



United States
Department of
Agriculture

**Forest
Service**

February 2007



Environmental Assessment

Upper McKenzie Boat Launch Projects

**McKenzie River Ranger District
Willamette National Forest**

Legal Location:

**T.16S, R.6E, Section 1; Frissell Boat Launch);
T.16S, R.6E, Section 9; (Paradise Boat Launch), and
T.16S, R.5E, Section 19; (Bruckart Boat Launch); Willamette Meridian;
Lane County, Oregon**

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Figure 1. Vicinity Map

Upper McKenzie Boat Launch Project

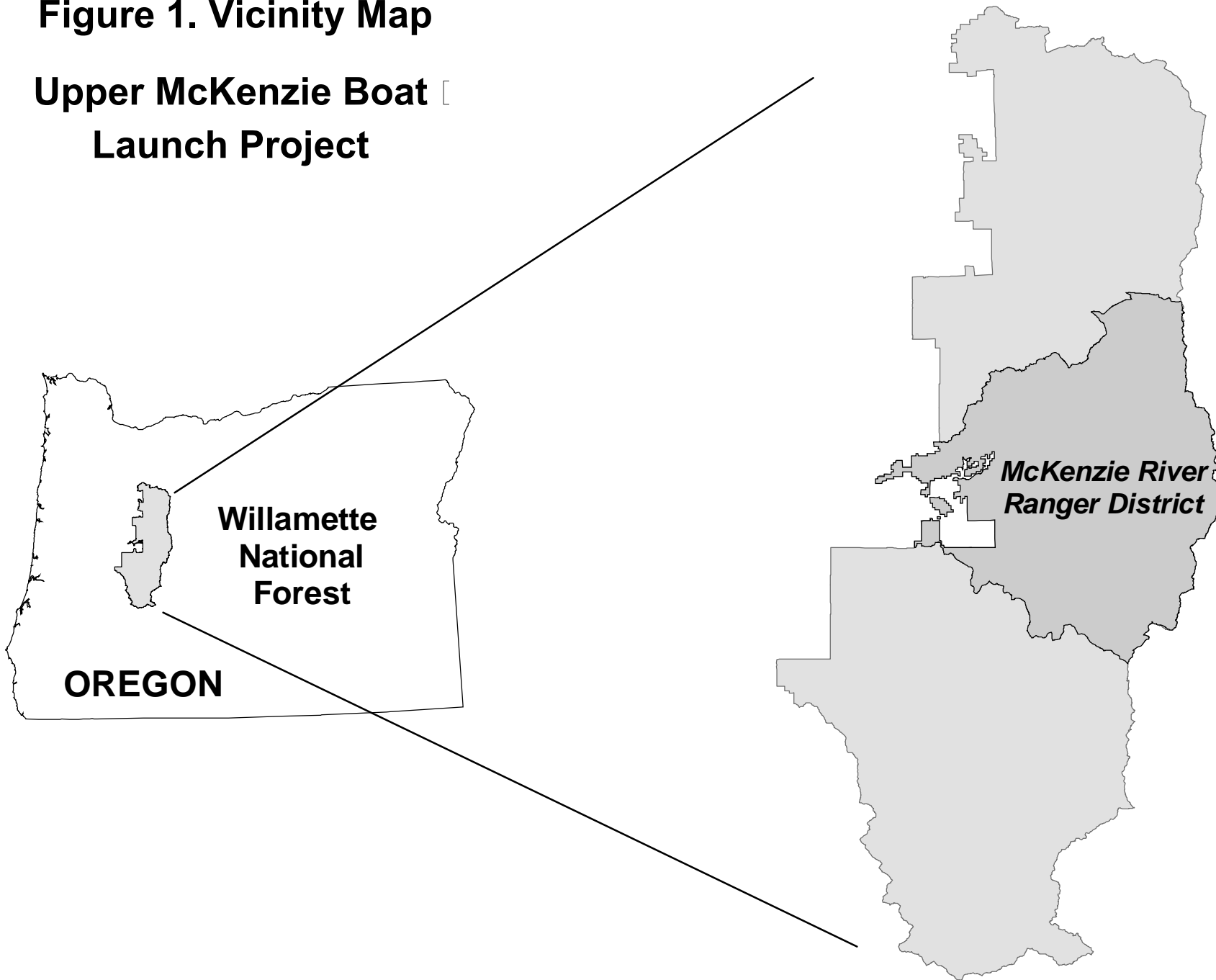


Figure 2. Vicinity Map

**Upper McKenzie
Boat Launch Project
McKenzie River
Ranger District**

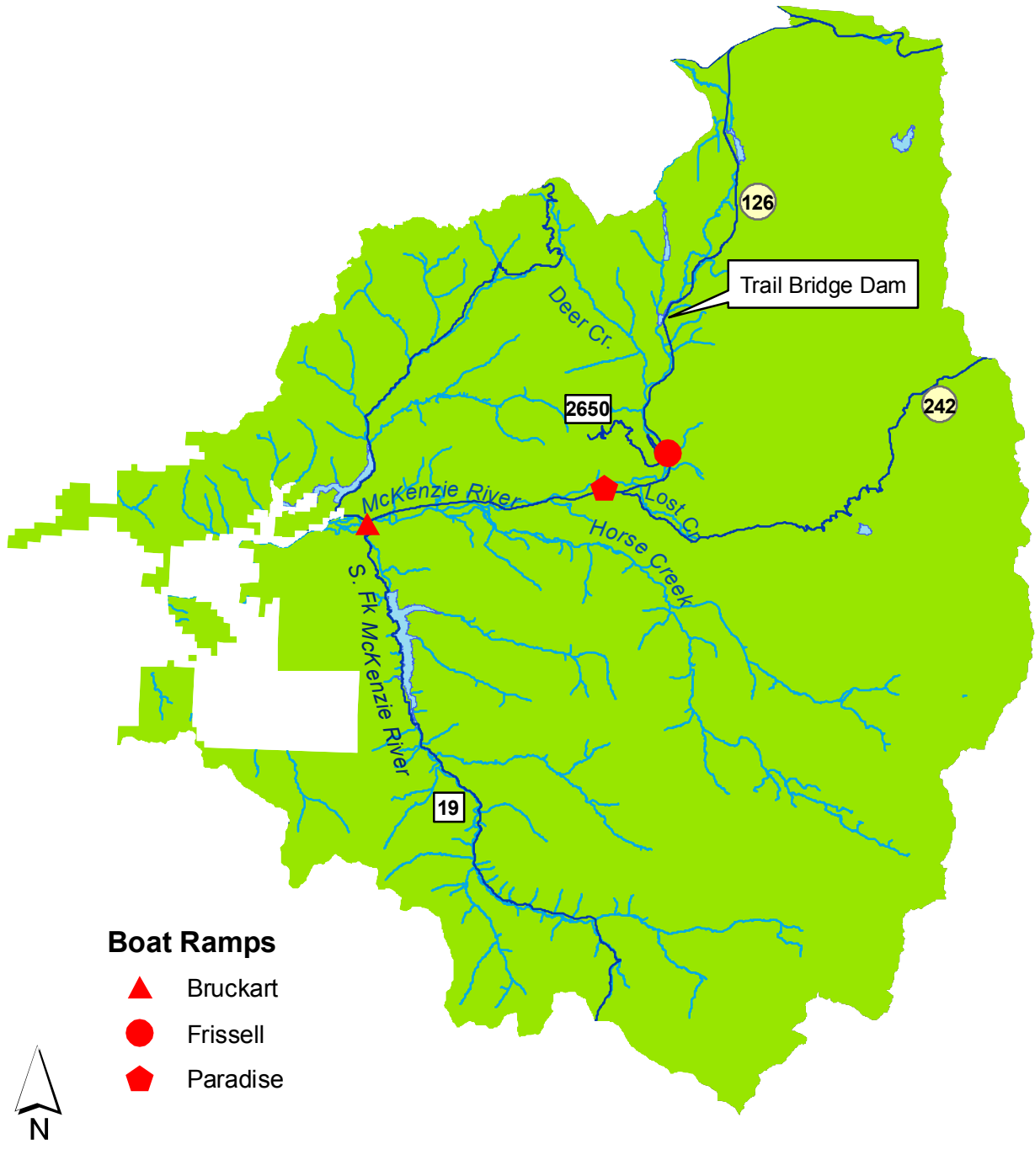


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CHAPTER 1. PURPOSE AND NEED FOR ACTION

Document Structure ---

The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and the two other alternatives. The document is organized into four parts:

- *Purpose and Need for Action:* The section includes information on the history of the project proposal, the purpose of and need for the project, and the agency’s proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.
- *Comparison of Alternatives, including the Proposed Action:* This section provides a more detailed description of the agency’s proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public and other agencies. This discussion also includes design measures and mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.
- *Affected Environment and Environmental Consequences:* This section describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by resource area. Within each section, the affected environment is described first, followed by the effects of the No Action Alternative that provides a baseline for evaluation and comparison of the other alternatives that follow.
- *Other Governments, Agencies, and Persons Consulted:* This section provides a list of agencies and other governments consulted during the development of the environmental assessment. It also includes mailing list for public scoping, and the list of document preparers.
- *Appendices:* The appendices provide more detailed information to support the analyses presented in the environmental assessment.

Additional documentation, including detailed analyses of project-area resources, may be found in the project planning record located at the McKenzie River Ranger District Office in McKenzie Bridge, Oregon.

Introduction

The McKenzie River is an important and valuable river to Oregon in terms of challenge to the skills of whitewater rafters, kayakers, and drift boat users. The upper McKenzie River, from Olallie Campground to Bruckart Bridge, is popular for Recreationists from the Willamette Valley and Central Oregon. Oregon state law prohibits any motorized boating on the upper McKenzie River. Frissell, Paradise and Bruckart boat launches on this section of river receive moderate to heavy seasonal use and are the subject of this analysis (see Figure 2).

Information collected during calendar year 2005 indicates that Paradise Boat Launch served 6,566 clients of commercial trips and 331 non-commercial clients; Frissell Boat Launch served 2,509 commercial clients and 190 non-commercial clients; while Bruckart Boat Launch served 3,861 commercial clients and 184 non-commercial clients. There were a total of 2,250 commercial crafts using these three launches and 302 non-commercial crafts. Information on commercial use is obtained through McKenzie River Ranger District records for the special use permits holders operating as outfitter/guides. Non-commercial use is determined by a voluntary boater registration card system.

Frissell Boat Launch, the most upstream of the three sites, is located within the upper McKenzie River National Wild and Scenic River and Oregon State Scenic Waterway corridors. It is on river left (looking downstream), and just upstream of the Frissell-Carpenter bridge (or Buck Bridge) and is adjacent to Oregon State Highway 126 – a National Scenic Byway in this location. The boat ramp is steep and comprised of loose gravels with buttress logs, and is oriented at a perpendicular angle to the river where boats launch into fast water.

Paradise Boat Launch, located in the Paradise Campground and which is a day use complex, lies within the Oregon State Scenic Waterway corridor, but not in the Upper McKenzie National Wild and Scenic River corridor. The boat launch is located on river left (looking downstream) and is comprised of compacted gravels with a paved approach. The launch is located at the downstream end of a cobble bar and is oriented at a perpendicular angle to the river where boats launch into slow water.

Bruckart Boat Launch is the furthest downstream of the three sites and is located approximately 500 feet upstream of Bruckart Bridge on Forest Road 19. The launch site is adjacent to Oregon State Highway 126, which is within a National Scenic Byway in this location. The boat ramp is on river right (looking downstream) and is considered steep. The ramp is comprised of deteriorating concrete pads and loose gravel, and it is oriented at a perpendicular angle to the river where boats launch into fast water.

This project was initiated because of deteriorating conditions at these three ramps. Other concerns included the steepness of the angle with which boats launch into the river, and the need to improve access to each of the boat launches. In addition, uncertainties about the long term navigability of the McKenzie River through a perennial log jam located downstream of Bruckart Bridge is also an important factor in assessing the suitability of the Bruckart Boat Launch.

In 2003, funds were provided through the Secure Rural Schools Community Self-Determination Act of 2000, to conduct an assessment of Frissell, Paradise, and Bruckart boat launches and to determine the effects of reconstructing or relocating these sites.

Legal description of the project: T.16S., R.6E., Sec. 1, (Frissell Boat Launch); T.16S., R.6E., Sec. 9, (Paradise Boat Launch); and T.16S., R.6E., Sec. 18, (Bruckart Boat Launch); Willamette Meridian; Lane County, Oregon.

Purpose and Need for Action

The purpose and need for action for this initiative is to meet direction in the amended 1990 Willamette National Forest Land and Resource Management Plan (USDA Forest Service, 1990), to provide and maintain opportunities for river-oriented recreation activities on the upper McKenzie River. The Willamette Forest Plan recognizes the need to provide access to the river in the form of boat launch facilities for whitewater rafting, kayaking, and drift boating in. (See *Relationship to the Willamette Forest Plan* in this chapter.)

Frissell, Paradise and Bruckart launch facilities do not currently provide the level of developed recreation opportunities that is commensurate with projected need (Forest-wide Standards and Guideline, FW-006). Peak season boat launch use at these developed sites often results in over-crowded ramp areas, inadequate access roads and approaches to the ramps, and lack of vehicle parking. Large groups, primarily associated by permitted river outfitter-guides under Forest Service special-use permits, place a heavy demand on these launch sites in the summer.

The boat ramps are in need of repair or relocation to meet projected needs. Since the boat ramps are constructed with mostly compacted gravel and have slopes into the river in excess of 15%, unstable conditions exist for both pedestrians and vehicles attempting to launch inflatable rafts and drift boats. Each year, fluctuations in river levels and flow removes gravel at all three ramps, and specific to Bruckart ramp, also erodes the gravel around concrete and asphalt ramp additions. The ramps typically require annual maintenance to replace gravel, particularly at Frissell and Bruckart, which are more exposed to the main current of the McKenzie River.

Frissell Boat Launch has been identified for relocation and improvement in the Upper McKenzie River Management Plan (USDA Forest Service, 1992). This plan, which amended the Willamette Forest Plan in 1992, includes a set of actions designed to resolve issues and help attain the desired future condition for the upper McKenzie River. The Plan identifies the need to develop a Capital Investment Program proposal for Buck Bridge dispersed recreation area (including Frissell launch), which would include re-establishment of restroom facilities, consideration of building a new boat launch on the west side of the McKenzie River, and closing the boat launch on the east side (on Oregon State Highway 126).

Proposed Action

In response to the need for action, the District Ranger of the McKenzie River Ranger District proposes to relocate boat launches at Frissell and Bruckart launch sites, and reconstruct the existing boat launch at Paradise. This proposed action is represented as Alternative 2 in this assessment, and it satisfies the need to provide and maintain opportunities for river-oriented recreation activities on the upper McKenzie River, as directed by the amended Willamette Forest Plan.

Actions Specific to Frissell Boat Launch

- Relocate by constructing a new launch site on river-right, across the McKenzie River from the existing site and downstream from the Frissell-Carpenter Bridge (see Appendix F, Figure 3). A new pre-fabricated concrete ramp would be installed measuring approximately 16 feet wide by 40 feet long (640 square feet). The ramp would extend into the river approximately 10 to 15 feet. Approximately 12 to 20 red alder trees would be felled. These red alders would be spread in the floodplain to serve as down woody material where it is feasible to do so without creating greater disturbance.
- Construct a new paved access road with a loop at the ramp, a staging area along the road, and a concrete pad to seasonally locate portable toilets on (see Appendix F, Figure 4). The new road would require felling and removal of approximately 52 conifer trees and 4 hardwoods, which would be decked and used for in-stream fish habitat or spread in the riparian reserve to serve as down woody material where it is feasible to do so without creating greater disturbance.
- Improve two pull outs along Forest Road 2650 to provide parking for vehicles and trailers. Improvements would include blading the existing shoulders to ensure proper drainage and safety, conducting some brushing, and adding aggregate.
- Decommission the existing boat launch on river-left and restore the river bank and a portion of the terrace. The existing buttress logs and cable would be removed from the site. A portion of the existing pull-out access would remain for motor vehicles along State Highway 126 (see Appendix F, Figure 5). The existing boat launch and pullout area are along the Santiam Pass-McKenzie Pass National Scenic Byway. The decommissioned boat ramp location and a portion of the highway pullout would be restored by shaping a berm to divert or contain runoff and seeding with native grasses. The large pull out would be rehabilitated by importing topsoil and re-shaping the surface.

Actions Specific to Paradise Boat Launch

- Install a new pre-fabricated concrete ramp at the existing ramp site that is wide enough to serve as two ramps (see Appendix F, Figures 6 and 7). The ramps would measure approximately 40 feet by 32 feet (1,280 square feet) and would extend into the river approximately 10 to 15 feet. Connect the existing approach road to the concrete ramp with new asphalt apron (approximately 710 square feet of new pavement). Relocate approximately 20 small boulders (16 inches to 24 inches in diameter) that would block use of the extended ramp width during low flow months.

- Pave an additional 130 feet of road-side parking in the day-use area near the ramp. The proposed location is currently unpaved native surface, and used by the public for parking.
- Designate an additional staging area adjacent to the launch area at a historic camp site established by the CCC with signing.
- Improve an existing user trail within the bank-full width of the river, adjacent to and downstream from the boat ramp. The trail is used to facilitate unloading large groups during “take out” activities. Actions include moving one 20” log and minor brush cutting.

Actions Specific to Bruckart Boat Launch

- Relocate by constructing a new launch site on the same side of the river (river-right) downstream from Bruckart Bridge (see Appendix F, Figure 8). A new pre-fabricated concrete ramp would be installed measuring approximately 16 feet wide by 40 feet in length (640 square feet). The ramp would extend into the river approximately 10 to 15 feet. Approximately 12 to 20 red alder trees would be felled. The cut alders would be spread in the floodplain to serve as down woody material where it is feasible to do so without creating greater disturbance.
- Construct a new paved access road with a loop at the ramp, including turnouts, parking stalls, a staging area, and concrete toilet pad to seasonally locate portable toilets on at the new site (see Appendix F, Figure 9). The construction of an access and loop road, staging area, and toilet pad would require the felling of approximately 47 conifers and numerous vine maple. Those trees that are suitable for fish habitat enhancement projects would be staged in a location separate from the new launch location and used in future projects. Those trees that were not suitable would be spread out in the terrace area to serve as down woody material where it is feasible to do so without creating greater disturbance. All stumps would be flush cut.
- Provide additional parking along Forest Road 19 by widening the shoulders. Fill material would be required to widen the shoulders prior to paving. One parking area would be 90 feet long by 10 feet wide (900 square feet), and the other would be 150 long by 10 feet wide (1,500 square feet) on the opposite side of Road 19 (2,400 square feet in total).
- Decommission the existing boat launch site and an existing native surfaced road that connects Bruckart landing to Forest Road 19 (see Appendix F, Figure 10). Decommissioning would include scarifying 2 to 4 inches deep and seeding with native grasses.

Decision Framework

The Responsible Official for this proposal is the McKenzie River District Ranger. While considering the purpose and need to provide and maintain opportunities for river-oriented recreation activities on the upper McKenzie River, as directed by the amended Willamette Forest Plan, the responsible official shall review the proposed action and the other alternative actions, and may decide to:

- select the proposed action, or
- select another action alternative that has been considered in detail, or
- modify an action alternative, or
- select the no-action alternative.

The Responsible Official would also determine if the selected alternative is consistent with the Willamette Forest Plan or if the Forest Plan should be amended in this action.

Relationship to the Forest Plan

In April 1994, the Willamette National Forest Land and Resource Management Plan, (USDA Forest Service, 1990) was amended by the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Spotted Owl, April 1994 (USDA Forest Service and USDI Bureau of Land Management, 1994). The Northwest Forest Plan modified the Willamette Forest Plan by overlaying management areas and their accompanying standards and guidelines.

In order to eliminate repetition and focus on site-specific analysis, this EA is tiered to the following documents as permitted by 40 CFR 1502.20:

- The Willamette National Forest Land and Resource Management Plan (Forest Plan) FEIS and Record of Decision (ROD) dated July 31, 1990, and all subsequent NEPA analysis for amendments, including the April 1994, Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Spotted Owl, or Northwest Forest Plan (USDA Forest Service and USDI Bureau of Land Management, 1994), and the accompanying Land and Resource Management Plan, as amended. The Forest Plan guides all natural resource management activities and establishes management standards and guidelines for the Willamette National Forest. It describes resource management practices, levels of resource production and management, and the availability and suitability of lands for resource management.
- This EA also tiers to a recent broader scale analysis for invasive plants (the Pacific Northwest Region Final Environmental Impact Statement for the Invasive Plant Program, 2005, hereby referred to as the R6 2005 FEIS) (USDA Forest Service, 2005). The R6 2005 FEIS culminated in a Record of Decision (R6 2005 ROD) that amended the Willamette National Forest Plan by adding management direction relative to invasive plants. This project is intended to comply with the new management direction. Proposed actions would also incorporate measures contained in the December 1988, Record of Decision and FEIS for Managing Competing and Unwanted Vegetation, and the requirements of the Mediated Agreement, signed May 24, 1989 by USFS, NCAP, OFS, et al.

The Willamette Forest Plan includes the following resource management goals, which are the basis for Forest management. The following are pertinent to recreation:

- Meeting the goals and objectives of the National Recreation Strategy.
- Maintaining and protecting existing and potential recreation sites, consistent with public demand, through operation, maintenance, and rehabilitation activities.
- Providing for distribution of a broad spectrum of developed recreation opportunities and experiences consistent with Forest use patterns and public demand.
- Providing for the protection, management and, where practicable, enhancement of the “outstandingly remarkable values” of designated Wild and Scenic Rivers.

Watershed Analysis

Two watershed analyses have been conducted in the project areas to meet direction in the 1994 Northwest Forest Plan. These analyses develop and document a scientifically-based understanding of the processes and interactions occurring within the Upper McKenzie Watershed and Quartz Creek and Minor Tributaries Watershed (see Appendix F, Figure 11).

Frissell and Paradise Boat Launches are in the Upper McKenzie Watershed. The Upper McKenzie Watershed Analysis was completed in August 1995. Bruckart Boat Launch lies within the Quartz Creek and Minor Tributaries watershed. The Quartz Creek and Minor Tributaries Watershed Analysis was completed in April 1998.

Key Watersheds

Key Watersheds are not a designated management area, but overlay all management areas. All 24.455 million acres of Forest Service, BLM, and other federally-administered lands within the range of the northern spotted owl are also allocated into one of three watershed categories: Tier 1 Key Watersheds, Tier 2 Key Watersheds, or non-Key Watersheds (all others). Key Watersheds overlay portions of all six categories of designated areas and matrix found in the Northwest Forest Plan Record of Decision. In Key Watershed areas additional management requirements are placed on activities.

Key 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.

Frissell Boat Launch lies within the Upper McKenzie River Tier 1 Key Watershed. Both Paradise and Bruckart launches are within non-Key Watersheds. The new road construction proposed for Frissell Boat Launch would add approximately 0.1 mile of new road construction in this Key Watershed. Since 1994, other projects have cumulatively decommissioned approximately 11.14 miles of road in the Upper McKenzie Watershed, a majority of which was done with the Robinson-Scott Landscape Management Project. The total mileage of already decommissioned roads is enough to offset 0.1 mile of new road

construction at Frissell Boat Launch to meet the “No Net Increase” in roads in this Key Watershed as directed by the 1994 Northwest Forest Plan ROD (B-19).

Management Areas

Management Areas (MAs) are units of land with boundaries that can be located on the ground, each having specific direction for management as detailed in the Forest Plan. Management Area direction consists of an emphasis statement, goals, desired future condition, and a description of Standards and Guidelines. In addition, the Forest Plan contains Forest-wide standards and guidelines that apply to all management areas unless specifically exempted by Management Area direction.

The table below displays Willamette Forest Plan Management Areas and Northwest Forest Plan Land Allocations that are within the boat launch project action areas. Action areas are those sites where proposed activities could take place, or sites designated for fueling or fuel storage. The following table displays Management Area designations in the 1990 Willamette Forest Plan, and the overlying designations from the 1994 Northwest Forest Plan.

Table 1. Management Areas within the McKenzie River Boat Launch Project

Willamette Forest Plan Management Areas	Northwest Forest Plan Management Areas	Boat Launches
MA-5a – McKenzie River Special Interest Area (SIA)	Administratively Withdrawn	Bruckart, Paradise
MA-6d – McKenzie River Wild & Scenic River (Recreation Classification)	Congressionally Reserved	Frissell
MA-11a – Scenic (Modification Middleground)	Matrix	Bruckart
MA-11f – Scenic (Retention Foreground)	Matrix	Paradise
MA-14a – General Forest	Matrix	Frissell
MA-15 – Riparian Area	Riparian Reserve	Bruckart, Frissell, Paradise
MA-17 – Adaptive Management Area	Adaptive Management Area	Bruckart, Frissell, Paradise

MA-5a, McKenzie River Special Interest Area (SIA)

The goals of this Management Area are to preserve lands in Special Interest Areas that contain exceptional scenic, cultural, biological, geological or other unusual characteristics; and to foster public use and enjoyment in selected SIAs through facility development.

Special Interest Area development activities could include roads, trails, trailheads, sanitation facilities, interpretive signing, or others as appropriate. Bruckart Boat Launch is within MA-5a.

MA-6d, Designated Wild and Scenic River – Upper McKenzie River

The McKenzie River is designated as a Wild and Scenic River (WSR) with a “Recreation” River Class, because it possesses numerous outstandingly remarkable values (ORV) such as: prominent recreational

opportunities, spectacular scenery, unique geological and hydrologic attributes, outstanding water quality, and diverse fish populations and habitat. In 1992, the Upper McKenzie River Management Plan and accompanying Environmental Assessment was completed to comply with law established by the 1968 National Wild and Scenic Rivers Act. This comprehensive River Management Plan tiered to the 1990 Willamette Forest Plan.

In 1988, the upper McKenzie River was designated as Wild and Scenic from Clear Lake to Scott Creek, a 12.7 mile stretch. The upper terminus is established where the McKenzie River flows out of Clear Lake. The lower terminus is at the confluence of Scott Creek and the McKenzie River. The McKenzie River is divided into three WSR segments (A, B, and C) omitting the existing hydroelectric developments: Segment A is a 1.8 mile segment from Clear Lake to the head of maximum pool at Carmen Reservoir. Segment B is a 4.3 mile segment from a point 100 feet downstream from Carmen Dam to the maximum pool at Trail Bridge Reservoir. Segment C is a 6.6 mile segment from the developments at the base of the Trail Bridge Reservoir Dam to Scott Creek.

The legislation required the USDA Forest Service to develop a management plan for this designated river in three years. In 1992, the Willamette National Forest released the Upper McKenzie River Management Plan Environmental Assessment and Management Plan and Decision Notice (USDA Forest Service, 1992) to meet Federal and State laws and provide a guide to management of both the Federal and State designated portions of the McKenzie River. Federal management goals for this project can be found in the Upper McKenzie River Management Plan (1992). This project works toward meeting those goals by providing opportunities for a wide range of river-oriented recreation activities, and by striving for a balance of resource use and protection and permitting other activities to the extent that they protect and enhance the river's outstandingly remarkable values and special attributes.

The plan also included distinct actions designed to resolve the major issues identified and to help attain the desired future condition for the upper McKenzie River. One of the actions was the development of a Capital Investment Program proposal for Buck Bridge (Frissell) dispersed recreation area. As discussed in the Purpose and Need for action, proposals that were foreseen in that analysis include re-establishment of restroom facilities, consideration of building a new boat launch on the west side of the McKenzie River, and closing the boat launch on the east side (on Oregon State Highway 126).

Actions within this management area must protect the river's free flowing character and maintain and enhance its outstandingly remarkable values and special attributes.

The Frissell Boat Launch is located within Segment C of the Upper McKenzie Wild and Scenic River.

Oregon State Scenic Waterway

Segments of the McKenzie River within this project area are also within portions of the Oregon State Scenic Waterway, administered by the Oregon State Parks and Recreation Commission. The Scenic Waterway Act and Commission rules require the evaluation of proposed development within ¼ mile from

each side of the river. Concurrence of project effects with Oregon State Parks and Recreation Division is necessary through Section 7 Wild and Scenic River analysis. An analysis of potential project effects to the outstandingly remarkable values of the Wild and Scenic River (Section 7 Wild and Scenic River analysis) has been prepared for this project proposal.

The termini and boundaries of the State Scenic Waterway designation are different from the Federal Wild and Scenic McKenzie designation. Approximately 16 miles of the upper McKenzie are designated as State Scenic Waterway. The boundaries are ¼ mile on both sides of the river. The upper terminus is established where the McKenzie River flows out of Clear Lake. The State Scenic Waterway omits the stretch from Carmen Reservoir to Tamolitch Falls, and also omits the hydroelectric developments. The lower terminus is Paradise Campground. The State Scenic Waterway has three unnumbered segments. The first is 1.8 miles from Clear Lake downstream to Carmen Reservoir. The second is approximately 2 miles long from Tamolitch Falls to Trail Bridge Reservoir. Finally, the third segment is approximately 12 miles long from Trail Bridge Dam downstream to Paradise Campground. The segments have a dual classification. The west side of the McKenzie River is classified as Scenic River Area, and the east side of the river is classified as Recreation River Area.

Goals of the State Scenic Waterway Program for this project can be found in the Upper McKenzie River Management Plan (1992). The following are those that are directly applicable to this project:

- To protect the free flowing character of designated rivers for fish, wildlife, and recreation.
- To protect and enhance the scenic, aesthetic, natural, recreation, scientific, and fish and wildlife values along scenic waterways. New development or changes of existing uses proposed within a scenic waterway are reviewed before they may take place.

Frissell and Paradise Boat Launches both lie within the Oregon State Scenic Waterway. In the proposed action, Frissell is relocated to the west side of the river (Scenic River classification). In Alternative 3, Frissell remains on the east side of the river (Recreation River classification). Paradise Boat Launch remains in its current location in both action alternatives (Recreation River classification). Bruckart Boat Launch is not located within either the federal Upper McKenzie Wild and Scenic River corridor or the Oregon State Scenic Waterway.

MA-11a Scenic (Modification Middleground)

The goal of this management area is to create and maintain desired visual characteristics of the forest landscape through time and space. Visually sensitive landscapes will be managed for a modest level of scenic quality. This area will also be managed for other resource goals including timber production, recreation opportunities, watershed protection, and maintenance of wildlife habitat.

MA-11f Scenic (Retention Foreground)

The goal of this management area is to create and maintain desired visual characteristics of the forest landscape through time and space. Visually sensitive landscapes will be managed for a high level of scenic quality. This area will also be managed for other resource goals including maintenance of wildlife habitat, recreation opportunities, watershed protection, and timber production.

MA-14 General Forest / Matrix

The primary goal of this management area is to produce an optimum and sustainable yield of timber based on the growth potential of the land that is compatible with multiple use objectives and meets environmental requirements for soil, water, air and wildlife habitat quality. In addition this area can provide many opportunities for public use and enjoyment.

MA-15 Riparian Area / Riparian Reserves

The primary goal in this management area is to maintain the role and function of rivers, streams, wetlands, and lakes in the landscape ecology. Riparian Reserves are one of the six designated management areas identified in the Northwest Forest Plan.

Riparian Reserves usually include at least the water body, inner gorges, all riparian vegetation, 100-year floodplain, landslides, and landslide-prone areas. Reserve widths are based on some multiple of a site-potential tree, or a prescribed slope distance, whichever is greater. Reserve widths may be adjusted based on watershed analysis to meet Aquatic Conservation Strategy (ACS) objectives from the Northwest Forest Plan. The ACS was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems on public lands by maintaining and restoring ecosystem health at watershed and landscape scales. The intent is to protect habitat for fish and other riparian-dependent species and to restore currently degraded habitats.

Frissell, Paradise, and Bruckart boat launches are within riparian reserves. The proposed relocation areas in the proposed action also include riparian reserves.

MA-17 Central Cascades Adaptive Management Area

Adaptive Management Areas (AMAs) are landscape units designated to encourage the development and testing of technical and social approaches to achieving desired ecological, economic, and other social objectives. The overall objective for AMAs is to learn how to manage on an ecosystem basis in terms of both technical and social challenges, and in a manner consistent with applicable laws.

The specific emphasis for the Central Cascades AMA are intensive research on forest management in experiments and demonstrations at the stand and watershed level; approaches for integrating forest and stream management objectives and on implications of natural disturbance regimes; and management of young and mature stands to accelerate development of late-successional conditions. Bruckart Boat launch is within the Central Cascades AMA.

Issue Development

Scoping and Public Involvement

Scoping is the process for determining issues relating to a proposed action and includes review of written comments, distribution of information about the project, interdisciplinary Team (IDT) meetings, and local news releases.

The Project was initiated in January 2003 and was listed in the spring 2003 issue of the Willamette Forest Focus--the quarterly schedule of proposed actions (SOPA) for the Willamette National Forest. Information on the project appeared in the local McKenzie River newspaper, The River Reflections, on February 12, 2003. The information appeared in the Register-Guard Discovery Magazine (May 22, 2003) requesting public input. Scoping letters were sent to interested parties including the Tribal Governments on February, 10, 2003 and May 29, 2003. A field trip was held for the public on Saturday, September 20, 2003 to review proposals and visit the launch locations. Several comments were received from letters during scoping and as a result of the field trip. These comments contributed to the design of the proposed action and to Alternative 3. Interdisciplinary Team responses to comments are found in Appendix G.

Significant Issues

Forest Service regulations (1950, chapter 11(3)) require that issues that are not significant to the project or that have been covered by prior environmental review be identified and eliminated from detailed study. Discussion of these issues should be limited to a brief statement of why they will not have a significant effect on the human environment or a reference to their coverage elsewhere. The issues will be listed as “Significant Issues,” and “Other Issues”.

The public and IDT identified many issues. The responsible official considered these pertinent issues and determined which are significant to the project. The following Significant Issues drove the development of an alternative to the proposed action. The Significant Issues are tracked through issue identification (in this chapter), alternative description in Chapter 2, and environmental consequences in Chapter 3.

Recreation Capacity

Issue: The design of the launch facilities may affect the number of people and number of crafts that can be accommodated at each site at one time, and the amount of crowding that occurs at each facility.

Unit of Measure: Qualitative. The effects are based on the degree to which the alternatives affect the number of people and number of crafts that can be accommodated at the site at one time. Factors considered when assessing each of the alternatives included degree of crowding at each facility, amount of vehicle parking area available at each launch site, amount of staging area space available at each launch

site, and numbers of people and craft accommodated.

Safety and Access

Issue: High velocity river flows at Frissell and Bruckart sites make it hazardous to launch or land at these facilities.

Unit of Measure: Qualitative description of river velocity in the immediate area of the launch and proposed locations. A qualitative estimate is needed due to safety considerations. Velocities will be described qualitatively in the immediate vicinity of existing ramps and proposed relocation sites.

Issue: The steep condition of the ramps at Frissell and Bruckart make it hazardous for people to access the boats.

Unit of Measure: grade of ramp, location of ramp, and surface type of ramp existing ramps in relation to proposed designs.

Threatened, Endangered, Sensitive (TES) Fish, and Management Indicator Species (MIS) Fish

Issue: The location of boat ramps could affect some life history stages of TES and MIS fish, and migratory, spawning, or rearing habitat.

Unit of Measure: Qualitative. Describe the quality of migratory, spawning, and rearing habitat of TES listed fish species (spring Chinook salmon and bull trout) and fisheries MIS (rainbow and Coastal cutthroat trout) in current locations and proposed relocation sites, and qualitatively describe the effects of project implementation.

Other Issues: _____

These *other issues* were addressed in project development. The issue statements below are followed by reasons why they were not considered significant to the development of alternatives and not fully analyzed. However, they may serve as important tools that are used to qualitatively evaluate differences between alternatives.

Vehicle Capacity and Design

The design of the boat launches and the staging areas may affect the types of watercraft that can be accommodated at each site at the number of launches that may occur at one time. This issue was not considered significant for the development of alternatives because the proposed action and the other action alternative are designed to accommodate the types of craft currently using the facilities.

In addition, the Oregon Department of Transportation (ODOT) provided input to the project during a field trip to Frissell and Bruckart launch sites on January 8, 2003. ODOT's design features are based on Oregon law and their input to re-designed turnout at Frissell Boat Launch is incorporated into Alternative 3.

Water Quality

The project could affect stream banks and beds, river dynamics, riparian and upland vegetation during boat launch site reconstruction, relocation, and rehabilitation activities. Stream temperatures could potentially be affected by the removal of riparian vegetation.

This issue was not considered significant to the formation of alternative because the effects on water quality from through disturbance would be short term and mitigation measures would limit effects on riparian resources (see Chapter 2, Mitigation Measures and Project Design Measures).

Heritage Resources

The proposed boat launch reconstruction, relocation, and rehabilitation activities could potentially affect heritage resources in the immediate vicinity.

Surveys of the proposed project area have been completed. No historic properties were identified. The Zone Archaeologist would evaluate any properties discovered during the course of project implementation for significance.

Noxious Weeds

The project poses a concern for the introduction of noxious weeds due to the ground disturbing nature of the activities.

Mitigation measures will be used to mitigate the potential introduction of noxious weeds (see Chapter 2, Mitigation and Project Design Measures.)

Threatened, Endangered, Sensitive, or Other Wildlife Species of Concern

The proposed action may have the potential to disturb TES wildlife species either directly affecting habitat or from disturbance during implementation.

This issue was not considered significant because any potential impacts to known TES wildlife species in the area can be avoided through mitigation such as survey and monitoring, and requiring seasonal restrictions during implementation (see Chapter 3, TES Wildlife).

Wildlife Management Indicator Species (MIS)

The proposed action may have the potential to disturb wildlife MIS species either directly affecting habitat or from disturbance during implementation.

This issue was not considered significant because any potential impacts to MIS wildlife species in the area can be avoided through survey and monitoring and mitigation requiring seasonal restrictions during implementation. (see Chapter 3, TES Wildlife).

Wild and Scenic River and State Scenic Waterway

The proposed action could affect the outstandingly remarkable values and attributes within designated river segments. This issue was not considered significant because a Section 7, Wild and Scenic Rivers Act analysis has been completed, and it determined that the proposed actions would not diminish the outstanding remarkable values and attributes for which the upper McKenzie River segment was designated (see Appendix E).

West Cascades and Santiam Pass – McKenzie Pass National Scenic Byways

Both Frissell Boat launch and Bruckart Boat Launch are currently situated along the West Cascades National Scenic Byway. Frissell Boat Launch is also along the Santiam Pass – McKenzie Pass National Scenic Byway, which coincides with the West Cascades Scenic Byway on this segment. In 1997, the West Cascades Scenic Byway Corridor Management Plan was completed (USDA Forest Service. 1997).

One of the goals and objectives of the management plan is to coordinate management of public use sites to further protect and enhance natural and cultural resources, and to provide continuity of design. The proposed action would relocate both Frissell Boat Launch sites to the opposite side of the river from State Highway 126 but within view of the highway. Bruckart Boat Launch would be relocated away from State Highway 126, but within view from Forest road 19, also along the West Cascades National Scenic Byway. The design of these new boat ramps has been done to retain native vegetation and to be consistent with Willamette Forest Plan standards and guidelines for development of recreation sites.

Relocating the launch facilities includes actions to restore the existing boat ramps and parking areas. Design features have been incorporated enhancement measures protect scenic quality along the frontage view of the Scenic Byway. (See Chapter 2 and 3 for details.)

Chapter 2. ALTERNATIVES, Including the Proposed Action

This chapter describes and compares the alternatives considered for the McKenzie River Boat Launch Project. This section also presents the alternatives in comparative form, defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. This analysis considers the reconstruction of the boat launches, the relocation of the boat launches, and the no action alternative (no change from existing design or maintenance regime).

Alternatives Considered but Eliminated from Detailed Study

Federal agencies are required by NEPA to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14).

Comments were received during scoping that favored improvements to an existing boat launch at MP 52 of State Highway 126, which is the developed trailhead for the McKenzie River National Recreation Trail. The ID Team considered these comments and the suggestions to modifications this site. An alternative to carry forward improvements at the trailhead was eliminated from this analysis when the team reviewed the November 1999 Decision Memo that implemented the development of this site in 2002. The Decision Memo states that the primary uses will be as a trailhead for the National Recreation Trail, and as an interpretive site for the West Cascades National Scenic Byway.

Alternatives

Alternative 1, (No Action) – The Current Management Situation

Alternative 1 does not meet the purpose and need to provide and maintain opportunities for river-oriented recreation activities on the upper McKenzie River, as directed by the amended Willamette Forest Plan. The no-action alternative would not take actions to improve the conditions of boat launches or move them from their current location. This alternative does not improve existing parking or staging areas.

Ongoing annual maintenance of the boat ramps would continue because ramps structures at all boat launches would continue to require annual maintenance to replace gravels, particularly at Frissell and Bruckart where they are more exposed to the main current of the McKenzie River.

Alternative 2 - The Proposed Action

The Proposed Action would relocate the Frissell and Bruckart boat launches, and reconstruct the Paradise Boat Launch. Alternative 2 would meet the need to provide and maintain opportunities for river-oriented recreation activities on the upper McKenzie River, as directed by the amended Willamette Forest Plan.

Actions Specific to Frissell Boat Launch:

- Relocate to a launch site on river-right, across the McKenzie River from the existing site and downstream from the Frissell-Carpenter Bridge (see Appendix F, Figure 3). A new pre-fabricated concrete ramp would be installed measuring approximately 16 feet wide by 40 feet long (640 square feet). The ramp would extend into the river approximately 10 to 15 feet from bank-full width. Up to 240 square feet of concrete pad would be in the river channel (Appendix F, Figure 4). Approximately 12 to 20 red alder trees would be removed from the floodplain where the new ramp would be placed. The cut alders would be spread in the floodplain to serve as down woody material where it is feasible to do so without creating greater disturbance.
- Construct a new paved access road with a loop at the ramp. The road would have a staging area and include a concrete pad to seasonally locate portable toilets on (see Appendix F, Figure 4). Approximately 30 Douglas-fir would be cut, 18 Western red cedar, 4 Western hemlock, 4 big leaf maple, and Pacific yew trees on the terrace would need to be felled to construct the access and loop road, staging area, and toilet pad. Those trees that are suitable for fish habitat enhancement projects would be staged in a location separate from the new launch location and used in future projects. Those trees that were not suitable would be spread out in the terrace area to serve as down woody material where it is feasible to do so without creating greater disturbance. All stumps would be flush cut. The approximate area of disturbance for the loop road, staging area, and concrete pad for the portable toilet would be 10,936 square feet.
- Improve two pull outs along Forest Road 2650 to provide parking for vehicles and trailers. Improvements would include blading the existing shoulders to ensure proper drainage and for safety, brushing, and adding aggregate surfacing.
- Decommission the existing boat launch on river-left and restore the river bank and a portion of the terrace. The existing buttress logs and cable would be removed from the site. A portion of the existing pull-out access would remain for motor vehicles along State Highway 126 (see Appendix F, Figure 5). The boat ramp location and a portion of the highway pullout would be seeded with native grasses, shrubs and conifers.
The large pullout is along the West Cascades National Scenic Byway, and would be rehabilitated by importing topsoil and shaping it into hummocks to serve as a barrier between the highway and the river by acting as a soil filter and as a berm that diverts water into existing vegetation. The hummocks would be re-vegetated along with the old ramp site to keep vehicles from driving onto the area.

Actions Specific to Paradise Boat Launch:

- Install a new pre-fabricated concrete ramp at the existing ramp site that is wide enough to serve as two ramps (see Appendix F, Figure 7). The ramps would measure approximately 40 feet by 32 feet

(1,280 square feet) and would extend into the river approximately 10 to 15 feet. Connect the existing approach road to the concrete ramp with new asphalt apron (approximately 710 square feet of new pavement).

- Relocate approximately 20 existing small boulders within the river (16 inches to 24 inches in diameter) that would block use of the extended ramp width during low flow months. An excavator would be used to place these small boulders further into the channel where the river can mobilize and relocate them.
- Pave an additional 130 feet of road-side parking in the day-use area near the ramp. The proposed location is unpaved and currently used by the public for parking on a native surface.
- Designate an additional staging area adjacent to the launch area with signing. The site is an existing historic camp site established by the CCC.
- Improve an existing user trail within the bank-full width of the river, adjacent to and downstream from the boat ramp. The trail is used to facilitate unloading large groups during “take out” activities. Actions include moving one 20” log and minor brush cutting.

Actions Specific to Bruckart Boat Launch:

- Relocate the ramp to a new site downstream from Bruckart Bridge on the same side of the river (river right) (See Appendix F, Figure 8). The ramp would be made of prefabricated concrete and would be 16 feet wide by 40 feet in length (640 square feet) and would extend into the river approximately 10 to 15 feet from bank-full width (up to 240 square feet of concrete pad in river channel) (See Appendix F, Figure 9). Approximately 12 to 20 red alder trees would be removed from the floodplain where the new ramp would be placed. The cut alders would be spread in the floodplain to serve as down woody material where it is feasible to do so without creating greater disturbance.
- Construct and pave an access road, loop road, turnout, parking stalls, staging area, and concrete toilet pad at the new site. The design of the loop road minimizes the number of large trees that would be felled and moved. Approximately 33 Douglas-fir, 1 Western red cedar, 12 Western hemlock, and 1 Pacific yew on the terrace would be felled to construct the access and loop road, staging area, and portable toilet pad. Those trees that are suitable for fish habitat enhancement projects would be staged in a location separate from the new launch location and used in future projects. Those trees that were not suitable would be spread out in the terrace area to serve as down woody material where it is feasible to do so without creating greater disturbance. All stumps would be flush cut. The total approximate area of disturbance for these actions is 19,840 square feet.
- Provide additional parking along Forest Road 19. Fill material would be brought in to widen the shoulders prior to paving. One parking area on the opposite side of Road 19 would be 90 feet long

by 10 feet wide (900 square feet), and the other would be 150 long by 10 feet wide (1,500 square feet). Total area of parking expansion would be approximately 2,400 square feet.

- Decommission the existing boat launch site (see Appendix F, Figure 10), by grass seeding the old ramp site with native grasses and red alder, planting vine maple, big leaf maple, and conifers. Also decommission an existing, compacted native surfaced loop road that connects Bruckart landing to Forest Road 19. Decommissioning would include scarifying the surface layer 2 to 4 inches in depth and seeding with native grass. The length of existing loop road that would be decommissioned is approximately 861 feet. The total approximate area that would be decommissioned is 10,000 square feet.

Alternative 3

Alternative 3 meets the need to provide and maintain opportunities for river-oriented recreation activities on the upper McKenzie River, as directed by the amended Willamette Forest Plan. The launch sites would remain in the same location where they currently exist, but would be reconstructed to reduce safety hazards and improve access. The reconstruction design reduces maintenance needs by reducing the amount of gravel that is placed on the current ramps. However, these designs would likely require 20 cubic yards of riprap at both Frissell and Bruckart. Alternative 3 would not implement the recommendations found in the Upper McKenzie River Management Plan (1992).

Actions Specific to Frissell Boat Launch:

- Install a pre-fabricated concrete ramp at the existing site, placing it at a downstream angle. The new ramp would be approximately 16 feet wide by 40 feet long (640 square feet) and it would extend into the river approximately 10 to 15 feet from bank-full width (up to 240 square feet of concrete pad in river channel). Approximately 20 cubic yards of rip-rap would be required to armor the upstream side of the boat ramp. The boulders would be placed on the river bank and a portion of the river bed.
- Re-grade the surface of the existing parking area to minimize sediment transport to the river and incorporate the recommendations from ODOT that revises the traffic flow pattern and makes efficient use of the pullout space.
- Provide a site at the boat launch for portable toilets.

Actions Specific to Paradise Boat Launch:

The actions at Paradise Boat Launch would be the same as in Alternative 2.

Actions Specific to Bruckart Boat Launch:

- Install a pre-fabricated concrete ramp at the existing site and place it at a downstream angle. The new ramp would be approximately 16 feet wide by 40 feet long (640 square feet) and it would extend into the river approximately 10 to 15 feet from bank-full width (up to 240 square feet of concrete pad in river channel). Approximately 20 cubic yards of rip-rap would be required to armor the upstream side of the boat ramp. The boulders would be placed on the river bank and a portion of the river bed.
- Re-grade the surface of the existing parking area to minimize sediment transport to the river and incorporate the recommendations from ODOT that uses small barrier structures and signs to revise the traffic flow pattern and make efficient use of the large pullout space. Traffic control at the launch location would be designed to provide for efficient use of space and flow of traffic.
- Provide a site at the boat launch for portable toilets.

Mitigation Measures and Project Design Measures

In addition to site specific measures identified in this document, this project would comply with all applicable Oregon State Water Quality statutes through compliance with Forest Plan Standards and Guidelines and General Water Quality Best Management Practices (USDA Forest Service, November 1988) as per the following document signed by both parties on May 10, 2002.

NFS 02-MU-11060000 MEMORANDUM OF UNDERSTANDING between USDA FOREST SERVICE and OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY TO MEET STATE AND FEDERAL WATER QUALITY RULES AND REGULATIONS.

The General Water Quality Best Management Practices (USDA Forest Service, November 1988) requires an Erosion Control Plan. Prior to starting work, the Contractor submits a plan which sets forth erosion control measures to be used. Operations would not begin until the Forest Service has made written approval of the plan. The plan recognizes mitigation measures required in the contract. All contracts specify that operations be scheduled and conducted to minimize erosion. These measures address Forest Wide Standard and Guideline (S&G) FW-089.

Approval of the erosion control measures plan would be conducted using an interdisciplinary approach. The measures approved by the interdisciplinary team will be reflected in the contracts specifications and provisions. Monitoring and enforcement of the erosion control plan would be the responsibility of the Contracting Officer's Representative (COR). Watershed and fisheries specialists would be on the work site during in-river work.

In the case of a hazardous spill, the Willamette National Forest has a Hazardous Spill Control and Emergency Response Plan, which is consistent with S&G FW-091 (USDA Forest Service, Willamette NF, February 17, 2004). The plan contains specific information and requirements on the following:

- Emergency Notification
- Quick Response Checklist
- Hazardous Spill Coordinators & Key District Personnel
- Federal Emergency Response – U.S. Coast Guard & EPA
- Forest Service - Scope & Purpose
- Elements of the Emergency Response Plan
- Pre-emergency Planning and Coordination with Outside Parties
- Personnel Roles, Lines of Authority, Communication and Training
- Emergency Recognition and Prevention
- Safe Distances and Places of Refuge
- Site Security and Control
- Evacuation Routes and Procedures
- Decontamination
- Termination, Critique of Response and Follow Up

The plan requires the contractor to have two *Spill Response Kits* on the project site whenever equipment is operating. One spill response kit shall be sufficient to absorb 34 gallons of oil, and designed to float on the surface while absorbing oil and repelling water. Equipment shall be furnished on a fully operational basis, of modern design and in good operating condition with no fuel or oil leaks.

Specific Project Design Features for Activities In-stream or Adjacent to Streams:

- During construction activities, silt barriers will be placed as needed to prevent movement of sediment from the worksite to the river. Fisheries or watershed personnel will be consulted on the need for, and the specific locations for placement of these barriers.
- Upon completion of construction activities areas of exposed soil will be seeded or planted with native species. Areas will be mulched with weed free straw to prevent erosion and potential sediment transport.
- All equipment that will be used for instream work in the McKenzie River will be free of leaks and cleaned of grease, oil, and other solvents prior to use, and will be equipped with drip pans or diapers and water friendly fluid systems (i.e. non-petroleum based fluids).
- Fuel storage will not be permitted within Riparian Reserves (within 320 feet of fish bearing streams). Fueling sites will be designated by the COR and will not be within 150 feet of water.

- New ramps and roads will be designed to shed water into vegetation. The areas where new construction would take place are composed of glacial/fluviol material and soils are very porous and permeable. Due to these conditions no surface runoff to the river is expected. The exception to this is the ramp itself where rain water would shed to the river.
- Any trees that need to be removed for the project would be spread in the Riparian Reserve in a fashion that does not cause too much disturbance; trees that are suitable for fish habitat projects will be staged for use at a future time.
- The project will minimize the need to cut big trees would utilize previously disturbed areas.

Specific Project Design Features for Wildlife:

- Work in the McKenzie River can take place during the instream work period (July 1 – August 15). It is likely that work would occur between July 16 and August 15 due to wildlife seasonal operating periods.
- Implementation of any action alternative will have no effect to the northern spotted owl. A seasonal operating restriction from March 1-July 15 would protect nesting owls which may be present during the critical breeding season. However, the project is adjacent to highway 126 and or the McKenzie River and ambient noise levels are continually high.
- Because project activities would occur near bald eagle foraging and nesting habitat along the McKenzie River, a seasonal restriction from January 1-August 30 would be required. This restriction may be lifted if non-nesting is verified within the area.
- Project activities would occur in the riparian areas adjacent to the McKenzie River that may provide nesting habitat for harlequin ducks. Therefore, a seasonal restriction from April 1-June 30 would be required. The felling and leaving on site of individual trees for safety and parking in riparian areas would benefit this species by supplementing down woody material in their habitat. Flush cut any stumps (S&G MA 6c-12).

Specific Project Design Features for Noxious Weeds

- All equipment shall be power washed to remove all foreign or noxious seeds/weeds prior to entering Forest Service lands. Equipment will be free of all seed and debris that may contain plant seeds (i.e. soil and vegetation). Material brought in to reconstruct the boat launches, such as fill soil or gravel, will be free of weeds and weed seed.

CHAPTER 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section summarizes the physical, biological, social and economic environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for comparison of alternatives presented in Chapter 2.

The cumulative effects discussed in this section include an analysis and a concise description of the identifiable present effects of past actions to the extent that they are relevant and useful in analyzing whether the reasonably foreseeable effects of the agency proposal for action and its alternatives may have a continuing, additive, and significant relationship to those effects. The cumulative effects of the proposed action and the alternatives in this analysis are primarily based on the aggregate effects of the past, present, and reasonably foreseeable future actions. Individual effects of past actions are not listed or analyzed, and are not necessary to describe the cumulative effects of this proposal or the alternatives. (CEQ Memorandum, Guidance on the Consideration of Past Actions in Cumulative Effects Analysis, June 24, 2005.)

Recreation Capacity and Design

Affected Environment

The Frissell Boat Launch is located within the State Scenic Waterway designated portion of the upper McKenzie River. The Paradise Boat Launch, situated within the Paradise Campground complex, is located at the western terminus of the State Scenic Waterway. Frissell and Bruckart boat launches are both located on the West Cascades National Scenic Byway. Neither facility is signed as a boat launch. No highway approach signing exists to direct recreationists to the launches. Recreational activities and recreational users are diverse in and around the boat launch locations. Scenic viewing is an important recreational activity in the corridor, especially scenic viewing from Highway 126, the river and the McKenzie River National Recreation Trail (NRT). The McKenzie River NRT begins at a developed trailhead at MP 52 on State Highway 126, which is co-located with an interpretative site designed for the West Cascades National Scenic Byway.

The McKenzie River NRT is closely associated with the Frissell boat launch and is visible from the existing launch site. A McKenzie River NRT trailhead is also located within the Paradise Day Use Area. The Paradise Day Use Area is accessed by a shoulderless, two lane paved road. This road accesses a picnic area, amphitheatre, private driveway, restrooms and the Paradise Boat Launch.

The tables below displays use for calendar year 2005. Adding together both launch and take-out, Paradise launch served a total of 6,566 of commercial clients and 331 non-commercial clients, Frissell served 2,509 commercial clients and 190 non-commercial clients while Bruckart served 386,1 commercial

clients and 184 non-commercial clients. A total of 2,250 commercial crafts and 302 non-commercial crafts used these three launches in 2005.

Non-commercial use is determined by a voluntary boater registration card system. Compliance rate of the voluntary system is estimated to be approximately 50% based on days monitored when the registration boxes were in place. Registration boxes were up April to September, but three were vandalized or removed earlier in the season. No reports were made for organized group use in 2005.

Table 2. Recreation Use at the Boat Launches in 2005

	Frissell Launch	Frissell Take Out	Paradise Launch	Paradise Take Out	Bruckart Launch	Bruckart Take Out
Commercial Clients	2,509	0	5,700	866	8	3,853
Non-Comm Clients	187	3	243	88	0	184
Total Clients	2,696	3	5,943	954	8	4,037
Commercial Crafts	489	0	953	151	6	651
Non-Commercial Crafts	66	3	99	66	0	68
Total Crafts	555	3	1,052	217	6	719

Actual numbers would increase with the estimated 50% non-commercial trips that did not participate in the voluntary registration system and by approximately 25% for the portion of the year that the boxes were not in place. Table 4 provides use numbers with the estimated increases:

Table 3. Estimated Recreation Use at Boat Launches for 2005

	Frissell Launch	Frissell Take Out	Paradise Launch	Paradise Take Out	Bruckart Launch	Bruckart Take Out
Total Clients	2,929	7	6,246	1,064	8	4,267
Total Crafts	637	7	1,175	299	6	804

Although not an issue during the Upper McKenzie River Plan (Upper McKenzie River Management Plan, 1992), crowding at river launch facilities is now known to be an increasing problem. The McKenzie River is accessed by 14 boat launches; however, there is uneven use across boat launches with some receiving the majority of use and some having almost no use. Over 500 commercial trips launched at Paradise and nearly 300 commercial trips took out at Bruckart in 2001. 71 commercial trips launched at Frissell in the same year. Commercial group sizes range from as few as one client to over 40. In 1990, approximately 4500 boaters were estimated to have floated the river stretch between Olallie and Blue River. The

majority of these boaters, both commercial and private, used Paradise Boat Launch (Moran, 1990). Records indicate that commercial use has steadily increased since 1990. Although there is inconclusive information regarding waiting times at launches, boaters have expressed frustration regarding delays at take-outs and waiting time at put-ins. Crowding and competition for parking, however, is clearly an issue at some launches, particularly at Paradise.

Issue of Recreation Capacity

The design of the launch facilities may affect the number of people and number of crafts that can be accommodated at each site at one time, and the amount of crowding that occurs at each facility. This issue is measured qualitatively. The effects are based on the degree to which the alternatives affect the number of people and number of crafts that can be accommodated at the site at one time. Factors considered when assessing each of the alternatives included degree of crowding at each facility, amount of vehicle parking area available at each launch site, amount of staging area space available at each launch site, and numbers of people and craft accommodated.

Environmental Consequences

Effects of Alternative 1 - No Action

Under the no action alternative, the amount of vehicle parking space and staging area space at each of the launch sites would not be changed. Numbers of craft accommodated at one time would not change. Crowding at launch sites could increase as river use increases over time.

Effects of Alternative 2 – Proposed Action

Direct and Indirect Effects

Frissell: Under this alternative there is no net gain of parking as compared to the current location of the Frissell launch. However, crowding at the launch site would be reduced by the addition of a formal staging area that is not currently available at the existing Frissell launch.

Paradise: This alternative would increase the number of people and craft accommodated at Paradise due to an increase in roadside parking, the addition of a second staging area, and the addition of another ramp allowing more than one craft to be launched at one time. Improvement of a trail access to the staging area below the ramp would reduce crowding at the shoreline.

Bruckart: Under this alternative there is no net gain of parking as compared to the current location of the Bruckart launch. However, crowding at the launch site would be reduced by the addition of a formal staging area that is not currently available at the existing Bruckart launch.

Effects of Alternative 3

Direct and Indirect Effects

Frissell: This alternative would reduce the numbers of people and craft accommodated at the Frissell launch at one time due to the redesign of traffic control to meet Oregon Department of Transportation standards along Highway 126. Total parking and staging area would be reduced at Frissell under this alternative.

Paradise: Same effects as in Alternative 2.

Bruckart: The amount of vehicle parking space at Bruckart would be reduced due to design of traffic controls to meet Oregon Department of Transportation standards along Highway 126. Crowding would not be reduced at Bruckart under this alternative as no additional staging area or pedestrian access would be developed.

Safety and Access

Affected Environment

The Frissell Boat Launch and aggregate surfaced parking area is located adjacent to State Highway 126. There is no directional signing for traffic flow in and out of the site, nor any indication of desired parking patterns. The current ramp is steep, constructed with embedded wooden poles, cabled together and placed in a step pattern to retain the aggregate from sloughing into the river. The ramp is on the outside of a curve and high river flows routinely erode the bottom of the ramp. Regular aggregate replacement is required to keep this ramp in its current condition. It is generally positioned perpendicular to the river. The bottom of the ramp exceeds 50% grade. The middle portion is approximately 30% grade with the top leveling out to a 15% grade. Over the entire ramp the average grade is 26%.

Paradise Boat Launch is in a developed day use area with paved access road and parking areas. There is a paved one-way loop road that provides convenient truck and trailer access to the ramp. The current ramp is aggregate and wide enough for two crafts to put in unless the first one in decides to use the middle of the ramp. There have been complaints that the grades are too steep and when rigs pull out of the ramp they spin their tires and throw aggregate. This ramp requires minor annual maintenance.

Bruckart Boat Launch is in many ways similar to Frissell Boat Launch, located adjacent to the state hwy 126, aggregate parking area and a steep ramp located on the outside of a curve in the river. During high flows the ramp is undercut. Efforts at minimizing this have been made by placing large riprap up stream of the ramp and are successful for a few years time. The current ramp is asphalt with grades exceeding 35% at the bottom of the ramp and decreasing to 15% at the top. Over the entire ramp the average grade is 22%.

Issue of Safety and Access

High velocity river flows at Frissell and Bruckart sites make it hazardous to launch or land at these facilities. Analysis of this issue included the qualitative description of river velocity in the immediate area of the launch and proposed locations by alternative. A qualitative estimate was chosen to capture the safety considerations. River velocities are described qualitatively in the immediate vicinity of existing ramps and proposed relocation sites.

The steep condition of the ramps at Frissell and Bruckart also make it hazardous for people to access the boats. Analysis of this issue is also measured by the grade of the ramp, location of ramp, and surface type of ramp existing ramps in relation to proposed designs.

The effects of the alternatives on this issue are based on the degree to which the alternatives affect the safety of the users in accessing boats and rafts. Factors considered when analyzing each of the alternatives included the percent slope of each ramp and the angle of Frissell and Bruckart ramps to the river.

Environmental Consequences

Effects of Alternative 1 – No Action

Under the no action alternative, the percent slope of each ramp and the angle of the ramps would not be changed. Consequently, the safety of the users while accessing boats and rafts would not be changed. The ramps would remain in their current locations at Frissell and Bruckart which would maintain their site on the main current side of the river channel. There would therefore be no change in the hazardous conditions at these launch locations. Since Paradise launch is at the bottom of a cobble bar in relatively quiet water it is not as hazardous to launch from. Under the no action alternative the condition would remain the same.

Effects of Alternative 2 – Proposed Action

Direct and Indirect Effects

Frissell: This alternative of relocating to below Frissell-Carpenter Bridge would increase the safety of the users while accessing their river craft by reducing the grade of the ramp. The relocation site downstream of Frissell-Carpenter Bridge is on the inside of the river bend near the top of a small cobble bar. It creates conditions where the river bank is not as steeply entrenched and the river velocities are less than current ramp locations. All of these conditions make it possible to place a boat ramp at a relatively flat grade (12-15%) and improve access conditions.

Paradise: Since Paradise launch is at the bottom of a cobble bar in relatively quiet water it is not as hazardous to launch from, but this alternative should increase the safety of the users by reducing the grade of the ramp, increasing the width and providing a concrete surface.

Bruckart: Relocating the ramp to below Bruckart Bridge would increase the safety of the users while accessing their river craft by reducing the grade of the ramp. It would also improve conditions for landing craft at the launch. The relocation site downstream of Bruckart Bridge is on the inside of the river bend near the top of a small cobble bar, which creates conditions where the river bank is not as steeply entrenched and the river velocities are less than current ramp locations. All of these conditions make it possible to place a boat ramp at a relatively flat grade (12-15%) and improve access conditions.

Effects of Alternative 3

Direct and Indirect Effects

Frissell: Alternative 3 would increase the safety of the users by reducing the grade of the ramp and providing a concrete surface. The ramp would be constructed at an approximately 45 degree angle to the river. This increases the horizontal length of the ramp, reducing grades to 20% or less.

This alternative maintains the ramp on the main river current side of the channel. Changing the angle of the ramp and reducing its grade would reduce hazards associated with accessing the boat by foot and loading into the boat. However, by keeping the ramp in its current location, it retains those hazards associated with fast moving water (i.e. difficult landing and launching). In contrast, Alternative 2 would have a greater reduction in hazards due to a relative reduction in river currents on the inside bend of the river channel.

Paradise: Same as in Alternative 2

Bruckart: This alternative would increase the safety of the users by reducing the grade of the ramp and providing a concrete surface. The ramp would be constructed at an approximately 45 degree angle to the river, which increases the horizontal length of the ramp and reducing the grade to 15% or less. The safety of vehicle traffic in and out of the site would be increased by signing and pavement markings.

This alternative maintains the ramp on the current side of the main river channel. Changing the angle of the ramp reduces its grade and reduces hazards associated with accessing the boat by foot and loading into the boat. However, by keeping the ramp in its current location retains those hazards associated with fast moving water (i.e. difficult landing and launching). In contrast, Alternative 2 would have a greater reduction in hazards due to a relative reduction in river currents on the inside bend of the river channel.

Cumulative Effects

The existing boat ramps and launches at Frissell, Paradise, and Bruckart have evolved since they were built, and have been contributing to river-oriented recreation opportunities for the public over the past several decades.

Ramp relocations at Frissell and Bruckart, with more defined parking and staging areas and the improved access at Paradise in the Alternative 2, accommodate the existing demand by the public and reduce crowding. At Paradise Day Use Area, more people and water craft may be accommodated at one time. Under Alternative 2, access and safety would be improved for people and water craft due to firmer or more stable ramp surfaces and reduced slopes.

Although Alternative 3 improves access and reduces safety hazards Frissell and Bruckart, currently available parking space and staging areas may be reduced to accommodate the redesign of traffic controls to meet highway transportation standards.

There are no reasonably foreseeable future management actions which would contribute to changing the capacities for launching boats, amount of parking space for vehicles, designation of staging areas, ramp slope and surface, access or safety for people utilizing these facilities. No further improvements to the three boat launch facilities and no development of additional boat launch facilities are planned.

Threatened, Endangered, Sensitive (TES) Fish, and Management Indicator Species (MIS) Fish _____

Affected Environment

The bull trout (*Salvelinus confluentus*) and the Upper Willamette spring chinook salmon (*Oncorhynchus tshawytscha*) are both species listed as threatened under the Endangered Species Act. Coastal cutthroat trout (*Oncorhynchus clarki*) and rainbow trout (*Oncorhynchus mykiss*) are Management Indicator Species (MIS). All species can be found in the project area during portions of their life history.

Migratory Habitat

There are no barriers to migration in the project area. Trail Bridge Dam is a barrier to migration in the main stem McKenzie River and is approximately five miles upstream of Frissell Boat Launch (the most upstream of the three launches in the project area).

Spawning Habitat

Cutthroat trout tend to spawn in small tributaries of the McKenzie River. Rainbow trout have been observed spawning in the mainstem McKenzie River, but no redds were observed during spawning ground surveys.

Bull trout do not spawn near any of the boat launch locations. Bull trout spawning occurs in tributaries over 4 miles upstream of Frissell Boat Launch where ground water from the high cascades provides stream temperatures cold enough for incubation and early rearing.

Spring Chinook salmon spawn throughout the McKenzie River. Important areas include the tail-outs of pools, side channels, and gravel depositional areas associated with large wood or some other physical

feature. Spawning ground surveys have been conducted at all boat launch sites and the following paragraphs summarize results of those surveys.

At Frissell, the river at the existing site and the proposed site are high velocity rapids. This does not provide suitable spawning habitat for TES/MIS fishes. The closest spawning site downstream of the Frissell location is at tail-out of “Blue Pool” which is approximately ½ mile downstream. One spring Chinook redd was observed at Blue Pool in 2006.

At Paradise, the channel downstream of the ramp on river left is a rapid and is bordered by rip-rap along Paradise campground. This does not provide good spawning conditions for spring Chinook salmon. However, shallow margin habitat on river right (the inside of the river bend) could provide spawning sites but no redds have been observed during spawning ground surveys. Side channels further downstream (about 1 river mile) are areas of known salmon spawning.

At Bruckart, the closest known salmon spawning habitat is 1,000 feet downstream of proposed ramp site. Chinook have been seen spawning 500 feet downstream of the existing Bruckart Boat Launch on the opposite side of the river. Turbidity is not expected to reach any further than 300 feet downstream, and if a pulse did occur due to rehabilitation or construction activities it would not cross the river, but rather would stay on the main current side of the river.

Rearing Habitat

Bull trout have specific habitat requirements depending on the life history stage. Bull trout fry and juvenile rearing habitat is found in the same streams where spawning occurs. Some older juveniles (3 and 4 year old) could rear in the vicinity of Frissell Boat Launch due to the cold temperatures in the river, but it is unlikely these juveniles rear downstream near Paradise and Bruckart boat launches. Sub-adult (4 and 5 year old) and adult (5 years and older) have suitable water temperature conditions at all three boat launch locations, but deep pools are absent at the launch sites. Deep pools are an important habitat element for rearing sub-adults and adults.

Important rearing habitat for spring Chinook salmon include deep pools for both adults holding during the summer and juveniles rearing during downstream migration. Juveniles also require quiet areas in the river to rear such as side channels and river margins especially near physical features like large wood or boulders. These areas are located throughout the project area, but deep pools are absent at the launch sites.

Issue of TES/MIS Fish Migratory, Spawning, or Rearing Habitat

The location of boat ramps could affect TES/MIS fish migratory, spawning, or rearing habitat.

Unit of Measure. The analysis of this issue used qualitatively descriptions of the effects of project implementation. This description considered the quality of migratory, spawning, and rearing habitat of MIS (rainbow and Coastal cutthroat trout) and ESA listed species (spring Chinook salmon and bull trout) in current locations and proposed relocation sites.

Environmental Consequences

Effects of Alternative 1 – No Action

Direct and Indirect Effects

Migratory Habitat – There would be no change to migratory habitat for any fish species with the implementation of Alternative

Spawning Habitat – The boat launches do not have a direct effect on spawning habitat for TES/MIS fish because spawning habitat does not exist in direct proximity to any of the existing ramps. All bull trout spawning in the McKenzie River occurs upstream of Frissell Boat Launch (in Anderson and Olallie creeks), and therefore none of the alternatives have the causal mechanisms to affect bull trout spawning. During field investigations the closest spawning habitat found for other salmonid fishes (both TES and MIS) was downstream of the ramps at Bruckart. Spawning Chinook salmon were observed approximately 500 feet downstream of the existing ramp and on the opposite side of the river. At Frissell, the closest spawning was at Blue Pool, which is approximately ½ mile downstream; and at Paradise, the closest spawning habitat was over 1 mile downstream.

Cutthroat trout primarily spawn in tributaries to the McKenzie River so it is highly unlikely that the boat ramp project could affect their spawning habitat directly, or indirectly. Rainbow trout have been observed spawning in the main stem McKenzie River. However, the closest potential spawning sites are about ½ mile downstream from Frissell, about 1 mile downstream of Paradise, and about ¼ mile downstream of Bruckart.

Boat launch use and maintenance can have indirect effects on spawning habitat due to the need to occasionally replace gravel on ramps. Fine sediment associated with replaced aggregate could potentially impact spawning areas. However, it is unlikely that the amount of fines associated with regular gravel maintenance have measurable adverse effects on spawning habitat. For example if Alternative 1 were selected, gravel placed at ramp sites in order to maintain them would continue when needed. Typical quantities of gravel required to maintain the ramps are 1-2 cubic yards per year for all three ramps. However, there are years when no gravel is required for maintenance. Most of the gravel is placed at Frissell and Bruckart due to their positioning on the bank where they are subjected to the main river current. A “sediment budget” of the upper McKenzie River was recently conducted by Stillwater Sciences as a study for the Eugene Water & Electric Board (Stillwater Sciences 2006a). The study provided an estimate of average annual sediment yield in metric tons per year ($t\ y^{-1}$) for the upper McKenzie River, and the cumulative results for sediment yield up to the confluence of Scott Creek were 25,450 $t\ y^{-1}$. Scott Creek is just downstream of the Frissell launch site. Given the relatively minor amount of gravel that is used to maintain the ramps this alternative if selected would not have a significant effect on fish habitat in the main stem McKenzie River. In addition, during spawning ground surveys below all boat ramps in 2006 those gravel patches where spawning was possible did not visually appear to be adversely affected by fine sediments. The ongoing use and maintenance of the boat ramps could potentially affect spawning

habitat for TES/MIS fish but given study findings (Stillwater Sciences 2006a) and field investigations conducted by fisheries personnel, it is unlikely that ramp maintenance is having negative effects on spawning habitat.

Rearing Habitat – The type of river habitat needed for rearing TES/MIS fish (e.g. deep pools, pocket pools, or shallow river channel margins) depends on the species and life history stage of the particular fish.

The amount of gravel needed to maintain the ramps relative to the natural sediment regime is not sufficient to fill deep pools, or pocket pools given the stream discharge of the river and its ability to mobilize and transport gravel size sediments. Maintenance can have potential effects to margin habitat in direct proximity to the river. This would primarily affect Chinook salmon fry, and rainbow trout fry that would seek this shallow, low velocity habitat for cover after emergence from the redd. Sediments from the ramp could affect the spaces between cobbles (interstitial spaces) where small fish can take cover, however this impact would be limited to an area in direct proximity to the ramp and would likely change with seasonal flow regimes.

It is highly unlikely that bull trout fry would be found in direct proximity to the ramps due to the temperature regimes. Buchanan and Gregory (1997) indicate that optimal “early” fry rearing takes place at temperatures 4 - 4.5° C (39.2 - 40.1° F) and “late” fry rearing at temperatures from 4 - 10° C (39.2 - 50.0° F). Spence and others (1996) also indicated that these temperatures were optimal. Table 6 below displays stream temperature data collected by the Forest Service. Bull trout fry rear in streams like Olallie Creek and Anderson Creek where temperatures are cold. In the river temperatures are warm relative to the bull trout “natal” streams. River temperatures at Frissell Boat Launch are approximately 10.1° C as measured by Stillwater Sciences in 2005 downstream of Deer Creek, and all other main stem temperature (McKenzie River near Ranger Station [relatively close to Paradise], and the USGS gage at Bruckart Boat Launch – Table 7) show summer temperatures above 12° C which is too warm for optimal bull trout fry rearing. In addition to temperature conditions, the flow conditions in the river are high relative to the spawning tributaries and a small bull trout fry would have difficulty finding cover in the river. During field investigations no bull trout fry were located at any of the boat launch sites.

Spring Chinook fry can use margin habitat after emergence from the redd, but as they grow they will move to pocket pool habitat and eventually they will school in large, deep pools. Boat ramp maintenance could affect river margin habitat which in turn could affect fry habitat. As with rainbow and cutthroat trout fry, the effects would be limited to the area in direct proximity to the ramps and would be seasonal in nature. Relative to the amount of rearing habitat the McKenzie River provides for salmonid fishes, the impact to river margin habitat if Alternative 1 is selected is minor.

Table 4. Stream Temperature Data Collected by the Forest Service in 2005

Stream Name	Geographic Description of Sensor Location	Geologic Province	7-Day Average Maximum in Degrees Celsius	Date of Maximum Temperature
Anderson Creek (Boulder Cr / Frissell Cr 6th)	At Highway 126	New High Cascades	6.6	September 14
Boulder Creek (Boulder Cr / Frissell Cr 6th)	Near Mouth	Old High Cascades ^a	13.1	August 8
McKenzie River (Boulder Cr / Frissell Cr 6th)	Below Trail Bridge Dam	Primarily High Cascades at this point, but influenced by Smith River watershed and Trail Bridge Reservoir upstream	10.6	August 4
McKenzie River (McKenzie Bridge 6th)	Near Ranger Station	McKenzie River Glacial Valley ^b	12.2	August 9
Olallie Creek (Boulder Cr / Frissell Cr 6th)	At Highway 126	New High Cascades	5.5	July 10
Scott Creek (Boulder Cr / Frissell Cr 6th)	Near Mouth	Old High Cascades	12.2	August 10

^a The term Old High Cascades is used only to describe how Scott Creek and Boulder Creek cut through Pleistocene glacial deposits and “New” High Cascade lavas in their headwater areas, but further downstream incise underlying older High Cascades lava that have been subjected to fluvial processes for a longer period of time and McKenzie River glacial deposits.

^b The term “McKenzie River Glacial Valley” is used at this site since because the river is in a glacial valley confined by two east-west trending ridges, but is not a recognized province name.

Information was reviewed for the USGS gauge that is located immediately adjacent to Bruckart Boat Ramp. The USGS name for this gage location is:

- McKenzie River above South Fork near Rainbow, Oregon.
- USGS ID: 14159110

Table 5. Data from USGS Gage near Bruckart Boat Ramp in 2005

Date of 7-Day Average Maximum	Temperature in Degrees Celsius
July 20	13.7
August 8, 9, 10, and 11	13.5
September 1	12.2
September 30 ^a	9.8

^a The 7-day avg max for the month of September was on the 1st. The September 30 7-day avg max is provided to show the decreasing trend in temperature during the month of September.

Cumulative Effects of Alternative 1, No Action

The installation of the boat ramps and launch facilities at Frissell, Paradise, and Bruckart, have resulted in a situation that requires the annual input of gravel to the boat ramp structures to replace annual removal during high flows. The no-action alternative would not change the current need for added gravel each year. As stated above, relative to the natural sediment regime in the river, the amount of gravel used to maintain the boat ramps is having minor effects to fish habitat. Those effects are found in direct proximity to the ramps where fines can affect the interstitial spaces where rainbow, cutthroat, and Chinook fry could take cover.

There are no reasonably foreseeable future management actions along the upper McKenzie River that would result in additional, measurable change to fish habitat in the direct proximity to the boat ramps.

Effects of Alternative 2 – Proposed Action

Direct and Indirect Effects

Frissell Boat Launch – The relocation activities would take place on the southwestern terrace in a river bend. Individual trees removed at this site on the terrace would include Douglas-fir and western red cedar, and red alder where approximately a 12-16 foot wide area at the ramp location. Some of the upland trees and all the red alder provide shade to the river. However, the removal of these trees is not expected to have a measurable effect on stream temperatures for the following reasons. The majority of crowns on the large conifers would be maintained through project design, which avoids big trees where possible. Spring-fed flows from ground water sources dominate the river flow at this site during the summer and the removal of individual trees (approximately 12 to 20 red alder) would not be of the magnitude that the impacts could be measured at the site scale or the sub-watershed scale.

Evidence for this rationale can be found in the temperature monitoring results for the McKenzie River upstream and downstream of the Deer Creek confluence. Deer Creek is about 3 river miles upstream of the Frissell Boat Launch site and it contributes “warm” water to the McKenzie River that is 19.0 degrees Celsius (66.2 degrees Fahrenheit) in temperature (7-day average maximum in 2005). Monthly maximum 7-day average temperatures in the river above and below the Deer Creek confluence were 9.3o C (48.7o F) and 10.3 (50.5o F) in 2004 (Stillwater Sciences 2006b). In 2005, temperature monitoring above and below recorded 9.3o C (48.7o F) and 10.1 (50.2o F) (Stillwater Sciences 2006b). If a stream system the size of Deer Creek (a 23 mi² watershed) contributes warm 19.0o C water to the river, and can only have a 1o C (1.8o F) impact on temperatures, it seems extremely unlikely that the removal of a dozen or so red alder and individual upland trees in a spring-fed dominated location could be measurable.

The new ramp would cover approximately 640 square feet. The ramp would extend into the river approximately 10 to 15 feet from bank-full width. Up to 240 square feet of concrete pad would be in the river channel. The approximate area of disturbance for the loop road, staging area, and concrete pad for the toilet would be 10,936 square feet.

Construction of the two pull outs along Forest Road 2650 would occur on disturbed ground and no new fill would be required to improve them. These existing pull outs are approximately 50 feet in length and 90 feet in length, and are both 10 feet wide (total area of 1,593 square feet – this figure includes “tapers” on the pullouts). Since no new ground would be disturbed to improve these pull outs (i.e. they are already disturbed ground) the square footage of “improvement” is not included in the total area of disturbance shown in the following table.

Table 6: Summary of Project Area Impacts Described Above^a

Site	Total Area of Impact in Sq Ft.	Total Area Decommissioned in Sq Ft.	Total Area of Concrete Ramp in Bankfull Width in Sq Ft. ^b
Frissell	10,936	2,670	240
Paradise	3,439	0	480
Bruckart	19,900	10,000	240

^a These figures are approximate as designs are conceptual, and they represent a “worst case scenario.” That is, the total area impacted will likely be less and the total area restored will likely be greater. All of the area summarized is within the Riparian Reserve.

^b This figure is included in the “total impact” column and represents the amount of ramp that would be “in the water” during normal flows.

Decommissioning the existing boat launch on river-left involves removing the existing buttress logs and cable from the site. The river bank and a portion of the terrace would be restored. A portion of the existing pull-out access would remain for motor vehicles along State Highway 126 (see Appendix F, Figure 5).

The decommissioned boat ramp location and a portion of the highway pullout would be restored. The large pull out would be rehabilitated by importing topsoil and re-shaping the surface. The ramp site would include seeding with native seed and red alder, planting vine maple trees, big leaf maple, and conifers (Douglas-fir or Western red cedar depending on what is available). The vegetation would be monitored thru the seasons (for up to 2 years) and if the site requires additional seeding or tree planting due to mortality or for any other reason, it would take place during the appropriate planting season.

The large pull out would be rehabilitated by importing topsoil and shaping it into hummocks. These hummocks would also be seeded with native grass to serve as a barrier between the highway and the river by acting as a soil filter and as a berm that diverts water into existing vegetation. Vegetated hummocks are desired since this is along the West Cascades National Scenic Byway. The measure would keep vehicles from driving onto the area. The approximate area of decommissioning for these actions totals 2,670 square feet.

Paradise Boat Launch –Alternatives 2 and 3 take the same actions at Paradise Boat Launch, which would occur on the south river bank. The parking lot work in the day use area is far enough away (100 to 150

feet) from the river that trees removed would not impact shade conditions. No tree removal is proposed at the ramp location and staging area location.

The replacement concrete ramp at the existing site would have a decreased gradient relative to the existing ramp and would measure 40 feet by 32 feet (1,280 square feet). The approach road is currently paved so the only new paving expected at the ramp would be the apron in order to connect the loop road to the concrete ramp (approximately 710 square feet of new pavement). The ramp would extend into the river approximately 10 to 15 feet from bank-full width (up to 480 square feet of concrete pad in river channel). The total area at the ramp site that would be concrete and asphalt is approximately 1,990 square feet.

An excavator would need to wade approximately 25 feet into the river to place the 20 small boulders, 16 inches to 24 inches in diameter, further into the channel where the river can mobilize and relocate them. The river is approximately 145 feet wide in this location.

The road side parking sites in the day-use area are approximately 125 to 150 from the river and are currently used as unpaved parking spaces. This “additional” road side parking would formalize the areas by paving the bare sites. Some small trees less than 6 inches in diameter (big leaf maple, Western hemlock, and vine maple) would need to be cut. The additional areas would be 50 feet by 10 feet, and 80 feet by 10 feet which would increase the impervious area in the Paradise day use area by 1,449 square feet (this figure includes “tapers” on the pullouts).

An additional staging area close to the launch area would be designated by signing an area not currently vegetated (it is a former historic camp site established by the CCC). No aggregate would be placed on this staging area, and no real “on the ground” changes would occur except for signing to designate it as a staging area.

An existing user-trail that is within bank-full width would be improved by placing spawning size gravels (1 to 3 inch), relocating large woody material, and trimming riparian vegetation (Figure 7). This user trail is approximately 20 feet away from the river during base flow conditions. The rationale for placing spawning size gravel on the trail is due to its location within bank-full width. When floods mobilize gravel on the user trail, it would at least be appropriate for spawning in whatever location the river places it. The piece of wood to be relocated is 22 feet in length by 19.5 inches in diameter. It would be moved upstream onto the cobble bar to remain within the bank-full channel. The riparian vegetation to be trimmed is along the user trail and is comprised of alders and vine maple.

Bruckart Boat Launch – Relocation of the ramp to the new site downstream from Bruckart Bridge is on the same side of the river (river right). Therefore, all actions would occur on the north river bank and trees removed in this proposal would not be shade trees for the river, so no impact on stream temperatures at the site scale is anticipated.

The ramp would be prefabricated concrete, 16 feet wide by 40 feet in length (640 square feet) and would extend into the river approximately 10 to 15 feet from bank-full width (up to 240 square feet of concrete pad in river channel). The access road, loop road, turnout, parking stalls, staging area, and concrete toilet pad at the new have been designed to minimize the number of large trees to be felled and moved. The total approximate area of disturbance for these actions is 19,840 square feet.

The additional parking along Forest Road 19 would require fill material to widen the shoulders and paving. One parking area on the opposite side of Road 19 would be 90 feet long by 10 feet wide (900 square feet), and the other would be 150 long by 10 feet wide (1,500 square feet) The total area of parking expansion would be approximately 2,400 square feet.

Decommission the old site would require grass seeding the old ramp site with native grasses and red alder, planting vine maple, big leaf maple, and conifers (Douglas-fir or Western red cedar depending on what is available). The vegetation would be monitored thru the seasons (for up to 2 years) and if the site requires additional seeding or tree planting due to mortality or for any other reason, it would take place during the appropriate planting season.

Decommission the existing loop road that connects Bruckart landing to Forest Road 19 would be done by scarifying the surface layer 2 to 4 inches in depth. The road is a compacted, native surface road. The underlying subsoil is comprised of glacial-fluvial deposits that are very permeable and porous so no surface runoff is expected after scarification. Native grass seed would be applied to the scarified surface to prevent soil erosion and would be monitored for 2 years. If for any reason further seeding is required, it would take place during the appropriate planting season. The length of existing loop road that would be decommissioned is approximately 861 feet. The total approximate area that would be decommissioned is 10,000 square feet.

The use of equipment in and adjacent to streams could result in a risk of introduction of petroleum and other contaminants into the McKenzie River. Mitigation measures are in the design of the alternative to avoid this risk. Any equipment used for reconstruction or relocation activities that are in or directly adjacent to water would be required to use lubricating products other than petroleum. That is, vegetable oil based lubricants. Equipment would be required to be clean and free of any leaks before working in or directly adjacent to water.

Migratory Habitat: The implementation of the proposed action would have no direct effect on migratory habitat since it would not create barriers to upstream or downstream migration routes.

During in-river work to place the prefabricated concrete ramp there could be short term (measured in an hour or hours, not days) indirect effects due to turbidity pulses that “hug” the river bank where work is occurring. These pulses could cause migrating fish to move from turbid water to clear water and potentially delay the fish from migrating. However, since the turbidity pulse would be measured in hour(s) and not take up the entire river channel, any delay would be minor. In addition, river conditions at the new ramp sites and at Paradise are such that the deeper side of the channel is across the river from the

ramp where adults would be migrating during the summer months to their spawning areas. Based on previous work done on the boat ramp at the McKenzie Bridge campground, a turbidity pulse would be expected to “hug” the river bank where work is occurring and dissipate within 100 feet. Best Management Practices requirements would not allow a turbidity pulse to be visible 100 feet downstream of the work site that lasts half an hour, and based on the work done at McKenzie Bridge campground boat ramp it is expected that this BMP could be met.

Spawning Habitat: No effect to cutthroat spawning habitat is expected since they typically spawn in tributaries to the McKenzie River. No effect to bull trout spawning habitat is expected since they spawn in tributaries upstream from Frissell Boat Launch. No direct effects to spawning habitat are expected from the proposed action on any salmonid fish since no habitat exists in direct proximity to the proposed ramp sites or at Paradise.

A potential exists for indirect effects to spring Chinook salmon and rainbow trout in the form of fine sediments impacting redds, but they are expected to be immeasurable. This is because of the distance downstream to spawning locations.

At Frissell, the closest known spawning habitat for Chinook salmon or rainbow trout is at Blue Pool which is about ½ mile downstream of the proposed ramp location. Implementation of the proposed action could have an indirect effect on spawning habitat at Blue Pool if the turbidity plume reached that far. However, BMP's should prevent such an effect from occurring.

At Paradise the closest known spawning habitat is approximately 1 mile downstream and effects from activities at the boat ramp are not expected to have any effect on spawning habitat.

At Bruckart, the closest known spawning habitat downstream of the proposed boat launch is over 1000 feet away, and no effects from construction activities are expected to reach this far downstream.

Rearing Habitat: As was discussed in analysis for the no action alternative, this alternative is not of the scope that it would negatively affect rearing habitat that exists in the form of deep pools, or pocket pools. It would however change the river margin habitat from a natural substrate to a concrete boat ramp. The area of this impact would be limited. Frissell and Bruckart would impact approximately 240 square feet each, and Paradise 480 square feet. In addition to this impact, decommissioning activities at the old ramp sites would improve river margin habitat at Frissell and Bruckart. A length of river bank about 20 feet at Frissell and about 25 feet at Bruckart would be restored.

Given the amount of river margin habitat in the main stem McKenzie River relative to these impacts, the proposed action is not expected to have negative affects on the overall condition of rearing habitat of salmonid fish populations. However, the ramps would negatively affect a specific area of previous river margin habitat to concrete.

Cumulative Effects

With implementation of the proposed action, regular maintenance at the existing, poorly designed boat ramps would be eliminated. There would no longer be the need to place gravel on these sites and that would reduce the amount of sediment entering the river from human caused sources. The new ramps would be located on the less erosive side of the river and would be made of concrete. They would not require annual gravel supplementation for maintenance and hence less fine sediment should reach the river.

The decommissioning of the old boat ramps at Bruckart and Frissell would rehabilitate what are now bare river banks on the erosive side of the river. By vegetating these slopes this would reduce the amount of fine sediment entering the river at these sites. The current ramps at Bruckart and Frissell are designed to provide a direct avenue for surface runoff from the highway and parking areas to the river. Rehabilitation activities on the terraces would decrease the amount of direct surface runoff that enters the river. Rehabilitation would improve infiltration into the soil and ensure that surface runoff was directed thru vegetation before entering the river, which would be a beneficial cumulative effect to water quality, and hence to fish.

Considering the cumulative effects of the three boat ramps and launch facilities, Alternative 2 would result in decreased annual sediment release into the river in the proximity of the boat ramps, thereby reducing the cumulative effects of past action which installed poorly designed boat launches along the upper McKenzie River.

There are no reasonably foreseeable future management actions along the upper McKenzie River that would result in additional, measurable change to fish habitat in the direct proximity to the boat ramps.

Effects of Alternative 3

Direct and Indirect Effects

The Frissell and Bruckart launch sites would remain in the same location where they currently exist, but would be reconstructed to reposition them to reduce safety hazards and improve access. The repositioning requires 20 cubic yards of riprap placed at both ramps. The reconstruction design reduces maintenance needs by reducing the amount of gravel that is placed on the current ramps each year.

Frissell Boat Launch – The pre-fabricated concrete ramp at the existing site would be placed at a downstream angle and would require 20 cubic yards of rip-rap to armor the upstream side of the boat ramp. The boulders would be placed on the river bank and a portion of the river bed. The new ramp would be approximately 16 feet wide by 40 feet long (640 square feet) and it would extend into the river approximately 10 to 15 feet from bank-full width (up to 240 square feet of concrete pad in river channel). Five or six small trees would need to be cut down to place the new ramp at an angle. There are 5 hardwood trees (red alder and big leaf maple), and one Western red cedar. The existing parking area would be re-graded to minimize sediment transport to the river.

Paradise boat Launch – The actions at Paradise Boat Launch would be the same as in Alternative 2.

Bruckart Boat Launch –The pre-fabricated concrete ramp at the existing site would also be placed it at a downstream angle and would require 20 cubic yards of rip-rap would be required to armor the upstream side of the boat ramp. The boulders would be placed on the river bank and a portion of the river bed. The new ramp would be approximately 16 feet wide by 40 feet long (640 square feet) and it would extend into the river approximately 10 to 15 feet from bank-full width (up to 240 square feet of concrete pad in river channel). Six or seven small trees would need to be cut down to place the new ramp at an angle, which consist of 5 hardwood trees (red alder and big leaf maple), and two small Douglas-fir. The existing parking area would be re-graded to minimize sediment transport to the river.

Migratory Habitat

The effect to migratory habitat would be similar to Alternative 2 (i.e. a short term turbidity plume that could displace fish to the other side of the river, or delay migration). The new ramps would not pose a migratory barrier to any TES or MIS fishes, so there would be no direct or indirect effect to migratory habitat.

Spawning Habitat

The effects to spawning habitat would be similar to Alternative 2. That is, there is a potential for mobilized fine sediments to affect downstream spawning areas for rainbow trout and spring Chinook salmon. However, like Alternative 2 these effects are expected to be immeasurable due to the distance to downstream spawning locations.

Rearing Habitat

Alternative 3 would change specific locations within the river from natural river bed to concrete. The area would be similar to the area affected in Alternative 2, but the rearing habitat at the existing Bruckart and Frissell boat ramps is not optimal rearing habitat for juvenile TES or MIS fish due to the flow velocities. These two ramps are located on the side of the river where the main current is directed (the erosive side of the channel) and it would be difficult for small fish (fry) to take cover in these areas compared to the new ramp locations in Alternative 2.

Since the ramps would be constructed on the erosive side of the river they would likely require rip rap to minimize scour due to river flows. Approximately 20 cubic yards of rip rap would be required at Bruckart and Frissell. Schmetterling and others (2001) found that rip rap may provide habitat for juvenile salmonids and bolster densities on reaches of stream that have been “severely degraded.” They also found that rip rap does not provide the intricate habitat requirements for multiple age classes or species of fish provided by natural vegetated stream banks. Streambanks with rip rap have fewer undercut banks, less low-overhead cover and are less likely than natural streambanks to contribute large woody debris to the

stream (Schmetterling et. al. 2001). These examples of habitat simplification due to rip rap could be expected if Alternative 3 was implemented.

Cumulative Effects of Alternative 3

This alternative would reduce the amount of gravel required to maintain existing boat ramps due to their replacement with concrete ramps. However, since Bruckart and Frissell would remain on the erosive side of the river they would require rip rap to minimize scour. This rip rap along with a change from natural river bed to concrete would simplify habitat for TES and MIS fish. These salmonid fishes require complex habitats in order to carry out their life history requirements.

Highway 126 is directly adjacent to the river in some segments and in these areas rip rap is present. Paradise campground is also adjacent to the river and in some sections rip rap has been placed to armor the bank and protect the campground. If Alternative 3 was implemented, it would increase the amount of river bank with rip rap. Cumulatively this leads to simplification of habitat for TES and MIS fish which could have negative effects on their ability to fulfill life history requirements (e.g. freshwater rearing)

There are no reasonably foreseeable future management actions along the upper McKenzie River that would result in additional, measurable change to fish habitat in the direct proximity to the boat ramps.

Heritage Resources

Before the 1856 Dayton Treaty, west-side Indian tribes (likely ancestors of the Molalla and Kalapuya) used the upper McKenzie River area. Although there were no resident Indian bands in the South Fork McKenzie drainage at the time of white settlement, a band of Kalapuya Indians lived in a village at the mouth of the McKenzie, near its confluence with the Willamette River. They may have visited or traveled through the area during the summer. However, once they were relocated to the Grand Ronde or Siletz reservations in the mid to late 1850s, they could not easily get to the area. From 1860 to 1920, bands from the Warm Springs Reservation visited the area, gathering huckleberries, hunting, and grazing ponies in the summer and early fall. The area was also used for sheep grazing at the turn of the century from 1880-1920.

Field surveys for the Boat Launch project did not locate any new cultural sites at Frissell, Paradise, or Bruckart boat launches where proposed actions or alternative actions would occur. In addition, no cultural sites have been located in previous surveys of the area.

Implementation of Alternatives 1, 2, and 3 would not directly nor indirectly affect heritage resources since there would be no change to the integrity of heritage resource sites. During implementation, the District Archeologist would evaluate any subsequent discoveries.

Wildlife

Affected Environment for MIS/TES

Management Indicator Species (MIS) were addressed in the Willamette Forest Plan. They include the spotted owl, pileated woodpecker, marten, elk, deer, cavity excavators, bald eagle, peregrine falcon, and fish. All of the management indicator species may occur in the project area. Through Region-wide coordination, each Forest identified the minimum habitat distribution and habitat characteristics needed to satisfy the life history needs of MIS. Management recommendations to ensure their viability were incorporated into all Willamette Forest Plan actions. Current conditions for the spotted owl and bald eagle are discussed in Appendix B, the Wildlife Biological Evaluation.

The Endangered Species Act (ESA), administered by the U.S. Fish and Wildlife Service (USFWS), mandates protection of threatened and endangered species. Listed species are typically habitat-specific with narrow geographic and environmental distributions. Proposed, threatened, endangered, and sensitive (PETS) species have specific requirements under the ESA and Willamette National Forest Plan to maintain viability. Protection includes managing habitat to minimize impacts, as well as prohibition of noise disturbance during the breeding season. Consultation is required with USFWS on activities that may affect these species or their habitat.

The scale of analysis for the northern spotted owl, a Threatened Species, and other MIS is the project area because of the known distribution of spotted owls and associated owl home-range delineations. Past surveys for spotted owls have documented three spotted owl activity centers within 1.2 miles of the boat launch project. These three owl pairs have an established 100-acre late successional reserve delineated for each site.

Bald eagles have been observed flying through the McKenzie River corridor. Eagles utilize large old-growth conifers in proximity to large water bodies and abundant prey. Annual surveys are conducted to determine eagle use and occupancy.

Project activities would occur in the riparian areas adjacent to the McKenzie River that may provide dispersal habitat for harlequin ducks.

All boat launch areas are adjacent to highway 126 and the McKenzie River where ambient noise levels are continually high and where the large open corridors provide poor habitat due to exposure from aerial predators such as goshawks and great horned owls.

Survey and Manage Wildlife Species

On January 9, 2006 Judge Pechman signed an Order on Plaintiffs' Motion for Injunctive Relief that set aside the March 22, 2004 Survey and Manage ROD, reinstated the January 2001 Survey and Manage ROD, and instructed affected Forest Service and Bureau of Land Management units to "not authorize, allow, or permit to continue any logging or other ground disturbing activities on projects to which the

2001 ROD applied unless such activities are in compliance with the provisions of the 2001 ROD (as the 2001 ROD was amended or modified as of March 21, 2004).

To comply with this order, Forest Service and Bureau of Land Management units are required to survey for 2001 ROD (amended March 2004) Category A and C species.

Surveys were conducted for Survey and Manage and Protection Buffer Wildlife Species in all areas proposed for ground disturbing activities, prior to the effective date of the March 2004, amendment. No Survey and Manage mollusks, red tree voles, or great gray owls were found during these surveys.

Migratory Land Birds

Migratory landbirds and their required protection are outlined in the January 11, 2001, Executive Order “Responsibilities of Federal Agencies to Protect Migratory Birds.” A Memorandum of Understanding was signed between the USFS and USFWS to complement the January 2001, Executive Order. Agreed-to measures include identification of habitats needed by priority species. Habitats vary broadly for this large group of species. The Boat Launch Project Area contains populations of migratory landbirds typical of the western Cascades.

There are 85 bird species recognized as neotropical migrants on the Willamette National Forest. Thirty-five of these species found on the Willamette National Forest have been identified as species of concern (Sharp, Brian. 1992). These species are associated with old-growth, riparian, rocky cliffs, or grass habitats. Snags in the area may be providing important habitat for Vaux’s swifts, Williamson’s sapsuckers, and American kestrels. Old growth stands occupy portions of this landscape, which may be supporting Cooper’s hawks, olive-sided flycatchers, western wood-pewee, and mountain bluebirds. Riparian habitat associated with streams in the area may be providing habitat for riparian-associated species such as Williamson’s flycatchers, tree swallows, and red-eyed vireos.

Environmental Consequences

Effects of Alternative 1 – No Action

There would be no effect or impact on MIS or TES wildlife or other wildlife species of concern with this alternative. With no boat launch improvements implemented, there would be no loss of existing habitat and no noise disturbance would occur. Annual ramp maintenance activities would continue the existing short-term noise disturbance from equipment.

Effects of Alternative 2 and 3

Implementation of either Alternative 2 or 3 would have no effect on the northern spotted owl. The project area is within three historic 1.2 mile radius northern spotted owl home ranges. The closest known activity center is over 0.5 miles away. Individual tree removal would result in a minimal change to low quality dispersal habitat with an immeasurable effect. The project is adjacent to highway 126 and the McKenzie

River where ambient noise levels are continually high and where the large open corridors are providing poor habitat do to exposure from aerial predators such as goshawks and great horned owls.

Annual bald eagle surveys have failed to document any bald eagle nests or roosts in the project area. The closest bald eagle nest is over 2 miles away. Limited bald eagle foraging use occurs on the river. The limited scale of this project would not affect the ability of bald eagles to continue foraging within the vast river corridor.

Project activities would occur in the riparian areas adjacent to the McKenzie River that may provide dispersal habitat for harlequin ducks. Harlequins are very mobile and adaptable to human disturbances on the river (ie rafters and boaters). The felling and leaving on site of individual trees for safety and parking in riparian areas would benefit this species by supplementing down woody material in their habitat. This project is not expected to have a measurable impact on harlequin ducks.

Cumulative Effects

Since neither the proposed actions, nor Alternative 3 would not result in any additional direct effects on wildlife MIS, TES, migratory land birds, or Survey and Manage species, there are no additional cumulative effects to the above species or their habitat. There no reasonably foreseeable future actions within the analysis area that could result in additional cumulative effects.

Botanical

Affected Environment

Sensitive Plants

The Forest Service manual directs us to ensure the viability of sensitive botanical species as well as preclude trends toward endangerment that would result in the need for Federal listing (Forest Service, 1991). There are no listed Threatened or Endangered plant species on the Willamette National Forest. Other rare plants, often not associated with older forests, are compiled on a Regional Forester's Sensitive Species List (USDA Forest Service, 2006). These species and their habitats are often rare and limited in distribution. A prefield review was conducted in April 2004 to determine which sensitive species have historically been documented in the Boat Launch Reconstruction project area. There are no documented sites of sensitive plants in the project area.

Intuitive-controlled field surveys in April 2004 followed up the prefield review to determine presence of sensitive plant species within project area, as well as suitable habitat potentially affected by the proposed project. No sensitive plants were observed during these surveys.

Survey and Manage Botanical Species

As stated above in the Wildlife section regarding Survey and Manage wildlife species, the Forest Service and Bureau of Land Management units are required to survey for 2001 ROD (amended March 2004) Category A and C species. Intuitive-controlled field surveys in 2000 and 2001 followed up the prefield review to determine presence of sensitive plant species within those special habitat areas, as well as other potential habitats. No sensitive plants were observed during these surveys.

Survey and Manage botanical species are species that are genuinely rare or, because of lack of information about them, the agencies did not know whether they would adequately be protected by other elements of the Northwest Forest Plan. The list of species that have potential habitat within the planning area and Survey and Manage species located in the planning area can be found in the Botanical Resource Report located in Appendix D.

In 2004, the Record of Decision to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines was released (USDA Forest Service and USDI Bureau of Land Management, 2004a). As a result, some of the species that were formerly Survey and Manage are now managed under the interagency Special Status Species Program (SSSP) as sensitive species. A pre-field review of the project area was conducted to determine the presence of potential habitat for former Survey and Manage species. Surveys were conducted in 2000, 2001 and 2006 in these potential habitats. Results from the pre-field review and surveys are above in Table 41, and in Appendix D.

Environmental Consequences

Effects of Alternative 1 – No Action

Direct and Indirect Effects

The no-action alternative would have no direct or indirect impact on sensitive plants or Survey and Manage species that are managed under the Forest Service Sensitive Species Program. No potential habitat would be degraded or removed for these species under this alternative.

Effects of Alternative 2 and 3

Direct and Indirect Effects

There is potential habitat present in the project area for six species currently listed on the Willamette National Forest Sensitive Species List, 2006 (three are Survey and Manage lichens) listed in Appendix D. Surveys of the project area have not documented any sensitive plant species or Survey and Manage species. However, some of the unoccupied potential habitat that is present in the project area would be removed under both of these alternatives.

More riparian habitat would be removed with Alternative 2 as compared to Alternative 3. However, the absence of known populations in the project area would result in no direct and indirect effects to

sensitive and Survey and Manage plants; therefore producing no measurable impacts with either action alternative.

Cumulative Effects

The analysis area for cumulative effects is the existing boat launches, loop road, and parking areas, plus the proposed development areas for Frissell, Bruckart, and Paradise boat launches. These areas were chosen because activities outside the analysis area would have no effect on sensitive species, or Survey and Manage species with suitable habitat located within the project analysis area.

As discussed above, implementation of the proposed action or any alternatives would not have direct or indirect adverse effects on sensitive plants or Survey and Manage species species. Based on the analysis of this project there would be no incremental change to sensitive species or Survey and Manage species.

Noxious Weeds

Noxious weeds on the McKenzie River Ranger District are predominately located along roads, power line corridors, and at recreation sites. They are primarily introduced or spread by vehicle traffic, road maintenance, recreational user, and ground-disturbing activities, such as road construction.

Vehicular traffic and road maintenance oftentimes create enough of a foothold for weed establishment, while providing access (via motorized vehicles) to other un-colonized areas. Most weed species become established as a result of a soil disturbance activity. Once they are established, they are able to persist and reproduce with little competition from native vegetation.

There are numerous weed species known to occur adjacent to the boat launches and project area. Spotted knapweed (*Centaurea maculosa*), St. John's wort (*Hypericum perforatum*) and false brome (*Brachypodium sylvaticum*) can be found along stretches of Road 19 and Highway 126. Weeds along Highway 126 receive chemical treatments annually by the Oregon Department of Agriculture.

None of the aforementioned weeds are present at the existing launches or in the proposed development areas. Spotted knapweed is present at the current Frissell Boat Launch and Scotch broom (*Cytisus scoparius*) is abundant at the Bruckart Boat Launch. Design measures, mitigation measures, and Best Management Practices would be implemented to minimize their spread.

Direct, Indirect, and Cumulative Effects

The analysis area for cumulative effects is the existing boat launches, loop road, and parking areas, adjacent roads, plus the proposed development areas for Frissell and Bruckart. These areas were selected for the known distribution of noxious weeds and because it contains likely travel routes for the proposed project.

Even without past or present management (i.e. vehicular traffic from recreational outfitting) in the proposed project areas, noxious weeds would still be present from natural and biological vectors.

Implementing Alternative 2, with construction of 0.1 mile of paved loop road at Frissell Boat Launch and 0.1 mile of paved loop road at Bruckart Boat Launch, offers the greatest opportunity of noxious weed spread. There would also be a short-term increase in potential for noxious weed spread because it removes more riparian vegetation than the other Alternatives. However, Alternative 2 provides less disturbed ground over time at Paradise Boat Launch because it proposes to pave the existing parking areas where Scotch broom is found. Alternative 2 also proposes to decommission 861 feet of existing loop road that connects Bruckart landing to Forest Road 19. Decommissioning this loop road would reduce the spread of Scotch broom by limiting seed contact with human vectors. Native grass seed would be applied to the scarified surface to prevent soil erosion and would be monitored for 2 years.

The cumulative effect of the proposed action would be an overall decrease in noxious weeds within the project area, considering the new construction of paved loop roads and parking at Frissell and Bruckart, the paving of parking and staging at Paradise, and decommissioning the road currently connecting Bruckart Boat Launch with Forest road 19.

There are no other reasonably foreseeable future actions in the vicinity of the boat launches that would contribute to the spread of noxious weeds within the project areas.

Wild and Scenic River and State Scenic Waterway _____

The Section 7 analysis for the McKenzie River Wild and Scenic Waterway, which is included as Appendix E, has determined that:

The McKenzie River Boat Launches Project is consistent with Section 7 of the Wild and Scenic Rivers Act, and will have a direct effect on the river, but not an adverse effect on the values for which the river was authorized by Congress. The project is also consistent with the current Forest Land and Resource Management for the Willamette N.F. and the Record of Decision for Amendments of Land Management Planning Documents within the Range of the Northern Spotted Owl. The project is supported by the Upper McKenzie River Management Plan (1992). It is recognized that there will be short-term effects but that they are at an acceptable level. Free-flowing conditions will be maintained, and Outstandingly Remarkable Values will be maintained.

Concurrence was received from the Oregon Parks and Recreation Department on February 16, 2007.

Compliance with Other Laws, Regulations and Policies

This section describes how the action alternatives comply with applicable State and Federal laws, regulations and policies.

Federal Laws:

The Preservation of Antiquities Act, June 1906 and the National Historic Preservation Act, October 1966 – Consultation State Historic Preservation Office is completed under the Programmatic Agreement among the United States Department of Agriculture, Forest Service, Pacific Northwest Region (Region 6), the Advisory Council on Historic Preservation, and the Oregon State Historic Preservation Officer regarding Cultural Resource Management on National Forests in the State of Oregon, as amended in June 2004. Field surveys where ground-disturbing activities would occur in the project area have been completed. The surveys did not identify any sites. Should sites be found during ground disturbing activities, the District Archaeologist would be immediately notified. This project meets the criteria listed in Appendix C of the above-mentioned programmatic agreement, thus it is excluded from case by case review. Because heritage resources would not be affected by proposed activities under any action alternative, there would be no effect to any historic property listed in or eligible to the National Register of Historic Places.

The Endangered Species Act (ESA), December 1973 – The ESA establishes a policy that all federal agencies would seek to conserve endangered and threatened species of fish, wildlife and plants. Biological Evaluations for plants and wildlife have been prepared, which describes possible effects of the proposed action on sensitive, and other species of concern that may be present in the project area. A Biological Assessment was prepared for both the northern spotted owl, and for the threatened bull trout and spring Chinook salmon. Formal Consultation was required for bull trout and spring Chinook salmon. See “Consultation and Coordination – Coordination with Other Governments and Agencies.”

The Clean Water Act, 1987 – This act establishes a non-degradation policy for all federally proposed projects. Compliance with the Clean Water Act would be accomplished through planning, application and monitoring of Best Management Practices (BMPs) where needed.

Magnuson-Stevens Fishery Conservation and Management Act, 1976 (MSA) – This project is in the middle of the McKenzie River sub-basin. The McKenzie River channel is listed as Essential Fish Habitat (EFH) for spring chinook salmon. Consultation with NOAA Fisheries under the MSA has been conducted along with ESA consultation.

Inventoried Roadless Areas and Wilderness – There are no actions proposed within Inventoried Roadless Areas (IRAs) or Wilderness in the project.

Executive Order 13186: Neotropical Migratory Birds – There are 85 bird species recognized as neotropical migrants on the Willamette National Forest. Thirty-five of these species found on the Willamette have been identified as species of concern (Sharp 1992). A Memorandum of Understanding was signed between the USFS and USFWS to complement the January 2001 Executive Order.

There are no effects on populations of migratory landbirds typical of the western Cascades (See Appendix B).

Executive Orders 11988 and 11990: Floodplains and Wetlands – Executive Order 11988 requires government agencies to take actions that reduce the risk of loss due to floods, to minimize the impact of floods on human health and welfare, and to restore and preserve the natural and beneficial values served by floodplains. The proposed action would occur within 100-year floodplains.

Executive Order 11990 requires government agencies to take actions that minimize the destruction, loss, or degradation of wetlands.

Executive Order 12898: Environmental Justice – Executive Order 12898 requires that federal agencies adopt strategies to address environmental justice concerns within the context of agency operations.

The National Environmental Policy Act (NEPA), 1969 – NEPA establishes the format and content requirements of environmental analysis and documentation. Preparation of this EA was done in full compliance with these requirements.

The National Forest Management Act (NFMA), 1976 – The proposed action is consistent with the NFMA. (See Chapter 1, Forest Plan)

Forest Plan Consistency – The Willamette National Forest produced a Forest Plan in accordance with the National Forest Management Act of 1990, as amended. The Willamette Forest Plan, as amended, provides guidelines for management of the developed sites and providing river-oriented recreation. The Forest Plan also provides guidelines for management of Forest system roads on National Forest System lands. This action is in compliance with all natural resource management direction and established management standards and guidelines (see Chapter 1).

Other Jurisdictions – There are no other jurisdictions within any of the three boat launch project areas.

Energy Requirements and Conservation Potential – Some form of energy would be necessary the construction and installation of the boat ramps, loop roads, staging areas, and parking areas, which requires the use of mechanized equipment.

Prime Farmland, Rangeland, and Forestland – The proposal does not occur within or involve prime farmland or rangeland.

Unavoidable Adverse Effects – Certain activities associated with this action would take place directly in the McKenzie River (i.e. the placement of a pre-cast concrete ramp). Due to the need to conduct in-water work there are certain unavoidable adverse effects that could impact listed fish species (spring Chinook salmon and bull trout). This required the Forest Service to conduct formal consultation under the Endangered Species Act with the NMFS and USFWS. As part of the consultation process NMFS and USFWS provide, in a Biological Opinion, mandatory “terms and conditions” that the Forest Service must implement to minimize the impact on listed fish. Also see “Consultation and Coordination – Coordination with Other Governments and Agencies.” (see Appendix A.)

Irreversible and Irretrievable Effects – “Irreversible” commitment of resources refers to a loss of future options with nonrenewable resources. An “Irretrievable” commitment of resources refers to loss of opportunity due to a particular choice of resource uses. There would be an irreversible commitment of resources with the use of mineral materials to provide rock, gravel and asphalt paving in the construction of the new loop road at both Frissell and Bruckart boat launches. There would be an irretrievable commitment of resources in the minor amount of timber value in the trees cut for the clearing during construction of the loop roads. These trees are proposed to be used for in-stream fish habitat structures (see Chapter 2).

Monitoring Plan ---

Noxious Weeds

District personnel will complete noxious weed surveys after implementation, as a mitigation measure to determine if pressure washing off-road equipment before boat launch installation was effective. Noxious weed treatments would occur if necessary.

TES and MIS Fish

Water quality conditions will be monitored during boat launch construction to determine if there are any potential effects to TES/MIS fish. Vegetation (grass and trees) at rehabilitation sites and areas of new construction will be monitored for 2 years to ensure planting success. If monitoring finds the need for additional planting, it would take place during the appropriate season.

CONSULTATION AND COORDINATION

Coordination with Other Governments and Agencies ____

Consultation with the State Historic Preservation Office (SHPO) for “No Effect” projects is facilitated by the June 2004 Programmatic Agreement among the Forest Service, the Advisory Council on Historic Preservation, and SHPO. Under the terms of that Agreement, concurrence authority for findings of No Effect has been delegated to the Forest Specialist. A concurrence of “No Historic Properties Effected” finding was received from Forest Archaeologist Cara Kelly (the designated Forest Specialist for the Willamette National Forest) on November 2, 2006. The concurrence form, documenting compliance with the National Historic Preservation Act, can be found in Appendix C.

Because of the lack of or minor effects of this project on habitat for any listed Threatened, Endangered, or Sensitive wildlife species, no formal or informal consultation was required with the USDI Fish and Wildlife Service on the northern spotted owl.

Due to the potential for “take” to bull trout and spring Chinook salmon (as defined by the Endangered Species Act), formal consultation was required with USDC National Marine Fisheries Service (NMFS) (for Upper Willamette River spring Chinook salmon) and with USDI Fish and Wildlife Service (USFWS) (for Columbia River Basin bull trout). A Biological Assessment was prepared for fish and is included as Appendix A. A Biological Evaluation was prepared for botanical and wildlife species and is included as Appendix B. A Biological Opinion (BO) was received from the USFWS on February 16, 2007 that provided mandatory “terms and conditions” that the Forest Service must implement in order to minimize “take” on bull trout. A BO from NMFS that addresses spring Chinook salmon is pending. A BO must be received from NMFS before the Responsible Official can sign a decision document for this project. A copy of the BO that addresses bull trout, provided by the USFWS, is available in the project analysis file.

The Oregon Parks and Recreation Department reviewed the Wild and Scenic River Section 7 analysis and provided concurrence of its findings on February 16, 2007. In their response they supported the actions at Frissell and Paradise Boat Launches.

Project Mailing List:

Scoping letters were sent to interested parties including the Tribal Governments on February, 10, 2003, and May 29, 2003. A field trip was held for the public on Saturday, September 20, 2003, to review proposals and visit the launch locations. Comments were received as a result of the scoping letter and field trip. Responses to the scoping comments can be found in Appendix G.

Federal, State, and Local Agencies:

USDI Fish and Wildlife Service
USDI Bureau of Land Management – Eugene District
Oregon Department of Fish and Wildlife
Oregon Department of Parks and Recreation
Oregon State Marine Board
Oregon Department of Transportation
Eugene Water and Electric Board
Commission on Indian Services
Linn County Commissioners
Lane County Parks

Tribal Organizations

Confederated Tribes of the Grand Ronde
Confederated Tribes of the Siletz Indians
Confederated Tribes of the Warm Springs
The Klamath Tribe

Individuals and Organizations:

Blue River CDC
Forest Conservation Council
Santiam Fish and Game
Obsidians
Many Rivers Group, Sierra Club
Rocky Mountain Elk Foundation – Oregon Field Director
The Register Guard
Jim Baker – McKenzie Guardians
Jim Berl – Oregon Guides and Packers
Roger Borine – Oregon Hunters Association
Ralph and Ellen Core
McKenzie Watershed Council
Ken and Louise Engelman - River Reflections
Michael Greenbaum
Doug Heiken – Oregon Natural Resources Council
James Johnston – Cascadia Wildlands Project
Mike Kerrick
Craig Patterson
Greg Pitts – Oregon Council – Federation of Flyfishers
Andy Stahl – Forest Service Employees for Environmental Ethics
Dave Stone – Conservation Leader, Lane County Audubon Society

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APPENDICES

Appendix A – Fisheries Biological Assessment/Evaluation and Magnuson-Stevens Act Assessment

Appendix B – Wildlife Biological Evaluation

Appendix C – SHPO Concurrence Documentation

Appendix D – Botany Biological Evaluation

Appendix E – Wild and Scenic Rivers Act Section 7 Analysis

Appendix F – Project Maps and Drawings

Appendix G – Scoping Comments and Agency Responses

Appendix A – Fisheries Biological Assessment/Evaluation and Magnuson-Stevens Act Assessment

BIOLOGICAL ASSESSMENT

Project Name: McKenzie River Boat Launches Project

NEPA Document Name: McKenzie River Boat Launches Project, Willamette National Forest, 2006

Watershed Analysis: Upper McKenzie Watershed Analysis (1995); Quartz Creek and Minor Tributaries Watershed Analysis (1998).

Other ESA Consultation: None required

Administrative Unit: Willamette National Forest , McKenzie River Ranger District

Prepared By: Ramon Rivera, Supervisory Fisheries Biologist, McKenzie River Ranger District and Dave Kretzing, Supervisory Hydrologist, McKenzie River Ranger District

Reviewed By: Wade Sims, ESA Consultation Biologist (Fisheries), Willamette N.F.

Date of Final Version: December 13, 2006

Table 1. ESA Unit, Critical Habitat, and EFH Addressed in this BA:

ESA Listed Species or Habitat	ESA Status	ESA EFH Determination
Upper Willamette River Chinook Salmon	Threatened	May Affect, Likely to Adversely Affect
Critical Habitat - UWR Chinook Salmon	Designated	May Affect, Likely to Adversely Affect
Columbia River Basin Bull Trout	Threatened	May Affect, Likely to Adversely Affect
Critical Habitat - Columbia River Basin Bull Trout	Exempt	No Effect
Essential Fish Habitat – Spring Chinook Salmon	N/A	May Adversely Affect

Table 2. Project Location (See Figure 1 for map of 5th and 6th field HUCs)

USGS Hydrologic Unit Code (HUC)	HUC Scale	HUC Name	NW Forest Plan Key Watershed?
17090004	4 th Field	McKenzie River	No
1709000401	5 th Field	Upper McKenzie River	Yes
170900040106	6 th Field	Boulder Creek / Frissell Creek	Yes
170900040109	6 th Field	McKenzie Bridge	No
1709000405	5 th Field	McKenzie River / Quartz Creek	No
170900040502	6 th Field	McKenzie River / Elk Creek	No

INTRODUCTION

The McKenzie River is a popular boating river and is used by people from the Willamette Valley as well as Central Oregon. This project involves reconstructing or relocating existing boat launches in the upper McKenzie River. The three sites assessed in this document are Frissell, Paradise, and Bruckart.

Project design criteria were developed by an Interdisciplinary Team (IDT) that included engineering, recreation, fisheries, hydrology, wildlife, botany, and Special Uses Administrators. The intent is to minimize disturbance at all locations, and this is especially true for in-river work. For example, equipment will work from the bank as much as possible, but some in-river time will be required at Paradise Boat Launch to relocate some small boulders. As another example, designs will incorporate existing roads where possible at all sites and new roads will be carefully located to minimize the number of trees that will need to be cut.

Frissell boat launch is the most upstream of the three launches and lies within the Upper McKenzie Wild and Scenic River, and Oregon State Scenic Waterway. Paradise boat launch is located within the Paradise campground and day use complex. It lies within the Oregon State Scenic Waterway corridor, but is not in the Federal Wild and Scenic River corridor. Bruckart boat launch is the furthest downstream of the three locations and is located approximately one quarter mile upstream of Bruckart Bridge (Forest Road 19). Bruckart is neither a State Scenic Waterway or a Federal Wild and Scenic River.

DESCRIPTION OF THE PROPOSED ACTION

Purpose and Need:

The purpose and need for action is to improve public safety and relieve recreation user congestion at Frissell, Paradise, and Bruckart developed boat launch facilities.

There is also a need to provide developed recreation opportunities in the upper McKenzie River that are compatible with individual management area objectives and sensitive to public demand and use, as directed by the 1990 Willamette National Forest Land and Resource Management Plan, as amended. Alternative designs should consider current demand for boat launch facilities on the upper McKenzie River from the recreating public, for both private river trips and with permitted, special-use river guides.

The boat launch ramps at all three sites are constructed with mostly compacted gravel and have slopes in excess of 15%, creating unstable conditions for pedestrians and vehicles attempting to launch or land boats and inflatable rafts. Depending on the flow regime in a given year, fluctuations in river level and flow velocity remove gravel at all the ramps. All boat ramps, but especially Frissell and Bruckart, typically require semi-annual maintenance to replace gravel. There is a need to implement improvements at each boat launch due to deterioration, to reduce the safety hazards associated with accessing the launch sites, and to improve launching and landing conditions at the sites.

There is also a need to increase the staging areas at Frissell, Paradise, and Bruckart boat launch facilities to relieve periods of congestion when two or more boating parties are assembling, and/or launching boats or inflatable rafts.

Legal description of the project: T.16S., R.6E., Sec. 1, Willamette Meridian; Lane County, Oregon (Frissell Launch), and T.16S., R.6E., Sec. 9, Willamette Meridian; Lane County, Oregon (Paradise Launch), and T.16S., R.6E., Sec. 18, Willamette Meridian; Lane County, Oregon (Bruckart Launch).

See Figure 2 for a map showing the general vicinity of all boat launch locations analyzed in this BA.

Proposed Action:

The District Ranger of the McKenzie River Ranger District proposes to relocate boat launches at Frissell and Bruckart sites, and reconstruct the existing boat launch at Paradise in order to double its capacity.

The following actions are proposed at **Frissell Boat Launch** (Figure 3):

- Construct a new launch site by placing a pre-fabricated concrete ramp in a new location across the McKenzie River and downstream from the Frissell-Carpenter Bridge (river right looking downstream). The new ramp site would be approximately 16 feet wide by 40 feet long (640 square feet). The ramp would extend into the river approximately 10 to 15 feet from bankfull width (up to 240 square feet of concrete pad in river channel). See Figure 4.
- Construct a paved access road, loop road, staging area, and a concrete toilet pad for a “porta-pottie” at the new boat launch location. Design will utilize as much existing road as possible at this site in order to minimize disturbance. The total approximate area of disturbance for these actions is 10,936 square feet. See Figure 4.
- Improve two pull outs along Forest Road 2650 to provide parking for vehicles and trailers. Improvement is defined as blading the existing shoulders to ensure proper drainage and safety, conducting some brushing, and adding aggregate. These pullouts are disturbed ground and no new fill will be required to improve them. These existing pull outs are approximately 50 feet in length and 90 feet in length, and they are 10 feet wide (total area of 1,593 square feet – this figure includes “tapers” on the pullouts). Since no new ground would be disturbed to improve these pull outs (i.e. they are already disturbed ground) the square footage of “improvement” is not included in the total area of disturbance. See Figure 4.
- Decommission the existing boat launch on river left and restore the river bank and a portion of the terrace. The existing buttress logs and cable would be removed from the site. A portion of the existing pull-out access would remain along State Highway 126 for motor vehicles. See Figure 5.
- Rehabilitate the decommissioned boat ramp location and a portion of the highway pullout. This will be accomplished by grass seeding the old ramp site with native

grasses and red alder, planting vine maple trees, big leaf maple, and conifers (Douglas-fir or Western red cedar depending on what is available). The vegetation will be monitored thru the seasons (for up to 2 years) and if the site requires additional seeding or tree planting due to mortality or for any other reason, it will take place during the appropriate planting season. The large pull out will be rehabilitated by importing topsoil and shaping it into hummocks. These hummocks will be seeded with native grass and will serve as a barrier between the highway and the river by acting as a soil filter and as a berm that diverts water into existing vegetation. Vegetated hummocks are desired since this is a Federal Scenic Byway, and they will keep vehicles from driving onto the area. See Figure 5.

- The total approximate area of decommissioning for these actions is 2,670 square feet.

The following actions are proposed at **Paradise Boat Launch** (Figure 6):

- Place a pre-fabricated concrete ramp at the existing site that is wide enough to serve as two ramps that would have a decreased gradient relative to the existing ramp. The ramp would be 40 feet by 32 feet (1,280 square feet). The approach road is currently paved so the only new paving expected at the ramp will be the apron in order to connect the loop road to the concrete ramp (approximately 710 square feet of new pavement). The ramp would extend into the river approximately 10 to 15 feet from bankfull width (up to 480 square feet of concrete pad in river channel). The total area at the ramp site that would be concrete and asphalt is approximately 1,990 square feet. See Figure 7.
- Relocate approximately 20 small boulders (16 inches to 24 inches in diameter) that block use of the extended ramp width during low flow months. This will be accomplished by utilizing an excavator to place these small boulders further into the channel where the river can mobilize and relocate them. The excavator would have to wade approximately 25 feet into the river to accomplish this task. The river is approximately 145 feet wide in this location. See Figure 7.
- Provide additional road side parking in the day-use area. These sites are approximately 125 to 150 from the river and currently serve as defacto parking spaces that are not paved. This “additional” road side parking would formalize the areas by paving the bare sites. Some small trees less than 6 inches in diameter (big leaf maple, Western hemlock, and vine maple) would need to be cut. The additional areas would be 50 feet by 10 feet, and 80 feet by 10 feet which will increase the impervious area in the Paradise day use area by 1,449 square feet (this figure includes “tapers” on the pullouts). See Figure 7.
- Designate an additional staging area close to the launch area. This will be accomplished by signing an area that is currently not vegetated (it is a former historic camp site established by the CCC). No aggregate would be placed on this staging area, and no real “on the ground” changes will occur except for signing to designate it as a staging area. See Figure 7.

- Improve an existing user trail that is within bankfull width by placing spawning size gravels (1 to 3 inch), relocating large woody material, and trimming riparian vegetation. This user trail is approximately 20 feet away from the river during base flow conditions. The rationale for placing spawning size gravel on the trail is due to its location within bankfull width. If/when floods mobilize gravel on the user trail, it will at least be appropriate for spawning in whatever location the river places it. The piece of wood that needs to be relocated is 22 feet in length by 19.5 inches in diameter. It will be moved upstream onto the cobble bar and will remain within the bankfull channel. The riparian vegetation that needs to be trimmed is along the user trail and is comprised of alders and vine maple.

The following actions are proposed at **Bruckart Boat Launch** (Figure 8):

- Relocate the ramp to a new site downstream from Bruckart Bridge on the same side of the river (river right). The ramp would be made of prefabricated concrete and would be 16 feet wide by 40 feet in length (640 square feet). The ramp would extend into the river approximately 10 to 15 feet from bankfull width (up to 240 square feet of concrete pad in river channel). See Figure 9.
- Construct and pave an access road, loop road, turnout, parking stalls, staging area, and concrete toilet pad at the new site. The area will be designed to minimize the number of large trees that would need to be felled and moved. The total approximate area of disturbance for these actions is 19,840 square feet. See Figure 9.
- Provide additional parking along Forest Road 19 by widening the shoulders. This will require bringing in fill material in order to widen the shoulders and pave them. One parking area would be 90 feet long by 10 feet wide (900 square feet), and the other would be 150 long by 10 feet wide (1,500 square feet) on the opposite side of Road 19 (2,400 square feet in total). See Figure 9.
- Decommission the existing boat launch site. This will be accomplished by grass seeding the old ramp site with native grasses and red alder, planting vine maple, big leaf maple, and conifers (Douglas-fir or Western red cedar depending on what is available). The vegetation will be monitored thru the seasons (for up to 2 years) and if the site requires additional seeding or tree planting due to mortality or for any other reason, it will take place during the appropriate planting season. See Figure 10.
- Decommission an existing loop road that connects Bruckart landing to Forest Road 19. This road is composed of native surface and is compacted. Decommissioning will be accomplished by scarifying the surface layer 2 to 4 inches in depth. The underlying subsoil is comprised of glacial-fluvial deposits that are very permeable and porous so no surface runoff is expected after scarification. Native grass seed will be applied to the scarified surface to prevent soil erosion and will be monitored for 2 years. If for any reason further seeding is required, it will take place during the appropriate planting season. The length of existing loop road that would be decommissioned is approximately 861 feet. See Figure 10.

- The total approximate area that would be decommissioned is 10,000 square feet.

Table 3. Summary of Project Area Impacts Described Above^a

Site	Total Impact in Square Feet	Total Decommissioned in Square Feet	Total Concrete Ramp in Bankfull Width in Square Feet ^b
Frissell	10,936	2,670	240
Paradise	3,439	0	480
Bruckart	19,900	10,000	240

^a These figures are approximate as designs are conceptual, and they represent a “worst case scenario.” That is, the total area impacted will likely be less and the total area restored will likely be greater. All of the area summarized is within the Riparian Reserve.

^b This figure is included in the “total impact” column and represents the amount of ramp that would be “in the water” during bankfull flows.

General Project Design Features

In addition to site specific measures identified in this document, this project will comply with all applicable Oregon State Water Quality statutes through compliance with Forest Plan Standards and Guidelines and General Water Quality Best Management Practices (USDA Forest Service, November 1988) as per the following document signed by both parties on May 10, 2002.

NFS 02-MU-11060000 MEMORANDUM OF UNDERSTANDING between
USDA FOREST SERVICE and OREGON DEPARTMENT OF
ENVIRONMENTAL QUALITY TO MEET STATE AND FEDERAL WATER
QUALITY RULES AND REGULATIONS.

The General Water Quality Best Management Practices (USDA Forest Service, November 1988) requires an Erosion Control Plan. Prior to starting work the Contractor submits a plan which sets forth erosion control measures to be used. Operations cannot begin until the Forest Service has given written approval the plan. The plan recognizes mitigation measures required in the contract. All contracts specify that operations be scheduled and conducted to minimize erosion.

Approval of the erosion control measures plan will be conducted using an interdisciplinary approach. The measures approved by the interdisciplinary team will be reflected in the contracts specifications and provisions. Monitoring and enforcement of the erosion control plan will be the responsibility of the Contracting Officer’s Representative (COR). Watershed and fisheries specialists will be on the work site during in-river work.

In the case of a hazardous spill, the Willamette National Forest has a Hazardous Spill Control and Emergency Response Plan (signed by Forest Supervisor Dallas Emch on February 17, 2004). The plan contains specific information and requirements on the following:

- Emergency Notification
- Quick Response Checklist
- Hazardous Spill Coordinators & Key District Personnel
- Federal Emergency Response – U.S. Coast Guard & EPA
- Forest Service - Scope & Purpose
- Elements of the Emergency Response Plan
- Pre-emergency Planning and Coordination with Outside Parties
- Personnel Roles, Lines of Authority, Communication and Training
- Emergency Recognition and Prevention
- Safe Distances and Places of Refuge
- Site Security and Control
- Evacuation Routes and Procedures
- Decontamination
- Termination, Critique of Response and Follow Up

The contractor shall have two SPILL RESPONSE KITS on the project whenever equipment is operating. One spill kit shall be sufficient to absorb 34 gallons of oil, designed to float on the surface, while absorbing oil and repelling water.

Equipment shall be furnished on a fully operational basis, of modern design and in good operating condition with no fuel or oil leaks. All equipment shall be power washed to remove all foreign or noxious seeds/weeds prior to entering Forest Service lands.

Specific Project Design Features

- During construction activities, silt barriers will be placed as needed to prevent movement of sediment from the worksite to the river. Fisheries or watershed personnel will be consulted on the need for, and the specific locations for placement of these barriers. These measures will be requirements in the contract.
- Upon completion of construction activities areas of exposed soil will be seeded or planted with native species. Areas will be mulched with weed free straw to prevent erosion and potential sediment transport. These measures will be requirements in the contract.

- All equipment that will be used for instream work in the McKenzie River will be cleaned of grease, oil, and other solvents prior to use, and will be equipped with drip pans or diapers and water friendly fluid systems (i.e. non-petroleum based fluids). These measures will be requirements in the contract.
- Fuel storage will not be permitted within Riparian Reserves (within 320 feet of fish bearing streams). Fueling sites will be designated by the COR and will not be within 150 feet of water. These measures will be requirements in the contract.
- New roads, staging areas, and parking areas will be designed to shed water into vegetation. The areas where new construction would take place are composed of glacial/fluvial material and soils are very porous and permeable. Due to these conditions no surface runoff to the river is expected. The exception to this is the ramp itself where rain water would like shed to the river before entering the soil.
- Any trees that need to be removed for the project would be spread in the Riparian Reserve in a fashion that does not cause too much disturbance; trees that are suitable for fish habitat projects will be staged for use at a future time.
- The project will be designed to minimize the need to cut big trees.
- Work in the McKenzie River will take place during the instream work period (July 1 – August 15).

Project Elements:

This project has been separated into 2 project elements which are described below.

New boat launch construction on the river terrace, river bank, and river bed.

- Placement of pre-fabricated concrete ramp in the floodplain and river channel.
- Construction of loop roads, staging sites, and parking sites.
- Manipulation of boulders in river channel, and relocation of one piece of woody material at Paradise.

Decommissioning of old boat launch sites at Frissell and Bruckart.

- Removing any structural elements.
- Shallow ripping compacted areas and re-vegetating, and/or bringing in topsoil and placing it in hummocks and vegetating.

Element 1: New boat launch construction on the river bed, river bank, and river terrace.

Frissell Boat Launch

The **Action Area (Figure 11)** for this element and location is defined as approximately one quarter of the terrace area on river right downstream of the Frissell-Carpenter Bridge

(approximately 250,000 square feet or about 5.7 acres); the 2650 road including improved shoulder parking and length to the designated fueling area which is 800 feet away from any surface water (this is an established waste area and any waste will be placed here outside of the floodplain); an area of the floodplain approximately 40 feet long by 16 feet wide (640 square feet) where the ramp will be placed; an area from the new ramp location out into the river 65 feet (the bankfull width of the river is approximately 130 feet at this location) to a downstream point 300 feet from the new ramp location (19,500 square feet of the rivers surface area), and including the average depth of the river at this location which is 5 feet ($300' \times 65' \times 5' = 97,500$ cubic feet).

Placement of pre-fabricated concrete ramp in the floodplain and river channel

- Construction of the new launch site will be accomplished by placing a pre-fabricated concrete ramp in a new location across the McKenzie River from the existing ramp and downstream from the Frissell-Carpenter Bridge (river right looking downstream). This action will require the removal of 12 to 20 red alder which will be spread out in the floodplain and/or Riparian Reserve. Removal and relocation of the alders should take no more than one working day. Placement of the concrete ramp in the floodplain and river bed should take no more than one working day. In-water work would occur during the in-water work period (July 1 to August 15) unless otherwise required and authorized by NMFS, USFWS, and ODFW.

Construction of loop road, staging site, and parking sites

- Work activities on the terrace could take up to 2 months and will take place during the summer (likely between July and September). The terrace where the new boat launch site will be located is used by dispersed campers and there is a web of native surface roads in the area. Construction of the access road, loop road, staging area, and toilet pad will be designed to shed surface runoff into existing vegetation on the terrace. Given the flat nature of the terrace (See Figure 11) and the permeable soils, no surface runoff directly into the river is expected from these sites. The obvious exception to this being the ramp itself which will likely shed surface water toward the river.
- Some large conifers (20 to 50 inches in diameter) may need to be felled and moved in order to construct the new site, but our intent is to use as much currently disturbed area as possible to minimize the need to cut trees. It is unknown at this time how many trees will need to be cut, but those trees that are suitable for fish habitat work will be staged for future projects. Those trees not suitable for fish habitat work will be placed within the Riparian Reserve in appropriate areas. That is, where they will not interfere with the boat launch site or dispersed camp sites, and where it is practical to place them without too much additional disturbance by the equipment.
- Parking will be provided along the 2650 road by improving existing pull outs along the road. Improvement is defined as blading the existing shoulders to ensure proper drainage and safety, conducting any needed brushing, and placing

aggregate. These pullouts are on previously disturbed ground and no new fill will be required to improve them.

Paradise Boat Launch

The **Action Area (Figure 12)** for this element and location is defined as the Paradise day use area including all existing loop roads, parking sites, and picnic areas; two sites in the day use area that are adjacent to the existing loop road and parking area (50 feet by 10 feet, and 80 feet by 10 feet); an area of the floodplain approximately 40 feet long by 32 feet wide (1,280 square feet) where the ramp will be placed; an area from the new ramp location out into the river 65 feet (the bankfull width of the river is approximately 144 feet at this location) to a downstream point 300 feet from the new ramp location (19,500 square feet of the rivers surface area), and including the average depth of the river at this location which is 7 feet ($300' \times 65' \times 7' = 136,500$ cubic feet).

Placement of pre-fabricated concrete ramp in the floodplain and river channel

- Construction of the new launch site will be accomplished by placing a pre-fabricated concrete ramp in the existing location that would be wide enough to serve as two ramps. The new ramp would be approximately 32 feet wide by 40 feet long. The approach road is currently paved so the only new paving expected at the ramp will be the apron in order to connect the loop road to the concrete ramp. The apron is located approximately 20 to 25 feet away from the McKenzie River at base flow conditions. The ramp would extend into the river approximately 10 to 15 feet from bankfull width (up to 480 square feet of concrete pad in river channel). No trees will need to be removed in order to place the new ramp, but a stump will be removed. In-water work would occur during the in-water work period (July 1 to August 15). In-water work to place the concrete ramp should take no more than one work day.

Construction of additional parking sites

- The construction of additional parking sites is within 150 feet of the river but there is vegetative buffer between the two, and no overland flow of sediment or sheeting over pavement is expected to directly reach the river. Work could take 3 to 4 weeks to complete in the day use area.

Relocation of small boulders and woody material

- Relocation of approximately 20 small boulders (16 inches to 24 inches in diameter) that block use of the extended ramp width during low flow months will be accomplished by have an excavator place these small boulders further into the channel where the river can mobilize and relocate them. The excavator would have to wade approximately 25 feet into the river to accomplish this task. The river is approximately 145 feet wide in this location. The piece of wood that needs to be relocated is 22 feet in length by 19.5 inches in diameter. It will be moved upstream onto the cobble bar and will remain within the bankfull channel.

All of this work should take no longer than half of a work day, and will likely take place before the concrete ramp is placed.

Bruckart Boat Launch

The **Action Area (Figure 13)** for this element and location is defined as the portion of the river terrace downstream and upstream of Bruckart Bridge (Forest Road 19) on river right that is National Forest System lands (approximately 1000 feet by 500 feet = 500,000 square feet or 11.5 acres); the portion of Forest Road 19 from its junction with Highway 126 to its junction with Road 1900-410 (approximately 1.0 mile); Forest Road 1900-410 from its junction with Road 19 approximately 2 miles to Strube Flat (an established waste area outside of the floodplain); an area from the new ramp location out into the river 65 feet (the bankfull width of the river here is approximately 160 feet) to a downstream point 300 feet from the new ramp location (19,500 square feet of river surface area), and including the average depth of the river which is estimated to be 7 feet at this location (300'x65'x7' = 136,500 cubic feet).

Placement of pre-fabricated concrete ramp in the floodplain and river channel

- Construction of the new launch site will be accomplished by placing a pre-fabricated concrete ramp in a new location on the same side of the river, but downstream of Bruckart Bridge (river right looking downstream). The new ramp would be approximately 16 feet wide by 40 feet long. The ramp would extend into the river approximately 10 to 15 feet from bankfull width (up to 240 square feet of concrete pad in river channel). This action will require the removal of 12 to 20 red alder and about 6 small conifers (less than 6 inches in diameter) which will be spread out in the floodplain and/or Riparian Reserve. Removal and relocation of the trees should take no more than one working day. Placement of the concrete ramp in the floodplain and river bed should take no more than one working day. In-water work would occur during the in-water work period (July 1 to August 15).
- Construction of loop road, staging site, and parking sites
- Work activities on the terrace could take up to 2 months and will take place during the summer (likely between July and September). Construction of the access road, loop road, parking stalls, turnout, staging area, and toilet pad will be designed to shed surface runoff into existing vegetation on the terrace. Given the flat nature of the terrace and the permeable soils, no surface runoff directly into the river is expected from these sites. The obvious exception to this being the ramp itself which will likely shed surface water toward the river.
- Some large conifers (20 to 50 inches in diameter) may need to be felled and moved in order to construct the new site, but our intent is to design the loop road in a fashion that minimizes the need to cut large trees. It is unknown at this time how many trees will need to be cut, but those trees that are suitable for fish habitat work will be staged for future projects. Those trees not suitable for fish habitat work will be placed within the Riparian Reserve in appropriate areas. That is,

where they will not interfere with the boat launch site, and where it is practical to place them without too much additional disturbance by the equipment.

Element 2: Decommissioning of old boat launch sites at Frissell and Bruckart.

No decommissioning activities are proposed at the Paradise boat launch or day use area.

Frissell Boat Launch

The **Action Area (Figure 11)** for this element and location is defined as all portions of the existing Frissell boat ramp and Highway pullout; the 2650 road length to the designated fueling area which is 800 feet away from any surface water (this is an established waste area and any waste will be placed here outside of the floodplain); an area from the old ramp location out into the river 65 feet (the bankfull width of the river is approximately 130 feet at this location) to a downstream point 300 feet from the new ramp location (19,500 square feet of the rivers surface area), and including the average depth of the river at this location which is 5 feet ($300' \times 65' \times 5' = 97,500$ cubic feet).

Removing structural elements

- Decommission the existing boat launch on river left and restore the river bank and a portion of the terrace. The existing buttress logs and cable would be removed from the site. This should take less than one working day.

Shallow ripping compacted areas and re-vegetating, and/or bringing in topsoil and placing it in hummocks and re-vegetating

- Rehabilitate the decommissioned boat ramp location and a portion of the highway pullout. The ramp site will not be scarified with heavy equipment because it already has loose soils due to use. Some of this soil may be removed if we determine it will likely enter the river. If any scarification is needed of the ramp site, it would be accomplished with a hand rake in order to minimize disturbance while still providing a seed bed for grass and red alder. In addition to grass seeding the old ramp site with native grasses and red alder, we would spread straw mulch, plant vine maple, big leaf maple, and conifers (Douglas-fir or Western red cedar depending on what is available). The vegetation will be monitored thru the seasons (for up to 2 years) and if the site requires additional seeding or tree planting due to mortality or for any other reason, it will take place during the appropriate planting season.
- A portion of the large pull out, located on a relatively flat terrace separating the highway from the McKenzie River, will be rehabilitated by scarifying the compacted layer no greater than 4 inches in depth and importing topsoil that will be shaped into hummocks and a soil windrow. These structures will be seeded with native grass and will serve as a barrier between the highway and the river by acting as a soil filter and as a berm that diverts water into existing vegetation.

Vegetated hummocks are desired since this is a Federal Scenic Byway and they will keep vehicles from driving onto the area. This technique has been used on other sections of Highway 126 and has been successful at preventing surface runoff from directly reaching the river.

- Decommissioning activities and rehabilitation work is estimated to take up to 5 working days and will take place during the summer (likely between July and September).

Bruckart Boat Launch

The **Action Area (Figure 13)** for this element and location is defined as all portions of the existing Bruckart boat ramp and parking area; the loop road between the parking area and Forest Road 19; an area from the old ramp location out into the river 65 feet (the bankfull width of the river here is approximately 160 feet) to a downstream point 300 feet from the new ramp location (19,500 square feet of river surface area), and including the average depth of the river which is estimated to be 7 feet at this location (300'x65'x7' = 136,500 cubic feet).

Removing structural elements

The existing ramp and a portion of the parking area are comprised of concrete, asphalt, and aggregate. All concrete and asphalt will be removed. This activity is estimated to take up to 2 working days.

Shallow ripping compacted areas and re-vegetating, and/or bringing in topsoil and placing it in hummocks and re-vegetating

- The techniques used at Frissell would also be used on the old Bruckart ramp site. That is, we will remove any loose material that could enter the river, scarify with hand rakes, straw mulch, seed with native grasses and red alder, plant vine maple, big leaf maple, and conifers (Douglas-fir or Western red cedar depending on what is available). The vegetation will be monitored thru the seasons (for up to 2 years) and if the site requires additional seeding or tree planting due to mortality or for any other reason, it will take place during the appropriate planting season. A windrow made of topsoil will be used to ensure that any potential surface runoff is diverted away from the old ramp slope and into existing vegetation.
- Decommissioning an existing loop road that connects Bruckart landing to Forest Road 19 will be accomplished by placing hummocks at the junctions of the road and grass seeding. The remainder of the road would be scarified to a depth of 2 to 4 inches and grass seeded. The road is located on a flat terrace approximately 10 to 50 feet from the McKenzie River. The underlying subsoil is glacial-fluvial deposits that are very permeable and porous so no surface runoff is expected. Native grass seed will be applied to the scarified surface to prevent soil erosion and will be monitored for 2 years. If for any reason further seeding is required, it will take place during the appropriate planting season.

Evaluation of Baseline Condition for McKenzie River Boat Launches Project Upon Bull Trout and Spring Chinook Salmon in the Upper McKenzie River 5th Field Watershed.

Upper McKenzie River 1709000401 (5th field HUC)

Boulder Creek/Frissell Creek 170900040106 (6th field HUC)

McKenzie Bridge 170900040109 (6th field HUC)

Note: Discussion of population characteristics in the Baseline Condition evaluation also includes information from the Kink Creek 6th field sub-watershed (170900040103), The Smith River 6th field sub-watershed (170900040104) and the Deer Creek 6th field sub-watershed (170900040105). These sub-watersheds are not in the project area for the boat launches project, but important information on bull trout and spring Chinook salmon has been collected in these sub-watersheds so it is presented as background information within the context of the 5th field watershed.

POPULATION CHARACTERISTICS (Bull Trout)

Population Size and Distribution:

Buchanan and others (1997) documented three isolated bull trout populations in the McKenzie River and they are: (1) the Mainstem population, (2) the South Fork Population, and (3) the Trail Bridge population. Both the Mainstem and Trail Bridge populations can be found within the Upper McKenzie River 5th field watershed. The South Fork is a separate 5th field watershed, but redd numbers are provided.

Table 4. Bull trout redd counts from spawning surveys by ODFW, Stillwater Sciences and Forest Service; 1989-2005.

Year	McKenzie River Population										Trail Bridge Population			S.Fk McKenzie
	Anderson Creek				Olallie Creek			McKenzie River below Trail Bridge Dam	Total McKenzie Population	McKenzie R. above Trail Bridge Dam	Sweetwater Creek	Total Trail Bridge Population	Roaring River	Total S.Fk McKenzie Pop.
	Below Culvert	USFS Index Reach	Above Culvert	Total Stream	Below Culvert	Above Culvert	Total Stream							
1989	-	7	-	7	-	-	-	-	7	-	-	-	-	
1990	-	9	-	9	-	-	-	-	9	-	-	-	-	
1991	0	8	8	8	-	-	-	-	8	-	-	-	-	
1992	4	13	9	13	-	-	-	-	13	-	-	-	-	
1993	4	15	11	15	-	-	-	-	15	-	-	-	1	
1994	7	22	23	30	3	-	3	-	33	0	0	0	1	
1995	3	30	70	73	1	9	10	-	83	7	0	7	2	
1996	1	26	81	82	0	7	7	-	89	7	0	7	0	
1997	7	18	78	85	0	9	9	-	94	3	0	3	0	
1998	4	29	75	79	0	7	7	-	86	2	0	2	6	
1999	13	47	64	77	0	6	6	-	83	0	0	0	13	
2000	15	44	68	83	0	9	9	-	92	0	2	2	25	
2001	6	23	66	72	2	4	6	-	78	1	2	3	34	
2002	9	31	51	60	5	5	10	-	70	3	1	4	25	
2003	6	23	50	56	7	10	17	0	73	9	4	13	27	
2004	6	24	43	49	7	5	12	1	62	15	9	24 ^a	32	
2005	7	24	40	47	7	5	12	2	61	10	9	19	35	

^a The high redd count in 2004 for the Trail Bridge population can be attributed to an increased effort in survey.

Table 5. Total Bull Trout Redd Tally for Upper McKenzie River 5th Field Watershed

Year	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Redds	33	90	96	97	88	83	94	81	74	86	86	80

Additional estimates of the population size for bull trout were made for the Trail Bridge population as part of a hydropower licensing effort. Stillwater Sciences is the consultant to the Eugene Water & Electric Board (EWEB) and the following table displays their estimates.

Table 6. Population estimates for Trail Bridge bull trout. Confidence intervals in parentheses when available. Based on Stillwater Sciences (2006c and 2006f)

Life-stage	Year	Method	Estimated population size +/- 95% C.I.
Adults	2004	Two adults for every confirmed bull trout redd, and half the “unknown” redds (11). Assumes annual spawning.	70 ^a
	2004	Petersen estimator applied to redd counts and PIT tag recaptures of adults	141 +/- 41
Adults/subadults combined	2005	Program MARK	105 (30-280)
	2004	Program MARK	111 (29-307)
	2004	Baited Video Station estimate for bull trout > 200 mm (7.9 in) FL	254 (128-538) ^b
Juveniles	2004	Total number observed in snorkel survey of all habitat units	14 in Sweetwater Creek
		Extrapolated snorkel survey results	377 (168 minimum) in Carmen Bypass Reach
	2005	Modified Petersen estimator	351 +/- 253 in Trail Bridge Reservoir
		Program MARK	264 (121 – 725) in Trail Bridge Reservoir
Fry outmigrating from Carmen Bypass Reach	2004	Petersen estimate	802
	2005	Petersen estimate	841

^a This estimate is conservative, if a proportion of the population spawns bi-annually. Stillwater Sciences (2006c) cite Baxter and Baxter (2002) as evidence that some populations spawn every other year.

^b This estimate is higher than other estimates partly because it includes large juveniles in the calculation.

Baseline Condition: Based upon redd surveys and abundance estimates for the Trail Bridge population it is likely that the number of adult bull trout in the Upper McKenzie River 5th field HUC is between 50 and 500. Population size is estimated at 194 adult fish in calendar year 2004 with 70 fish from Trail Bridge, and 124 fish from the Mainstem (2 fish per redd). This estimate would be conservative since some bull trout may spawn bi-annually, and it is typical to see a small “satellite” male with a larger spawning pair so some redds have 3 fish. This indicator is considered to be FUNCTIONING AT RISK.

Growth and Survival:

Information on the Trail Bridge population has recently been collected by Stillwater Sciences (2006c) on growth, age structure, and survival. However, there is some information that was collected on PIT tagged fish that were located downstream of Trail Bridge dam. They become de facto Mainstem bull trout when they are entrained at Trail Bridge. The following is a summary of their findings.

Age determinations based on scale analysis were precise to +/- 1-year. A sub-sample of scales was evaluated on separate occasions to estimate the precision of age determinations. Agreement was reached between the final age determinations for 37% of the samples (n = 63), with 78% of the disagreements being 1 year apart, and 22% at 2 years apart (n = 40).

Growth rate of bull trout in Stillwater Science’s Study Area did not appear dependent on initial size (see Table 7 below). Size-at-age data from scale analysis indicated that bull trout in the Study Area are typically age 3 or older when they become subadults, and are generally older than age 4 when they become adults. Based on size, the range in spawning age is between ages 4 and 7. Reservoir trapping captures indicated that a variety of ages/sizes of bull trout are currently residing in Trail Bridge Reservoir. No bull trout older than age 7 were observed. The data suggest that a portion of the bull trout population remains in Carmen Bypass Reach until at least age 4, while only reaching 200 mm FL.

Table 7. Annual growth rates of bull trout in the Study Area (from Stillwater Sciences 2006c).

Life stage (sample size)	Initial size FL			Individual growth rates cm/yr (in/yr)		
	Min cm (in)	Max cm (in)	Avg cm (in)	Min cm/yr (in/yr)	Max cm/yr (in/yr)	Avg cm/yr (in/yr)
Subadult and adult (n = 11)	33.5 (13.2)	58.4 (23.0)	44.7 (17.6)	2.9 (1.1)	10.6 (4.2)	5.9 (2.3)
Juvenile (n = 5)	14.2 (5.6)	23.0 (9.1)	18.1 (7.1)	3.6 (1.4)	12.8 (5.0)	6.7 (2.6)

Stillwater Sciences (2006c) assessed bull trout survival using PIT tag recapture data to estimate minimum annual survival, and minimum over-winter survival (see Table below). All 2003 tags detected or recaptured in 2005 had been previously detected or recaptured in 2004. Annual survival rates were also estimated using Program MARK (see Table below). Low recaptures of subadults in 2005 prevented an estimate of survival of subadults tagged in 2004. Recapture periods of juveniles were too varied to estimate confidence intervals, and these estimates should be considered less precise than those for subadult and adults.

Table 8. Bull trout survival estimates, 2003-2005.

Life stage	Year tagged	Annual survival estimate (%) +/- 95% C.I.	Method
Adult	2003	53	Minimum estimate based on PIT tag recaptures
		75 (52-89)	Program MARK
Subadult		38	Minimum estimate based on PIT tag recaptures
		66 (46-89)	Program MARK
Adult	2004	20	Minimum estimate based on PIT tag recaptures
		84 (66-94)	Program MARK
Subadult		17	Minimum estimate based on PIT tag recaptures
Juvenile		6	Minimum estimate based on PIT tag recaptures
		40	Program MARK

The only information on the resilience of bull trout populations is for the Trail Bridge population. This information was developed by Stillwater Sciences (2006f) using a population dynamics model.

The bull trout population upstream of Trail Bridge Dam exhibited a high resiliency in recovering from a modeled catastrophic fish kill of all life-stages of bull trout in lower Carmen Bypass Reach (the McKenzie River between the head of Trail Bridge Reservoir and Tamolitch Falls) and Sweetwater Creek. In the years following the fish kill, the adult population in Trail Bridge Reservoir would be maintained by the abundance of age 2+ juveniles and subadults rearing there. However, once the current population of age 2+ juveniles became subadults, the lack of recruitment of age 2+ juveniles from Carmen Bypass Reach and Sweetwater Creek would limit recruitment to the subadult life-stage; for the next two years, the adult population would decrease based on the estimated annual adult mortality of 20%. Three years following the disturbance, age 2+ recruits from Carmen Bypass Reach and Sweetwater Creek would again become available to recruit to the subadult life-stage in Trail Bridge Reservoir, and 4 years following the disturbance, the subadults would be available to recruit to the adult population. The age structure of the adult populations would be biased toward older fish (> age 5) individuals until subadult to adult recruitment resumed.

The bull trout population upstream of Trail Bridge Dam also showed a high resiliency in recovering from a modeled catastrophic fish kill of all life-stages of bull trout in Trail Bridge Reservoir. During the year of the fish kill, the subadult/adult population would be extirpated. By the first year following the disturbance, age 2+ juveniles would seed the reservoir from production in the lower Carmen Bypass Reach and Sweetwater Creek, and

by the second year these juveniles would recruit to the subadult life-stage, and to the adult life-stage within three years following the disturbance. The age structure of the adult population would be biased towards younger (all age 4 fish) individuals in the third year following the disturbance, and the proportion of older adults would increase each year thereafter.

Overall, short-term alterations in the amount or quality of habitat (e.g. physical habitat, food availability) at crucial life-stages are not likely to cause long-term effects on the bull trout population. The bull trout population is highly resilient to disturbance based on:

- Age structure of adult population from age 4+ to 7+ (Stillwater Sciences 2006c),
- High production of juveniles relative to the adult population,
- Spawning habitat in both the Carmen Bypass Reach and Sweetwater Creek, and
- Habitat supporting rearing to age 2+ juveniles in both the Carmen Bypass Reach and Sweetwater Creek.

Baseline Condition: The findings by Stillwater Sciences (2006f) suggest that the Trail Bridge population is resilient to single pulse catastrophic disturbance. Based on redd surveys, the Trail Bridge population appears to be on the increase and the Mainstem population appears to be decreasing. This steady reduction in the number of redds for the Mainstem population is troubling and of concern, but it does not appear to be based on habitat factors or water quality. Due to this steady reduction in redd numbers in Anderson Creek this indicator is considered **FUNCTIONING AT RISK**.

Life History Diversity and Isolation:

The migratory form is present in the Trail Bridge and Mainstem bull trout populations. Habitat is considered good to excellent. However, Trail Bridge Dam does not have upstream passage facilities. Downstream passage (entrainment) occurs through the turbines and via the spillway (Stillwater Sciences 2006b). If a bull trout survives entrainment, they are lost to the Trail Bridge population and become part of the Mainstem population. It is unknown if these entrained fish spawn in Anderson or Olallie Creek.

Two culverts under Highway 126 have been replaced with baffled pipes (Olallie Creek and Sweetwater Creek) and are effective in passing adult bull trout. The culvert at Anderson Creek has not been barrier.

Baseline Condition: Due to the lack of connectivity between the Mainstem and Trail Bridge populations because of the dam, this indicator is considered to be **FUNCTIONING AT RISK**.

Persistence and Genetic Integrity:

As stated above, Trail Bridge Dam does not have passage and this restricts connectivity. In addition, Stillwater Sciences (2006a) and Spruell (2006) found that bull trout /brook

trout hybrids are present above Trail Bridge Dam. They also noted that the potential effects of brook trout on bull trout may be changing. The bull trout population above Trail Bridge Dam appears to be increasing, and trap sampling suggests that brook trout abundance has decreased in Trail Bridge Reservoir over the last 10-15 years. However, bull trout and brook trout hybridization continues even with shifts in relative abundance.

Baseline Condition: Given these conditions this indicator is considered to be FUNCTIONING AT RISK.

Water Quality:

Temperature:

The following table provides the seven day average maximum for various streams within the Upper McKenzie River 5th field HUC. This data was collected by the Forest Service.

Table 9. 7-day average maximum for various streams within the Upper McKenzie River 5th field HUC

Stream Name	Geographic Description of Sensor Location	Geologic Province	7-Day Average Maximum in Degrees Celsius	Date of Maximum Temperature
Anderson Creek (Boulder Cr / Frissell Cr 6 th)	At Highway 126	New High Cascades	6.6	September 14
Boulder Creek (Boulder Cr / Frissell Cr 6 th)	Near Mouth	Old High ^a Cascades	13.1	August 8
McKenzie River (Boulder Cr / Frissell Cr 6 th)	Below Trail Bridge Dam	Primarily High Cascades at this point, but influenced by Smith River watershed and Trail Bridge Reservoir upstream	10.6	August 4
McKenzie River (McKenzie Bridge 6 th)	Near Ranger Station	McKenzie ^b River Glacial Valley	12.2	August 9
Olallie Creek (Boulder Cr / Frissell Cr 6 th)	At Highway 126	New High Cascades	5.5	July 10
Scott Creek (Boulder Cr / Frissell Cr 6 th)	Near Mouth	Old High Cascades	12.2	August 10

^a The term Old High Cascades is used only to describe how Scott Creek and Boulder Creek cut through Pleistocene glacial deposits and “New” High Cascade lavas in their headwater areas, but further downstream incise underlying older High Cascades lava that have been subjected to fluvial processes for a longer period of time and McKenzie River glacial deposits.

^b The term “McKenzie River Glacial Valley” is used at this site since because the river is in a glacial valley confined by two east-west trending ridges, but is not a recognized province name.

Bull trout spawning does not take place near any of the boat launch locations. The closest known spawning is in Olallie Creek which is 6 miles upstream of Frissell launch (the most upstream site).

Based on snorkel surveys conducted by ODFW and bank observations along the McKenzie River by the Forest Service, it appears that bull trout fry rearing is primarily taking place in the tributaries where spawning takes place. Forest Service monitoring and inventories have only documented fry in streams where the 7-day average maximum does not exceed 7.5° C. Buchanan and Gregory (1997) indicate that optimal “early” fry rearing takes place at temperatures 4-4.5° C and “late” fry rearing at temperatures from 4-10° C. Spence (1996) also indicated that these temperatures were optimal. Temperatures downstream of Deer Creek are just over 10° C. Due to river temperature conditions, and since Forest Service and ODFW inventories have not documented bull trout fry downstream of Deer Creek, it is highly unlikely that bull trout fry will be affected by boat launch activities.

Bull trout juveniles rear in the same areas where spawning takes place and temperatures are below 12 ° C in these areas, but older juveniles have been seen in the mainstem river as far downstream as Frissell Creek (Stillwater Sciences 2006c) where temperatures are around 10 degrees Celsius. Suitable temperatures in the river exist as far downstream as Lost Creek (9.3 ° C in Lost Cr.).

Adult and sub-adult bull trout use these areas as well, and temperatures are below 15° C. These life history stages have also been documented in Deer Creek (19° C near mouth, and 16.7° C above the powerline). It is presumed that sub-adult and adult bull trout are entering these systems to forage on prey species because conditions are not suitable for spawning or rearing.

Deer Creek is a Western Cascade stream and as such it is typically warmer, produces more sediment, and has a flashier hydrograph than High Cascade Streams (USDA Forest Service 1995). Deer Creek has been impacted by human activities (hydropower transmission lines, timber harvest, and road construction) and these activities have likely affected stream temperatures.

Although Deer Creek is relatively warm (19° C at mouth), as it enters the mainstem McKenzie River these warm temperatures are overwhelmed by flows from the mainstem and Olallie Creek. Water from the McKenzie River and Olallie Creek comes from cold water springs with steady flows. The following table shows 7-day monthly maximum temperatures in years 2004 and 2005 for sites above and below the Deer Creek confluence with the McKenzie River.

Table 10. Monthly Maximum 7-Day Average Temperatures in McKenzie River in Degrees Celsius (Fahrenheit) (Stillwater Sciences 2006h)

Location	Year	7-Day Monthly Maximum	Month
Upstream of Deer Creek Confluence	2004	9.3 (48.7)	July and August
Downstream of Deer Creek Confluence	2004	10.3 (50.5)	July
Upstream of Deer Creek Confluence	2005	9.3 (48.7)	July and August
Downstream of Deer Creek Confluence	2005	10.1 (50.2)	July and August

Note: all sites are within the Boulder Creek / Frissell Creek 6th field sub-watershed.

In September 1999, a project was implemented to collect stream temperatures in the McKenzie River using Forward Looking Infrared (FLIR) technology (Torgersen, et. al.) which documented similar effects. That is, Deer Creek water was warm, but when it entered the McKenzie River it was overwhelmed by Ollalie Creek’s cold water influence.

Baseline Condition for bull trout: Although Deer Creek is above 15 degrees Celsius for periods of the year, the overwhelming influence of spring fed water maintains cold water temperatures in areas where bull trout adults and sub-adults migrate (i.e. there are no thermal barriers to migration from adult rearing areas to spawning areas). Temperatures are well within tolerance limits for juvenile rearing in the 5th field. Temperatures are good for bull trout spawning in known spawning areas. Incubation is above the 5 degree threshold during some part of the year in every stream except Olallie Creek. This is typically during spawning, and temperatures drop during the winter. The temperature sensor in this 5th field that is in the most downstream location, and is in the mainstem river (McKenzie River near Ranger Station), has a 7-day average maximum of 12.2 degrees Celsius in August. Despite the warm water temperatures that come from Western Cascade streams this indicator is considered to be PROPERLY FUNCTIONING for bull trout due to the overwhelming influence of spring fed water in the 5th field.

Baseline Condition for spring Chinook salmon: In areas of known spring Chinook spawning and rearing, temperatures are within the thresholds. They range from 10.6 to 12.2 degrees Celsius in this 5th field watershed. The warmer temperatures of Deer Creek do not present a thermal barrier to Chinook spawning and migrating in the upper McKenzie River. This indicator is considered PROPERLY FUNCTIONING.

Suspended Sediment – Intergravel DO/Turbidity:

Intergravel Dissolved Oxygen measurements have been collected and reported by Stillwater Sciences (2006h). The measurements were taken as part of hydropower licensing and are limited to the Carmen Smith Project area.

Table 11. Average Dissolved Oxygen Measurements McKenzie River (Stillwater Sciences 2006h)

Date	Site Description	Average Temperature (degrees C)	Average DO mg/L	Average % saturation
August 2004	McKenzie River downstream of Trail Bridge Dam at upper spawning channel bar-rack	9.9	12.0	116.1
August 2004	McKenzie River downstream of Trail Bridge Dam at lower spawning channel weir-box	9.9	11.8	113.7

Bjornn and Reiser (1991) report that minimum DO recommended for spawning fish (at least 80% of saturation, and not even temporarily less than 5.0 mg/L) should provide the minimum needs of migrating salmonids. For incubation requirements they recommended that concentrations should be at or near saturation, and that temporary reductions drop no lower than 5.0 mg/L for anadromous salmonids. For juvenile rearing requirements they found that salmonids may be able to survive when DO conditions are relatively low (<5 mg/L), but growth, food conversion efficiency, and swimming performance will be adversely affected.

Turbidity measurements have been collected and reported by Stillwater Sciences (2006h). The measurements were taken as part of hydropower licensing and are limited to the Carmen Smith Project area.

Table 12. Water clarity measurements during 2004 sampling events (Stillwater Sciences 2006h)

Site Description	Turbidity (NTU)			
	May	Aug	Oct	Dec
McKenzie River downstream of Trail Bridge Dam	0.80	0.24	0.19	0.28
McKenzie River downstream of Olallie Creek	0.00	0.00	0.15	0.00
McKenzie River upstream of Deer Creek confluence	0.50	0.18	0.22	0.34
McKenzie River downstream of McKenzie Bridge	0.70	0.25	0.24	2.20

Bjornn and Reiser (1991) cite a study that found adult salmonids did not migrate in streams where suspended sediment concentrations exceeded 4000 mg/L. They also found that larger juvenile and adult salmon and trout appear little effected by ephemerally high concentrations of suspended sediments that occur during most storms and episodes of snow melt. They cite studies that found coho juveniles could be affected by turbidities that ranged from 60 to 70 NTU.

Baseline Condition: Measurements taken by Stillwater Sciences show DO and NTU conditions in the McKenzie River are well above these minimum requirements. This indicator is considered to be PROPERLY FUNCTIONING.

Chemical Contamination/Nutrients:

The McKenzie River is not listed as 303d for chemicals. Water quality is excellent in this 5th field. There are no agricultural, industrial, or other sources of chemical contamination. It is likely that hydrocarbons on Highway 126 get washed into the river during rain events.

Baseline Condition: Since there is no indication of chemical contamination in this 6th field, this indicator is PROPERLY FUNCTIONING.

Habitat Access:

Physical Barriers:

There is one human-made barrier in the Boulder Creek/Frissell Creek 6th field subwatershed. This barrier is the Trail Bridge Dam tailrace barrier and it is intended to force fish into the Carmen Smith Spawning Channel. In 1961 EWEB constructed a spawning channel below Trail Bridge Dam to mitigate for the lack of passage to upstream habitats. The spawning channel has two 250 foot riffles for spawning, and has recently been augmented with fresh gravels. It successfully produces tens of thousands of salmon fry, but does not provide good rearing habitat. Salmon fry must enter the river proper to seek better rearing conditions.

Baseline Condition: Since this barrier is intended to serve as a barrier, and it is the only human caused barrier in the 6th field subwatershed, this Indicator is considered to be PROPERLY FUNCTIONING.

Habitat Elements:

Substrate Character and Embeddedness (in areas of the gravels and subsurface areas):

The upper McKenzie River 5th field watershed is large and has two very different geologic provinces that produce different levels of sediment.

Stillwater Sciences (2006d) conducted intensive surveys in various reaches within the Upper McKenzie River 5th field watershed. The following information is a summary of their findings on the composition of channel substrate at those intensive sites within the Boulder Creek / Frissell Creek 6th field, and the McKenzie Bridge 6th field.

The McKenzie River at Trail Bridge gage site is strongly confined, with steep hillslopes directly joining the channel. In the upper portion of the site, narrow terraces of glacial

deposits occupy the eastern channel bank; in the lower portion of the reach, narrow terraces occupy the western channel bank. No alluvial bars were found in this study site. Channel banks within the study site are stable, and bank erosion was associated with root throw pits when trees were uprooted due to windthrow or mortality (Stillwater Sciences 2006d).

The McKenzie River downstream of Frissell Creek site is located in a straight, relatively uniform reach that is confined by hillslope, with no floodplain areas. The effects of lower slope and stream power and high sediment inputs from Deer and Frissell creeks are evidenced by cobble and gravel deposits along lower velocity zones, but sediment deposits remain submerged at low flows and do not support riparian vegetation. Bank conditions were stable throughout the site and no evidence of channel aggradation or degradation was visible (Stillwater Sciences 2006d). This survey site is the closest to Frissell boat launch and is located approximately 1.5 miles upstream.

The gage site on the McKenzie River at McKenzie Bridge is downstream of the point where the valley morphology transitions to a broader, glaciofluvial valley with a higher degree of floodplain connectivity and complexity. The change in valley morphology leads to noticeably different site characteristics than at the other McKenzie River sites: (1) decreased slope and channel confinement, (2) stable, forested islands that are composed of alluvial material delivered during outsized paleofloods that are no longer part of the current climate setting, (3) alluvial bars that are attached to the upstream ends of the islands, (4) increased frequency of perennial side channels that flow around the islands, and (5) higher large woody debris loading due to side channels and islands that collect fluvially transported wood. The site is bordered by terraces of glacial valley fill on both sides of the channel (Stillwater Sciences 2006d). This survey site is the closest to Paradise boat launch and is approximately 1.5 miles downstream.

Table 13. Percent area of dominant channel facies at intensive study sites. Stillwater Sciences (2006d)

Substrate type	McKenzie River at USGS Trail Bridge gage ^a	McKenzie River downstream of Frissell Creek ^a	McKenzie River at USGS McKenzie Bridge gage (main channel) ^b	McKenzie River at USGS McKenzie Bridge gage (side channel) ^b
Percent area of dominant channel facies				
Sand	0	0	0	0
Gravel	1	8	1	12
Cobble	21	73	55	88
Boulder	78	20	44	0
Estimated reach-average particle size weighted by facies area (mm)				
D₅₀	260	140	220	125
D₈₄	480	260	680	250

^a Within the Boulder Creek / Frissell Creek 6th field sub-watershed

^b Within the McKenzie Bridge 6th field sub-watershed

Table 14. Frequency of particle embeddedness classes at intensive study sites. Stillwater Sciences (2006d)

Particle embeddedness class (%)	McKenzie River at USGS Trail Bridge gage ^a	McKenzie River downstream of Frissell Creek ^a	McKenzie River at USGS McKenzie Bridge gage ^b
Frequency of particle embeddedness classes (%)			
0-10	36	34	23
10-20	20	9	18
20-30	8	18	13
30-40	4	7	12
40-50	4	9	12
50-60	16	2	7
60-70	4	9	7
70-80	8	5	8
80-90	0	7	0
90-100	0	0	0

^a Within the Boulder Creek / Frissell Creek 6th field sub-watershed

^b Within the McKenzie Bridge 6th field sub-watershed

Baseline Condition: The Upper McKenzie River 5th field watershed displays substrate and embeddedness characteristics indicative of the varied geology. Streams in the Western Cascades contribute significant quantities of sediment to the McKenzie River, and in those areas where streams flow through the High Cascades little sediment is yielded (Stillwater Sciences 2006g; USDA Forest Service 1995).

The reach of river between Trail Bridge Dam and Deer Creek is significantly sediment supply limited in those particle sizes that are suitable as spawning material. Stillwater Sciences (2006g) estimated that 3,350 metric tons of coarse sediment (>2 mm) is annually captured by Smith and Trail Bridge reservoirs.

The extensive road network in Western Cascades Geology in this 6th field watershed and the ongoing sediment depravation in the reach of river between Trail Bridge Dam and Deer Creek caused by reservoir trapping provide the rationale to make the determination of FUNCTIONING AT RISK.

Large Woody Debris:

Inventories by Stillwater Sciences (2006e) found that pieces of large woody material downstream of Trail Bridge Dam ranged from 6 pieces to 65 pieces depending on the reach. In general, in the upper river wood is in single pieces but as you move further down the river to the lower portions of this 5th field watershed pieces tend to be in jams.

The following table provides large woody debris frequencies from selected sub-reaches in the McKenzie River (Stillwater Sciences 2006e). Total wood includes all pieces 25 feet in length and 24 inches in diameter. Large wood includes only pieces 50 feet in length and 36 inches in diameter.

Table 15. Large woody debris frequencies from selected sub-reaches in the McKenzie River (Stillwater Sciences 2006e)

Reach	Total wood frequency (pieces/mile)	Large wood frequency (pieces/mile)
1 ^a	253	43
2 ^b	222	36
3 ^c	21	6

^a McKenzie Bridge 6th field. This reach is downstream of Paradise boat launch.

^b McKenzie Bridge 6th field This reach is upstream of Paradise boat launch.

^c Frissell Creek / Boulder Creek 6th field. This reach is immediately upstream of the Frissell boat launch.

It is unlikely that the reach of McKenzie River from Trail Bridge Dam to Lost Creek could maintain 80 pieces of large woody material per mile due to high LWD transport capacity of the reach and limited geomorphic surfaces to induce LWD deposition. Downstream of Lost Creek there is a higher frequency of depositional surfaces (e.g. stable islands, alluvial bars, and side channels).

Minear (1994) found that there was reduction in pool forming elements (i.e. large wood) and noted a 19% decrease over the study area.

Baseline Condition: Since the criteria of 80 pieces per mile has not been met, given the findings of Minear (1994), and due to the presence of Highway 126 in sections of the river that were once riparian area, this element is FUNCTIONING AT RISK. However, in the critical spawning and rearing areas for bull trout (lower Carmen Bypass Reach, Sweetwater Creek, Anderson Creek, and Olallie Creek) woody material frequency is more than adequate and considered Properly Functioning.

Pool Frequency and Quality / Large Pools:

This type of data has not been systematically collected in the mainstem river by the Forest Service.

Baseline Condition: In general pools are rare in the upper McKenzie River which is a steep headwater system. Those pools that do exist are deep and large. If the channel was not constrained by Highway 126, and if woody material recruitment was higher, it is expected that there would be a greater number of pools in the upper river. Minear (1994) found that there was a decrease in large pools in the reach from Trail Bridge Dam to Belknap Springs from 10 to 8 between calendar years 1937 and 1991. Due to these conditions (constrained channel and reduced wood recruitment due to Highway 126) this element is considered to be FUNCTIONING AT RISK.

Off-channel Habitat:

The criteria in the “Table of Population and Habitat Indicators” do not seem appropriate for the upper McKenzie River. That is, “watershed has many ponds, oxbows, backwaters, and other off-channel and low energy areas.” These criteria would be appropriate for a valley river system, but not a headwater river.

Minear (1994) found that channel straightening occurred due to constraint from Highway 126, and her study documented a decrease in off-channel length. In the reach from Trail Bridge Dam to Belknap Springs Minear (1994) documented a decrease in side channel length from 1,039 meters in the 1949 aerial photos, to 669 meters in the 1986 photos.

Baseline Condition: The presence of Highway 126 constrains the river, and given Minear’s (1994) findings that straightening has occurred and that there has been a loss in side channel length in the upper McKenzie River, this indicator is considered to be FUNCTIONING AT RISK.

Refugia:

The upper McKenzie River has habitats capable of supporting strong and significant populations. However, many human activities take place in the upper watershed. There is a hiking trail, a state highway, a hydroelectric facility, recreation on the river (fishing and floating), and forest management.

Baseline Condition: Given all these human activities in the watershed this element is considered NOT PROPERLY FUNCTIONING.

Channel Condition & Dynamics:

Average Wetted Width/Maximum Depth Ratio in scour pools in a reach:

In tributaries where inventories are conducted the type of data collected is: bankfull width to depth ratios at riffles. This type of data has not been collected in the mainstem McKenzie River below Trail Bridge Dam due to safety considerations. However, Stillwater Sciences (2006d) used a boat to collect bankfull width to depth ratios.

Table 16. Width to depth ratios collected by Stillwater Sciences (2006d)

Site description	Cross section	Bankfull width	Bankfull depth	Bankfull width/depth
McKenzie River at USGS Trail Bridge Dam gage ^a	1	118	5.2	23
McKenzie River downstream of Frissell Creek ^a	1	121	5.3	23
	2	138	4.3	33
	3	131	5.5	24
McKenzie River at USGS McKenzie Bridge gage ^b	1	144	7.2	20

^a Frissell Creek / Boulder Creek 6th field

^b McKenzie Bridge 6th field

Baseline Condition: All of the sites where measurements could be taken exceed criteria in the habitat indicators table. Therefore this indicator is NOT PROPERLY FUNCTIONING.

Streambank Condition:

In general, the McKenzie River in the 6th field subwatersheds where this project occurs have stable banks. This is due to the dominance of spring-fed water in the upper watershed. However due to Highway 126, rip-rap can be found on some banks and rip-rap has been placed adjacent to Paradise Campground.

Baseline Condition: Given the presence of rip-rap associated with the highway and campground, and since inventories have not measured this specific element in the mainstem river, this element is considered to be FUNCTIONING AT RISK.

Floodplain Connectivity:

The term “flood” is one that is rarely used in the High Cascades geologic portion of the upper McKenzie River watershed. In the reach between Trail Bridge Dam and Deer Creek it is very rare that water would reach the floodplain. Due to the stable flow regime in this reach side channels are rare and the channel is entrenched.

In other river segments in the 6th field subwatersheds the presence of Highway 126 has constrained the river, and rip-rap is present along some sections of the highway and along Paradise Campground.

Baseline Condition: Due to the presence of Highway 126 and the rip-rap along the river segment near Paradise Campground, this indicator is FUNCTIONING AT RISK.

Flow/Hydrology:

Change in Peak/Base Flows:

Tributary hydrologic inputs to the McKenzie River downstream of Trail Bridge Dam currently include Anderson Creek, Ollallie Creek, and Lost Creek (sourced predominantly in High Cascades terrain east of the McKenzie River); Twisty Creek, Boulder Creek, and Scott Creek (sourced predominantly in glacial terrain); and Deer Creek and Frissell Creek (sourced predominantly in Western Cascades terrain). Natural inflow to the Carmen-Smith Hydroelectric Project from the McKenzie and Smith rivers closely matches outflow at the Trail Bridge Powerhouse tailrace on a daily flow basis, and effects on the annual volume of water delivered downstream of Trail Bridge Dam are small. Pre- and post-Project records for the USGS McKenzie Bridge gage indicate no Project impacts on typical flow statistics such as mean annual and mean monthly flows; the 1-, 3-, or 7-day minimum or maximum flows; or the timing of the 1-day minimum and maximum flows (Stillwater Sciences 2006a). Pre-Project (1911–1962) exceedance probabilities of mean annual flow, and post-Project (1963–1994) exceedance probabilities were very similar. Comparison of pre- and post-Project annual peak flows indicates that post-Project flows are greater at recurrence intervals less than 1.5 years, but are less at recurrence intervals greater than 1.5 to 10 years.

It is likely that forest management activities (timber harvest and road building) in the Western Cascades portion of this 6th field subwatersheds have affected peak and base flows, but the extent has not been evaluated for this project.

Baseline Condition: Given this uncertainty, the determination for this Indicator is FUNCTIONING AT RISK.

Increasing in Drainage Network:

There has most likely been an increase in the drainage network in the two 6th field subwatersheds in question. The effects of an increase in drainage network are more of an issue in the Western Cascades Geologic Province. Increases in the drainage network due to roads appear to be of limited or no consequence in the High Cascades Province where bull trout streams occur. The differences between the geologic provinces provide for stark contrasts in topography and drainage development and reflect the underlying geology, geomorphology, and hydrology in the upper McKenzie watershed (Stillwater Sciences 2006g).

Western Cascades volcanic landscapes comprised of older, deeply weathered, and uplifted basalt flows and volcanoclastic rocks have evolved through debris sliding, debris flows, and deep-seated mass wasting. Steep slopes with shallow, rapid subsurface flow are dissected by a dense network of steep, incised channels that efficiently convey surface runoff and sediment. Stream channels in the Western Cascades exhibit dynamic morphology in response to peaked storm runoff, high sediment yield, and periodic debris

flows (Stillwater Sciences 2006g). Given the geologic context in these areas, it is likely that road building has had the effect of increasing the drainage network.

High Cascade landscapes, in contrast, are composed of broad areas of hydrologically disconnected surface runoff due to low gradient topography, disorganized drainage patterns, and subsurface flow through relatively unweathered and rapidly permeable Quaternary volcanic flows. Stream discharge remains relatively constant throughout the year regardless of winter rainfall or rain-on-snow events. This characteristic surface and subsurface hydrology, in combination with predominantly low gradient hillslopes with low drainage density, results in very low sediment yield in the High Cascades. Channel morphology is relatively static, as evidenced by mature and upland riparian vegetation growing near a stable base flow water surface elevation, and moss-covered bed particles and large wood in active channels (Stillwater Sciences 2006g). Given the geologic context in these areas, it is likely that road building has had minimal effect on increasing the drainage network.

Baseline Condition: The amount of roads in the Boulder Creek/Frissell Creek and McKenzie Bridge 6th field subwatersheds are “greater than moderate” so this indicator would be considered to be Not Properly Functioning. However, since the effects of an increase in drainage network are realized for that portion of the watershed in the Western Cascades, and not the High Cascades, it seems more appropriate to consider this indicator FUNCTIONING AT RISK.

Watershed Conditions:

Road Density and Location: The Upper McKenzie River 5th field watershed has a road density of 1.9 miles per square mile (see Figure 14). This ratio is considered Functioning at Risk for bull trout, and Properly Functioning for Chinook salmon. However, in this watershed road location has a greater impact on habitat characteristics and poses a greater risk to McKenzie River water quality.

Highway 126 is adjacent to the McKenzie River for a great proportion of its length, and has the greatest impact on the river (see Figure 2). Where it is directly adjacent to the river it constrains the channel, has rip-rap along the bank, and has eliminated a source of large woody material to the river. The highway’s location poses the greatest risk to aquatic habitats and water quality due to the risk of chemical spill from truck-tankers.

Baseline Condition: Given the road densities in the 5th field watershed, and due to Highway 126 and the existence of other valley bottom roads within the 5th field watershed, this element is considered FUNCTIONING AT RISK.

Disturbance History:

The measure of ECA is not meaningful in the upper McKenzie River 5th field watershed due to the behavior of the High Cascades Geology. It is meaningful for the Western Cascades Geology.

Baseline Condition: Approximately 19.5% of the entire watershed is in a managed condition, but this does not mean that all 19.5% has been clearcut. However, given the matrix criteria of 15% this Indicator is FUNCTIONING AT RISK.

Riparian Reserves:

There are approximately 39,215 acres of Riparian Reserve in the Upper McKenzie 5th field watershed (see Figure 15). In general, the Riparian Reserve of the mainstem river is in good condition with mature vegetation and a long-term supply of woody material. However, there is also development along the mainstem river in the form of a hydroelectric facility, Highway 126, Belknap Hot Springs Resort, developed campgrounds and dispersed camping, a hiking trail, summer recreation residences, private residences, and the existence of the town of McKenzie Bridge, Oregon.

Baseline Condition: Many of the Riparian Reserves in the 5th field are in good to excellent condition, but due to the amount of development in the mainstem river Riparian Reserve, and due to the presence of Highway 126 this element is considered to be FUNCTIONING AT RISK.

Disturbance Regime:

The disturbance regime has been impacted in this 5th field watershed, especially in the Western Cascades portion of the watershed. There is a legacy of intensive forest management (timber harvest and road network) in the Deer Creek watershed. This has likely increased the sediment yield from that watershed compared to reference conditions (Stillwater Sciences 2006; Upper McKenzie Watershed Analysis 1995). There is also a large, deep-seated earthflow in the Deer Creek watershed and this naturally occurring feature provided Deer Creek with a historically high sediment load.

Baseline Condition: Forest management and Highway 126 have impacted the disturbance regime in the upper McKenzie River 5th field. However, the High Cascades provide an aquatic resiliency to disturbance in the overall 5th field. This indicator is FUNCTIONING AT RISK.

INTEGRATION OF SPECIES AND HABITAT CONDITIONS (Bull Trout Only)

Habitat for bull trout in the upper McKenzie River 5th field watershed is most likely the best that can be found in Western Oregon. However, the presence of Trail Bridge dam, and Highway 126 have significant impacts on connectivity and long-term habitat maintenance. The bull trout population is not large enough to be considered “secure.” The relatively lower number of redds in current inventories compared to the highs of 1996 and 1997 in Anderson Creek are a continuing concern. Finally, ongoing hybridization between brook trout and bull trout continues in the Trail Bridge population.

Baseline Condition: Due to the presence of Highway 126, Trail Bridge dam, all the human activities that take place in the upper watershed, and brook trout x bull trout hybridization, this element is considered to be FUNCTIONING AT RISK.

Evaluation of Baseline Condition for McKenzie River Boat Launches Project Upon Bull Trout and Spring Chinook Salmon in the McKenzie River/Elk Creek 6th Field Watershed.

McKenzie River/Elk Creek 170900040502 (6th field HUC)

Note: Quartz Creek is a tributary to the mainstem river and that portion of the 5th field watershed is downstream of the project area and action area.

SUBPOPULATION CHARACTERISTICS (Bull Trout Only)

Population Size and Distribution:

Bull trout do not spawn in this 6th field sub-watershed. The McKenzie River in this location would provide rearing habitat for subadult and adult bull trout. Bull trout in this river segment are part of the Mainstem population, and any bull trout that were entrained at Trail Bridge Dam (Trail Bridge population) or Cougar Dam (Army Corps of Engineers dam on South Fork McKenzie River – South Fork population).

In calendar year 2005, sixty-one (61) bull trout redds were tallied in Mainstem population spawning sites (note: these spawning sites are in different 5th and 6th field HUCs). With two fish per redd it is estimated that the population that uses this 6th field sub-watershed is 122 adult bull trout. This is a conservative estimate since some bull trout may spawn biannually, and it is likely that bull trout from the South Fork population and the Trail Bridge population are also found in this 6th field.

Baseline Condition: Adults in this population are less than 500 but greater than 50. This indicator is FUNCTIONING AT RISK.

Growth and Survival:

Bull trout do not spawn in the mainstem McKenzie River in this 6th field sub-watershed. This portion of the river is not suitable since the stream temperatures are not in the preferred range for spawning, incubation, or early rearing. The only known suitable spawning areas for bull trout in the Mainstem subpopulation are two spring fed streams (Olallie and Anderson Creeks) which are approximately 20 miles upstream of the Bruckart project site.

The Mainstem population has not been analyzed for resiliency in a similar manner to the Trail Bridge population. The best information available for analysis is redd survey results in Anderson and Olallie Creek. The recent numbers in Olallie Creek, relative to

the 1990's, show an increase. However, Anderson Creek continues to show lower redd tallies.

Baseline Condition: The steady reduction in the number of redds for the Mainstem population is troubling and of concern, but it does not appear to be based on habitat factors or water quality. Due to this steady reduction in redd numbers in Anderson Creek this indicator is considered FUNCTIONING AT RISK.

Life History, Diversity, and Isolation:

Fluvial bull trout use the McKenzie River as foraging, adult rearing, and migratory habitat. The only known spawning habitat that the Mainstem population successfully utilizes, are Anderson and Olallie creeks which are tributaries to the upper McKenzie River. Trail Bridge and Cougar dams have blocked upstream migration to the Upper McKenzie and the South Fork McKenzie, respectively. This has forced isolation of the three sub-populations (South Fork, Mainstem, and Trail Bridge).

Baseline Condition: The Mainstem population is fluvial, and the Trail Bridge and South Fork populations have been forced into a fluvial/adfluvial life history. They appear to be rearing well in the reservoir, but unsafe downstream entrainment at dams is still a problem.

Within this 6th field sub-watershed there are no human caused barriers to bull trout. However the bull trout that utilize this 6th field come from the Mainstem, South Fork, and Trail Bridge populations, and those populations are disconnected from spawning areas due to dams without upstream passage and safe downstream passage. Therefore this indicator is FUNCTIONING AT RISK.

Persistence and Genetic Integrity:

At the 5th field watershed level, and the 6th field sub-watershed level there are no connectivity barriers for bull trout. Barriers that do exist (Trail Bridge and Cougar Dams) occur in different 5th field watersheds.

Within the McKenzie River/Elk Creek 6th field sub-watershed no brook trout have been reported by anglers. The only area where brook trout x bull trout hybridization has been documented is in the Trail Bridge population.

Baseline Condition: There are no indications of hybridization for the bull trout that utilize the McKenzie River/Elk Creek 6th field sub-watershed. However the existence of Trail Bridge and Cougar Dams, although in different 5th field watersheds, requires that this indicator be rated as FUNTIONING AT RISK.

Water Quality:

Temperature:

In September 1999, a project was implemented to collect stream temperatures in the McKenzie River using Forward Looking Infrared (FLIR) technology (Torgersen, et. al.). This project documented temperatures at the confluence of the mainstem McKenzie and South Fork McKenzie River as 10.5 degrees Celsius and 11.3 degrees Celsius, respectively.

The following table provides maximum 7-day averages for tributaries in the McKenzie River/Elk Creek 6th field sub-watershed, and Quartz Creek which is a separate 6th field that has its confluence with the McKenzie River over 6 river miles downstream of Bruckart Boat Launch. Data collected by Forest Service in 2005.

Table 17. 7-day average maximum temperature (degrees C) data collected by the Forest Service in 2005

Stream Name	Geographic Description of Sensor Location	7-Day Average Maximum in Degrees Celsius	Date of Maximum Temperature
Cone Creek	Above private land	16.6	September 10
Mill Creek	Above private land	14.2	September 10
Mill Creek	Below private land	20.0	September 10
Unnamed McKenzie Trib	Mid-slope location near Thor's Hammer. No surface connection to McKenzie River in the summer.	17.4	July 23
Quartz Creek	Above private land	15.5	September 10

Information was reviewed for the USGS gauge that is located immediately adjacent to Bruckart Boat Ramp. The USGS name for this gage location is:

- McKenzie River above South Fork near Rainbow, Oregon.
- USGS ID: 14159110

Table 18. Data from USGS Gage near Bruckart Boat Ramp in 2005

Date of 7-Day Average Maximum	Temperature in Degrees Celsius
July 20	13.7
August 8, 9, 10, and 11	13.5
September 1	12.2
September 30 ^a	9.8

^a The 7-day avg max for the month of September was on the 1st. The September 30 7-day avg max is provided to show the decreasing trend in temperature during the month of September.

Baseline Condition: Tributaries that have a surface connection to the mainstem McKenzie River in this 6th field sub-watershed are warm. However, the mainstem remains relatively cold due to the influence of ground water from the upper watershed.

Bull trout use this 6th field to rear as subadults and adults, and as a migratory corridor to upstream spawning areas. The USGS gage shows that the 7-day average maximum in the mainstem did not exceed 15 degrees Celsius.

This is not an area of “high concentration” for chinook spawning (personal communication with Mark Wade of ODFW). The Oregon Department of Fish and Wildlife has conducted aerial redd surveys along the McKenzie River. They found that the highest concentrations occurred from Trail Bridge dam downstream to the McKenzie River Trailhead. From the trailhead down to the confluence with Horse Creek spawning concentrations were considered “light.” And finally, from Horse Creek downstream to Finn Rock bridge (this reach encompasses almost the entire 6th field discussed here) spawning was “moderate.” Spawning begins around mid-August and continues thru early October with a peak in early October . During that time period temperatures were below 14 degrees Celsius (57 degrees Fahrenheit) providing suitable spawning conditions.

Given the temperatures recorded and the life history phases using this 6th field sub-watershed, this indicator is PROPERLY FUNCTIONING.

Suspended Sediment – Intergravel DO/Turbidity:

No intergravel DO information is available, however turbidity information is available from the USGS gage near Bruckart Boat Ramp.

During the winter of calendar year 2005 there was a high water event that peaked on December 30 and 31. A second event occurred in 2006 on January 10 and 11. The following table displays peak turbidity measurements during the high water at two gages on the McKenzie River that are 14.9 miles apart. The gage near Vida, OR is an indicator of the influence of private land management, especially in Quartz Creek. During the high water events field investigations showed a stark difference in turbidity upstream and downstream of Quartz Creek. The gage above the South Fork near Rainbow, OR has private land influence, but since the land base upstream of this gage is predominantly National Forest System it is a reasonable indicator of conditions upstream.

Table 19. Turbidity measurements from USGS gages on the McKenzie River

Location of Gage	Date	Turbidity in FNU ^a	Discharge in cfs
McKenzie River above South Fork Near Rainbow, OR (River Mile 62.3)	12/30/2005	139.0	18,662
	12/31/2005	139.0	18,706
	01/10/2006	139.0	18,313
	01/11/2006	139.0	18,313
	02/01/2006	4.2	6,727
McKenzie River near Vida, OR (River Mile 47.4)	12/30/2005	332.0	21,769
	12/31/2005	236.0	21,809
	01/10/2006	169.0	20,745
	01/11/2006	332.0	21,373
	02/01/2006	329.0	12,204

^a An FNU is a Formazin Nephelometric Unit. It is a measure of turbidity commonly used in Europe and is similar to Nephelometric Turbidity Unit (NTU). The difference is based on the wavelength used to make

the measurement. NTUs are measured with a white light, while FNUs are measured with an infrared light. Due to the fact that suspended particles scatter light of different wavelengths with varying efficiency, FNU data often are not directly comparable to NTU data.

These turbidity events were relatively high for the McKenzie River hydrologic regime. The readings at the two gages show high turbidity that occurred during a storm, but the high turbidity on February 1 was from a slide on private land in the Quartz Creek watershed downstream of National Forest System lands. This information is only used for comparison to turbidity conditions on the same day at the upstream gage that is a reasonable indicator for conditions in the McKenzie River/Elk Creek 6th field sub-watershed.

Baseline Condition: Relative to measurements downstream of National Forest System lands, turbidity in the McKenzie River/Elk Creek 6th field sub-watershed is considered “moderate.” On the high water event on 12/30/2005 the upper gage was 193 FNUs lower than the lower gage that is approximately 9 river miles downstream of National Forest System lands. The FNU graphs show that the high water events caused a spike in turbidity, but they also show that during the spawning and incubation season in the McKenzie River/Elk Creek 6th field turbidity conditions were low to moderate. This indicator is FUNCTIONING AT RISK.

Chemical contamination/Nutrients:

The McKenzie River is not listed as 303d for chemicals. There are no agricultural, industrial, or other sources of chemical contamination. It is likely that hydrocarbons on Highway 126 get washed into the river during rain events. This 6th field does however have a number of private residences, and mixed ownerships. It is unknown if, or at what level, chemicals from private residences, the town of Blue River, and private timberlands are entering the McKenzie River in this 6th field sub-watershed.

Baseline Condition: Since there is no indication of chemical contamination in this 6th field, this indicator is PROPERLY FUNCTIONING.

HABITAT ACCESS

Physical Barriers:

There are no physical barriers to either upstream or downstream migration in the 6th field sub-watershed. Major streams entering the mainstem McKenzie River in this sub-watershed either have bridges or culverts that do not prevent passage.

Baseline Condition: Given the absence of human caused barriers to bull trout and spring Chinook salmon in this 6th field sub-watershed, this indicator is PROPERLY FUNCTIONING.

HABITAT ELEMENT

Substrate Character and Embeddedness:

Development along the terraces and flood plains of the McKenzie River, especially early road construction and road maintenance activities, has locally resulted in increased bank erosion and the introduction of sediment into the river system. Volumetrically, it is unlikely that this amount of sediment has had a serious, long-term negative impact on channel processes (Quartz Creek and Minor Tributaries Watershed Analysis 1998).

The two major river systems that enter into the McKenzie River/Elk Creek 6th field sub-watershed are Blue River and South Fork McKenzie River. They are each independent 5th field watersheds, and both have Army Corps of Engineers flood control dams (Blue River dam at about river mile 1.5; and Cougar Dam at about river 4.5). Each of these dams traps tens of thousands of cubic yards of sediment.

Baseline Condition: The specific measurement has not been taken throughout the mainstem river in this 6th field sub-watershed. Visually it appears that cobble and gravel dominate the channel in this 6th field, and bedload material is well sorted.
FUNCTIONING AT RISK.

Large Woody Material:

In this 6th field watershed, two inventories have been conducted to count wood in the McKenzie River. One was done in 1997 to evaluate large wood associated with the “Mile Post 44 Logjam” and the other was done in 1999 (Bennett) that covered areas in the 6th field not evaluated by the 1997 effort.

The 1997 evaluation looked at wood in the river from the confluence with the South Fork McKenzie River upstream to Belknap Bridge (upstream of Dearborn Island). This evaluation reach is approximately 4 river miles in length. The following table provides counts of woody material in the reach.

Table 20. Woody Material in the area of the MP 44 Logjam

Location	Pieces of large woody material (>10' long, 12" diameter)	Key Pieces of large woody material (>30' long, 20" diameter)
Associated With Mile Post 44 Logjam	151 ^a	66
River Meander Near Mile Post 44 Logjam	57	24
Remainder of Study Reach	26	14
Total	234^a	104

^a Count of woody material associated with the Mile Post 44 jam was a significant underestimate due to an abundance of pieces deep within the jam which could not be enumerated.

In addition to the wood counted in the Mile Post 44 Logjam study (1997), the following wood was counted in 1999 by a contractor (Bennett) in areas of the 6th field that were not covered in the 1997 inventory.

Table 21. Woody material inventory conducted by Bennett (1999)

Size of Woody Material	Pieces
Small (25' x 12")	59
Medium (50' x 24")	10
Large (50' x 36")	0

Twenty-six pieces of woody material in the jam area were measured to be over 100' long and six were more than 150' long. The largest piece of woody material in the study area was 182' long with bark and root wad still attached. Since the time of the study in 1997, at least 5 more pieces had entered the MP 44 Log Jam area. However, during the high water events of December 2005 and January 2006 dynamic changes took place at the log jam. Woody material was transported downstream and much of it can be found at the heads of islands in this 6th field. Large trees with partial crowns and with root wads attached were also deposited in the log jam area. Channel shifts took place and gravels and cobbles were mobilized, transported, and deposited into new areas. This specific segment of the McKenzie River where the log jam occurs is the most dynamic and complex of the "upper river" (upstream of Vida, OR).

An updated inventory has not been accomplished since the changes, the jam area and the 6th field remains rich with woody material. The deposits at the heads of islands will provide for long-term maintenance of off channel habitats, and provide cover during future high water events. The log jam area remains a complex network of rearing, spawning and migratory channels for spring Chinook salmon.

Baseline Condition: Given the amount of woody material inventoried, this indicator is PROPERLY FUNCTIONING.

Pool Frequency and Quality:

The McKenzie River varies in width in the 6th field sub-watershed. It is over 40 feet throughout the sub-watershed and over 65 feet in other portions. In the "South Fork to Finn Rock" reach there are approximately 2.5 large pool per mile in a segment where the river is over 65 feet wide.

The following table is from Minear (1994) and shows changes in large pools in two reaches of her study. Minear (1994) looked at changes between 1938 and 1991 using aerial photos. A large pool was defined as a pool with a minimum depth of 2 meters and an area of at least 40 square meters.

Table 22. Changes in Large Pools

Reach	1938 Number of Pools	1991 Number of Pools	Percent Change
Rainbow to South Fork Junction	22	6	-73%
South Fork to Finn Rock	21	13	-38%

The McKenzie River/Elk Creek 6th field sub-watershed has had private land development, the town of Blue River is partially in the 6th field, and Highway 126 or McKenzie River Drive are adjacent to the river almost along the entire length in this 6th field. The presence of these paved roads prevents full riparian development on the north side of the river, and constrains the river. These conditions are not conducive to the promotion of large pools in a river channel.

Baseline Condition: There have been dynamic changes to the river since the 1991 aerial photograph series (e.g. the 1996 floods, and smaller events). However, a similar exercise to inventory pools with aerial photos has not taken place, nor has a ground inventory of pools. Given the reductions in large pool habitat found by Minear (1994), the low number of large pools that are found in the 6th field, and the chronic effect of paved roads adjacent to the river throughout much of the 6th field sub-watershed, this indicator is NOT PROPERLY FUNCTIONING.

Off Channel Habitat:

The following table displays the changes in side channel numbers and length found by Minear (1994) using aerial photos in the 6th field subwatershed.

Table 23. Changes in side channel numbers and length found by Minear (1994) using aerial photos

Reach	Number of Side Channels 1945/49	Number of Side Channels 1986	Side Channel Length (m) 1945/49	Side Channel Length (m) 1986
Rainbow to South Fork Junction	21	7	6,027	973
South Fork to Finn Rock	7	9	5,957	3,077

The Mile Post 44 Log Jam is located at the lower end of the “Rainbow to South Fork Junction” reach and has undergone dynamic changes since the 1986 photo time series, as has the “South Fork to Finn Rock” reach. The large woody material deposits at the heads of islands will provide for long-term maintenance of off channel habitats, and provide cover during future high water events. The log jam area remains a complex network of rearing, spawning and migratory channels for spring Chinook salmon.

Baseline Condition: Channel complexity is high in this section of the “upper river” (i.e. upstream of Vida, OR). This can be attributed to geomorphic conditions and geographic location. The lower boundary of this 6th field sub-watershed is near the lower terminus of Pleistocene glacial advance (Upper McKenzie River Watershed Analysis 1995). Downstream of this 6th field the McKenzie River channel is influenced by the Western Cascade geology and naturally becomes more constrained relative to the glacial-valley segment of the McKenzie River/Elk Creek 6th field sub-watershed. The reach of river from the South Fork to Finn Rock is geomorphically set up to have high channel complexity. However, due to the presence of Highway 126 and McKenzie River Drive the channel is constrained on the north side and inhibits lateral scour. This indicator is FUNCTIONING AT RISK.

Refugia:

The McKenzie River has habitats capable of supporting strong and significant populations. However, many human activities take place in the upper watershed and that is especially true in the McKenzie River/Elk Creek 6th field sub-watershed. The presence of Highway 126 and McKenzie River Drive (both paved roads) adjacent to the river, mixed ownership, numerous private residences within the river valley and some directly adjacent to the river, and recreational boating. This 6th field does not function as a “refugia” and is therefore NOT PROPERLY FUNCTIONING.

CHANNEL CONDITIONS AND DYNAMICS

Width to Depth Ratio:

Width to depth ratios have not been physically collected in the main stem McKenzie River. The following is an estimate of bankfull width (using a range finder), and a visual estimate of bankfull depth. The McKenzie River/Elk Creek 6th field sub-watershed is in a segment of the McKenzie River where two large flood control dams impact the sediment and flow regime.

Table 24. Estimated width to depth ratio at Bruckart boat launch

Site description	Bankfull width	Bankfull depth	Bankfull width/depth
Current Bruckart boat launch site	160	7	22

Baseline Condition: An estimate of the bankfull width to depth ratio is greater than both criteria in the matrix of indicators (20 for bull trout; 12 for spring Chinook salmon). This indicator is NOT PROPERLY FUNCTIONING.

Streambank Conditions:

Streambank conditions in the 6th field in general are good. However, some of the banks along the McKenzie River in the 6th field have been reinforced with rip-rap (e.g. at the

head of Dearborn Island). Development along the terraces and flood plains of the McKenzie River, especially early road construction and road maintenance activities, has locally resulted in increased bank erosion and the introduction of sediment into the river system. Volumetrically, it is unlikely that this amount of sediment has had a serious, long-term negative impact on channel processes (Quartz Creek and Minor Tributaries Watershed Analysis 1998).

Baseline Condition: Streambank conditions in the 6th field in general are good. However, due to the presence of paved roads that have required rip-rap in places, and the presence of some private residences along the river that have placed rip-rap along the bank, this indicator is FUNCTIONING AT RISK.

Floodplain Connectivity:

Floodplain connectivity is a concern in this 6th field sub-watershed due to the presence of flood control dams (Cougar and Blue River) in tributary 5th field watersheds. These dams do not allow peak flows to inundate the floodplains in a similar spatial and temporal frequency as compared to historic conditions. In addition there are areas of rip-rap along the river bank that do not allow lateral scour to occur.

Baseline Condition: Given the presence of flood control dams in tributary 5th field watersheds and changes to natural bank conditions, this indicator is NOT PROPERLY FUNCTIONING.

FLOW/HYDROLOGY

Changes in Peak/Base Flows:

Upstream of the McKenzie River/Elk Creek 6th field sub-watershed the flow regime is not impacted by flood control dams, so the hydrologic regime that flows into this 6th field is “natural” for the most part. However, there are two tributary 5th field watersheds (South Fork and Blue River) that enter this 6th field that have significantly affected the hydrograph as compared to historic conditions.

Baseline Condition: Due to the presence of two flood control dams, the peak and base flows in this 6th field sub-watershed are not characteristic of historic conditions. Therefore, this Indicator is NOT PROPERLY FUNCTIONING.

Increases in Drainage Network:

There is significant mixed ownership in this 6th field. There is a State highway (Hwy 126), there are municipal roads (town of Blue River), private timber company roads, other private land holder roads, and Forest Service roads.

Many roads in the 6th field are paved roads administered by the State of Oregon or the Forest Service and are in good shape. However, Highway 126 and McKenzie River Drive have a significant impact on the river due to their location.

Baseline Condition: NOT PROPERLY FUNCTIONING

WATERSHED CONDITION

Road Density and Location (Figure 16):

There is significant mixed ownership in this 6th field. There is a State highway (Hwy 126), there are municipal roads (town of Blue River), private timber company roads, other private land holder roads, and Forest Service roads.

Many roads in the 6th field are paved roads administered by the State of Oregon or the Forest Service and are in good shape. However, Highway 126 and McKenzie River Drive have a significant impact on the river due to their location.

The following table displays existing road densities for all roads in the 5th field watershed (McKenzie River/Quartz Creek). These figures represent data on National Forest System lands (i.e. private land is not in the road density calculation).

Table 25. Existing Road Densities in the McKenzie River / Quartz Creek 5th field HUC

Location	Density Forest Service
McKenzie River/ Quartz Creek 5 th Field Watershed	2.8

Baseline Condition: The density ratio of 2.8 is considered Not Properly Functioning for bull trout and Functioning at Risk for Chinook salmon. However, the data used in this analysis only include Forest Service roads and lands. Private timber lands in Quartz Creek do not have the rigorous requirements of the Northwest Forest Plan, and harvest activities are substantial. When taking into account the watershed impacts caused by private timber harvest, this indicator is considered NOT PROPERLY FUNCTIONING at the 5th field watershed level.

Disturbance History:

This 5th field watershed (McKenzie River/Quartz Creek - 1709000405) has a history of significant human caused disturbance.

Timber harvest by private companies has been extensive in the past and continues to the present. The Forest Service has acquired lands along the river terraces that was clear cut using ground based yarding methods. These lands were cut 50 to 60 years ago and many of the old roads are in disrepair. The Forest Service has also extensively managed portions of the river terraces in the past (Mill Creek area). Those stands are currently 30

to 50 years old and densely stocked. In the Quartz Creek portion of the 5th field watershed extensive clear cutting continues by a private timber company.

Oregon State Highway 126 and other roads have had adverse impacts on the watershed by constraining the river, permanently removing riparian areas, and providing an avenue for chemical spills.

Baseline Condition: Given the human caused disturbance that has occurred in the past, and continues in the present, this indicator is NOT PROPERLY FUNCTIONING.

Riparian Reserves:

There are approximately 4,561 acres of Riparian Reserve on National Forest System lands in the 5th field watershed (see Figure 17). Development along the terraces and flood plains of the McKenzie River, especially early road construction and road maintenance activities, has locally resulted in increased bank erosion and the introduction of sediment into the river system. Volumetrically, it is unlikely that this amount of sediment has had a serious, long-term negative impact on channel processes (Quartz Creek and Minor Tributaries Watershed Analysis 1998).

Many of the Riparian Reserves in the 5th field either have had some form of timber harvest, or there is a residence, or a road (paved or gravel). The Riparian Reserve on the north side of the river is a paved highway, but there are some small pockets of mature/old growth forest. The south side, in general, has a more mature forest. The Elk Creek/Cone Creek system has had relatively little disturbance and is part of a Late Successional Reserve.

Baseline Condition: Due to the presence of Highway 126, McKenzie River Drive, and the amount of residential development along the river in the McKenzie River/Elk Creek 6th field sub-watershed, and the substantial amount of timber harvest in the Quartz Creek 6th field sub-watershed, this indicator is NOT PROPERLY FUNCTIONING.

Disturbance Regime:

There has been significant human disturbance in this 5th field in the form of road building, timber harvest, private land development, and flood control dams in tributary 5th field watersheds that significantly impact the disturbance regime of the McKenzie River/Elk Creek 6th field sub-watershed.

Baseline Condition: The extent of human induced disturbance, and interruption of disturbance (i.e. flood control dams) have created conditions in the 5th field watershed that are NOT PROPERLY FUNCTIONING.

INTEGRATION OF SPECIES AND HABITAT CONDITIONS (Bull Trout Only)

Bull trout use this 6th field as a foraging area for sub-adults and adults. Adult bull trout also use this 6th field as a migratory corridor upstream to the spawning tributaries of Olallie and Anderson Creeks.

Despite the high amount of human influence in the McKenzie River/Elk Creek 6th field sub-watershed, the river still provides good water temperatures and complex habitat for bull trout. This section of the McKenzie River contains the most complex habitat in the upper river due to the presence of the Mile Post 44 logjam. However, it can only be considered to be functioning at risk due to the human impacts.

Flood control dams have significantly altered the disturbance regime; river banks and terraces have had significant development; and Highway 126 and McKenzie River Drive directly impact the river throughout much of the 6th field. These are chronic cumulative effects that will continue to impact the river into the foreseeable future.

Baseline Condition: FUNCTIONING AT RISK

Bull Trout Critical Habitat

Federally managed land covered by the Northwest Forest Plan are exempted from Critical Habitat designation for bull trout (Federal Register – Final Rule 6 October 2004). This project and the downstream effects due to implementation will only affect Federally managed lands, therefore there will be no effect to bull trout critical habitat.

Table 26. Distance to closest bull trout critical habitat downstream of launch sites

Boat launch site	Closest designated bull trout critical habitat downstream of launch sites
Frissell	Approximately 1 river mile downstream to Belknap Springs property boundary.
Paradise	Approximately 1 river mile downstream to private timber lands boundary.
Bruckart	Approximately 1500 feet downstream from existing Bruckart boat launch, and approximately 500 feet downstream from new site.

Since bull trout critical habitat will not be affected, Primary Constituent Elements for bull trout critical habitat are not evaluated for this project.

Critical Habitat spring Chinook salmon

Environmental Baseline Condition, Critical Habitat PCEs

Critical Habitat has been designated for Upper Willamette River Chinook salmon. This designation for chinook salmon includes the reach of the McKenzie River flowing through the Action Areas. NMFS has determined that there are six primary constituent elements (PCEs) essential for the conservation of chinook salmon. These are sites and habitat components that support one or more life stages, including:

- 1) Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development;
- 2) Freshwater rearing sites with:
 - (i) Water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility;
 - (ii) Water quality and forage supporting juvenile development; and
 - (iii) Natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.
- 3) Freshwater migration corridors free of obstruction and excessive predation with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival;
- 4) Estuarine areas free of obstruction and excessive predation with:
 - (i) Water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and saltwater;
 - (ii) Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels; and
 - (iii) Juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation.
- 5) Nearshore marine areas free of obstruction and excessive predation with:
 - (i) Water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and
 - (ii) Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels.
- 6) Offshore marine areas with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation.

Only PCEs 1-3 are found within the 6th field subwatersheds. The baseline condition of these PCEs is described below:

Freshwater Spawning Sites: Baseline Condition

The McKenzie River in the project area provides favorable spawning sites for spring Chinook salmon. The Oregon Department of Fish and Wildlife has conducted aerial redd surveys along the McKenzie River. They found that the highest concentrations occurred from Trail Bridge dam downstream to the McKenzie River Trailhead. From the trailhead down to the confluence with Horse Creek spawning concentrations were considered “light.” And finally, from Horse Creek downstream to Finn Rock bridge spawning was “moderate.”

The river reach between Trail Bridge Dam and Deer Creek is sediment supply limited, with a coarse armored bed. Very little suitable size spawning gravel can be found in this reach. This is a natural condition given the geology, but Trail Bridge and Smith Dams upstream of this reach capture all the sediment from the upper watershed. For example, before the dams were constructed it is estimated that the reach immediately below Trail Bridge Dam had a sediment yield of 1,230 t y⁻¹ (metric tons per year). Under current conditions it is estimated that this reach has a sediment yield of 40 t y⁻¹ (Stillwater Sciences 2006d and 2006g). Consequently this reach has very little available spawning habitat. The Eugene Water & Electric Board did build the Carmen Smith Spawning Channel in 1961 and this spawning channel provides the best “gravel patch” in the reach between Trail Bridge Dam and Deer Creek. In 2004, 70 spring Chinook redds were constructed in the spawning channel, and the number of Chinook salmon produced was estimated at 98,400 (Stillwater Sciences 2006c).

Downstream of Deer Creek suitable spawning gravels begin to make up more of the particle facies in substrate samples due to the influence of tributary Western Cascade (geology) streams.

Temperatures in the project area are favorable for spring Chinook spawning. In some streams dominated by Western Cascades Geology (Deer Creek, Frissell Creek) stream temperatures are warm. In High Cascades areas (the mainstem river from Trail Bridge Dam to Lost Creek) stream temperatures are cold. In areas of high Chinook spawning concentrations stream temperatures are excellent for spawning, and incubation/larval development (see Tables 27 and 28 below).

Freshwater Rearing Sites: Baseline Condition

Cover in the upper river in the form of interstitial spaces in the substrate, undercut banks, and overhanging vegetation are abundant. Large pools are rare which is a natural condition in High Cascades Geology, however the presence of Highway 126 provides further constraint on the channel and has permanently removed sources of large woody material.

Downstream of Belknap Springs as the river makes its bend westward, it becomes less constrained as it flows through a glacial valley. More physical features in the channel (i.e. islands) can be found with an associated increase in channel complexity and log jams. This reach provides abundant rearing habitat for juvenile spring Chinook salmon.

Minear (1994) found a significant reduction in the number of pools between Horse Creek and Finn Rock (near Quartz Creek) by comparing changes in aerial photos thru a number or time series. Adjacent to this segment of river are McKenzie River Drive and Oregon State Highway 126. In some sections these paved roads are directly adjacent to the McKenzie River and this has impacted important source areas of large wood. This segment of the river still provides important rearing areas due to the number of side channels.

The Mile Post 44 Log Jam is located in the McKenzie River/Elk Creek 6th field sub-watershed. The log jam area is a complex network of rearing, spawning and migratory channels for spring Chinook salmon. The large woody material deposits at the heads of islands in this 6th field sub-watershed will provide for long-term maintenance of off channel habitats, and provide cover during future high water events.

Temperatures are favorable for rearing in the McKenzie River. The following table provides the seven day average maximum for various streams within the Upper McKenzie River 5th field HUC. This data was collected by the Forest Service.

Table 27. 7-day average maximum for various streams within the Upper McKenzie River 5th field HUC

Stream Name	Geographic Description of Sensor Location	Geologic Province	7-Day Average Maximum in Degrees Celsius	Date of Maximum Temperature
Anderson Creek (Boulder Cr / Frissell Cr 6 th)	At Highway 126	New High Cascades	6.6	September 14
Boulder Creek (Boulder Cr / Frissell Cr 6 th)	Near Mouth	Old High ^a Cascades	13.1	August 8
McKenzie River (Boulder Cr / Frissell Cr 6 th)	Below Trail Bridge Dam	Primarily High Cascades at this point, but influenced by Smith River watershed and Trail Bridge Reservoir upstream	10.6	August 4
McKenzie River (McKenzie Bridge 6 th)	Near Ranger Station	McKenzie ^b River Glacial Valley	12.2	August 9
Olallie Creek (Boulder Cr / Frissell Cr 6 th)	At Highway 126	New High Cascades	5.5	July 10
Scott Creek (Boulder Cr / Frissell Cr 6 th)	Near Mouth	Old High Cascades	12.2	August 10

^a The term Old High Cascades is used only to describe how Scott Creek and Boulder Creek cut through Pleistocene glacial deposits and “New” High Cascade lavas in their headwater areas, but further

downstream incise underlying older High Cascades lava that have been subjected to fluvial processes for a longer period of time and McKenzie River glacial deposits.

^b The term “McKenzie River Glacial Valley” is used at this site since because the river is in a glacial valley confined by two east-west trending ridges, but is not a recognized province name.

Table 28. Data from USGS Gage near Bruckart Boat Ramp in 2005

Date of 7-Day Average Maximum	Temperature in Degrees Celsius
July 20	13.7
August 8, 9, 10, and 11	13.5
September 1	12.2
September 30 ^a	9.8

^a The 7-day avg max for the month of September was on the 1st. The September 30 7-day avg max is provided to show the decreasing trend in temperature during the month of September.

Stillwater Sciences (2006h) conducted benthic macroinvertebrate surveys as part of a hydropower licensing project for the Eugene Water & Electric Board. The samples discussed for the boat launch project are the only samples that occurred within a project sub-watershed (Frissell Creek/Boulder Creek 6th field).

To provide an integrated assessment of the combined effects of potential stressors on the aquatic ecosystem, multi-metric scores were calculated based on invertebrate assemblage metrics. Both the ODEQ Level III metric and Karr’s Benthic Index of Biotic Integrity (BIBI) were developed with a wider geographic coverage and an emphasis on human-related impacts (e.g., sediment loading, organic enrichment, temperature, DO, etc.). In addition to the ODEQ and BIBI scores discussed above, the ABA Assessment Score was calculated based on an assessment developed by Aquatic Biology Associates, Inc. The ABA Assessment Score was developed to encompass a larger number of taxa and metrics than the ODEQ or BIBI metrics and includes taxa specific to the mountain streams of western Oregon and Washington (Stillwater Sciences 2006h).

The values for the ABA Assessment Score ranged more widely than the ODEQ or BIBI metrics, but also corresponded to moderate to high biotic integrity. Although the multi-metrics are not statistically independent because they are calculated from a single collection of organisms, they provide an integrative approach for measuring ecological conditions and are less susceptible to the variability frequently associated with individual metrics. That is, if multiple metrics from a given sample indicate a similar level of habitat integrity or water quality, the conclusions can be considered more reliable than if the metrics indicate inconsistent results.

The following table shows multi-metric scores calculated for the McKenzie River samples collected in 2004 (Stillwater Sciences 2006h). The second table shows multi-metric scores with respect to biotic integrity categories (Stillwater Sciences 2006h).

Table 29. Multi-metric scores for samples collected in 2004 (Stillwater Sciences 2006h)

Site description	ODEQ Level III Assessment score	Karr's BIBI score	ABA Assessment score
McKenzie River downstream of Trail Bridge Reservoir	48	42	69.4
McKenzie River downstream Olallie Creek	48	42	76.6
McKenzie River upstream of the confluence with Deer Creek	46	42	71.8

Table 30. Multi-metric scores and biotic integrity categories (Stillwater Sciences 2006h)

Biotic habitat integrity	ODEQ Level III score	Karr's BIBI score	ABA Assessment score
Very High	> 39	> 40	90-100
High			80-89
Moderate	30-39	25-39	60-79
Low	20-29	0-24	40-59
Severe habitat and/or water quality limitations	< 20		< 40

Samples collected for this study scored within a relatively narrow and high range that indicates biological conditions are among the highest found within the region. Overall, site scores indicate little or no impairment at sites within the Study Area. Although not truly independent measures, all three multi-metrics were similar and suggest relatively high biological condition for all sites surveyed within Frissell Creek/Boulder Creek 6th field sub-watershed (Stillwater Sciences 2006h).

Freshwater Migration Corridors: Baseline Condition

Within the project area there are no barriers to spring Chinook migration. However, Trail Bridge Dam upstream of Frissell Boat Launch is a complete barrier to further upstream migration. The McKenzie River in the project area provides suitable stream temperatures for both adult and juvenile migration. Stream flows in Western Cascades are flashy and have low base flows in the late summer and early fall (spawning season). However, the spring fed streams from the High Cascades provide a relatively high discharge in the summer and buffers the effects of the Western Cascades low base flows.

EFFECTS OF THE PROPOSED ACTION

A. Introduction

The effects to baseline habitat indicators were assessed for both of the project elements:

- 1) New boat launch construction on the river bed, river bank, and river terrace,
- 2) Decommissioning of old boat launch sites at Frissell and Bruckart.

The potential effects (negative, positive, or neutral) that the implementation of each project element may have on each indicator or group of indicators was assessed, where applicable, using the AP factors as defined below:

Proximity ~ The geographic relationship between the project element or action and the species/designated critical habitat.

Probability ~ The likelihood that the species or habitat will be exposed to the biotic or abiotic effects of the project element or action to the indicator.

Magnitude ~ The severity and intensity of the effect.

Distribution ~ The geographic area in which the disturbance would occur (may be several small effects or one large effect).

Frequency ~ How often the effect would occur.

Duration ~ How long the effect would last. Potential categories include (a) short-term event whose effects subside immediately (pulse effect); (b) sustained, long-term effect, or chronic effect whose effects persist (press effect); and (c) permanent event that sets a new threshold for a species' environment (threshold effect).

Timing ~ When the effect would occur in relation to the species' life-history patterns.

Nature ~ Effects of the action on elements of a species' life cycle, population size or variability, or distribution; or on the primary constituent elements of critical habitat, including direct and indirect effects.

As the AP directs, the Proximity, Probability, and Magnitude factors are to be considered first. If either of the following conclusions are made, no further analysis of the PE for that indicator is needed:

- 1) There is no probability or there is a discountable (extremely unlikely to occur) probability of the impact occurring; and/or
- 2) The magnitude of the effect is insignificant (not able to be meaningfully measured, detected, or evaluated) or non-existent.

Project Effects to Habitat Indicators

The potential effects that the implementation of this project may have on each indicator (or group of indicators) is described in the following narrative. This discussion is conducted for each project element (or group of elements) and then a summary of the effects is provided for the indicator.

The following Indicator will not be discussed or carried through the factor analysis of Project Elements because: (1) they cannot affect an Indicator because there is no causal mechanism; or (2) they are duplicative or are better described under a different Indicator.

- **Physical Barriers:** This project has no causal mechanism to affect this indicator. New instream structures will not be barriers to ESA-listed fish. New road construction would not cross any streams.

TEMPERATURE	Baseline Condition	
	Boulder Cr / Frissell Cr and McKenzie Bridge 6 th Field Sub-watersheds (040106 and 040109, respectively)	McKenzie River / Elk Creek 6 th Field Sub-watershed (040502)
	PF	PF

Project Element 1: New boat launch construction on the river bed, river bank, and river terrace

Proximity: The boat launch project would have activities immediately adjacent to, and directly in, aquatic habitats that are occupied by ESA-listed fish species.

Probability: It is likely that ESA-listed fish species and their habitat will be affected by new boat launch construction. At the site scale, individual trees will need to be removed (relocated within the Riparian Reserve or used for fish habitat projects) to construct the new loop roads and launches. At Frissell Creek about 12 to 20 red alder would need to be removed from the bank to place the new ramp. At Paradise, no trees need to be removed at the launch site and the trees at the day use area are small hardwoods and Western hemlocks (4 to 6 inches in diameter). At Paradise a vegetative buffer (approximately 100 to 150 feet in width) of old growth will remain between the parking sites and the river. At Bruckart, none of the trees that would need to be removed are shade trees since the launch sites are on the north bank of the river.

Magnitude:

Frissell Boat Launch – The activities will take place on the southwestern terrace in a river bend. Individual trees removed at this site on the terrace will include Douglas-fir and western red cedar, and about a dozen red alder will need to be removed from the bank (approximately a 12-16 foot wide area where the ramp will be placed). Some of the

upland trees and all the red alder provide shade to the river. However, the removal of these trees is not expected to have an effect on stream temperatures for the following reasons. The majority of crowns on the large conifers will be maintained as the project will be designed to avoid as many big trees as possible. Spring-fed flows from ground water sources overwhelmingly dominate the river flow at this site in the summer and the removal of individual trees (approximately 12 to 20 red alder) will not be of the magnitude that the impacts could be measured at the site scale or the sub-watershed scale. Evidence for this rationale can be found in the temperature monitoring results for the McKenzie River upstream and downstream of the Deer Creek confluence. Deer Creek is contributing water that is 19.0° C to the McKenzie River (7-day average maximum in 2005). Monthly maximum 7-day average temperatures in the river above and below the Deer Creek confluence were 9.3° and 10.3° in 2004 (Stillwater Sciences 2006h). In 2005, temperature monitoring above and below recorded 9.3° and 10.1° (Stillwater Sciences 2006h). If a stream system the size of Deer Creek (23 mi² watershed) contributes warm 19.0° C water to the river, and can only have a 1° C impact on temperatures, it seems extremely unlikely that the removal of a dozen or so red alder and individual upland trees in a spring-fed dominated location could be measurable.

Paradise Boat Launch – The activities at Paradise will take place on the south river bank. The parking lot work in the day use area is far enough away from the river that trees removed will not impact shade conditions. At the ramp location and staging location no trees need to be removed.

Bruckart Boat Launch – The activities at Bruckart will take place on the north river bank. Therefore, no trees removed are shade trees and there would be no impact on stream temperatures at the site scale.

Element Summary: Due to the dominant influence of groundwater sources in the upper McKenzie River, and due to the limited amount of disturbance to shade trees, the effect of this project element on stream temperatures is **NEGATIVE**, but of **insignificant** magnitude and impossible to measure given the limited scope of the project.

Project Element 2: Decommissioning and rehabilitation of old boat launch sites

Since no decommissioning activities will take place at Paradise Boat Launch it is not discussed in “element 2” factor analysis.

Proximity: The boat launch project would have activities immediately adjacent to aquatic habitats that are occupied by ESA-listed fish species.

Probability: The probability that stream temperatures will be affected by decommissioning and rehabilitation activities at Frissell and Bruckart boat launches is highly unlikely. The rationale for this finding is as follows: the old launch sites at both Frissell and Bruckart are on the north bank of the river and any trees planted at these sites

to stabilize soils will not serve as shade trees. Therefore the potential effects to this indicator from rehabilitation activities, and in turn to listed fish and their habitat, is entirely discountable.

Element Summary: Decommissioning and rehabilitation activities at old boat launch sites will have a **NEUTRAL** effect on this Indicator. The rationale for this finding is as follows: the old launch sites at both Frissell and Bruckart are on the north bank of the river and any trees planted at these sites to stabilize soils will not serve as shade trees. This element does not have a causal mechanism to affect stream temperature, and the effect is neutral.

Indicator Summary

Project elements will have a **NEGATIVE** effect on this indicator due to the removal of shade trees at Frissell launch. However, the potential effects to stream temperatures and in turn to listed fish are of **insignificant** magnitude and impossible to measure given the limited scope of the project and the influence of spring-fed flows..

The only launch site that could have a direct impact on shade trees is Frissell. Impacts to trees at Paradise launch are far enough away from the river that shade will not be affected, and at Bruckart activities take place on the north bank of the river so none of the trees serve as shade trees.

The removal of shade trees at Frissell is expected to have **insignificant** effects on stream temperatures for the following reasons. The majority of crowns on the large conifers will be maintained as the project will be designed to avoid as many big trees as possible. Spring-fed flows from ground water sources overwhelmingly dominate the river flow at this site in the summer and the removal of individual trees (approximately 12 to 20 red alder) will not be of the magnitude that the impacts could be measured at the site scale or the sub-watershed scale. Evidence for this rationale can be found in the temperature monitoring results for the McKenzie River upstream and downstream of the Deer Creek confluence. Deer Creek is contributing water that is 19.0° C to the McKenzie River (7-day average maximum in 2005). Monthly maximum 7-day average temperatures in the river above and below the Deer Creek confluence were 9.3° and 10.3° in 2004 (Stillwater Sciences 2006h). In 2005, temperature monitoring above and below recorded 9.3° and 10.1° (Stillwater Sciences 2006h). If a stream system the size of Deer Creek (23 mi² watershed) contributes warm 19.0° C water to the river, and can only have a 1° C impact on temperatures, it is extremely unlikely that the removal of a dozen or so red alder and individual upland trees in a spring-fed dominated location could be measurable.

SUSPENDED SEDIMENT – INTERGRAVEL DO/TURBIDITY	Baseline Condition	
	Boulder Cr / Frissell Cr and McKenzie Bridge 6 th Field Sub-watersheds (040106 and 040109, respectively)	McKenzie River / Elk Creek 6 th Field Sub-watershed (040502)
SUBSTRATE CHARACTER AND EMBEDDEDNESS	PF	FAR
	FAR	FAR

Project Element 1: New boat launch construction on the river bed, river bank, and river terrace

Proximity: The boat launch project would have activities immediately adjacent to, and directly in, aquatic habitats that are occupied by ESA-listed fish species.

Probability: It is likely that adult and juvenile spring Chinook salmon; and adult, sub-adult, and juvenile bull trout will be exposed to short turbidity pulses during instream work. Therefore the potential effects of turbidity are not discountable.

It is impossible for any mobilized sediment from this project to reach bull trout spawning sites since all bull trout spawn well upstream from the boat launches. It is unlikely that these turbidity pulses will reach areas where spring Chinook spawn as all sites are well over 300 feet downstream of launch sites. All sediment mobilized would be sediment already existing in the river channel (i.e. no additional sources of sediment would be created with this project). Therefore the potential effects to substrate character and embeddedness to areas where listed fish spawn are expected to be insignificant. However, in the three locations where ramps would be placed the substrate character will change from a natural streambed (cobble and gravel) to a concrete substrate.

Magnitude: Ground disturbing construction on the terraces is not expected to deliver sediment to the river channel. Due to the flat nature of the terraces (see figures 11, 12, and 13), sediment delivery prevention measures (silt fencing, mulching and seeding exposed areas, etc.) are expected to be successful at trapping any mobilized soil. The subsoil of these terrace areas are comprised of glacial fluvial material and are very permeable and porous. Any over land flow directed at undisturbed sites will infiltrate the soil quickly. Therefore, no turbidity or sediment delivery effects are expected from new launch sites.

The following table summarizes the area potentially changed from natural river bottom to concrete.

Table 31. Area potentially changed from natural river bottom to concrete.

6 th Field Subwatershed	Site Name	Total Concrete Ramp in Bankfull Width in Square Feet ^b
Boulder Cr / Frissell Cr	Frissell	240
McKenzie Bridge	Paradise	480
McKenzie River / Elk Creek	Bruckart	240

At the Frissell launch site an annual average sediment yield of 26,200 t y⁻¹ (Stillwater Sciences 2006g) exists under current conditions and the project could potentially impact a site of 240 square feet. The amount of sediment that could be mobilized at the site level when viewed in the context of the annual average sediment yield appears to be insignificant from a habitat standpoint and this logic is true at all boat launch sites. Since spawning areas for spring Chinook salmon are greater than 300 feet downstream, there should be no change to substrate character or embeddedness values at those sites due to project implementation.

However, there will be a **measurable negative** effect to the substrate character at the site scale of each ramp. The substrate will be changed from a natural riverbed with gravel and cobbles to a concrete ramp. This change will reduce cover for spring Chinook salmon fry by the values shown in the table above. This would adversely affect both Critical Habitat and Essential Fish Habitat for spring Chinook salmon.

Pulses of turbidity could harass fish by displacing them for a short period of time to the opposite side of the river where no turbidity is expected. This would harass the fish and is considered “take.”

Distribution: These turbidity pulses would take place in three different 6th field subwatersheds across two 5th field watersheds. It is expected that visible turbidity will be detectable up to 100 feet downstream of the work site, but for the purposes of this biological assessment, it is determined that this turbidity plume may extend as far as 300 feet downstream from each instream work site in order to ensure incidental “take” is covered. In addition, the plume may extend approximately 65 feet out into the river (width).

Frequency: It is expected that the ground disturbing activities on the river terraces, banks, and bed will only take place once. The turbidity pulse from instream work would only occur while preparing the bank and bed for the boat ramp, and during placement. Once the ramp was keyed-in, the potential for turbidity would end. It is unlikely that all three ramps would be worked on during the same season due to funding considerations. Therefore, it is possible that one ramp per year could be worked on distributing the effects over three years at the site scale.

Duration: This would be a short term turbidity event whose effects would subside almost immediately (pulse effect). If there is a discernable increase in turbidity 100 feet downstream in excess of 30 minutes the contractor must cease operations and modify control measures. Given the size and discharge of the river it will be very difficult to isolate the ramp sites, and to do so would cause a significant and longer impact on the

river. The best approach would be to complete in-water work with all due diligence to minimize the turbidity effects. The Contractor will have to provide a plan to minimize turbidity impacts that the Forest Service approves. Fisheries and/or hydrology specialists will be at the work sites during in-water work to assist the Contracting Officer's Representative (COR) with enforcement of the measures approved in the plan.

The change from a natural river bed to a concrete ramp would be "permanent" at each of the three launch sites.

Timing: In-water and other work would occur during the required work periods for these sites (July 1 to August 15). Work on the terrace would occur during the summer (July to September).

Bull Trout: The closest suitable bull trout spawning habitat is in Olallie Creek which is approximately 6 river miles upstream of Frissell launch (the most upstream project site). Therefore, bull trout spawning habitat will not be affected by this project.

Bull trout spawning in the upper McKenzie River starts in mid-September and continues till the end of October. Upstream or downstream migrating adults, and rearing subadults, could be influenced by activities at the boat launch sites. The primary affect expected is displacement of fish to the unaffected side of the river due to the increased turbidity. The displacement is expected to last "hours" not "days." The only launch site that has the potential to affect juvenile bull trout is Frissell. Juveniles have been observed in the mainstem river as far downstream as Lost Creek (approximately 3 river miles downstream of Frissell launch, and approximately 1.5 miles upstream of Paradise launch).

Chinook Salmon: Based on spawning surveys in the Carmen Smith Spawning Channel, the peak of spawning activity is during the first half of October.

At Frissell, the closest known salmon spawning area is Blue Pool which is approximately ½ mile downstream and no effects are expected to reach this area. It is likely that adults will be migrating to holding pools during the instream work period. The river at Frissell is a rapid that salmon would have to move through quickly. By late September the majority of juvenile chinook should have migrated well downstream of Frissell.

At Paradise, the channel downstream of the ramp on river left is a rapid and is bordered by rip-rap along Paradise campground. This does not provide good spawning conditions for spring Chinook salmon. However, shallow margin habitat on river right (the inside of the river bend) could provide spawning sites, and side channels further downstream (about 1 river mile) are areas of known salmon spawning. Juvenile Chinook could be rearing in pocket pool habitat and in the same side channels where spawning takes place.

At Bruckart, the closest known salmon spawning habitat is about 1000 feet downstream of new ramp site. Juvenile chinook could also be rearing in pocket pool habitat in the channel.

Nature: Due to the "pulse effect" nature of activities on the terrace, bank, and bed, activities are not expected to have a long term effect on this Indicator. The turbidity pulses will be short lived, and should only affect one side of the river channel. At all

three launch sites the deeper (thalweg) side of the river is across from boat ramp activities. If fish are displaced due to turbidity effects, they would move to deeper water away from the work sites. This displacement could subject fish to predation since fish may have to leave good cover during daylight hours to find a different site to take cover.

Element Summary: Boat launch construction activities in the river bed and on the bank are expected to have a **measurable NEGATIVE** impact on this Indicator, primarily due to a change from a natural riverbed to a concrete substrate at the specific ramp locations. This would reduce cover for spring Chinook salmon fry that use the river margin for rearing habitat. In addition, short term increase in suspended sediment/turbidity would occur with this project and may displace migrating adult fish and juveniles. These effects will be of short duration (measured in hours, not days).

Project Element 2: Decommissioning and rehabilitation of old boat launch sites

Proximity: Decommissioning activities at the boat ramps will take place on areas directly adjacent to Highway 126 and the McKenzie River. These areas are compacted, lack vegetation, and the ramp approaches provide an avenue for direct surface runoff.

Probability: There is potential for juvenile spring Chinook salmon; and adult, sub-adult, and juvenile bull trout to be exposed to short turbidity pulses during the first winter after rehabilitation activities. It is unlikely that this will occur, but it is not entirely discountable. The source of this potential turbidity is the decommissioned ramp sites at Frissell and Bruckart (i.e. not from the terrace areas that are rehabilitated).

It is impossible for any mobilized sediment from this project to reach bull trout spawning sites since all bull trout spawn well upstream from the boat launches. It is unlikely that these turbidity pulses will reach areas where spring Chinook spawn as all sites are well over 300 feet downstream of launch sites. Therefore the potential effects to **substrate character and embeddedness** to areas where listed fish spawn **are insignificant**.

Since substrate character would improve at the rehabilitated boat launch sites due to the cessation of maintenance activities, and re-vegetation efforts. Due to the small site scale this action would produce an **insignificant positive** effect to this indicator.

Magnitude:

Frissell – An area of 2,670 feet is expected to be rehabilitated at the Frissell launch. The existing ramp is approximately 16 feet wide by 30 long. The existing buttress logs will be removed, and any loose soil we feel might enter the river will be removed and placed on the terrace where it can't reach the river. Some of this material may stay on the slope to provide for a seed bed. If any compacted areas on the slope need to be scarified, this would be accomplished with a hand rake just deep enough to provide for a seed bed. Re-vegetation of the slope will be accomplished by grass seeding the old ramp site with native grasses and red alder, planting vine maple trees, big leaf maple, and conifers (Douglas-fir or Western red cedar depending on what is available). The vegetation will

be monitored thru the seasons (for up to 2 years) and if the site requires additional seeding or tree planting due to mortality or for any other reason, it will take place during the appropriate planting season. Straw mulch will be placed on exposed surfaces to minimize soil erosion.

Surface runoff from the highway and terrace will be filtered through existing vegetation and directed away from the former ramp slope by the placement of a series of hummocks. The large pull out will be rehabilitated by importing topsoil and shaping it into hummocks. These hummocks will be seeded with native grass and will serve as a barrier between the highway and the river by acting as a soil filter and as a berm that diverts water into existing vegetation.

Bruckart – Similar rehabilitation techniques will take place at Bruckart. An estimated area of 10,000 square feet will be rehabilitated at Bruckart including a loop road that connects the launch site to Forest Road 19.

This will be accomplished by grass seeding the old ramp site with native grasses and red alder, planting vine maple, big leaf maple, and conifers (Douglas-fir or Western red cedar depending on what is available). The vegetation will be monitored thru the seasons (for up to 2 years) and if the site requires additional seeding or tree planting due to mortality or for any other reason, it will take place during the appropriate planting season. Straw mulch will be placed on exposed surfaces to minimize soil erosion. A windrow of soil (or a berm) would be located on the elevated terrace above the old ramp slope. This windrow would be grass seeded and would serve to ensure any surface runoff was directed to existing vegetation before reaching the river.

- Decommission an existing loop road that connects Bruckart landing to Forest Road 19 will be accomplished by scarifying the surface layer 2 to 4 inches in depth. The underlying subsoil is comprised of glacial-fluvial deposits that are very permeable and porous so no surface runoff is expected after scarification. Native grass seed will be applied to the scarified surface to prevent soil erosion and will be monitored for 2 years. If for any reason further seeding is required, it will take place during the appropriate planting season. The length of existing loop road that would be decommissioned is approximately 861 feet.
- Decommissioning and rehabilitation of existing sites that currently deliver sediment and surface runoff from Highway 126, will minimize these effects into the future from Frissell and Bruckart boat launches.

When viewed in the context of the underlying sediment regime in the McKenzie River, the magnitude of effects due to rehabilitating these two boat launch sites are **positive but insignificant**.

Element Summary: There is the potential for a short term **NEGATIVE** effect to this indicator due to decommissioning and rehabilitation activities, but this effect is considered **insignificant**. The potential for an effect would be possible during the first winter after rehabilitation as vegetation would be young, or still seed. Minimization measures (i.e. placing straw mulch on exposed sites, directing surface flow away from the

former ramp, scarification of compacted soils, seeding, and planting) will reduce short term potential effects that are considered negative.

Indicator(s) Summary

The project elements are expected to have **measurable NEGATIVE** effect to these indicators (see Table 31). The indicator for substrate character and embeddedness is not expected to have significant negative effects to areas where listed fish spawn. The indicator for turbidity is expected to have short term negative effects where listed fish rear or migrate.

The effects to turbidity from project element #1 would come in the form of a short term event whose effects would subside almost immediately (pulse effect). If there is a discernable increase in turbidity 100 feet downstream in excess of 30 minutes the contractor must cease operations and modify control measures. Given the size and discharge of the river it will be very difficult to isolate the ramp sites, and to do so would cause a significant and longer impact on the river. The best approach would be to complete in-water work with all due diligence to minimize the duration of turbidity effects. The Contractor will have to provide a plan to minimize turbidity impacts that the Forest Service approves. Fisheries and/or hydrology specialists will be at the work sites during in-water work to assist the Contracting Officer's Representative (COR) with enforcement of the measures approved in the plan.

Due to the "pulse effect" nature of activities on the terrace, bank, and bed, activities are not expected to have a significant effect on this Indicator. The turbidity pulses will be short lived, and should only affect one side of the river channel. At all three launch sites the deeper (thalweg) side of the river is across from boat ramp activities. If fish are displaced due to turbidity effects, they would move to deeper water away from the work sites. This displacement could subject fish to predation since fish may have to leave good cover during daylight hours to find a different site to take cover. The displacement is expected to last "hours" not "days."

CHEMICAL CONTAMINANTS / NUTRIENTS	Baseline Condition	
	Boulder Cr / Frissell Cr and McKenzie Bridge 6 th Field Sub-watersheds (040106 and 040109, respectively)	McKenzie River / Elk Creek 6 th Field Sub-watershed (040502)
	PF	PF

Project Element 1: New boat launch construction on the river bed, river bank, and river terrace

And

Project Element 2: Decommissioning and rehabilitation of old boat launch sites

There is no evidence that the McKenzie River is chemically contaminated, or suffers from eutrophic conditions.

Proximity: These project elements are in immediate proximity to LFH in the McKenzie River.

Probability: Machinery utilized for this project will be operating in close proximity to the McKenzie River. A fuel spill could occur, potentially contaminating the river. Project design measures will be in place to reduce the probability of a spill. These measures include:

- Two spill kits will be required at each work site.
- All equipment that will be used for instream work in the McKenzie River will be cleaned of grease, oil, and other solvents prior to use, and will be equipped with drip pans or diapers and water friendly fluid systems (i.e. non-petroleum based hydraulic fluids).
- Fuel storage will not be permitted within Riparian Reserves (within 320 feet of fish bearing streams). Fueling sites will be designated by the COR and will not be within 150 feet of water.
- At Frissell the designated fueling and storage site is 800 feet away from the river.
- At Paradise there is no good site for storage so it will not be allowed at the campground. However, if the contractor needs a site it would be the McKenzie Airfield (1500 feet away from the river). Fueling will be at the Highway 126 / Forest Road 2600-300 junction (approximately 1300 feet from river).
- At Bruckart the site would be an old road that is approximately 300 to 400 feet away from the river depending on which specific site on the road is selected.

These management practices will be effective at protecting the McKenzie River and preventing spill contamination. Past monitoring of similar instream and near stream projects have shown the rate of contamination to be very infrequent. Therefore, there will be a discountable probability that this project will have a negative effect on this indicator.

Indicator Summary

Project design measures and careful implementation will reduce the probability of this indicator being negatively affected to near zero. The negative effect is **discountable**.

LARGE WOODY DEBRIS	Baseline Condition	
	Boulder Cr / Frissell Cr and McKenzie Bridge 6 th Field Sub-watersheds (040106 and 040109, respectively)	McKenzie River / Elk Creek 6 th Field Sub-watershed (040502)
	FAR	PF

Project Element 1: New boat launch construction on the river bed, river bank, and river terrace

Proximity: Construction activities will occur in direct proximity to listed fish habitat.

Probability: The likelihood that listed fish and their habitat will be affected by the need to remove and relocate woody material for construction activities is high.

Magnitude:

Frissell - Construction of the new ramp site will require the removal of 12 to 20 red alder which will be spread out in the floodplain and/or Riparian Reserve. Removal and relocation of the alders should take no more than one working day.

Some large conifers (20 to 50 inches in diameter) may need to be felled and moved in order to construct launch facilities on the terrace. Our intent is to use as much currently disturbed area as possible given the existing web of native surface roads on the terrace to minimize the need to cut trees. It is unknown at this time how many trees will need to be cut, but those trees that are suitable for fish habitat work will be staged for future projects. Those trees not suitable for fish habitat work will be placed within the Riparian Reserve in appropriate areas. That is, where they will not interfere with the boat launch site or dispersed camp sites, and where it is practical to place them without too much additional disturbance by the equipment.

Paradise – No trees will be removed for the placement of a new boat ramp. Trees that need to be cut for the parking sites in the day use area are in a location where they can not contribute large woody material to the river. This is due to the presence of the parking lot for the day use area that lies in between the “new parking sites” and the river. New parking sites are approximately 150 feet from the river (it varies depending on which

site). In addition, these trees are shrubby hardwoods (e.g. vine maple), and small conifers (Western hemlock and Western red cedar).

A piece of woody material will need to be relocated that is within the bankfull width. It blocks a user access trail and is 22 feet in length by 19.5 inches in diameter. It will be moved upstream onto the cobble bar remaining within the bankfull channel.

Bruckart – Construction of the new boat ramp will require the removal of 12 to 20 red alder and about 6 small conifers (less than 6 inches in diameter) which will be spread out in the floodplain and/or Riparian Reserve.

- Some large conifers (20 to 50 inches in diameter) may need to be felled and moved in order to construct the new launch facilities on the terrace, but our intent is to design the loop road in a fashion that minimizes the need to cut large trees. It is unknown at this time how many trees will need to be cut, but those trees that are suitable for fish habitat work will be staged for future projects. Those trees not suitable for fish habitat work will be placed within the Riparian Reserve in appropriate areas. That is, where they will not interfere with the boat launch site, and where it is practical to place them without too much additional disturbance by the equipment.

The activities required to implement the project will have a **NEGATIVE** effect on the large wood indicator. However, for the following reasons this effect is considered to be **insignificant**:

- Those trees that are appropriate for fish habitat projects will be staged for use at a later date.
- Those trees that are not appropriate for fish habitat projects will be scattered in the floodplain (alders) or in the Riparian Reserve (conifers).
- The terrace areas where new boat launch construction would take place are on the inside bend of the river. That is, they are not on the erosive outside bend of the river. Due to this spatial location on the inside of the bend it is unlikely that these trees would be mobilized and be transported to the bankfull river channel during a flood.

Element Summary: Project element #1 could have a **NEGATIVE** effect on this indicator. These potential effects are considered **insignificant** given the rationale described above.

Project Element 2: Decommissioning and rehabilitation of old boat launch sites

Proximity: Decommissioning and rehabilitation activities would occur directly adjacent to habitat with listed fish present.

Probability: Rehabilitation activities would plant a small number of hardwoods and conifers. It is probable that these trees planted on the former ramp slope could one day be delivered to the river channel.

Magnitude: The alder seed and hardwoods that would be planted on the ramp slopes may one day become mature trees. However, alders are not as effective as conifers at interacting with river flows and sediment to create fish habitat. This is due to the ability of microbes to readily colonize them and begin the decomposition process. This characteristic does make alders important to river ecosystem as sources of allochthonous material needed to fuel the energy flow processes, but their role as habitat forming features in the channel is limited.

Approximately 5 conifers (Douglas-fir and/or Western red cedar) will be planted on each of the former ramp slopes and monitored for two years to ensure survival. The limited size of these ramps (around 15 wide by 30 feet long) will only provide enough space for one mature conifer (maybe two).

Hardwoods planted will eventually provide allochthonous material to the river ecosystem via their leaves and woody material. Conifers will eventually provide large wood to the river, but likely only 1 tree per 5th field. These beneficial effects would begin within the decade and continue into the future. However given the limited area that would be rehabilitated directly next to the river and the limited number of conifers planted, this project element would have an **insignificant POSITIVE** effect on the indicator.

Element Summary: Boat launch decommissioning and rehabilitation activities will have an **insignificant POSITIVE** effect on this indicator due to the limited space available for tree growth.

Indicator Summary

Boat launch construction and decommissioning activities will have an **insignificant NEGATIVE** effect on this indicator. The following rationale is provided for this finding:

- Those trees that are appropriate for fish habitat projects will be staged for use at a later date.
- Those trees that are not appropriate for fish habitat projects will be scattered in the floodplain (alders) or in the Riparian Reserve (conifers).
- The terrace areas where new boat launch construction would take place are on the inside bend of the river. That is, they are not on the erosive outside bend of the river. Due to this spatial location on the inside of the bend it is unlikely that these trees would be mobilized and be transported to the bankfull river channel during a flood.
- The limited area that would be rehabilitated directly next to the river and the limited number of conifers planted would have an insignificant positive effect on the indicator.

POOL FREQUENCY AND QUALITY LARGE POOLS.	Baseline Condition	
	Boulder Cr / Frissell Cr and McKenzie Bridge 6 th Field Sub-watersheds (040106 and 040109, respectively)	McKenzie River / Elk Creek 6 th Field Sub-watershed (040502)
	FAR	NPF

Project Element 1: New boat launch construction on the river bed, river bank, and river terrace

Proximity: There are no pools in direct proximity to new boat launch construction activities. The closest pool to any of the launch sites is “Blue Pool” which is approximately ½ mile downstream of Frissell. This is well downstream of the proposed action area, and no effects from this project element are expected to effect pool frequency or size.

Probability: It is extremely unlikely that construction activities would have an effect on pools in the McKenzie River. The closest large pool, Blue Pool, was formed due to the interaction of river flows and a bedrock control feature on the right bank (looking downstream). Changes to substrate character and embeddedness in spawning locations was found to be highly unlikely, and impacts to woody material were found to have an insignificant effect.

Element Summary: It is extremely unlikely that any project element effects could affect the bedrock adjacent to Blue Pool (about ½ mile downstream). Therefore, this project element would have a **NEUTRAL** effect on pool frequency and large pools.

Project Element 2: Decommissioning and rehabilitation of old boat launch sites

Proximity: There are no pools in direct proximity to decommissioning and rehabilitation activities. The closest pool to any of the launch sites is “Blue Pool” which is approximately ½ mile downstream of Frissell. This is well downstream of the proposed action area, and no effects from this project element are expected to effect pool frequency or size.

Probability: It is extremely unlikely that decommissioning and rehabilitation activities would have an effect on pools in the McKenzie River. The closest large pool, Blue Pool, was formed due to the interaction of river flows and a bedrock control feature on the right bank (looking downstream). Changes to substrate character and embeddedness in spawning locations were found to be highly unlikely, and impacts to woody material were found to have an insignificant effect.

Element Summary: It is extremely unlikely that any project element effects could affect the bedrock adjacent to Blue Pool (about ½ mile downstream). Therefore, this project element would have a **NEUTRAL** effect on pool frequency and large pools.

Indicator Summary

Project elements would have a **NEUTRAL** effect on pool frequency, quality, and size. The following rationale is provided for this finding:

- There are no large pools in any of the action areas.
- Changes to substrate character and embeddedness in spawning locations were found to be highly unlikely, and impacts to woody material were found to have an insignificant effect.
- Blue Pool, the largest pool near any of the project sites, was formed by the interaction of river flows, bedload, and a bedrock feature on river right. No project element effects are expected to travel as far downstream as Blue Pool (about ½ mile).
- Activities from both project elements are small in scope relative to the discharge and size of the McKenzie River. It is highly unlikely that any effects will realized in pools in the 6th field subwatersheds.

OFF-CHANNEL HABITAT	Baseline Condition	
	Boulder Cr / Frissell Cr and McKenzie Bridge 6 th Field Sub-watersheds (040106 and 040109, respectively)	McKenzie River / Elk Creek 6 th Field Sub-watershed (040502)
	FAR	FAR

Project Element 1: New boat launch construction on the river bed, river bank, and river terrace

And

Project Element 2: Decommissioning and rehabilitation of old boat launch sites

Proximity: Off channel habitat exists in all 6th field subwatersheds where project activities would take place. This is especially true for the McKenzie Bridge 6th field, and the McKenzie River / Elk Creek 6th field.

Probability: It is unlikely that project elements will affect off-channel habitat at the scale of the 6th field sub-watershed or the action area. This is due to the distance between project activities and downstream off channel habitat. Project implementation does not require working in off channel habitat, placing parking sites near them, or building access

roads across them. Neither project element, individually or collectively, would result in a loss of off channel habitat.

Element Summary: There is no causal mechanism to effect this indicator, and this project will therefore have a neutral effect on this indicator.

Indicator Summary

There is no causal mechanism to effect this indicator since no project work would occur in off channel habitat, and no facilities will be constructed near off channel habitat. Neither project element, individually or collectively, would result in a loss of off channel habitat. This project will therefore have a **NEUTRAL** effect on this indicator.

REFUGIA	Baseline Condition	
	Boulder Cr / Frissell Cr and McKenzie Bridge 6 th Field Sub-watersheds (040106 and 040109, respectively)	McKenzie River / Elk Creek 6 th Field Sub-watershed (040502)
	NPF	NPF

Project Element 1: New boat launch construction on the river bed, river bank, and river terrace

And

Project Element 2: Decommissioning and rehabilitation of old boat launch sites

Proximity: There is no refugia in direct proximity to the boat launch project areas. The best refugia in the McKenzie River 4th field sub-basin is Horse Creek. The majority of land in Horse Creek is in Wilderness designation.

Probability: The probability that the boat launch project will affect refugia in Horse Creek is extremely discountable.

Element Summary: It is extremely unlikely that the boat launch project could affect refugia characteristics in Horse Creek (the closest refugia). This is due to the fact that Horse Creek is a separate 5th field watershed and none of the project activities are tributary to Horse Creek. Therefore, the boat launch project will have a **NEUTRAL** effect on this indicator.

Indicator Summary

It is extremely unlikely that the boat launch project could affect refugia characteristics in Horse Creek (the closest refugia). This is due to the fact that Horse Creek is a separate 5th field watershed and none of the project activities are tributary to Horse Creek.

Therefore, the boat launch project will have a **NEUTRAL** effect on this indicator.

WIDTH TO DEPTH RATIOS	Baseline Condition	
	Boulder Cr / Frissell Cr and McKenzie Bridge 6 th Field Sub-watersheds (040106 and 040109, respectively)	McKenzie River / Elk Creek 6 th Field Sub-watershed (040502)
	NPF	NPF

Project Element 1: New boat launch construction on the river bed, river bank, and river terrace

And

Project Element 2: Decommissioning and rehabilitation of old boat launch sites

Proximity: The new concrete ramps will be in direct proximity to the river bed and bank.

Probability: Activities will affect the river banks, however it is highly unlikely that project activities will affect this indicator. The project elements would not cause the river to become shallow, or cause the channel to widen. This finding is based on observations at other boat launches in the upper McKenzie River where no apparent effects to width to depth ratios are discernable.

Indicator Summary

Project elements do not require river bed or banks to be altered in such a manner that width to depth ratios could be caused at the action area or sub-watershed level. There are no causal mechanisms that would affect the width to depth ratios of the McKenzie River channel. Therefore, these project elements would have a **NEUTRAL** effect on this indicator.

STREAMBANK CONDITION	Baseline Condition	
	Boulder Cr / Frissell Cr and McKenzie Bridge 6 th Field Sub-watersheds (040106 and 040109, respectively)	McKenzie River / Elk Creek 6 th Field Sub-watershed (040502)
	FAR	FAR

Project Element 1: New boat launch construction on the river bed, river bank, and river terrace

Proximity: The new concrete ramps will be in direct proximity to the river bed and bank.

Probability: Activities on the river bank will affect this indicator.

Magnitude: Changes would occur to the river bank due to the placement of a concrete ramp.

Table 32. Change from river band and bed to concrete boat ramp

6 th Field Subwatershed	Site Name	Area changed from river bank and bed to concrete boat ramp
Boulder Cr / Frissell Cr	Frissell	16' x 40' (640 ft ²)
McKenzie Bridge	Paradise	32' x 40' (1,280 ft ²)
McKenzie River / Elk Creek	Bruckart	16' x 40' (640 ft ²)

As described in the baseline condition discussion, in general, the McKenzie River in the 6th field subwatersheds where this project occurs have stable banks. This is due to the dominance of spring-fed water in the upper watershed. However due to Highway 126, rip-rap can be found on some banks and rip-rap has been placed adjacent to Paradise Campground.

Development along the terraces and flood plains of the McKenzie River, especially early road construction and road maintenance activities, has locally resulted in increased bank erosion and the introduction of sediment into the river system. Volumetrically, it is unlikely that this amount of sediment has had a serious, long-term negative impact on channel processes (Quartz Creek and Minor Tributaries Watershed Analysis 1998).

Project activities would move this indicator in the direction of further development on the river bank.

Distribution: See table above.

Frequency: The change from river bank to concrete boat ramp would only take place once.

Duration: Placement of the prefabricated concrete boat ramp would permanently change the condition of the river bank (see table 32 above).

Timing: The ramps would be placed during the instream work period (July 1 to August 15).

Nature: The limited scope of the project (see table 32 above) will limit the impact to listed fish and their habitat. Bull trout and spring Chinook do not spawn in the action areas of the different ramps, but do migrate thru them. The ramps will not impede migration of adults or any other life history stage.

The primary direct effect would be to spring Chinook fry by changing the condition of the habitat. The existing condition is a natural river bank and bed on the inside river bend. This provides lower velocity, shallow margin habitat where Chinook fry can take cover. The banks are stable and river bed substrates are comprised of cobble and small boulders that provide complex habitat small fish can use for cover. Concrete ramp will not significantly affect the flow regime along the river margin, but they will simplify the habitat (see table 32 above for area changed by placement of concrete boat ramps). This will reduce the amount of cover small fish could use in the river.

Element Summary: Although the area is limited in scope and distributed across three 6th field subwatersheds (see table above), the placement of prefabricated concrete boat ramps at the proposed locations will permanently change the river banks in those areas. This will have the direct effect of reducing cover for small fish due to the simplification of habitat. These effects move this indicator in a **measurable NEGATIVE** direction.

Project Element 2: Decommissioning and rehabilitation of old boat launch sites

Proximity: The decommissioned and rehabilitated river banks that currently serve as boat launches are in direct proximity to listed fish habitat.

Probability: Activities on the river bank will affect this indicator.

Magnitude:

Frissell – An area of river bank approximately 16 feet wide by 30 feet long (480 square feet) would be rehabilitated. This would be accomplished by removing structural elements followed by seeding and tree planting.

Bruckart – An area of river bank approximately 20 feet wide by 30 feet long (600 square feet) would be rehabilitated. This would be accomplished by removing structural elements followed by seeding and tree planting.

The area of river bank rehabilitated would improve the conditions over time. However, the area of rehabilitation relative to the amount of stream bank in the action areas and 6th field subwatersheds is insignificant. Therefore the magnitude of effect on stream banks would be **insignificant**.

Element Summary: The decommissioning and rehabilitation river banks that currently serve as boat launches would move this indicator in a **POSITIVE** direction. However, relative to the amount of stream banks in the 6th field subwatersheds the amount of area rehabilitated is **insignificant**. It would improve cover conditions for small fish, but these current ramps enter into the main river current (the thalweg). This high velocity margin habitat would not be preferred by small fish so improvements to that habitat will be limited.

Indicator Summary

Project Element #1 would have negative effects on this indicator, and Project Element #2 would have positive effects to this indicator. The life history stage of listed fish that will be affected is spring Chinook fry. The habitat that would be affected by element #1 is preferable as cover for small fish, whereas the habitat improved by element #2 is fast moving water where small fish would have difficulty taking cover. The proposed project would have an overall **measurable NEGATIVE** effect on this indicator.

FLOODPLAIN CONNECTIVITY	Baseline Condition	
	Boulder Cr / Frissell Cr and McKenzie Bridge 6 th Field Sub-watersheds (040106 and 040109, respectively)	McKenzie River / Elk Creek 6 th Field Sub-watershed (040502)
	FAR	NPF

Project Element 1: New boat launch construction on the river bed, river bank, and river terrace

And

Project Element 2: Decommissioning and rehabilitation of old boat launch sites

Proximity: FEMA has not developed floodplain maps for the project areas. However, it is obvious that this project is in direct proximity to the floodplain of the McKenzie River. Floodplains in the upper McKenzie River are not extensive given entrenched condition of the River. This is a “natural” condition, but has potentially been influenced by the construction of dams in the river which have trapped substantial amounts of sediment.

Probability: It is likely that project elements will affect floodplains.

Magnitude: The project will not affect a significant portion of the floodplain (see table below)

Table 33. Area floodplain changed from river bank and bed to concrete boat ramp

6th Field Subwatershed	Site Name	Area floodplain changed from river bank and bed to concrete boat ramp
Boulder Cr / Frissell Cr	Frissell	16' x 40' (640 ft ²)
McKenzie Bridge	Paradise	32' x 40' (1,280 ft ²)
McKenzie River / Elk Creek	Bruckart	16' x 40' (640 ft ²)

The area described above includes that portion of the ramp that will be in the river channel, and even with that included the area is still very small relative to all the floodplain area in the McKenzie River.

At Frissell an area 16 feet wide by 30 feet long (480 square feet) would be rehabilitated. At Bruckart an area 20 feet wide by 30 feet long (600 square feet) would be rehabilitated. This is an insignificant amount of area when taken in the context of a 5th field watershed.

Project design of a boat launch or rehabilitation project would not cause a disconnection of the floodplain from the river. A small area relative to the watersheds where the boat launch work would take place would be negatively affected. In terms of effects to listed fish it would be an insignificant effect for the following reasons:

- Listed fish would still be able to access the floodplain during high water events.
-
- Trees that need to be cut in the floodplain to place the new ramps will remain in the floodplain as “down woody material.” This woody material will provide cover for fish during high water events. Should these trees become mobilized and transported in the future they would be lost to the action area floodplain, but since they will remain available to the river they will likely end up in the floodplain downstream. In any case these trees will remain part of the aquatic/riparian ecosystem but will be on the ground or in the river rather than standing.

Indicator Summary

Project elements would negatively affect a small area of the floodplain, but would not affect the ability of flood flows to reach the floodplain.

The Upper McKenzie River 5th field watershed is approximately 230,400 acres in size, and the McKenzie River / Quartz Creek 5th field watershed is approximately 47,360 acres in size. The area impacted by project elements is small relative to 5th field watershed area (see table below).

Table 34. Summary of Project Area Impacts^a

Site	Total Impact in Square Feet	Total Decommissioned in Square Feet	Total Concrete Ramp in Bankfull Width in Square Feet ^b
Frissell	10,936	2,670	240
Paradise	3,439	0	480
Bruckart	19,900	10,000	240

^a These figures are approximate as designs are conceptual, and they represent a “worst case scenario.” That is, the total area impacted will likely be less and the total area restored will likely be greater. All of the area summarized is within the Riparian Reserve.

^b This figure is included in the “total impact” column and represents the amount of ramp that would be “in the water” during normal flows.

Listed fish would still be able to access the floodplain during high water events, and trees that need to be cut in the floodplain to place the new ramps will remain in the floodplain as “down woody material.” This woody material will be available to provide cover for fish during high water events.

Given the small scope of the project relative to watershed size, since the project would not inhibit flood flows from reaching the floodplain, and since woody material cut in the floodplain would remain as “down wood,” project elements would have an **insignificant NEGATIVE** effect on this indicator.

CHANGES IN PEAK / BASE FLOWS	Baseline Condition	
	Boulder Cr / Frissell Cr and McKenzie Bridge 6 th Field Sub-watersheds (040106 and 040109, respectively)	McKenzie River / Elk Creek 6 th Field Sub-watershed (040502)
	FAR	NPF

Project Element 1: New boat launch construction on the river bed, river bank, and river terrace

And,

Project Element 2: Decommissioning and rehabilitation of old boat launch sites

Proximity: The project is in direct proximity to listed fish habitat.

Probability: Project element #1 would require cutting down trees and creating impervious surfaces by paving access roads and placing a concrete boat ramp in the floodplain. These activities would also create small openings in the canopy and reduce evapotranspiration rates. All these factors have the potential to influence the rate, timing, and magnitude of precipitation runoff to the McKenzie River.

Magnitude: Roads constructed for the project will be paved which will create impervious surfaces. However, based upon field investigations by the District hydrologist and fish biologist our findings are that this would have effects on peak and base flows that cannot be measured. Roads will drain surface water (rain) off the road and towards existing vegetation. The terrace areas where new roads will be constructed are comprised of glacial/fluvial materials and are very porous and permeable. Any surface water will drain off the roads and into this material where it will readily enter the ground water system before it drains to the river. The concrete ramp itself will likely shed rain water directly toward the river before it has an opportunity to enter the soil.

Decommissioning and rehabilitation activities will improve permeability due to scarification of compacted areas and re-vegetation. However given the limited scope of rehabilitation activities relative to watershed size, it is highly unlikely that there will be a measurable effect to peak or base flows.

The Upper McKenzie River 5th field watershed is approximately 230,400 acres in size, and the McKenzie River / Quartz Creek 5th field watershed is approximately 47,360 acres in size. The area potentially affected by project elements relative to watershed size is small (see table below).

Table 35. Summary of Project Area Impacts^a

Site	Total Impact in Square Feet	Total Decommissioned in Square Feet	Total Concrete Ramp in Bankfull Width in Square Feet ^b
Frissell	10,936	2,670	240
Paradise	3,439	0	480
Bruckart	19,900	10,000	240

^a These figures are approximate as designs are conceptual, and they represent a “worst case scenario.” That is, the total area impacted will likely be less and the total area restored will likely be greater. All of the area summarized is within the Riparian Reserve.

^b This figure is included in the “total impact” column and represents the amount of ramp that would be “in the water” during normal flows.

Given the limited area of effect due to the project elements relative to watershed size, **the potential for negative effects to be significant is low.**

Indicator Summary

The project elements will have an **insignificant NEGATIVE** effect on this indicator. The negative determination is due to the need to cut down trees, the creation of impervious surfaces, and the creation of small openings. The limited scope of the project relative to watershed area, and the highly permeable/porous soils in project areas would limit the significance of effect to this indicator.

INCREASES IN DRAINAGE NETWORK	Baseline Condition	
	Boulder Cr / Frissell Cr and McKenzie Bridge 6 th Field Sub-watersheds (040106 and 040109, respectively)	McKenzie River / Elk Creek 6 th Field Sub-watershed (040502)
	FAR	NPF

Project Element 1: New boat launch construction on the river bed, river bank, and river terrace

And

Project Element 2: Decommissioning and rehabilitation of old boat launch sites

Proximity: Portions of the project roads would be constructed in direct proximity to listed fish habitat.

Probability: The probability that listed fish and their habitat would be affected by this project element is high.

Magnitude: Roads and their impervious surfaces can cause increases in the drainage network. It is expected that this project element will have an **insignificant negative** effect on this indicator for the following reasons:

- The terrace areas where new roads will be constructed are comprised of glacial/fluvial materials and are very porous and permeable. Therefore, most surface water (rain) will drain off the roads and into this material where it will readily enter the ground water system before it drains to the river.
- The ramp itself will shed water directly to the river before it can enter the soil. This will be limited in scope (240 square feet for Frissell and Bruckart, and 480 square feet for Paradise). Relative to watershed area, these new impacts would be insignificant. In addition, project element #2 would be improving conditions for this indicator.

Indicator Summary

Project elements will have an **insignificant NEGATIVE** effect on this indicator that would difficult to measure in listed fish habitat (the McKenzie River). This is due to the limited scope of the project relative to watershed area, and due to the porous and permeable nature of the terrace areas where project activities would take place.

ROAD DENSITY & LOCATION	Baseline Condition	
	Upper McKenzie 5 th Field Watershed (0401)	McKenzie River / Quartz Cr 5 th Field Watershed (0405)
	NPF	NPF

The baseline condition determinations were NPF for both 5th field watersheds. The Upper McKenzie watershed (0401) has a road density of 1.934 miles/square mile (Figure 14); and the McKenzie / Quartz Creek watershed (0405) has a road density of 2.832 miles/square mile (Figure 16) (note: these figures are for National Forest System lands, not private lands). The Upper McKenzie River 5th field HUC is a Key Watershed, and since the inception of the NWFP 11.148 miles of road have been decommissioned.

Project Element #1 will increase the road density in the Upper McKenzie River from a road density of 1.934 mi/mi² to 1.943; and increase road density in the McKenzie / Quartz Creek watershed (0405) from 2.832 mi/mi² to 3.021.

Project Element #2 will decommission roads, but the amount of road decommissioned in the Upper McKenzie River (0401) is insignificant. In fact, it is the pullout of the highway that would be rehabilitated and not a “road” per se. Therefore, this project element would not decrease the road density in this watershed. The McKenzie / Quartz Creek watershed (0405) would have approximately 861 feet of road decommissioned. This would bring the road density down to approximately 2.858 mi/mi².

Roads that would be constructed and decommissioned are all within the Riparian Reserve land allocation. These roads are valley bottom roads.

The amount of road work (construction and decommissioning) would be insignificant relative to watershed size and road mileage. Therefore, the project as a whole would have an **insignificant NEGATIVE** effect on this watershed condition indicator.

DISTURBANCE HISTORY	Baseline Condition	
	Upper McKenzie 5 th Field Watershed (0401)	McKenzie River / Quartz Cr 5 th Field Watershed (0405)
	FAR	NPF

Project elements would marginally increase the amount of human caused disturbance in both watersheds.

Table 36. Summary of Project Area Impacts^a

Site	Total Impact in Square Feet	Total Decommissioned in Square Feet	Total Concrete Ramp in Bankfull Width in Square Feet ^b
Frissell	10,936	2,670	240
Paradise	3,439	0	480
Bruckart	19,900	10,000	240

^a These figures are approximate as designs are conceptual, and they represent a “worst case scenario.” That is, the total area impacted will likely be less and the total area restored will likely be greater. All of the area summarized is within the Riparian Reserve.

^b This figure is included in the “total impact” column and represents the amount of ramp that would be “in the water” during normal flows.

Since Project Element #1 impacts are greater than Project Element #2 benefits, this indicator would continue to have human induced disturbance. Therefore, the project as a whole would have a **measurable NEGATIVE** effect on this watershed condition indicator.

RIPARIAN RESERVES	Baseline Condition	
	Upper McKenzie 5 th Field Watershed (0401)	McKenzie River / Quartz Cr 5 th Field Watershed (0405)
	FAR	NPF

Project elements would marginally increase the amount of disturbance in both watersheds. There are approximately 39,215 acres (or 1,708,205,400 ft²) of Riparian Reserve in the Upper McKenzie River 5th field watershed, and approximately 4,561 acres (or 198,677,160 ft²) in the McKenzie River / Quartz Creek 5th field (National Forest System lands, only). See Figures 15 and 17.

Table 37. Riparian Reserve area and amount of potential disturbance

5 th Field Watershed	Riparian Reserve Area in 5 th field (square feet)	Riparian Area Disturbed in 5 th field (square feet)
Upper McKenzie 5 th Field Watershed (0401)	1,708,205,400 ft ²	17,045 ft ²
McKenzie River / Quartz Cr 5 th Field Watershed (0405)	198,677,160 ft ²	29,900 ft ²

Even including the amount of area decommissioned and rehabilitated (a short term disturbance) in the 5th fields, the amount of Riparian Reserve area impacted relative to the acreage of Riparian Reserve in the watersheds, the project would have an **insignificant NEGATIVE** effect on this watershed condition indicator.

DISTURBANCE REGIME	Baseline Condition	
	Upper McKenzie 5 th Field Watershed (0401)	McKenzie River / Quartz Cr 5 th Field Watershed (0405)
	NPF	NPF

The disturbance regime has been impacted in the Upper McKenzie River 5th field watershed, especially in the Western Cascades portion of the watershed. There is a legacy of intensive forest management (timber harvest and road network) in the Deer Creek watershed. This has likely increased the sediment yield from that watershed compared to reference conditions (Stillwater Sciences 2006; Upper McKenzie Watershed Analysis 1995). There is also a large, deep-seated earthflow in the Deer Creek watershed and this naturally occurring feature provided Deer Creek with a historically high sediment load.

There is a hydropower development in this 5th field watershed. However, current license requirements are very strict and the hydropower development is essentially a “run-of-the-river” project. That is, inflow must come close to equaling outflow, and therefore this 5th field has a predictable hydrograph.

There has been significant human disturbance in the McKenzie River / Quartz Creek 5th field watershed in the form of road building, timber harvest, private land development, and flood control dams in tributary 5th field watersheds that significantly impact the disturbance regime of the McKenzie River/Elk Creek 6th field sub-watershed. Due to these flood control dams the hydrograph is predictable, but in a negative sense. That is, flood flows are no longer allowed to maintain the river channel and fish habitat in this 5th field watershed.

Project elements will have an **insignificant NEGATIVE** effect on this watershed condition indicator. This is due to the limited area of impact relative to the area of the 5th field watersheds (see Table 37).

Project Effects to Population Indicators

The AP directs the assessment of population indicators when recovery plans are available for listed species. For this project, a draft recovery plan has been developed for Columbia River bull trout, but not for Upper Willamette River spring Chinook salmon. Therefore, the project effects to population indicators will only address bull trout.

POPULATION SIZE AND DISTRIBUTION	Baseline Condition	Baseline Condition
	Upper McKenzie 5 th Field Watershed (0401)	McKenzie River / Quartz Cr 5 th Field Watershed (0405)
	FAR	FAR

Effects of the Action: Indicator Summary:

Bull trout distribution ranges throughout the main stem McKenzie River where the action areas occur. A discussion of specific life history stages at each action area follows:

Frissell: The life history stages that could be expected at the Frissell action area are juvenile, subadult, and adult. Fry are not expected to be found this far downstream of Olallie Creek due to stream temperatures (see temperature discussion in Baseline Condition analysis and Table 9).

The project would not create structures that would impact the long term size or distribution of the bull trout population. In the short term a possibility exists that a juvenile bull trout could be harmed if equipment needs to enter the channel. If a small number of juvenile bull trout (e.g. less than 5) were harmed it would not be a number of sufficient size to impact the adult population in the long term. It is expected that larger bull trout could easily move out of the way of equipment, and that by working during the instream work period impacts to bull trout that could affect population size will be substantially minimized.

During in-water work, a short term turbidity plume is expected to occupy an area in the river approximately 65 feet in width by 300 feet in length and last less than one day. This turbidity plume will not occupy the entire river width as the river is approximately 130 feet. Therefore, any potential delay in adult bull trout migration to upstream spawning areas is expected to be minimal (i.e. measured in hours).

Paradise and Bruckart: The life history stages expected at these sites are subadults and adults. The width of the river at Paradise is approximately 144 feet, and 160 feet at Bruckart. A similar turbidity plume, both in size and duration, is expected at these sites during in-water work. However, since the river is wider the impact to migrating bull trout would be less than at Frissell. In addition, since the fish at these sites would be larger than at Frissell, it is expected that they could easily avoid equipment when it is working in water (i.e. there are no juveniles this far downstream).

Given the conditions at the boat launches, the life history stages potentially affected, and the minimization measures (i.e. working during the instream work period) the project is

expected to have an **INSIGNIFICANT NEGATIVE EFFECT** to the population size and distribution of bull trout.

GROWTH AND SURVIVAL	Baseline Condition	Baseline Condition
	Upper McKenzie 5 th Field Watershed (0401)	McKenzie River / Quartz Cr 5 th Field Watershed (0405)
	FAR	FAR

The project would have a neutral effect on stream temperatures (see temperature discussion in Baseline Condition analysis). Therefore no effect to bull trout growth and survival is expected due to temperature impacts.

As discussed above, bull trout fry are not expected to be present in any action area. Frissell boat launch could have juveniles present in the action area as well as subadults and adults. At Bruckart, only subadults and adults are expected to be present. All life stages potentially found at the various action areas are expected to be able to avoid equipment during in-water work. Therefore, this project would have an **INSIGNIFICANT NEGATIVE EFFECT** on the growth and survival of the bull trout population in the McKenzie River.

LIFE HISTORY DIVERSITY AND ISOLATION	Baseline Condition	Baseline Condition
	Upper McKenzie 5 th Field Watershed (0401)	McKenzie River / Quartz Cr 5 th Field Watershed (0405)
	FAR	FAR

This project would not create barriers to migration for any life history stage of bull trout. Nor would it have any effects on the presence or absence of brook trout in the McKenzie River. This project has no causal mechanism to affect the genetics or evolution of bull trout in the McKenzie River. Therefore this project would have a **NEUTRAL EFFECT** on the life history diversity and isolation of bull trout in the McKenzie River sub-basin.

PERSISTENCE AND GENETIC INTEGRITY	Baseline Condition	Baseline Condition
	Upper McKenzie 5 th Field Watershed (0401)	McKenzie River / Quartz Cr 5 th Field Watershed (0405)
	FAR	FAR

This project would not create barriers to migration for any life history stage of bull trout. Nor would it have any effects on the presence or absence of brook trout in the McKenzie River. There is the potential that during implementation (in-water work) there could be a short term turbidity plume (measured in hours) that could delay migrating adults heading to upstream spawning sites. However, given the short term nature of the impact, and since a portion of the river channel should be free of turbidity, it is not expected that the delay could cause any short or long term impact to this indicator. Therefore, this project will have a **NEUTRAL EFFECT** on the persistence and genetic integrity of bull trout in the McKenzie River.

Project Effects to Primary Constituent Elements (PCEs) of Critical Habitat

Only spring Chinook salmon Critical Habitat is located within the Action Areas. Within the Action Areas, only the following three PCEs are applicable:

FRESHWATER SPAWNING SITES

There are no spawning sites within any of the action areas, and no impacts to known spawning sites are expected (see substrate character and embeddedness /suspended sediment – intergravel do/turbidity factor analysis). Therefore, this project would have a **NEUTRAL EFFECT** on this PCE.

FRESHWATER REARING SITES

There is a potential for Chinook fry rearing habitat to be impacted by project element #1. This is due to the change from a natural cobble river bed to a concrete boat ramp. Chinook fry in their early stages will seek out rearing habitat along the river margin where velocities are slower. In these areas they can use the interstitial spaces between cobbles to take cover. Frissell and Bruckart would each change 240 square feet of this natural river margin habitat to concrete ramp and Paradise would change 480 square feet to concrete ramp (project element #1). Project element #2 would rehabilitate approximately 20 feet of river margin at Frissell and about 25 at Bruckart.

The change from cobble habitat to concrete ramp is “permanent.” However, these impacts from project elements 1 and 2 (measured in feet), are minor relative to the amount of river margin habitat in the two 5th field watersheds where projects are located (see Figures 1 and 2). In addition, the “old” ramps would be rehabilitated and their poor location would no longer impact the river. This project could have a slight **NEGATIVE EFFECT** on this PCE for Chinook fry. No other life stage of Chinook salmon is expected to have rearing habitat affected due to the distance of that habitat from the ramp sites.

FRESHWATER MIGRATION CORRIDORS

This project would not create permanent barriers to migration for either upstream or downstream migrating spring Chinook salmon. However, during in-water work activities (i.e. ramp placement) there is the potential for a turbidity plume. It is expected that this plume would only last one work day (measured in hours) at each site, and that the plume would not occupy the enter river channel. It is estimated that the plume will hug the side of the river where work is occurring. The estimated width of the plume at each site is 65 feet. The width of the river varies at each site (Frissell = 130'; Bruckart 144'; and Bruckart 160'), but enough room will be available for migrating spring Chinook salmon to swim by the work site during the turbidity plume. If there is a delay, it would be measured in hours not days.

Therefore, this project would have a slight (short term) **NEGATIVE EFFECT** on this PCE.

ESA Effects Determination

The potential effects to bull trout and spring Chinook salmon using a habitat approach was discussed in detail in the previous sections of this BA. The results of this analysis are summarized below.

Summary of effects to Habitat Indicators

		Temperature	Sediment	Chemical	Barriers	Substrate	LWD	Pools	Off Channel	Refugia	Width:Depth	Streambank	Floodplain	Flows	Drainage Network
Baseline	Boulder Frissell HUC6	PF	PF	PF	PF	AR	AR	AR	AR	NF	NF	AR	AR	AR	AR
	McK Bridge HUC6	PF	PF	PF	PF	AR	AR	AR	AR	NF	NF	AR	AR	AR	AR
	McK R Elk Cr HUC6	PF	AR	PF	PF	AR	PF	NF	AR	NF	NF	AR	NF	NF	NF
Element Summary	Element One	-I	-M	D	D	-M	-I	N	N	N	N	-M	-I	-I	-I
	Element Two	N	-I	D	D	+I	+I	N	N	N	N	+I	-I	-I	-I
Indicator Summary		-I	-M	D	D	-M	-I	N	N	N	N	-M	-I	-I	-I

Notes: Properly Functioning = "PF", Functioning at Risk = "AR", Not Properly Functioning = "NF"; Negative effect = "-", Positive effect = "+", Neutral effect = "N"; measurable magnitude (Greater than insignificant) = "M", Insignificant magnitude = "I", Discountable probability = "D" "Element 1 = boat launch construction" and "Element 2 = boat launch decommissioning"

Summary of effects to watershed indicators, spring Chinook salmon PCEs, and bull trout population indicators

		Watershed Condition Indicators				Critical Habitat Spring Chinook PCEs			Population Indicators Bull Trout			
		Road Density	Disturbance History	Riparian Reserves	Disturbance Regime	Freshwater Spawning Sites	Freshwater Rearing Sites	Freshwater Migration Corridor	Population Size and Distribution	Growth and Survival	Life History Diversity and Isolation	Persistence and Genetic Integrity
Baseline	Upper McK R HUC 5	NF	AR	AR	NF	N/A	N/A	N/A	AR	AR	AR	AR
	McK R / Quartz Cr HUC 5	NF	NF	NF	NF	N/A	N/A	N/A	AR	AR	AR	AR
Indicator Summary		-I	-M	-I	-I	N	-	-	-I	-I	N	N

The boat launch project is located in close proximity to habitat used by bull trout and spring Chinook salmon, and therefore, project activities are likely to affect these fish and their habitat. The project was designed to minimize negative effects to listed fish and their habitat, while still meeting the objectives of the project. There is a potential for disturbance/harassment (i.e. take) to both bull trout and spring Chinook salmon due to work on the stream bed and banks.

The implementation of this project would likely result in measurable negative effects to the Sediment/Turbidity indicator. This is due to a predicted turbidity plume that could occur during ramp placement at each of the three sites. Seasonal operating restrictions are expected to minimize adverse affects to listed fish, but the turbidity plumes could temporarily displace fish, cause gill abrasion if fish do not move, or delay upstream migration. The plumes are expected to last hours (not days) at each site and would not occupy the enter river channel width which would allow fish to find refuge in an unaffected portion of the river.

The implementation of this project would likely result in measurable negative effects to the Substrate Character indicator. This is due to change from natural riverbed (cobble and gravel substrate) to a concrete substrate. This change can be measured in square feet and is summarized previous sections of this BA. It would reduce the amount of available river margin habitat that spring Chinook fry use for rearing and cover at the site scale of each ramp.

The project would also permanently change small areas of streambank to a concrete ramp. This change can be measured in square feet and is summarized previous sections

of this BA. In these areas trees will no longer be able to grow and provide LWD and organic matter to the river.

In addition to this negative measurable change to the Streambank indicator and the Substrate indicator, two “old” boat ramps will be rehabilitated which would have an insignificant positive effect on these indicators. Trees planted on the rehabilitated ramps sites would have an insignificant positive effect on the LWD indicator.

PROJECT EFFECTS DETERMINATION KEY FOR SPECIES AND DESIGNATED CRITICAL HABITAT

1) Do any of the indicator summaries have a positive (+) or negative (-) conclusion?
Yes – Go to 2
No – No Effect

YES

2) Are the indicator summary results only positive?
Yes – NLAA
No – Go to 3

NO

3) If any of the indicator summary results are negative, are the effects insignificant or discountable?
Yes – NLAA
No – LAA, fill out Adverse Effects Form

NO

(See Appendix for LAA Effects Forms)

Aggregated Federal Effect

The Analytical Process requires that “action agencies would disclose in each BA the known projects that have not concluded consultation.” The AP further states, “There may be situations where two or more LAA land management actions within a 5th field watershed are undergoing consultation concurrently. The effects of each of these actions need to be accounted for in aggregate by the Services in their jeopardy/adverse modification analysis. Coordinate internally within the administrative unit, or with other Federal land management agencies as appropriate, in the preparation and submission of BAs, whether or not the concurrent submissions are combined or separate. Additionally, effects of projects for which consultation has been concluded are not addressed in the aggregate effects section, but are included in the description of environmental baseline.”

There are no known (fish) LAA actions occurring in either 5th field watershed that are undergoing consultation concurrently. Effects of projects for which consultation has been concluded have been addressed in the description of environmental baseline. In addition, State and private land actions were considered in the description of the environmental baseline (both actions that have been concluded, and actions that are “foreseeable”).

The following is a list of activities occurring within the two 5th field HUCs addressed in this BA. This is not a list of “concurrent consultation” actions by other Federal agencies (e.g. FERC, BLM, ACOE). This list is provided as information that was requested by the Services in order to aid in their jeopardy/adverse modification analysis.

- The Eugene Water & Electric Board operates a hydroelectric project in the Upper McKenzie River 5th field HUC. Trail Bridge dam does not provide passage for bull trout or spring Chinook salmon. The construction of the project isolated/fragmented the McKenzie River bull trout population. It has also affected the sediment regime and large wood routing in the upper McKenzie River. EWEB is currently in the process of filing for a new license to operate the project. A license is expected in late 2008. This project would undergo Section 7 ESA consultation before issuance of a license since FERC provides the federal nexus.
- The Willamette National Forest has a Section 10 (a)(1)(a) “take permit” (TE001822-4 valid from November 10, 2004 to November 9, 2008) in order to conduct bull trout monitoring (snorkel surveys, trapping, marking, redd surveys, and transplanting of fry to the Middle Fork Willamette River). The Willamette works in partnership with the Oregon Department of Fish and Wildlife to transfer fry to the Middle Fork. The permit allows for up to 25% of the estimated total production of Anderson Creek to be transferred; or up to 5000 bull trout fry.
- The Army Corps of Engineers will regulate flow in two 5th field HUCs that are not part of this proposed action, but were considered in the description of baseline due to their impacts on the McKenzie River/Quartz Creek 5th field HUC. Blue River Dam in the Blue River watershed, and Cougar Dam in the South Fork McKenzie River watershed have both significantly affected the flow regime, the sediment regime, large wood routing, and river temperature in the McKenzie River/Quartz Creek 5th field HUC. Cougar Dam caused the isolation and fragmentation of the McKenzie River bull trout population, and blocked spring Chinook salmon from accessing miles of suitable spawning and rearing habitat.

ESA Cumulative Effects

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

There are no known State, tribal, local or private actions that are reasonably certain to occur in the **action areas** as defined on pages 8, 10, and 11 of this BA. All action areas lie on National Forest System lands, and by definition there could not be any State, tribal, local, or private actions. Any action proposed by a non-federal entity in the action areas defined in this BA, would be subject to a “federal nexus” since the lands are part of the National Forest System and would therefore require Section 7 consultation.

The following is a list of activities that could be considered “reasonably certain to occur” outside of the action areas (as defined), but within the 5th field watersheds assessed in this BA.

- The public will use the river for boating and fishing. Fishing regulations are the jurisdiction of the State (ODFW).
- The Oregon Department of Transportation will likely continue to maintain State Highways 126 and 242. This can involve brushing, paving, snow removal, anti-freezing chemicals on bridges (e.g. propylene glycol, or ethylene glycol).
- The Oregon Department of Environmental Quality’s web site (<http://www.statelandsonline.com>) was consulted to determine if there were any “fill and removal” permits that would be issued within the 5th field HUCs evaluated in this BA. None were located on the web in the 5th fields, however some were located in the lower river (i.e. downstream of river mile 20). The most downstream ramp, Bruckart, is at river mile 63.3.
- The Oregon Department of Forestry regulates private timberlands. A review of logging operation notifications was not conducted for private lands in the 5th field HUCs assessed in this BA. However, it is likely that timber harvest operations will continue in the private timberlands under the guidelines of the Oregon Forestry Practices Act. See Figures 14-17 for a maps that show non-Forest Service lands in the 5th fields.

Magnuson-Stevens Act – Essential Fish Habitat Assessment

All EFH assessments must include the following information: (1) a description of the proposed action; (2) an analysis of the effects, including cumulative effects, of the proposed action on EFH, the managed species, and associated species, such as major prey species, including affected life-history stages; (3) the Federal agency's views regarding the effects of the action on EFH; and (4) proposed mitigation, if applicable (50 CFR 600.920(g)(2)).

The proposed action and analysis of effects (including cumulative effects) is found in the ESA portion of this BA. The proposed boat launches project would have an **ADVERSE AFFECT** on EFH for spring Chinook salmon fry, and a short term (measured in hours) negative affect on migratory habitat due to a turbidity plume. As described above under the PCE analysis, a small area of river bank and river bed would be changed to a concrete boat ramp (project element #1) and a small area would be restored to river bank (project element #2). Project Element #1 would adversely affect potential rearing habitat for young-of-year, spring Chinook fry.

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**DOCUMENTATION OF EXPECTED ADVERSE EFFECTS
TO LISTED FISH SPECIES AND THEIR HABITAT**

Name of action: McKenzie River Boat Launches Project

Species of concern: Bull Trout

HUC names and numbers in ESA action area:

USGS Hydrologic Unit Code (HUC)	HUC Scale	HUC Name	NW Forest Plan Key Watershed?
170900040106	6 th Field	Boulder Creek / Frissell Creek	Yes
170900040109	6 th Field	McKenzie Bridge	No
170900040502	6 th Field	McKenzie River / Elk Creek	No

Identify critical habitat area of concern: There is no bull trout critical habitat in the Action Areas.

Element(s) of the action causing the expected adverse effect: Both project elements have the potential to adversely affect bull trout due to short term turbidity plumes. However, project element #1 (boat launch construction) has a higher likelihood of adversely affecting listed fish because equipment must enter the water in order to place the boat ramps, and move small boulders at Paradise launch.

1. The proposed action may result in adverse effects through which of the following mechanisms (underline or circle and describe in a narrative).

Harm: act that actually kills or injures fish (may include habitat modification that significantly impairs behavioral patterns such as breeding, spawning, rearing, migrating, feeding or sheltering).

Harass: significantly disrupt normal behavior patterns such as breeding, feeding, or sheltering.

Other forms of take: pursue, hunt, shoot, wound, trap, capture, kill, collect, or delayed mortality from stress or disease.

Habitat: cause an adverse effect to occupied or accessible habitat of listed/proposed species; proposed/designated critical habitat. For anadromous fish, accessible habitat is considered to be occupied.

The potential adverse affect to listed fish would be in the form of **harassment** due to turbidity. Bull trout could be displaced as they seek the side of the river without any turbidity, and adults could be delayed due to turbidity.

There is a lesser potential that bull trout could be directly harmed due to equipment entering the river for ramp placement, or to move small boulders near the Paradise launch.

Finally, by changing a natural river bed (cobles) to concrete this has the potential to reduce cover habitat for juvenile bull trout at Frissell.

2. Nature, magnitude and probability

Describe the nature, magnitude and probability of the effects of the action on a species or habitat. Quantify where possible.

Nature: what indicator or habitat feature will be affected.

The indicators that could have a measurable negative affect due to project implementation are: turbidity, substrate character (i.e. the change from cobble to concrete at specific ramp sites), and streambank.

Magnitude: severity and intensity.

Contract specifications will require that water quality be maintained, but a short plume is expected at each ramp site when the river bed is being prepared for ramp placement. If a turbidity plume is noticeable 100 feet downstream of the work site for up to a half hour, the contractor must cease operations and develop a plan that will meet requirements. The turbidity plume is not expected to occupy the enter width of the river channel so fish would be able to leave turbid water. This turbidity plume is expected to last hours not days.

The new ramps will permanently change a portion of the riverbank and river bed. See Table 3 of this BA for areas at each ramps site.

Probability: likelihood of occurrence

It is likely that some bull trout would be affected by the implementation of this project due to the proximity.

3. Which of the following life stages, forms and essential behaviors will be adversely affected (underline or circle and describe as appropriate)?

Life history forms

Fluvial

The bull trout population in the McKenzie River is fluvial.

Life stages and essential behaviors

Juvenile, subadult, and adult bull trout could be adversely affected by this project.

Adult migration to spawning areas

The turbidity plume could delay adult migration for a day at each site. However, since the plume should not occupy the entire width of the river bull trout can still use that corridor of turbidity free river for migration.

4. Temporal Scale (frequency and duration) (underline or circle and describe as appropriate).

a. Frequency: How often will the effect occur?

Once at each new ramp site, and at the decommissioned sites.

b. Duration:

i. Short term or pulse effect: subsides almost immediately.

A short term turbidity pulse is expected at each ramp site during placement. This effect would be measured in hours.

ii. Long term or press effect: chronic.

The new ramps will permanently change a portion of the riverbank and river bed. See Table 3 of this BA for areas at each ramps site.

5. Spatial scale

a. Distribution: Describe the geographic extent of the effect (Note: describe in instructions)

Downstream of each existing ramp, and the two proposed ramps to a distance of 300 feet (length), and 65 feet into the river channel (width). See Action Area descriptions in this BA for detailed descriptions.

b. Proximity:

i. Describe where the effect is in relation to the species and its habitat.

The project is in direct proximity to listed fish habitat. See Table 3 for area in each 6th field HUC, and Figure 1 for a map.

ii. Note relationship to occupied habitat, designated critical habitat, or essential fish habitat

Boat ramps by their very nature are directly in listed fish habitat (see Table 3 for area). All three of the Action Areas have bull trout in proximity.

6. Tracking Adverse Effects:

Catalogue a unit number for this adverse effect and identify the specific location on the GIS water theme as a point, segment, or polygon datum (depending upon the nature of the effect).

7. Include this form and map in the BA.

**DOCUMENTATION OF EXPECTED ADVERSE EFFECTS
TO LISTED FISH SPECIES AND THEIR HABITAT**

Name of action: McKenzie River Boat Launches Project

Species of concern: Spring Chinook Salmon

HUC names and numbers in ESA action area:

USGS Hydrologic Unit Code (HUC)	HUC Scale	HUC Name	NW Forest Plan Key Watershed?
170900040106	6 th Field	Boulder Creek / Frissell Creek	Yes
170900040109	6 th Field	McKenzie Bridge	No
170900040502	6 th Field	McKenzie River / Elk Creek	No

Identify critical habitat area of concern: The river bank and river bed where new ramps would be placed would be permanently changed from “natural habitat” to “a concrete boat ramp.”

Element(s) of the action causing the expected adverse effects:

Both project elements have the potential to adversely affect bull trout due to short term turbidity plumes. However, project element #1 (boat launch construction) has a higher likelihood of adversely affecting listed fish because equipment must enter the water in order to place the boat ramps, and move small boulders at Paradise launch.

1. The proposed action may result in adverse effects through which of the following mechanisms (underline or circle and describe in a narrative).

Harm: act that actually kills or injures fish (may include habitat modification that significantly impairs behavioral patterns such as breeding, spawning, rearing, migrating, feeding or sheltering).

Harass: significantly disrupt normal behavior patterns such as breeding, feeding, or sheltering.

Other forms of take: pursue, hunt, shoot, wound, trap, capture, kill, collect, or delayed mortality from stress or disease.

Habitat: cause an adverse effect to occupied or accessible habitat of listed/proposed species; proposed/designated critical habitat. For anadromous fish, accessible habitat is considered to be occupied.

The potential adverse affect to listed fish would be in the form of **harassment** due to turbidity. Spring Chinook could be displaced as they seek the side of the river without any turbidity, and adults could be delayed due to turbidity.

There is a lesser potential that juvenile could be directly harmed due to equipment entering the river for ramp placement, or to move small boulders near the Paradise launch.

Finally, by changing a natural river bed (cobles) to concrete this has the potential to reduce cover habitat for Spring Chinook fry at Frissell.

2. Nature, magnitude and probability

Describe the nature, magnitude and probability of the effects of the action on a species or habitat. Quantify where possible.

Nature: what indicator or habitat feature will be affected

The indicators that could have a measurable negative affect due to project implementation are: turbidity, substrate character (i.e. the change from cobble to concrete at specific ramp sites), and streambank.

Magnitude: severity and intensity

Contract specifications will require that water quality be maintained, but a short plume is expected at each ramp site when the river bed is being prepared for ramp placement. If a turbidity plume is noticeable 100 feet downstream of the work site for up to a half hour, the contractor must cease operations and develop a plan that will meet requirements. The turbidity plume is not expected to occupy the enter width of the river channel so fish would be able to leave turbid water. This turbidity plume is expected to last hours not days.

The new ramps will permanently change a portion of the riverbank and river bed. See Table 3 of this BA for areas at each ramps site.

Probability: likelihood of occurrence

It is likely that some bull trout would be affected by the implementation of this project due to the proximity.

3. Which of the following life stages, forms and essential behaviors will be adversely affected (underline or circle and describe as appropriate)?

Life history forms

Anadromous

Only the anadromous form of Chinook salmon is present in the McKenzie River.

Life stages and essential behaviors

Spring Chinook fry could be directly affected by the change from riverbed to concrete ramp on the river margin. See Table 3 for area in each 6th field HUC.

Adult migration to spawning areas

The turbidity plume could delay adult migration for a day at each site. However, since the plume should not occupy the entire width of the river bull trout can still use that corridor of turbidity free river for migration.

4. Temporal Scale (frequency and duration) (underline or circle and describe as appropriate).

a. Frequency: How often will the effect occur?

Once at each new ramp site, and at the decommissioned sites.

b. Duration:

i. Short term or pulse effect: subsides almost immediately.

A short term turbidity pulse is expected at each ramp site during placement. This effect would be measured in hours.

ii. Long term or press effect: chronic.

The new ramps will permanently change a portion of the riverbank and river bed. See Table 3 of this BA for areas at each ramps site.

5. Spatial scale

a. Distribution: Describe the geographic extent of the effect (Note: describe in instructions)

Downstream of each existing ramp, and the two proposed ramps to a distance of 300 feet (length), and 65 feet into the river channel (width). See Action Area descriptions in this BA for detailed descriptions.

b. Proximity:

i. Describe where the effect is in relation to the species and its habitat.

The project is in direct proximity to listed fish habitat. See Table 3 for area in each 6th field HUC, and Figure 1 for a map.

ii. Note relationship to occupied habitat, designated critical habitat, or essential fish habitat

Boat ramps by their very nature are directly in listed fish habitat (see Table 3 for area). All three of the Action Areas have bull trout in proximity.

6. Tracking Adverse Effects:

Catalogue a unit number for this adverse effect and identify the specific location on the GIS water theme as a point, segment, or polygon datum (depending upon the nature of the effect).

7. Include this form and map in the BA.

Figure 1.

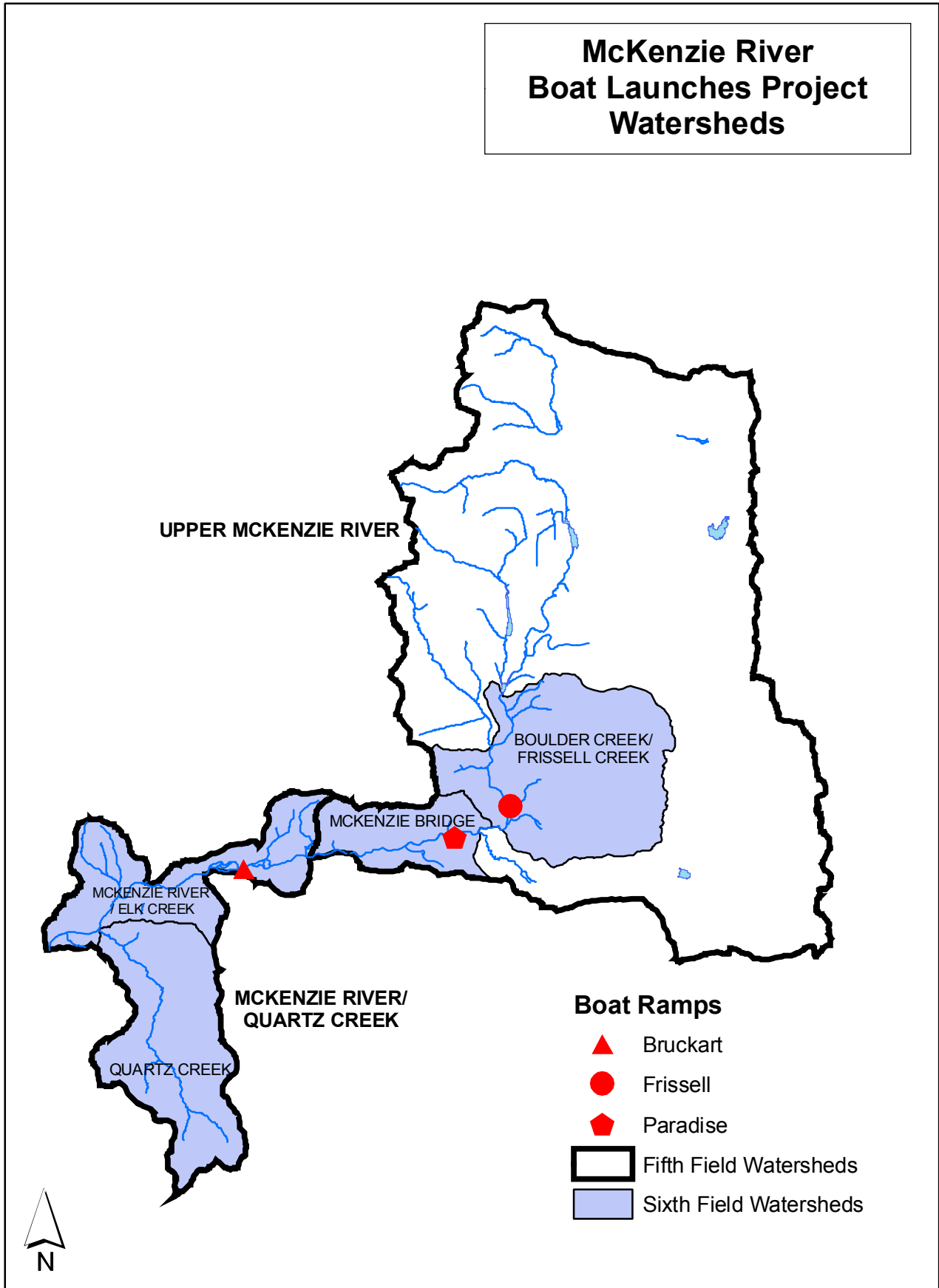


Figure 2.

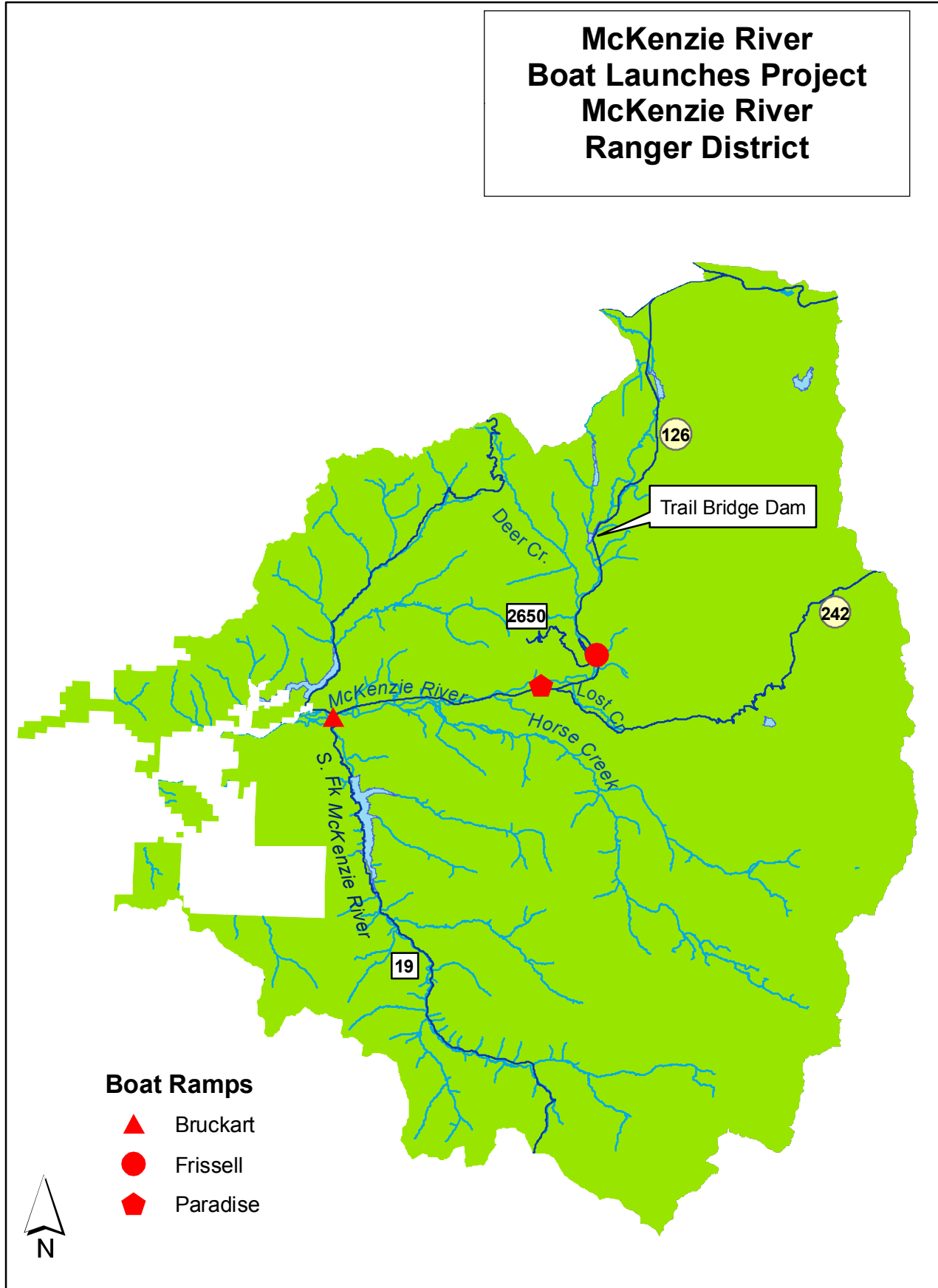


Figure 3.

McKenzie River Boat Launches Project Frissell Boat Launch

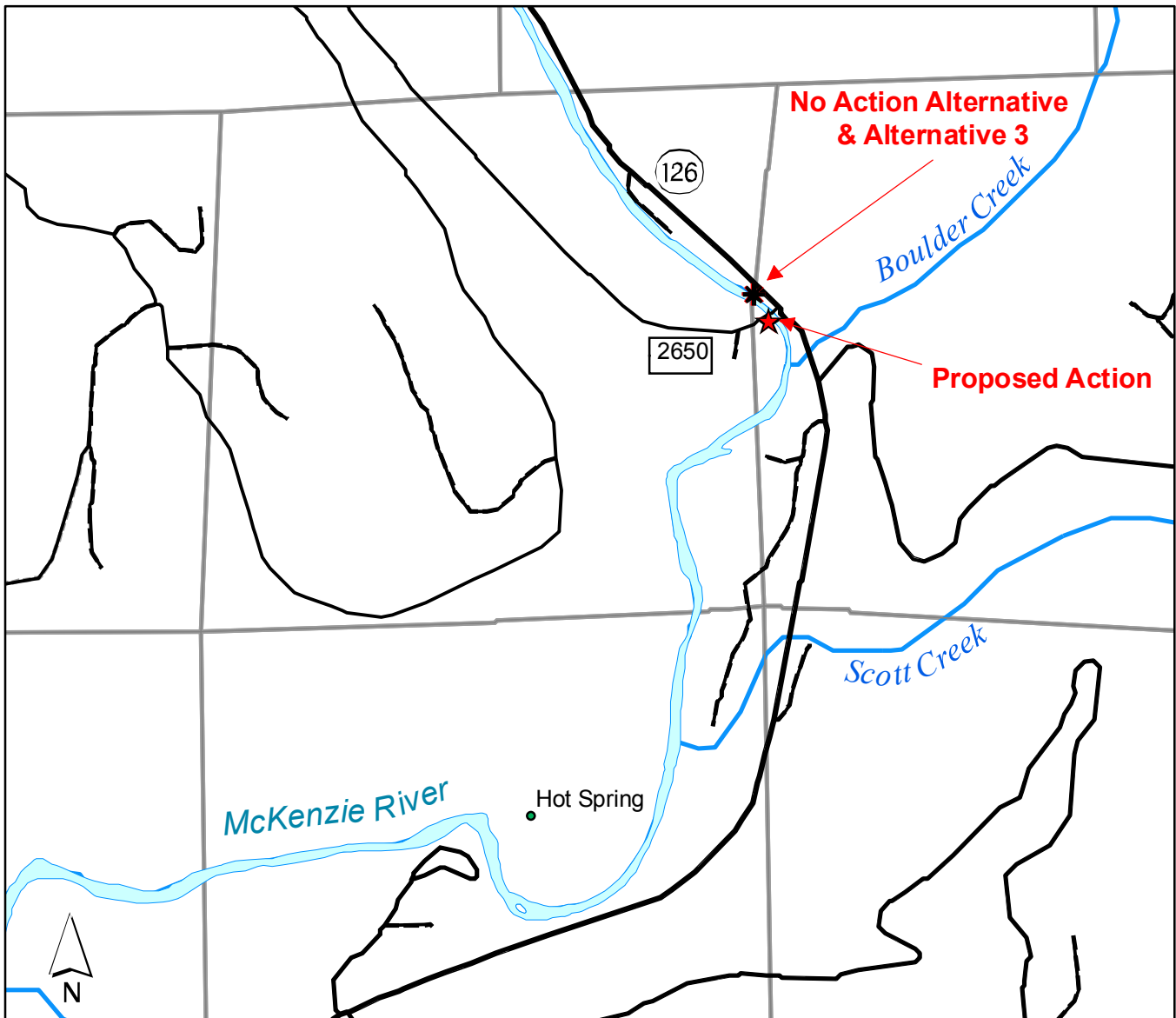
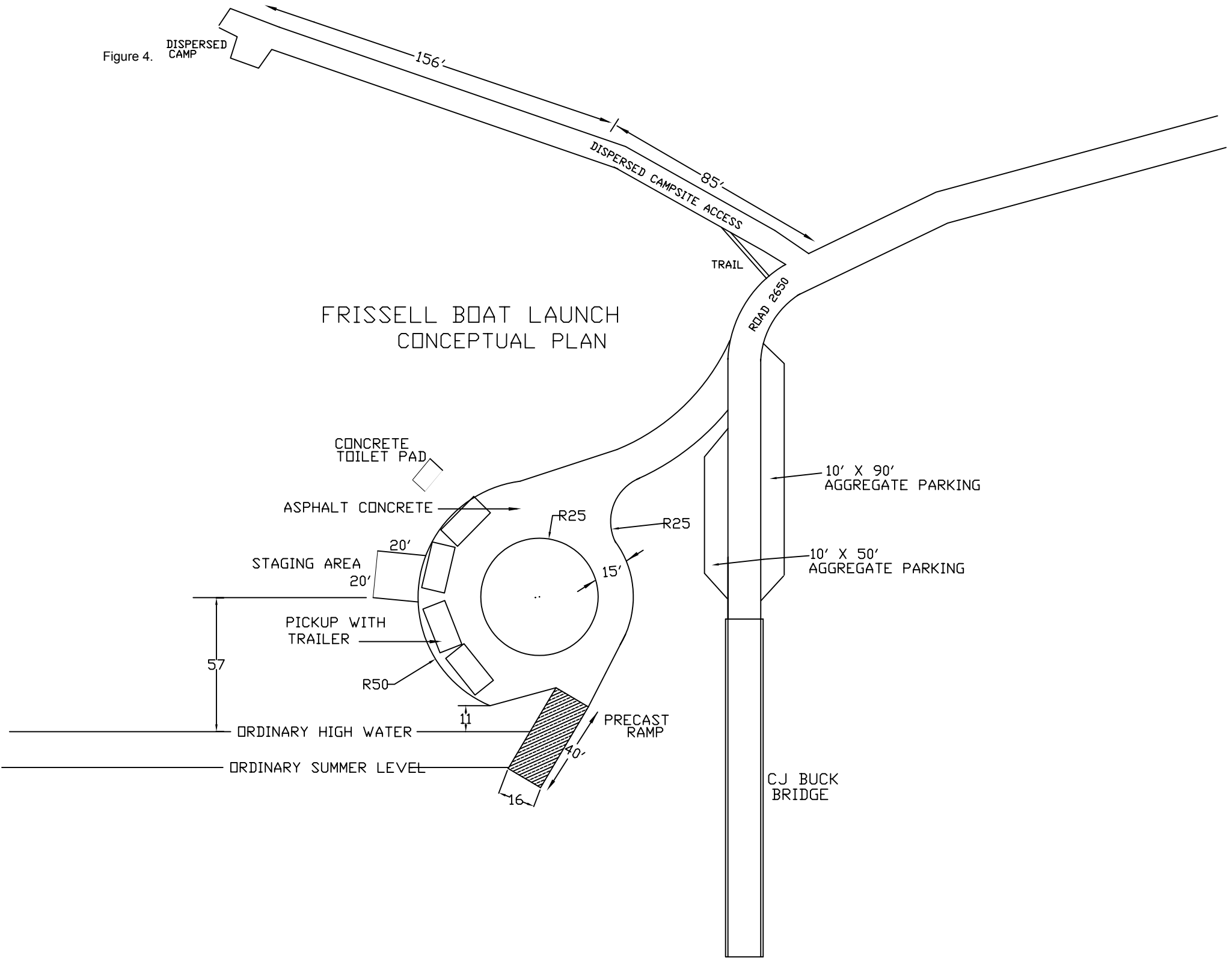


Figure 4.

DISPERSED CAMP



FRISSELL BOAT LAUNCH CONCEPTUAL PLAN

CONCRETE
TOILET PAD

ASPHALT CONCRETE

STAGING AREA
20'

PICKUP WITH
TRAILER

R50

ORDINARY HIGH WATER

ORDINARY SUMMER LEVEL

DISPERSED CAMPSITE ACCESS

TRAIL

ROAD 2650

10' X 90'
AGGREGATE PARKING

10' X 50'
AGGREGATE PARKING

CJ BUCK
BRIDGE

PRECAST
RAMP

156'

85'

R25

R25

15'

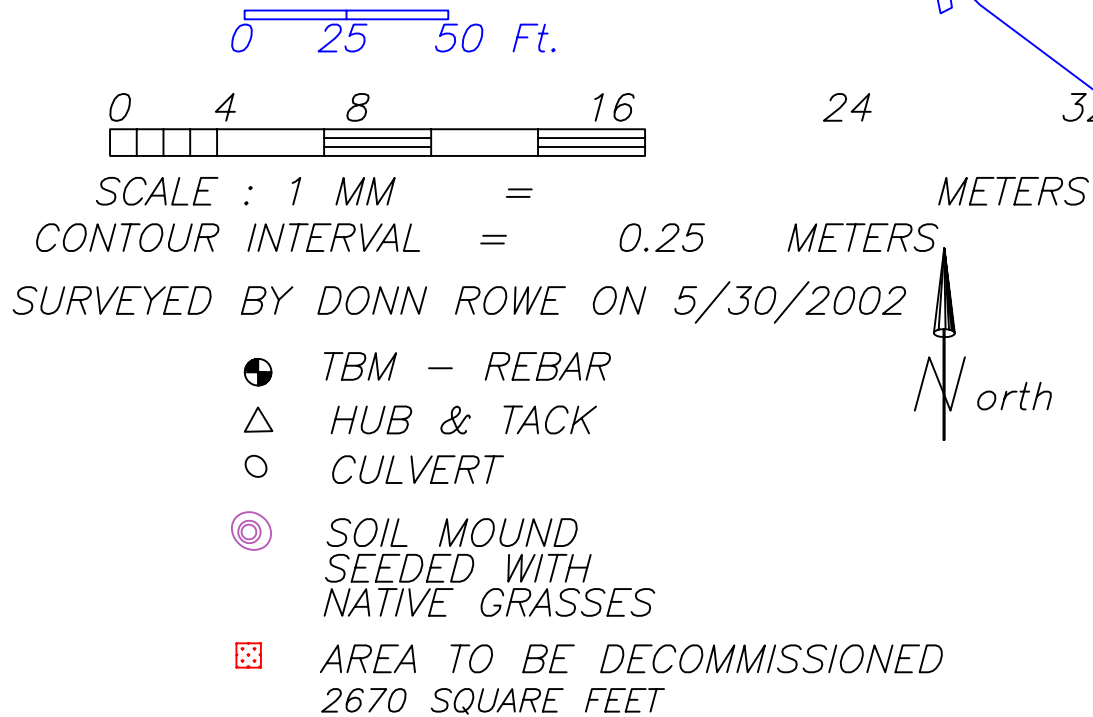
40'

16'

57'

Figure 5.

FRISSELL DECOMMISSIONING PLAN



- TBM - REBAR
- △ HUB & TACK
- CULVERT
- ⊙ SOIL MOUND SEEDED WITH NATIVE GRASSES
- ⊠ AREA TO BE DECOMMISSIONED 2670 SQUARE FEET

REMOVE EXISTING
TIMBER RAILS
SEED RAMP WITH
NATIVE GRASSES

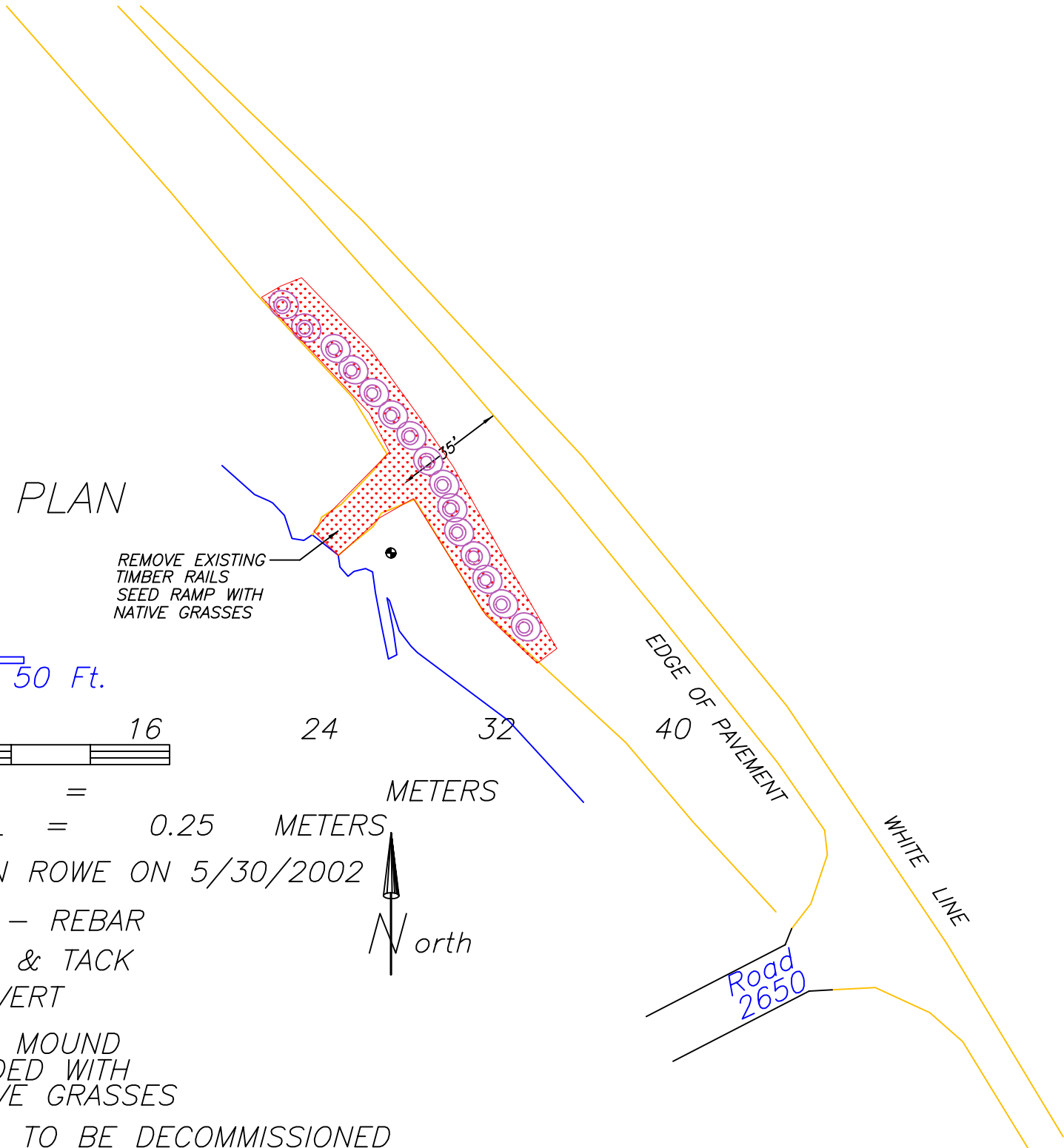


Figure 6.

McKenzie River Boat Launches Project Paradise Boat Launch

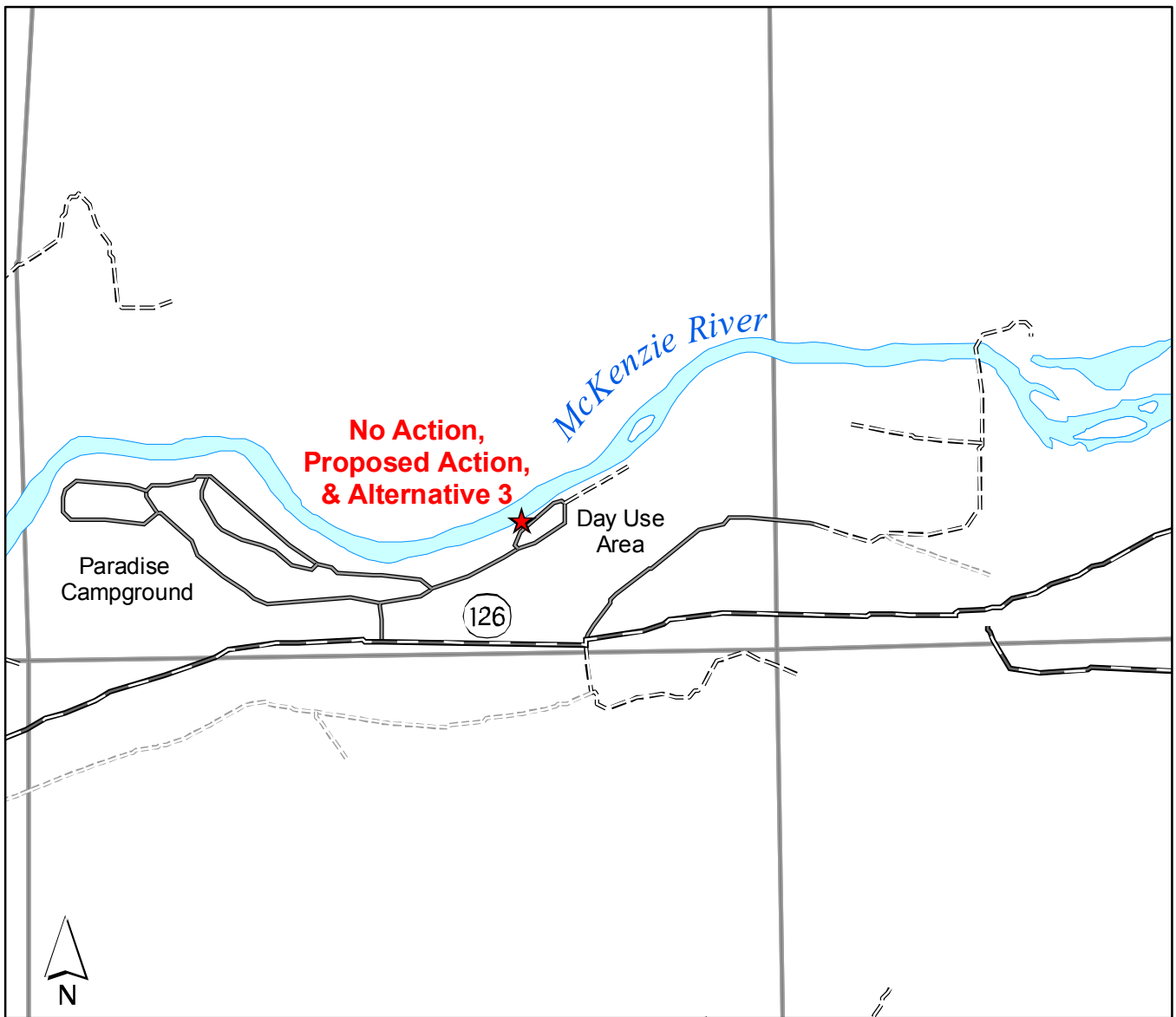


Figure 7.

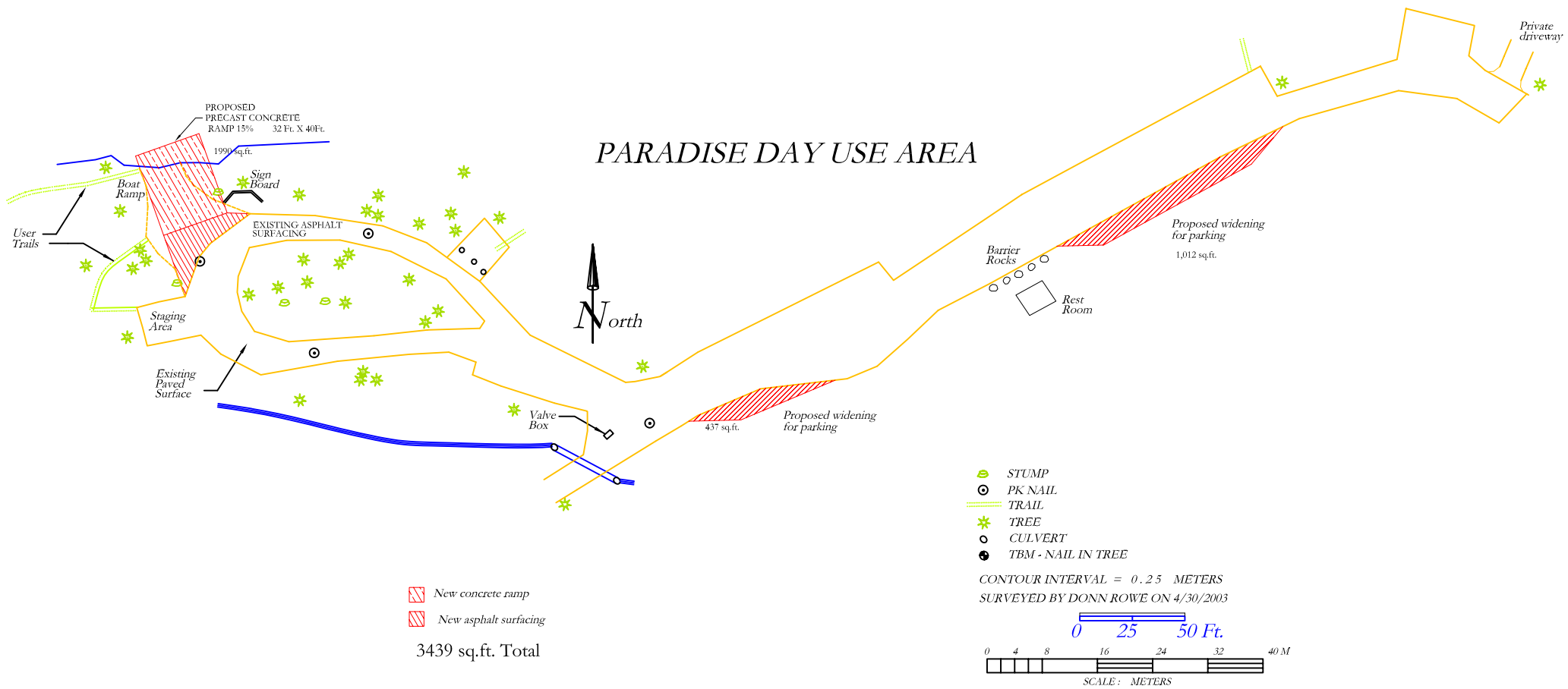


Figure 8.

McKenzie River Boat Launches Project Bruckart Boat Launch

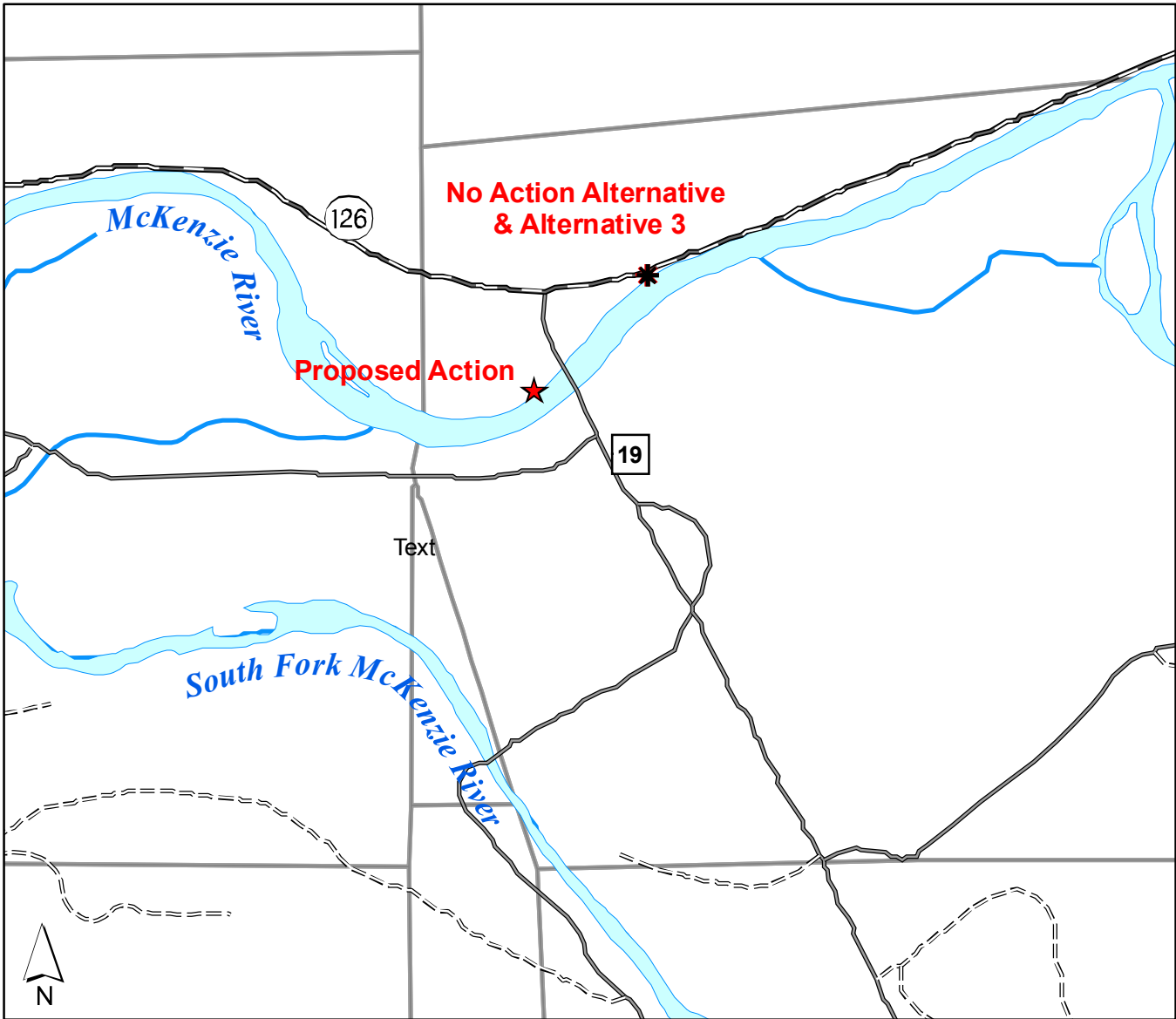


Figure 9.

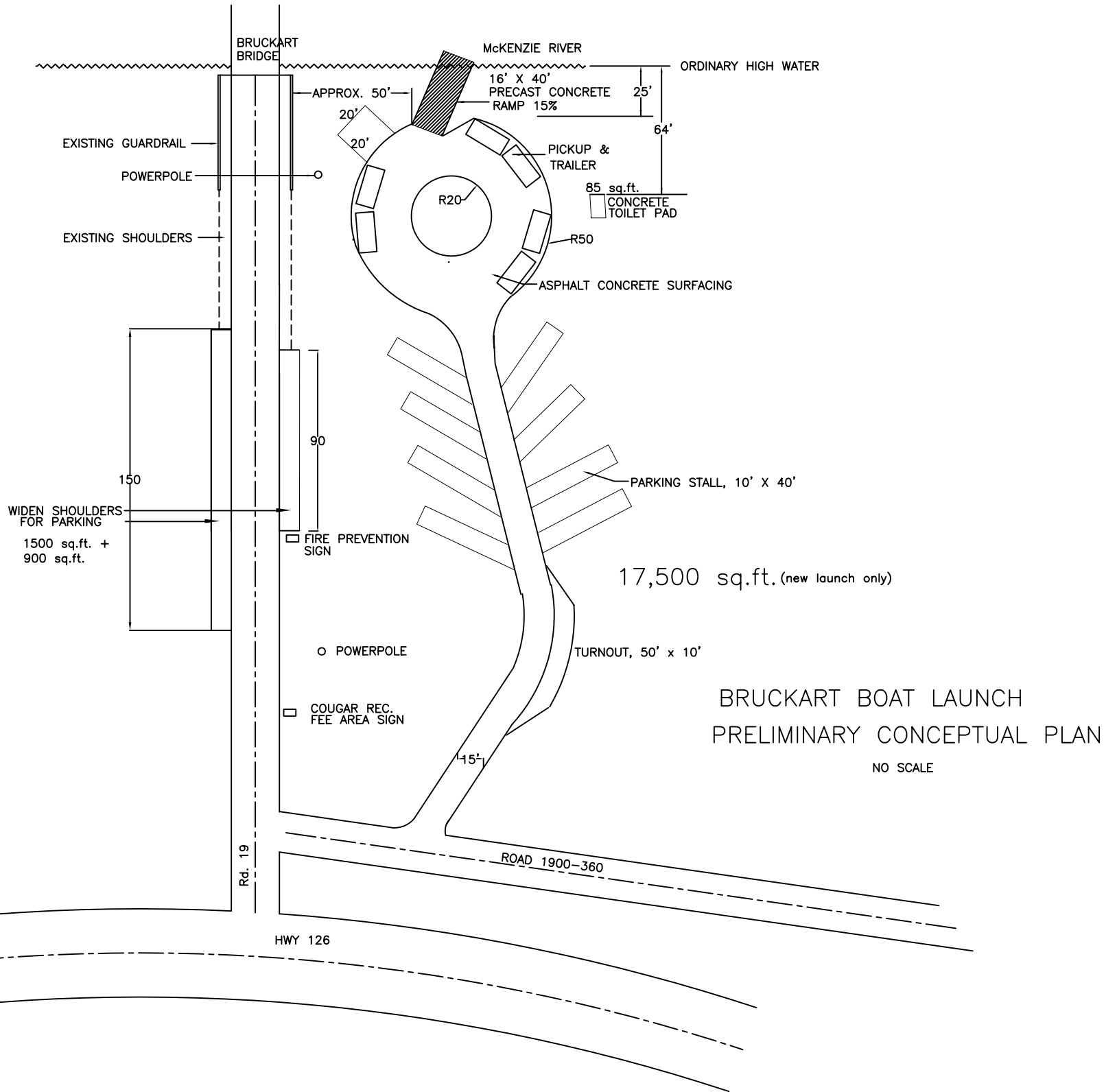
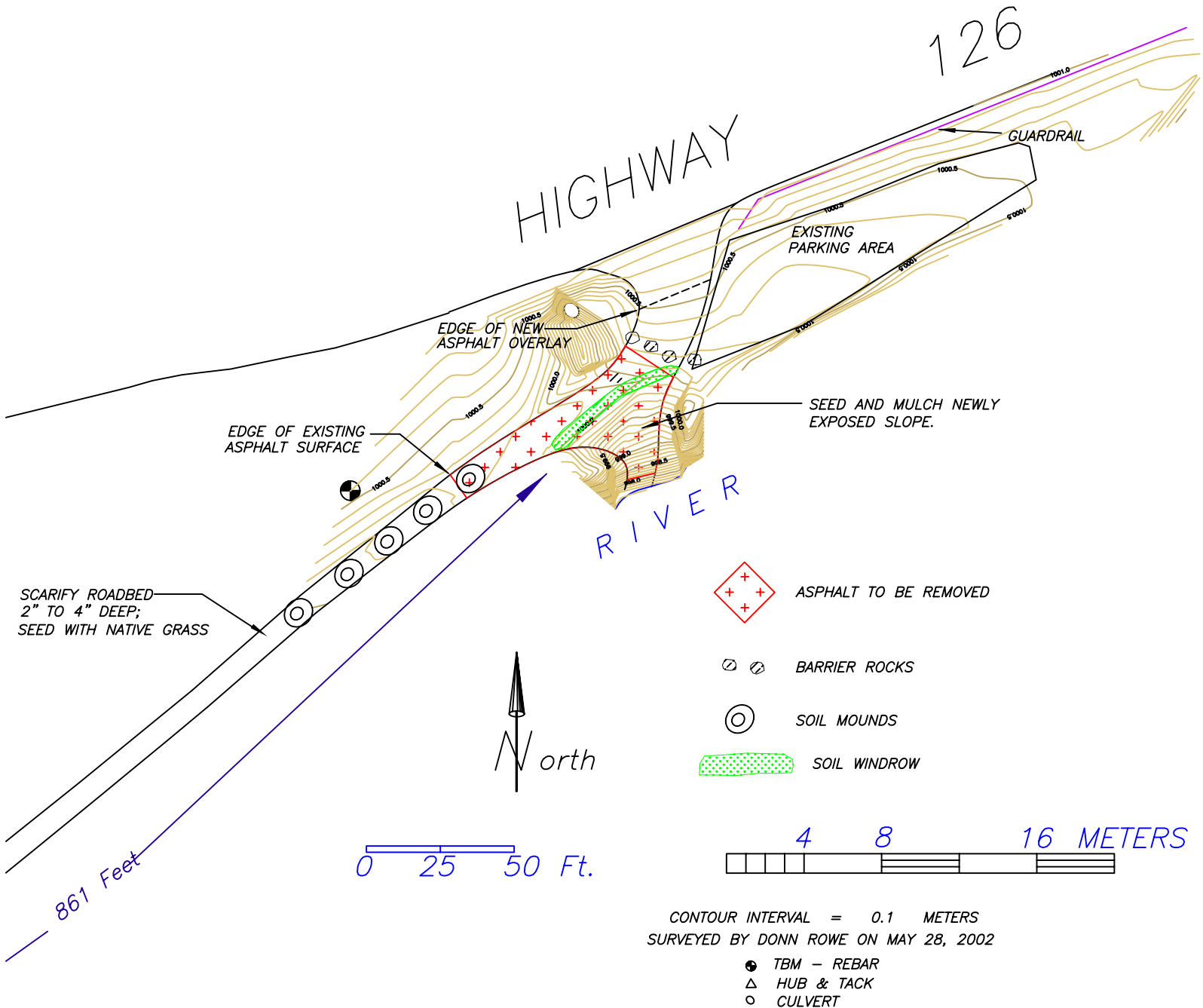


Figure 10.



EST. 10,000 SQUARE FEET
AREA TO BE DECOMMISSIONED

Figure 11.

Frissell Boat Launch Project Action Area

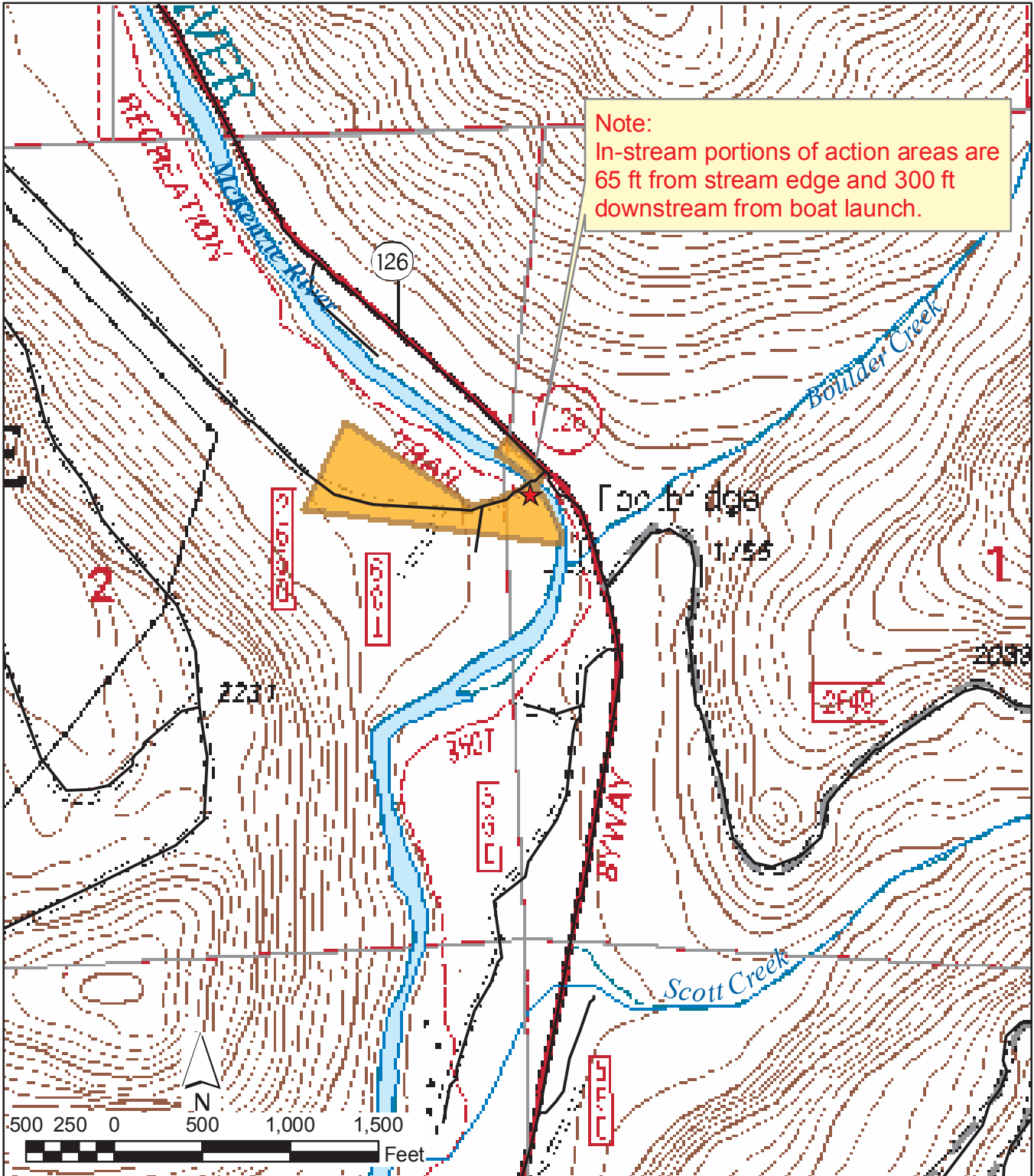


Figure 12.

Paradise Boat Launch Project Action Area

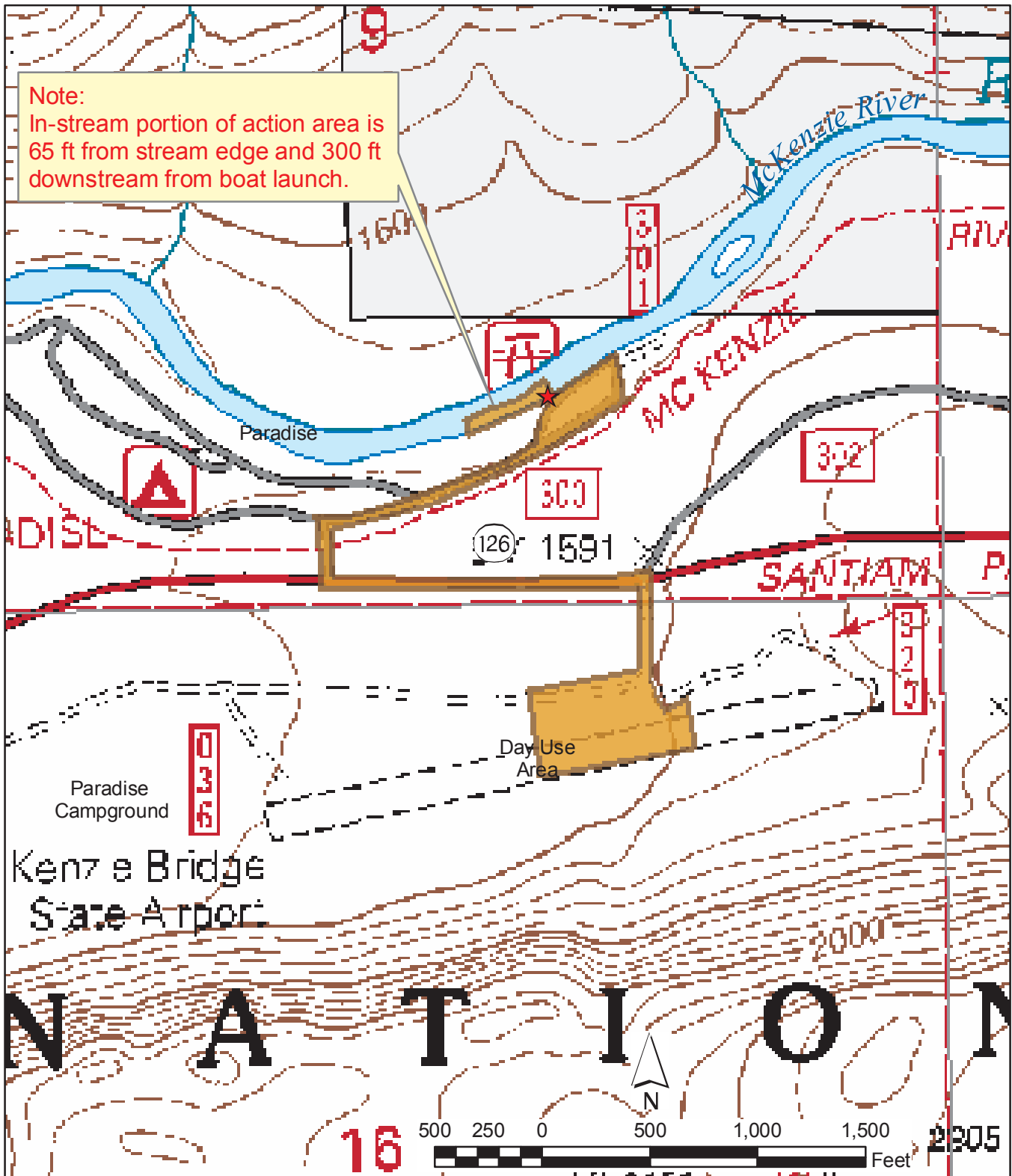


Figure 13.

Bruckart Boat Launch Project Action Area

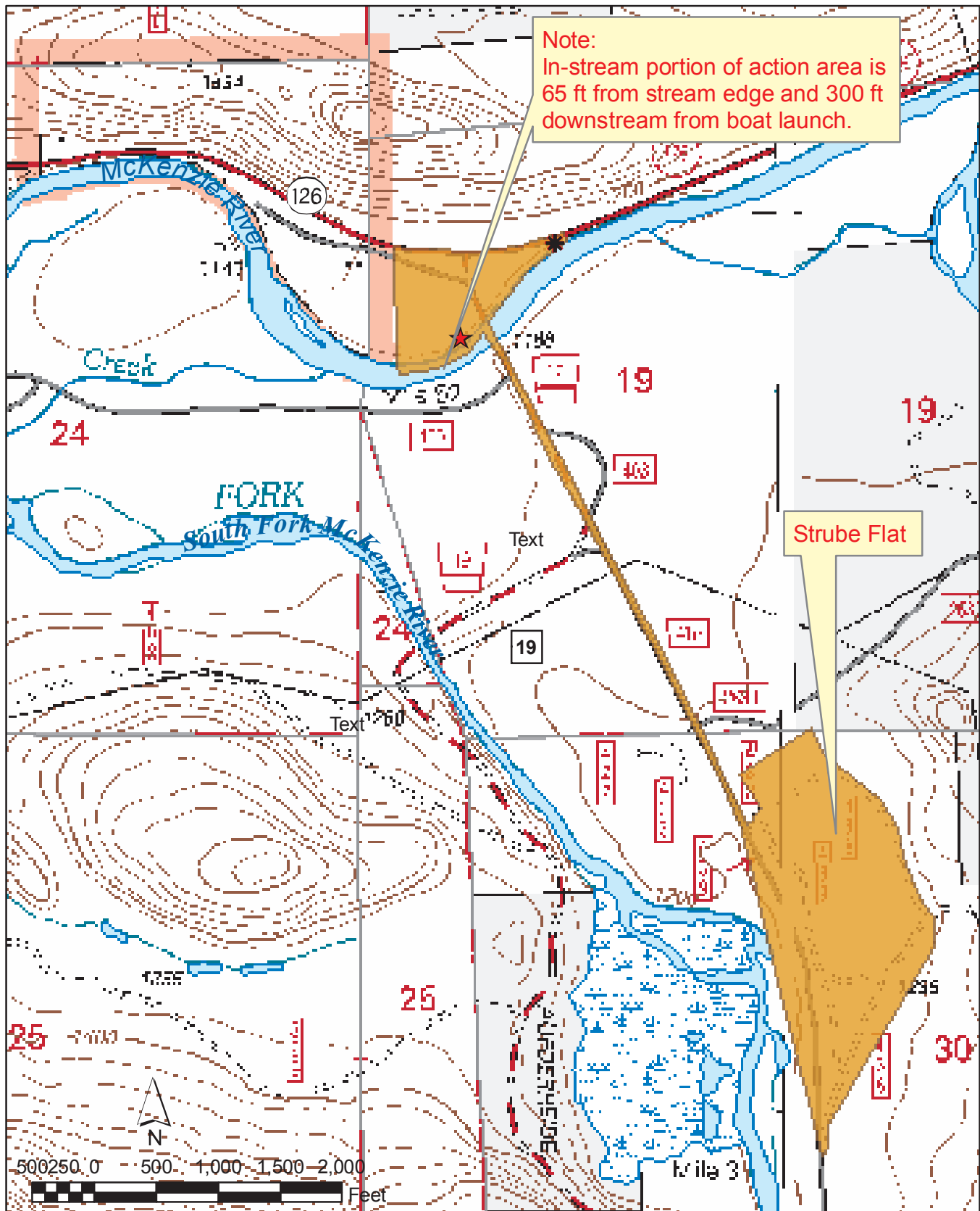
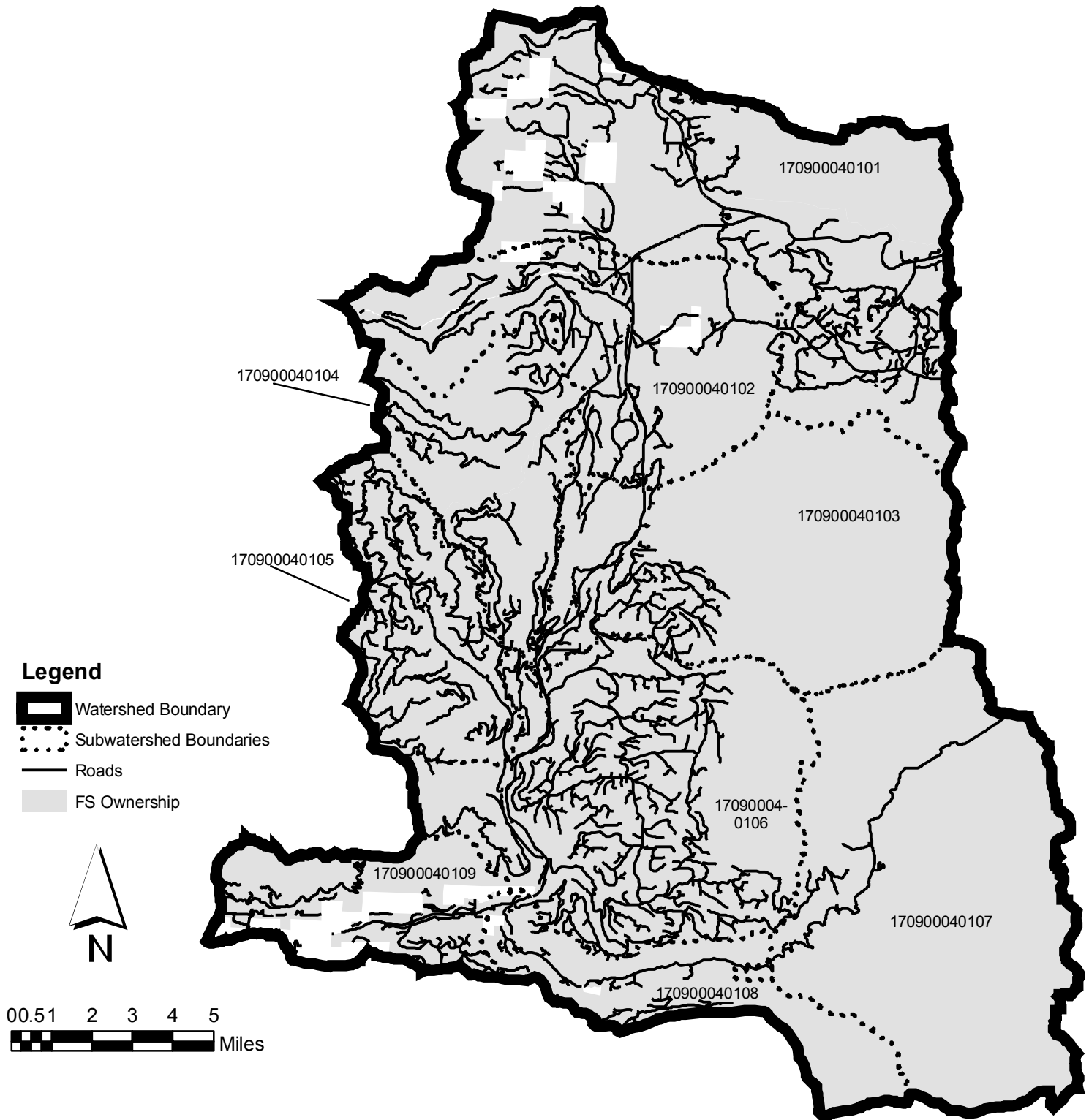


Figure 14.

UPPER MCKENZIE RIVER Watershed (1709000401) Roads



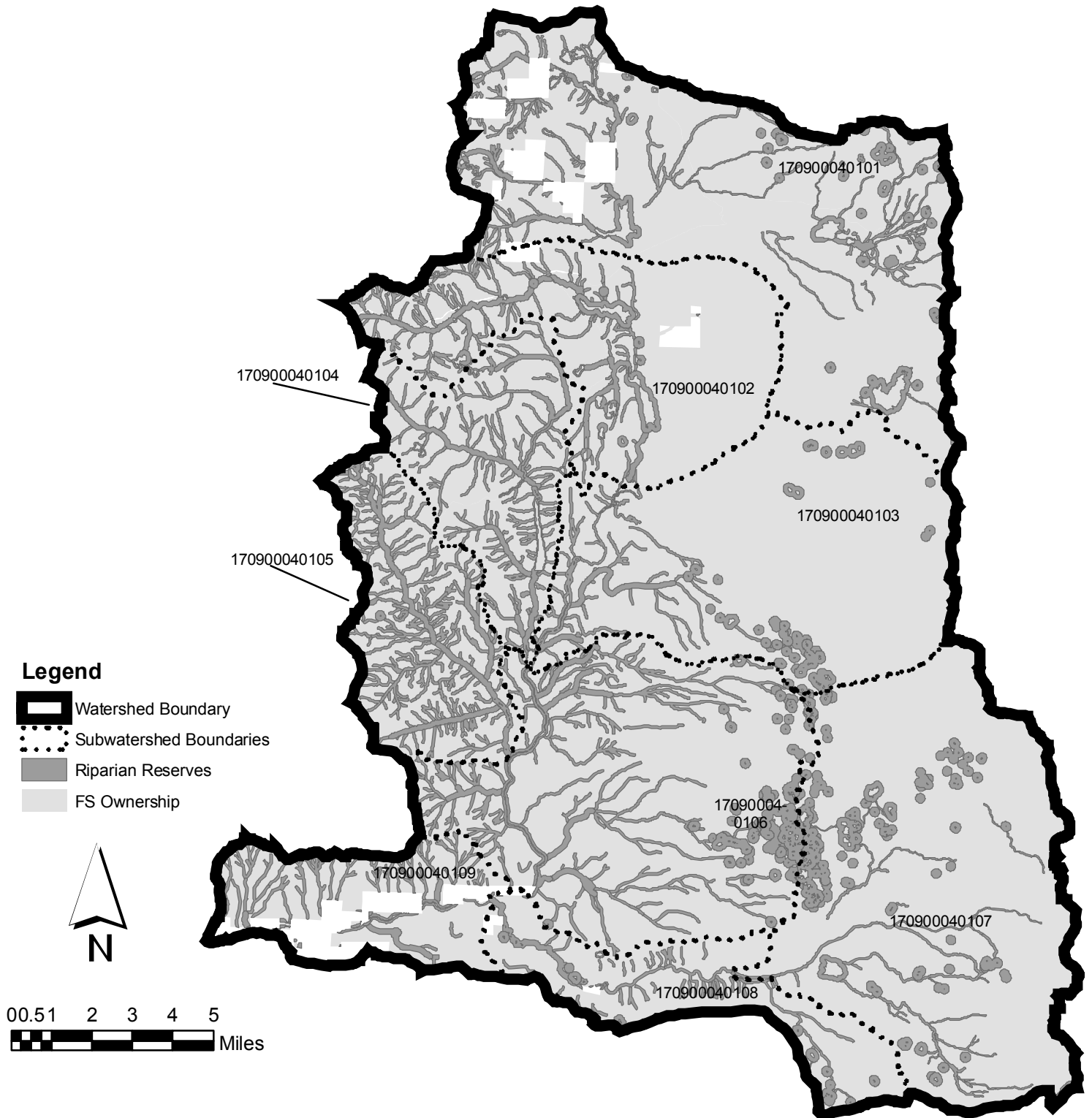
Legend

- Watershed Boundary
- Subwatershed Boundaries
- Roads
- FS Ownership



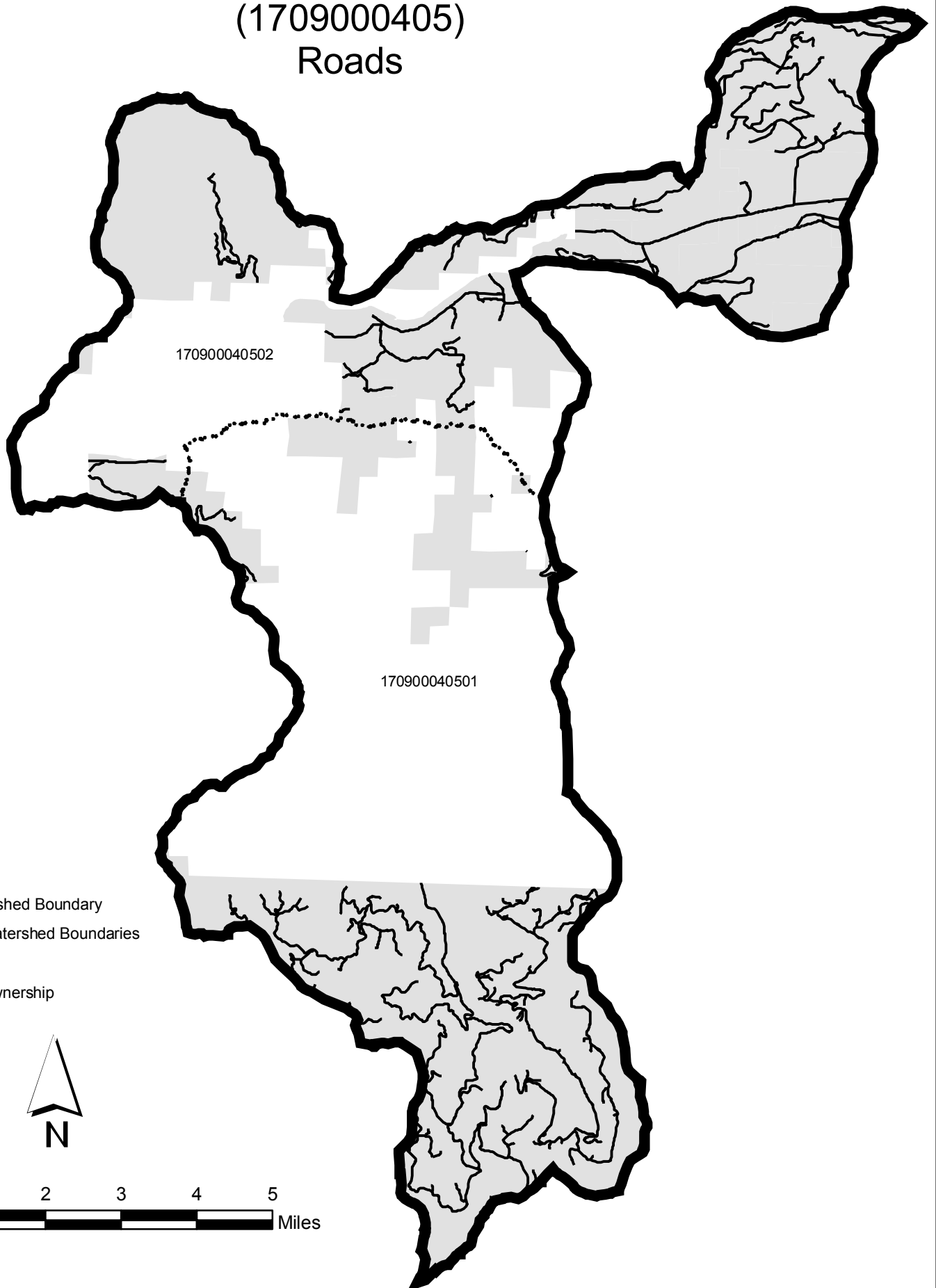
Figure 15.

UPPER MCKENZIE RIVER Watershed (1709000401) Riparian Reserves



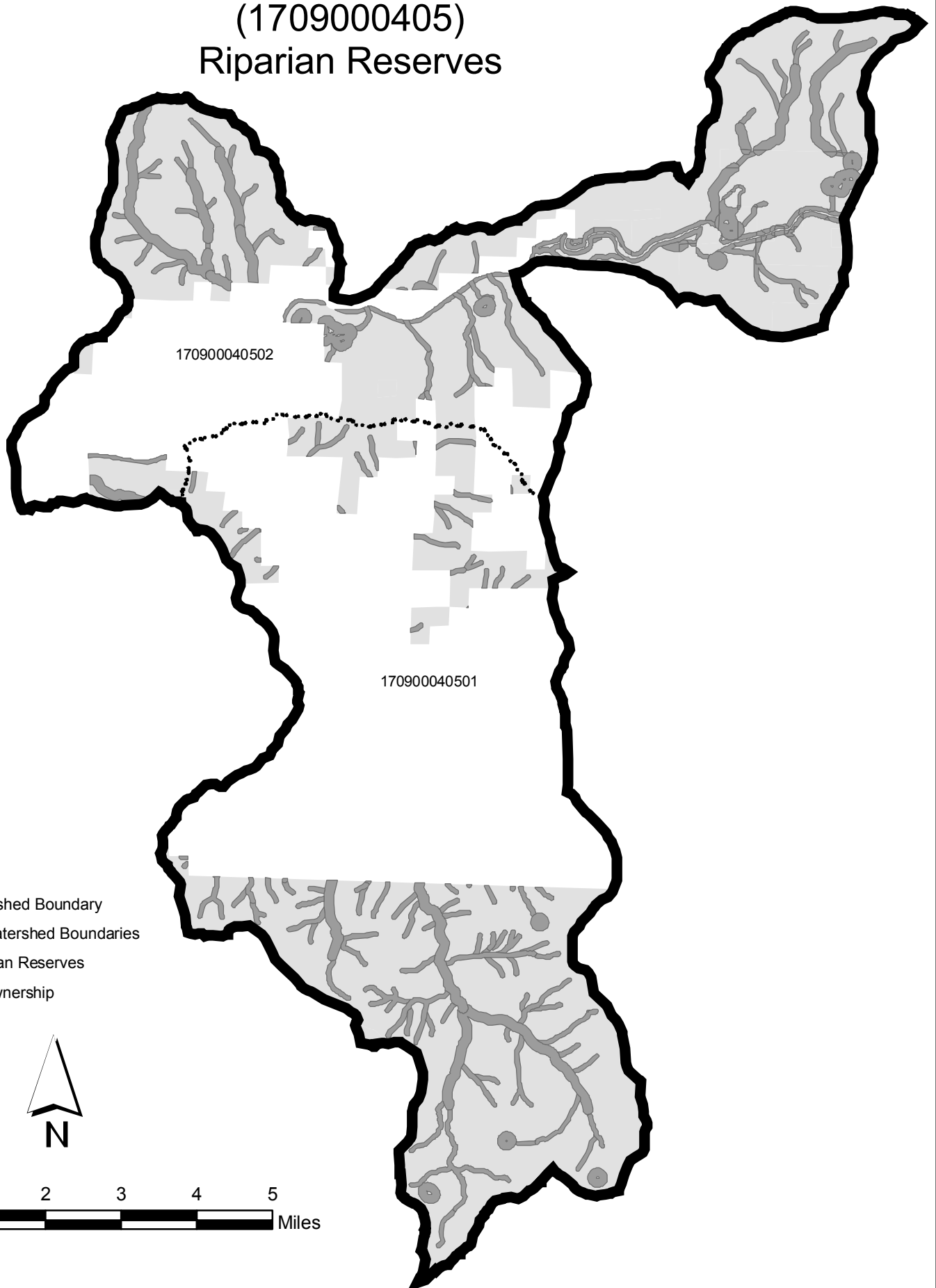
MCKENZIE QUARTZ CREEK Watershed (1709000405) Roads

Figure 16.



MCKENZIE QUARTZ CREEK Watershed (1709000405) Riparian Reserves

Figure 17.



Appendix B – Wildlife Biological Assessment

Appendix B

Upper McKenzie Boat Launch EA

Wildlife Biological Evaluation

Purpose/Location

The purpose of this Biological Evaluation is to review the McKenzie River Boat Launch Project in sufficient detail to determine whether the proposed action will result in a trend toward Federal listing of any sensitive wildlife species, or if the proposed action will affect wildlife species listed under the Endangered Species Act.

For specific project information, please refer to the Environmental Assessment and Analysis File.

Proposed Action and Purpose

The purpose of this project is to improve access, reduce safety hazards, and minimize sediment delivery to the river by reconstructing the Frissell, Paradise and Bruckart boat launches.

Summary of Mitigation Measures for Threatened, Endangered, and Sensitive (TES) Wildlife

There are no required wildlife restrictions for this project. Avoiding disturbing activities during the critical spotted owl breeding season March 1 – July 15 is recommended but not required as the closest owl activity center is over 0.5 miles away. Annual bald eagle surveys have failed to document any eagle nests or roosts in the project area. Avoiding disturbing activities in potential bald eagle habitat during the breeding season January 1 – August 31 is recommended but not required as the closest active bald eagle nest is over 2 miles away. The project is adjacent to Highway 126 and the McKenzie River which generate high levels of ambient noise.

Minimize damage to existing adjacent trees and vegetation during the project. Protection of the adjacent larger diameter trees and snags planned to be left shall be a priority when implementing the project.

Prefield Review

A prefield review of the proposed project area for wildlife species listed on the 2002 Regional Forester's List for the Willamette National Forest was conducted. There are no known threatened, endangered, or sensitive (TES) wildlife species located within the proposed McKenzie River Boat Launch project area. There is potential habitat for some species, however, and there are species located in the landscape that could be impacted directly by disturbance created during these activities or by the potential future habitat condition of the stands treated. Table 1 lists each TES species, the potential for effects from the proposed action, and mitigation measures necessary to alleviate potential effects.

Table 1: Summary of Impact Determinations for Wildlife Species on the Regional Forester's Sensitive Species List, Willamette National Forest. The Regional Forester is required to develop a sensitive species list under Forest Service Manual 2672.11. The Regional Forester's Sensitive Species List for Animals was last revised September 2002 (Forest Service Manual 2670 Interim Directive 90-1).

TES Species	Habitat present?	Impact/Required Mitigation
Least Bittern <i>Ixobrychus exilis</i>	No Habitat	NI
Bufflehead <i>Bucephala albeola</i>	No Habitat	NI
Harlequin Duck <i>Histrionicus histrionicus</i>	Habitat	NI
Yellow Rail <i>Coturnicops noveboracensis</i>	No Habitat	NI
Black Swift <i>Cypseloides niger</i>	No Habitat	NI
Tricolored Blackbird <i>Agelaius tricolor</i>	No Habitat	NI
Baird's Shrew <i>Sorex bairdii permiliensis</i>	Habitat	NI
Pacific Shrew <i>Sorex pacificus cascadenis</i>	Habitat Class III and IV streams	NI
California wolverine <i>Gulo gulo</i>	No Habitat	NI
Pacific Fisher <i>Martes pennanti</i>	Habitat	NI
Pacific Fringe-tailed Bat <i>Myotis thysanodes vespertinu</i>	No Habitat	NI
Townsend's Big-eared Bat <i>Corynorhinus townsendii</i>	Habitat	NI
Oregon Slender Salamander <i>Batrachoseps wrighti</i>	Habitat	NI
Cascade Torrent Salamander <i>Rhyacotriton cascadae</i>	Habitat	NI

TES Species	Proposed Action)	Impact/Required Mitigation
Foothill Yellow-legged Frog <i>Rana boylei</i>	No Habitat	NI
Oregon Spotted Frog <i>Rana pretiosa</i>	No Habitat	NI
Northwestern Pond Turtle <i>Clemmys marmorata marmorata</i>	No Habitat	NI
North American Lynx <i>Felis lynx canadensis</i>	No Habitat	NI
Northern Spotted Owl <i>Strix occidentalis</i>	Habitat	NE
Peregrine Falcon <i>Falco peregrinus anatum</i>	No Habitat	NI
Bald Eagle <i>Haliaeetus leucocephalus</i>	Habitat along haul road only	NE
Mardon Skipper <i>Polites mardon</i>	No Habitat	NI

NI / NE== No Impact for sensitive species. No Effect for TE species.

NLCT = May impact individuals or their habitat, but the action will Not Likely Contribute to a Trend towards Federal Listing or loss of viability to the population or species.

MANLAA=May Affect, Not Likely to Adversely Affect.

MCT = May impact individuals or their habitat, with a consequence that the action May Contribute to a Trend towards Federal Listing or a loss of viability to the population or species.

BI = Beneficial Impact.

Effects of the Proposed Project

There are no impacts/effects to any TES species with the implementation of Alternative 1, No Action.

Northern Spotted Owls: The boat launch areas are not currently providing spotted owl habitat. The project area is within three historic 1.2 mile radius northern spotted owl homeranges. The closest known activity center is over 0.5 miles away. A seasonal operating restriction from March 1-July 15 is recommended but not required. The project is adjacent to highway 126 and the McKenzie River and ambient noise levels are continually high. Alternatives 2 and 3 will have no effect on the northern spotted owl.

Bald eagles: The boat launch areas are not currently providing high quality bald eagle habitat. Noise generated from this project could disturb this species. Implementation of Alternatives 2 and

3 will not affect bald eagles. A seasonal restriction from January 1-August 30 is recommended but not required.

Harlequin ducks: There is no habitat for this species in the existing boat launches. However, riparian habitat adjacent to the boat launches may be suitable for harlequin duck dispersal. Implementation of Alternative 2 and 3 will not impact harlequin ducks.

No other TES wildlife species will be affected or impacted with this project.

Prepared by: /s/ Shane Kamrath, Wildlife Biologist
McKenzie River Ranger District
April 8, 2004

Table 2: Summary of Biological Background for Animal Species on the Regional Forester's Sensitive Species List, Willamette National Forest (September 2002).

Species	Habitat
BIRDS	
Northern Spotted Owl <i>Strix occidentalis caurina</i> <i>Status: Threatened</i>	Occur primarily in the interior of older timber stands with structure required for food, cover, nest sites, and protection from weather and predation. Reproductive habitat = forest w/ canopy closure 60 – 80%; multi-layered, multi-species canopy dominated by large overstory trees (> 30" dbh); abundant large trees w/deformities (e.g. large cavities, broken tops, dwarf-mistletoe infections, decadence); abundant large snags/down logs; and sufficient open flying space below the canopy. Foraging habitat = forest w/ > 2 canopy layers; overstory trees > 21" DBH; abundant snags/down wood; and a 60-80% canopy closure. Dispersal habitat = forest w/ > 11" DBH trees and > 40% canopy closure. Numerous nests recorded on the McKenzie River RD.
Northern Bald Eagle <i>Haliaeetus leucocephalus</i> <i>Status: Threatened</i>	Use scattered old-growth conifer trees in proximity to rivers, lakes, and reservoirs with plentiful prey. Feed primarily on fish, but will also eat waterfowl and carrion. On the McKenzie River RD, they currently nest at Clear Lake and Blue River Reservoir. There have been sightings at Trailbridge, Cougar, and Smith Reservoirs, Fish, Linton and Lost Lakes and along the McKenzie River.
American Peregrine Falcon <i>Falcon peregrinus anatum</i> <i>Status: Sensitive</i>	Preferred nesting sites are sheer cliffs 75 ft. or more in height. They forage within a variety of forest types. Numerous potential and occupied habitat occurs on the McKenzie River RD.
Least Bittern <i>Ixobrychus exilis</i> <i>Status: Sensitive</i>	Freshwater or brackish marshes with tall vegetation. Stalks through the weeds to find prey. Eats small fish, frogs, insects, small mammals, and sometimes bird eggs and chicks. Nests is small platform of sticks and live or dead vegetation, placed in cattails, bulrushes, or bushes 8-14" above water. Sightings of individuals at Fern Ridge and Salem. No recorded sightings or habitat on the McKenzie River RD.
Bufflehead <i>Bucephala albeola</i> <i>Status: Sensitive</i>	Summers on wooded lakes and rivers, winters on lakes and coastal waters. Nesting normally occurs near lakes in tree cavities 5-50 feet high. Dives underwater and eats small mollusks, fish, snail, and crustaceans. Also eats aquatic insects. Only documented wintering on McKenzie River RD.
Harlequin Duck <i>Histrionicus histrionicus</i> <i>Status: Sensitive</i>	During nesting (April-June) adults require fast-flowing water with one + loafing sites nearby, dense shrub or timber/shrub mosaic vegetation on the bank, and an absence of human disturbance. Nest on ground under the shelter of vegetation, rocks, or large woody debris. Midstream loafing sites are very important. Broods prefer low gradient streams with adequate macroinvertebrate abundance. Recorded breeding/foraging in tributaries to the McKenzie River and foraging in the McKenzie River.
Yellow Rail <i>Coturnicops noveboracensis</i> <i>Status: Sensitive</i>	Feeds in shallow water, eating snails, insects, and some seeds and grasses. Summers on wet meadows, marshes, winters on grasslands, fields, coastal marshes. No documented habitat on McKenzie River RD.

Species	Habitat
Black Swift <i>Cypseloides niger</i> Status: Sensitive	Found near cliffs in mountainous regions. Feeds on-the-wing eating flying insects. Nests in small colonies on ledges or mountain crevices, often behind a waterfall. There are historical summer records in the Santiam Pass area, Linn County, which suggests breeding in that area. No current sightings on the McKenzie River RD.
Tricolored Blackbird <i>Agelaius tricolor</i> Status: Sensitive	Found in freshwater marshes w/cattails and dense shrubs, grain fields. Feeds on the ground, eating insects, grains, and weed seeds. Nests in large colonies. Nest of coarse reeds and grasses lined with finer material placed in reeds above ground or water. Breeds locally in eastern Rogue Valley, S. Klamath Co, and mainly in north-central Oregon. Scattered summer reports in Willamette Valley. No documented sightings on the McKenzie River RD.
MAMMALS	
Baird's Shrew <i>Sorex bairdii permiliensis</i> Status: Sensitive	Not much is known of its habitat, but in 1986, 2 specimens were trapped from an open Douglas-fir forested area with numerous rotting logs in Polk Co. It has been trapped on the McKenzie River RD in the Mill Creek area and south as well as in the Blue River watershed.
Pacific Shrew <i>Sorex pacificus cascadenis</i> Status: Sensitive	Generally found in wet or marshy areas along class III-IV streams w/red alder-salmonberry-skunk cabbage and banks with abundant down material. Occasionally found in adjacent conifer forest w/moist abundant decaying logs and brush. Nests made of grasses, mosses, lichens, or leaves. Feed on slugs, snails, insects, and sometimes vegetation. No documented sightings on the McKenzie River RD.
Pacific Fisher <i>Martes pennanti</i> Status: Sensitive	Found in a wide variety of densely forested habitats at low to mid-elevations. Diet consists of small and medium-sized forest mammals (porcupines, snowshoe hares, tree squirrels, mice, and voles most common). Also eat carrion, and will seasonally eat birds, bird eggs, amphibians, fish, and insects. Use ground burrows, tree cavities, witches'-brooms or other clumped growth, or occasionally bird or small mammal nests as resting sites. Tree cavities are used by most maternal females with young and ground burrows are used mostly in winter. Data suggests they do better in areas with minimized fragmentation of old growth, second-growth, and riparian area and in areas with abundant down and standing woody material important. Few documented sightings on the McKenzie River RD, mostly in the higher elevations.
California Wolverine <i>Gulo gulo</i> Status: Sensitive	Found primarily in wilderness or remote country where human activity is limited. High elevation areas appear to be preferred in summer, which may effectively separate wolverines and intensive human disturbance in most areas. In winter, wolverines move to lower elevations which are snowbound with very limited human activity. They do not significantly use young, dense stands of timber or clearcuts. The majority of activity occurs in large expanses of scattered mature timber, with some use of ecotonal areas such as small timber pockets, and rocky, broken areas of timbered benches. Heavy use of openings w/ good winter populations of big game, a principal source of carrion which makes up much of the wolverine's diet. They also feed on marmots, snowshoe hares, various rodents, insects, insect larvae, eggs, and berries. Rare documented sightings on the McKenzie River RD, mostly at higher elevations.
Pacific Fringe-tailed Bat <i>Myotis thysanodes vespertinu</i> Status: Sensitive	Rare in Oregon. Very little known about habitat in Oregon. Three captured in 1971 were associated with young coniferous forest. They are known to use caves, mines, rock crevices, and buildings as both day and night roosts. Nothing is known about habits in winter. Diet of moths, leafhoppers, lacewings, daddy-loglegs, crickets, flies, true bugs, and spiders. No recorded sightings on the McKenzie River RD.

Species	Habitat
Canada Lynx <i>Felis lynx canadensis</i> Status: Threatened	At this time, the Regional Forester’s Sensitive Species List (2002) designated the lynx as suspected to occur on the Willamette National Forest. This species uses high elevation forested habitats that often coincide with populations of snowshoe hare. Forest conditions are generally lodgepole pine and subalpine fir.
AMPHIBIANS AND REPTILES	
Oregon Slender Salamander <i>Batrachoseps wrighti</i> Status: Sensitive	Live in forested areas, especially old-growth Douglas-fir and younger stands with abundant downed large logs. They lay their eggs under thick bark, inside a crevice in a log, or in talus. Juveniles and adults live under thick bark, inside partially decayed logs, or in debris piles around the bases of large snags. They also occur in moist talus w/ abundant woody debris. Documented sightings are scattered throughout McKenzie River RD at lower elevations.
Cascade Torrent Salamander <i>Rhyacotriton cascadae</i> Status: Sensitive	Live in very cold, clear springs, seeps, headwater streams, and waterfall splash zones. Forage in moist forests adjacent to these areas. Eggs are laid in rock crevices in seeps. Larve and adults live in gravel or under small cobbles in silt-free, very shallow water that is flowing or seeping. Adults may be found under debris on streambanks or in streamside forests and talus during rainy periods. Documented sightings from class IV stream headwater areas on McKenzie River RD.
Foothill Yellow-legged Frog <i>Rana boylei</i> Status: Sensitive	Live in sections of low-gradient streams with exposed bedrock or rock and gravel substrates. Attach eggs to the bottom of quiet scour-pools or riffles in gentle-gradient streams, often where there is only slight flow from the main river. Hatchlings cling to egg masses initially and then to rocks. Nearest known sightings are on private land adjacent to the Sweet Home RD to the northwest. No documented habitat or sightings on the McKenzie River RD.
Oregon Spotted Frog <i>Rana pretiosa</i> Status: Candidate for Federal Listing	Favor lakes and slow moving streams associated w/a permanent water source w/ a soft and muddy bottom. A marsh specialist w/strong preference/requirement for warmer waters; more aquatic than other ranids; often found in water or water’s edge floating on the surface or resting on aquatic vegetation. Diet is invertebrates caught above and below the surface. Early breeders: egg masses are typically deposited on top of one another in a communal fashion, not attached to vegetation, and deposited in warmer shallow water, making them susceptible to mortality due to freezing or drying. The only documented population on the McKenzie River RD occurs in and around Penn Lake in the Three Sisters Wilderness Area.
Northwestern Pond turtle <i>Clemmys marmorata marmorata</i> Status: Sensitive	Inhabits marshes, sloughs, moderately deep ponds, slow moving portions of creeks and rivers. Observed in altered habitats including reservoirs, abandoned gravel pits, stock ponds, and sewage treatment plants. Occur from sea level to about 1,830 meters. Require basking sites, such as partially submerged logs, vegetation mats, rocks and mud banks, and may even climb a short way onto tree branches that dip into the water. They use uplands for egg laying, overwintering, and dispersal. They may move up to 500 meters and possibly more for overwintering where they burrow into leaf litter or soil. Nest distances from the water course ranges from 3 meters to over 402 meters. Most nesting areas are characterized by sparse vegetation, usually short grasses or forbs. Documented sightings on the McKenzie River RD are in lower elevation side-channels of the McKenzie River.
INVERTEBRATES	
Mardon Skipper <i>Polites mardon</i> Status: Candidate for Federal Listing	The USFWS latest review indicated this species occurs in the Puget Sound and southern Cascades area of Washington, in the Siskiyou Mountains of Oregon, and in isolated remnants on serpentine grasslands in Del Norte County, California. They are not known to occur in this part of the Oregon Cascades. They generally occur in grassy openings in subalpine coniferous forests in mountain regions.

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Appendix B: Upper Mckenzie River Boat Launch Project EA Survey and Manage, Management Indicator Species, and Landbird Analysis April 8, 2004

Survey and Manage

The Record of Decision (ROD) for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (2001) amends the Northwest Forest Plan to provide a more efficient level of species protection. The ROD requires that all habitat altering projects consider their effects to Survey and Manage, Protection Buffer, and Mitigation Measure species. These species are expected to soon be covered under the Sensitive Species program.

Table 1: Survey and Manage, Protection Buffer, and Mitigation Measure Wildlife Species on the Willamette National Forest (ROD 2001, and updated with 2002 Annual Species Review results, March 2003). At the time of writing this document these species were covered under the Survey and Manage program. These species are expected to soon be covered under the Sensitive Species program.

SPECIES	Management Strategy	Habitat
Megomphix hemphilli (Linn and Marion Counties only)	A = Rare. Predisturbance surveys required. Manage known sites. 180' no-harvest buffer.	Forested areas with a hardwood component and down woody material
Megomphix hemphilli (S. of Linn/Benton Counties only)	F = Status Unknown. Strategic Surveys Required Only. Manage Known Sites. 180' no-harvest buffer.	Forested areas with a hardwood component and down woody material
Pristiloma arcticum crateris	B = Rare. Predisturbance Survey Required. Manage Known Sites. 180' no-harvest buffer.	Forested areas with a hardwood component and down woody material
Arthropods	F = Status Unknown. Strategic Surveys Required Only. 180' no-harvest buffer.	Unknown
Red Tree Vole	C = Uncommon. Predisturbance Survey Required. Manage High Priority Sites. 10 acre protection buffer.	Forested stands >10" DBH
Great Gray Owl	A = Rare. Predisturbance Survey Required. Manage Known Sites. 0.25 mile protection buffer on known site.	Mature stands near openings (natural or human-made)
Fringed myotis, silver-haired bat, long-eared myotis, long-legged myotis, and Townsend's big-eared bat.	Protect caves, abandoned mines, abandoned wooden bridges, and abandoned buildings.	Caves, mines, abandoned wooden bridges, and abandoned buildings.

SPECIES	Management Strategy	Habitat
Black-backed woodpecker	Manage snags to provide for 100% population levels	High elevation forests.
Pygmy nuthatch	Manage snags to provide for 100% population levels	High elevation forests.

Determination: Habitat for these species either does not occur in the project area or the activity is of a scope, scale, and intensity that the anticipated negative impact of the project on the habitat or life requirements of these species is so small as to not trigger a need to survey.

Management Indicator Species

Management Indicator Species (MIS) were addressed in the Willamette National Forest Plan (1990). They include the spotted owl, pileated woodpecker, marten, elk, deer, cavity excavators, bald eagles, peregrine falcons, and fish. Through Region-wide coordination, each Forest identified the minimum habitat distribution and habitat characteristics needed to satisfy the life history needs of the MIS's. Management recommendations to ensure their viability were incorporated into all WNF FSEIS Action Alternatives. This project meets applicable Standards and Guidelines from the WNF Plan. The amount or characteristics of habitat is not significantly changed with this project. With the 1996 and 2001 Amendments to the WNF Plan (i.e. the Northwest Forest Plan, NWFP), persistence for spotted owls, pileated woodpeckers, and marten was evaluated, and the FSEIS indicated persistent populations would be maintained under the NWFP Standards and Guidelines (Appendix J2). This project meets applicable Standards and Guidelines from the NWFP.

Migratory Landbirds

A January 11, 2001 Executive Order outlines the "Responsibilities of Federal Agencies to Protect Migratory Birds." Habitats vary broadly for this large group of species. The removal of standing trees and snags may unintentionally take individual migratory birds, but is not expected to have a measurable negative effect on bird populations because of the limited extent of the habitat removal. The seasonal restriction currently in place will restrict habitat-altering activities between March 1 through July 15, or August 30 if bald eagle surveys result in an extended seasonal restriction. This will reduce effects to nesting migratory birds, as well as non-migratory birds because most of them would have nested and fledged young by that time. Most primary and secondary cavity nesters complete nesting by the end of July (Oregon Breeding Bird Atlas 1995-1999).

/s/ Shane Kamrath
Wildlife Biologist

**Results of Prefield Review and Field Reconnaissance
for
Protection Buffer and
Survey and Manage Animal Species**

Willamette National Forest

Project Name: BOAT LAUNCH PROJECT

Location: Township 16S Range 5E and 6E

Is the project ground disturbing? Yes (if yes, then conduct survey if required by matrix) No
(if no, then document in project file)

Species	Habitat Present? Yes or N	Date Surveyed	Surveyors	Species Located	Additional Survey Needs? When and Where?
<i>Megomphix hemphi/li</i> Oregon megomphix	N/A	April 29, 2003 June 14, 2003	Shane Kamrath	No	No
<i>Pristiloma Articum</i> Crater Lake tightcoil	Yes	April 29, 2003	Shane Kamrath	No	No
<i>Strix nebulosa</i> Great gray owl	No	Surveys not required			
<i>Phenacomys (Arborimus)</i> Red tree vole	Yes	June 14, 2003	Shane Kamrath	No	No

As of January 2001, surveys for Oregon megomphix are only required in Linn County. This project is located in Lane county.

/s/ Shane Kamrath Date: 6/17/03
Wildlife Biologist

Appendix C – SHPO Concurrence Documentation

Project Review for Heritage Resources under the Terms of the 2004
 Programmatic Agreement among the USFS R6, ACHP, and SHPO
 June 2004

Forest:	Willamette
Ranger District:	McKenzie River
County:	Lane
Undertaking/Project Name	Upper McKenzie Boat Launch
USGS Quads:	Belknap Springs and Blue River 7.5, McKenzie Bridge 15'

By signing this document, the Forest Specialist certifies that for this project the Forest complies with Section 106 of the National Historic Preservation Act, under the terms of the 2004 Programmatic Agreement (PA) for the State of Oregon. This form shall be kept on file as supporting documentation

	Stipulation III (A) 1 Date:	Undertaking meets the criteria listed in Appendix A of the PA Inspection, monitoring, or other identification will be submitted to the Forest Specialist.
	Stipulation III(A)2 Date:	Undertaking meets the criteria listed in Appendix B of the PA. Inspection, monitoring, or other identification will be submitted to the Forest Specialist.
	Stipulation III(A)3	Undertaking meets the criteria listed in Appendix C (Exempt/Non-undertaking).
X	Stipulation III (B)1	Undertaking meets the criteria in the PA for a No Historic Properties Affected determination.
	Stipulation III(B)2	Undertaking meets the criteria in the PA for a Historic Properties Avoided determination.
	Stipulation III(B)3	The Forest has notified interested Tribes and persons, as appropriate, of the findings and made the findings available to the public.
	Stipulation III(B)5 Date:	No Adverse Effect (No Historic Properties Affected). The Forest finds that there are historic properties but the undertaking will have no effect on them as defined by 36 CFR 800.16(i). SHPO review period (30 days) required.

Appendix D – Botany Biological Evaluation



Date: 9 April 2004

File Code: 2670 Botany
Subject: BE for Boat Launch Reconstruction

I. Introduction

Purpose:

The purpose of this Biological Evaluation is to review the Boat Launch Reconstruction project in sufficient detail as to determine whether the proposed action will result in a trend toward Federal listing of any sensitive plant species.

Plant Species of Concern:

Current management direction mandates conservation of several categories of rare plants on the Willamette National Forest. Protection of Federally listed Threatened and Endangered species is mandated by the Endangered Species Act. No federally listed Threatened and Endangered, or Proposed plants, nor suitable habitat for these listed plants are known to occur in the project area. Sensitive species are protected by USDA Forest Service regulations and manual direction (FSM 2672.4).

Prefield reviews are conducted to determine which species from the Regional Foresters 2003 Sensitive Species List for the Willamette National Forest are known from the project area or have suitable habitat present and potentially occur in the project area. Results shown no known occurrences of sensitive plant species within the project area. There is potential habitat for three sensitive species in the project area (see Appendix A).

II. Description of the Proposed Project

Location:

This project is located on the McKenzie River Ranger District, Willamette National Forest. The boat launch locations are Frissell T16S, R6E, Sec 1, Paradise T16S, R6E, Sec 9, and Bruckart T16S, R5E, Sec 19.

Proposed Action and Purpose:

The McKenzie River Ranger District proposes to reconstruct boat launches at the Frissell, Paradise, and Bruckart launch sites. Currently, public launch facilities on the upper McKenzie River at Frissell, Paradise, and Bruckart sites are poorly designed and do not meet current and increasing demand for recreation access. Facilities are mostly compacted gravel and have slopes in excess of 15%, creating unstable conditions for pedestrians and vehicles. Due to deteriorating conditions there is a need to provide improved access, eliminate safety hazards, and minimize sediment delivery to the river.

III. Existing Environment

Survey Results:

A survey of the proposed project area for sensitive plants was conducted on June 9, 2003 and



July 9, 2003 by Susan Stearns. No sensitive plants were observed during the survey.

IV. Impacts of the Proposed Project

Direct and Indirect Impacts:

Implementation of this project will have no direct or indirect effect on sensitive plant species or their occupied habitat because they are not present in the project area.

Cumulative Effects:

The proposed action will have no cumulative effects on sensitive plant species or their occupied habitat because no sensitive plants are located within the project area.

V. Determination

It is my determination that implementation of this project will have no effect on sensitive plant species because no sensitive plants are located in the project area.

Prepared by: /s/Susan Stearns Date: 9 April 2004
Susan Stearns, Botanist
McKenzie River Ranger District

Appendix A: Willamette National Forest 2003 Sensitive Plant Species List

Species	Habitat Present in Project Area	Species Present in Project Area
<i>Agoseris elata</i>	N	N
<i>Arabis hastatula</i>	N	N
<i>Arnica viscosa</i>	N	N
<i>Asplenium septentrionale</i>	N	N
<i>Aster gormanii</i>	N	N
<i>Aster vialis</i>	N	N
<i>Botrychium minganense</i>	N	N
<i>Botrychium montanum</i>	N	N
<i>Botrychium pumicola</i>	N	N
<i>Calamagostis breweri</i>	N	N
<i>Carex livida</i>	N	N
<i>Carex scirpoidea var. stenochlaena</i>	N	N
<i>Cimicifuga elata</i>	Y	N
<i>Coptis trifolia</i>	N	N
<i>Corydalis aqua-gelidae</i>	Y	N
<i>Frasera umpquaensis</i>	N	N
<i>Gentiana newberryi</i>	N	N
<i>Iliamna latibracteata</i>	Y	N
<i>Lewisia columbiana var. columbiana</i>	N	N
<i>Lycopodiella inundata</i>	N	N
<i>Montia howellii</i>	N	N
<i>Ophioglossum pusillum</i>	N	N
<i>Pellaea andromedaefolia</i>	N	N
<i>Polystichum californicum</i>	N	N
<i>Potentilla villosa</i>	N	N
<i>Romanzoffia thompsonii</i>	N	N
<i>Scheuchzeria palustris var. americana</i>	N	N
<i>Sisyrinchium sarmentosum</i>	N	N
<i>Utricularia minor</i>	N	N
<i>Wolffia borealis</i>	N	N
<i>Wolffia columbiana</i>	N	N



Date: 9 April 2004

File Code: 2670 Plants
Subject: Supplemental Botany Report for Boat
Launch Reconstruction

This document serves as the Botanical Resource Report for the Boat Launch Reconstruction project on the McKenzie River Ranger District, Willamette National Forest. The boat launch locations are: Frissell T16S R6E Sec 1, Paradise T16S R6E Sec 9, and Bruckart T16S R5E Sec 19.

Sensitive Plants

A prefield review showed no known sensitive plant species in the project area. There is potential habitat for three sensitive plants. A survey of the project area was conducted by Susan Stearns on June 9, 2003 and July 9, 2003, no sensitive plant species were observed. Implementation of this project will have no effect on sensitive plant species or their habitat because no sensitive plant species are present in the project area.

Survey and Manage

This project is located within old-growth/late-successional habitat. There is potential habitat for survey and manage vascular plants, bryophytes, lichens or the fungus *Bridgeoporus nobilissimus*. The project areas was surveyed for S&M species at the same time as the sensitive plant surveys. No S&M vascular plants, lichens, bryophytes, or fungi were observed during the survey.

Noxious Weeds

This project poses a concern for the introduction of noxious weeds due to the ground disturbing nature of the project. The following measures will be used to mitigate the potential introduction of noxious weeds.

- Off road or ground disturbing equipment will be washed prior to entering National Forest land. Equipment will be free of all seed and debris that may contain plant seeds such as soil and vegetation.
- Material brought in to reconstruct the boat launches, such as fill soil and gravel, will be free of weeds and weed seed.

Revegetation

Ground that is adjacent to boat launches and is disturbed during implementation of this project will be planted with native vegetation to reduce the spread and introduction of noxious weeds. All plant material used for revegetation in the project will be native.

Prepared by: /s/Susan Stearns
Susan Stearns, District Botanist
McKenzie River Ranger District

Date: 9 April 2004



**Results of Prefield Review and Field Reconnaissance
for
Survey and Manage Plant Species
Willamette National Forest: FY 2003**

Project Name: Boat Launch Reconstruction
Launches

Unit #(s): Frissell, Paradise, and Bruckart

Township: _____ Range: _____ Section(s): _____

Is the project ground disturbing? Yes _____ (if yes, then conduct survey)
No _____ (if no, then document in project file)

Species	Habitat Present? (Y/N)	Date Surveyed	Surveyor(s) Name(s)	Species Located? (Y/N)	Additional Survey Needs? When and Where?
¹ <i>Botrychium minganense</i>	N	June 9, July 9, 2003	Susan Stearns	N	N
<i>*Botrychium montanum</i>	N	“	“	N	N
<i>Bridgeoporus nobilissimus</i>	N	“	“	N	N
<i>*Coptis trifolia</i>	N	“	“	N	N
<i>*Corydalis aqua-gelidae</i>	Y	“	“	N	N
<i>Cypripedium montanum</i>	N	“	“	N	N
<i>Dendriscoaulon intricatulum</i>	N	“	“	N	N
<i>*Eucephalus vialis</i>	N	“	“	N	N
<i>Hypogymnia duplicata</i>	N	“	“	N	N
<i>Leptogium cyanescens</i>	Y	“	“	N	N
<i>Lobaria linita</i>	N	“	“	N	N
<i>Nephroma occultum</i>	Y	“	“	N	N
<i>Pseudocyphellaria rainierensis</i>	Y	“	“	N	N
<i>Ramalina thrausta</i>	Y	“	“	N	N
<i>Schistostega pennata</i>	N	“	“	N	N
<i>Tetraphis geniculata</i>	N	“	“	N	N

Signature:

/s/ Susan Stearns
Botanist

9 April 2004
Date

¹ * Starred species are also on the Willamette NF Sensitive Species List



United States
Department of
Agriculture

Forest
Service

Willamette National Forest
McKenzie River
Ranger District

57600 McKenzie Highway
McKenzie Bridge, OR 97413
Tel (541) 822-3381
FAX (541) 822-7254_

File Code: 2670 Plants
Route To: Project Files

Date: February 9, 2007

Subject: Biological Evaluation Addendumem-Boat Launch Reconstruction

To: Ray Rivera Team Leader

Introduction

This report serves to supplement the April 9, 2004 Biological Evaluation prepared for Boat Launch Reconstruction Environmental Assessment.

This project is located on the McKenzie River Ranger District, Willamette National Forest. The boat launch locations are Frissell (T. 16 S, R. 6 E, Sec.1), Bruckart (T. 16 S, R. 5 E, Sec. 19) and Paradise (T. 16 S, R. 6 E, Sec. 9).

Prefield Review

A prefield review of the proposed project area for plant species listed on the Regional Foresters list for the Willamette National Forest was conducted in April 2004 and June 2006. No known sensitive plant populations were found during the prefield review. There is potential habitat for a number of plant species in the areas proposed for development. Attached is a copy of the sensitive plant list.

Survey Results

An intuitive controlled survey of the proposed project area for sensitive plants was conducted in April 2004. No sensitive plants were observed during the survey.

The project area was surveyed again in June 2006. No sensitive plants were found.

Effects Analysis

Implementation of this project will have no direct or indirect effect on sensitive plant species or their habitat because they are not present in the project area. The proposed action will have no cumulative effects on sensitive plant species or their habitat because no sensitive plants are located within the project area.

Determination

It is my determination that implementation of this project will have no effect on sensitive plant species because no sensitive plants are located in the project area.

Prepared by: _____
Burtchell Thomas, Botanist
McKenzie River Ranger District

Date: _____
February 9, 2007



Table 1: Summary of Potential Habitat and Presence for Sensitive Botanical Species

Species	Prefield Review	Species Presence
<i>Agoseris elata</i>	habitat not present	No
<i>Arabis hastatula</i>	habitat not present	No
<i>Arnica viscosa</i>	habitat not present	No
<i>Asplenium septentrionale</i>	habitat not present	No
<i>Aster gormanii</i>	habitat not present	No
<i>Boletus pulcherrimus</i>	habitat not present	No
<i>Botrychium minganense</i>	habitat not present	No
<i>Botrychium montanum</i>	habitat not present	No
<i>Botrychium pumicola</i>	habitat not present	No
<i>Bridgeoporus nobillissimus</i>	habitat not present	No
<i>Calamagrostis breweri</i>	habitat not present	No
<i>Carex livida</i>	habitat not present	No
<i>Carex scirpoidea</i> var. <i>stenochlaena</i>	habitat not present	No
<i>Castilleja rupicola</i>	habitat not present	No
<i>Chaenotheca subroscida</i>	habitat not present	No
<i>Cimicifuga elata</i>	habitat present	No
<i>Coptis trifolia</i>	habitat not present	No
<i>Cordyceps capitata</i>	habitat not present	No
<i>Cortinarius barlowensis</i>	habitat not present	No
<i>Corydalis aqua-gelidae</i>	habitat present	No
<i>Cudonia monticola</i>	habitat not present	No
<i>Dermatocarpon luridum</i>	habitat not present	No
<i>Eucephalis</i> (<i>Aster</i>) <i>vialis</i>	habitat not present	No
<i>Frasera umpquaensis</i>	habitat not present	No
<i>Gentiana newberryi</i>	habitat not present	No
<i>Gomphus kaufmanii</i>	habitat not present	No
<i>Gyromitra californica</i>	habitat not present	No
<i>Hypogymnia duplicata</i>	habitat not present	No
<i>Iliamna latibracteata</i>	habitat present	No
<i>Leptogium burnetiae</i> var. <i>hirsutum</i>	habitat not present	No
<i>Leptogium cyanescens</i>	habitat not present	No
<i>Leucogaster citrinus</i>	habitat not present	No
<i>Lewisia columbiana</i> var. <i>columbiana</i>	habitat not present	No
<i>Lobaria linita</i>	habitat not present	No
<i>Lupinus sulphureus</i> var. <i>kincaidii</i>	habitat not present	
<i>Lycopodiella inundata</i>	habitat not present	No
<i>Montia howellii</i>	habitat not present	No
<i>Mycenia monticola</i>	habitat not present	No

<i>Nephroma occultum</i>	habitat present	No
<i>Ophioglossum pusillum</i>	habitat not present	No
<i>Pannaria rubiginosa</i>	habitat not present	No
<i>Pellaea andromedaefolia</i>	habitat not present	No
<i>Peltigera neckeri</i>	habitat not present	No
<i>Peltigera pacifica</i>	habitat not present	No
<i>Phaeocollybia attenuata</i>	habitat not present	No
<i>Phaeocollybia dissiliens</i>	habitat not present	No
<i>Phaeocollybia pseudofestiva</i>	habitat not present	No
<i>Phaeocollybia sipei</i>	habitat not present	No
<i>Pilophorus nigricaulis</i>	habitat not present	No
<i>Polystichum californicum</i>	habitat not present	No
<i>Potentilla villosa</i>	habitat not present	No
<i>Pseudocyphellaria rainierensis</i>	habitat present	No
<i>Ramalina pollinaria</i>	habitat not present	No
<i>Ramaria amyloidea</i>	habitat not present	No
<i>Ramaria aurantiisiccescens</i>	habitat not present	No
<i>Ramaria largentii</i>	habitat not present	No
<i>Rhizomnium nudum</i>	habitat not present	No
<i>Romanzoffia thompsonii</i>	habitat not present	No
<i>Scheuchzeria palustris</i> var. <i>americana</i>	habitat not present	No
<i>Schistostega pennata</i>	habitat not present	No
<i>Scouleria marginata</i>	habitat present	No
<i>Sisyrrinchium sarmmentosum</i>	habitat not present	No
<i>Sowerbyella rhenana</i>	habitat not present	No
<i>Tetraphis geniculata</i>	habitat not present	No
<i>Tholurna disimilis</i>	habitat not present	No
<i>Usnea longissima</i>	habitat present	No
<i>Utricularia minor</i>	habitat not present	No
<i>Wolffia borealis</i>	habitat not present	No
<i>Wolffia columbiana</i>	habitat not present	No

ATTACHMENT 1: **Regional Forester's Sensitive Botanical Species List for the Willamette National Forest 2007.** Species of federal, state and local importance are included on the R-6 list.

Species	Occurrence on WNF	ONHP Status	State Status	Federal Status	Habitat Types
<i>Agoseris elata</i>	S	2			MM,DM
<i>Arabis hastatula</i>	D	1		SofC	RO
<i>Arnica viscosa</i>	S	2			RS
<i>Asplenium septentrionale</i>	S	2			RO
<i>Aster gormanii</i>	D	1			RS
<i>Boletus pulcherrimus</i>	D	1			CF
<i>Botrychium minganense</i>	D	2			RZ,CF
<i>Botrychium montanum</i>	D	2			RZ,CF
<i>Botrychium pumicola</i>	S	1	LT		HV
<i>Bridgeoporus nobilissimus</i>	D	1			CF
<i>Calamagrostis breweri</i>	D	2			MM,RZ
<i>Carex livida</i>	S	2			WM
<i>Carex scirpoidea</i>	D	2			RO
<i>var. stenochlaena</i>					
<i>Castilleja rupicola</i>	D	2			RO
<i>Chaenotheca subroscida</i>	D	3			CF
<i>Cimicifuga elata</i>	D	1	C		CF
<i>Coptis trifolia</i>	S	2			WM,CF
<i>Cordyceps capitata</i>	D	unlisted			CF
<i>Corydalis aqua-gelidae</i>	D	1	C		RZ,CF
<i>Cudonia monticola</i>	D	not listed			CF
<i>Dermatocarpon luridum</i>	S	3			RZ on rock
<i>Eucephalis (Aster) vialis</i>	S	1	LT	SofC	CF
<i>Frasera umpquaensis</i>	D	1	C		MM
<i>Gentiana newberryi</i>	D	2			MM
<i>Gomphus kaufmanii</i>	D	3			CF
<i>Gyromitra californica</i>	D	2			CF
<i>Hypogymnia duplicata</i>	S	3			CF
<i>Iliamna latibracteata</i>	S	2			CF,RZ
<i>Leptogium burnetiae</i>					
<i>var. hirsutum</i>	S	3			CF
<i>Leptogium cyanescens</i>	D	3			CF
<i>Leucogaster citrinus</i>	D	3			CF
<i>Lewisia columbiana</i>	D	2			RS
<i>var. columbiana</i>					
<i>Lobaria linita</i>	D	2			RO
<i>Lupinus sulphureus</i>					
<i>var. kincaidii</i>	S	1	LT	LT	MM,DM
<i>Lycopodiella inundata</i>	D	2			WM
<i>Lycopodium complanatum</i>	D	2			CF
Species	Occurrence on WNF	ONHP Status	State Status	Federal Status	Habitat Types
<i>Montia howellii</i>	D	4	C		RZ
<i>Mycenia monticola</i>	D	not listed			CF

<i>Nephroma occultum</i>	D	4			CF
<i>Ophioglossum pusillum</i>	D	2			WM
<i>Pannaria rubiginosa</i>	D	2			CF
<i>Pellaea andromedaefolia</i>	S	2			RO
<i>Peltigera neckeri</i>	D	not listed			CF
<i>Peltigera pacifica</i>	D	not listed			CF
<i>Phaeocollybia attenuata</i>	D	4			CF
<i>P. dissiliens</i>	D	3			CF
<i>P. pseudofestiva</i>	D	3			CF
<i>P. sipei</i>	D	3			CF
<i>Pilophorus nigricaulis</i>	D	2			RO
<i>Polystichum californicum</i>	D	2			RO
<i>Potentilla villosa</i>	D	2			RS, RO
<i>Pseudocyphellaria</i>					
<i>rainierensis</i>	D	4			CF,RZ
<i>Ramalina pollinaria</i>	D	2			CF, RZ
<i>Ramaria amyloidea</i>	D	2			CF
<i>R. aurantiiscescens</i>	D	4			CF
<i>R. largentii</i>	D	3			CF
<i>Rhizomnium nudum</i>	D	2			CF
<i>Romanzoffia thompsonii</i>	D	1			RS
<i>Scheuchzeria palustris</i>	D	2			WM
<i>var. americana</i>					
<i>Schistostega pennata</i>	D	2			CF
<i>Sisyrrinchium sarmentosum</i>	S	1	C	SofC	MM,DM
<i>Sowerbyella rhenana</i>	D	3			CF
<i>Tetraphis geniculata</i>	S	2			CF
<i>Tholurna disimilis</i>	D	2			CF
<i>Usnea longissima</i>	D	3			CF,RZ
<i>Utricularia minor</i>	D	2			SW
<i>Wolffia borealis</i>	S	2			SW
<i>Wolffia columbiana</i>	S	2			SW

Occurrence on Willamette National Forest:

- S = Suspected
- D = Documented

Oregon Natural Heritage Program (ORNHP):

- 1 = Taxa threatened or endangered throughout range.
- 2 = Taxa threatened or endangered in Oregon but more common or stable elsewhere.
- 3 = Species for which more information is needed before status can be determined, but which may be threatened or endangered (Review).
- 4 = Species of concern not currently threatened or endangered (Watch).

Oregon State Status:

- LT = Threatened
- LE = Endangered
- C = Candidate

Federal Status: These plant species were originally published as CANDIDATE THREATENED (CT) in the Smithsonian Report, **Federal Register**, July 1, 1975, or as PROPOSED ENDANGERED (PE) in a later report, **Federal Register**, June 16, 1976. The latest **Federal Register** consulted was dated September 30, 1993. Updated listings appear periodically in the Notice of Review (USFWS); the status of several species is categorized as follows:

- LE = Listed as an Endangered Species
- LT = Listed as a Threatened Species
- PE = Proposed as an Endangered Species
- PT = Proposed as a Threatened Species
- C = Candidate for Listing as Threatened or Endangered
- Sof C = Species of Concern; taxa for which additional information is needed to support proposal to list under the ESA.

Habitat Types:

- | | |
|----------------------------------|----------------------------|
| MM = Mesic meadows | RS = Rocky slopes, scree |
| WM = Wet meadows | RO = Rock outcrops, cliffs |
| DM = Dry meadows | DW = Dry open woods |
| RZ = Riparian zones, floodplains | HV = High volcanic areas |
| CF = Coniferous forest | SW = Standing water |

ATTACHMENT 2: Field reconnaissance survey levels for determining presence potential for TES species.

Level A:	Aerial photo interpretation and review of existing site records. Determination of the potential for a listed species to occur within the proposed project area. No field surveys completed.	
	Low potential:	Less than 40% potential for listed species inhabiting the project area.
	Moderate potential:	40-60% potential for a listed species inhabiting the proposed project area.
	High potential:	Greater than 60% potential for listed species inhabiting the proposed project area.
Level B:	Single entry survey of probable habitats. Areas are identified by photos and existing field knowledge. Field surveys are conducted during the season most favorable for species identification.	
	Low intensity:	Selected habitat surveys (approximately 5-10% of area) are conducted with a single entry for listed species inhabiting the proposed project area.
	Moderate intensity:	Selected habitat surveys (approximately 10-40% of area) are conducted with a single entry for listed species inhabiting the proposed project area.
	High intensity:	Selected habitat surveys (approximately 40-60% of area) are conducted with a single entry for listed species inhabiting the proposed project area.
Level C:	Multiple entry surveys are conducted for listed species likely to inhabit the proposed project area.	
	Low intensity:	Selected habitat surveys (approximately 5-10% of area) are conducted with repeated entries for listed species inhabiting the proposed project area.
	Moderate intensity:	Selected habitat surveys (approximately 10-60% of area) are conducted with repeated entries for listed species inhabiting the proposed project area.

High intensity:

Selected habitat surveys (approximately 60-80% of area) are conducted with repeated entries for listed species inhabiting the proposed project area.

ATTACHMENT 3:

**Conclusions Of Effects For Use In Biological Evaluations and Assessments
USDA Forest Service - Regions 1, 4, and 6
August, 1995**

Listed Species:

1. No Effect

Occurs when a project or activity will not have any “effect”, on a listed species, or critical habitat.

2. May Affect - Likely to Adversely Affect (LAA)

If the determination in the biological assessment is that the project May Affect - Likely to Adversely Affect a listed species or critical habitat, formal consultation must be initiated (50 CFR 402.12). Formal consultation must be requested in writing through the Forest Supervisor (FSM 2670.44) to the appropriate FWS Field Supervisor, or NOAA Fisheries office.

3. May Affect - Not Likely to Adversely Affect (NLAA)

If it is determined in the biological assessment that there are “effects” to a listed species or critical habitat, but that those effects are not likely to adversely affect listed species or critical habitat, then written concurrence by the FWS or NOAA Fisheries is required to conclude informal consultation (50 CFR 402.13).

4. Beneficial Effect

Written concurrence is also required from the FWS or NOAA Fisheries if a beneficial effect determination is made.

Requests for written concurrence must be initiated in writing from the Forest Supervisor to the State Field Supervisor (FWS or NOAA).

Proposed Species:

Whenever serious adverse effects are predicted for a proposed species or proposed critical habitat, conferencing is required with the FWS or NOAA Fisheries.

1. No Effect

When there are “no effects” to proposed species, conferencing is not required with FWS or NOAA.

2. Not Likely to Jeopardize the Continued Existence of the Species or Result in Destruction or Adverse Modification of Proposed Critical Habitat

This conclusion is used where there are effects or cumulative effects, but where such effects would not have the consequence of losing key populations or adversely affecting “proposed critical habitat”. No conferencing is required with FWS or NOAA if this conclusion is made. However, for any proposed activity that would receive a “Likely To Adversely Affect” conclusion if the species were to be listed, conferencing may be initiated.

3. Likely to Jeopardize the Continued Existence of the Species or Result in Destruction or Adverse Modification of Proposed Critical Habitat

This conclusion must be determined if there are significant effects that could jeopardize the continued existence of the species, result in adverse modification

or destruction of proposed critical habitat, and/or result in irreversible or irretrievable commitments of resources that could foreclose options to avoid jeopardy, should the species be listed. If this is the conclusion, conferencing with FWS or NMFS is required.

Sensitive Species:

1. No Impact (NI)

A determination of “No Impact” for sensitive species occurs when a project or activity will have no environmental effects on habitat, individuals, a population or a species.

2. May Impact Individuals or Habitat, But Will Not Likely Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability to the Population or Species (MIIH)

Activities or actions that have effects that are immeasurable, minor or are consistent with Conservation Strategies would receive this conclusion. For populations that are small - or vulnerable - each individual may be important for short and long-term viability.

3. Will Impact Individuals or Habitat With a Consequence That the Action May Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability to the Population or Species (WIFV)

Loss of individuals or habitat can be considered significant when the potential effect may be:

1. Contributing to a trend toward Federal listing (C-1 or C-2 species);
2. Results in a significantly increased risk of loss of viability for a species;
or,
3. Results in a significantly increased risk of loss of viability for a significant population (stock).

4. Beneficial Impact (BI)

Projects or activities that are designed to benefit, or that measurably benefit a sensitive species should receive this conclusion.

Appendix E – Wild and Scenic Rivers Act, Section 7 Analysis

Appendix E



United States
Department of
Agriculture

Forest
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File Code: 1950-1

Date: February 20, 2007

McKenzie River Boat Launches Project Wild and
Scenic River Section 7 Assessment

EXECUTIVE SUMMARY

This document summarizes the effects of the proposed McKenzie River Boat Launches Project on the McKenzie River. The boat launch sites in the project would directly affect the river because the concrete ramps would enter the river channel and affect the river bank and bed. This assessment reviews the effects of two launch sites found in the proposal: Frissell boat launch, and Paradise boat launch. Frissell is located in both the Federal Wild and Scenic River corridor and the Oregon State Scenic Waterway. Paradise is located in the Oregon State Scenic Waterway, but is not located in the Federal Wild and Scenic River corridor. A third boat launch found in the NEPA document, Bruckart boat launch, is not located in either the Federal or State designated corridors and is therefore not evaluated in this document.

Upper McKenzie Wild and Scenic River:

The upper McKenzie River is designated as a Wild and Scenic River (WSR) with a "Recreation" River Class, because it possesses numerous outstandingly remarkable values (ORV) such as: prominent recreational opportunities, spectacular scenery, unique geological and hydrologic attributes, outstanding water quality, and diverse fish populations and habitat. In 1992, the Upper McKenzie River Management Plan and accompanying Environmental Assessment was completed to comply with law established by the 1968 National Wild and Scenic Rivers Act. This comprehensive River Management Plan tiered to the 1990 Willamette Forest Plan.

The McKenzie River was designated from Clear Lake to Scott Creek, a 12.7 mile stretch. The upper terminus is established where the McKenzie River flows out of Clear Lake. The lower terminus is at the confluence of Scott Creek and the McKenzie River. The McKenzie River is divided into three WSR segments (A, B, and C) omitting the existing hydroelectric developments: Segment A is a 1.8 mile segment from Clear Lake to the head of maximum pool at Carmen Reservoir. Segment B is a 4.3 mile segment from a point 100 feet downstream from Carmen Dam to the maximum pool at Trail Bridge Reservoir. Segment C is a 6.6 mile segment from the developments at the base of the Trail Bridge Reservoir Dam to Scott Creek.

Federal management goals for the proposed project can be found in the Upper McKenzie River Management Plan (1992). The following are those that are directly applicable to this project:



- Protect the river's free-flowing character and maintain and enhance its outstandingly remarkable values and special attributes.
- Provide opportunities for a wide range of river-oriented recreation activities.
- Strive for a balance of resource use and protection, and permit other activities to the extent that they protect and enhance the river's outstandingly remarkable values and special attributes.

The Frissell boat launch is located within Segment C of the Upper McKenzie Wild and Scenic River.

Oregon State Scenic Waterway

Segments of the McKenzie River in the project areas are also within portions of the Oregon State Scenic Waterway, administered by the Oregon State Parks and Recreation Department. The Scenic Waterway Act and Commission rules require the evaluation of proposed development within ¼ mile from each side of the river. Concurrence of project effects to Oregon Scenic Waterway values with Oregon State Parks and Recreation Department will be necessary before project implementation can occur.

The termini and boundaries of the State Scenic Waterway designation are different from the Federal Wild and Scenic McKenzie designation. Approximately 16 miles of the upper McKenzie are designated as State Scenic Waterway. The boundaries are ¼ mile on both sides of the river. The upper terminus is established where the McKenzie River flows out of Clear Lake. The State Scenic Waterway omits the stretch from Carmen Reservoir to Tamolitch Falls, and also omits the hydroelectric developments. The lower terminus is Paradise Campground. The State Scenic Waterway has three unnumbered segments. The first is 1.8 miles from Clear Lake downstream to Carmen Reservoir. The second is approximately 2 miles long from Tamolitch Falls to Trail Bridge Reservoir. Finally, the third segment is approximately 12 miles long from Trail Bridge Dam downstream to Paradise Campground. The segments have a dual classification. The west side of the McKenzie River is classified as Scenic River Area, and the east side of the river is classified as Recreation River Area.

Goals of the State Scenic Waterway Program for this project can be found in the Upper McKenzie River Management Plan (1992). The following are those that are directly applicable to this project:

- To protect the free-flowing character of designated rivers for fish, wildlife, and recreation.
- To protect and enhance the scenic, aesthetic, natural, recreation, scientific, and fish and wildlife values along scenic waterways. New development or changes of existing uses proposed within a scenic waterway are reviewed before they may take place.

Frissell and Paradise boat launches both lie within the Oregon State Scenic Waterway. In the proposed action Frissell is relocated from the east side of the river (Recreation River classification) to the west side of the river (Scenic River classification), and the east side launch site would be closed and rehabilitated.

SECTION 7 DETERMINATION

Based on the analysis below, it is my finding that the proposed McKenzie River Boat Launches Project is consistent with Section 7 of the Wild and Scenic Rivers Act, and will have a direct effect on the river, but not an adverse effect on the values for which the river was authorized by Congress. The project is also consistent with the current Forest Land and Resource Management for the Willamette N.F. and the Record of Decision for Amendments of Land Management Planning Documents within the Range of the Northern Spotted Owl. The project is supported by the Upper McKenzie River Management Plan (1992). It is recognized that there will be short-term effects but that they are at an acceptable level. Free-flowing conditions will be maintained, and Outstandingly Remarkable Values will be maintained.

/s/ Mary Allison
MARY ALLISON
District Ranger

2/20/2007
Date

EVALUATION

The process outlined below follows the direction established by the Washington Office in 1994 as a "Procedure to Evaluate Water Resource Projects" (FSM 2354.7). The objective is to establish a uniform and consistent process to determine if projects would affect: 1) the free-flowing characteristics of the river and water quality, or 2) the values for which the river was established which are known as "Outstandingly Remarkable Values" (ORVs). ORVs are resource values that are unique, rare, or exemplary features of the Upper McKenzie River. The Upper McKenzie River is recognized for five ORVs: Scenic, Recreation, Geologic and Hydrologic, and Fish.

Members of the McKenzie River Ranger District evaluation team:

Dave Kretzing, Hydrology
John Harper, Recreation
Ramon Rivera, Fisheries
Phil Raab, Hydropower Coordinator

1) Define the Proposed Activity

The McKenzie River is a popular boating river and is used by people from the Willamette Valley as well as Central Oregon. Information collected during calendar year 2005 indicated that Paradise served 6,566 clients on commercial trips and 331 non-commercial clients; Frissell served 2,509 commercial clients and 190 non-commercial clients. Commercial use is conducted under a Special Use Permit system, and non-commercial use is determined by a voluntary boater registration card system.

Frissell boat launch is the most upstream of the two locations. It is on river left (looking downstream) just upstream of the Frissell-Carpenter (or Buck) bridge and is adjacent to Oregon State Highway 126 which is a National Scenic Byway in this location. The boat ramp is comprised of loose gravels with buttress logs, and is steep. It enters the river at a perpendicular angle into fast water.

Paradise boat launch is located within the Paradise campground and day use complex. It is located on river left and is comprised of compacted gravels with a paved approach. It enters the river at a perpendicular angle into slow water, and is located at the downstream end of a cobble bar.

The deteriorating conditions at these ramps, concerns about the steepness at the ramps, and concerns about the need to provide improved access were important considerations in developing the proposed action. In 2003, funds were provided by the Secure Rural Schools Community Self-Determination Act of 2000 to conduct an assessment of Frissell and Paradise boat launch sites to determine the effects of reconstructing or relocating these sites.

Legal description of the project: T.16S., R.6E., Sec. 1, Willamette Meridian; Lane County, Oregon (Frissell Launch), and T.16S., R.6E., Sec. 9, Willamette Meridian; Lane County, Oregon (Paradise Launch). See Figures 1 and 2 in the Environmental Assessment for this project.

Purpose and Need for Action

The purpose and need for action is to provide developed recreation opportunities in the upper McKenzie River that are compatible with individual management area objectives and sensitive to public demand and use, as directed by the 1990 Willamette National Forest Land and Resource Management Plan, as amended. Alternative designs should consider current demand for boat launch facilities on the upper McKenzie River from the recreating public, for both private river trips and with permitted, special-use river guides. In addition, the Upper McKenzie River Management Plan (1992) supported the development of a Capital Investment Program proposal for Buck Bridge (Frissell) dispersed recreation area. This would entail re-establishment of restroom facilities, consideration of building a new boat launch on the west side (river right) of the McKenzie, and closing the boat launch on the east side (river left) of the McKenzie.

The boat launch ramps at the sites are constructed with mostly compacted gravel and have slopes in excess of 15%, creating unstable conditions for pedestrians and vehicles attempting to launch boats and inflatable rafts. Each year, fluctuations in river level and flow velocity remove gravel at the ramps and they typically require annual maintenance to replace gravel. This is especially true at Frissell because it is subjected to the main current in the river.

Proposed Action

The District Ranger of the McKenzie River Ranger District proposes to relocate the Frissell boat launch to the west side of the river, decommission the existing Frissell site on the east side of the river, and reconstruct the existing boat launch at Paradise.

The following actions are proposed at Frissell Boat Launch:

- Construct a new launch site by placing a pre-fabricated concrete ramp in a new location across the McKenzie River from the current site, and downstream from the Frissell-Carpenter Bridge. In addition, the existing boat launch site would be decommissioned and rehabilitated (see Figure 3 of Appendix F in the EA for this project).
- The new ramp would be approximately 16 feet wide by 40 feet long (640 square feet) and would extend into the river approximately 10 to 15 feet (up to 240 square feet of concrete pad in river channel). In addition, a paved access road, loop road, staging area, and a concrete toilet pad for a “porta-pottie” would be constructed at the new boat launch location. The total approximate area of disturbance for these actions is 10,936 square feet (see Figure 4 of Appendix F in the EA for this project).
- Approximately 12 to 20 red alder trees would need to be removed from the floodplain where the new ramp will be placed. The cut alders would be spread in the floodplain to serve as down woody material. Approximately 30 Douglas-fir will need to be cut, 18 Western red cedar, 4 Western hemlock, 4 big leaf maple, and Pacific yew trees on the terrace would need to be felled to construct the access and loop road, staging area, and toilet pad. Those trees that are suitable for fish habitat enhancement projects would be

staged in a location separate from the new launch location and used in future projects. Those trees that were not suitable would be spread out in the terrace area to serve as down woody material. All stumps would be flush cut.

- Improve two pull outs along Forest Road 2650 to provide parking for vehicles and trailers. Improvement is defined as blading the existing shoulders to ensure proper drainage and safety, conducting some brushing, and adding aggregate. These pullouts are currently disturbed ground and no new fill will be required to improve them. These existing pull outs are approximately 50 feet in length and 90 feet in length, and they are 10 feet wide (total area of 1,593 square feet – this figure includes “tapers” on the pullouts). Since no new ground would be disturbed to improve these pull outs (i.e. they are already disturbed ground) the square footage of “improvement” is not included in the total area of disturbance (see Table 1).
- Decommission the existing boat launch on river left and restore the river bank and a portion of the terrace. The existing buttress logs and cable would be removed from the site. A portion of the existing pull-out access would remain along State Highway 126 for motor vehicles (see Figure 5 of Appendix F in the EA for this project).
- Rehabilitate the decommissioned boat ramp location and a portion of the highway pullout. This will be accomplished by grass seeding the old ramp site with native grasses and red alder, planting vine maple trees, big leaf maple, and conifers (Douglas-fir or Western red cedar depending on what is available). The vegetation will be monitored thru the seasons (for up to 2 years) and if the site requires additional seeding or tree planting due to mortality or for any other reason, it will take place during the appropriate planting season. The large pull out will be rehabilitated by importing topsoil and shaping it into hummocks. These hummocks will be seeded with native grass and will serve as a barrier between the highway and the river by acting as a soil filter. Vegetated hummocks are desired since this is a Federal Scenic Byway, and they will keep vehicles from driving onto the area (see Figure 5 of Appendix F in the EA for this project).
- The total approximate area of decommissioning for these actions is 2,670 square feet.

The following actions are proposed at Paradise Boat Launch (see Figure 6 of Appendix F in the EA for this project):

- Place a pre-fabricated concrete ramp at the existing site that is wide enough to serve as two ramps and would have a decreased gradient relative to the existing ramp (see Figure 7 of Appendix F in the EA for this project). The ramp would be 40 feet by 32 feet (1,280 square feet). The approach road is currently paved so the only new paving expected at the ramp will be the apron in order to connect the loop road to the concrete ramp (approximately 710 square feet of new pavement). The ramp would extend into the river approximately 10 to 15 feet (up to 480 square feet of concrete pad in river channel). The total area at the ramp site that would be concrete and asphalt is approximately 1,990 square feet.

- No trees would need to be cut to place the new boat ramp however an existing tree stump would need to be removed from the river bank. This stump was a “danger tree” directly adjacent to the existing ramp and was felled in the past.
- Relocate approximately 20 small boulders (16 inches to 24 inches in diameter) that would block use of the extended ramp width during low flow months. This will be accomplished by utilizing an excavator to place these small boulders further into the channel where the river can mobilize and relocate them. The excavator would have to wade approximately 25 feet into the river to accomplish this task. The river is approximately 145 feet wide in this location.
- Provide additional road side parking in the day-use area (see Figure 7 of Appendix F in the EA for this project). These sites are approximately 125 to 150 from the river and currently serve as parking spaces that are not paved. This “additional” road side parking would formalize the areas by paving the bare sites. Some small trees less than 6 inches in diameter (big leaf maple, Western hemlock, and vine maple) would need to be cut. The additional areas would be 50 feet by 10 feet, and 80 feet by 10 feet which will increase the impervious area in the Paradise day use area by 1,449 square feet (this figure includes “tapers” on the pullouts).
- Designate an additional staging area close to the launch area (see Figure 7 of Appendix F in the EA for this project). This will be accomplished by signing an area that is currently not vegetated (it is a former historic camp site established by the CCC). No aggregate would be placed on this staging area, and no real “on the ground” changes will occur except for signing to designate it as a staging area.
- Improve an existing user trail that is within bankfull width by placing spawning size gravels (1 to 3 inch), and trim riparian vegetation. This user trail is approximately 20 feet away from the river during base flow conditions. The rationale for placing spawning size gravel on the trail is due to its location within bankfull width. If/when floods mobilize gravel on the user trail, it will at least be appropriate for spawning in whatever location the river places it. The riparian vegetation that needs to be trimmed is along the user trail and is comprised of alders and vine maple.

Table 1. Summary of Project Area Impacts in Proposed Action^a

Site	Total Impact in Square Feet	Total Decommissioned in Square Feet	Total Concrete Ramp in Bankfull Width in Square Feet ^b	Cubic Yards of Riprap
Frissell	10,936	2,670	240	0
Paradise	3,439	0	480	0

^a These figures are approximate as designs are conceptual, and they represent a “worst case scenario.” That is, the total area impacted will likely be less and the total area restored will likely be greater.

^b This figure is included in the “total impact” column and represents the amount of ramp that would be “in the water” during bankfull flow conditions.

Construction, reconstruction, and decommissioning activities would likely occur during calendar years 2008 through 2011, depending on funding.

At Frissell, construction of a new site could take 1 to 3 months depending on environmental factors (wet conditions or extreme fire danger). Activities on the terrace would take place during the summer (July through September) and instream work would take place during established work periods (July 1 through August 15). Instream activities would likely take only one day of work. Decommissioning and rehabilitation of the existing boat launch site would take one day of work, and vegetative conditions would be monitored for two years to ensure establishment.

At Paradise, terrace work would take place during the summer months (July through September) and instream work during the established period (July 1 through August 15). Work on the parking sites and ramp approach should only take a week since paved roads and a paved approach already exist. Instream work should only take one day.

2) Describe How the Proposed Activity Will Directly Alter Within-Channel Conditions.

The Proposed Action would have direct impacts on the river channel due to the placement of a pre-fabricated concrete ramp. There would be approximately 240 square feet (ft²) of boat ramp in the river channel at Frissell, and 480 ft² at Paradise at the same approximate grade as the existing channel configuration. No riprap would be required to protect ramps in the Proposed Action.

The Proposed Action is not of the scope or magnitude that it could affect channel geometry, channel slope, or channel form. However, since the Proposed Action would rehabilitate the existing launch site at Frissell which is on the erosive side of the river (i.e. on the outside bend) there would be a reduction in amount of sediment entering the channel due to the need for maintenance. The new ramp location would be on the depositional side of the river (on the inside bend) and would not cause an increase in sediment delivery from the uplands or due to maintenance.

At Paradise the existing ramp site is on the downstream end of a gravel bar in slow water. No riprap is currently needed to protect the site, and none would be needed for reconstruction. The river bank where the extension of the boat ramp would occur is in a disturbed condition due to the presence of a sign board, and compaction due to foot traffic associated with the ramp. The activity is not of the scope or magnitude that it could affect channel geometry, channel slope, or channel form.

During placement of the pre-fabricated boat ramps it is likely that a short term turbidity pulse would occur. Based on a past project at the McKenzie Bridge Campground boat ramp, it is expected that this turbidity pulse would be measured in hours (not days), and would extend downstream less than 100 feet hugging the bank where the activity occurs. This would meet the requirements of the Willamette National Forest's Best Management Practices.

Stream temperatures could potentially be affected by the removal of riparian vegetation. However, this was not considered a significant issue that would drive an alternative. This is because canopy removal would be limited spatially if required at all. Specifically, at each boat launch location:

- Frissell Boat Launch – The activities will take place on the southwestern terrace in a river bend. Individual trees removed at this site on the terrace would include Douglas-fir and western red cedar, and red alder would need to be removed from the bank (approximately a 12-16 foot wide area where the ramp will be placed). Some of the upland trees and all the red alder provide shade to the river. However, the removal of these trees is not expected to have a measurable effect on stream temperatures for the following reasons. The majority of crowns on the large conifers would be maintained as the project would be designed to avoid as many big trees as possible. Spring-fed flows from ground water sources overwhelmingly dominate the river flow at this site during the summer and the removal of individual trees (approximately 12 to 20 red alder) would not be of the magnitude that the impacts could be measured at the site scale or the sub-watershed scale. Evidence for this rationale can be found in the temperature monitoring results for the McKenzie River upstream and downstream of the Deer Creek confluence. Deer Creek is about 3 river miles upstream of the Frissell boat launch site and it contributes “warm” water to the McKenzie River that has a temperature of 19.0 degrees Celsius (66.2 degrees Fahrenheit) (7-day average maximum in 2005). Monthly maximum 7-day average in the river above and below the Deer Creek confluence were 9.3° C (48.7° F) and 10.3 (50.5° F) in 2004 (Stillwater Sciences 2006b). In 2005, temperature monitoring above and below recorded 9.3° C (48.7° F) and 10.1 (50.2° F) (Stillwater Sciences 2006b). If a stream system the size of Deer Creek (a 23 mi² watershed) contributes warm 19.0° C water to the river, and can only have a 1° C (1.8° F) impact on temperatures, it seems extremely unlikely that the removal of a dozen or so red alder and individual upland trees in a spring-fed dominated location could be measurable.
- Paradise Boat Launch – The activities at Paradise will take place on the south river bank. The parking lot work in the day use area is far enough away (100 to 150 feet) from the river that trees removed will not impact shade conditions. At the ramp location and staging location no trees need to be removed.

The project activities would not impede navigation of the river. At Paradise it is proposed to relocate approximately 20 small boulders and this would improve the ability of boats to launch or land at the new ramp.

3) Describe How the Proposed Activity Will Directly Alter Riparian and/or Floodplain Conditions.

There would be a direct alteration of the riparian area and floodplain condition due to the placement of a pre-fabricated concrete boat ramp. The Frissell ramp would directly affect about 640 square feet of floodplain, and the Paradise ramp and approach would affect about 2,000 ft². Ramp placement would not cause a disconnection of the river from its floodplain.

At Frissell, the proposed action would require the removal and relocation of approximately 12 to 20 red alder trees from the riparian area and floodplain. These trees would be spread in the floodplain to serve as down woody material. Alders decompose rapidly since they are readily colonized by microbes. Given this condition they would likely only last a few years as down woody material, but during those years they would provide habitat for amphibians.

At Paradise no trees would be cut from the riparian area to place the concrete boat ramp. Trimming riparian vegetation along the existing user trail would maintain the vegetation as trees (vine maple and red alder), and would likely require some level of maintenance due to re-growth.

4) Describe How the Proposed Activity Will Directly Alter Upland Conditions.

Approximately 60 trees on the river terrace would need to be felled to make way for the new launch site at Frissell. Those trees that are suitable for fish habitat enhancement projects would be staged in a location separate from the new launch location and used in future projects. Those trees that were not suitable would be spread out in the terrace area to serve as down woody material. This would improve habitat conditions for small mammals, amphibians, and some bird species. All stumps would be flush cut for visual considerations.

At Frissell the Proposed Action would build a new boat launch facility on a river terrace. This terrace is currently used as a dispersed site by campers and has a web of native surface roads. Approximately 11,000 ft² (Table 1) would be paved to construct the access and loop road, staging site, and toilet pad.

Roads constructed for the project will be paved which will create impervious surfaces. However, based upon field investigations by the District hydrologist and fish biologist it has been determined that this would have effects on peak and base flows that cannot be measured. Roads will drain surface water (rain) off the road and towards existing vegetation. The terrace areas where new roads will be constructed are comprised of glacial/fluvial materials and are very porous and permeable. Any surface water will drain off the roads and into this material where it will readily enter the ground water system before it drains to the river. The concrete ramp itself will likely shed rain water directly toward the river before it has an opportunity to enter the soil. However, the limited area is not sufficient that it would have a measurable affect on peak and base flows.

Decommissioning and rehabilitation activities will improve permeability due to scarification of compacted areas and re-vegetation. However given the limited scope of rehabilitation activities relative to watershed size, it is highly unlikely that there will be a measurable effect to peak or base flows.

5) Evaluate and Describe How Changes in On-Site Conditions Can/Will Alter Existing Hydrologic or Biologic Processes.

Hydrologic Processes:

Since the proposed boat launches will approximate existing channel configurations, they will not impede flood flows from reaching floodplains. Since no riprap is necessary for these launches (i.e. Frissell is on the inside of the river bend, and Paradise is in slow water) there would not be a physical feature that could cause the river to change course.

The Upper McKenzie River 5th field watershed is approximately 230,400 acres in size, and the McKenzie River / Quartz Creek 5th field watershed is approximately 47,360 acres in size. The area potentially affected by project elements relative to watershed size is small (see table below).

Table 35. Summary of Project Area Impacts^a

Site	Total Impact in Square Feet	Total Decommissioned in Square Feet	Total Concrete Ramp in Bankfull Width in Square Feet ^b
Frissell	10,936	2,670	240
Paradise	3,439	0	480

^a These figures are approximate as designs are conceptual, and they represent a “worst case scenario.” That is, the total area impacted will likely be less and the total area restored will likely be greater. All of the area summarized is within the Riparian Reserve.

^b This figure is included in the “total impact” column and represents the amount of ramp that would be “in the water” during normal flows.

Due to the limited spatial extent of the boat launch project, significant changes to the amount or timing of flow, flow patterns, flood storage, aggradation/degradation of the channel are not expected.

Roads constructed for the project will be paved which will create impervious surfaces. However, based upon field investigations by the District hydrologist and fish biologist it has been determined that this would have effects on peak and base flows that cannot be measured. Roads will drain surface water (rain) off the road and towards existing vegetation. The terrace areas where new roads will be constructed are comprised of glacial/fluvial materials and are very porous and permeable. Any surface water will drain off the roads and into this material where it will readily enter the ground water system before it drains to the river. The concrete ramp itself will likely shed rain water directly toward the river before it has an opportunity to enter the soil. However, the limited area is not sufficient that it would have a measurable affect on peak and base flows.

Biologic Processes

Streamside vegetation will be impacted at Frissell in the area where the boat ramp will be placed (i.e. 640 square feet). These alders provide organic material to the river that microbes colonize and aquatic insects utilize as an energy source. They will be permanently lost to the stream bank and river ecosystem. However, vegetation will be established on the existing boat launch when it is decommissioned. These trees will eventually provide organic material to the river ecosystem. At Paradise, no streamside vegetation will be lost due to project activities.

Stillwater Sciences (2006) conducted benthic macroinvertebrate surveys as part of a hydropower licensing project for the Eugene Water & Electric Board. The samples discussed for the boat launch project are the only samples that occurred within a project sub-watershed (Frissell Creek/Boulder Creek 6th field).

To provide an integrated assessment of the combined effects of potential stressors on the aquatic ecosystem, multi-metric scores were calculated based on invertebrate assemblage metrics. Both the ODEQ Level III metric and Karr's Benthic Index of Biotic Integrity (BIBI) were developed with a wider geographic coverage and an emphasis on human-related impacts (e.g., sediment loading, organic enrichment, temperature, DO, etc.). In addition to the ODEQ and BIBI scores the ABA Assessment Score was calculated based on an assessment developed by Aquatic Biology Associates, Inc. The ABA Assessment Score was developed to encompass a larger number of taxa and metrics than the ODEQ or BIBI metrics and includes taxa specific to the mountain streams of western Oregon and Washington (Stillwater Sciences 2006).

The values for the ABA Assessment Score ranged more widely than the ODEQ or BIBI metrics, but also corresponded to moderate to high biotic integrity. Although the multi-metrics are not statistically independent because they are calculated from a single collection of organisms, they provide an integrative approach for measuring ecological conditions and are less susceptible to the variability frequently associated with individual metrics. That is, if multiple metrics from a given sample indicate a similar level of habitat integrity or water quality, the conclusions can be considered more reliable than if the metrics indicate inconsistent results.

The following table shows multi-metric scores calculated for the McKenzie River samples collected in 2004 (Stillwater Sciences 2006). The second table shows multi-metric scores with respect to biotic integrity categories (Stillwater Sciences 2006).

Table 2. Multi-metric scores for samples collected in 2004 (Stillwater Sciences 2006)

Site description	ODEQ Level III Assessment score	Karr's BIBI score	ABA Assessment score
McKenzie River downstream of Trail Bridge Reservoir	48	42	69.4
McKenzie River downstream Olallie Creek	48	42	76.6
McKenzie River upstream of the confluence with Deer Creek	46	42	71.8

Table 3. Multi-metric scores and biotic integrity categories (Stillwater Sciences 2006)

Biotic habitat integrity	ODEQ Level III score	Karr's BIBI score	ABA Assessment score
Very High	> 39	> 40	90-100
High			80-89
Moderate	30-39	25-39	60-79

Biotic habitat integrity	ODEQ Level III score	Karr's BIBI score	ABA Assessment score
Low	20-29	0-24	40-59
Severe habitat and/or water quality limitations	< 20		< 40

Samples collected for this study scored within a relatively narrow and high range that indicates biological conditions are among the highest found within the region. Overall, site scores indicate little or no impairment at sites within the Study Area. Although not truly independent measures, all three multi-metrics were similar and suggest relatively high biological condition for all sites surveyed within Frissell Creek/Boulder Creek 6th field sub-watershed (Stillwater Sciences 2006).

The McKenzie River has high biological productivity. It is highly unlikely that project activities will have an impact on productivity given the small scope of the project relative to watershed size.

Fish spawning does not occur near any of the boat launches. Field investigations documented the closest spawning took place ½ downstream of Frissell launch, and over 1 mile downstream of Paradise launch. Therefore, no effects to spawning habitat are expected due to project activities.

The small spatial extent of the project will not cause significant impacts to rearing habitat for fish. However, the specific area where the concrete boat ramp would occupy what previously was a natural river bed will alter rearing habitat for early emergent salmonid fry. For example, spring Chinook fry use the shallow river margin habitat for early rearing after emergence from the redd. There would be a reduction in complexity at the ramp site and therefore a reduction in fry cover. This is not considered significant since the area is 240 ft² at Frissell and 480 ft² at Paradise, in a river that provides more than 80 miles of rearing habitat.

Trees that must be felled for construction will be either left on site as down woody material or staged for future fish habitat projects. The remaining down wood will be beneficial for amphibian and avian species (i.e. harlequin ducks).

6) Estimate the Magnitude and Spatial Extent of Potential Off-Site Changes.

The Proposed Action is not of the scope or magnitude that it could affect channel geometry, channel slope, or channel form. However, since the Proposed Action would rehabilitate the existing launch site at Frissell which is on the erosive side of the river (i.e. on the outside bend) there would be a reduction in amount of sediment entering the channel due to the need for maintenance. The new ramp location would be on the depositional side of the river (on the inside bend) and would not cause an increase in sediment delivery from the uplands or due to maintenance.

At Paradise the existing ramp site is on the downstream end of a gravel bar in slow water. No riprap is currently needed to protect the site, and none would be needed for reconstruction. The

river bank where the extension of the boat ramp would occur is in a disturbed condition due to the presence of a sign board, and compaction due to foot traffic associated with the ramp. The activity is not of the scope or magnitude that it could affect channel geometry, channel slope, or channel form.

During placement of the pre-fabricated boat ramps it is likely that a short term turbidity pulse would occur. Based on a past project at the McKenzie Bridge Campground boat ramp, it is expected that this turbidity pulse would be measured in hours (not days), and would extend downstream less than 100 feet hugging the bank where the activity occurs. This would meet the requirements of the Willamette National Forest's Best Management Practices.

7) Define the Time Scale Over Which Steps 3 - 7 are Likely to Occur.

Construction, reconstruction, and decommissioning activities would likely occur during calendar years 2008 through 2011, depending on funding.

At Frissell, construction of a new site could take 1 to 3 months depending on environmental factors (wet conditions or extreme fire danger). Activities on the terrace would take place during the summer (July through September) and instream work would take place during established work periods (July 1 through August 15). Instream activities would likely take only one day of work. Decommissioning and rehabilitation of the existing boat launch site would take one day of work, and vegetative conditions would be monitored for two years to ensure establishment.

At Paradise, terrace work would take place during the summer months (July through September) and instream work during the established period (July 1 through August 15). Work on the parking sites and ramp approach should only take a week since paved roads and a paved approach already exist. Instream work should only take one day.

8) Compare Project Analyses to Management Goals and Objectives

This section documents the project effects on achievement, or timing of achievement, of management goals and objectives relative to free-flow, water quality, riparian area and floodplain conditions, and ORV's and river classification.

Federal management goals for this project can be found in the Upper McKenzie River Management Plan (1992). The following are those that are directly applicable to this project:

- Protect the river's free flowing character and maintain and enhance its outstandingly remarkable values and special attributes.
- Provide opportunities for a wide range of river-oriented recreation activities.
- Strive for a balance of resource use and protection, and permit other activities to the extent that they protect and enhance the river's outstandingly remarkable values and special attributes.

Goals of the State Scenic Waterway Program for this project can be found in the Upper McKenzie River Management Plan (1992). The following are those that are directly applicable to this project:

- To protect the freeflowing character of designated rivers for fish, wildlife, and recreation.
- To protect and enhance the scenic, aesthetic, natural, recreation, scientific, and fish and wildlife values along scenic waterways. New development or changes of existing uses proposed within a scenic waterway are reviewed before they may take place.

The Upper McKenzie River Management Plan (1992) supported the Proposed Action at Frissell boat launch. Support for this activity is found under “Management Actions” in the river management plan (RMP). That section in the RMP included distinct actions designed to resolve the major issues and help attain the desired future condition for the upper McKenzie River. The management intent is that these actions be implemented as soon as the necessary funding can be secured through the agency’s budgeting process. A recreation management action specifically found in the RMP is:

- *Develop a Capital Investment Program proposal for Buck Bridge (Frissell) dispersed recreation area. Re-establish restroom facilities and consider developing a boat launch on the west side of the McKenzie. If west side launch site is developed, close the launch site at the east side of Buck Bridge.*

The Proposed Action at Frissell boat launch is consistent with goals of the RMP and the Management Action for the “Buck Bridge dispersed recreation area.”

The RMP did not provide specific Management Actions at Paradise boat launch. However given the high use at the ramp, and due to hazards associated with slope and loose gravels on the ramp, the District Ranger determined there was a need to improve the boat ramp. The new ramp will double the size of the ramp and provide for better footing. No trees will need to be cut for ramp placement, and the river bank where the ramp will be placed is already “disturbed” (i.e. compacted) due to river users. The parking area activities would not be visible from the river due to existing vegetation.

The following is a consistency analysis of the Proposed Action and the applicable Standards and Guidelines (S&G’s) found in the RMP. The S&G’s are intended to help the manager stay within the constraints prescribed by law, as well as provide environmental safeguards for management activities. The S&G’s are one part of the complete management direction for Management Area 6d (MA-6d - Designated Wild and Scenic River). The management goals, desired future condition, management actions, and monitoring plan are also part of the management direction.

Specific terminology used in the S&G’s identifies the type of direction and degree of compliance required. Correct interpretation of the terms is critical to understanding the intent of the direction.

- The first intent is conveyed by the word “**shall.**” With this degree of compliance, the action is mandatory in all cases.
- The second intent is conveyed by the word “**should.**” With this degree of compliance, action is required, unless justifiable reason exists for not taking action. This direction is intended to require a practice unless it entails unacceptable hardship or expense. Exceptions to “should” restrictions are expected to occur infrequently.

RECREATION MANAGEMENT

MA-6d-01: The area shall be made available for maximum use for a range of trail- and river- related activities that are consistent with maintaining the area conditions and providing Recreational river experiences. This management prescription shall provide an ROS physical setting for roaded natural recreation.

The intent of the project is to continue to provide for recreational river experiences and related activities (for example: commercial and non-commercial boating) into the future. The poor access, steepness, and deteriorating/unstable conditions were key factors influencing the proposed relocation and/or reconstruction of the existing boat ramps. Since the river corridor (as viewed from the river and nearby McKenzie River Trail) will remain a mostly natural appearing environment, access points will continue to be provided for conventional motorized vehicles, and vegetation will be retained where possible for screening the ROS physical setting will be maintained within the roaded natural class.

SCENIC RESOURCES

MA-6d-06: All design and implementation practices should be modified as necessary to meet the VQO’s of Retention and Partial Retention as prescribed on the viewshed map for the river corridor.

The goal of management within the Wild and Scenic River corridor is to create and maintain desired visual characteristics of the forest landscape through time and space. The Wild and Scenic River Corridor will be managed for a high level of scenic quality. Vegetation will be retained where possible and is desirable for maintaining visual screening. On site modifications are currently present and visible within the river corridor (as viewed from the river and nearby McKenzie River Trail). Since relocation of Frissell Boat Launch includes decommissioning and planting the existing location and reconstruction at Paradise includes reorientation of the launch, the modifications will remain subtle and visually subordinate to the casual observer.

SOIL AND WATER QUALITY

MA-6d-07: Soil compaction should not exceed established limits, except as necessary for the development of campsites, administrative facilities, trail treads, trailheads and boat launch sites.

While compaction in excess of established limits is permitted “as necessary for the development of...boat launch sites”, actual compacted area within the riparian areas at the two sites that results from construction of the two boat launches is approximately 12%, which is well within the established limit of 20%.

RIPARIAN MANAGEMENT

MA-6d-14: The following process shall be used when projects or management activities have the potential to create long-term, short-term, or cumulative adverse effects to the values of rivers, streams, wetlands, lakes, or adjacent riparian areas:

1. Locate the riparian management area using the following criteria:

- **Within the 100 year floodplain;**
- **Occupied by water-tolerant vegetation;**
- **Having vegetation potentially capable of contributing organic small matter to the water body;**
- **Incorporate natural irregularities of topography and consider recreation and wildlife use patterns;**
- **Required to provide large woody material to the water body.**

2. Identify the beneficial uses, values, and objectives for the area. Wetland and riparian area values and objectives should be established on a subdrainage area or larger, and should address connectivity of riparian habitat and the influence on downstream effects.

3. Identify the effects of proposed actions on the following:

- **Objectives and ORV's for the W7s River.**
- **Public health, safety, and welfare, including water supply, quality, recharge, discharge; pollution; flood and storm hazards; and sediment and erosion;**
- **Maintenance of natural systems, including conservation of long-term productivity of existing flora and fauna, species and habitat diversity and stability, hydrologic utility, fish, wildlife, timber;**
- **Other uses of wetlands in the public interest, including recreational, scientific, and cultural uses.**

4. Assess necessary actions to preserve the beneficial values, and to reduce or mitigate loss of wetlands by giving preferential consideration to riparian dependent resources when conflicts occur among land uses.

5. Develop a riparian prescription that documents the objectives and actions to be implemented (including contract clauses and language as appropriate) in the riparian management area.

6. Monitor location and effects, and track results through appropriate databases.

Management practices shall be designed to prevent detrimental changes in water temperature or chemical composition, blockage of water courses, or sedimentation within the stream channel which could adversely affect water conditions for fish habitat.

The specific step-by-step process for evaluating projects described above was incorporated into the NEPA document and ESA Biological Assessment. Those documents fully described the known and potential effects to biological, physical, and social resources.

MA-6d-15: 100% of existing streamside shade should be maintained.

As described in this document, the NEPA document, and the ESA Biological Assessment some shade trees will need to be cut to place the ramp at Frissell. However, this S&G is a “should degree compliance.” In addition, given the spring-fed nature of the river near Frissell there would not be a measurable effect to temperatures at the site scale, or sub-watershed scale.

Decommissioning and rehabilitation of the existing Frissell boat ramp will include tree planting. However, the existing boat ramp is on the northeast side of the river so those trees will not provide shade to the river.

No shade trees will be cut for proposed activities at Paradise.

TIMBER MANAGEMENT

MA-6d-20: Stumps should be flush cut.

All stumps will be flush cut and this will be required by contract specifications.

FACILITIES

MA-6d-40: Development of additional roads and road bridges within the river corridor should be discouraged. Existing roads should be used whenever possible. If roads are constructed, or reconstructed, they should be located and designed to remain visually inconspicuous from the river surface and banks. Road construction/reconstruction, including side-casting and waste disposal, should not encroach upon the 100-year river floodplain.

This S&G is a “should degree compliance.” Proposed activities at Frissell would require the construction of new road within the river corridor. Within the Buck dispersed camping area where the new ramp would be located, there is currently a web of native surface roads. Designs will utilize as much of these roads as possible in order to minimize disturbance and the number of trees that need to be cut. The new access and loop road, toilet pad, and staging area would be visually inconspicuous from the river surface due to the elevated nature of the river terrace, and the remaining vegetation along the river bank.

A boat launch project by its very nature must encroach upon the 100-year floodplain. The new boat ramp at Frissell would be 16 feet wide and 40 feet long (640 ft²), and would be visible from the river surface. This S&G is a “should degree of compliance” and the proposed activity is supported by the river management plan.

The approach road and loop road already exist at Paradise launch. Within the floodplain there will be some additional paving to connect loop road to the new concrete boat ramp. Paving would be limited to the “apron.” The new boat ramp and paving of the apron is estimated to impact 1,990 ft². This activity will have a limited visual impact from the river surface. This is due to the current condition of the site which is compacted, has a limited amount of vegetation, a sign board, and a gravel boat ramp.

MA-6d-41: Structures, improvements, and signs shall be provided to enhance user experiences, facilitate use and administration of the area, and protect resources. Larger scale public use facilities, such as moderately sized campgrounds, public information centers, and administrative headquarters shall be allowed if such structures have been designed to take advantage topography and vegetative screening, and are out of view from the river. New structures that would have a direct and adverse effect on the rivers “Outstandingly Remarkable Values” should not be allowed.

Relocation and/or reconstruction of the existing boat ramps is intended to enhance the user’s experiences, facilitate use and administration of the area, and protect resources. Access and safety concerns will be minimized, ramps will be constructed for long term use and minimal maintenance, and erosion will be mitigated by providing more suitable location and/or orientation to the river. The direct effect on the rivers “Outstanding Remarkable Values” are expected to be beneficial; a mix of resource protection, facility enhancement, and facilitation of safe use into the future.

MANAGEMENT PLANNING

MA-6d-43: State and County agencies shall be notified of project level planning activities on national forest lands within the river corridor to assure coordination of management actions with Sate Scenic Waterway requirements.

The NEPA document and this W&SR Section 7 Assessment will be shared with appropriate agencies and project implementation would not occur until concurrence is received.

Finding of effect on ORV’s in the Upper McKenzie River:

1. Scenic values.

Proposed activities at Frissell would require the construction of new road within the river corridor. Within the Buck dispersed camping area where the new ramp would be located, there is currently a web of native surface roads. Designs will utilize as much of these roads as possible in order to minimize disturbance and the number of trees that need to be cut. The new access and loop road, toilet pad, and staging area would be visually inconspicuous from the river surface due to the elevated nature of the river terrace, and the remaining vegetation along the river bank.

A boat launch project by its very nature must encroach upon the 100-year floodplain. The new boat ramp at Frissell would be 16 feet wide and 40 feet long (640 ft²), and would be visible from the river surface. This S&G is a “should degree of compliance” and the proposed activity is supported by the river management plan.

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The scenic ORV for the Upper McKenzie Wild and Scenic River results from spectacular scenery. As stated in the management plan, “The McKenzie River and river corridor have received national and regional recognition for their scenic beauty.” In fact, “Some of the individual attractions that combine to create the McKenzie’s scenic beauty are water clarity and color, waterfalls and whitewater, lava flows, old growth forest, wildflowers, and fall colors.” (Upper McKenzie River Management Plan, 1992)

The aesthetic value of the Wild and Scenic River corridor will be retained. The character and appearance is, essentially, expected to be the same after implementation. Although the proposed relocation of Frissell boat launch would place the boat ramp on the west side of the river (State Scenic Waterway “scenic” classification) and some disturbance would be visible from reconstruction (alternative action for Frissell and proposed action for Paradise) in the existing locations, disturbed or decommissioned areas would be vegetated and expected to recover (become visually subordinate) over the next 4-5 years. Visual disruptions (for example: ground work and equipment in the corridor) are expected, however these disruptions are temporary (during project implementation) in nature. Upon completion, the project will not unreasonably diminish the Scenic ORV.

2. Recreation.

The recreation ORV for the Upper McKenzie Wild and Scenic River results from prominent recreational opportunities such as whitewater boating, hiking, and fishing. As written in the management plan, “Whitewater boating includes drift-boating, rafting, and kayaking, and is recognized as outstanding on the river stretch from Olallie Campground to Paradise Campground.” The plan also notes that “Camping, sightseeing, and photography are also popular on the upper McKenzie.” (Upper McKenzie River Management Plan, 1992)

The proposed relocation or reconstruction actions will mitigate the poor access, steepness, and deteriorating/unstable conditions of the existing boat launches. All action alternatives of this project are intended to safely facilitate public use, consistent with the roaded natural ROS class, and will also enhance recreational experiences along the river corridor. Some temporary interference (which may include closures) with road use, dispersed use, and access within the project areas should be expected to occur for the protection of public safety during project

implementation. The recreation ORV of the Wild and Scenic River corridor will be maintained and considered enhanced.

3. Geologic and Hydrologic.

The geologic and hydrologic ORV for the Upper McKenzie Wild and Scenic River results from the complex interplay of recent volcanic activity with the pre-existing McKenzie River. Sections of the river were buried by lava flows, creating “lost” sections and large springs where river flows re-emerge. Other lava flows filled the valley and created a series of majestic waterfalls where the river flowed over them. Residual heat from the lava flows has also resulted in the presence of hot springs along the river.

Neither the nature of the project or the scope of the proposed construction activities has resulted in conditions that can affect the relationship between river and lava that has created this ORV.

4. Water Quality.

The water quality ORV for Upper McKenzie Wild and Scenic River stems from the river’s water clarity, cold temperature, and its translucent blue coloration. As was previously discussed in the section “Describe How the Proposed Activity Will Directly Alter Within-Channel Conditions”, effects were disclosed regarding turbidity and stream temperature increases. These are the two most likely effects that could result in an effect on this ORV.

In the analysis, all disclosed effects on turbidity and water temperature are either small or un-measurable, extremely limited in the spatial extent of their occurrence, limited to a very short time frame, or some combination of these limits to their ability to impact the water quality ORV.

5. Fish.

The upper McKenzie River has excellent fish habitat and species diversity, and produces fish of good health, vigor, and size. The upper McKenzie is a regionally important producer of several fish species. The McKenzie River as a whole produces the major population of wild spring Chinook salmon for the Willamette River system; some of those Chinook are produced in the upper McKenzie. The upper McKenzie is noted for its populations of three native, wild trout species, the redbreast rainbow trout, bull trout, and cutthroat trout. The Forest Service finding agrees with the Congressional Record that fish in the upper McKenzie River are an outstandingly remarkable value.

The boat launches project could have short term negative effects on fish due to turbidity spikes during ramp placement. These are expected to last hours (not days) and since the plume would not occupy the entire river channel fish could move to a portion of the river where no turbidity is occurring. There would be a permanent change to the river bed and bank where the ramp would be located (see Table 1), but this is an impact that is limited spatially and is a minimal impact in relation to the amount of rearing habitat available in the 80 miles of the McKenzie River. For more specific information on impacts to fish and fish habitat see Section 5 (Biological Processes) of this document.

Given the limited scope of the boat launch project in relation to the river length and watershed size, this project would not diminish the fish ORV.

9) Section 7 Determination.

The proposed McKenzie River Boat Launches Project is consistent with Section 7 of the Wild and Scenic Rivers Act, and will have a direct effect on the river, but not an adverse effect on the values for which the river was authorized by Congress. The project is also consistent with the current Forest Land and Resource Management for the Willamette N.F. and the Record of Decision for Amendments of Land Management Planning Documents within the Range of the Northern Spotted Owl. The project is supported by the Upper McKenzie River Management Plan (1992). It is recognized that there will be short-term effects but that they are at an acceptable level. Free-flowing conditions will be maintained, and Outstandingly Remarkable Values will be maintained.

References:

Stillwater Sciences. 2006h. Water quality at the Carmen-Smith Hydroelectric Project, upper McKenzie River basin, Oregon. Final Report. Prepared by Stillwater Sciences, Arcata, California for Eugene Water & Electric Board, Eugene, Oregon.

USDA Forest Service, and Oregon State Parks & Recreation Department. 1992. Upper McKenzie River management plan.

USDA Forest Service. 1990, 1994. 2001, 2004 . Environmental Impact Statement, Land and Resource Management Plan, Willamette National Forest. Eugene, OR.

USDA Forest Service. 1994. Record of Decision and Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Related Species Within the Range of the Northern Spotted Owl. Portland, OR.

Appendix F – Figures and Drawings:

- **Figure 3 – Frissell Vicinity Map**
- **Figure 4 – Frissell Boat Launch Conceptual Plan**
- **Figure 5 – Frissell Decommissioning Plan**
- **Figure 6 – Paradise Boat Launch**
- **Figure 7 – Paradise Boat Launch Improvements**
- **Figure 8 – Bruckart Boat Launch**
- **Figure 9 – Bruckart Boat Launch Preliminary Conceptual Plan**
- **Figure 10 – Bruckart Decommissioning Plan**
- **Figure 11 – Watersheds**

Figure 3. Frissell Vicinity Map Upper McKenzie Boat Launch Project

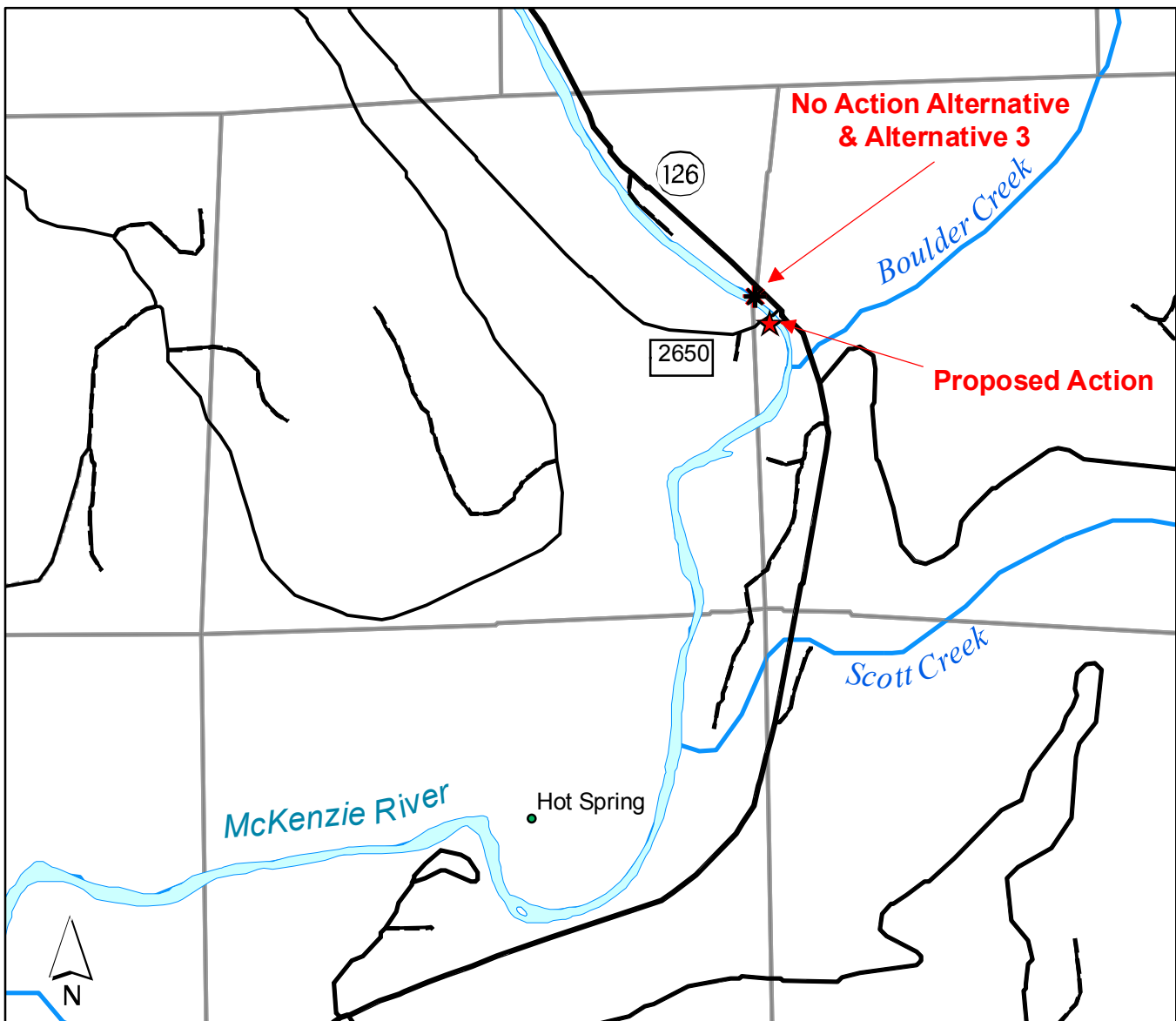


Figure 4.

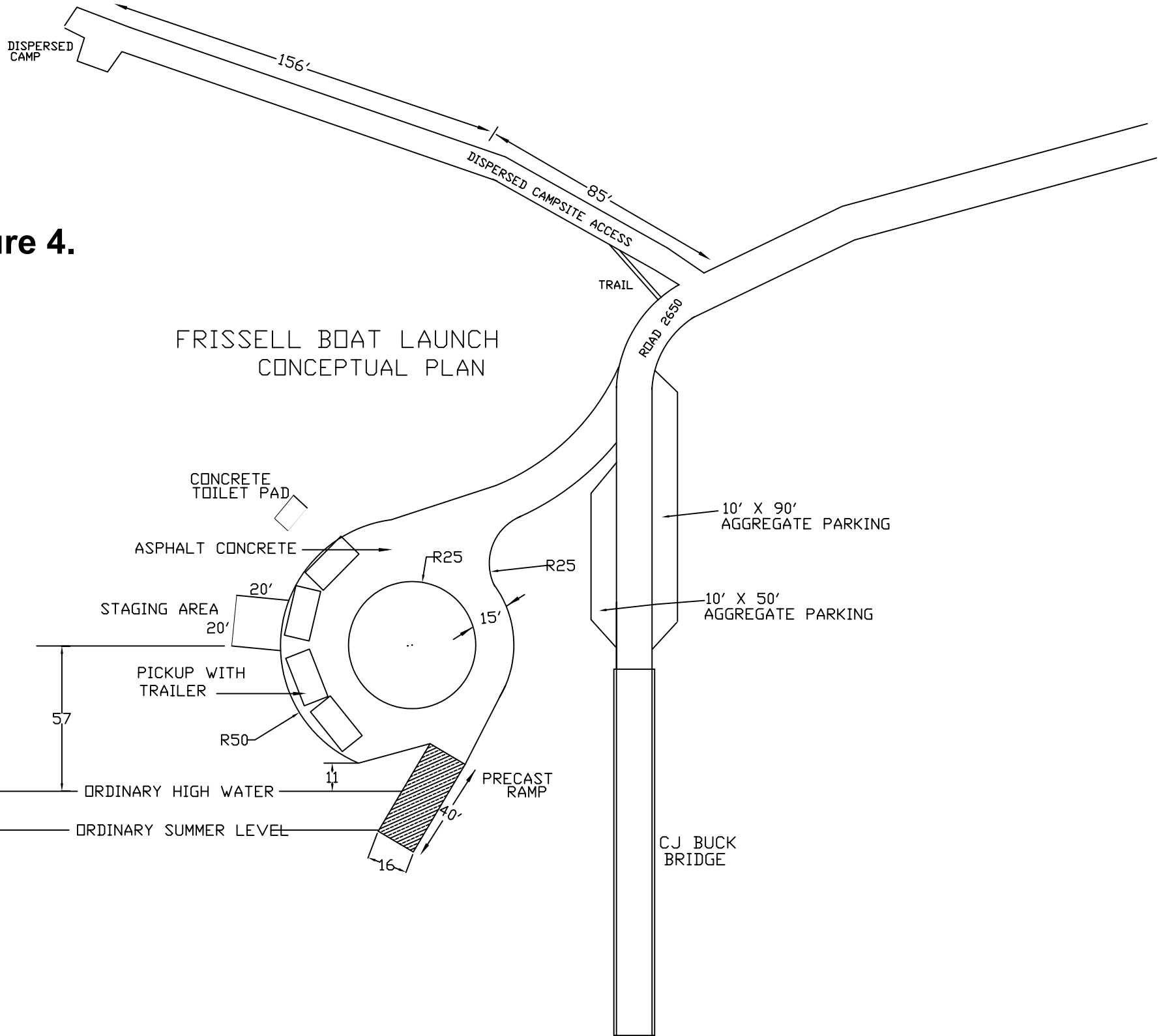
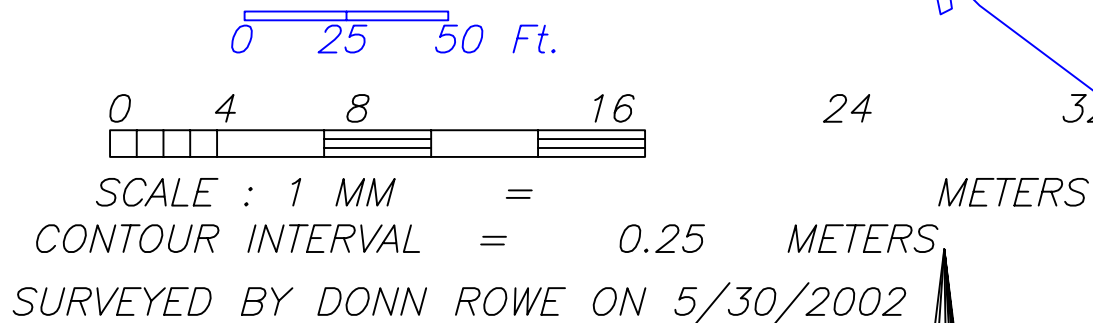


Figure 5.

*FRISSELL
DECOMMISSIONING PLAN*



- TBM - REBAR
- △ HUB & TACK
- CULVERT
- ⊙ SOIL MOUND SEEDED WITH NATIVE GRASSES
- ⊠ AREA TO BE DECOMMISSIONED 2670 SQUARE FEET

REMOVE EXISTING
TIMBER RAILS
SEED RAMP WITH
NATIVE GRASSES

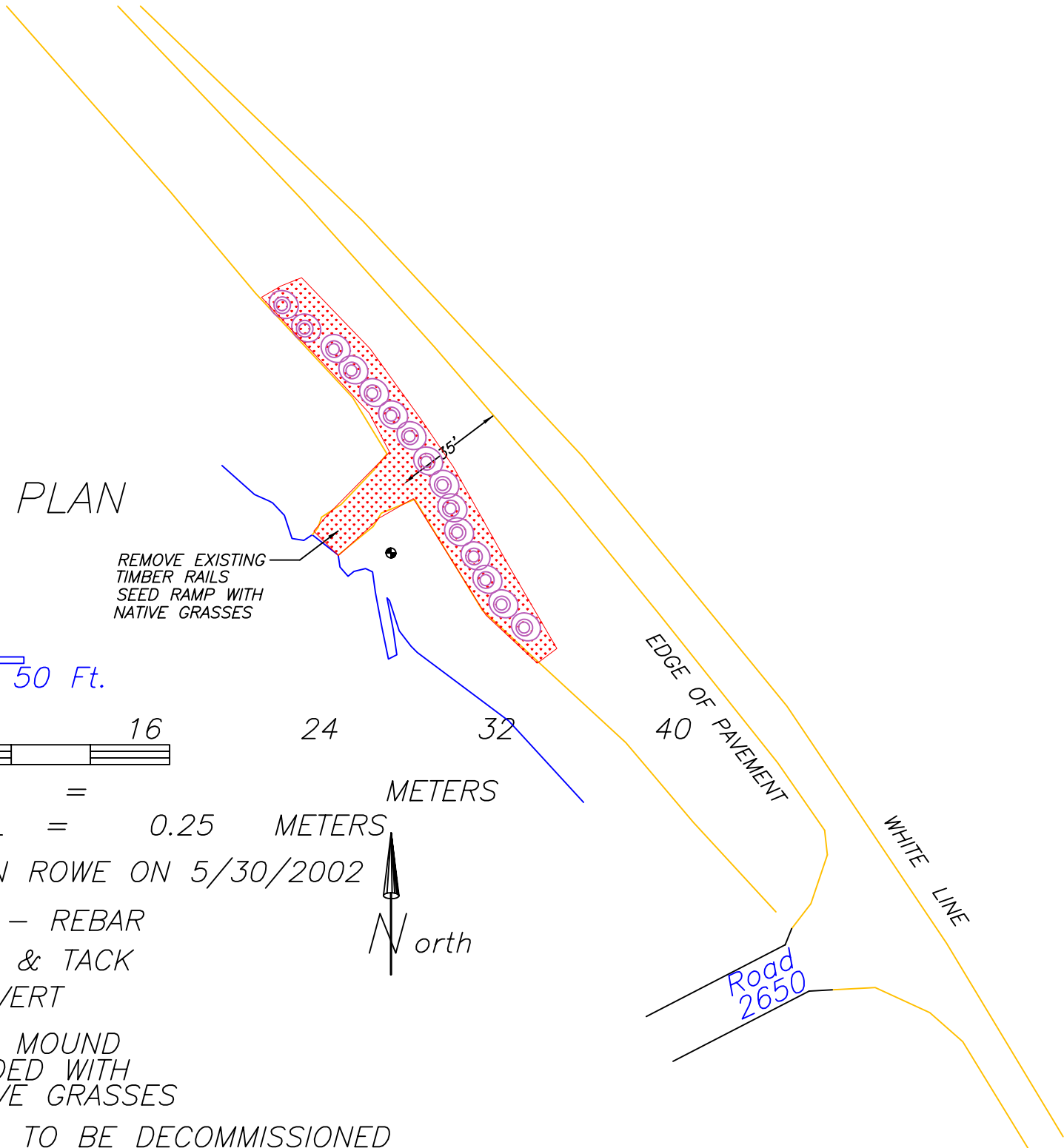


Figure 6.

**Upper McKenzie Boat Launch Project
Paradise Boat Launch**

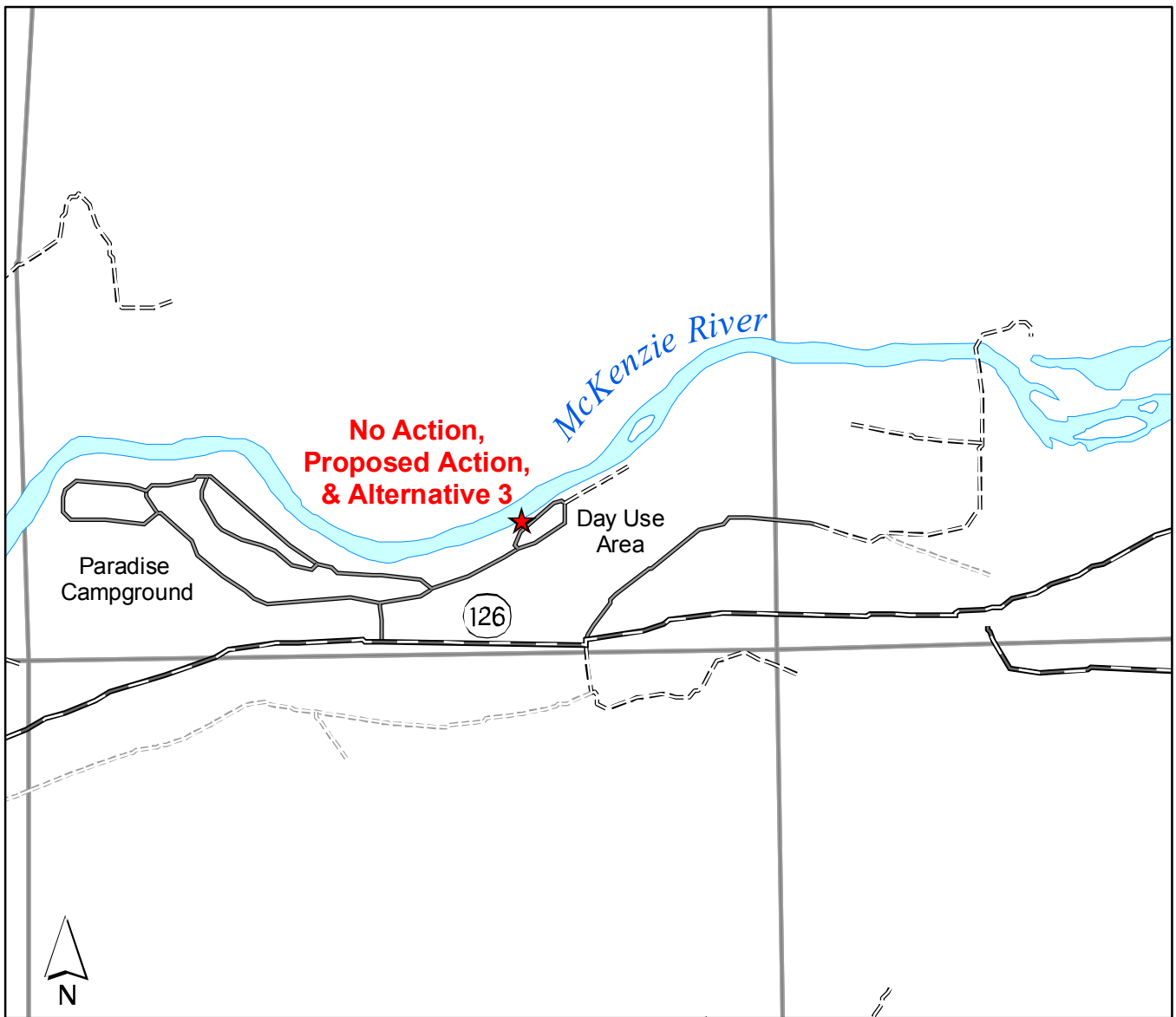


Figure 7.

Paradise Boat Launch Improvements

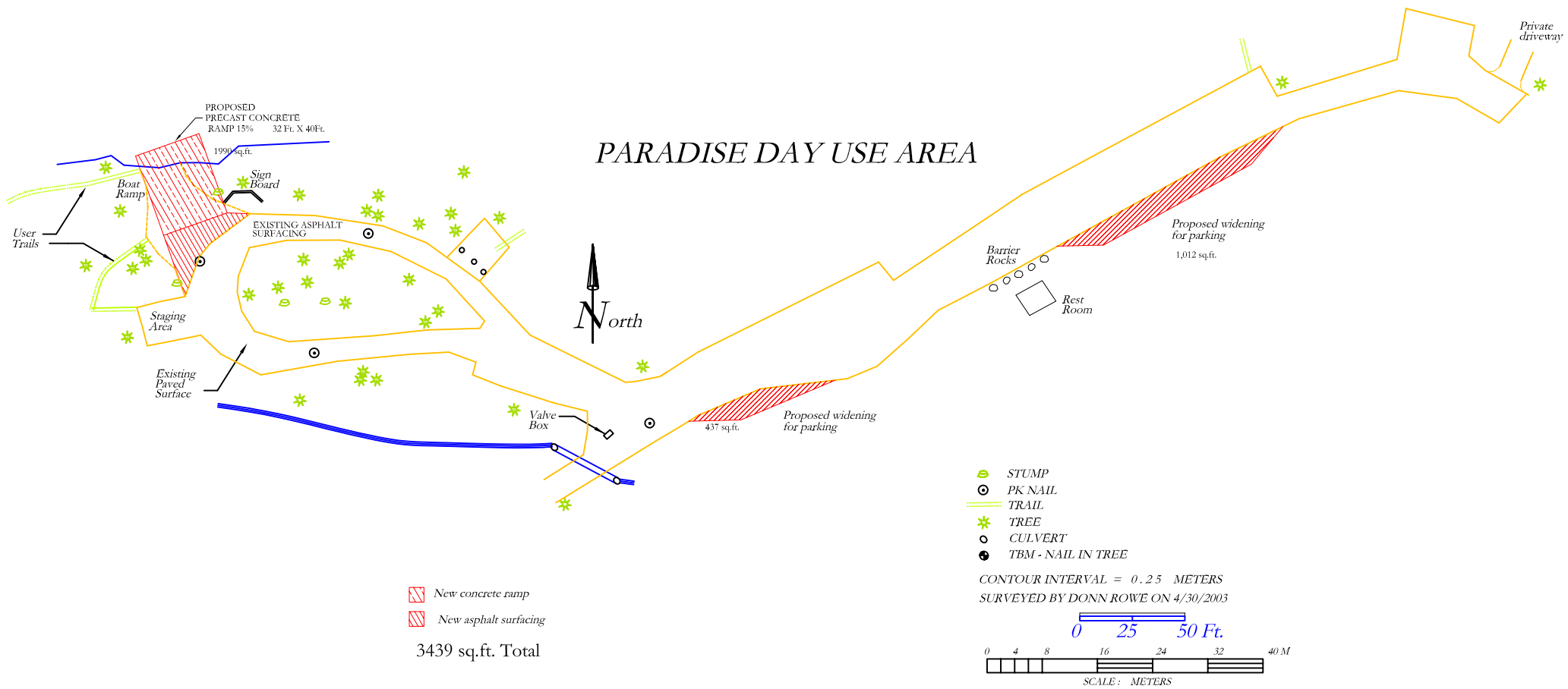


Figure 8.

**Upper McKenzie Boat Launch Project
Bruckart Boat Launch**

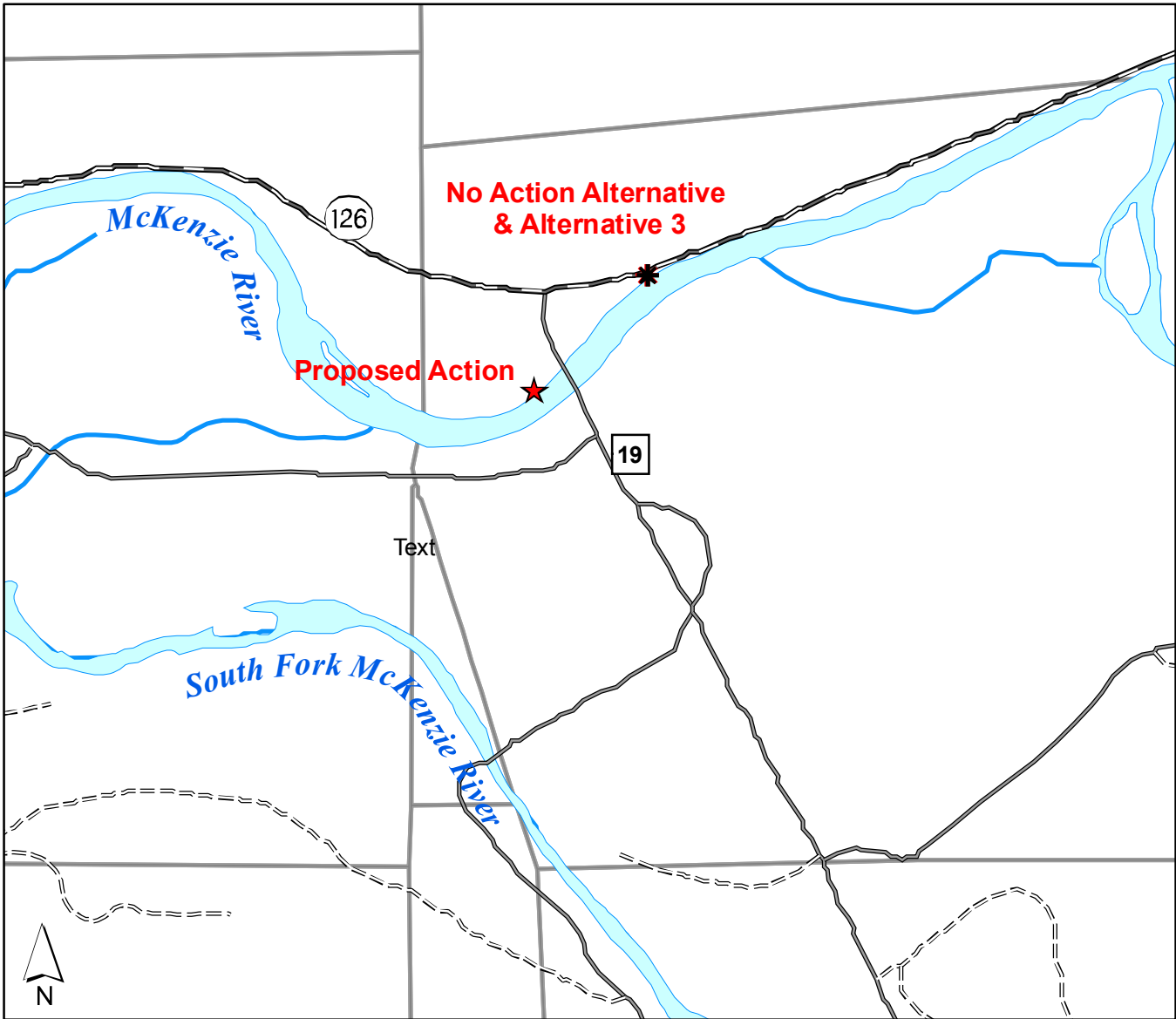


Figure 9.

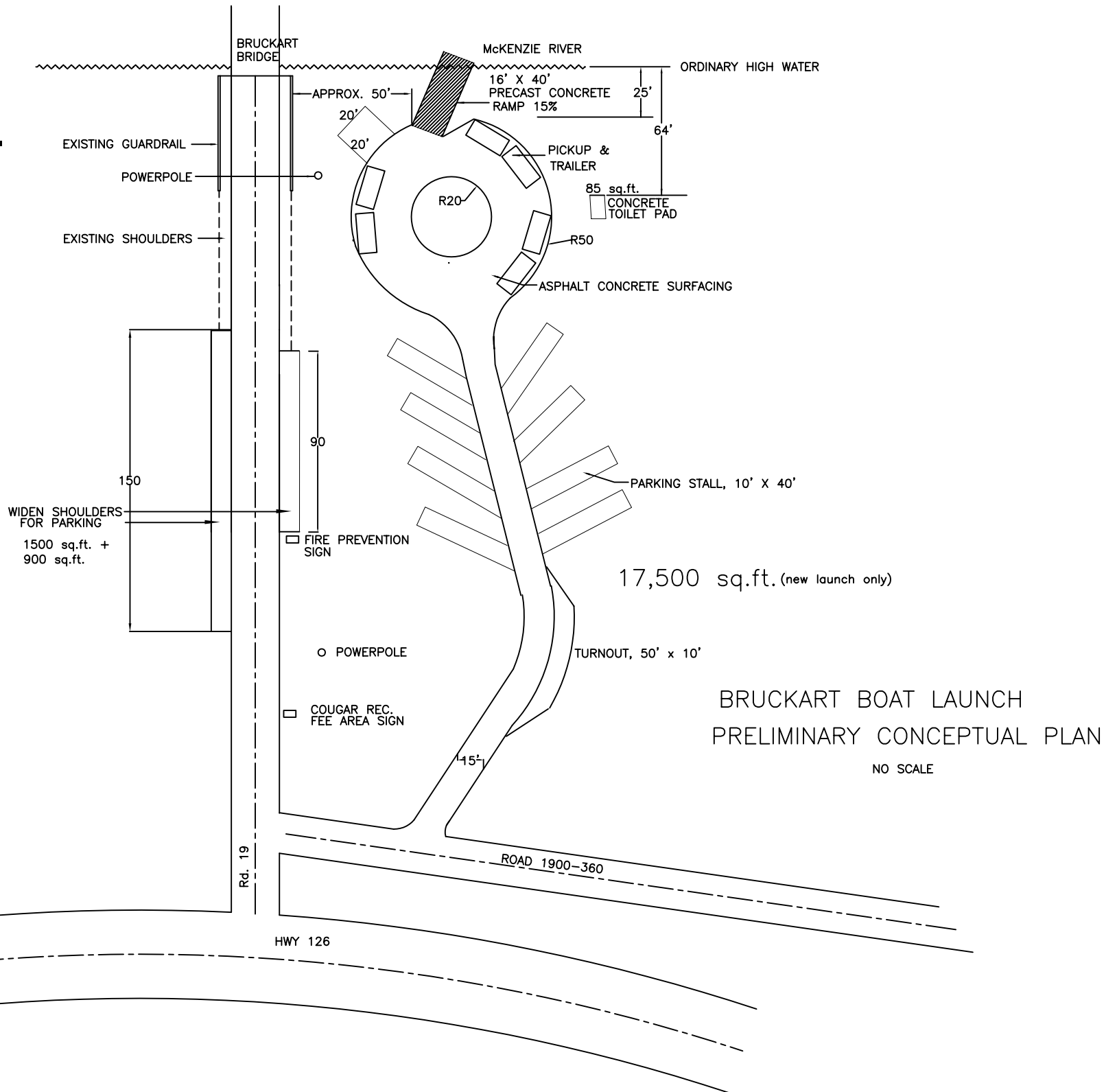
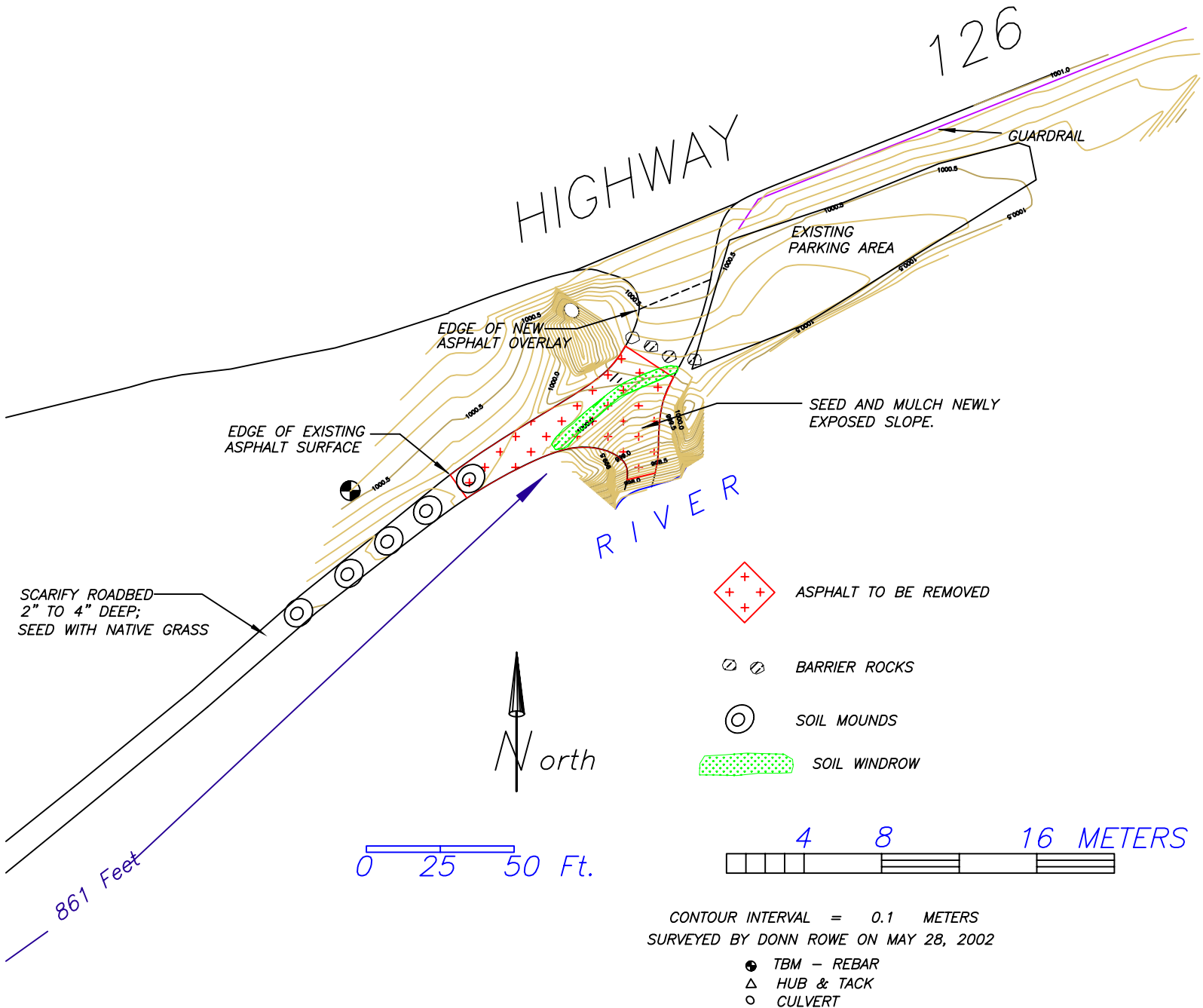


Figure 10.

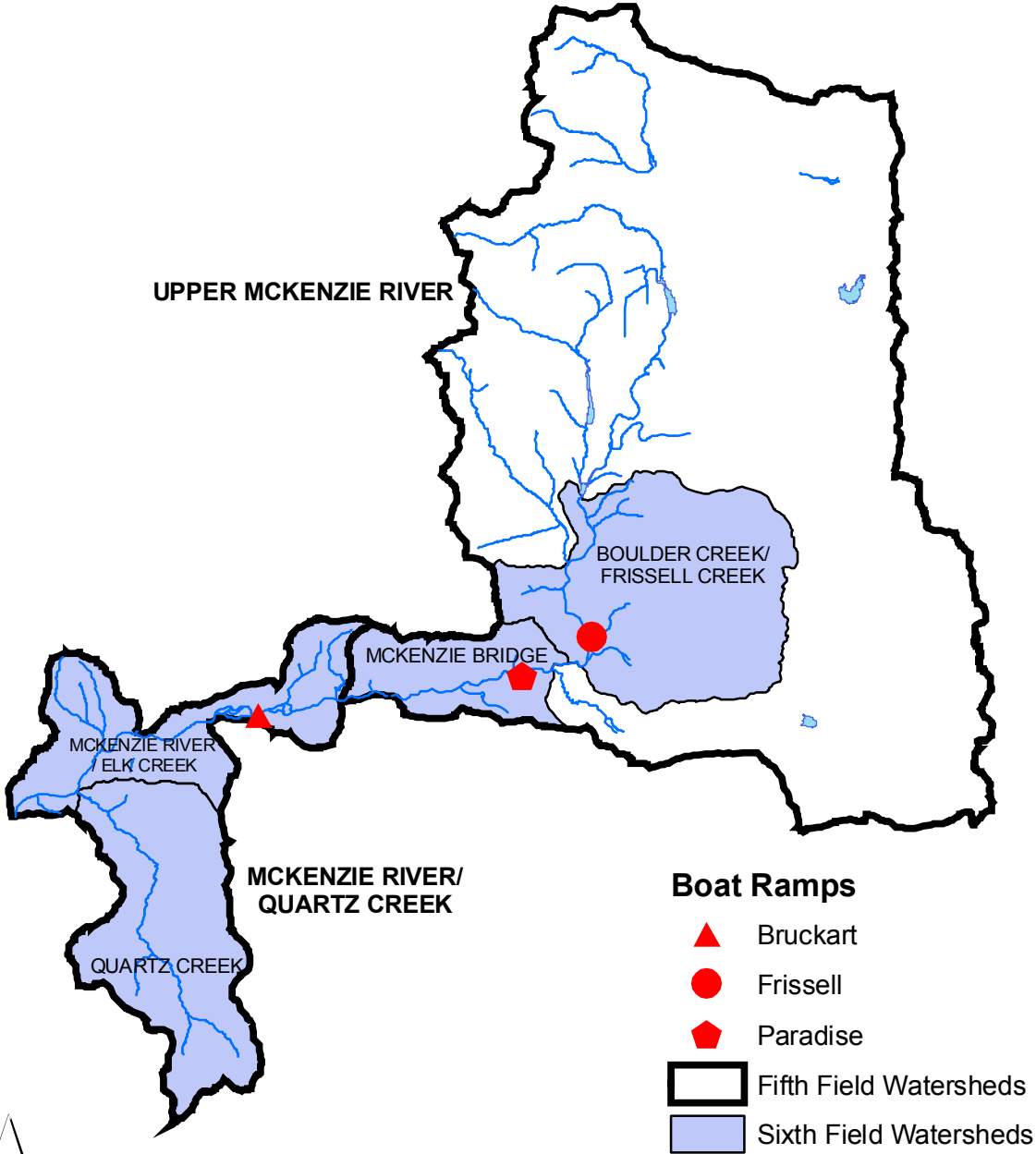
Bruckart Decommissioning Plan



EST. 10,000 SQUARE FEET
 AREA TO BE DECOMMISSIONED

Figure 11.

**Upper McKenzie
Boat Launch Project
Watersheds**



Appendix G – Scoping Comments and Agency Responses

Appendix G – Scoping Comments and Agency Response

Scoping Comments:

Below are ID Team responses to comments received during the scoping period from seven commenters.

Submitter and Date	Comment	Response and Where Addressed in the EA
<p>Dana Burwell 06/10/2002</p>	<p>Frissell - We talked about moving this landing across the river and down stream to a better location. Not able to do that, it would be good to put in boulders and make a lower grade ramp.</p> <p>Paradise – Build another raft launch at the very East end of the loop drive or somewhere between the east end of the loop and the current landing. This landing gets very heavy use at times and the current landing is inadequate. Another landing at the far end of the loop would be best.</p> <p>Bruckart – We need to move the landing down stream 100 yards to a better location and make it a wider two slot landing. Also, need to improve parking with a loop road off of Road 19.</p>	<p>Frissell - The proposed action and alternative 3 addresses these concerns. The proposed action would relocate the ramp to a better location, and alternative 3 would change the angle of the existing ramp and lower the grade.</p> <p>Paradise - This specific comment was not incorporated into the EA. Concerns about having two different boat ramps and impacts to the river bank drove the proposed action to double the size of the ramp at the existing site where river bank disturbance has already occurred.</p> <p>Bruckart – The proposed action would move the ramp downstream of Bruckart Bridge on a cobble bar. The ramp would not be doubled in size, but the cobble bar would provide sites to park boats while the ramp is busy. Parking would be improved and the loop road entrance would no longer be off Highway 126. The design includes a loop road coming off Forest road 1900-360.</p>

Submitter and Date	Comment	Response and Where Addressed in the EA
<p>Ken Helfrich 05/24/2002 and 03/03/2003</p>	<p>Frissell (emphasis added) landing becomes very difficult to launch a boat during low flows. The facility does not allow more than two boats to be parked or loading passengers at one time. The highway noise and the fact that big trucks and RV's use this Frissell as a rest area, makes the present boat ramp a difficult facility to use.</p> <p>I feel we need to move Frissell (emphasis added) landing across the river and below the bridge. There is an eddy to park more than one boat and much more gradual slope to the river. Parking could still be on the highway side and a small road could allow a drive around type of put-in. I fell it would be a better use of funds to construct a low impact landing on the north side of Frissell Bridge, rather than trying to fix the existing site.</p> <p>The proposals for improvements at Paradise (emphasis added) are much needed. Paradise has become the most popular put-in spot on the river, especially during low water years. It is necessary to give boaters a easy way to get boats and trailers in and out of the river. I feel it is appropriate to sacrifice certain aesthetics of boat landing facility to allow people access to a beautiful resource area. The area needs to be expanded to accommodate several groups at one time. A trail from the ramp down the riverbank would give better access to the boats. The road into and around the launch area needs to be widened to allow traffic easy access in and out of the area.</p> <p>The Bruckart (emphasis added) landing was established in a poor location because of the fast river current the ramp is subjected to. The present ramp being 90% into a fast and deep cutting riverbank presents some boater challenges. There is a lack of pools above and below the ramp so boats have no place to park or get stopped. It is no surprise that the ramp continues to wash out. We need to build a new ramp below the bridge where the water is slower, and more parking space is available.</p> <p>(McKenzie River) Trailhead (emphasis added) is a necessary boat ramp. The Trailhead (emphasis added) landing is a vested and historical boat landing that has been open to the public for years.</p>	<p>Frissell - The proposed action would relocate the ramp in the eddy described. A staging area would also be provided near the ramp for safety talks away from highway noise.</p> <p>Paradise – The proposed action addresses these concerns. In the proposed action, the ramp would be doubled in size, an additional staging area would be designated, and the existing user trail would be improved (i.e. gravel additions, trimming vegetation along the trail, and relocating woody material that blocks the trail).</p> <p>Bruckart – In the proposed action the site would be relocated downstream of Bruckart Bridge.</p> <p>Trailhead launch – There is no proposal to change this boat launch from the current condition. The primary use for this site is as a trailhead for the National Recreation Trail, and as an interpretive site for the West Cascades National Scenic Byway.</p>

Submitter and Date	Comment	Response and Where Addressed in the EA
Steve Schaefers 05/30/2002	I like the idea of pads like the one at McKenzie Bridge CG being used at the landings. As for putting large boulders above the landing to block the current, I would have a hydrologist look at this first. In high water events, these large rocks can create more damage to shoreline and may undercut the cement pad.	The proposed action addresses this comment. Conceptual designs found in Appendix F, have a ramp similar to the ramp at McKenzie Bridge campground.
Justin Wellman 05/24/2002	I received the letter about possible improvements and so far everything looks good. The access that needs the most attention is Bruckart and in addition to your list the culvert pipe just below the launch needs to be angled downstream or a guard needs to be put in place to keep rafts from being gouged on the corner of the pipe. This is more of a concern at high water.	In an action separate from this EA, the Forest Service cut the culvert so that it does not stick out into the river channel.
Melinda Allan for Al Law (no date)	<p>Frissell – Concrete pad would be good for driftboats, also launch rafts faster and reduce congestion. Calmer waters are wonderful for getting those first-time guests loaded safely.</p> <p>Paradise – An eddy to land in would be nice. Currently when the ramp is busy, there is no landing site for boats arriving from upstream. More trailer parking would be nice. Change the ramp from gravel to concrete with a lower grade so that non-SUVs can back trailers in; this would make launching faster and easier. A parking/launching/staging site on the loop itself would be great, or at least a flat spot on the loop with a picnic table so rafters don't take tables from non-rafters. Staging site might be located a little more away from the river so you don't have to shout over rapids to be heard by guests.</p> <p>Bruckart – Please! Lower grade concrete launch pad!! In the old days (before the old pavement washed away), we could load a heavy raft with only three people, now we need a group of six or more! Please also consider adding more boulders to increase eddy size (now we are landing with a throwbag, in higher waters). The one way loop road idea also sounds great.</p> <p>In conclusion, our main concerns for launch sites are:</p>	<p>Frissell - The proposed action would relocate the ramp to slower water, reduce the grade, and provide a concrete ramp. Alternative 3 would not move the ramp to slower water, but would provide a concrete ramp.</p> <p>Paradise - The proposed action would relocate small boulders near the ramp that will improve access. A double wide concrete ramp would replace the existing gravel ramp, and a new staging area would be designated.</p> <p>Bruckart – Both the proposed action and Alternative 3 would reduce the grade of the ramp. The proposed action would improve conditions by relocating the ramp downstream of Bruckart Bridge to slower water.</p>

Submitter and Date	Comment	Response and Where Addressed in the EA
	<ol style="list-style-type: none"> 1. Guest safety 2. Disabled easy access 3. Ease of launching, which increases efficiency so other boaters don't get impatient waiting. 4. Keep ramps open, not having rigs parked on them, or boaters taking forever to launch. 5. Appearance of ramp, porta-johns, garbage cans, etc. 6. Guide safety, for backing trailers, etc. 	
Jim Berl (no date)	<p>At Frissell Launch the current site problems include:</p> <ul style="list-style-type: none"> • The ramp is located on Hwy 126 with no guardrail for safety protection from highway traffic. The proximity to the highway makes it very difficult to give safety/paddle talks with traffic noise. • There is limited space for parking vehicles and also the ramp can be blocked by vehicles and 18 wheel trucks stopped for a rest break. • Many different kinds of craft use this launch including: rafts, pontoon boats, drift boats, inflatable and hard shell kayaks. There is very fast water at the put in with very little parking for boats in the water. • The ramp itself needs work for better and more easy access for boats dropping in and safety for people trying to load into their water craft. <p>In my opinion a launch site over Frissell bridge on the opposite side of the river from the current site would alleviate all these problems.</p> <p>At Paradise Launch current site problems include:</p> <ul style="list-style-type: none"> • A lack of adequate staging areas. • Compliance with use of staging area and not blocking ramp to inflate boats or give safety talks. • Lack of signs about not blocking ramp and river etiquette. • Lack of vehicle with trailer parking. 	<p>Frissell – The proposed action addresses this concern by relocating the ramp on the opposite side of the river just downstream of Buck Bridge.</p> <p>Paradise – The proposed action addresses these concerns by providing an additional staging area, and by doubling the size of the ramp. The proposed action would also add vehicle parking with trailer space in the existing day use area.</p> <p>The conceptual design does not limit the</p>

Submitter and Date	Comment	Response and Where Addressed in the EA
	<p>I need to speak very strongly for continued access for trailers to back into the ramp to unload boats. There is a wide variety of water craft used for recreation including drift boats, pontoon boats and large rafts that are either impractical or impossible to carry to the water. I am not in favor of any design that would limit these types of water craft from using the sites.</p> <p>At Bruckart Launch current site problems include:</p> <ul style="list-style-type: none"> • Space for parking boats at ramp in water is extremely limited with only one or two water craft at a time able to launch or take out. • Parking is limited and it is not easy to back to the ramp when vehicles are in the parking area. • Site distance from the river to the ramp is poor, causing conflicts with boaters trying to put in and take out. • The ramp itself is on a very steep slope, again causing problems for backing trailers and public safety when getting in or out at the site. • Proximity to highway and public safety. <p>The ramp itself is not good. I am not sure what improvements could be made, if any, at the current site. The issues of adequate water craft parking in the river, limited parking for vehicles, site distance from on the river, highway and vehicle safety as well as safety for people in the parking area and walking up and downs the ramp probably can not be solved here.</p> <p>Because of all these major issues at the current Bruckart launch site my suggestion is to build downstream at the bridge itself to alleviate these problems.</p> <p>At the Trail Head launch the current site problems include:</p> <ul style="list-style-type: none"> • Proximity to the highway for public safety as well as highway noise during client paddle talks. • Somewhat limited parking. • Boat ramp is not obvious or well signed. <p>Possible ramp improvements might be:</p>	<p>type of water craft that could use the Paradise launch site. By placing a concrete ramp at the site it should be easier and safer to back a trailer down to the river.</p> <p>Bruckart – The proposed action addresses these concerns by relocating the ramp downstream of the Bruckart Bridge. Conceptual designs would reduce the grade of the ramp and improve parking.</p> <p>Trailhead - An alternative with improvements to this ramp was considered in response to this comment but not fully developed. A 1999 Decision Memo, which implemented development of the pullout where this boat ramp is located, states that the primary uses will</p>

Submitter and Date	Comment	Response and Where Addressed in the EA
	<ul style="list-style-type: none"> • Better marking of ramp and signs stating not to block ramp at any time. • Depending on how much use this site gets with ramps 2 miles either direction that are good ones there might be a possibility for removal and restoration of this ramp. 	<p>be as a trailhead for the National Recreation Trail, and as an interpretive site for the West Cascades National Scenic Byway.</p>
<p>Steve Ponder 09/23/2003</p>	<p>In general, I endorse the Forest Service recommended action alternatives for the Frissell, Paradise and Bruckart boat ramps. The existing Frissell and Bruckart ramps are not only inconvenient but represent a safety hazard to boaters who try to use them.</p> <p>The proposed Bruckart ramp area is a much more appropriate location for parking. Building a new ramp somewhere in the vicinity of the bridge seems appropriate. I am somewhat concerned that locating the boat ramp and the parking is on different sides of the busy highway to Cougar reservoir would create a safety hazard to pedestrians and to boaters moving rigs back and forth. Traffic controls may need to be considered. I also wonder whether Delta Campground has been evaluated as a potential ramp site, since it already has a road and parking network.</p>	<p>The proposed action and Alternative 3 were designed in a fashion that reduces hazards associated with the existing ramps.</p> <p>The design for parking at Bruckart considers appropriate signage and what types of traffic controls would be necessary.</p> <p>Delta Campground was not considered as a potential site because a ramp at that site would be on the outside bend of the river, and would require cutting thru the river terrace. This would maintain some of the existing problems associated with the current Bruckart ramp.</p>