byway project.

- Construction of the Nestucca Access Road along much of the Nestucca River (1958-1960). This includes approximately 2.5 miles of road within 100 feet of the Nestucca River between Elk Creek and McGuire Reservoir. Building the road constricted the stream channel, removed streamside vegetation and large woody debris including wood jams in the channel, and reduced future sources of large wood.
- Meadow Lake Dam Failure – November 1962. Failure of the Meadow Lake Dam and the resultant flooding removed riparian vegetation and LWD, scoured channels and disconnected natural floodplains along several miles of the upper Nestucca River below the dam site. Failure had significant effects on streambeds, banks and hydrology, and resulted in diminished availability of spawning gravels. Many of these impacts are still being realized.
- Major storms and flooding - 1945, 1950, 1955, 1964-65, 1972, 1996 and 1998. In 2007 an additional but localized major rain-on-snow event occurred in the Headwaters Nestucca 6th Field Watershed. These events caused numerous landslides; increased sediment loads; and altered LWD placement and channel morphologies.
- Historic stream cleaning portions of the Nestucca River by BLM and ODFW - 1960, 1966 and 1970.
- The McGuire Dam and Reservoir were constructed on the upper Nestucca River in 1968 to supply water to the City of McMinnville. The dam was raised and water storage capacity of the McGuire Reservoir was expanded in 2003-04. Loss of riparian habitats and wetlands, timber harvest, and increased sedimentation during construction and release of water. City of McMinnville was required by ODFW to make fish passage improvements on the mainstem Nestucca River at “the chute” located at the downstream end of Meadow Lake (T3S, R6W, section 8) as part of their mitigation responsibilities; this work was completed in 2003 and improved fish passage within the area.
- There have been several phases of fish habitat enhancement work implemented within the Nestucca Watershed including multiple projects involving extensive large wood placement. Throughout the 1980’s projects included the construction of alcoves. Riparian plantings were also conducted at numerous times at many sites from the 1980’s to the present. The latest phase of fish habitat enhancement (large wood placement) in the main stem of the Nestucca was completed in the summer of 2013. A total of approximately 40 trees were placed into Walker Creek within the Headwaters Nestucca 6th field Watershed in 2013 and 2014 (Salem District Aquatic and Riparian Habitat Restoration Environmental Assessment (DOI-BLM-OR-S0000-2012-0001-EA). Many of these added, historic LWD fish structures have been formed into large jams during various flood events and there is an identified need to do some maintenance work on some of the existing fish habitat structures to help realize their intended benefit.
- McMinnville Water and Light Department is currently planning a project to divert a portion of winter flows in Walker Creek to McGuire and/or Haskins Reservoirs.

FOREST MANAGEMENT - The management of forests has had and continues to have an impact upon traffic volumes on Byway project roads and the habitats available to wildlife, fish and plants.

- Historic BLM forest management practices in the Nestucca Watershed have had results which are still being realized today. Thousands of acres of mid-seral stands were commercially thinned in the late 1960s, 1970s and 1980s. Most of this thinning was light and uniform; most of the snags, green trees with defect, and old-growth remnants which were present at the time of the thinnings within or near the thinning units were felled and/or harvested. Clearcut harvesting removed nearly all of the remaining patches of old-growth forest, fragmented much of the existing mid-seral to early mature forest habitat, and reduced patch sizes and the amount of interior forest habitat.
- There are several BLM commercial Density Management (thinning) projects recently completed (since 1994), currently active or in various stages of the planning process which are located within and/or near the Nestucca River watershed. These projects all have similar objectives to promote late-seral habitat

and include the following: Muletail (EA# OR-086-95-13); Rye Mountain (EA# OR-086-95-12); Phoenix (EA# OR-086-95-19); Willy's Elk (EA# OR-086-98-05); Baker Creek I (EA# OR-086-03-02); Southern Flame I and Southern Flame II (EA# OR-086-04-01); Jane's Remains, Hoag Heaven and Fan Creek (EA# OR-086-06-05); Head East (EA# OR-086-08-05); ReBear Density Management project (EA# OR-086-03-01); the Cedar Creek Projects (DOI-BLM-OR-S060-2010-0010-EA) and the Walker Creek Terrestrial Restoration Project (DOI-BLM-OR-S060-2011-0012-EA). These projects have totaled approximately 3,300 acres of commercial density management thinning. Some of these more recent projects have the potential to impact traffic volumes on Byway project roads, especially Bald Mountain Road, during the same general timeframe as the Byway project is proposed for implementation. This potential is described within *Traffic Safety Plan: Traffic Safety along the Nestucca Back Country Byway during heavy log haul and timber harvest activities* (USDI BLM, unpublished report dated June 6, 2013 - revised May 15, 2014).

- Young Stand Maintenance – Generally pre-commercial thinning (PCT) within young plantations (either variable spaced or more routine) and other minor vegetation management projects such as white pine pruning (DOI-BLM-OR-S060-2009-0004-CX).
- Continued management of Oregon Department of Forestry (ODF) lands within the area in accordance with ODF's - *Northwest Oregon - State Forest Management Plan*, Revised Plan (ODF April 2010).
- Continued forest management of McMinnville Water and Light forest lands.
- Less information is available on habitat altering management activities that are scheduled to occur on non-Federal (private) lands within the area but aerial photos show that very little merchantable timber remains near the Byway project area. The general trend on private land is one of harvest activities which result in decreasing quantities of mid- and late-seral habitat, that is, forest stands greater than 40- to 60-years-old harvested primarily through clearcut harvesting. The majority of the industrial timber company land in the area is owned by Weyerhaeuser or Stimson and is managed for timber production on relatively short rotations in compliance with the Oregon Forest Practices Act. This precludes the development and/or maintenance of mid- or late-seral habitats and effectively results in the private land base being maintained in a continual condition of earlier seral stage habitats. However, shrub species (competing vegetation) within young private plantations are often eliminated by the application of herbicides which compromises the habitat value of the early-seral stage habitats for a wide array of species.

WILDLIFE HABITAT ENHANCEMENT - In addition to the forest management projects noted above, projects specifically designed to enhance wildlife habitat in the vicinity of the Byway project impact the habitats available to wildlife.

- BLM has implemented Wildlife Habitat Enhancement Projects on approximately 2,000 acres of conifer-dominated stands located in the Nestucca Watershed since 1996. These projects primarily involved snag creation through tree topping or girdling green trees within the live crown or at the base, along with some falling of green trees for down woody debris. To date, approximately 6,000 trees have been treated in the Nestucca Watershed. (most recent NEPA document is DOI-BLM-OR-S000-2013-0001-CX)
- Bat boxes have been installed under a number of existing bridges within the Nestucca Watershed.

SPECIAL FOREST PRODUCTS – The harvesting of Special Forest Products (especially firewood) has an impact upon traffic volumes on Byway project roads as well as upon the habitats available to wildlife.

- BLM issues Special Forest Products permits including firewood in compliance with the BLM Special Forest Products program (BLM CX # DOI-BLM-OR-S000-2014-0001-CX).
- ODF issues personal and commercial permits for Special Forest Products, including firewood, on lands they manage within the Tillamook State Forest.
- US Forest Service issues permits for Special Forest Products, including firewood along non-key roads, on lands they manage with the Siuslaw National Forest.
- Regardless of ownership, forested lands that are not behind gates restricting vehicular access experience sporadic and scattered illegal tree felling and firewood theft.

RECREATION - The general public's recreational activities have an impact upon traffic volumes on Byway project roads.

- Recreational opportunities on or near the Byway include fishing, hunting, camping, bicycling, pleasure driving, hiking, water activities, picnicking, nature viewing, target shooting and Off-Highway Vehicle (OHV) use.
- The Nestucca Back Country Byway passes through the area containing BLM's Upper Nestucca OHV Trail System. Maintenance and operation of the Upper Nestucca OHV trail system is on-going, including up to two OHV special events per year involving the trail system (BLM EA #OR086-97-05).
- Recreation management on Oregon Department of Forestry (ODF) lands consistent with the Tillamook State Forest Recreation Action Plan 2000 (ODF, 2000). Considerable OHV usage occurs on lands managed by ODF directly north of the Nestucca River Watershed, within the Trask River drainage.
- Except for the Nestucca River ACEC, BLM lands in the area are generally open to the public for dispersed camping. Dispersed camping is most prevalent on BLM lands within the area of the Upper Nestucca OHV area from June through September, and in other various locations during the fall rifle hunting seasons for deer and elk. Camping usually occurs in areas with direct vehicular access such as old landings, at larger remote road junctions and on dead end logging spurs. Stay limits for all camping throughout the public managed forest is 14-days in a 28 day period at which time the campers must move at least 25 air miles from the previously occupied site.
- An occasional Special Recreation Permit authorizing applicants use of BLM roads and lands to conduct activities (road rallies, timed races, bicycle tours, etc.).
- Continued management and use of four BLM campgrounds (Alder Glen, Elk Bend, Fan Creek, and Dovre).
- Continued management and use of USFS Rocky Bend Campground and Niagara Falls Hiking Trail.
- Camp Cooper Boy Scout Camp (T4S., R7W., section 2) is accessed from roads contained within the Byway, most notably Bald Mountain Road. It serves approximately 2,000 campers and staff during the summer months.
- Cycle Oregon is currently partnering with the Oregon Parks and Recreation Department, Oregon State Forestry, Port of Tillamook Bay and Tillamook County on the Salmonberry Corridor Project. This project would create a rails-to-trail paved path along the 86-mile Port of Tillamook Bay railroad between Banks and Tillamook. This is a multi-year project, currently in the early planning stage, and would complement a completely paved Nestucca Access road in offering options for cyclists to travel between the Oregon coast and the Willamette Valley (Cycle Oregon scoping comment, Project Record Document 14).

OTHER

- Management and use of the BLM Cedar Creek Shop. The Cedar Creek Shop is a BLM maintenance shop and storage yard used by BLM road maintenance crew and recreation, engineering, fisheries staff. It is located in T.3S., R.6W., section 5 (SW1/4). Access to this site is via Cedar Creek road which is currently gated by a Weyerhaeuser gate.

9. GLOSSARY AND ACRONYMS

9.1 Glossary

303(d) Water Quality Listing - Impaired waters, identified by ODEQ, that do not meet water quality standards as required by the Clean Water Act.

Acre - A measure of surface land area, in U.S. customary units, measuring 43,560 square feet, which is 1/640 of a square mile (or approximately 0.4 hectares). If square, it is nearly 209 feet on each side.

Alternative - One of several proposed management actions that have been studied and found to meet the goals and objectives of a project's purpose and need and, as a result, is suitable to aid decision-making.

Anadromous Fish - Fish that are born and reared in freshwater, move to the ocean to grow and mature, and return to freshwater to reproduce. Includes species such as salmon and steelhead.

Aquatic Conservation Strategy (ACS) - A Northwest Forest Plan methodology designed to restore and maintain the ecological health of watersheds and aquatic ecosystems, consisting of four components: riparian reserves, key watersheds, watershed analysis, and watershed restoration.

Aquatic Habitat - Habitat for fishes, vertebrate and invertebrate wildlife species and vascular and non-vascular plants occurring in free water (e.g. lakes, ponds, streams, rivers, springs and seeps).

Baseline - The starting point for the analysis of environmental consequences, often referred to as the Affected Environment. This starting point may be the condition at a point in time (e.g., when inventory data is collected) or the average of a set of data collected over a specified number of years.

Bed Load - Coarse sediment particles with a relatively fast settling rate that move by sliding, rolling or bouncing along the streambed in response to higher stream flows.

Beneficial Use - In federal and state water use law, uses of water necessary for the survival or well-being of man, plants and wildlife. Examples include: instream, out of stream, and ground water uses; domestic, municipal, and industrial water supplies; mining, irrigation, and livestock watering; fish and aquatic life; wildlife watering; fishing and water contact recreation; aesthetics and scenic attraction; hydropower; and commercial navigation.

Best Management Practices (BMPs) - BMPs are defined as methods, measures, or practices selected on the basis of site-specific conditions to ensure that water quality would be maintained at its highest practicable level. BMPs include, but are not limited to, structural and nonstructural controls, operations, and maintenance procedures. BMPs can be applied before, during, and after pollution-producing activities to reduce or eliminate the introduction of pollutants into receiving waters (40 CFR 130.2, EPA Water Quality Standards Regulation).

Biological Assessment - A biological assessment is a document that evaluates potential effects of a proposed action to listed and proposed species and designated and proposed critical habitat and determines whether any such species or habitats are likely to be adversely affected by the action. It is used in determining whether formal consultation or conferencing with the U.S. Fish and Wildlife Service or National Marine Fisheries Service is necessary (50 CFR 402.12[a])

Biological Opinion (BO) - An opinion by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service as to whether or not a federal action is likely or not to jeopardize the continued existence of listed species, or would result in the destruction, or adverse modification, of critical habitat. The opinion may contain reasonable and prudent alternatives, a statement of anticipated take of listed animals, and conservation recommendations for listed plants.

Bureau Sensitive Species (BS) - A special status species category established by the BLM that includes those plant and animal species eligible for status as federally listed, federal candidate, state listed, or state candidate (plant) species; on List 1 of the Oregon Natural Heritage Database or approved for this category by the BLM state director; or included under agency species conservation policies.

Coarse Woody Debris (CWD) – The term coarse woody debris usually refers to the combination of both snag and down log habitat. Snags include standing dead trees. Down logs (or down woody debris) generally include those portions of trees at least 20 feet long and 20 inches in diameter that have naturally fallen or have been cut and left in the forest.

Chipseal - Chipsealing (also chip sealing) is a common pavement maintenance practice that extends pavement life and provides a durable driving surface. Chipseals are typically used on rural roads carrying lower traffic volumes. With chipsealing, a thin film of heated asphalt liquid is sprayed onto the road surface, followed by the placement of small aggregates ("chips"). The chips are then compacted to orient the chips for maximum adherence to the asphalt, and excess stone is swept from the surface.

Connected Action - Connected actions include those portions of the project that depend on the “proposal” for their justification. These actions support the proposal and would not occur without implementation of the action.

Critical Habitat – Critical habitat is an Endangered Species Act term denoting a specified, designated geographic area occupied by a federally listed species, and on which the physical and biological features are found that are essential to the conservation and recovery of that species and that may require special management or protection.

Cross-drain Culvert: Culverts strategically installed to pass ditch runoff or drain seeps and springs, safely under the road prism (often referred to as relief culverts).

Cumulative Effect - The impact on the environment that results from incremental impacts of an action when added to other past, present, and reasonably foreseeable future actions regardless of which agency or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time.

Dry Season: An annually variable period of time, starting after spring rains cease and when hillslope subsurface flow declines; drying intermittent streams and roadside ditches. Generally June through October, but may start or end earlier depending on seasonal precipitation influences.

Effective Shade - The proportion of direct beam solar radiation reaching a stream surface to total daily solar radiation.

Environmental Effects - The direct, indirect and cumulative effects of a proposed action or alternative on existing conditions in the environment in which the action(s) would occur. Also see *baseline*.

ESA Consultation - A formal review between the U.S. Fish and Wildlife Service or National Marine Fisheries Service and another federal agency when it is determined that an action by the agency may affect a species that has been listed as threatened or endangered under the Endangered Species Act (ESA) or its critical habitat to ensure that the agency’s action does not jeopardize a listed species or destroy or adversely modify critical habitat.

Fine Sediment - Fine-grained soil material, less than 2mm in size, normally deposited by water, but in some cases by wind (aeolian) or gravity (dry ravel).

Floodplain - Level lowland bordering a stream or river onto which the flow spreads at flood stage.

Large Woody Debris (LWD) - Trees and logs in the stream channels or the floodplains that are large enough to provide habitat for aquatic species. LWD is generally greater than 12 inches in diameter on small streams and greater than 24 inches diameter on larger streams.

Land Use Allocation (LUA) - A designation for a use that is allowed, restricted, or prohibited for a particular area of land. Examples include the matrix, adaptive management, riparian reserve or late-successional reserve land use allocations.

Lidar - (also written LIDAR, LiDAR or LADAR) is a surveying technology that measures distance by illuminating a target with a laser light.

Non-point Source Pollution - Water or air pollutants where the source of the pollutant is not readily identified and is diffuse, such as the runoff from urban areas, agricultural lands, or forest lands. Also see *point source*.

Northwest Forest Plan (NWFP) - *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl and Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Related Species within the Range of the Northern Spotted Owl* (1994) (Northwest Forest Plan). A 1994 common management approach for the 19 national forests and 7 BLM districts located in the Pacific Northwest ecological region and jointly approved by the Secretary of Agriculture and the Secretary of the Interior.

ODFW in-stream work period - Oregon Department of Fish and Wildlife designated guidelines that identify periods of time for in-water work that would have the least impact on important fish and wildlife resources. Work periods are established to avoid the vulnerable life stages of fish including migration, spawning and rearing. Work periods are established for the named stream, all upstream tributaries, and associated lakes within a watershed. For the Nestucca 5th field watershed this period is July 1 to September 15. For the Yamhill 4th field Watershed this period is July 15 to September 30. (ODFW– June, 2008)

Point Source - An origin of water or air pollutants that is readily identified, such as the discharge or runoff from an individual industrial plant or cattle feedlot. Also see *nonpoint source*.

Primary Constituent Element (PCE) - Those physical and biological features of a landscape that a species needs to survive and reproduce.

Road Prism - the area of the ground containing the road surface, shoulder, roadway ditches, cut slope and fill slope.

Road Sub-grade – the prepared earth surface on which the road foundation is placed.

Record of Decision/Resource Management Plan (ROD/RMP) - Salem District Record of Decision and Resource Management Plan (1995). A BLM planning document, prepared in accordance with Section 202 of the Federal Land Policy and Management Act that presents systematic guidelines for making resource management decisions for a Field Office. An RMP is based on an analysis of an area's resources, their existing management, and their capability for alternative uses. RMPs are issue-oriented and developed by an interdisciplinary team with public participation.

Site-Potential Tree – The average maximum height of the tallest dominant trees (200 years or older) for a given site class (from FEMAT 1993, p.V-34). Under the NWFP and ROD/RMP the site-potential tree height is used to calculate the width of the Riparian Reserves. The average site-potential tree height for stands within the vicinity of the Byway project has been determined to be 240 feet.

Snag - Any standing (upright) dead or mostly dead tree. Snags are important habitat elements for a wide range of species.

Special Forest Products (SFP) - Those plant and fungi resources that are harvested, gathered, or collected by permit, and have social, economic, or spiritual value. Common examples include mushrooms, firewood, Christmas trees, tree burls, edibles and medicinals, mosses and lichens, floral and greenery, and seeds and cones, but not soil, rocks, fossils, insects, animal parts, or any timber products of commercial value.

Special Status Species - Those species that are listed under the Endangered Species Act as threatened or endangered (including proposed and candidate species); listed by a state as threatened, endangered or candidate species; and listed by the BLM as sensitive species. Under the BLM Special Status Species policy (BLM 6840), the BLM State Director has created an additional category called Bureau Strategic Species (see glossary *Bureau strategic species*).

Standards and Guidelines – Rules for managing lands in the different land use allocations found in the NWFP and ROD/RMP.

Stream, Intermittent - Drainage feature with a dry period, normally for three months or more, where the action of flowing water forms a channel with well-defined bed and banks, supporting bed-forms showing annual scour or deposition, within a continuous channel network.

Stream, Perennial - Permanent channel drainage feature with varying but continuous year-round discharge, where the base level is at or below the water table.

Total Maximum Daily Load (TMDL) - Is a regulatory term in the U.S. Clean Water Act (CWA), describing the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards. It is for a particular pollutant calculated to protect the beneficial use that is most sensitive to that pollutant.

Turbidity - Is the amount of light scattered or absorbed by a fluid and is measured in nephelometric turbidity units (NTU).

Underdrain: Culverts installed to convey water from springs, and seeps encountered during road construction, under the road.

Watershed - All of the land and water within the boundaries of a drainage area that are separated by land ridges from other drainage areas. Larger watersheds can contain smaller watersheds that all ultimately flow their surface water to a common point.

Water drafting site: Site to provide a short duration, small pump operation that withdraws water from streams or impoundments to fill conventional tank trucks or trailers.

Wetland - Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, as defined by the 1972 Federal Clean Water Act. These wetlands generally meet the jurisdictional wetland criteria.

9.2 Additional Acronyms

AASHTO - American Association of State Highway and Transportation Officials

ACEC - Area of Critical Environmental Concern

ACOE - Army Corps of Engineers

ACS - Aquatic Conservation Strategy

AMA - Adaptive Management Area (a Land Use Allocation)

ARBO II - Aquatic Restoration Biological Opinion

BLM - Bureau of Land Management

BMP - Best Management Practices

BS - Bureau Sensitive (a category of species under the Oregon/Washington Special Status Species Policy)

CWD - Coarse Woody Debris
 DBH - Diameter at Breast Height
 DPS - Distinct Population Segment (the smallest division of a taxonomic species permitted to be protected under the Endangered Species Act.)
 DSL – Division of State Lands
 EA - Environmental Assessment
 EDRR - Early Detection Rapid Response Species (a category of invasive plant species)
 EFH - Essential Fish Habitat
 ESA - Endangered Species Act
 FHWA - Federal Highway Administration
 FONSI - Finding of No Significant Impact
 IDT - Interdisciplinary Team
 LSR - Late Successional Reserve (a Land Use Allocation)
 LUA - Land Use Allocation
 LUP - Land Use Plan
 LWD - Large Woody Debris
 MP - Milepost
 MSA - Magnuson-Stevens Fishery Conservation and Management Act
 NEPA - National Environmental Policy Act (1969)
 NMFS - National Marine Fisheries Service
 PCE - Primary Constituent Element
 PCT - Pre-commercial Thinning
 NWFP - Northwest Forest Plan - April 1994 (*Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl and Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl*)
 ODEQ - Oregon Department of Environmental Quality
 ODFW- Oregon Department of Fish and Wildlife
 ODOT - Oregon Department of Transportation
 OHV - Off Highway Vehicle
 OSP - Oregon State Police
 RMP/FEIS - Salem District Proposed Resource Management Plan / Final Environmental Impact Statement (1994)
 ROD/RMP - Salem District Record of Decision and Resource Management Plan (1995)
 RR - Riparian Reserve (Land Use Allocation)
 RSS - Reinforced Soil Slopes
 SRMA - Special Recreation Management Area
 SSC – Suspended Sediment Concentration
 TEP - Tillamook Estuaries Partnership
 VRM - Visual Resources Management
 TMDL - Total Maximum Daily Load
 USDI - United States Department of the Interior
 USFS - United States Forest Service
 USFWS - United States Fish and Wildlife Service
 WFLHD - Western Federal Lands Highway Division (of the Federal Highway Administration)
 WOP - Western Oregon Programmatic (an ESA consultation package)

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