ENDANGERED SPECIES ACT SECTION 7 CONSULTATION

BIOLOGICAL OPINION

61130-2010-F-0239

for

U. S. Army Corps of Engineers

Standard Local Operating Procedures for Endangered Species (SLOPES) for Selected Nationwide Permit Activities Affecting Bull Trout in Western Montana and Northern Idaho

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INTRODUCTION

Purpose of the Consultation

Section 404 of the Clean Water Act requires authorization from the Secretary of the Army, acting through the Corps of Engineers (Corps), for the discharge of dredged or fill material into waters of the United States, including jurisdictional wetlands. Discharges of fill material include, but are not limited to, the placement of material such as soil, rock, and large woody debris necessary for the construction of structures, roadways, dams/dikes, and stabilization of eroding stream banks.

A programmatic Biological Assessment (BA) was developed cooperatively by the U.S. Army Corps of Engineers Regulatory offices in Walla Walla and Omaha Districts, to initiate Endangered Species Act (ESA) consultation with the U.S. Fish and Wildlife Service (Service) under Section 7 of the Endangered Species Act for minor actions in northern Idaho and western Montana that may affect bull trout and Kootenai white sturgeon (COE 2012). This document addresses the consultation requirements for bull trout. Consultation for Kootenai white sturgeon will be addressed separately. The BA proposes the establishment of a protocol of Standard Local Operating Procedures for Endangered Species (SLOPES), which would be applicable to activities that typically require review and verification under commonly utilized Nationwide Permits (NWPs) pursuant to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act (Fed Reg Vol. 63, No. 126, July 1, 1998).

The Agencies' intent of establishing SLOPES is to provide more efficient use of government resources required to conduct numerous ESA consultations for minor activities and to document compliance with the ESA for actions which may be authorized by NWPs affecting aquatic endangered species. Actions authorized by NWPs by definition have minimal individual and cumulative adverse environmental impact due to limitations in size and scope of the projects. The implementation of SLOPES also encourages the use of low-impact methods and materials which permit applicants can incorporate into the planning and design of their projects, thus receiving expedited regulatory approval. Ultimately the establishment of SLOPES is expected to further minimize impacts to important aquatic and riparian areas that bull trout depend upon for their continued survival, while making the most efficient use of limited government resources, and streamlining the permit verification process for applicants.

The biological assessment (USACE 2012) identifies conservation measures (CM) which must be incorporated into individual projects involving specified activities to be covered for ESA compliance under this programmatic consultation. Projects proposed that could impact other species not addressed in this consultation will continue to have individual ESA consultation, as will projects that meet the requirements of actions which could be authorized by the NWPs but do not incorporate the conservation measures specified herein or that do not comply with the exclusions specified (Appendix A). Consultation for projects that incorporate the specified conservation measures and meet all other requirements for the NWPs will be covered by this programmatic consultation.

The types of projects these SLOPES will apply to will be in the vast majority of cases, low impact, low risk, routine actions. It is limited to areas that are already developed. Many of the activities verified under these actions are related to improving and upgrading aging public infrastructure. This SLOPES will not apply to the actions that pertain to new residential (e.g., NWP 29 type actions), commercial, industrial or institutional development (e.g., NWP 39 type actions), or to the new road or utility work required to establish a new residential, commercial, industrial or institutional development. The expectation for excluding these activities from SLOPES will allow the agencies to better predict cumulative and indirect effects over the next several years. **The intent of the SLOPES is to cover non-federal land where the Army Corps of Engineeers is the lead consulting agency. Other federal agencies may follow the conservation measures, and in so doing may benefit from streamlined consultation, but must initiate consultation and obtain their own authorization for incidental take, as appropriate.**

Geographic Scope

The geographic area covered by this SLOPES includes portions of western Montana and northern Idaho in the Columbia River and the St. Mary Bull Trout Interim Recovery Units (RU) (USFWS 2002). The entire range of white sturgeon in the United States is a subset of this geographic area contained within the Kootenai River (see Figure 1).

Timeframe

The consultation is intended to cover the specified Corps activities during the five year period following the effective date in 2013 through 2018. The SLOPES may be revisited during that five year period, if new information becomes available that warrants re-initiation of consultation. Annual meetings will occur to discuss the permits authorized under this SLOPES consultation, the quantity and type of resources that were impacted, and the effectiveness of conservation measures incorporated to minimize impacts.

Jeopardy Analysis

Jeopardy determinations for bull trout are made at the scale of the listed entity, which is the coterminous United States population (64 FR 58910). This follows the April 20, 2006 analytical framework guidance described in the Service's memorandum to Ecological Services Project Leaders in Idaho, Oregon and Washington from the Assistant Regional Director – Ecological Services, Region 1. The guidance indicates that a biological opinion should concisely discuss all the effects and take into account how those effects are likely to influence the survival and recovery functions of the affected interim recovery unit(s), which should be the basis for determining if the proposed action is "likely to appreciably reduce both survival and recovery of the coterminous United States population of bull trout in the wild."

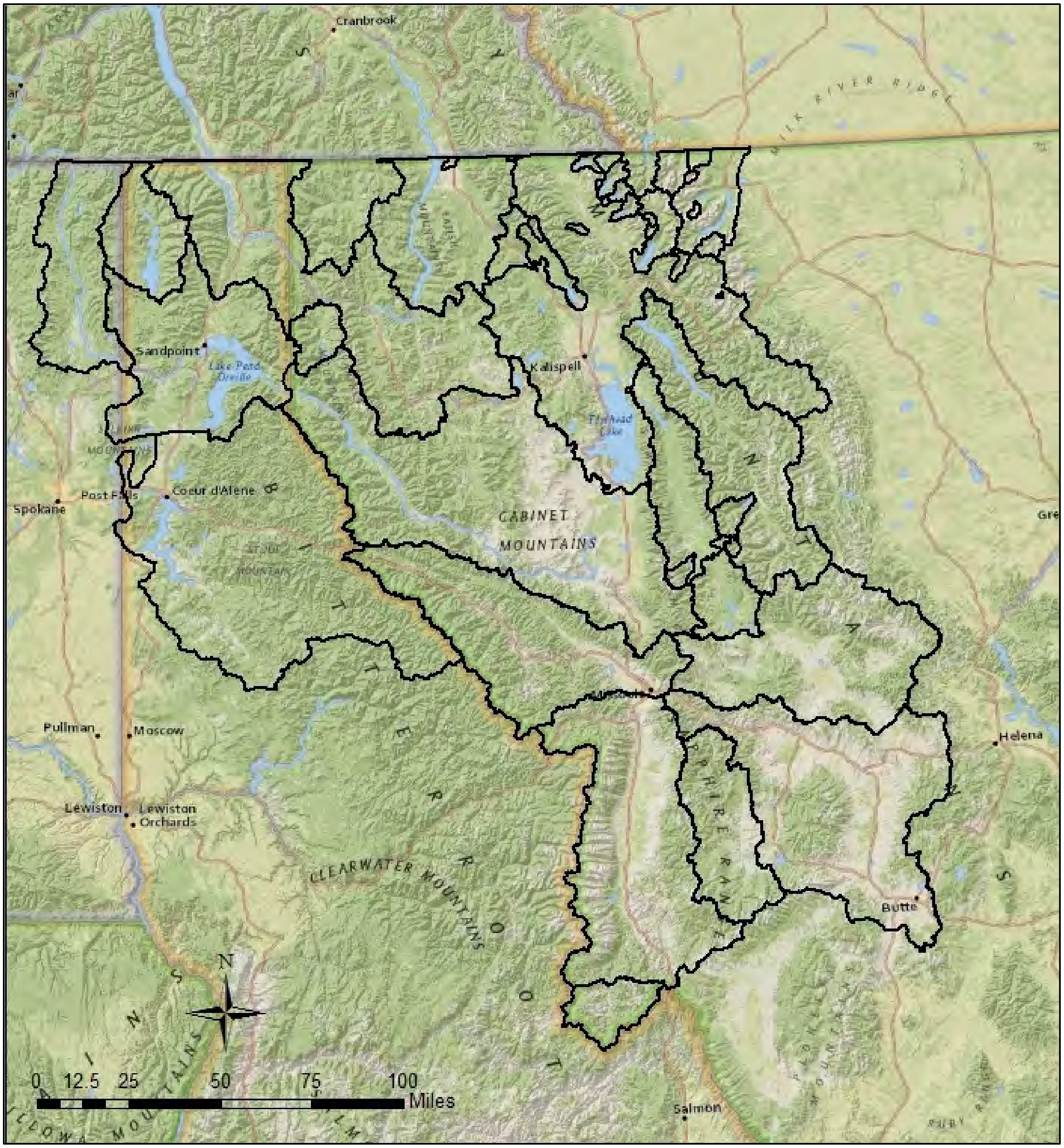

Figure 1. Geographic area of consultation (Montana and Idaho portions only)

For the purposes of bull trout jeopardy analysis the Service uses the hierarchal relationship between units of geographical scales that characterize effects at the lowest unit or scale (i.e. local population) toward the highest unit or scale of analysis (i.e. the Columbia River Interim Recovery Unit). This analytical framework relies heavily on the importance of core area bull trout populations to survival and recovery of the species. Core areas form the building blocks that provide for conserving bull trout evolutionary legacy as represented by the major evolutionary groups (Coastal, Snake River, and Upper Columbia River). Should the adverse effects of a proposed action not rise to the level where it appreciably reduces both survival and recovery of the species at a lower scale, such as the local or the core population, by deduction the proposed action would not jeopardize bull trout at the higher scale of the interim recovery unit (Columbia River) or the coterminous United States (i.e., range wide). Therefore, the determination would result in a no-jeopardy finding. However, should a proposed action produce adverse effects that are determined to appreciably reduce both survival and recovery of the species at a lower scale of analysis, then further analysis is warranted at the next higher scale. "If a proposed Federal action is incompatible with the viability of the affected core area population(s), inclusive of associated habitat conditions, a jeopardy finding may be warranted, because of the relationship of each core area population to the survival and recovery of the species as a whole." (75 FR 63943)

In summary, until the Draft Bull Trout Recovery Plan is finalized, the Service has adopted the use of *local population, core area, critical habitat unit, and interim recovery unit* for purposes of consultation and recovery (USFWS 2002). For the purposes of this consultation the hierarchal relationships between these geographical units of analysis are illustrated in Table 1.

The action area for this biological opinion is non-federally owned lands within the listed core areas in the Clark Fork, Coeur d'Alene and Kootenai Management Units of the Columbia River Interim Recovery Unit and the St. Mary Interim Recovery Unit. Core areas with little to no non-federal land have been eliminated from the analysis (see Analysis of Species and Critical Habitat Likely to be Affected, below). The analysis of effects at the level of local population is not considered in detail because projects are initiated at the sole discretion of non-federal applicants, rather than being directed by the Corps, and site-specific locations and types of projects are not predictable. Such effects can only be generally predicted, based on federal vs. non-federal ownership of the watersheds that support local populations. This biological opinion addresses only the impacts to the federally listed bull trout and their designated critical habitat within the action area. It does not address the overall environmental acceptability of the proposed action. Impacts to Kootenai white sturgeon will be addressed in a separate document.

Adverse Modification of Designated Critical Habitat

Critical habitat designations identify habitat areas that provide essential life cycle needs of the species, using the best available scientific and commercial data (75 FR 63898). Further guidance is provided in the Director's December 9, 2004, memorandum (USFWS 2004a), which is in response to litigation on the regulatory standard for determining whether proposed Federal agency actions are likely to result in the "destruction or adverse modification" of designated critical habitat under Section 7(a)(2) of the ESA. This memorandum outlines interim measures for conducting Section 7 consultations pending the adoption of any new regulatory definition of "destruction or adverse modification." Consequently, this biological opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, the Service relied upon the statutory provisions of the ESA to complete the following analysis with respect to critical habitat.

Adverse modification determinations are made at the rangewide scale, based on impacts to one or more critical habitat units. Impacts to the primary constituent elements (PCEs) are assessed within the action area (USFWS 2004a), and projected to the critical habitat unit. Table 1 shows the hierarchal relationship between units of analysis for bull trout that determine whether the proposed action is likely to destroy or adversely modify the designated critical habitat by altering the PCEs to such an extent that the conservation value of the critical habitat is appreciably reduced. If the adverse effects of the proposed action rise to the level where the conservation value of critical habitat is substantially degraded within a core area, then an analysis is made as to whether the conservation value is also substantially degraded in the critical habitat unit.

Table 1. Hierarchy of units of analysis for bull trout jeopardy and adverse modifications analysis for this biological opinion.

Interim Recovery Units/DPS Columbia River Recovery Unit St. Mary River Recovery Unit	
Management Units/ Critical Habitat Units Clark Fork Management Unit/Clark Fork River Basin Coeur d'Alene Management Unit/ Coeur d'Alene Lake Basin Kootenai Management Unit/ Kootenai River Basin (Three of 23 Management Units in the Columbia River Interim Recovery Unit/DPS) St. Mary River Basin	
Core Areas	
Clark Fork River Mgmt Unit	**Coeur d'Alene Lake Mgmt Unit**
Bitteroot River	Coeur d'Alene Lake
Blackfoot River	
Clark Fork River - Middle	**Kootenai River Mgmt Unit**
Clark Fork River - Upper	Bull Lake
Clearwater River & Lakes	Kootenai River
Cyclone Lake	Lake Koocanusa
Flathead Lake	Sophie Lake
Lake Pend Oreille	
Lindbergh Lake	**St. Mary Recovery Unit**
Lower Clark Fork River	Lee Creek
Pend Oreille River	St. Mary River
Priest Lakes	
Rock Creek	
Swan Lake	
Upper Stillwater Lake	
Upper Whitefish Lake	
West Fork Bitterroot River	
Whitefish Lake	

Consultation History

Consultation began between Omaha District and the Montana Fish and Wildlife Service Office (Region 6), and between Walla Walla District and the Idaho Fish and Wildlife Service (Region 1) in October, 2009. Originally, informal programmatic consultation was being pursued for potential impacts to bull trout, Kootenai River white sturgeon, and their critical habitats related to minor actions implemented under certain nationwide permits for western Montana and northern Idaho (Columbia River Recovery Unit and St. Mary's Recovery Unit). The process of programmatic consultation within the Corps is referred to as SLOPES (standard local operating plan for endangered species). Development of SLOPES is being encouraged within the Corps in order to address workload issues, especially for recurring actions requiring consultation.

An interagency SLOPES team agreed to meet regularly to discuss actions to be covered within the BA, anticipated impacts, conditions, geographic scope, and other topics related to the BA. Discussions also included expanding the geographic scope, reducing the geographic scope, inclusion of other federal agencies in the consultation, whether to include additional species in the consultation, and whether the consultation should be informal or formal. The majority of coordination has been done via conference call. SLOPES team calls were held on the dates listed below.

SLOPES CONFERENCE CALL DATES:

2009	2010	2011	2012
Oct 19	Jan 25	Oct 20	Jan 11
Nov 16	March 8	Nov 16	Feb 15
	April 7	Dec 14	Feb 29
	April 20		Mar 8
	May 24		Mar 21
	June 28		Apr 10
	July 28		Apr 12
	August 25		Apr 18
	Sept 16		Apr 24
	Nov 16		May 29
			Jun 4
			Aug 23
			Nov 7

Multiple draft versions of the Biological Assessment (BA) were completed in the time period between January 2010 and December 2012 and were circulated among team members for review, generally followed by a conference call to discuss feedback.

The full team met in person to discuss the document October 5 and 6, 2010, in Spokane, WA. It was during this meeting that it was decided that the Corps should pursue formal consultation for some actions, shifting the focus of the BA. The Montana office offered to be the lead for consultation.

The BA was formally transmitted by the Corps to the FWS Montana Ecological Services field office (Region 6) on August 31, 2012, and the FWS Northern Idaho Ecological Services field office (Region 1) on September 5, 2012, along with a request to enter into formal consultation. Corps and Service staff worked together informally during the fall of 2012, further editing the

BA to include additional text and references. The BA was deemed adequate by the Service on December 11, 2012.

Although ESA consultation is between the Corps and the Service, other partners participated and offered assistance during the development of the BA. Tribal consultation occurred between the Tribes listed below and the Omaha and Walla Walla Districts of the Corps.

SLOPES PARTICIPANTS:

WESTERN MONTANA TEAM

OMAHA DISTRICT CORPS
Helena, MT Field Office
Missoula, MT Field Office
Omaha, NE Field Support Office

USFWS
Montana Field Office

TRIBES
Confederated Salish & Kootenai Tribe
Blackfeet Tribe

NORTHERN IDAHO TEAM

WALLA WALLA DISTRICT CORPS
Walla Walla, WA Office
Coeur d'Alene, ID Field Office

USFWS
Northern Idaho Field Office

TRIBES
Kalispell Tribe of Indians
Coeur d'Alene Tribe
Kootenai Tribe of Idaho

OTHER
NRCS
Bonneville Power Administration

DESCRIPTION OF THE PROPOSED ACTION

Activities which may be covered by eight NWPs (Table 2) are proposed for inclusion in this SLOPES protocol including their respective regional conditions (RCs), specific conditions that have been added by the States or Tribes through their authority pursuant to Section 401 of the Clean Water Act (401Cs). Required conservation measures (CMs) and exclusions (EXs) are then further applied to the existing eight NWP conditions to create the SLOPES protocol.

Each NWP has an associated set of limitations on how much physical change is allowable and mandatory general conditions to which permittees must adhere (USACE 2012). In some cases, special project-specific conditions are added to further minimize adverse impacts, or to require compensatory mitigation where warranted. Regional conditions and 401c conditions for each state are detailed in the BA (USACE 2012). The SLOPES protocol is not intended to duplicate protective measures already employed in the existing NWPs, but was developed to provide additional measures specific to protecting listed species and their critical habitat.

The SLOPES protocol was designed to cover projects that are relatively low impact, low risk, and routine actions. It is limited to areas that are already developed. Many of the activities authorized under these NWPs are related to improving and upgrading aging public or private infrastructure. This SLOPES will not apply to activities associated with new residential (e.g., NWP 29 type actions), commercial, industrial or institutional development (e.g., NWP 39 type actions), or to the new road or utility work required to establish a new residential, commercial, industrial or institutional development.

Table 2. Nationwide Permits and added conditions included in the SLOPES protocol.

NWP Number – Description	Walla Walla District	Omaha District
3 – Maintenance	401C	RC, 401C
12 – Utility Work	401C	RC, 401C
13 - Bank Stabilization	RC, 401C	RC, 401C
14 – Transportation Work	RC, 401C	RC, 401C
18 – Minor Discharges	401C	RC, 401C
19 – Minor Excavation	401C	RC, 401C
27 – Restoration	RC, 401C	RC, 401C
33 – Temporary Access/Dewatering	RC, 401C	RC, 401C

Conservation measures must be incorporated into individual projects involving specified activities to be covered for ESA compliance under this programmatic consultation. Projects proposed that could impact other species not addressed in this consultation will continue to have individual ESA consultation, as will projects that meet the requirements of the NWPs but do not incorporate the conservation measures specified herein. Consultation for projects that incorporate the specified conservation measures and meet all other requirements for the NWPs will be covered by this programmatic consultation. Conservation measures and exclusions, as applicable, will be specified for project activities, irrespective of the NWP which may be used to authorize the project, however, for clarity of explanation, CMs and EXs are listed below under the NWP which is most closely applicable. See Appendix A for a comprehensive list of all conservation measures and exclusions.

To facilitate the analysis of effects, the actions covered by this SLOPES were grouped into three “impact categories:”

Impact Category 1 – Short-term Disturbance. This category contains actions that consist primarily of short-term disturbance as is typical for maintenance, utility crossings, minor discharges and dredging, and impacts related to temporary construction access and dewatering.

Impact Category 2 – Short-term Disturbance/Detrimental Habitat Modification. This category includes streambank stabilization activities designed to arrest horizontal channel migration.

Impact Category 3 – Short-term Disturbance/Beneficial Habitat Modification. This category includes projects for aquatic habitat restoration, establishment, and enhancement.

The following conservation measures apply to all activities authorized under SLOPES:

1. All work should be performed in the dry when possible. Any work in flowing water must be completed by working from the top of the bank and work areas must be isolated from flowing or open water using cofferdams, silt curtains, sandbags or other approved means to keep sediment from entering flowing or open water, unless isolating the area and working in the channel would result in less habitat disturbance.

2. The Corps will check with appropriate sources to determine whether or not listed fish are present or likely to be present during any proposed in-water work. Where necessary, work timeframes will be added as special permit conditions to minimize adverse impacts to listed fish. (SLOPES condition)

    a. Bull trout: For projects involving in-channel or riparian disturbance (e.g., excavation or construction within the bank-full channel or a 35 ft buffer each side of channel) the following timing stipulations will apply as the period when activities are allowable to minimize adverse impacts: (1) July 1 to September 30 in foraging, migration or over-wintering habitats; and (2) May 1 to August 31 in spawning and rearing habitats.

    b. Kootenai white sturgeon: In-channel disturbance is limited to the period between August 1 to April 1.

Impact Category 1 – Short-term Disturbance

NWP 3 – Maintenance; NWP 12 - Utility Line Activities; NWP 18 – Minor Discharges; NWP 19 – Excavation; NWP 33 - Temporary Construction, Access, and Dewatering

Maintenance: (NWP 3 type actions) Maintenance involves the repair, rehabilitation, or replacement of any previously authorized, currently serviceable, structure or fill provided that the structure or fill is not to be put to uses differing from those uses specified or contemplated for it in the original permit or the most recently authorized modification. Examples of maintenance activities covered by this SLOPES include clearing accumulated organic debris from inlets, outlets, abutments, and piers, removal of sediment or debris inside a culvert or under a bridge, replacement and maintenance of culverts or bridges, or re-burying exposed utility lines. These actions typically involve excavation, grading, and placement of fill material. Small organic debris consists of twigs, leaves, and bushes. Large organic debris includes tree trunks, rootwads, and branches.

NWP 3 does not allow a change in use of the structure or fill; however, minor deviations in the structure's configuration or filled area, including those due to changes in materials, construction techniques, or current construction codes or safety standards that are necessary to make the repair, rehabilitation, or replacement are authorized.

Note: Many maintenance activities are not regulated and do not require a permit from the Corps, and are thus not covered in the protocol. All regulated maintenance activities that comply with the conditions of NWP 3 are included.

Examples of maintenance activities that would be covered under this SLOPES include:
- ✓ Replacing damaged culverts and bridge abutments
- ✓ Replacing a damaged storm water or sewer outfall at the same location
- ✓ Repairing 30 feet of a 150 foot long riprap revetment that washed away in a high flow event.
- ✓ Replacing a concrete retaining wall panel that has cracked and slumped out of position.
- ✓ Removing partially buried woody debris from a bridge abutment with heavy equipment, to prevent damage to the bridge.
- ✓ Removing accumulated sediment to re-establish function to a municipal water intake.

Conservation Measures:

3. Only the minimum amount of native material necessary to maintain the function of the structure or fill, will be removed.
4. Woody debris removal will be completed in the following priority: (1) Pull and release whole logs or trees downstream; (2) pull whole logs and trees and place in the riparian area; (3) remove whole logs or trees for replacement within the same stream reach or a reach nearby; and (4) pull, cut only as necessary, and release logs and trees downstream.
5. Replacement of existing stream crossings will be designed to promote natural sediment transport, allow maximum fluvial debris movement, and improve horizontal and vertical continuity and connectivity of the stream-floodplain systems where practicable.
6. If replacing a bridge with a culvert, the culvert must be sized to allow for equal or increased cross sectional area of the ordinary high water channel as compared to the previously existing bridge. The new culvert must be an open bottom arch or box, or must be oversized and countersunk into the substrate to allow unimpeded natural movement of existing streambed material.

Utility Line Activities: (NWP 12 type actions) Utility line construction or repair could involve excavation, temporary side casting of excavated material, placement of pipeline or cable in a trench, backfilling of the trench, and restoration of the work site to pre-construction contours and vegetation. A utility line is any pipe or pipeline for the transportation of any gaseous, liquid, liquefiable, or slurry substance, for any purpose, and any cable, line, or wire for the transmission for any purpose of electrical energy, telephone and telegraph messages, and radio and television communication. The term “utility line” does not include activities which drain a water of the United States, such as drainage tile; however, it does apply to pipes conveying drainage from one area to another. Infiltration galleries are considered utility lines.

Examples of activities excluded from coverage by this SLOPES:

- Oil and gas exploration or production, construction or upgrading of a gas, sewer or water line to support a new or expanded service area, and foundations for transmission towers.
- Utility crossings involving open trenches where the trench material is sidecast in the stream and flow is not diverted around the open trench, (a.k.a. wet trenching).
- Instream work involving utility lines greater than 6 inches in diameter.

Conservation Measures:

7. Utility stream crossings shall be perpendicular to the watercourse, or nearly so, and designed in the following priority: (1) directional drilling, boring and jacking; and (2) dry trenching or plowing.
8. If trenching or plowing are used, all work shall be completed in the dry and backfilled with native material and any large wood displaced by trenching or plowing will be returned to its original position wherever feasible.
9. Install utility lines or cables using a static plow or knifing method.
10. At stream crossings, the area along the bank disturbed by the utility work will be revegetated with native species. A revegetation plan must be submitted with the application specifying species, planting or seeding rates and maintenance measures to ensure 80% cover (ground or canopy) after three years.
11. All pits and other excavations associated with utility installation will be placed where they will not cause damage to the streambed or streambanks, or allow wastewater or spoil material to enter the water. Erosion and sediment control measures must be put in place prior to beginning work and remain in place until the work is completed and the trench is backfilled and stabilized.

***Minor Discharges and Excavation*:** (NWP 18 & 19 type actions) This category includes minor discharges and excavations such as small structural fills, minor excavations or dredging necessary for culvert maintenance, installation of outfall structures and minor repairs of previously authorized structures or fills. The quantity of fill or excavation is limited to 25 cubic yards below the ordinary high water mark.

Examples of activities excluded from coverage by this SLOPES:

- Outfalls where none previously existed
- Intakes where none previously existed
- Unscreened intakes
- Any instream structure that could become a barrier to fish movement during low flows.
- Any regulated excavation greater than 10 cubic yards total.

Conservation Measures:

12. Structural fills with materials such as concrete shall be placed into tightly sealed forms or cells that do not contact the waterway until fully cured.
13. Any intake structure shall meet NOAA screening criteria.

***Temporary Construction, Access, and Dewatering*:** (NWP 33 type actions) This category of activities includes temporary structures, fills, and work that may be associated with other activities that may not necessarily be covered by this SLOPES. For example, a state's Department of Transportation (DOT) may be consulting with USFWS on a large federally funded project. The DOT's contractor, who will provide the details of the temporary work associated with the highway project, will be given the opportunity to review and incorporate this SLOPES into their proposal for temporary facilities, with the understanding that if they comply with the approved conservation measures, the DOT will not have to consult with the USFWS on the activities associated with the temporary facilities. The outcome may be that the contractor's proposal is approved faster and work may begin sooner than if the DOT had to consult separately for the temporary work, the details of which are usually not known at the time of consultation on the larger parent project.

Examples of activities excluded from coverage by this SLOPES:

- ✗ Temporary bypass channels in excess of 300 linear feet
- ✗ Dewatering that places a stream into a pipe more than 300 feet long or for more than 30 days.

Conservation Measures:

14. All construction impacts must be confined to the minimum area necessary to complete the project and boundaries of clearing limits associated with site access and construction will be clearly marked to avoid or minimize disturbance of riparian vegetation, wetlands and other sensitive sites.
15. Project operations must cease under high flow conditions that may result in inundation of the project area.
16. If native woody riparian vegetation must be removed for temporary access purposes, the vegetation must be cut flush with the ground surface or folded over. The root mass must be left intact, and any exposed soil must be reseeded with native grasses or forbs after construction is completed.
17. Each non-native tree or shrub that must be removed as a result of the project will be replaced with a native species of tree or shrub in accordance with NRCS recommendations for native species appropriate for the project location.

Impact Category 2 – Short-term Disturbance/Detrimental Habitat Modification

NWP 13 – Streambank and Shoreline Stabilization; NWP 14 – Linear Transportation Projects

Streambank and Shoreline Stabilization: (NWP 13 type actions) Stabilization activities include the placement of material along or adjacent to streambanks or shorelines for the purpose of increasing resistance to erosion by moving water. Methods may include hardening the bank with vegetation, soil, large wood, rock, or by creating structures to divert stream flow away from the bank or reduce the effects of wave action by utilizing in-water structures such as dikes, groins, buried groins, drop structures, porous weirs, weirs, riprap, rock toes, and similar structures. Streambank stabilization usually includes the placement of fill material below the ordinary high water mark of streams in order to prevent damage to existing adjacent structures caused by the erosive force of flowing water. Shoreline stabilization involves placing fill material below the ordinary high water mark in order to protect lake and reservoir shorelines from erosion caused by wind and wave action. It is important to note the difference between stream restoration and bank stabilization projects. Proposed projects should be looked at closely to determine if the intent is to arrest lateral movement of a bank or shoreline to preserve property (stabilization), or to re-establish vegetative and geomorphologic stability in a disturbed environment, such as an overgrazed or burned riparian area (restoration).

This SLOPES encourages the use of bioengineering principles and practices. Bioengineering is defined as the integration of living woody and herbaceous materials along with organic and inorganic materials to increase the strength and structure of soil. Streambank soil bioengineering is defined as the use of living and nonliving plant materials in combination with natural and synthetic support materials for slope stabilization, erosion reduction, and vegetative establishment (NRCS 2007). The following streambank and shoreline stabilization methods, individually or in combination, are included in this SLOPES: woody plantings; herbaceous cover; deformable soil reinforcement; coir logs, straw bales and straw logs to trap sediment; engineered log jams (use of concrete logs is not proposed); and stream barbs made of wood. The use of quarried stone riprap or barbs would be limited as follows: The elevation of the rock toe would be limited to the ordinary high water mark. The portion of bank above the rock toe will be vegetated with native trees, shrubs, grasses and forbs according to an approved revegetation plan submitted concurrently with the application.

Examples of activities excluded from coverage by this SLOPES:

- Riprap that extends above the ordinary high water mark.
- Stabilization methods in stream environments that do not include a vegetative component.
- New sea walls, retaining walls or bulkheads, where none previously existed.
- Any project utilizing broken, poured or precast concrete.
- Any project utilizing treated lumber or wood.
- Any project that exceeds one cubic yard of riprap per linear foot below ordinary high water.

Conservation Measures:

18. The design of any proposed stabilization structures must incorporate bioengineering principles.
19. Any structure that protrudes into the river must be designed by a professional engineer/hydrologist experienced in the design of such structures.
20. The largest riprap/rock material must be keyed into the toe of the bank.
21. Existing channel form and dimension must be maintained to the maximum extent possible.
22. If using wood, it must be intact, hard, and undecayed to partly decaying with untrimmed root wads to provide functional refugia habitat for fish. Wood must be obtained from outside of the channel.

23. Unless naturally-occurring material is present at the site, appropriate measures must be taken to ensure retention of fine soil particles beneath riprap/rock material. Measures can include the use of coarse sand and fine gravel, suitable biodegradable geotexile material, or a 50/50 mixture of native streambed material taken from the toe trench where riprap will be keyed into the river bed, and topsoil from sloping of the upper bank area placed behind the riprap/rock.
24. Clean natural angular rock or stone may be used to anchor or stabilize large wood, fill scour holes, prevent scouring or undercutting of an existing structure, or to construct a barb, weir or other properly designed and approved in-water structure. The use of rock or stone must comply with the Corps policy on prohibited materials.
25. Rock riprap shall be individually placed without end dumping.
26. All repairs of previously existing bank protection structures (unless such repairs are exempt from Section 404 compliance) shall incorporate bioengineering principles, with minimal use of clean natural rock or stone and maximum revegetation of the bankline above the ordinary high water mark.
27. If the entire structure has been destroyed or damaged beyond repair, replacement of the structure shall utilize bioengineering principles and methods, and will incorporate native vegetation.
28. Stabilization activities shall not exceed 300 linear feet per continuous run of material.
29. Where applicable (based on criteria specified in the Montana Stream Mitigation Procedures; MSMP), the applicant shall follow mitigation requirements as defined in the MSMP.
30. Stabilization activities shall involve the discharge of no more than 1 cubic yard per linear foot below ordinary high water (OHW).
31. No refueling of equipment will take place within 100 linear feet of OHW or the wetland boundary.
32. Equipment must have a five gallon capacity spill kit on board at all times when working near water.
33. Within the first planting season post-construction, the stabilized bank shall be revegetated with native or other approved species.
34. A revegetation plan must be submitted with the application specifying species, planting or seeding rates and maintenance measures to ensure 80% coverage (ground or canopy) after three years.
    a. Equipment such as backhoes, excavators, dump trucks, and cranes shall be operated from the top of bank or along the shore and not allowed to enter the waterway, unless work area isolation would result in less habitat disturbance.

Linear Transportation Projects**:** (NWP 14 type actions) Linear transportation projects include new highway construction (but not those associated with new development) or improvement of an existing highway, road, street or bridge, including widening, repairing, realigning, reconstructing or removing existing roads and bridges, or replacing culverts under roads including temporary fills and access fills. Linear transportation projects may involve excavation, grading, filling, placement of culverts, construction of bridges, and construction of drainage features. Linear transportation projects may also include construction and maintenance of railroad tracks and supporting fill, bridges, trestles, and culverts.

Examples of activities excluded from coverage by this SLOPES:

- ✗ Stream or wetland impacts for new road construction within 300 feet of occupied bull trout or Kootenai River white sturgeon streams.
- ✗ Bridge abutments below ordinary high water of occupied streams where none previously existed.
- ✗ Channel maintenance that does not involve work area isolation to retain suspended sediment.
- ✗ A replacement bridge without full removal of the existing bridge, support structures and approach fill.

Conservation Measures:

35. Replacement of existing or new permanent stream crossings shall be designed to promote natural sediment and debris transport and maximize connectivity of the stream-floodplain system. If the crossing will occur near a known or suspected spawning area, only full span bridges or streambed simulation may be used.
36. Culvert replacements or modifications shall be done in the dry (could be accomplished by temporary dewatering), unless it can be confirmed by a qualified fisheries biologist that no listed fish are present during instream activities.
37. Appropriate grade controls shall be included to prevent culvert failure caused by changes in stream elevation.
38. Road crossing and bridge structures shall be designed to direct surface drainage into areas or features designed to prevent erosion of soil and entry of other pollutants directly into waterways or wetlands (such as biofiltration swales or other treatment facilities).
39. Cleaning of culverts and trash racks and removal of drift material shall be conducted by working from the top of the bank, unless isolating the area and working in the channel would result in less habitat disturbance. Only the minimum amount of wood, sediment and other natural debris necessary to maintain structure function shall be removed. All large wood recovered during cleaning will be placed downstream. All routine work will be done in the dry, using work area isolation if necessary.

Impact Category 3 – Short-term Disturbance/Beneficial Habitat Modification

Aquatic Habitat Restoration, Establishment, and Enhancement Activities**:** (NWP 27 type actions) This category may include road decommissioning; actions to set-back or remove water control structures (e.g., small dams (<10 feet head difference), levees, dikes, berms, weirs); remove trash and other artificial debris dams that block fish passage; provide stormwater management that restores natural or normative hydrology; remove sediment bars or terraces that block fish passage within 50 feet of a tributary mouth; place large wood within the channel or riparian area; installation of stream flow and current deflectors; enhancement, restoration or creation of riffle and pool stream structure; placement of instream habitat structures;

modifications of the stream bed and/or banks to restore or create stream meanders; reshaping of streambanks to reconnect with adjacent floodplain; installation of streambank vegetation; backfilling of artificial channels and drainage ditches; removal of existing drainage structures; construction of small nesting islands; construction of open water areas; activities needed to reestablish vegetation; and other activities described in Nationwide Permit 27.

Examples of activities excluded from coverage by this SLOPES:

- Pond construction or expansion in streams or wetlands.
- Large dam removal projects (>10' head difference).
- Projects that involve relocating more than 300 feet of channel (cumulative total for the entire project).
- Use of concrete logs, cable (wire rope) or chains to permanently anchor any structure.

Conservation Measures:

40. No part of water control structure, such as barbs, may exceed bank full elevation, including all rock buried in the bank key.
41. Maximum barb length will not exceed 1/4 of the bankfull channel width.
42. Structures that protrude into the stream (barbs, vanes, spurs) must be designed by a qualified engineer, or geomorphologist.
43. Trenches excavated for a bank key above ordinary high water shall be backfilled with soil and planted with native vegetation.
44. Rock shall be individually placed without end dumping.
45. All stream and wetland restoration activities shall include adequate precautions to prevent post-construction stranding of juvenile or adult fish which must be described in detail in the application.

Any proposals to add spawning gravel must first be reviewed and approved by the local state fisheries biologist. Spawning gravel must be inspected by either a state fisheries biologist or a qualified fisheries biologist familiar with the site's characteristics and requirements.

STATUS OF BULL TROUT AND CRITICAL HABITAT

Listing History

The coterminous United States population of the bull trout (*Salvelinus confluentus*) was listed as threatened on November 1, 1999 (64 FR 58910). The threatened bull trout occurs in the Klamath River Basin of south-central Oregon and in the Jarbidge River in Nevada, north to various coastal rivers of Washington to the Puget Sound and east throughout major rivers within the Columbia River Basin to the St. Mary-Belly River, east of the Continental Divide in northwestern Montana (Cavender 1978, Bond 1992, Brewin and Brewin 1997, Leary and Allendorf 1997).

Throughout its range, the bull trout is threatened by the combined effects of habitat degradation, fragmentation and alterations associated with: dewatering, road construction and maintenance, mining, and grazing; the blockage of migratory corridors by dams or other diversion structures; poor water quality; incidental angler harvest; entrainment (a process by which aquatic organisms are pulled through a diversion or other device) into diversion channels; and introduced non-native species (64 FR 58910).

The bull trout was initially listed as three separate Distinct Population Units (DPSs)(63 FR 31647, 64 FR 17110). The preamble to the final listing rule for the United States coterminous population of the bull trout discusses the consolidation of these DPSs, plus two other population segments, into one listed taxon and the application of the jeopardy standard under section 7 of the ESA relative to this species (64 FR 58930):

> "Although this rule consolidates the five bull trout DPSs into one listed taxon, based on conformance with the DPS policy for purposes of consultation under section 7 of the Act, we intend to retain recognition of each DPS in light of available scientific information relating to their uniqueness and significance. Under this approach, these DPSs will be treated as interim recovery units with respect to application of the jeopardy standard until an approved recovery plan is developed. Formal establishment of bull trout recovery units will occur during the recovery planning process."

Current Status and Conservation Needs

Five segments of the coterminous United States population of the bull trout are considered essential to the survival and recovery of this species and are identified as interim recovery units: (1) Jarbidge River; (2) Klamath River; (3) Columbia River; (4) Coastal-Puget Sound; and (5) St. Mary-Belly River (USFWS 2002). Each of these segments is necessary to maintain the bull trout's distribution, as well as its genetic and phenotypic diversity, all of which are important to ensure the species' resilience to changing environmental conditions.

The proposed action occurs in the Columbia River and St. Mary-Belly River interim recovery units. A summary of the current status and conservation needs in the Columbia River unit is presented below, followed by the St. Mary-Belly River unit. A comprehensive discussion of the current status and conservation needs of the bull trout within all five interim recovery units is found in the Service's draft recovery plan for the bull trout (USFWS 2002).

Generally, the conservation needs of the bull trout are often generally expressed as the need to provide the four "C's": cold, clean, complex, and connected habitat. Cold stream temperatures, clean water quality that is relatively free of sediment and contaminants, complex channel characteristics (including abundant large wood and undercut banks), and large patches of such habitat that are well connected by unobstructed migratory pathways are all needed to promote conservation of bull trout at multiple scales ranging from the coterminus to local populations. The recovery planning process for the bull trout (USFWS 2002, 2004b) has also identified the following conservation needs for the bull trout: (1) maintain and restore multiple, interconnected populations in diverse habitats across the range of each interim recovery unit; (2) preserve the diversity of life-history strategies; (3) maintaining genetic and phenotypic diversity across the range of each interim recovery unit; and (4) establish a positive population trend. Recently, it has also been recognized that bull trout populations need to be protected from catastrophic fires across the range of each interim recovery unit.

Central to the survival and recovery of the bull trout is the maintenance of viable core areas (USFWS 2002, 2004b). A core area is defined as a geographic area occupied by one or more local bull trout populations that overlap in their use of rearing, foraging, migratory, and overwintering habitat, and in some cases in their use of spawning habitat. Each of the interim recovery units listed above consists of one or more core areas. Approximately 118 core areas are recognized across the United States range of bull trout (USFWS 2002, 2004b).

The Columbia River interim recovery unit currently contains about 90 core areas and 500 local populations. About 62 percent of these core areas and local populations occur in central Idaho and northwestern Montana. The condition of the bull trout within these core areas varies from poor to good but generally all have been subject to the combined effects of habitat degradation, fragmentation and alterations associated with one or more of the following activities: dewatering; road construction and maintenance; mining, and grazing; the blockage of migratory corridors by dams or other diversion structures; poor water quality; incidental angler harvest; entrainment into diversion channels; and introduced non-native species. The Draft Bull Trout Recovery Plan (USFWS 2002) identifies the following conservation needs for this unit: maintain or expand the current distribution of the bull trout within core areas; maintain stable or increasing trends in bull trout abundance; maintain/restore suitable habitat conditions for all bull trout life history stages and strategies; and conserve genetic diversity and provide opportunities for genetic exchange.

In Canada, bull trout occur east of the Continental Divide in the upper MacKenzie River basin (Arctic drainage) of the Northwest Territories, British Columbia, and Alberta and in the upper Peace, Athabasca, North Saskatchewan, and South Saskatchewan River basins (Hudson Bay drainage) of Alberta. In the United States, however, the only bull trout populations east of the Continental Divide are found in the headwaters of the Oldman River, a tributary to the South Saskatchewan River drainage. This international drainage is formed by the Waterton, Belly, and Saint Mary rivers, which originate on the east slopes of the Rocky Mountains in Glacier National Park, Montana. The Waterton and Belly rivers flow north into Waterton Lakes National Park, Alberta. The Saint Mary River flows northeasterly across the northwest corner of the Blackfeet Reservation before crossing the international border. Bull trout apparently colonized the waters east of the Continental Divide via postglacial dispersal routes from refugia in the MacKenzie and Columbia River basins and elsewhere, soon after the Pleistocene glaciation approximately 12,000 years ago. (Nelson and Paetz 1992; Haas and McPhail 2001). The U.S. portions of the Waterton and Belly River basins lies wholly within Glacier National Park, with limited anthropogenic influences and natural conditions dominating. Therefore, the remainder of the discussion for the St. Mary-Belly River unit will focus on the St. Mary River basin.

Life History

Bull trout exhibit both resident and migratory life history strategies. Both resident and migratory forms may be found together, and either form may produce offspring exhibiting either resident or migratory behavior (Rieman and McIntyre 1993). Resident bull trout complete their entire life cycle in the tributary (or nearby) streams in which they spawn and rear. The resident form tends to be smaller than the migratory form at maturity and also produces fewer eggs (Fraley and Shepard 1989; Goetz 1989). Migratory bull trout spawn in tributary streams where juvenile fish rear 1 to 4 years before migrating to either a lake (adfluvial form), river (fluvial form) (Fraley and Shepard 1989; Goetz 1989), or saltwater (anadromous) to rear as subadults or to live as adults (Cavender 1978; McPhail and Baxter 1996). Bull trout normally reach sexual maturity in 4 to 7 years and may live longer than 12 years. They are iteroparous (they spawn more than once in a lifetime), and both repeat- and alternate-year spawning has been reported, although repeat-spawning frequency and post-spawning mortality are not well documented (Leathe and Graham 1982; Fraley and Shepard 1989; Pratt 1992; Rieman and McIntyre 1996).

The iteroparous reproductive system of bull trout has important repercussions for the management of this species. Bull trout require two-way passage up and downstream, not only for repeat spawning but also for foraging. Most fish ladders, however, were designed specifically for anadromous semelparous (fishes that spawn once and then die, and therefore require only one-way passage upstream) salmonids. Therefore even dams or other barriers with fish passage facilities may be a factor in isolating bull trout populations if they do not provide a downstream passage route.

Growth varies depending upon life-history strategy. Resident adults range from 6 to 12 inches total length, and migratory adults commonly reach 24 inches or more (Pratt 1985; Goetz 1989). The largest verified bull trout is a 32-pound specimen caught in Lake Pend Oreille, Idaho, in 1949 (Simpson and Wallace 1982).

Habitat Characteristics

Bull trout have more specific habitat requirements than most other salmonids (Rieman and McIntyre 1993). Habitat components that influence bull trout distribution and abundance include water temperature, cover, channel form and stability, valley form, spawning and rearing substrate, and migratory corridors (Fraley and Shepard 1989; Goetz 1989; Hoelscher and Bjornn 1989; Sedell and Everest 1991; Howell and Buchanan 1992; Pratt 1992; Rieman and McIntyre 1993, 1995; Rich 1996; Watson and Hillman 1997). Watson and Hillman (1997) concluded that watersheds must have specific physical characteristics to provide the habitat requirements necessary for bull trout to successfully spawn and rear and that these specific characteristics are not necessarily present throughout these watersheds. Because bull trout exhibit a patchy distribution, even in pristine habitats (Rieman and McIntyre 1993), fish should not be expected to simultaneously occupy all available habitats (Rieman et al.1997).

Migratory corridors link seasonal habitats for all bull trout life histories. The ability to migrate is important to the persistence of bull trout (Rieman and McIntyre 1993; Gilpin 1997; Rieman et al. 1997). Migrations facilitate gene flow among local populations when individuals from different local populations interbreed, or stray, to nonnatal streams. Local populations that are extirpated by catastrophic events may also become reestablished by bull trout migrants.

However, it is important to note that the genetic structuring of bull trout indicates that there is limited gene flow among bull trout populations, which may encourage local adaptation within individual populations, and that reestablishment of extirpated populations may take a very long time (Spruell et al. 1999; Rieman and McIntyre 1993).

Cold water temperatures play an important role in determining bull trout habitat, as these fish are primarily found in colder streams (below 59 degrees Fahrenheit), and spawning habitats are generally characterized by temperatures that drop below 48 degrees Fahrenheit in the fall (Fraley and Shepard 1989; Pratt 1992; Rieman and McIntyre 1993).

Thermal requirements for bull trout appear to differ at different life stages. Spawning areas are often associated with cold-water springs, groundwater infiltration, and the coldest streams in a given watershed (Pratt 1992; Rieman and McIntyre 1993; Baxter and McPhail 1997; Rieman et al. 1997). Optimum incubation temperatures for bull trout eggs range from 35 to 39 degrees Fahrenheit whereas optimum water temperatures for rearing range from about 46 to 50 degrees Fahrenheit (McPhail and Murray 1979; Goetz 1989; Buchanan and Gregory 1997). In Granite Creek, Idaho, Bonneau and Scarnecchia (1996) observed that juvenile bull trout selected the coldest water available in a plunge pool, 46 to 48 degrees Fahrenheit, within a temperature gradient of 46 to 60 degrees Fahrenheit. In a landscape study relating bull trout distribution to maximum water temperatures, Dunham et al. (2003a) found that the probability of juvenile bull trout occurrence does not become high (i.e., greater than 0.75) until maximum temperatures decline to 52 to 54 degrees Fahrenheit.

Although bull trout are found primarily in cold streams, occasionally these fish are found in larger, warmer river systems throughout the Columbia River basin (Fraley and Shepard 1989; Rieman and McIntyre 1993, 1995; Buchanan and Gregory 1997; Rieman et al. 1997). Factors that can influence bull trout ability to survive in warmer rivers include availability and proximity of cold water patches and food productivity (Myrick et al. 2002). In Nevada, adult bull trout have been collected at 63 degrees Fahrenheit in the West Fork of the Jarbidge River (S. Werdon, USFWS, pers. comm. 1998) and have been observed in Dave Creek where maximum daily water temperatures were 62.8 to 63.6 degrees Fahrenheit. In the Little Lost River, Idaho, bull trout have been collected in water having temperatures up to 68 degrees Fahrenheit; however, bull trout made up less than 50% of all salmonids when maximum summer water temperature exceeded 59 degrees Fahrenheit and less than 10% of all salmonids when temperature exceeded 63 degrees Fahrenheit (Gamett 1999). In the Little Lost River study, most sites that had high densities of bull trout were in an area where primary productivity increased in the streams following a fire (B. Gamett, U.S. Forest Service, pers. comm. 2002).

All life history stages of bull trout are associated with complex forms of cover, including large woody debris, undercut banks, boulders, and pools (Fraley and Shepard 1989; Goetz 1989; Hoelscher and Bjornn 1989; Sedell and Everest 1991; Pratt 1992; Rich 1996; Sexauer and James 1997; Watson and Hillman 1997). Maintaining bull trout habitat requires stability of stream channels and maintenance of natural flow patterns (Rieman and McIntyre 1993). Juvenile and adult bull trout frequently inhabit side channels, stream margins, and pools with suitable cover

(Sexauer and James 1997). These areas are sensitive to activities that directly or indirectly affect stream channel stability† and alter natural flow patterns. For example, altered stream flow in the fall may disrupt bull trout during the spawning period, and channel instability may decrease survival of eggs and young juveniles in the gravel from winter through spring (Fraley and Shepard 1989; Pratt 1992; Pratt and Huston 1993). Pratt (1992) indicated that increases in fine sediment reduce egg survival and emergence.

Bull trout typically spawn from August to November during periods of decreasing water temperatures. Preferred spawning habitat consists of low-gradient stream reaches with loose, clean gravel (Fraley and Shepard 1989). Redds are often constructed in stream reaches fed by springs or near other sources of cold groundwater (Goetz 1989; Pratt 1992; Rieman and McIntyre 1996). Depending on water temperature, incubation is normally 100 to 145 days (Pratt 1992), and after hatching, juveniles remain in the substrate. Time from egg deposition to emergence of fry may surpass 200 days. Fry normally emerge from early April through May, depending on water temperatures and increasing stream flows (Pratt 1992; Ratliff and Howell 1992).

Migratory forms of the bull trout appear to develop when habitat conditions allow movement between spawning and rearing streams and larger rivers or lakes where foraging opportunities may be enhanced (Frissell 1993). For example, multiple life history forms (e.g., resident and fluvial) and multiple migration patterns have been noted in the Grande Ronde River (Baxter 2002). Parts of this river system have retained habitat conditions that allow free movement between spawning and rearing areas and the mainstem Snake River. Such multiple life history strategies help to maintain the stability and persistence of bull trout populations to environmental changes. Benefits to migratory bull trout include greater growth in the more productive waters of larger streams and lakes, greater fecundity resulting in increased reproductive potential, and dispersing the population across space and time so that spawning streams may be recolonized should local populations suffer a catastrophic loss (Rieman and McIntyre 1993; MBTSG 1998; Frissell 1993). In the absence of the migratory bull trout life form, isolated populations cannot be replenished when disturbance makes local habitats temporarily unsuitable, the range of the species is diminished, and the potential for enhanced reproductive capabilities are lost (Rieman and McIntyre 1993).

Diet

Bull trout are opportunistic feeders, with food habits primarily a function of size and life-history strategy. Resident and juvenile migratory bull trout prey on terrestrial and aquatic insects, macrozooplankton, and small fish (Boag 1987; Goetz 1989; Donald and Alger 1993). Adult migratory bull trout feed on various fish species (Leathe and Graham 1982; Fraley and Shepard 1989; Brown 1994; Donald and Alger 1993). In coastal areas of western Washington, bull trout feed on Pacific herring (*Clupea pallasi*), Pacific sand lance (*Ammodytes hexapterus*), and surf smelt (*Hypomesus pretiosus*) in the ocean (Brown 1994).

Bull trout migration and life history strategies are closely related to their feeding and foraging strategies. Optimal foraging theory can be used to describe strategies fish use to choose between alternative sources of food by weighing the benefits and costs of capturing one choice of food over another. For example, prey often occurs in concentrated patches of abundance ("patch model," Gerking 1994). As the predator feeds the prey population is reduced, and it becomes more profitable for the predator to seek a new patch rather than continue feeding on the original one. This can be explained in terms of balancing energy acquired versus energy expended. In the Skagit River system, anadromous bull trout make migrations as long as 121 miles between marine foraging areas in Puget Sound and headwater spawning grounds, foraging on salmon eggs and juvenile salmon along their migratory route (Brown 1994). Anadromous bull trout also use marine waters as migratory corridors to reach seasonal habitats in non-natal watersheds to forage and possibly overwinter (Brenkman and Corbett 2005; Goetz 1994).

A single optimal foraging strategy is not necessarily a consistent feature in the life of a fish, but this foraging strategy can change from one life stage to another. Fish growth depends on the quantity and quality of food that is eaten (Gerking 1994) and as fish grow their foraging strategy changes as their food changes in quantity, size, or other characteristics. Resident and juvenile migratory bull trout prey on terrestrial and aquatic insects, macrozooplankton, mysids and small fish (Shepard et al. 1984, Boag 1987, Goetz 1989, Donald and Alger 1993). Bull trout that are 4.3 inches long or longer commonly have fish in their diet (Shepard et al. 1984), and bull trout of all sizes have been found to eat fish half their length (Beauchamp and Van Tassell 2001).

Migratory bull trout begin growing rapidly once they move to waters with abundant forage that includes fish (Shepard et al. 1984). As these fish mature they become larger bodied predators and are able to travel greater distances (with greater energy expended) in search of prey species of larger size and in greater abundance (with greater energy acquired). In Lake Billy Chinook as bull trout became increasingly piscivorous with increasing size, the prey species changed from mainly smaller bull trout and rainbow trout for bull trout less than 17.7 inches in length to mainly kokanee for bull trout greater in size (Beauchamp and Van Tassell 2001).

Migration allows bull trout to access optimal foraging areas and exploit a wider variety of prey resources. Bull trout likely move to or with a food source. For example, some bull trout in the Wenatchee basin were found to consume large numbers of earthworms during spring runoff in May at the mouth of the Little Wenatchee River where it enters Lake Wenatchee (USFWS 2003). In the Wenatchee River, radio-tagged bull trout moved downstream after spawning to the locations of spawning chinook and sockeye salmon and held for a few days to a few weeks, possibly to prey on dislodged eggs, before establishing an overwintering area downstream or in Lake Wenatchee (USFWS 2003).

Status and Distribution

Columbia River Basin

Generally, where status is known and population data exists, bull trout populations throughout the Columbia River basin are at best stable and more often declining (Thomas 1992; Schill 1992;

Pratt and Huston 1993; USFWS 2005a, 2005b). Bull trout in the Columbia basin have been estimated to occupy about 45 percent of their historic range (Quigley and Arbelbide 1997). Many of the bull trout core areas occur as isolated watersheds in headwater tributaries, or in tributaries where the migratory corridors have been lost or restricted. Few bull trout core areas are considered strong in terms of relative abundance and core area stability (63 FR 31647-31674, June 10, 1998, USFWS 2005a, 2005b). Strong core areas are generally associated with large areas of contiguous habitat.

Status of Bull Trout in the Clark Fork Management Unit

Within the Clark Fork management unit of western Montana and northern Idaho, the Draft Bull Trout Recovery Plan describes 38 bull trout core areas (now 37 core areas, memorandum to the Acting Regional Director, Ecological Services, Region 1, Portland, OR, from Field Supervisor, Montana Ecological Services, Helena, MT., July 14, 2006) and at least 152 local populations (USFWS 2002).

The Clark Fork River Management Unit is among the largest and most diverse across the species range and contains the highest number of core areas of any management unit, due in large part to the preponderance of isolated headwater lakes in the system. In the Clark Fork River Management Unit (USFWS 2002), which includes all of the Clark Fork River Basin from Albeni Falls Dam (outlet of Lake Pend Oreille) upstream to Montana headwaters, the Service described 37 core areas for bull trout. Bull trout within the larger and more diverse core areas are typically characterized by having relatively small amounts of genetic diversity within a local population but high levels of divergence between them (see for example Spruell et al. 1999, Kanda and Allendorf 2001; Neraas and Spruell 2001). At the lowest rung in the hierarchical organizational level, the Draft Bull Trout Recovery Plan (USFWS 2002) describes groups of bull trout that spawn together in tributaries as local populations. There are 152 local populations of bull trout currently described in the Clark Fork River Management Unit (USFWS 2002).

The Service considers many of the core areas in the Clark Fork River drainage to be at risk of extirpation due in part to natural isolation, single life-history form, and low abundance. Expansion of nonnative species including lake trout into headwater lakes is the single largest human-caused threat in most of the 25 primarily adfluvial core areas (Fredenberg 2008); dams and degraded habitat have contributed to bull trout declines across this Management Unit.

Protect, restore and maintain suitable habitat conditions within the Clark Fork River Management Unit are a high priority identified in the draft Recovery Plan (USFWS 2002). Apart from migration impacts from the major dams, threats in the Clark Fork River Management Unit include, in order of importance, non-native species, water withdrawals, angling and poaching, forestry practices management and legacy mining impacts (Fredenberg 2008). Maintaining and improving habitat condition on federal lands in western Montana is crucial for the recovery of the species.

Status of Bull Trout in the Kootenai River Management Unit

The Kootenai River Management Unit forms part of the range of the Columbia River population segment. The Kootenai River Management Unit is unique in its international configuration, and recovery will require strong international cooperative efforts. Within the Kootenai River Management Unit, the historic distribution of bull trout is relatively intact. Abundance of bull trout in portions of the watershed has been reduced, and remaining populations are fragmented. The Kootenai River Management Unit includes 4 core areas (Lake Koocanusa, Kootenai River, Sophie Lake, Bull Lake) and 10 local populations.

The greatest threats to bull trout in this Management Unit, in order of magnitude, are introduced species, forestry, water withdrawals, angling and poaching, migration barriers, residential development, and mining (Fredenberg 2008). Distribution of bull trout has changed little since listing as bull trout continue to be present in nearly all major watersheds where they likely occurred historically.

St. Mary-Belly River Basin

Within the St. Mary drainage, bull trout are widely distributed and often locally abundant throughout the basin upstream from St. Mary Reservoir, Alberta, including the river and all major lakes (7) and tributaries (10) to which bull trout had historical access (Mogen and Kaeding 2005a and 2005b; Mogen 2012). Much of the habitat is protected and lies within pristine Glacier National Park. Timber harvest, livestock-grazing, mining, and non-native species introductions do not appear to be major factors affecting this population. Both migratory and resident populations exist within the drainage and spawning occurs annually in at least seven of the tributaries. Those lakes known to contain adfluvial bull trout populations include St. Mary, Lower St. Mary, Red Eagle, Cracker, Sherburne, Upper Slide and Lower Slide lakes. St. Mary tributaries that have viable bull trout populations include Red Eagle, Boulder, Canyon, Kennedy, Otatso and Lee creeks. Bull trout also occasionally use Divide Creek for spawning as indicated by the presence of young fish in some years. Juvenile and adult bull trout have also been found in Swiftcurrent, Rose and Wild creeks, and a few smaller unnamed tributaries, but for various reasons spawning does not occur in those streams. During annual summer (July-August, 1998-2011) electrofishing surveys in those tributaries, bull trout were commonly encountered and frequently the most numerous fish in the samples. Although they occur in several tributaries, brook trout abundance is mostly limited where they exist, and brown trout have never occurred in the drainage. The primary threats to this population of bull trout appear to be fish passage, canal entrainment (Mogen et al. 2011), and habitat loss associated with the Bureau of Reclamation projects.

The historic distribution of native fishes in the St. Mary River drainage was delimited by the many natural, year-round barriers to fish movement. Waters that were upstream from such barriers and historically barren of fish included the entire upper Red Eagle, Swiftcurrent, Kennedy and Otatso Creek watersheds, and the headwaters of the St. Mary River itself (Figure X1). Among the fishes indigenous to the drainage, bull trout, westslope cutthroat trout, and mountain whitefish (*Prosopium williamsoni*) are believed to have occurred in all of the streams and lakes to which they had access, including the Slide Lakes, while lake trout inhabited only St. Mary and Lower St. Mary lakes (Brown 1971). Nowhere else in the contiguous United States are bull trout naturally sympatric with lake trout (Donald and Alger 1993). Also indigenous to the drainage are northern pike (*Esox lucius*), burbot (*Lota lota*), and lake whitefish (*Coregonus clupeaformis*), all of which inhabit the St. Mary lakes, and white sucker (*Catostomus commersoni*), longnose sucker (*Catostomus catostomus*), mountain sucker (*Catostomus platyrhynchus*), lake chub (*Couesius plumbeus*), trout-perch (*Percopsis omiscomaycus*), longnose dace (*Rhinichthys cataractae*), pearl dace (*Margariscus margarita*), mottled sculpin (*Cottus bairdi*), and spoonhead sculpin (*Cottus ricei*), which inhabit many of the streams and lakes to which the fish had natural access (Brown 1971).

Land-use practices that may impair bull trout habitat are limited in the St. Mary River drainage in Montana. Within Glacier National Park, no extant land-use activities are known to adversely affect bull trout. On the Blackfeet Reservation, land-use practices that may adversely affect bull trout primarily consist of livestock grazing and timber harvest. Although both practices occur in limited areas, timber harvest is extensive in some parts of the Lee Creek drainage.

In addition, along the lower reach of Swiftcurrent Creek, which historically flowed into the St. Mary River downstream from Lower St. Mary Lake, a dike was constructed which channeled the stream into the lake itself. That allowed water released from Lake Sherburne to be diverted into the St. Mary Canal. During the non-irrigation months and after all water-debt is repaid to Canada in accordance with the Boundary Waters Treaty of 1909, Sherburne Dam is completely closed to allow for refilling of the reservoir, leaving the 5.4-km stretch of Swiftcurrent Creek between the dam and the Boulder Creek confluence devoid of flow (about October through March).

Five-year Bull Trout Status Review

In 2005, the Service assessed the conservation status of bull trout and the vulnerability for each of 121 bull trout core areas (now 118 core areas; USFWS 2005b). We reviewed the Bull Trout Core Area Conservation Assessment and concluded that the original threats to bull trout still existed for the most part in all core areas, but no substantial new and widespread threats were discovered during this review or in the review of previous biological opinions on bull trout. This finding indicates the baseline conditions overall rangewide had not changed substantially in the last five years and that the trend and magnitude of the rangewide population had not worsened nor did it improve measurably.

The risk assessment or ranking portion of the status review was modeled to assess the relative status of each of the 118 core areas. The model used to rank the relative risk to bull trout was based on the Natural Heritage Programs' NatureServe Conservation Status Assessment Criteria, which had been applied in previous assessments of fish status, including bull trout (Master et al. 2003; MNHP and MFWP 2004). The model integrated four factors: population abundance, distribution, population trend, and threats. For a complete understanding of the ranking process, a more thorough review of the report which describes the model and the output is required (USFWS 2005b).

In the Clark Fork River Management Unit the status assessment denoted 16 of 37 core areas at "high risk" of extirpation because of rapidly declining numbers and/or substantial imminent threats. Ten core areas were found to be "at risk" with moderate imminent or substantial non-imminent threats, and nine core areas were designated as a "potential risk" for extirpation primarily due to uncertainty regarding short-term population trends.

For the Kootenai River Management Unit the status assessment indicated that two of the four core areas (Kootenai River and Bull Lake) are considered to be at "at risk" because of very limited and/or declining numbers, range, and/or habitat, making the bull trout in this core area vulnerable to extirpation. The Lake Koocanusa core area is considered to be at "low risk" because bull trout are common or uncommon, but not rare, and usually widespread through the core area. The Sophie Lake core area is considered to be at "high risk" because of extremely limited and/or rapidly declining numbers, range, and/or habitat, making the bull trout in this core area highly vulnerable to extirpation.

In the St. Mary-Belly River the status assessment indicated that Red Eagle Lake and Cracker Lake core areas are at risk because of limited population, limited spawning habitat, and isolation. Lee Creek and St. Mary core areas are at risk because of the uncertainty of migratory and overwintering habitat quality downstream in Canada in the St. Mary River and St. Mary Reservoir. The St. Mary core area is at high risk from entrainment, impacts to fish passage, and habitat degradation from infrastructure and operation associated with the Bureau of Reclamation's St. Mary-Milk River irrigation project. Impacts from this project represent the single largest threat to bull trout in the St. Mary-Belly River Interim Recovery Unit.

Recommended actions that would benefit bull trout in the St. Mary River drainage include: (1) facilitation of year-round movement of adult bull trout over the St. Mary Diversion dam; (2) prevention of bull trout entrainment in the St. Mary Canal; (3) release of water from Sherburne Dam to provide adequate winter habitat for bull trout downstream in Swiftcurrent Creek and consequently the lower St. Mary River; and (4) assessment and remediation, if necessary, of the effects of water diversion into the St. Mary Canal (i.e., the removal of water from the drainage) on bull trout habitat in the St. Mary River downstream from the diversion, in Montana and Alberta.

Status of Designated Critical Habitat

Legal Status

The Service published a final critical habitat designation for the coterminous United States population of bull trout on October 18, 2010 (75 FR 63898); the rule became effective on November 17, 2010. A justification document was also developed to support the rule and is available on the Service's website (http://www.fws.gov/pacific/bulltrout). The scope of the designation involved the species' coterminous range, which includes the Jarbidge River, Klamath River, Columbia River, Coastal-Puget Sound, and Saint Mary-Belly River population segments (also considered as interim recovery units). Designated bull trout critical habitat is of two primary use types: 1) spawning and rearing (SR), and 2) foraging, migration, and overwintering (FMO) and includes both reservoirs/lakes and stream/shoreline miles.

The 2010 revision increases the amount of designated bull trout critical habitat by approximately 76 percent for miles of stream/shoreline and by approximately 71 percent for acres of lakes and reservoirs compared to the 2005 designation. For the Columbia River Basin 16,915.9 miles of stream and 427,044 acres of reservoirs/lakes were designated as critical habitat.

This rule also identifies and designates as critical habitat approximately 822.5 miles of streams/shorelines and 16,701.3 acres of lakes/reservoirs of unoccupied habitat to address bull trout conservation needs in specific geographic areas in several areas not occupied at the time of listing. No unoccupied habitat was included in the 2005 designation. These unoccupied areas were determined by the Service to be essential for restoring functioning migratory bull trout populations based on currently available scientific information. These unoccupied areas often include lower main stem river environments that can provide seasonally important migration habitat for bull trout. This type of habitat is essential in areas where bull trout habitat and population loss over time necessitates reestablishing bull trout in currently unoccupied habitat areas to achieve recovery.

Conservation Role and Description of Critical Habitat

The conservation role of bull trout critical habitat is to support viable core area populations (75 FR 63898:63943 [October 18, 2010]). The core areas reflect the metapopulation structure of bull trout and are the closest approximation of a biologically functioning unit for the purposes of recovery planning and risk analyses. Critical habitat units (CHUs) generally encompass one or more core areas and may include FMO areas, outside of core areas, that are important to the survival and recovery of bull trout.

Thirty-two CHUs within the geographical area occupied by the species at the time of listing are designated under the revised rule. Twenty-nine of the CHUs contain all of the physical or biological features identified in this final rule and support multiple life-history requirements. Three of the mainstem river units in the Columbia and Snake River basins contain most of the physical or biological features necessary to support the bull trout's particular use of that habitat, other than those physical biological features associated with primary constituent elements (PCEs) 5 and 6 (described below), which relate to breeding habitat.

The primary function of individual CHUs is to maintain and support core areas, which 1) contain bull trout populations with the demographic characteristics needed to ensure their persistence and contain the habitat needed to sustain those characteristics (Rieman and McIntyre 1993); 2) provide for persistence of strong local populations, in part, by providing habitat conditions that encourage movement of migratory fish (MBTSG 1998; Rieman and McIntyre 1993); 3) are large enough to incorporate genetic and phenotypic diversity, but small enough to ensure connectivity between populations (Hard 1995; Healey and Prince 1995; MBTSG 1998; Rieman and McIntyre 1993); and 4) are distributed throughout the historic range of the species to preserve both genetic and phenotypic adaptations (Hard 1995; MBTSG 1998; Rieman and Allendorf 2001; Rieman and McIntyre 1993).

Primary Constituent Elements for Bull Trout

Within the designated critical habitat areas, the PCEs for bull trout are those habitat components that are essential for the primary biological needs of foraging, reproducing, rearing of young, dispersal, genetic exchange, or sheltering. Based on our current knowledge of the life history, biology, and ecology of this species and the characteristics of the habitat necessary to sustain its essential life-history functions, we have determined that the following PCEs are essential for the conservation of bull trout and may require special management considerations or protection:

1. Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.
2. Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.
3. An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.
4. Complex river, stream, lake, reservoir, and marine shoreline aquatic environments, and processes that establish and maintain these aquatic environments, with features such as large wood, side channels, pools, undercut banks and unembedded substrates, to provide a variety of depths, gradients, velocities, and structure.
5. Water temperatures ranging from 2 °C to 15 °C (36 °F to 59 °F), with adequate thermal refugia available for temperatures that exceed the upper end of this range. Specific temperatures within this range will depend on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shading, such as that provided by riparian habitat; streamflow; and local groundwater influence.
6. In spawning and rearing areas, substrate of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount of fine sediment, generally ranging in size from silt to coarse sand, embedded in larger substrates, is characteristic of these conditions. The size and amounts of fine sediment suitable to bull trout will likely vary from system to system.
7. A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, minimal flow departure from a natural hydrograph.
8. Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.

9. Sufficiently low levels of occurrence of non-native predatory (e.g., lake trout, walleye, northern pike, smallmouth bass); interbreeding (e.g., brook trout); or competing (e.g., brown trout) species that, if present, are adequately temporally and spatially isolated from bull trout.

The revised PCE's listed above are similar to those previously in effect under the 2005 designation. The most significant modification is the addition of a ninth PCE to address the presence of nonnative predatory or competitive fish species. Although this PCE applies to both the freshwater and marine environments, currently non-native fish species present no concern in the marine environment, though this could change in the future.

Note that only PCEs 2, 3, 4, 5, and 8 apply to marine nearshore waters identified as critical habitat. Also, lakes and reservoirs within the CHUs also contain most of the physical or biological features necessary to support bull trout, with the exception of those associated with PCEs 1 and 6. Additionally, all except PCE 6 apply to FMO habitat designated as critical habitat.

Critical habitat includes the stream channels within the designated stream reaches and has a lateral extent as defined by the bankfull elevation on one bank to the bankfull elevation on the opposite bank. Bankfull elevation is the level at which water begins to leave the channel and move into the floodplain and is reached at a discharge that generally has a recurrence interval of 1 to 2 years on the annual flood series. If bankfull elevation is not evident on either bank, the ordinary high-water line must be used to determine the lateral extent of critical habitat. The lateral extent of designated lakes is defined by the perimeter of the waterbody as mapped on standard 1:24,000 scale topographic maps. The Service assumes in many cases this is the full- pool level of the waterbody. In areas where only one side of the waterbody is designated (where only one side is excluded), the mid-line of the waterbody represents the lateral extent of critical habitat.

Current Condition of Bull Trout Critical Habitat

The condition of bull trout critical habitat varies across its range from poor to good. Although still relatively widely distributed across its historic range, the bull trout occurs in low numbers in many areas, and populations are considered depressed or declining across much of its range (67 FR 71240). This condition reflects the condition of bull trout habitat. The decline of bull trout is primarily due to habitat degradation and fragmentation, blockage of migratory corridors, poor water quality, past fisheries management practices, impoundments, dams, water diversions, and the introduction of nonnative species (63 FR 31647, 64 FR 17112).

There is widespread agreement in the scientific literature that many factors related to human activities have impacted bull trout and their habitat, and continue to do so. Among the many factors that contribute to degraded PCEs, those which appear to be particularly significant and have resulted in a legacy of degraded habitat conditions are as follows:

- fragmentation and isolation of local populations due to the proliferation of dams and water diversions that have eliminated habitat, altered water flow and temperature regimes, and impeded migratory movements (Dunham and Rieman 1999; Rieman and McIntyre 1993);

- degradation of spawning and rearing habitat and upper watershed areas, particularly alterations in sedimentation rates and water temperature, resulting from forest and rangeland practices and intensive development of roads (Fraley and Shepard 1989; MBTSG 1998);
- the introduction and spread of nonnative fish species, particularly brook trout and lake trout, as a result of fish stocking and degraded habitat conditions, which compete with bull trout for limited resources and, in the case of brook trout, hybridize with bull trout (Leary et al. 1993; Rieman et al. 2006);
- degradation of FMO habitat resulting from reduced prey base, roads, agriculture, development, and dams.

CLIMATE CHANGE

Future Regional and Local Climatic and Hydrologic Trends

Over the last 50 years, average spring snowpack (April 1 snow water equivalent) has declined and average snowmelt runoff is occurring earlier in the spring. These trends are observed for northwestern Montana, the entire Pacific Northwest, and much of the western U.S. Since the available data is limited to the last 50 years, it is not clear whether these trends are persistent long-term trends or reflect short-term decade-to-decade variability that may reverse in coming years. Several recent studies of the same trends across the entire western U.S. have concluded that natural variability explains some, but not all, of the west-wide trend in decreasing spring snowpack and earlier snowmelt runoff.

Potential changes in streamflow and rising stream temperatures are likely to increase risks to maintaining existing populations of native cold-water aquatic species. Over the last century, most native fish and amphibians have declined in abundance and distribution throughout the western U.S., including northwest Montana. It is unknown whether, or to what degree, these changes are attributable to climate trends. Potential climate-induced trends of altered streamflow timing, lower summer flows, and increased water temperature will likely reduce the amount, quality, and distribution of habitat suitable for native trout, and contribute to fragmentation of existing populations. Climate related impacts are likely to add cumulatively to other stressors on native fish and amphibian species. Non-native trout and other aquatic species better adapted to warm water temperatures may increase in abundance and expand their existing ranges.

These climatic and hydrologic trends, combined with climate-related trends in wildfires and forest mortality from insects and diseases, can significantly affect aquatic ecosystems and species (Dunham et al. 2003b, Casola et al. 2005, Dunham et al. 2007, Isaak et al. 2010). A growing body of literature has linked these hydrologic trends with impacts to aquatic ecosystems and species in western North America, often as a result of climate-related factors affecting stream temperatures and the distribution of thermally suitable habitat (Petersen and Kitchell 2001, Morrison et al. 2002, Bartholow 2005, Kaushal et al. 2010, Isaak et al. 2010). Lower summer streamflows and higher air temperatures, as observed over recent decades in northwestern Montana, are generally expected to result in increased stream temperatures. However, stream temperatures are controlled by a complex set of site-specific variables; including shading from riparian vegetation, wind velocity, relative humidity, geomorphic factors, groundwater inflow, and hyporheic flow (Caissie 2006).

Potential impacts to fish include:

- Egg incubation and fry emergence may be adversely affected due to flood flows, dewatering, and/or water temperatures. Shifts in the timing and magnitude of natural runoff will likely introduce new selection pressures that may cause changes in the most productive timing or areas for spawning.
- Spring/summer rearing may be adversely affected due to reduction in stream flow and higher water temperatures.
- Overwinter survival may be positively affected by higher winter water temperatures enabling fish to feed more actively, potentially increasing growth rates if sufficient food is available. If food is limited, the elevated metabolic demands could reduce winter growth and survival.

Effects of Climate Change on Bull Trout and Critical Habitat

Based on modeling, Rieman et al. (2007) indicated that the effects of climate change on bull trout populations in the United States are more pronounced in some regions than in others because bull trout are distributed across a broad range of environments and landforms of varied relief. Future loss of bull trout habitat due to climate warming within the interior Columbia River basin was predicted to be 18 to 92 percent of habitat areas that are currently thermally suitable and 27 to 99 percent of large (> 10,000 ha) habitat patches (Rieman et al. 2007). If that were to occur, bull trout would remain in only a few high-elevation strongholds, becoming functionally extinct because the populations would be too small and isolated to guarantee ample genetic flow (Rieman et al. 2007). Because loss and fragmentation of habitats with warming has important implications for bull trout conservation, the loss of isolated patches of habitat could affect bull trout populations at a disproportionately greater level than that predicted based only on the overall loss of habitat area (Rieman et al. 2007). The model also predicted that of the three major bull trout basins in Montana, the Clark Fork River basin is at greatest risk from climate change, followed by the Flathead and Kootenai River basins.

Bull trout is the native trout species most vulnerable to potential increases in stream temperatures because it has the coldest range of thermally suitable habitat among native salmonids in the Northern Rockies. For this species, increasing stream temperatures may cause a net loss of habitat because areas are not available further upstream to replace those that become unsuitably warm. Warmer stream temperatures may also lead to nonnative fish and other aquatic species moving into previously unsuitable upstream areas where they will compete with native species (Rieman et al. 2007, Rahel and Olden 2008, Fausch et al. 2009, Haak et al. 2010)

Projected increases in air temperatures, along with projected decreases in summer stream flows, will likely lead to warmer stream temperatures in the Columbia River basin, particularly during summer low flow periods (Casola et al. 2005). Recent scientific publications suggest that projected air temperature changes are likely to reduce the distribution of thermally suitable natal habitat for bull trout, fragment existing populations, and increase risk of local extirpation (Rieman et al. 2007, Isaak et al. 2010). However, the risk of climate-induced extirpation in subbasins of northwestern Montana may be less than other, relatively drier and warmer, subbasins in the Columbia River basin (Rieman et al. 2007).

Effects of climate change on bull trout described above, largely describes the anticipated effects on bull trout habitat. Therefore, these same trends are expected to affect critical habitat. One objective of the 2010 final rule designating bull trout critical habitat was to identify and protect those habitats that provide resiliency for bull trout use in the face of climate change. Over a period of decades, climate change may directly threaten the integrity of the essential physical or biological features described in PCEs 1, 2, 3, 5, 7, 8, and 9. Protecting bull trout strongholds and cold water refugia from disturbance and ensuring connectivity among populations were important considerations in addressing this potential impact. Additionally, climate change may exacerbate habitat degradation impacts both physically (e.g., decreased base flows, increased water temperatures) and biologically (e.g., increased competition with non-native fishes).

ANALYSIS OF SPECIES AND CRITICAL HABITAT LIKELY TO BE AFFECTED

Core Areas Not Likely and Likely to be Affected

The intended target of this SLOPES consultation is projects on private or non-federally owned land undertaken by private landowners, non-profit groups, or entities of state and local governments where no other federal nexus is present (USACE 2012). While other federal agencies may choose to follow the conservation measures specified in SLOPES and are encouraged to do so, such action agencies retain the responsibility to initiate consultation with the Service under section 7 of the ESA for their projects.

A geospatial analysis of federal vs. non-federal land ownership within each core area was completed for all core areas within the geographic scope of the consultation (Figure 1). Within the three management units of the Columbia River RU, all of the core areas in the Kootenai and Coeur d'Alene MUs contain significant portions of non-federal land. In the Clark Fork MU, 19 of 37 core areas are 98 to 100 percent federal land, and in the St. Mary RU, four of six core areas are almost entirely federal land (Table 3; see also Appendix B). The Corps had zero non-federal applications for NWPs during the period analyzed and expects no such applications during the timeframe covered by this consultation (USACE 2012). Therefore, we conclude that these core areas with over 98 percent federal land will not be affected under this consultation. They will not be discussed further, and no incidental take will be authorized.

The remaining core areas have been stratified by the expected level of impact from implementation of the SLOPES protocol by non-federal applicants, based on the level of activity observed during the period analyzed (2007-2011) and the percentage of non-federal ownership (USACE 2012). Expected permit activity is based on past permit activity, as it is primarily a function of the degree of private land development and population in the area. Information from local Corps project managers was also incorporated in projecting the expected future level of permit activity (Latka 2013, pers. comm.).

For these affected core areas the percentage of non-federal ownership, projected permit activity, and the aggregate impact of SLOPES is displayed in Table 4. Core areas with fewer than

Table 3. Core Areas with no effects/not covered by this consultation.

Core Area	Mgmt Unit	Recovery Unit	Federal Ownership
Akokala Lake	Clark Fork	Columbia River	100%;Glacier National Park
Arrow Lake	Clark Fork	Columbia River	100%, Glacier National Park
Big Salmon Lake	Clark Fork	Columbia River	100%, US Forest Service
Bowman Lake	Clark Fork	Columbia River	100%, Glacier National Park
Cyclone Lake	Clark Fork	Columbia River	100%, US Forest Service
Doctor Lake	Clark Fork	Columbia River	100%, US Forest Service
Frozen Lake	Clark Fork	Columbia River	100%, US Forest Service
Harrison Lake	Clark Fork	Columbia River	100%, Glacier National Park
Holland Lake	Clark Fork	Columbia River	>98%, US Forest Service
Hungry Horse Reservoir	Clark Fork	Columbia River	100%, US Forest Service
Isabel Lakes	Clark Fork	Columbia River	100%, Glacier National Park
Kintla Lake	Clark Fork	Columbia River	100%, Glacier National Park
Lake McDonald	Clark Fork	Columbia River	100%, Glacier National Park
Lincoln Lake	Clark Fork	Columbia River	100%, Glacier National Park
Logging Lake	Clark Fork	Columbia River	100%, Glacier National Park
Lower Quartz Lake	Clark Fork	Columbia River	100%, Glacier National Park
Quartz Lake	Clark Fork	Columbia River	100%, Glacier National Park
Trout Lake	Clark Fork	Columbia River	100%, Glacier National Park
Upper Kintla Lake	Clark Fork	Columbia River	100%, Glacier National Park
Belly River		St. Mary	100%, Glacier National Park
Cracker Lake		St. Mary	>98%, Glacier National Park
Red Eagle Lake		St. Mary	100%, Glacier National Park
Slide Lake		St. Mary	100%, Glacier National Park

five expected permits are classified as “minimal” impact, those with 5 to 25 as “low,” those with 26 to 50 as “moderate,” those with 51 to 100 as “high,” and those with over 100 as “very high.” For core areas that extend into Washington, only the Idaho portion was included in the analyses of land ownership and permit activity. This initial analysis assesses only the degree of impact based on the level of permit activity. Further analysis will examine patterns of permit activity within the three impact categories, focusing most strongly on those core areas with moderate to very high levels of expected permit activity (Table 4).

Critical Habitat Not Likely and Likely to be Affected

Critical habitat on non-federal land in the Clark Fork, Coeur d'Alene, and Kootenai River Basins will be affected by the SLOPES protocol (see Appendix B). In the St. Mary River Basin, critical

Table 4. Bull Trout Core Areas Likely to be Affected by SLOPES Projects

Recovery Unit / Management Unit / Core Area	% Non-Federal Ownership	Non-Federal NWPs	Expected Aggregate Impact of SLOPES Permits
Columbia River RU			
Clark Fork River MU			
Bitterroot River	25-50	155	Very High
Blackfoot River	>50	41	Moderate
Clark Fork River - Middle	25-50	47	Moderate
Clark Fork River - Upper	>50	70	High
Clearwater River & Lakes	25-50	2	Minimal
Cyclone Lake	25-50	0	Minimal
Flathead Lake	25-50	60	High
Lake Pend Oreille	>50*	205*	Very High
Lindbergh Lake	<10	3	Minimal
Lower Clark Fork River	>50	78	High
Pend Oreille River	>50*	0*	Minimal
Priest Lakes	>50*	14*	Low
Rock Creek	10-24	1	Minimal
Swan Lake	25-50	8	Low
Upper Stillwater Lake	25-50	0	Minimal
Upper Whitefish Lake	>50	0	Minimal
West Fork Bitterroot River	<10	1	Minimal
Whitefish Lake	>50	16	Low
Coeur d'Alene Lake MU			
Coeur d'Alene Lake	25-50	152	Very High
Kootenai River MU			
Bull Lake	10-24	2	Minimal
Kootenai River	25-50	50	Moderate
Lake Koocanusa	10-24	14	Low
Sophie Lake	>50	0	Minimal
St. Mary RU			
Lee Creek	>50	0	Minimal
St. Mary River	25-50	0	Minimal

* Includes only Idaho portions of the core areas; Washington portions not analyzed

habitat was designated only within Glacier National Park, and no critical habitat was designated on the Blackfeet Indian Reservation in the Final Rule Designating Critical Habitat for Bull Trout (75 FR 63898). Therefore, critical habitat in the St. Mary River Basin will not be affected by this SLOPES protocol and will not be further discussed in the biological opinion.

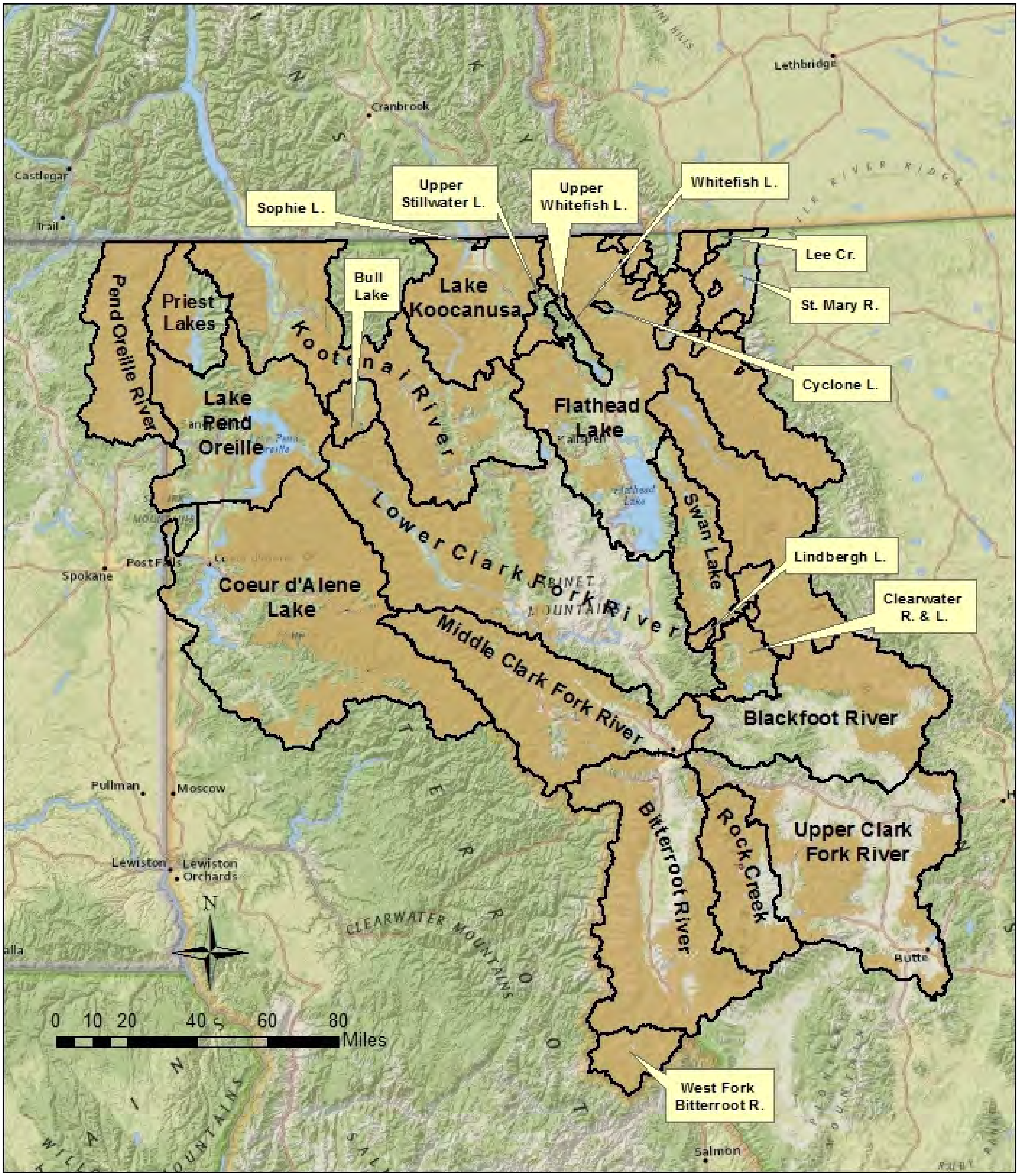

Figure 2. The action area (unshaded portions) within bull trout core areas affected by SLOPES protocol. Unlabeled core areas are not part of the action area.

The action area within the geographic scope of this SLOPES protocol is illustrated in Figure 2. All core areas that will be affected are labeled on the figure. Those core areas that will not be affected, as listed in Table 3, are not labeled. **Shaded out areas comprising federal land in Montana and Idaho, plus all areas within Washington State, are not part of the action area.**

ENVIRONMENTAL BASELINE

Status of Bull Trout in the Action Area

The geographic area for the SLOPES protocol spans western Montana and northern Idaho. Major river basins include the Clark Fork, Pend Oreille, Flathead, Kootenai, and Coeur d'Alene west of the continental divide; east of the divide it includes the St. Mary basin. Within this geographic area, significant portions are not within the action area, as federal land is not part of the action (see Figure 2). Twenty-five core areas have some land within the action area, which includes private, state, tribal, and local government ownerships. These core areas, along with the percentage of non-federal land and expected project activity and aggregate impacts, are displayed in Table 4 above.

The status of bull trout populations within affected core areas varies widely, and resident, adfluvial, and fluvial migratory populations can all be found within the action area. We do not have reliable abundance data for all these basins, but we can characterize them in a qualitative way based on number of local populations and some incomplete abundance information. For the purposes of this document, strong populations are those that are well distributed and relatively abundant within the capability of the watersheds in which they exist. Basins known to have the strongest populations of bull trout include Lake Pend Oreille, Lake Koocanusa and Swan Lake. Moderate populations, relative to core area size and habitat potential are present in Blackfoot River, Clearwater Lakes and River, and Flathead Lake. Other core areas hold weak populations, for a variety of reasons. Some are core areas isolated with artificial barriers (e.g., Clark Fork River core areas); some have naturally limiting habitat (e.g. Lee Creek), while others have habitat degraded by factors such as predation or competition from introduced species or water diversions (e.g., Rock Creek and Bitterroot River). Population estimates for many core areas are not well known (USFWS 2005a, 2005b, 2008). For detailed descriptions of the status of each core area and their local populations see USFWS 2005a, USFWS 2008, Mogen 2012, and USFS 2013.

Status of Bull Trout Critical Habitat in the Action Area

Bull trout critical habitat for the action area is displayed by core area in maps in Appendix B. Foraging-migrating-overwintering comprises the vast majority of bull trout habitat, including designated critical habitat, within the action area. Most of the FMO habitat in affected core areas occurs on non-federal land, with the exception of Flathead Lake core area. In contrast, most spawning and rearing habitat occurs on federal land, with spawning in the mid to upper elevations (USFS 2013).

In general, the status of bull trout critical habitat varies with the degree of human use and development. Areas with high levels of urbanization, residential development, or extensive irrigated agriculture have generally poorer quality habitat than those areas that are relatively undeveloped. Where urban, residential, and agricultural development are lacking, road networks associated with forest management constitute the primary impact to critical habitat.

Significant threats to bull trout habitat differ by core area. Table 5 shows the relative threats that exist for each of the complex core areas (those that contain multiple local populations) in the action area, as ranked by interagency teams of scientists (USFWS 2008) with minor updates. The most significant threat among core areas is introduced species, followed by forest management; angling and poaching and migration barriers are the next most prevalent threats.

Table 5. Relative threats by core area for sixteen complex core areas in the action area.

Core Area	Dewatering	Entrainment	Migration Barriers	Forest Mgmt	Transport Networks	Livestock Grazing	Residential Dev’t	Water Quality	Angling & Poaching	Introduced Species
Upper Clark Fork River	2				3			3		1
Rock Creek						3			1	1
Blackfoot River	1			3		1		1		2
Clearwater River and Lakes			2	3						1
Middle Clark Fork River				2	2				3	1
West Fk Bitterroot River				2			3			1
Bitterroot River	1						3			2
Lake Pend Oreille			1	3						2
Lower Clark Fork			1	3						2
Priest Lake			3	2						1
Swan Lake				2					3	1
Flathead Lake				2					3	1
Lake Koocanusa		3		1					2	
Kootenai River				3				2		1
Coeur d’Alene Lake				2	3			3		1
St. Mary River	1	1	1							
PERCENT with THREAT	**25.0**	**12.5**	**31.3**	**81.3**	**18.8**	**12.5**	**12.5**	**25.0**	**31.3**	**93.8**

With regards to the activities covered under the proposed SLOPES protocol, baseline habitat conditions are not well known. No comprehensive inventory exists for the number of road crossings or utility crossings on non-federal land. An inventory of road crossings for state forest lands in western Montana showed over 2000 distributed among 11 bull trout core areas, with another 340 expected over a 50-year timeframe (USFWS 2011).

Channel migration zone studies and inventories of bank modification have been conducted for a limited number of localized areas in western Montana. In a 60-mile stretch of the Bitterroot River between Darby and Florence, armoring of various kinds was present on 12 percent of banks (Boyd and Thatcher 2008). In a 24-mile stretch of the Flathead River just above Flathead Lake, bank armor was found to be extensive, even when numerous sites were not visible due to high lake levels or vegetation (Boyd et al 2010). Preliminary studies for channel migration zone mapping on the Upper Clark Fork River between Garrison and Drummond, MT indicate that bank armoring and floodplain isolation are extensive in the study area due to transportation infrastructure (Boyd, pers. comm. 2012). The study also identified a significant opportunity for functional restoration through the incorporation of bioengineering in bank stabilization and breaching or removal of abandoned railway lines that isolate wetlands and floodplain areas.

Conservation Plans Affecting Multiple Core Areas

The Plum Creek Native Fish HCP covers approximately 965,000 acres of land (USFWS et al. 2000) and the Montana DNRC HCP (USFWS 2011) covers over half a million acres of land, within western Montana. Lands within these HCPs occur adjacent to several hundred miles of stream reaches, including substantial holdings that were identified as important bull trout habitat. Through implementation of these HCPs, proactive management is occurring to protect and restore important bull trout habitat, while at the same time allowing the permittees to manage and harvest their timber base, construct and maintain roads, and manage other resources such as grazing allotments and recreational properties. An active monitoring strategy is being applied to track compliance and measure important habitat and population parameters. Implementation is being achieved, but it is too soon to assess the overall effectiveness of the program in protecting and restoring bull trout and their habitat.

Another region-wide ongoing conservation initiative that operates in the area is the Bonnieville Power Association's Integrated Fish and Wildlife Program. The program provides mitigation for the effects of hydro-power development in the Columbia Basin and is operated in conjunction with the Northwest Power and Conservation Council. The program funds habitat improvement projects such as land purchases, stream restoration, irrigation efficiency, fish passage restoration, riparian enhancement, road decommissioning, and other projects through various partners, including state and federal agencies and local tribes (see http://efw.bpa.gov/). Funds are available through this program for all of the geographic area covered by the proposed SLOPES protocol with the exception of the St. Mary River Basin.

The Northern Region of the U.S. Forest Service has recently completed a bull trout conservation strategy for USFS lands in western Montana to guide conservation activities by identifying those areas where conservation actions will most effectively contribute to bull trout recovery (USFS 2013). Priority watersheds and the conservation actions needed have been identified at the subwatershed level (HUC6), providing a framework for planning and implementing actions intended to improve local bull trout habitat and populations. All of these actions will occur on federal land, and, thus, do not directly affect the baseline of the action area, but should result in cumulative habitat improvement to those core areas affected. This program applies to Montana west of the Continental Divide; Forest Service lands do not occur within St. Mary River Basin and the national forests in northern Idaho did not participate in developing a bull trout conservation strategy.

EFFECTS OF THE ACTION

"Effects of the action" refers to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action that will be added to the environmental baseline. Direct effects are considered immediate effects of the project on the species or its habitat. Indirect effects are those caused by the proposed action and are later in time, but are still reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend upon the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consultation.

Factors to be Considered for Bull Trout and Critical Habitat

The evaluations of the effects of the action are meant to assess how the baseline habitat conditions would be affected by implementation of the activities under the specified Corps nationwide permits with the added conservation measures of the SLOPES protocol. The actual effects of implementing the SLOPES protocol cannot be determined precisely, but can be inferred. Just as there are highly variable baseline conditions across watersheds in the action area, so too, the rate and direction of changing baseline conditions in the action area will be variable.

Projects authorized under a Corps permit by definition have impacts below the ordinary high water mark (OHW) within the active channel of a stream or the regularly inundated/saturated area of lake/wetland. As detailed in the description of the proposed action, all the activities authorized under the proposed SLOPES protocol may entail a short term disturbance associated with construction that may affect any bull trout present in the area at the time. Some activities entail only a short term disturbance with little lasting habitat modification (Impact Category 1), others entail short term disturbance and habitat modification, either primarily detrimental (Impact Category 2) or primarily beneficial (Impact Category 3). The SLOPES protocol incorporates required conservation measures to minimize the effects of such activity, but cannot completely eliminate these effects.

We do not expect that every project carried out under SLOPES will have adverse effects to bull trout. Even for projects in occupied habitats there will be a range of effects depending on the size of the stream, the geology of the basin, soil types, condition of the riparian area, the type of project, the nature of bull trout use at the project site, the ability of fish to escape to unaffected areas, the type of habitat provided at the site, and other factors. In some cases the effects to bull trout will be insignificant because of their limited extent or discountable when fish are unlikely to be present or absent. In other circumstances, such as a project going in occupied spawning and rearing habitat, the temporary (occurring during project implementation) effects are likely to be adverse. The programmatic nature of this consultation limits our ability to consider the site specific factors.

Given the programmatic framework for this consultation, the short term and long term effects that may accompany implementation of a single permit must be aggregated to consider the effects of the expected project activity to a given core area population over the five-year time frame. The nature of the short term and long term effects to the species and habitat will be discussed first, followed by an analysis of effects expected in a given core area over the five-year time frame.

Sediment

A temporary increase in suspended sediment and turbidity is the most significant potential effect of construction activities below OHW. Habitat indicators affected will include sediment and substrate embeddedness.

Increases in suspended sediment can affect salmonids in several ways. Sublethal behavioral effects of suspended sediment on salmonids include habitat avoidance and subsequent effects on fish distribution (Servizi and Martens 1991), reduced feeding and repressed growth rates (Newcombe and MacDonald 1991), respiratory impairment (Servizi and Martens 1991), reduced tolerance to disease and toxicants (Goldes et al. 1988), and physiological stress (Servizi and Martens 1991). Harvey and Lisle (1998) reported that slight elevations in suspended sediment may reduce feeding efficiency and growth rates of some salmonids and high concentrations of suspended sediment can affect survival, growth, and behavior of stream biota. At high concentrations, fish may cease feeding completely (Sigler et al. 1984) or may avoid high concentrations of suspended sediments altogether (Hicks et al. 1991). Even temporary spikes of suspended sediment may negatively affect salmonid behavior and may be lethal (Hicks et al. 1991). In addition, social behavior may be altered by suspended sediment (Berg and Northcote 1985). Suspended sediment may alter food supply by decreasing abundance and availability of aquatic insects; however, the precise thresholds of fine sediment in suspension or in deposits that result in harmful effects to benthic invertebrates are difficult to characterize (Chapman and McLeod 1987).

High levels of deposited sediments in spawning gravels (12 to 20 percent, typically) can increase mortality of salmonid eggs and alevins by reducing waterflow through spawning gravel, which can suffocate eggs, and by preventing fry from emerging from the gravel. Levels of fine sediment in streambed gravels have been negatively correlated with salmonid embryo survival (Tappel and Bjornn 1983) and the quality of juvenile rearing habitat (Bjornn et al. 1977). Weaver and Fraley (1991) observed an inverse relationship between the percentage of fine sediment in substrates and survival to emergence of bull trout embryos. Entombment was the major mortality factor in these tests. Densities of juvenile bull trout were found to be lower in areas of high sediment levels and cobble embeddedness (MBTSG 1998). Because of their close association with the substrate, juvenile bull trout distribution and rearing capacity are affected by sediment accumulations (Baxter and McPhail 1997). As deposition of fine sediments in salmonid spawning habitat increases, mortality of embryos, alevins, and fry increases (Chamberlain et al. 1991).

Downstream migration by bull trout provides access to more prey, better protection from avian and terrestrial predators, and alleviates potential intraspecific competition or cannibalism in rearing areas (MBTSG 1998). One of the benefits of migration from tributary rearing areas to larger rivers or estuaries is increased growth potential. However, increased sedimentation may result in premature or early migration of the juveniles and adults, avoidance of habitat, and migration of non-migratory, resident bull trout. Migration exposes fish to many new hazards, including passage of sometimes difficult and unpredictable physical barriers, increased vulnerability to predators, exposure to introduced species, exposure to pathogens, and the challenges of new and unfamiliar habitats (MBTSG 1998). High turbidity may delay migration back to spawning sites by interfering with cues necessary for orientation, although turbidity alone does not seem to affect homing. Delays in spawning migration and associated energy expenditure may reduce spawning success and, therefore, population size (Bash et al. 2001).

Noggle (1978) reported that extremely high concentrations of suspended sediments can cause fish mortality through gill abrasion. Furthermore, he observed that feeding rates of coho salmon decreased when turbidity levels reached certain thresholds. Turbidity is usually a near-linear function of suspended sediment such that as turbidity increases concentration of suspended sediment increases in proportion (Bash et al. 2001).

Foltz et al (2008) monitored sediment and turbidity during culvert removals, and found that without mitigation sediment yields ranged from 170 to 2.6 kg in the 24 hour period following culvert removal. Mitigation using two straw bales placed in the stream reduced the 24-hour sediment yield to between 3.1 to 0.2 kg. Lacking any mitigation, sediment concentrations exceeded the sublethal stress criterion of 500 mg/l for three hours immediately below the culvert removal site in 4 out of 11 locations, and was never exceeded 810 meters below the site. Peak sediment concentrations without mitigation ranged from 28,400 to 9900 mg/l at the removal site vs. 1300 to 900 mg/l with mitigation. The criterion for decreased feeding in juvenile coho salmon of 25 mg/l for 1 hour was always exceeded at the culvert site and 100 m downstream, irrespective of mitigation (Foltz et al. 2008).

Additional suspended sediment associated with a project is expected to move through the water column, becoming deposited on the substrate in areas of lower velocity, including pools or slack waters. Higher flows within the year following project implementation are expected to remobilize sediments, carrying them further downstream to be deposited. Eventually most sediments mobilized during project implementation will be carried downstream to larger streams, rivers, or water bodies within the watershed. Because high flows that re-mobilize project-related sediments are expected to occur when background sediment levels are naturally elevated, they are expected to have less potential for effects to bull trout. High flow events during the spring following project implementation are expected to flush any deposited sediment from the project area (Bash et al 2001).

We anticipate that permit actions may increase substrate embeddedness within 600 feet downstream of project sites in spawning-rearing habitat where juvenile bull trout exist. Any change to substrate embeddedness below project sites is considered a significant temporary disruption in the normal feeding and sheltering behavior of juvenile bull trout, which are typically less mobile than adults. Increased levels of substrate embeddedness are expected to be temporary (less than a year) in nature, as we expect either fall or winter storm events or natural high spring flows to mobilize any sediment that was deposited due to permitted activities within one year of implementation.

Minimization Measures for Sediment

The intensity, severity, and duration of sediment impacts from activities incorporating the SLOPES protocol will be minimized by the following requirements (see Conservation Measures and Exclusions in Appendix A):

- All work to be performed in the dry when possible;
- Timing of in-water work constrained;
- Isolation of in-water work by cofferdams, silt curtains, sand bags, and other methods;
- Timing stipulations specific to FMO and SR habitats to reduce bull trout vulnerability and the likelihood of presence (FMO: 7/1 – 9/30; SR 5/1 – 8/31);
- Limited removal of native material only to that which is necessary to maintain the function of the structure;
- Directional drilling or dry trenching for utility stream crossings (wet trenching is not allowed);
- Limit the size of excavations to less than 10 cubic yards and the volume of fill to one cubic yard per linear foot below OHW;
- Individual placement of rock without end dumping;
- Limit the extent of bank stabilization or stream channel relocation to 300 linear feet;
- Incorporate measures to ensure the retention of fine soil particles beneath riprap materials;
- Design culverts and bridges with grade controls to prevent culvert failure and with features to prevent runoff from directly entering the waterway;
- Limit temporary bypass channels to 300 feet;
- Limit dam removals to a 10 foot head difference.

These measures will greatly reduce the amount and duration of sediment increases, and the direct effects on any fish that may be present. Particularly in FMO habitat, they are likely to eliminate lethal effects and may often reduce impacts below the level at which take is reasonably certain to occur. As discussed above, egg, fry, and juvenile life stages are more vulnerable to sediment impacts, so lethal effects are more likely to occur in occupied spawning and rearing habitat. From a programmatic standpoint, we expect that adverse effects are likely to occur within the five-year timeframe. The likelihood of adverse effects from sediment is directly proportional to the level of permit activity within a given core area during the five-year time frame. (See the analysis of effects below.)

Conservation measures and exclusions designed into the SLOPES protocol are intended to prevent the majority of sediment from being delivered to stream habitat and to minimize release of sediment in the water during in-channel work. The requirement for all projects authorized under the SLOPES to adhere to habitat-specific construction timeframes reduces the likelihood of bull trout presence in FMO habitat and reduces vulnerability for young-of-the-year in spawning-rearing habitat. Prolonged exposure to increased suspended sediment levels will not occur and most potential effects to bull trout are expected to be sublethal.

Dewatering

Potential impacts of dewatering include temporary stranding of fish, temporary loss of wetted channel, temporary barriers to movement, temporary loss of areas for feeding, migrating, and cover, and potential entrainment in pumps and diversions. Direct effects would generally result from the introduction of sediment into stream channels, temporary blockage of upstream and/or downstream fish passage, and fish handling and direct disturbances associated with dewatering and construction activities. A requirement for fish salvage prior to dewatering is not included in the SLOPES Conservation Measures.

Minimization Measures for Dewatering

Consultation with a local biologist is required regarding whether listed species are likely to be present during the proposed period of dewatering, and appropriate timeframes will be added as special permit conditions to minimize adverse effects. The requirement for all projects authorized under the SLOPES to adhere to habitat-specific construction timeframes reduces the likelihood of bull trout presence, especially in FMO habitat. Given the limits on the size of projects under SLOPES, we expect few, if any,lethal effects to occur in FMO habitat. Dewatering that occurs in occupied spawning-rearing habitat is likely to result in some mortality. Fewer than three percent of projects during the analysis period entailed dewatering (USACE 2012)., so the likelihood of programmatic adverse effects is already very low

Chemical Contamination

Bull trout could also be affected through impacts to water quality through chemical contamination. Heavy machinery use in stream channels raises concern for the potential of an accidental spill of fuel, lubricants, hydraulic fluid, and similar contaminants into the riparian zone, or directly into the water where they could adversely affect habitat, injure or kill aquatic food organisms, or directly impact bull trout.

Petroleum-based contaminants such as fuel, oil, and some hydraulic fluids, contain poly-cyclic aromatic hydrocarbons, which can cause chronic sublethal effects to aquatic organisms (Neff 1985). Fuels and petroleum products are moderately to highly toxic to salmonids, depending on concentrations and exposure time. Free oil and emulsions can adhere to gills and interfere with respiration, and heavy concentrations of oil can suffocate fish. Evaporation, sedimentation, microbial degradation, and hydrology act to determine the fate of fuels entering fresh water (Saha and Konar 1986). Ethylene glycol (the primary ingredient in antifreeze) has been shown to result in sublethal effects to rainbow trout at concentrations of 20,400 mg/L (Staples 2001). Brake fluid is also a mixture of glycols and glycol ethers, and has about the same toxicity as antifreeze.

During project implementation, heavy machinery will be used adjacent to the stream channel and within the dewatered stream channel. Therefore, there is the potential to introduce petroleum products into waterways during work activities. The relevant mechanism of effect is the accidental spill of petroleum-based products during fueling and equipment operations. The likelihood of a fuel spill occurring on travel routes is low due to the limited potential for refueling or maintenance of motorized vehicles. Any adverse effect related to a fuel spill is dependent upon the size of the spill, proximity of the spill to action area streams, and success of containment.

Minimization Measures for Chemical Contamination

Project design features are incorporated as part of the SLOPES protocol to prevent toxic materials from entering live water. The majority of work is anticipated to occur outside of flowing water, which limits the potential for chemical contamination. Due to the project's design features, the possibility of petroleum-based products reaching occupied waters is very unlikely. If a spill occurs, amounts will likely be small because they will be related to individual vehicles and not associated with larger fuel transport and related transfer operations. No fueling of equipment is allowed within 100 linear feet of the OHW or wetland boundary. Equipment must have a 5-gallon capacity spill kit on board at all times when working near water, thus making it unlikely that any machinery or equipment fluids will be spilled in volumes or concentrations large enough to harm bull trout in or downstream of the project area. The requirement for all projects authorized under the SLOPES to adhere to habitat-specific construction timeframes reduces the likelihood of bull trout presence in FMO habitat and reduces vulnerability for young-of-the-year in spawning-rearing habitat. In light of these features, we expect the effects to bull trout associated with chemical contamination to be discountable.

Entrainment in Intake Structures

Intake structures may be associated with excavation or discharge activities that are usually authorized under NWP 18 (Minor Discharge) or NWP 19 (Excavation). Such activities do not include intake structures for agricultural or forestry operations, which are exempt from the requirements of section 404 (USACE 2012). Intake structures may result in entrainment of bull trout if they are not screened. If a return or bypass channel does not provide egress from the intake, we expect that any fish that become entrained will be killed or effectively removed from the population.

Minimization Measures for Entrainment in Intake Structures

The SLOPES protocol requires that all permitted activities that include an intake structure must be screened to prevent entrainment of fish and other aquatic organisms. Screening must adhere to NOAA standards (NMFS 2008) when the intake structure is located in an occupied stream. Screening of intake structures following the appropriate standards for the most vulnerable life-stage that is likely to be present will prevent entrainment; swimming ability of the fish is the primary consideration, along with type of screen, structure placement, orientation to the flow, hydraulics, screen material, and other factors (NMFS 2008). Nonetheless, some take may still occur because of the potential for impingement of juvenile fish against the screen (Rochester et al. 1984). Such impingement is most likely for juvenile fish in spawning and rearing habitat, depending on flow conditions, but unlikely for subadult and adult bull trout. NWP 18 and 19 both limit projects to no more than 25 cubic yards of fill or excavation below OHW. The SLOPES protocol further excludes any excavation greater than 10 cubic yards total. Given these size limitations and adult and subadult life stage, we do not expect take associated with intake structures in FMO habitat. Only one permit (out of 965) for an intake structure is documented for the action area during the analysis period; it was located in FMO lake habitat (USACE 2012). Therefore we conclude adverse effects from intake structures are not reasonably likely to occur.

Bank and Channel Modification

Bank Stabilization and Linear Transportation Activities

Within the context of this SLOPES, activities to modify banks of streams and lakes are generally permitted under NWP 13 (bank stabilization) or NWP 14 (linear transportation). Stabilization activities include the placement of material along or adjacent to streambanks or shorelines for the purpose of increasing resistance to erosion by moving water. Methods may include hardening the bank with vegetation, soil, large wood, rock, or by creating structures to divert stream flow away from the bank or reduce the effects of wave action by utilizing in-water structures such as dikes, groins, buried groins, drop structures, porous weirs, weirs, riprap, rock toes, and similar structures. Streambank stabilization usually includes the placement of fill material below the ordinary high water mark of streams in order to prevent damage to existing adjacent structures caused by the erosive force of flowing water. Shoreline stabilization involves placing fill material below the ordinary high water mark in order to protect lake and reservoir shorelines from erosion caused by wind and wave action (USACE 2012). Linear transportation projects may also involve excavation, grading, filling, placement of culverts, construction and maintenance of bridges or trestles, and construction of drainage features.

In addition to the direct effects of construction detailed above, activities associated with bank stabilization and linear transportation projects modify habitat by preventing natural channel migration and reducing riparian vegetation. Affected habitat indicators may include large woody debris, pool frequency and quality, large pools, off-channel habitat, refugia, wetted-width/max depth ratio, streambank condition, and floodplain connectivity. Depending on the project, they may also encroach on the stream channel with fill or crossing structures, such as bridge abutments and culverts.

All stabilization measures are intended to prevent or reduce lateral stream migration. Such changes tend to simplify in-channel habitat directly, or through geomorphic changes that precipitate channelization and downcutting, reducing instream heterogeneity in general and pool habitat, in particular (Fischenich 2003, Bowen et al. 2003). Sources for large woody debris in the riparian area are often reduced by bank modification activities. Stream functions most likely to be impacted by stabilization measures include stream evolution processes, riparian succession, sedimentation, habitat, and biological community interaction (Fischenich 2003).

Shallow low-velocity areas such as channel margins and side channels are preferentially used by subadult bull trout for foraging (Muhlfeld et al. 2003). Channel simplification results in decreased availability of shallow, low velocity areas that are important refugia and foraging habitat for young salmonids, particularly during runoff (Bowen et al. 2003). Channel modifications that reduce the frequency and duration of inundation of side channels, or reduce side-channel formation rates, or directly preclude inundation or accessibility of side channels reduce the foraging and escape habitat for juvenile and subadult fish, thus possibly reducing recruitment (Zale and Rider 2003). On the positive side, artificially placed boulders and shoreline irregularities associated with rip rap, barbs and jetties may provide increased complexity that benefits juvenile salmonids in rivers that currently lack heterogeneity (Zale and Rider 2003). Depending on size and placement, riprap provides interstitial spaces and high amount of surface area where aquatic invertebrates flourish, thus adding productivity in rivers where such habitat is lacking (Craig and Zale 2001). Deflection structures tend to create habitats with low water velocities and more heterogeneity of depth, velocity, and streambed than revetted banks (Craig and Zale 2001).

In general, the net impact of bank and channel modification depends on whether the new structure results in more simple or complex habitats. In relatively complex systems, stabilization reduces channel braiding and meandering, thereby reducing habitat diversity, resulting in less diverse and productive fish assemblages (Craig and Zale 2001).

In a lake environment, the effects of shoreline stabilization are not well-studied. Analogous to habitat use in rivers (Muhlfeld et al. 2003) we would expect subadults would be most likely to use shallow, near-shore habitats of lakes for foraging. However, in one study at Lake Pend Oreille (Bellgraph et al. 2012), bull trout were not detected in snorkeling surveys of littoral areas or in the stomach contents of predator fish taken from these areas, even though bull trout are fairly abundant in Lake Pend Oreille. Effects from shoreline stabilization under the SLOPES protocol are therefore expected to be insignificant.

Stream Restoration Activities

Stream restoration activities are generally permitted under NWP 27 and may include road decommissioning; actions to set-back or remove water control structures (*e.g.*, small dams (<10’ head difference), levees, dikes, berms, weirs); remove trash and other artificial debris dams that block fish passage; provide stormwater management that restores natural or normative hydrology; remove sediment bars or terraces that block fish passage within 50 feet of a tributary mouth; place large wood within the channel or riparian area; installation of stream flow and current deflectors; enhancement, restoration or creation of riffle and pool stream structure; placement of instream habitat structures; modifications of the stream bed and/or banks to restore or create stream meanders; reshaping of streambanks to reconnect with adjacent floodplain; installation of streambank vegetation; backfilling of artificial channels and drainage ditches; removal of existing drainage structures; construction of small nesting islands; construction of open water areas; activities needed to reestablish vegetation; and other related activities (USACE 2012).

By definition, stream restoration activities are intended to remediate past impacts which have resulted in down-cutting of streams, habitat simplification, and the interruption of channel evolution and riparian succession. Beyond the immediate construction impacts, these activities are deemed beneficial to bull trout and their habitat. By adding complexity and heterogeneity to stream habitats that are relatively uniform and lacking in elements such as boulders, vegetation, large woody debris, and deep pools, foraging and sheltering habitat increases in quantity and quality for all life history stages. Such improvements are expected to benefit recruitment to the population (Zale and Rider 2003). The degree of such benefit will depend on the location and relative improvement for the site. Habitat improvements carried out in areas dominated by non-native fish or where elevated stream temperatures preclude occupation may result in little benefit for bull trout. Community-level shifts from nonnative to native trout were limited to restoration activities in the mid to upper basin that were designed to emulate natural channel conditions (Pierce et al. 2013).

The indirect effects of placing boulders and large wood for restoration purposed in areas where these natural features have been reduced or removed are likely to include increased habitat diversity and complexity, greater flow heterogeneity, increased coarse sediment storage, gravel retention for spawning habitat, more long-term nutrient storage and more substrate for aquatic vertebrates, moderation of flow disturbances, and refugia for fish during high flow events (Negeshi and Richardson 2003, Roni et al. 2006). The indirect effects of gravel placement are likely to compensate for an identified loss of the natural gravel supply, thus increasing the quantity and quality of spawning habitat (WDFW 2004).

The rate and extent of stream restoration and recovery of natural function will vary from site to site. Sites that are surrounded by intensive land use and severe upstream disturbance are less likely to be successful than sites surrounded by wildlands where the headwaters are protected. Stream restoration activities are expected to generally result in positive benefits to fish habitat, but they are unlikely to overcome the constraints of a severely degraded site. Benefits of stream restoration to bull trout are expected to be greatest in locations where spawning-rearing habitat is enhanced or expanded near to source populations (Pierce et al. 2013) or where activities provide fish passage to suitable habitat that was previously blocked.

Minimization Measures for Bank and Channel Modification

The SLOPES protocol specifies many required conservation measures and exclusions that are designed to minimize the expected long-term detrimental habitat modification associated with bank stabilization and linear transport activities. All the minimization measures discussed above for sediment, dewatering, and chemical contamination are required for construction associated with bank and channel modification, as applicable to the specific project. The most significant minimization measures specific to bank and channel modification include:

- Incorporation of bioengineering principles (including for repair and maintenance of existing stabilization) and the requirement for a vegetative component using native species;
- A prohibition against riprap that extends above OHW;
- Requirement for design by a professional engineer or hydrologist for any structure that protrudes into the river;
- Maintaining existing channel form and dimension to the maximum extent possible;
- A limit of 300 linear feet per continuous run of material and 300 feet of channel relocation;
- Maximum barb length limited to ¼ of the bankfull channel width;
- Requirement for a revegetation plan using native species that will be implemented within the first planting season after construction and will ensure 80% coverage after three years;
- Precautions to prevent post-construction stranding of fish;
- Review and approval by a state fisheries biologist for additions of spawning gravel.

Minimization measures specifically applicable to linear transportation projects include:

- Exclusion of new road construction within 300 feet of an occupied stream;
- Exclusion of new bridge abutments in occupied streams where none previously existed;
- Complete removal of all existing structures and fill when replacing a bridge or trestle;
- Stream crossings must be designed to promote natural sediment and debris transport and maximize connectivity with the floodplain; full-span bridges or streambed simulation are required in known spawning areas;
- Grade controls are required to prevent culvert failure from changes in stream elevation;
- Crossing structures must be designed to direct surface drainage so as to prevent erosion and direct entry of runoff into waterways.

The Corps has formally adopted Stream Mitigation Procedures for Montana (USACE 2013), which may be required for projects under 300 linear feet depending on the degree of existing bank modification in the immediate and adjacent reaches. Mitigation emphasizes activities to enhance the riparian area, such as by planting trees or establishing a grazing exclosure. Other actions may be pursued if on-site riparian enhancements are not practicable. Idaho will also follow the procedure where applicable (USACE 2012).

The requirement for all projects authorized under the SLOPES to adhere to work habitat-specific construction timeframes reduces the likelihood of bull trout presence in FMO habitat and reduces vulnerability for young-of-the-year in spawning-rearing habitat.

In all, these minimization measures reduce the direct effects of construction, as discussed under the effects for sediment, dewatering, and chemical contamination. Limits to the size of projects, limited use of riprap, and an emphasis on bioengineering, and revegetation or enhancement with native species greatly reduces the long-term detrimental effects to habitat that may accompany bank stabilization and other treatments that seek to restrict lateral movement of streams and rivers by providing shade and nutrient inputs and allowing for some degree of riparian succession (Fischenich 2003).

Analysis of Effects for Bull Trout

For discussion of the analysis of effects of the action for bull trout, core areas will be grouped together based on the expected activity and aggregate impact of the SLOPES protocol over five years. Such grouping naturally separates the relatively rural and wildland dominated core areas from those that are increasingly developed and managed, often with substantial urban centers, as these are the areas with the greatest permit activity, and therefore the greatest potential effects from the SLOPES protocol.

Aggregate Effects by Core Area

In order to analyze the effects to the species range-wide, the effects of the various activities which may occur under this SLOPES must be aggregated across the expected amount of SLOPES activity within each core area over the five-year timeframe. (See Tables 3 and 4 in Analysis of Species and Critical Habitat Likely to be Affected.) The expected activity is based on patterns observed during the five-year analysis period, 2007-2011. Expected activity and type of take for each core area is discussed below.

Because this program entails agency response to individual permit applications initiated by private parties and local governments the exact number and location of activities is not predictable. Core areas with moderate or greater expected number of permits are discussed in more detail than those with minimal to low numbers, as uncertainty regarding the type and location increases with low levels of activity. Maps displaying federal vs. non-federal land and occupied FMO and SR bull trout habitat for each core area are found in Appendix B.

Core Areas with Minimal Activity

The following core areas (Table 6) are expected to have very few permits issued, and some are likely to see no permit activity during the five-year term. At such low-levels of permit activity, we cannot predict with certainty that take will occur, but we assume that if permit activity occurs, take may occur at the level indicated, based on the habitat present in the action area.

Lethal take is expected to occur only if projects occur on or within ½ mile upstream of actual spawning areas; potential spawning areas occur on non-federal land in most of these core areas (see Appendix B). For Bull Lake, Lee Creek, and St. Mary core areas spawning activity is known to occur at mid to upper elevations on federal land (USFS 2013, Mogen 2012), and impacts to eggs or fry within the gravel are not expected. Sophie Lake is similar, except that spawning occurs only in the higher elevations in Canada (USFWS 2005a). Sublethal take is expected for SLOPES activities in FMO habitat, based on the minimization measures required for construction and habitat impacts. We do not expect discernible effects at the core area population level based on minimization measures, the low level of activity expected, and the relatively small proportion of spawning-rearing habitat within the action area in these core areas.

Table 6. Core Areas with minimal expected effects.

Columbia River RU	**Type of Habitat**	Expected # Permits	Expected Take*	Expected Effect to CH*
Clark Fork River MU				
Clearwater River & Lakes	FMO/SR	2	Lethal and/or Sublethal	Adverse
Cyclone Lake	FMO/SR	0	Lethal and/or Sublethal	Adverse
Lindbergh Lake	FMO	3	None	Not likely
Pend Oreille River	FMO	0	None	Not likely
Rock Creek	FMO/SR	1	Lethal and/or Sublethal	Adverse
Upper Stillwater Lake	FMO/SR	0	Lethal and/or Sublethal	Adverse
Upper Whitefish Lake	FMO/SR	0	Lethal and/or Sublethal	Adverse
West Fork Bitterroot River	FMO/SR	1	Lethal and/or Sublethal	Adverse
Kootenai River MU				
Bull Lake	FMO/SR	2	Sublethal	Adverse
Sophie Lake	FMO/SR	0	Sublethal	NA
St. Mary RU				
Lee Creek	FMO/SR	0	Sublethal	NA
St. Mary River	FMO/SR	0	Sublethal	NA

* Assuming at least one SLOPES project occurs in occupied habitat.

Lindbergh Lake and Pend Oreille River core areas are exceptions where we do not expect any adverse effects to bull trout or designated critical habitat. Private land in the Lindbergh Lake core area is limited to the northeast corner of the lake and comprises less than five percent of the core area; no streams occur on private land, only lakeshore habitat. As discussed above, bull trout use of shallow shoreline habitat appears minimal, even where robust populations are known to exist in a lake environment (Bellgraph et al. 2012). For the Pend Oreille River core area, less than three miles of the mainstem of the Pend Oreille River occurs in Idaho, the remainder of the core area, including all spawning and rearing habitat, being located in Washington, and therefore not covered in this biological opinion. The Pend Oreille River in northwestern Idaho is artificially regulated reservoir habitat, controlled by the operations of hydroelectric dams at Albeni Falls, three miles upstream of the state line and Boundary Dam, 50 miles downstream. As such it is effectively lakeshore habitat where changing reservoir levels limit biological complexity, adding to its unsuitability for bull trout use. In addition, effects from construction are diluted and can be easily avoided by bull trout in this large waterbody.

Core Areas with Low Activity

Core areas with fewer than 20 expected SLOPES projects during the five-year timeframe include Priest Lakes, Swan Lake, and Whitefish Lake in the Clark Fork Management Unit, and Lake Koocanusa in the Kootenai River Management Unit. The exact location and type of impact category (short-term disturbance, detrimental or beneficial habitat modification) are not predictable. We assume that, on average, four SLOPES projects per year are likely to occur in these core areas.

Priest Lake: For the Priest Lakes core area, impacts are most likely to occur in FMO habitat along the shores of Priest Lakes, Granite Creek, Caribou Creek and Indian Creek, where higher development density occurs. Spawning and rearing habitat in Trapper Creek, Lion Creek, Two Mouth Creek and North and South Fork Indian Creek may be impacted. However, only one permit occurred in these areas during the period analyzed (USACE 2012), so we expect that most effects will be sublethal with less than one SLOPES project per year occurring in SR habitat where lethal effects are likely. We do not expect negative impacts to the core area population.

Swan Lake: For the Swan Lake core area most past and expected activity occurs in FMO habitat on Swan Lake and Swan River where development is concentrated. During the period analyzed eight non-federal NWP permits were issued for the Swan Lake core area; none of the projects occurred within sub-watersheds that support spawning for a local population in the core area. Seven of nine local populations could be affected by SLOPES projects in spawning-rearing habitat on non-federal land. However, much of this land is state or private forest land or is owned and managed by Montana Fish, Wildlife, and Parks for wildlife habitat. New private development is most likely to occur on private forest lands in closest proximity to already developed lands adjacent to major public roads. Conservation easements held by various private and government entities serve to limit development on some of these lands. SLOPES projects associated with road construction or maintenance may occur on state and private forest lands. Assuming the past pattern of project activity continues, we expect most effects will be sublethal with an average of less than one SLOPES project per year occurring in active spawning habitat. We do not expect negative impacts to the core area population.

Whitefish Lake: Non-federal land comprises over 85% of the Whitefish Lake core area. Sixteen projects occurred during the period analyzed. Over half took place on Swift Creek which comprises the migratory corridor for spawning in West Fork Swift Creek. All of the projects on Swift Creek entailed stream restoration that is expected to have a long-term benefit on bull trout habitat. All other projects took place on Whitefish Lake or on unoccupied streams (USACE 2012). Assuming the past pattern of project activity continues, we expect most effects will be sublethal with an average of less than one SLOPES project per year occurring in active spawning habitat. We do not expect negative impacts to the core area population.

Lake Koocanusa: Non-federal land with occupied bull trout streams in the Lake Koocanusa core area occurs primarily in the Tobacco River Valley. Grave Creek contains the only known local population on non-federal land; Sinclair Creek, Therriault Creek, and Young Creek are known only to provide incidental use to sub-adults (USFS 2013). Of the 14 projects that were permitted during the analysis period most were short-term disturbance associated with utility line work. Bank stabilization occurred only in unoccupied lakes. Stream restoration projects occurred on both Grave and Therriault Creeks (USACE 2012). We expect most covered activity during the SLOPES timeframe will entail projects in FMO habitat, where population and infrastructure are most prevalent, and projects on Grave and Therriault Creeks. Sub-lethal effects to the Grave Creek local population may occur to juveniles, but as the primary spawning areas occur on federal land in the upper watershed (USFS 2013), we do not expect lethal effects to eggs or fry. We do not expect negative impacts to the core area population.

Core Areas with Moderate Activity

Core areas with between 21 and 50 expected projects in the five-year timeframe are deemed to have moderate aggregate impacts from the SLOPES program. These include the Blackfoot River and Middle Clark Fork River core areas in the Clark Fork Management Unit and the Kootenai River core area in the Kootenai Management Unit.

Blackfoot River: This area has been a focus of conservation and restoration activity since the formation of the Blackfoot Challenge partnership in 1993. Private land is concentrated in lower elevation agricultural lands along the Blackfoot River. In 2003, The Blackfoot Challenge and The Nature Conservancy initiated the purchase and resale of 89,215 acres of Plum Creek timber lands within the Blackfoot watershed, with approximately 75% being transferred to federal or state ownership, thus removing these lands from the potential development base (USFS 2013).

Local populations may be affected by SLOPES projects in Gold, Cottonwood, Monture, Poorman, and Landers Fork Creeks and the North Fork Blackfoot River. Arrastra, Sauerkraut, and Alice Creek are other streams with potential impacts where bull trout may occur at least sporadically. Most of the mainstem of the Blackfoot River, where FMO habitat occurs is privately owned; fewer than 15 percent of projects occurred here during the analysis period. As in other core areas, most spawning sites are found on federal land in the middle and upper parts of the watershed, but cannot be ruled out for non-federal land, given its extent (see Appendix B).

Almost 40 percent projects occurring during the analysis period in the Blackfoot River were stream restoration projects (Impact Category 3), with bank stabilization and linear transportation activities (Impact Category 2) being the next most common (USACE 2012). Approximately half of all projects in the core area occurred in unoccupied streams. We expect that each local population may experience 1-2 projects per year that will result in sub-lethal and minor lethal effects to eggs, fry and juvenile bull trout. Projects in FMO habitat are expected to result in sublethal adverse effects to adult and subadult bull trout. We expect restoration activities to continue in the watershed, with continued improvement to stream habitats. We do not expect discernible effects to the Blackfoot River core area population as a result of SLOPES activities during the five-year timeframe.

Kootenai River: Non-federal land in areas occupied by bull trout in the Kootenai River core area occurs primarily along the Kootenai and Fisher Rivers and Libby Creek in Montana, and along the Kootenai River and Deep Creek in Idaho, all of which comprise FMO habitat. Spawning and rearing streams on non-federal land include O'Brien, Pipe, Parmenter, Flower, Big Cherry, and West Fisher Creeks (see Appendix B).

Just over 60 percent of permit activity in the core area occurred in occupied bull trout habitat, approximately half in FMO and half in SR. All of the projects authorized in SR habitat were stream restoration activities in Pipe Creek (USACE 2012). We expect sub-lethal and minor lethal effects to eggs, fry and juvenile bull trout in SR habitat and sublethal effects to adults and subadults in FMO habitat from SLOPES projects. We do not expect discernible effects to the core area population.

Middle Clark Fork River: Non-federal land is concentrated in the upper end of the core area from the confluence with the Blackfoot River downstream and all along the Clark Fork River (FMO habitat). Portions of the St. Regis River and the lower ends of Fish Creek and Rattlesnake Creek also comprise FMO habitat on private land (see Appendix B).

Of the eight local populations in the Middle Clark Fork River most are limited to federal lands in the middle to upper portions of the watershed. Rattlesnake and Fish Creek are the two streams with robust spawning that have substantial areas of non-federal land. However, spawning beds are known to occur only on the federal land, with remnant populations on the private land portion (USFS 2013). Other areas with substantial private land where bull trout may be present in low numbers include Grant, Albert, and Petty Creeks. Bull trout may also be present in low numbers in Little Joe, Twelvemile, and Trout Creeks where private land is limited to the lowest reaches. In all of these streams, the life-stage most likely to be affected is subadult out-migrants (USFS 2013).

Over 75 percent of the projects in the Middle Clark Fork River were bank stabilization and linear transport activities in Impact Category 2; maintenance of existing projects was the next most common activity at about 15 percent. Just less than 80 percent of projects occurred in streams where bull trout are believed to be present at least in low numbers (USACE 2012). In both FMO and SR habitat we expect sublethal adverse effects to subadult and adult bull trout. Because of the location of spawning areas, the relative importance of resident (non-fluvial) populations, and the low numbers of bull trout present in the lower portions (USFS 2013), we do not expect lethal effects to any local populations or a discernible effect to the core area population.

Core Areas with High Activity

Flathead Lake: This core area is the largest and most complex in western Montana, including Flathead Lake, the Flathead River, and the North and Middle Forks of the Flathead River. (The South Fork of the Flathead is now contained in the Hungry Horse core area.) Much of this area is wilderness and national park. Non-federal land (including tribal trust land) occurs primarily around FMO habitat on Flathead Lake, the North Fork, the lower end of the Middle Fork, the mainstem of the Flathead River, and along the Stillwater and Whitefish Rivers. Spawning and rearing habitat on non-federal land occurs west of the North Fork, primarily in the Coal Creek State Forest. Other SR streams with some non-federal land in the North Fork drainage include Trail, Moose, Whale, Hay and Moran Creeks (see Appendix B). Only Trail Creek, Whale Creek and Coal Creek harbor local populations of bull trout; spawning reaches are located on federal lands in middle to upper elevations (USFS 2013).

Almost two-thirds of the activity during the analysis period was for projects in Impact Category 2, with another 30 percent in Impact Category 1; only four stream restoration projects occurred in the core area (USACE 2012). Approximately 75 percent of projects occurred in occupied habitat with most in FMO habitat on Flathead Lake and the Flathead River. No projects occurred in occupied SR habitat. Assuming the same pattern of activity continues we expect only sublethal effects to adult and subadult bull trout in FMO habitat in rivers from SLOPES projects. Any projects which may occur in non-federal SR habitat are expected to have mostly sublethal and minor lethal effects. SLOPES projects in Flathead Lake are not likely to adversely affect bull trout. We do not expect discernible effects to the Flathead Lake core area population from SLOPES activities.

Lower Clark Fork: Non-federal land in the Lower Clark Fork River core area is concentrated in the eastern portion in the Thompson River, Flathead and Jocko Valleys. Similar to the Middle Clark Fork, a corridor of non-federal ownership occurs west of Plains, MT along the Flathead and the Clark Fork Rivers downstream to the core area/state boundary at Cabinet Gorge Dam. The vast majority of occupied streams on non-federal land comprise FMO habitat in the Flathead River (below Kerr Dam), the Jocko and Thompson Rivers and Prospect Creek. Local populations with some presence on non-federal land include Thompson River (Fishtrap Creek, Beatrice Creek and the Little Thompson River), Prospect Swamp Creek, Rock Creek, Graves Creek, and Jocko River (see Appendix B). Spawning areas for the Jocko River are located high in headwaters within the Mission Mountains Tribal Wilderness Area on the Flathead Indian Reservation.

Just less than 60 percent of project activity occurred in occupied bull trout habitat during the period of analysis and was focused on habitat restoration (Impact Category 3) with Impact Category 2 the next most common (USACE 2012). Over 90 percent of impacts to occupied bull trout streams occurred in FMO habitat, with almost 60 percent in Noxon Reservoir. As discussed above, we do not expect adverse effects from SLOPES projects in lake or reservoir habitat. We expect sublethal adverse effects to adult and subadult bull trout in FMO river habitat from SLOPES projects. Any SLOPES projects which may occur in SR habitat in Fishtrap Creek or Little Thompson River are expected to have lethal effects to eggs or fry if they are ½ mile or less upstream from spawning areas. SLOPES projects on other spawning and rearing streams in the core area are expected to have sublethal effects because actual spawning occurs in higher elevations on federal land. We do not expect discernible effects to the core area population from SLOPES activities.

Upper Clark Fork: Over 65 percent of the Upper Clark Fork River core area is in non-federal ownership. Essentially all of the Clark Fork River is non-federally owned, all of which is FMO habitat. The lower end of Flint Creek also includes non-federally owned FMO habitat. Important SR habitat in the action area occurs in Harvey, upper Flint, Marshall, Boulder, Racetrack, and Warm Springs Creek and its tributaries (see Appendix B).

More than half of the permits issued in the core area during the analysis period entailed Impact Category 1 activities resulting in short-term disturbance, with another 40 percent in Impact Category 2 (disturbance/detrimental habitat modification. However, fewer than 15 percent of the all permits occurred in occupied bull trout waterways, most of which were in FMO habitat. We expect sublethal effects to adult and subadult bull trout in FMO habitat from SLOPES projects and these are expected to be very low as only 100 – 200 adult bull trout are believed to be present in the Upper Clark Fork River system (USFS 2013). Any SLOPES projects which may occur in SR habitat Boulder Creek or Warm Springs Creek and its tributaries may have lethal effects to eggs or fry if they are ½ mile or less upstream from actual spawning areas. We do not expect discernible effects to the core area population from SLOPES activities.

Core Areas with Very High Activity

Bitterroot River: Just less than 35 percent of the Bitterroot core area is in non-federal ownership along either side of the Bitterroot River, the majority occurring east of the river (see Appendix B). Lolo Creek, Burnt Fork River, and East Fork Bitterroot River include other FMO habitat with substantial non-federal land. Warm temperatures, natural and anthropogenic dewatering limit spawning activity to the upper watersheds on federal land, with many local populations dominated by resident fish (USFS 2013). Nonetheless, we assume that juvenile fish may be present in most occupied SR habitat on non-federal land, as some juvenile fish may "leak" downstream from resident populations. In Cameron Creek bull trout use appears limited to incidental summer use by adults, and in Rye Creek they have been absent since the wildfires of 2000 (Nyce, pers. comm. 2013).

Seventy percent of permit activity during the analysis period occurred in occupied bull trout habitat. Of that activity, almost 80 percent occurred in FMO habitat; the remaining 20 percent occurred in a variety of spawning-rearing streams with no one stream dominant (USACE 2012). Sixty percent of all activity was Impact Category 2, followed by 35 percent in Impact Category 1, and only 5 percent in Impact Category 3. Given the high percentage of projects associated with long-term habitat degradation, we expect 10 to 20 projects per year will have sub-lethal or minor lethal effects to juvenile and subadult bull trout and sub-lethal effects to adults. We do not expect discernible effects to the population in the core area.

Lake Pend Oreille: Over 60 percent of the Idaho portion of Lake Pend Oreille core area is in non-federal ownership, concentrated in FMO habitat along the Lake Pend Oreille and the Clark Fork, Pend Oreille, Priest, East, and Pack Rivers and in Lightning Creek. Spawning and rearing habitat in the action area occurs in Trestle Creek, Strong Creek, Granite Creek, Gold and North Gold Creeks, and the North and Middle Forks of East River. Strong Creek, Gold Creek and tributaries of East River are the only watersheds where active spawning beds may be found on non-federal land (see Appendix B).

Almost 80 percent of permit activity during the analysis period occurred in occupied bull trout habitat. Of that activity, over 46 percent took place in Lake Pend Oreille, and another 36 percent occurred in the Pend Oreille River (USACE 2012), which is essentially reservoir habitat with water levels determined by releases from Albeni Dam near the border with Washington. Thus, we would expect over 80 percent of all permit activity in waters occupied by bull trout in this core area to be not likely to adversely affect bull trout and their habitat. We expect an average of no more than twelve SLOPES projects per year will have adverse, mostly sublethal effects in bull trout FMO or SR habitat. Only five percent of all projects occurred in occupied SR streams, so we expect few, if any, lethal effects to eggs, fry, and juvenile bull trout from SLOPES projects. We do not expect discernible effects to the core area population.

Coeur d'Alene Lake: Just less than 44% of the Idaho portion of Coeur d'Alene Lake core area is in non-federal ownership, concentrated in FMO habitat along the Coeur d'Alene, St. Joe, and Spokane Rivers and Lake, Benewah, and Mica Creeks (see Appendix B). Boulder Creek holds the only non-federal SR habitat in the core area, but does not currently hold a spawning population (Deeds, pers. com., 2013).

Approximately two-thirds of permits issued during the analysis period occurred in occupied bull trout habitat. Of these, 99 percent occurred in FMO habitat in the Coeur D'Alene and St. Joe Rivers and Benewah Creek. Assuming a similar pattern of activity, and given unconfirmed spawning in Boulder Creek, we expect sublethal effects to adult and subadult bull trout from SLOPES projects in the Coeur d'Alene core area with no discernible effects to the population.

Effects to Bull Trout Critical Habitat

The analysis of the effects of the SLOPES protocol on the species includes an assessment of how the value and functionality of habitat for bull trout is affected by the action. The analysis of the effects to designated critical habitat is comparable, though conducted using a slightly different approach addressing the functionality of the primary constituent elements (PCEs). As the conservation role of bull trout critical habitat is to support viable core area populations (75 FR 63898), we do not anticipate many circumstances that the "outcome of the consultation to address critical habitat will result in any significant additional project modifications or measures."

Critical habitat occurs within the action area of all core areas affected by the action, except for Sophie Lake, St Mary, and Lee Creek. We do not expect adverse effects to critical habitat in lakes and reservoirs, and thus do not expect adverse effects to critical habitat in Lindbergh Lake and Pend Oreille River core areas which do not contain any other type of critical habitat within the action area (see Appendix B).

Construction associated with SLOPES activities in all impact categories is expected to create temporary disturbance which may temporarily degrade critical habitat; bank stabilization and linear transport activities in Impact Category 2 are expected to have long-term negative effects to critical habitat with some minor benefits; stream restoration activities in Impact Category 3 are expected to have long-term benefits to critical habitat. An analysis of the effects of SLOPES activities on the functionality of the PCEs follows and is summarized in Table 7.

Temporary negative impacts to PCEs 1, 4 and 8 will occur from construction activities that produce a temporary increase in sediment or possibly minor chemical contamination or that require temporary dewatering. Conservation measures that reduce raw, eroding banks and require the incorporation of bioengineering and riparian vegetation applicable to Impact Category 2 activities may have minor long-term beneficial effects, especially in spawning areas. Stream restoration activities in Impact Category 3 are expected to provide long-term benefits when projects are designed to reduce delivery of background sediment or other pollutants.

Table 7. Primary constituent elements for bull trout critical habitat and expected effects from SLOPES activities.

PCE #	PCE Description	Impact Category 1	Impact Category 2	Impact Category 3
1	Permanent water having low levels of contaminants such that normal reproduction, growth and survival are not inhibited	Temporary degrade	Temporary degrade/ minor long-term benefit	Temporary degrade/ long-term benefit
2	Water temperatures ranging from 2° to 15°C (36° to 59°F), with adequate thermal refugia available for temperatures at the upper end of this range. Specific temperatures within this range will vary depending on bull trout life history stage and form, geography, elevation, diurnal and seasonal variation, shade, such as that provided by riparian habitat, and local groundwater influence	No effect	Minor degrade	Long-term benefit
3	Complex stream channels with features such as woody debris, side channels, pools, and undercut banks to provide a variety of depths, velocities, and instream structures	Temporary degrade	Long-term degrade	Temporary degrade/ long-term benefit
4	Substrates of sufficient amount, size, and composition to ensure success of egg and embryo over-winter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount of fine substrate less than 0.63 cm (0.25 in) in diameter and minimal substrate embeddedness are characteristic of these conditions	Temporary degrade in SR habitat	Temporary degrade/ minor long-term benefit in SR habitat	Temporary degrade/ long-term benefit in SR habitat
5	A natural hydrograph, including peak, high, low, and base flows within historic ranges or, if regulated, a hydrograph that demonstrates the ability to support bull trout populations	No effect	No effect	No effect
6	Springs, seeps, groundwater sources, and subsurface water connectivity to contribute to water quality and quantity	No effect	Long-term degrade	Long-term benefit
7	Migratory corridors with minimal physical, biological, or chemical barriers between spawning, rearing, over-wintering, and foraging habitats, including intermittent or seasonal barriers induced by high water temperatures or low flows	No effect	No effect	Long-term benefit
8	An abundant food base including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish	Temporary degrade	Temporary degrade/ minor long-term benefit	Temporary degrade/ substantial long-term benefit
9	Few or no predatory, interbreeding, or competitive nonnative species present	No effect	No effect	No effect

Activities in Impact Category 2 are expected to reduce the functionality of PCEs 3 and 6 by limiting natural horizontal migration of streams and thus development of channel complexity, side channel habitat and riparian succession. These activities may also affect long-term reductions in floodplain connectivity, either directly or indirectly. The effect on PCE 2 is expected to be minor or even insignificant because of the requirement to incorporate streambank vegetation above OHW. In a similar but opposite fashion, stream restoration activities are expected to result in long-term improvement in functionality for these PCEs.

SLOPES activities are expected to have no effect on PCEs 5, 7, and 9 except when restoration activities are specifically undertaken to restore fish passage, as in removing a small dam. In such cases, we expect a long-term benefit to the function of migratory corridors.

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 considered in this biological opinion. 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 ESA.

This proposed SLOPES protocol covers a suite of activities on non-federal lands that require a permit from the Corps. Projects that do not meet the SLOPES requirements must be addressed with an individual consultation. Therefore, the only activities within OHW to be considered under cumulative effects are those activities on private land associated with agriculture and forestry that are exempt from section 404 permitting. Where federal funding, such as from the Natural Resources Conservation Service, is employed on private land, consultation under the ESA is required.

Residential and commercial development along rivers, streams and lakes is anticipated to continue to increase in core areas with substantial urban and suburban populations, or where recreational opportunities abound and substantial areas of private land exist. These core areas include the Bitterroot, Blackfoot, all sections of the Clark Fork, Flathead Lake and Lake Pend Oreille in the Clark Fork Management Unit; plus Coeur d'Alene Lake and the Kootenai River in their respective management units. Other core areas that are currently more rural and have experienced slower development may see an increase if economic conditions change; these include Clearwater River and Lakes, Swan Lake, and Whitefish Lake. Other core areas not listed have substantial areas of state or tribal land where development is curtailed.

Forest harvest on private and state lands is an ongoing activity which, along with associated road activity, is likely to affect bull trout. Habitat conservation plans have been completed in Montana with Plum Creek Timber (2000) and Montana Department of Natural Resources and Conservation (2011), which should contribute to improving bull trout habitat on covered forest lands within the action area.

Angler harvest and poaching has been identified as one reason for bull trout decline (USFWS 2002). Recreational fishing will likely increase as the general residential population in western Montana increases. In addition, misidentification of bull trout has been a concern because of the similarity of appearance with brook trout. Although harvest of bull trout is illegal, incidental catch does occur and the fate of the released bull trout is unknown, but some level of hooking mortality is likely due to the associated stress and handling of the release (Long 1997).

The harvest of bull trout, either unintentionally or illegally, could have a direct effect on the local resident bull trout population and possibly the migratory component of bull trout populations in Montana. The extent of the effect would be dependent on the amount of increased recreational fishing pressure, which is a function of the increased number of fishermen utilizing the fish resources each season. Illegal poaching is difficult to quantify, but is expected to increase in likelihood as the human population in the vicinity grows.

CONCLUSION

Because they entail direct disturbance and impacts to streams, the activities authorized by the Corps under the Nationwide Permits addressed in this SLOPES protocol are generally deemed likely to adversely affect bull trout when carried out in occupied streams and/or designated critical habitat. Activities that conform to SLOPES requirements are expected to be insignificant or discountable in foraging-migrating-overwintering habitat in lakes or reservoirs. The amount of expected take is, if anything, overestimated, because of the low density and/or low probability of bull trout presence in portions of some occupied streams or rivers. While general predictions can be made as to waterways affected by SLOPES projects, specific locations cannot be predicted, so a conservative approach is adopted.

The SLOPES protocol imposes additional conservation measures and exclusions not included in the Nationwide Permits which serve to minimize, but cannot eliminate, these adverse effects particularly for occupied spawning and rearing habitat. Additional conservation measures included in this SLOPES are designed to ensure well-designed and effective projects and to incorporate habitat benefits. Following the SLOPES protocol is optional for permit applicants, but incentives are provided through stream-lined consultation and the clear specification of requirements. By providing incentives for applicants to this SLOPES, detrimental impacts from the Corps permitting program under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act will likely be reduced and the long-term benefits of stream restoration activities will likely increase.

Adverse effects of at least a temporary nature are expected from all SLOPES projects in designated critical habitat. Long-term adverse effects to critical habitat are expected from bank stabilization and linear transportation activities in Impact Category 2; long-term benefits are expected from stream restoration activities in Impact Category 3.

Jeopardy Analysis

After reviewing the current status of bull trout, the environmental baseline for the action area, the effects of the proposed management actions, and the cumulative effects, it is the Service's biological opinion that the actions as proposed, are not likely to jeopardize the continued existence of bull trout. This conclusion is based on the magnitude of the project effects in relation to the listed population. Implementing regulations for section 7 (50 CFR 402) defines "jeopardize the continued existence of" as "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species."

Jeopardy determinations for bull trout are made at the scale of the listed entity, which is the coterminous United States population (64 FR 58910). This follows the April 20, 2006, analytical framework guidance described in the Service's memorandum to Ecological Services Project Leaders in Idaho, Oregon and Washington from the Assistant Regional Director – Ecological Services, Region 1 (USFWS 2006). The guidance indicates that a biological opinion should concisely discuss all the effects and take into account how those effects are likely to influence the survival and recovery functions of the affected interim recovery unit(s), which should be the basis for determining if the proposed action is "likely to appreciably reduce both survival and recovery of the coterminous United States population of bull trout in the wild."

As discussed earlier in this biological opinion (see Introduction section), the approach to the jeopardy analysis in relation to the proposed action follows a hierarchal relationship between units of analysis (i.e., geographical subdivisions) that characterize effects at the lowest unit or scale of analysis (the local population) toward the highest unit or scale of analysis (the Columbia River Interim Recovery Unit) of analysis. The hierarchal relationship between units of analysis (local population, core areas) is used to determine whether the proposed action is likely to jeopardize the survival and recovery of bull trout. Should the adverse effects of the proposed action not rise to the level where it appreciably reduces both survival and recovery of the species at a lower scale, such as the local or core population, the proposed action could not jeopardize bull trout in the coterminous United States (i.e., rangewide). Therefore, the determination would result in a no-jeopardy finding. However, should a proposed action cause adverse effects that are determined to appreciably reduce both survival and recovery of the species at a lower scale of analysis (i.e., local population), then further analysis is warranted at the next higher scale (i.e., core area).

Of 48 core areas within the geographic area of this SLOPES protocol, 23 will not be affected because they have no potential for projects on non-federal land (see Table 3). Adverse effects to the species are expected in 23 of the 25 core areas likely to be impacted in the action area, however most of these effects are expected to be sublethal. In core areas where past and expected permit activity is minimal to low (fewer than 20 projects in five years), general locations of projects are difficult to predict, so we have assumed that lethal effects will occur in spawning areas if they are present on non-federal lands. Discernible negative effects to populations are not expected in any of the 25 affected core areas.

The nature of expected take is presented in Table 8. Within the Columbia River Recovery Unit SLOPES projects are expected to have adverse effects in 16 of 37 core areas in the Clark Fork

Table 8. Nature of expected bull trout take and level of SLOPES activity for the action area within each core area.

Recovery Unit Management Unit Core Area	Nature of Expected Take	Expected SLOPES Activity
Columbia River RU		
Clark Fork River MU		
Bitterroot River	Lethal	Very High
Blackfoot River	Lethal	Moderate
Clark Fork River - Middle	Sublethal	Moderate
Clark Fork River - Upper	(Lethal)	High
Clearwater River & Lakes	Lethal*	Minimal
Cyclone Lake	Lethal*	Minimal
Flathead Lake	(Lethal)	High
Lake Pend Oreille	(Lethal)	Very High
Lower Clark Fork River	(Lethal)	High
Priest Lakes	Lethal*	Low
Rock Creek	(Lethal)	Minimal
Swan Lake	(Lethal)	Low
Upper Stillwater Lake	Lethal*	Minimal
Upper Whitefish Lake	Lethal*	Minimal
West Fork Bitterroot River	Lethal*	Minimal
Whitefish Lake	Lethal*	Low
Coeur d'Alene Lake MU		
Coeur d'Alene Lake	Sublethal	Very High
Kootenai River MU		
Bull Lake	Sublethal	Minimal
Kootenai River	(Lethal)	Moderate
Lake Koocanusa	Sublethal	Low
Sophie Lake	Sublethal	Minimal
St. Mary RU		
Lee Creek	Sublethal	Minimal
St. Mary River	Sublethal	Minimal

(Lethal): most project activity will result in sublethal take with lethal take occurring for a minority of projects that occur in spawning-rearing habitat at or within ½ mile upstream of spawning sites.
* Lethal effects are expected if projects occur at or within ½ mile upstream of spawning sites. Project activity in the core area is too low to confidently predict where projects will occur; however, some lethal effects may occur, as SR habitat and known spawning areas occur on non-federal lands.

Management Unit; in the Kootenai River Management Unit, sublethal adverse effects are expected in 3 of 4 core areas and minor lethal effects in one core area (i.e., a minority of projects implemented may have lethal effects); in the Coeur d'Alene Management Unit sublethal adverse effects are expected in the single core area. In the St. Mary Recovery Unit two of six core areas may be affected by sublethal adverse effects and a minimal number of projects.

Our conclusion is based on the magnitude of the project effects in relation to the core area bull trout populations, aggregated to the management unit (where applicable), then to the recovery unit, and finally to the range-wide population in the United States. Our rationale for this no jeopardy conclusion is based on the following:

- Minimization measures implemented through required Conservation Measures and Exclusions (Appendix A) for all SLOPES activities are likely to be effective in short-term impacts of construction for all projects and long-term habitat degradation from reduced complexity for projects in Impact Category 2. Long-term habitat improvements will result from projects in Impact Category 3.
- Because of the nature and location of non-federal lands which comprise the action area within the larger geographic area (Appendix B), the vast majority of projects in occupied bull trout waters will occur in FMO habitat, where we expect few, if any, lethal adverse effects from SLOPES projects. The analysis of past activity further shows that for many core areas a high percentage of projects occur in waterways not occupied by bull trout. Most spawning and rearing habitat within the action area is located at lower elevations, while spawning sites occur in mid to upper elevations, predominantly on federal lands, thus making impacts to eggs and fry unlikely and limiting expected impacts to juvenile, subadult, and adult bull trout. Lethal effects that may occur in spawning habitat are expected to be uncommon, relative to the SLOPES program as a whole.
- Through core area specific analysis of the expected level of project activity, the location of activity, and the level of take, we conclude that discernible effects are not expected for any core area populations within the covered geographic area.

As a result, the Service concludes that implementation of this project is not likely to appreciably reduce the reproduction, numbers, or distribution of bull trout at the scale of any of the affected core areas, and by extension in the Clark Fork River, Kootenai River, and Coeur d'Alene Lake Management Units and the larger scale of the Columbia River and St. Mary Interim Recovery Units. Therefore, the Service concludes that this program will not appreciably reduce both the survival and recovery and would not jeopardize bull trout at the range-wide scale of the listed entity, the coterminous population of the United States.

Adverse Modification Analysis

After reviewing the current status of bull trout, the environmental baseline for the action area, the effects of implementing the SLOPES protocol, and the cumulative effects, we conclude that the actions as proposed are not likely to destroy or adversely modify bull trout critical habitat. This conclusion is based, in part, on the magnitude of the project effects in relation to the designated critical habitat at the Clark Fork River Basin, Kootenai River Basin and Coeur d'Alene River Basin scales. Critical habitat in the St. Mary Basin will not be affected by the proposed action.

The effect of SLOPES activities on critical habitat is primarily temporary degradation associated with construction activities (Table 7). Long-term degradation is expected locally for bank stabilization and linear transportation activities, which are limited to 300 linear feet. Even in the unlikely event that all activity under the SLOPES protocol is in critical habitat the percentage within each core area that could have impacts, based on the number of permits allowed (see

Incidental Take Statement), is generally less than two percent and does not exceed six percent (Table 9). The actual percentage having long-term impacts is expected to be substantially less, as not all SLOPES activities entail adverse effects to critical habitat , and the large majority of affected core areas contain occupied habitat that is not designated critical habitat (see Appendix B). All activities in Impact Category 3 are expected to benefit critical habitat in the long term. Core areas not listed are expected to have no adverse effects.

Table 9. Maximum percent of designated critical habitat with persistent adverse effects by core area, assuming all SLOPES projects would entail bank stabilization in critical habitat.

Clark Fork River Basin	# SLOPES Projects	Miles CH	Max % CH Affected
Bitterroot River	120	426.3	1.6
Blackfoot River	40	254.3	0.9
Clark Fork River - Middle	40	323.6	0.7
Clark Fork River - Upper	75	262.6	1.6
Clearwater River & Lakes	10	79.0	0.7
Cyclone Lake	5	6.0	4.7
Flathead Lake	75	427.5	1.0
Lake Pend Oreille	60	218.5	1.6
Lower Clark Fork River	75	283.4	1.5
Priest Lakes	20	109.0	1.0
Rock Creek	10	214.9	0.3
Swan Lake	20	140.2	0.8
Upper Stillwater Lake	5	27.8	1.0
Upper Whitefish Lake	5	5.9	4.8
West Fork Bitterroot River	5	87.6	0.3
Whitefish Lake	20	18.8	6.0
Coeur d’Alene Lake Basin			
Coeur d’Alene Lake	120	510.5	1.3
Kootenai River Basin			
Bull Lake	10	17.1	3.3
Kootenai River	40	268.7	0.8
Lake Koocanusa	20	38.8	2.9

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the Corps so they become binding conditions of any contract issued for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps (1) fails to assume and implement the terms and conditions or (2) fails to require applicants to adhere to the terms and conditions of the incidental take statement, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Corps must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR 402.14(I)(3)].

The biological assessment (USACE 2012) describes actions anticipated to occur during implementation of the SLOPES protocol and proposes actions that, when implemented, are likely to adversely affect bull trout. The Service anticipates that implementation of the SLOPES protocol as described in the biological assessment would likely impart a level of adverse effect to individual bull trout to the extent that incidental take occurs.

Amount or Extent of Take Anticipated

The Service anticipates that project activities may result in incidental take of bull trout in the form of harm, harassment, or mortality related to the expected short-term impacts associated with construction for all impact categories and long-term impacts associated with habitat degradation for activities in Impact Category 2 that are intended to limit lateral movement of stream channels. Construction effects are expected to include temporary increases in suspended sediment, temporary displacement of fish or blockage of migration from dewatering, and the possibility of minor chemical contamination from equipment leaks. Habitat indicators that may be affected include sediment, chemical contaminants/nutrients, physical barriers, and substrate embeddedness. Bank stabilization and activities associated with linear transportation projects may have long-term effects on large woody debris, pool frequency and quality, large pools, off-channel habitat, refugia, wetted-width/max depth ratio, streambank condition, and floodplain connectivity. Temporary and long-term effects from the proposed activities are anticipated to have adverse effects and likely result in mostly sublethal effects, impairing feeding and sheltering patterns of juvenile, subadult and adult bull trout and some lethal effects for eggs, fry, and juveniles in active spawning areas.

The amount of take that may result from implementation of the proposed action is difficult to quantify for the following reasons:

- The duration and magnitude of sediment and associated construction effects will be related to weather conditions and the effectiveness of the mitigation measures.
- The amount and precise location of temporary sediment plumes depends on numerous factors (flow regime, size of stream, channel roughness).
- Measures proposed by the Corps to minimize impacts to bull trout habitat will likely be effective to varying degrees depending upon site-specific conditions and factors explained above.
- Losses of bull trout in any life stage caused by project-related effects are expected to be low and may be masked by, or impossible to differentiate from, those occurring as a result of wide seasonal fluctuations in numbers.

For these reasons, the Service concludes that the actual amount or extent of the anticipated incidental take is difficult to determine, as is detection of incidental take. In these cases, we use surrogates to measure the amount or extent of incidental take, and determine when the amount of take anticipated has been exceeded.

The action area consists of only non-federal lands and is comprised primarily of foraging-migrating-overwintering habitat where adult and subadult bull trout may be present. For most core areas, most of the spawning-rearing habitat occurs in the higher elevations on federal land, with the action area generally including the lower portions of spawning-rearing habitat near the confluence with FMO habitat. In such areas juvenile bull trout may also be present, and eggs and fry are not likely to be present. The potential for take of eggs and fry has been analyzed for bull trout core areas where substantial spawning and rearing habitat occurs in the action area. The past pattern of project activities has been used to infer the expected level of activity and to reasonably limit the level of take by core area.

Take is authorized for Corps activities permitted under the SLOPES protocol according to Table 10 as total number of projects over five years and the maximum number per year for each core area. Only those projects which occur in occupied streams or less than one stream-mile upstream from occupied streams are expected to have adverse effects. SLOPES projects which occur on unoccupied streams more than one stream-mile from the confluence with an occupied stream, and projects which occur in lakes or reservoirs, are deemed not likely to adversely affect bull trout and their habitat, and thus are not tallied against these limits for allowable take. Lindbergh Lake and Pend Oreille River core areas have no take authorized as they include only lake/reservoir habitat within the action area and adverse effects are not expected to occur.

Table 10. Authorized incidental take for bull trout from anticipated SLOPES projects by core area for the next 5 years:

Recovery Unit / Management Unit / Core Area	# SLOPES Projects in 5 years	Maximum # SLOPES Projects/yr
Columbia River RU		
Clark Fork River MU		
Bitterroot River	120	30
Blackfoot River	40	15
Clark Fork River - Middle	40	15
Clark Fork River - Upper	75	25
Clearwater River & Lakes	10	3
Cyclone Lake	5	2
Flathead Lake	75	25
Lake Pend Oreille	60*	20*
Lower Clark Fork River	75	25
Priest Lakes	20*	6*
Rock Creek	10	3
Swan Lake	20	6
Upper Stillwater Lake	5	2
Upper Whitefish Lake	5	2
West Fork Bitterroot River	5	2
Whitefish Lake	20	6
Coeur d'Alene Lake MU		
Coeur d'Alene Lake	120	30
Kootenai River MU		
Bull Lake	10	3
Kootenai River	40	15
Lake Koocanusa	20	6
Sophie Lake	5	2
St. Mary-Belly River RU		
Lee Creek	5	2
St. Mary River	5	2

* Includes only Idaho portions of the core areas; no take authorized for Washington State.

Effect of the Take

In the preceding biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to bull trout or destruction or adverse modification of critical habitat. This program will affect the Columbia River Interim Recovery Unit (21 of 97 core areas), with minimal effects expected for the St. Mary-Belly Interim Recovery Unit (2 of 6 core areas), and will not appreciably reduce the likelihood of survival and recovery of either of these population segments. Three out of 22 management units in the Columbia River Interim Recovery Unit will be affected: Clark Fork River (16 of 37 core areas), Kootenai River (4 of 4 core areas), and Coeur d'Alene Lake (1 of 1 core area). The action area includes non-federal lands within these units, thus core areas that are entirely federal land will not be affected. We do not expect appreciable changes in the numbers, distribution or reproduction of bull trout in any of the core areas or local populations as a result of the application of the SLOPES protocol. Through the use of this protocol, effects to bull trout are expected to be reduced relative to Corps permit activities in the absence of the protocol. Stream restoration activities which are implemented under the protocol are expected to contribute to the conservation and recovery of bull trout.

Reasonable and Prudent Measures

The Service concludes that the following reasonable and prudent measures (RPM) are necessary and appropriate to minimize the take of bull trout caused by the proposed action.

1. Assess, identify and implement means to reduce the potential for incidental take of bull trout resulting from construction and maintenance of projects authorized under the SLOPES protocol.

2. Implement monitoring and reporting requirements for the each Regulatory Office as outlined below.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Corps and its cooperators, including applicants, must comply with the following terms and conditions, which implement the reasonable and prudent measures described above:

1. To implement RPM #1, the Corps shall:

    a. Utilize the Effects Screen for SLOPES projects, as shown in Appendix C, to assess the likelihood of level of affect for each project.

    b. Incorporate all applicable Conservation Measures and Exclusions as proposed by the Corps and listed in Appendix A as required conditions.

    c. For in-water work apply work windows as listed in Appendix A, Conservation Measure 2, or as specified by the local state or tribal fisheries biologist based on local knowledge and conditions.

    d. For any project that entails dewatering, conduct fish salvage operations prior to construction, following recommendations of the local state or tribal fisheries biologist.

2. To implement RPM 2#, the Army Corps of Engineers, Montana and Idaho Regulatory Offices shall each maintain a list of projects authorized each year under the SLOPES protocol, including:
    a. Bull trout core area
    b. Waterbody and type of bull trout habitat (SR vs FMO) for any occupied waterbody or designated critical habitat
    c. Impact category and type of permit
    d. Date implemented (beginning/end)
    e. Any bull trout that are captured, handled, or killed

Notification, Reporting, and Coordination Requirements

The following project notification and reporting information must be collected and forwarded to the USFWS, as necessary and included in the annual monitoring report and the annual coordination meeting between the USFWS and the Corps:

1. Request for variance: A request for approval of an alternative condition than is identified in this document as appropriate for "approval in writing by USFWS" may be included in the Project Notification Form or other appropriate means. The request must be in writing and include the following information. Any variance that will result in greater effects or greater take than provided in this biological evaluation is not authorized by this SLOPES protocol. USFWS will approve or disapprove the request, in writing, within 30 calendar days of receipt of the variance request. The variance request must include the following:
    i. Justification for the proposed variance.
    ii. Description of additional actions necessary to offset any likely adverse effects of the variance, as appropriate.
    iii. An explanation of how the resulting effects are within the range of effects considered in this SLOPES.

2. Project Completion Report or Memo to File: Each permit issued by the Corps under this SLOPES must require the applicant to submit a project completion report to the Corps within 60 days of finishing work below ordinary high water. For civil works projects, the Corps project manager must prepare a project completion memo to file. Each report or memo must contain the following information and be available for inspection on request by the USFWS.
    i. Applicant's name and permit number (if any).
    ii. Corps contact person.
    iii. Project name.
    iv. Type of activity.
    v. Project site, including any compensatory mitigation site, by 5th field HUC
    vi. Start and end dates for work completed.
    vii. Photos of habitat conditions at the project site, which may include any compensatory mitigation site, before, during, and after project completion.

viii. Projects with the following work elements must include these data.

(1) Work cessation – Dates work ceased due to high flows.

(2) Site preparation – Riparian area cleared within 150 feet of ordinary high water; upland area cleared; new impervious area created.

(3) Streambank stabilization – Type and amount of materials used; project size (one bank or two, width and linear feet).

3. Compensatory Mitigation Report: For each project requiring compensatory mitigation, the applicant must submit a compensatory mitigation report by December 31 each year after the project is completed until the Corps approves that performance standards have been met. This report must describe the date and purpose of each visit to a compensatory mitigation site, site conditions observed during that visit, and any corrective action planned or taken.

4. Annual Program Report: An annual monitoring report must be completed by February 15 each year that describes the Corps' efforts to carry out this SLOPES. The report must include the cumulative list of projects by bull trout core area, an assessment of overall program effectiveness, and any other data or analyses the Corps deems necessary or helpful to assess habitat trends as a result of actions authorized by this SLOPES.

5. Annual Coordination Meeting: A coordination meeting must take place with USFWS and interested Tribal representatives by March 31 each year to discuss the annual monitoring report and any actions that will improve conservation or make the program more efficient or more accountable. The Corps will provide for review a sample of 10 project completion reports representing the range of activities authorized under SLOPES. At each coordination meeting the number of yearly and cumulative SLOPES projects will be reviewed, along with an assessment of impacts, and effectiveness of conservation measures.

   Annual coordination meetings are intended to serve an adaptive management purpose. Conservation measures may be revised as experience and knowledge is gained in implementation of SLOPES projects. The number of projects allowed as the surrogate measure for incidental take may be adjusted by amendment to this biological opinion based on assessment of program activity and the validity of assumptions for incidental take.

CONSERVATION RECOMMENDATIONS

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

1. The Corps should participate in and encourage the development of large-scale assessment of channel modifications and floodplain impacts, such as the channel migration zone studies or hydrogeomorphic assessments to provide a basis for assessing the cumulative impact of bank stabilization activities on riverine function and habitat development. As such a task is not practicable for one agency acting alone, we recommend collaboration and joint funding with other agencies, tribes, and private entities to prioritize and complete such assessments.

2. The Corps, in conjunction with USFWS, state, county, and tribal water agencies, conservation districts, and interested non-profits groups, should provide outreach and education regarding conservation measures included in this SLOPES to encourage use of these practices to reduce impacts to riverine habitat for all species.

REINITIATION NOTICE

This concludes formal consultation on programmatic Specific Local Operating Procedures for Endangered Species for western Montana and northern Idaho. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if:

1. The amount or extent of incidental take is exceeded. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

2. New information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion.

3. The agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this Opinion.

4. A new species is listed or critical habitat designated that may be affected by the action.

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APPENDICES

Appendix A: Conservation Measures and Exclusions under SLOPES

SLOPES Conservation Measures

1. All work should be performed in the dry when possible. Any work in flowing water must be completed by working from the top of the bank and work areas must be isolated from flowing or open water using cofferdams, silt curtains, sandbags or other approved means to keep sediment from entering flowing or open water, unless isolating the area and working in the channel would result in less habitat disturbance.
2. The Corps will check with appropriate sources to determine whether or not listed fish are present or likely to be present during any proposed in-water work. Where necessary, work timeframes will be added as special permit conditions to minimize adverse impacts to listed fish.
    a. Bull trout: For projects involving in-channel or riparian disturbance (e.g., excavation or construction within the bank-full channel or a 35 ft buffer each side of channel) the following timing stipulations will apply as the period when activities are allowable to minimize adverse impacts: (1) July 1 to September 30 in foraging, migration or over-wintering habitats; and (2) May 1 to August 31 in spawning and rearing habitats.
    b. Kootenai white sturgeon: In-channel disturbance is limited to the period between August 1 to April 1.
3. Only the minimum amount of native material necessary to maintain the function of the structure or fill will be removed.
4. Woody debris removal will be completed in the following priority: (1) Pull and release whole logs or trees downstream; (2) pull whole logs and trees and place in the riparian area; (3) remove whole logs or trees for replacement within the same stream reach or a reach nearby; and (4) pull, cut only as necessary, and release logs and trees downstream.
5. Replacement of existing stream crossings will be designed to promote natural sediment transport, allow maximum fluvial debris movement, and improve horizontal and vertical continuity and connectivity of the stream-floodplain systems where practicable.
6. If replacing a bridge with a culvert, the culvert must be sized to allow for equal or increased cross sectional area of the ordinary high water channel as compared to the previously existing bridge. The new culvert must be an open bottom arch or box, or must be oversized and countersunk into the substrate to allow unimpeded natural movement of existing streambed material.
7. Utility stream crossings shall be perpendicular to the watercourse, or nearly so, and designed in the following priority: (1) directional drilling, boring and jacking; and (2) dry trenching or plowing.
8. If trenching or plowing are used, all work shall be completed in the dry and backfilled with native material and any large wood displaced by trenching or plowing will be returned to its original position wherever feasible.
9. Install utility lines or cables using a static plow or knifing method.

10. At stream crossings, the area along the bank disturbed by the utility work will be revegetated with native species. A revegetation plan must be submitted with the application specifying species, planting or seeding rates and maintenance measures to ensure 80% cover (ground or canopy) after three years.
11. All pits and other excavations associated with utility installation will be placed where they will not cause damage to the streambed or streambanks, or allow wastewater or spoil material to enter the water. Erosion and sediment control measures must be put in place prior to beginning work and remain in place until the work is completed and the trench is backfilled and stabilized.
12. Structural fills with materials such as concrete shall be placed into tightly sealed forms or cells that do not contact the waterway until fully cured.
13. Any intake structure shall meet NOAA screening criteria.
14. All construction impacts must be confined to the minimum area necessary to complete the project and boundaries of clearing limits associated with site access and construction will be clearly marked to avoid or minimize disturbance of riparian vegetation, wetlands and other sensitive sites.
15. Project operations must cease under high flow conditions that may result in inundation of the project area.
16. If native woody riparian vegetation must be removed for temporary access purposes, the vegetation must be cut flush with the ground surface or folded over. The root mass must be left intact, and any exposed soil must be reseeded with native grasses or forbs after construction is completed.
17. Each non-native tree or shrub that must be removed as a result of the project, will be replaced with a native species of tree or shrub in accordance with NRCS recommendations for native species appropriate for the project location.
18. The design of any proposed stabilization structures must incorporate bioengineering principles.
19. Any structure that protrudes into the river must be designed by a professional engineer/hydrologist experienced in the design of such structures.
20. The largest riprap/rock material must be keyed into the toe of the bank.
21. Existing channel form and dimension must be maintained to the maximum extent possible.
22. If using wood, it must be intact, hard, and undecayed to partly decaying with untrimmed root wads to provide functional refugia habitat for fish. Wood must be obtained from outside of the channel.
23. Unless naturally-occurring material is present at the site, appropriate measures must be taken to ensure retention of fine soil particles beneath riprap/rock material. Measures can include the use of coarse sand and fine gravel, suitable biodegradable geotexile material, or a 50/50 mixture of native streambed material taken from the toe trench where riprap will be keyed into the river bed, and topsoil from sloping of the upper bank area placed behind the riprap/rock.
24. Clean natural angular rock or stone may be used to anchor or stabilize large wood, fill scour holes, prevent scouring or undercutting of an existing structure, or to construct a

barb, weir or other properly designed and approved in-water structure. The use of rock or stone must comply with the Corps policy on prohibited materials.

25. Rock riprap shall be individually placed without end dumping.
26. All repairs of previously existing bank protection structures (unless such repairs are exempt from Section 404 compliance) shall incorporate bioengineering principles, with minimal use of clean natural rock or stone and maximum revegetation of the bankline above the ordinary high water mark.
27. If the entire structure has been destroyed or damaged beyond repair, replacement of the structure shall utilize bioengineering principles and methods, and will incorporate native vegetation.
28. Stabilization activities shall not exceed 300 linear feet per continuous run of material.
29. Where applicable, the applicant shall follow mitigation requirements as defined in the Montana Stream Mitigation Procedures. (Includes Idaho, to the extent applicable.)
30. Stabilization activities shall involve the discharge of no more than 1 cubic yard per linear foot below ordinary high water (OHW).
31. No refueling of equipment will take place within 100 linear feet of OHW or the wetland boundary.
32. Equipment must have a five gallon capacity spill kit on board at all times when working near water.
33. Within the first planting season post-construction, the stabilized bank shall be revegetated with native or other approved species.
34. A revegetation plan must be submitted with the application specifying species, planting or seeding rates and maintenance measures to ensure 80% coverage after three years.
35. Replacement of existing or new permanent stream crossings shall be designed to promote natural sediment and debris transport and maximize connectivity of the stream-floodplain system. If the crossing will occur near a known or suspected spawning area, only full span bridges or streambed simulation may be used.
36. Culvert replacements or modifications shall be done in the dry (could be accomplished by temporary dewatering), unless it can be confirmed by a qualified fisheries biologist that no listed fish are present during instream activities.
37. Appropriate grade controls shall be included to prevent culvert failure caused by changes in stream elevation.
38. Road crossing and bridge structures shall be designed to direct surface drainage into areas or features designed to prevent erosion of soil and entry of other pollutants directly into waterways or wetlands (such as biofiltration swales or other treatment facilities).
39. Cleaning of culverts and trash racks and removal of drift material shall be conducted by working from the top of the bank, unless isolating the area and working in the channel would result in less habitat disturbance. Only the minimum amount of wood, sediment and other natural debris necessary to maintain structure function shall be removed. All large wood recovered during cleaning will be placed downstream. All routine work will be done in the dry, using work area isolation if necessary.
40. No part of water control structure, such as barbs, may exceed bank full elevation, including all rock buried in the bank key.

41. Maximum barb length will not exceed 1/4 of the bankfull channel width.
42. Structures that protrude into the stream (barbs, vanes, spurs) must be designed by a qualified engineer, or geomorphologist.
43. Trenches excavated for a bank key above ordinary high water shall be backfilled with soil and planted with native vegetation.
44. Rock shall be individually placed without end dumping.
45. All stream and wetland restoration activities shall include adequate precautions to prevent post-construction stranding of juvenile or adult fish which must be described in detail in the application.
46. Any proposals to add spawning gravel must first be reviewed and approved by the local state fisheries biologist. Spawning gravel must be inspected by either a state fisheries biologist or a qualified fisheries biologist familiar with the site's characteristics and requirements.

Activities Excluded from the SLOPES Protocol

1. Oil and gas exploration or production, construction or upgrading of a gas, sewer or water line to support a new or expanded service area, and foundations for transmission towers.
2. Utility crossings involving open trenches where the trench material is sidecast in the stream and flow is not diverted around the open trench, (a.k.a. wet trenching).
3. Instream work involving utility lines greater than 6 inches in diameter.
4. Outfalls where none previously existed
5. Intakes where none previously existed
6. Unscreened intakes
7. Any instream structure that could become a barrier to fish movement during low flows.
8. Any regulated excavation greater than 10 cubic yards total.
9. Temporary bypass channels in excess of 300 linear feet.
10. Dewatering that places a stream into a pipe more than 300 feet long or for more than 30 days.
11. Riprap that extends above the ordinary high water mark.
12. Stabilization methods in stream environments that do not include a vegetative component.
13. New sea walls, retaining walls or bulkheads, where none previously existed.
14. Any project utilizing broken, poured or precast concrete.
15. Any project utilizing treated lumber or wood.
16. Any project that exceeds one cubic yard of riprap per linear foot below ordinary high water.
17. Stream or wetland impacts for new road construction within 300 feet of occupied bull trout or Kootenai River white sturgeon streams.
18. Bridge abutments below ordinary high water of occupied streams where none previously existed.

19. Channel maintenance that does not involve work area isolation to retain suspended sediment.
20. A replacement bridge without full removal of the existing bridge, support structures and approach fill.
21. Pond construction or expansion in streams or wetlands.
22. Large dam removal projects (>10’ head difference).
23. Projects that involve relocating more than 300 feet of channel (cumulative total for the entire project).
24. Use of concrete logs, cable (wire rope) or chains to permanently anchor any structure.

Appendix B: Action Area Maps for Bull Trout Occupied Waters and Designated Critical Habitat

The following maps show streams and lakes which are known or suspected to be occupied by bull trout, categorized as foraging-migrating-overwintering (FMO) and spawning-rearing (SR), within the action area for each bull trout core area. Federal lands and all lands in the included core areas in Washington State are blocked out. Where possible, multiple core areas within a geographic region are shown. Map scales range from 1:500,000 to 1:850,000, so as to allow the largest core areas to be displayed on one page (except for Flathead Lake) with adequate detail. Geographic sections are ordered generally west to east and north to south. Map titles include only core areas that may be affected by the action. Occupied water bodies and designated critical habitat are shown separately. Lakes within federal ownership are visible because they are not part of the land ownership database, and adjacent lands indicate whether the shoreline is within the action area.

Map 1: Pend Oreille River, Priest Lakes, Lake Pend Oreille, Kootenai River, Bull Lake, Lake Koocanusa, Sophie Lake Core Areas.

Map 2: Coeur d'Alene Lake Core Area.

Map 3: Lower Clark Fork River Core Area.

Map 4: Middle Clark Fork River Core Area.

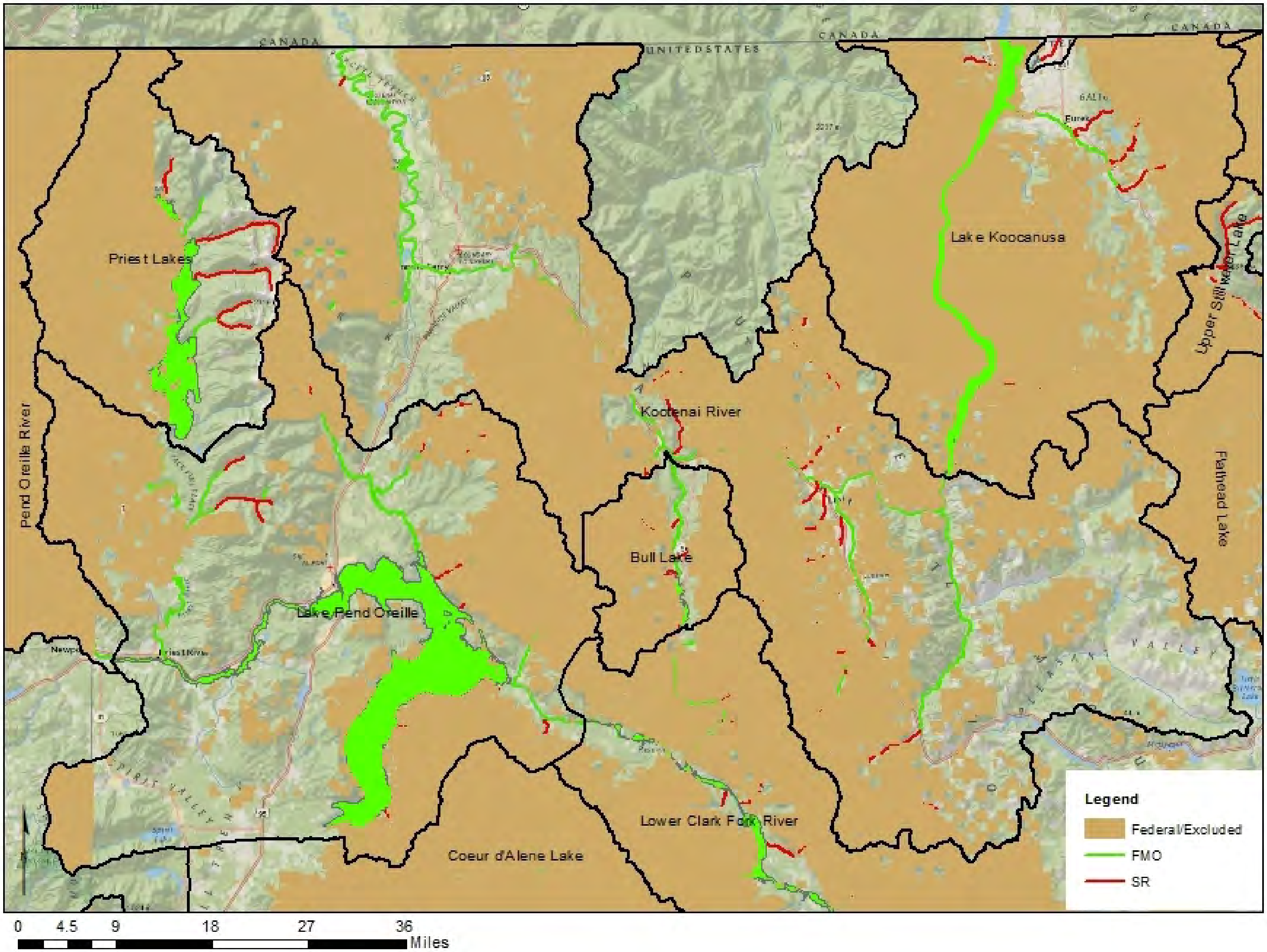
Map 5: Flathead Lake (north portion), Whitefish Lake, Upper Whitefish Lake, Upper Stillwater Lake, Cyclone Lake, Lee Creek, and St. Mary River Core Areas.

Map 6: Flathead Lake (south portion), Swan Lake, and Lindbergh Lake Core Areas.

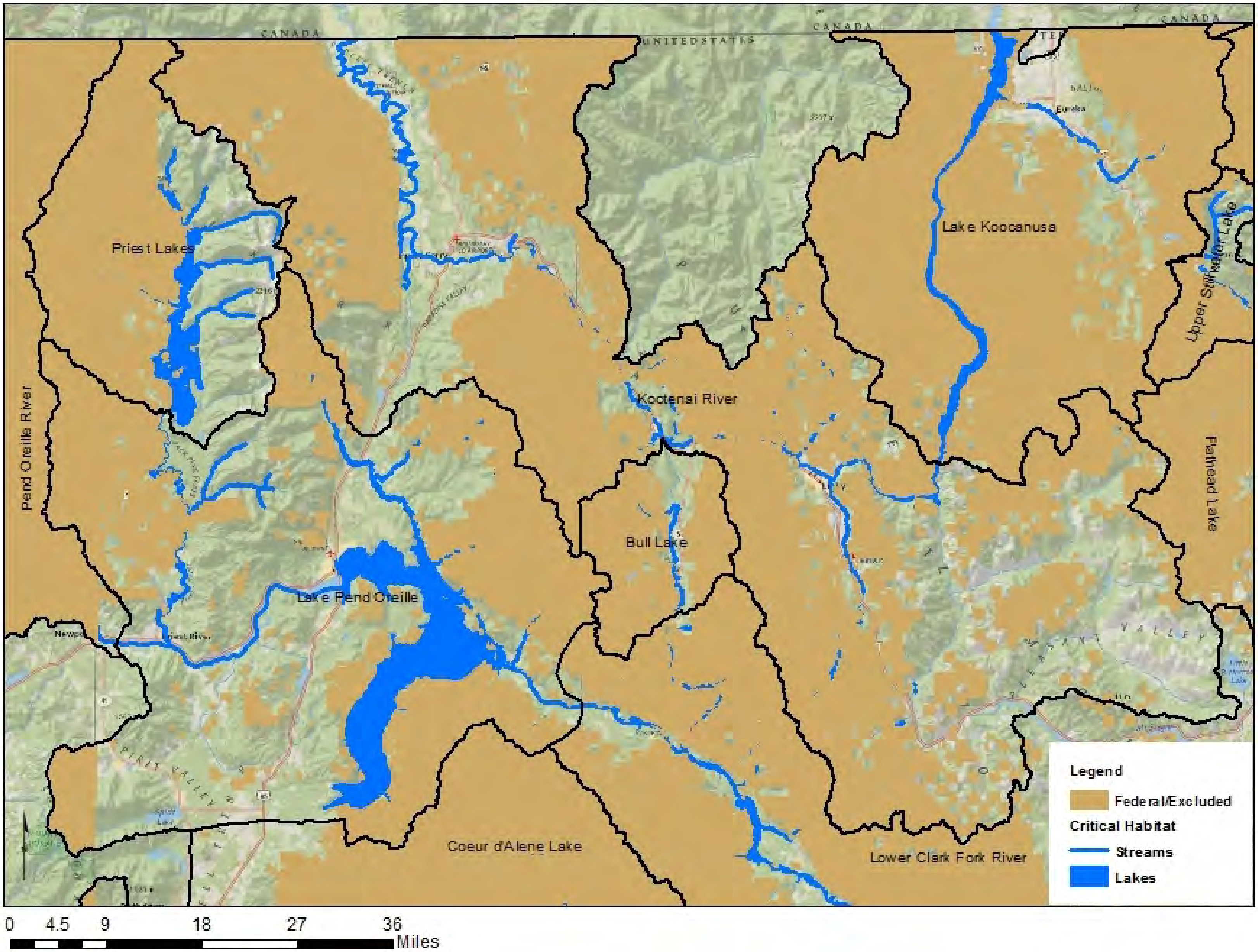
Map 7: Bitterroot River, West Fork Bitterroot River, and Rock Creek Core Areas.

Map 8: Blackfoot River and Upper Clark Fork River Core Areas.

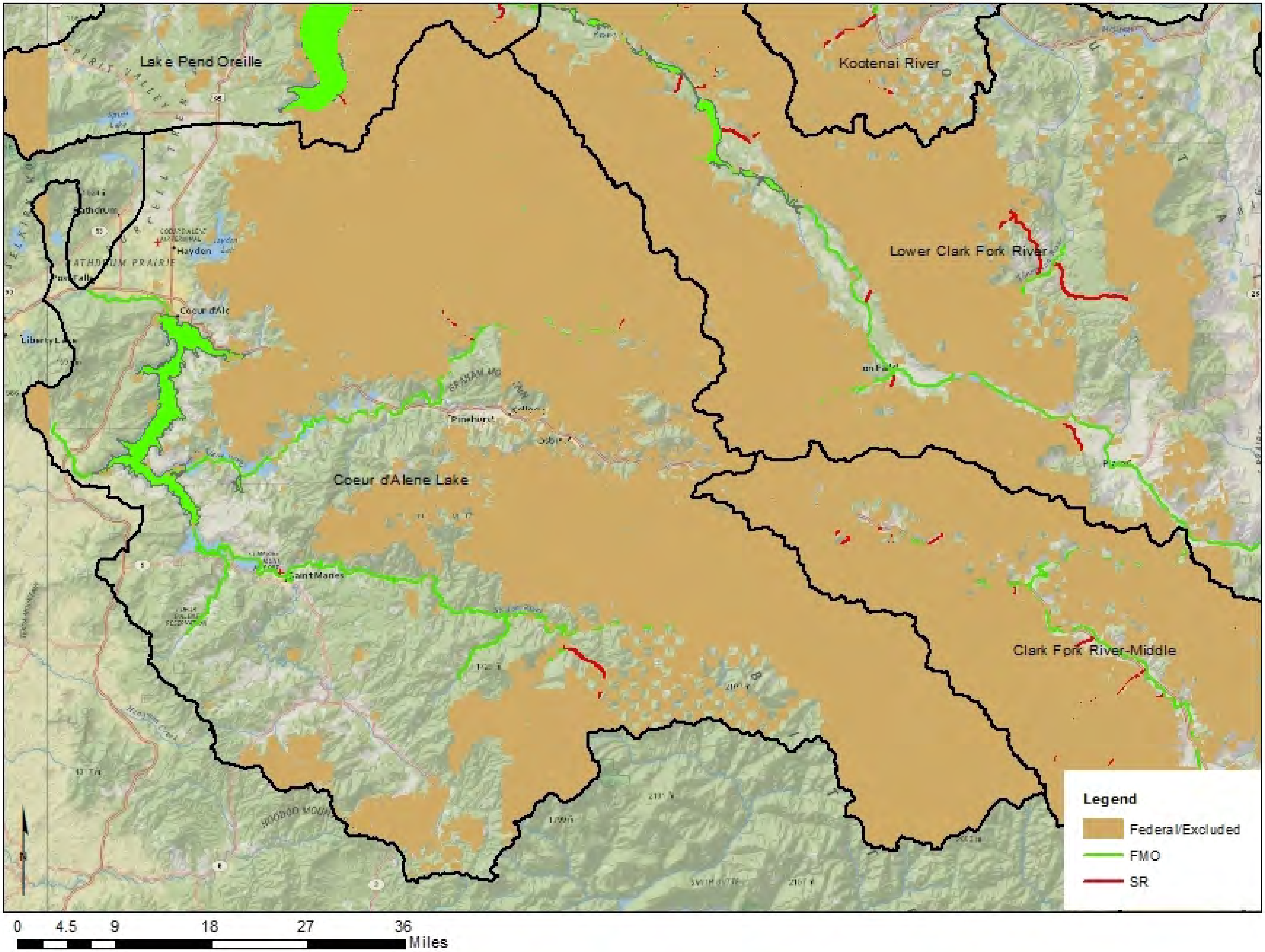
Map 1a: Bull trout occupied waters and action area (unshaded) in Pend Oreille River, Priest Lakes, Lake Pend Oreille, Kootenai River, Bull Lake, Lake Koocanusa, Sophie Lake Core Areas.



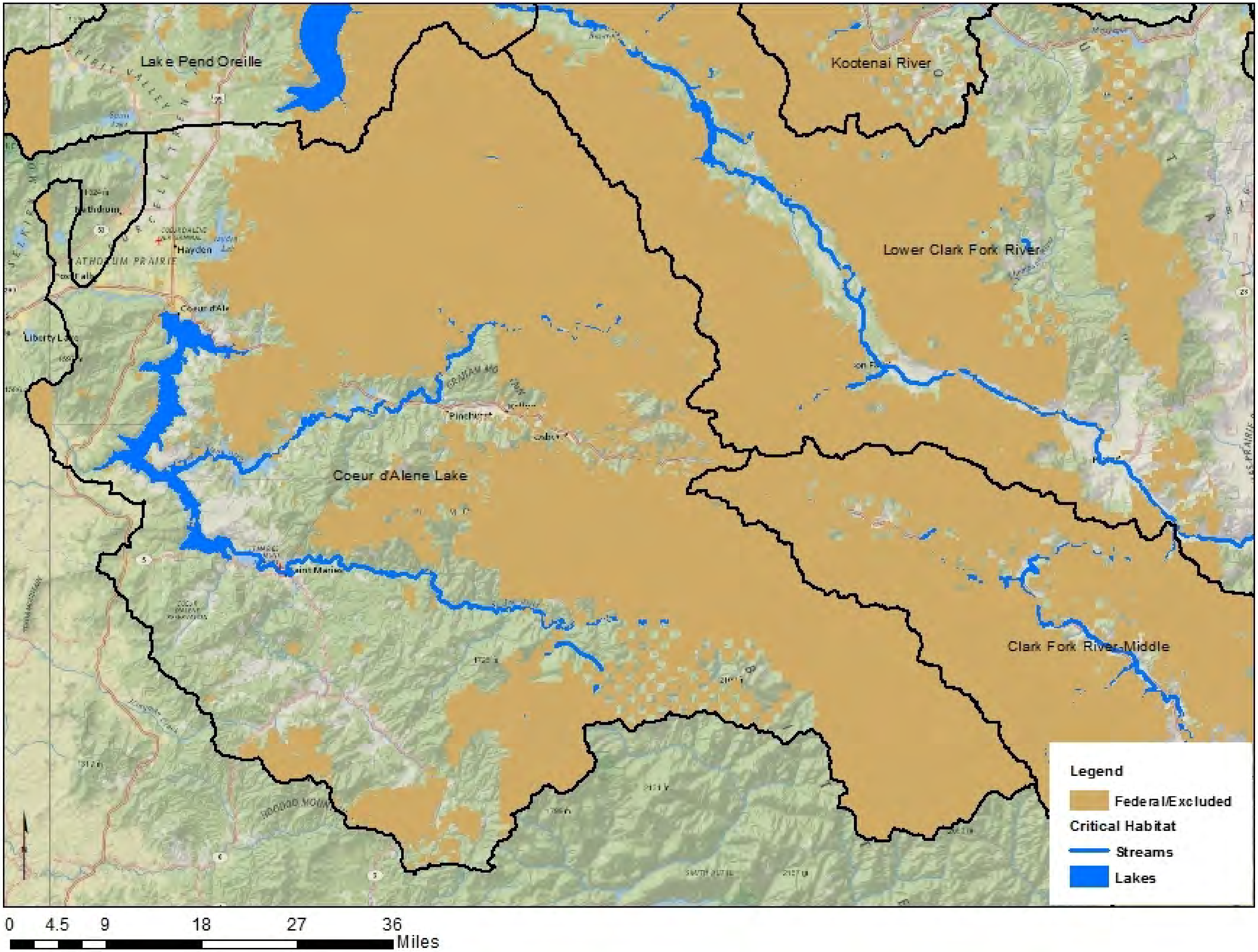
Map 1b: Designated critical habitat and action area (unshaded) in Pend Oreille River, Priest Lakes, Lake Pend Oreille, Kootenai River, Bull Lake, Lake Koocanusa, Sophie Lake Core Areas.



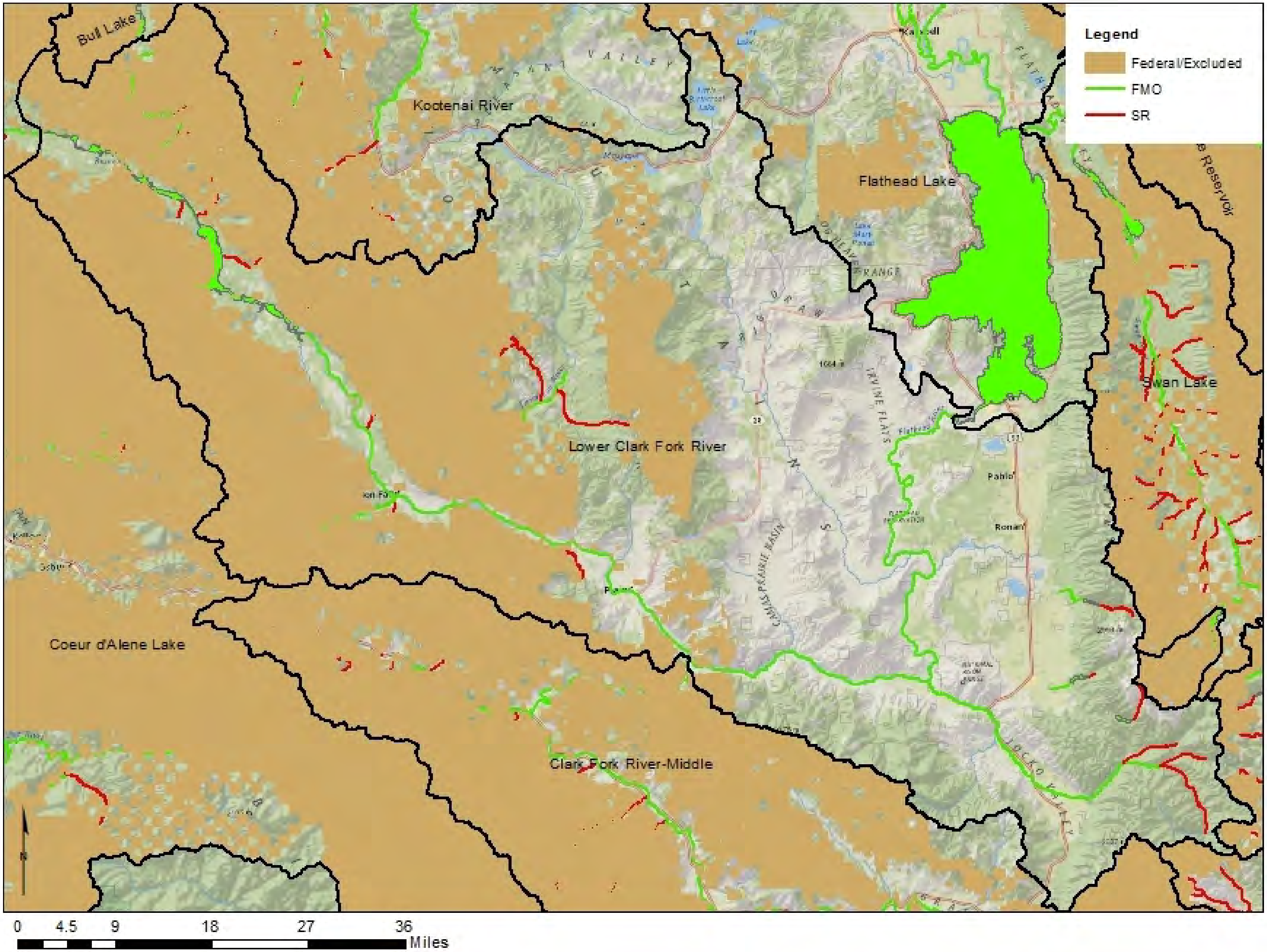
Map 2a: Bull trout occupied waters and action area (unshaded) in Coeur d'Alene Lake Core Area.



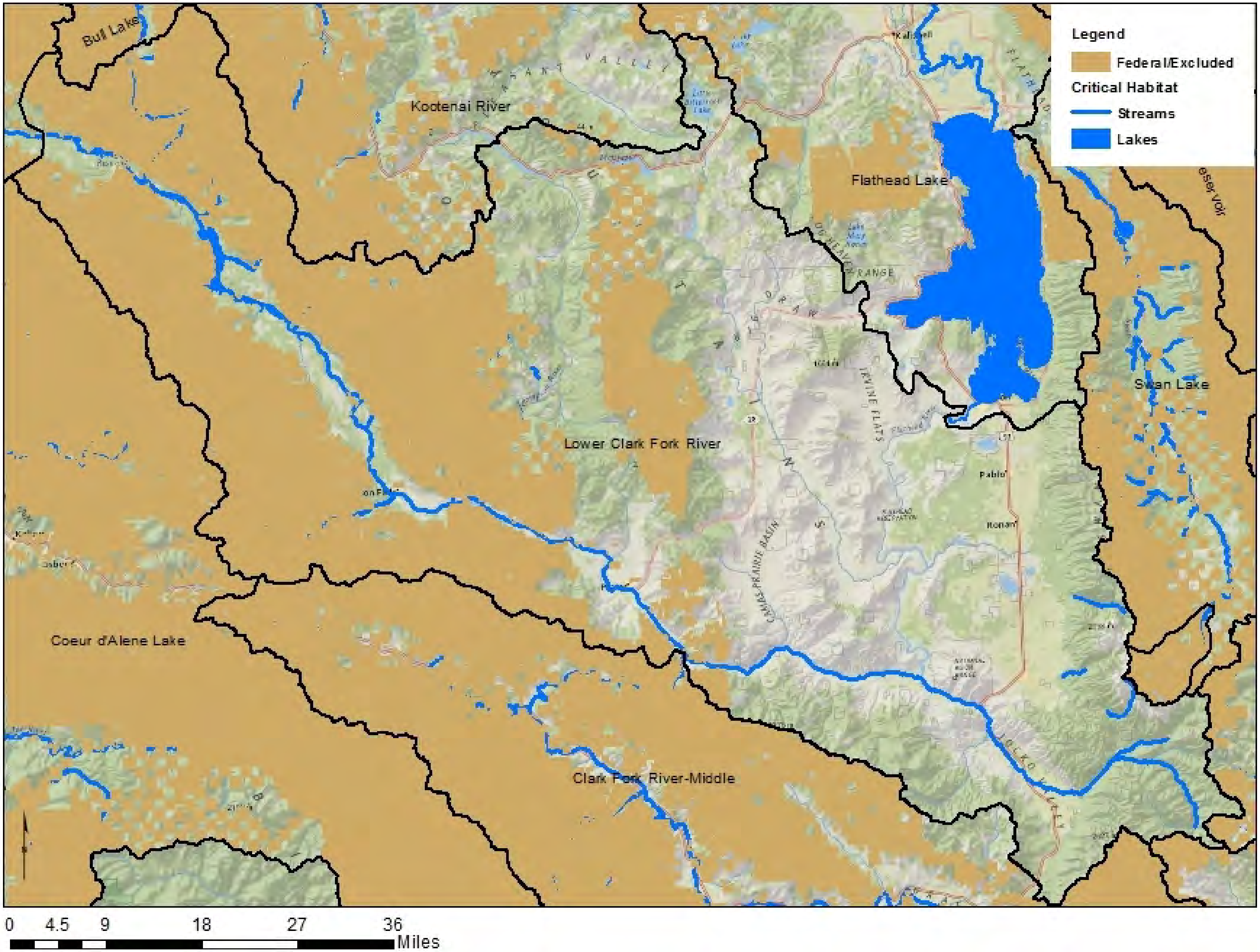
Map 2a: Designated critical habitat and action area (unshaded) in Coeur d'Alene Lake Core Area.



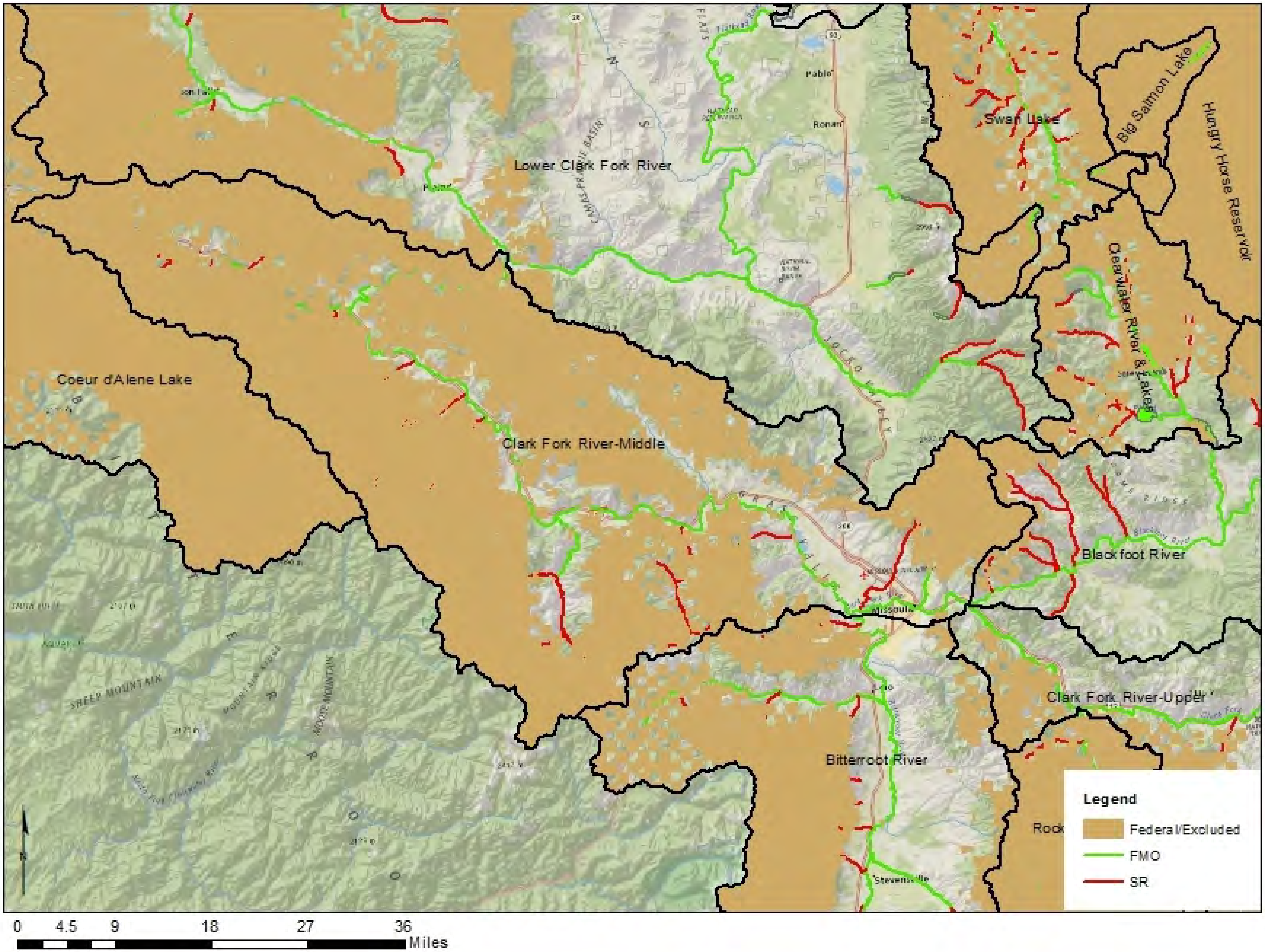
Map 3a: Bull trout occupied waters and action area (unshaded) in Lower Clark Fork River Core Area.



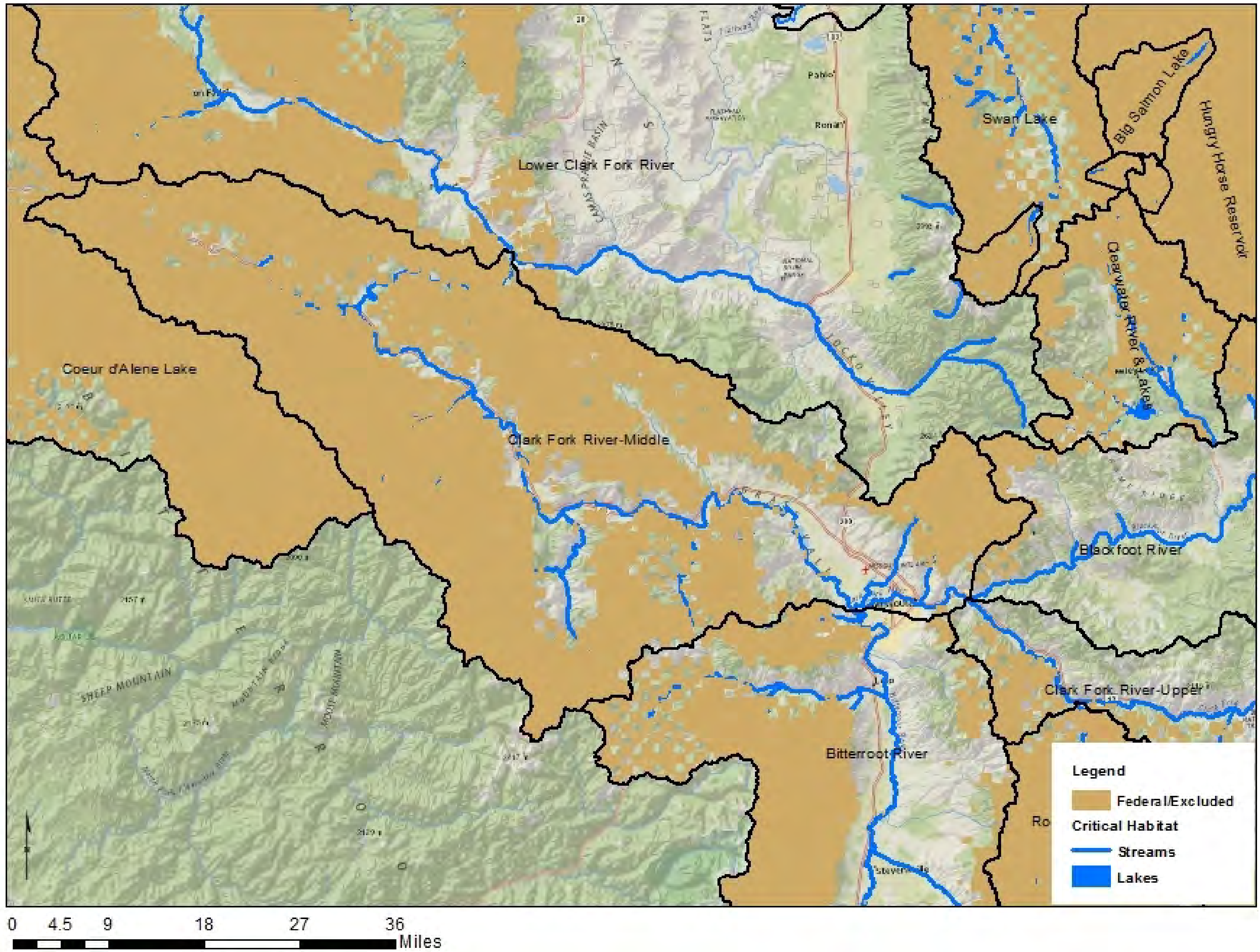
Map 3b: Designated critical habitat and action area (unshaded) in Lower Clark Fork River Core Area.



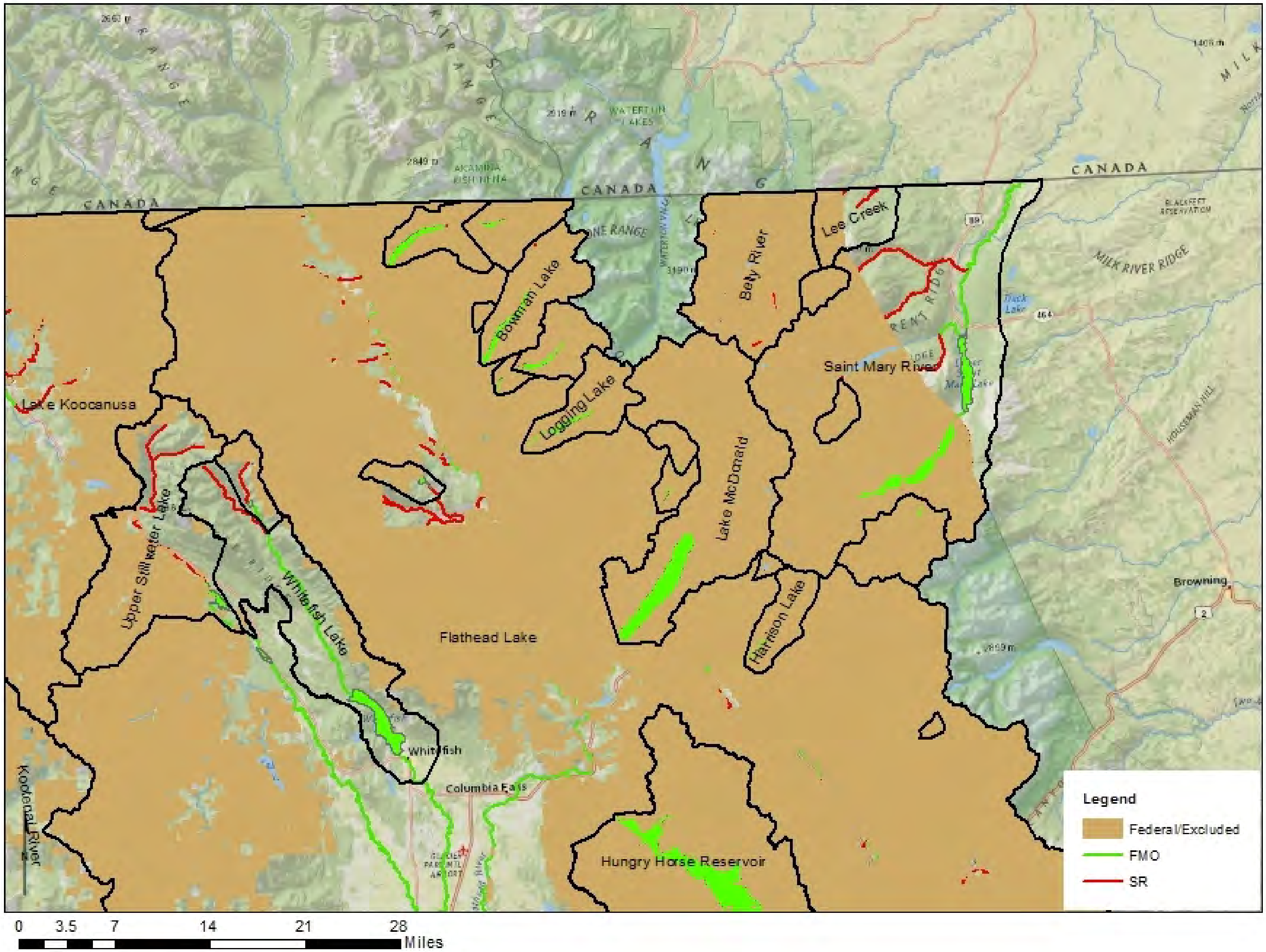
Map 4a: Bull trout occupied waters and action area (unshaded) in Middle Clark Fork River Core Area.



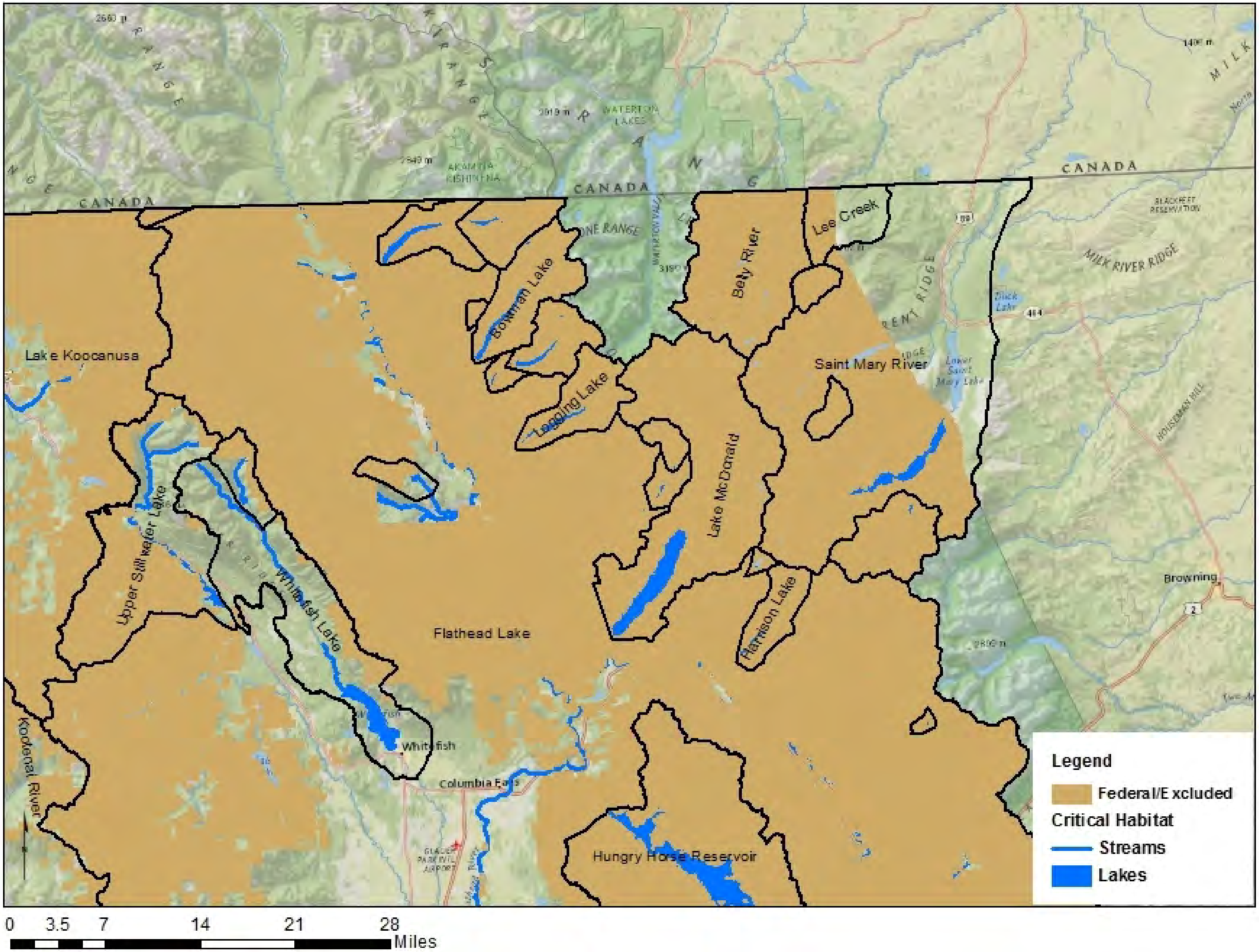
Map 4b: Designated critical habitat and action area (unshaded) in Middle Clark Fork River Core Area.



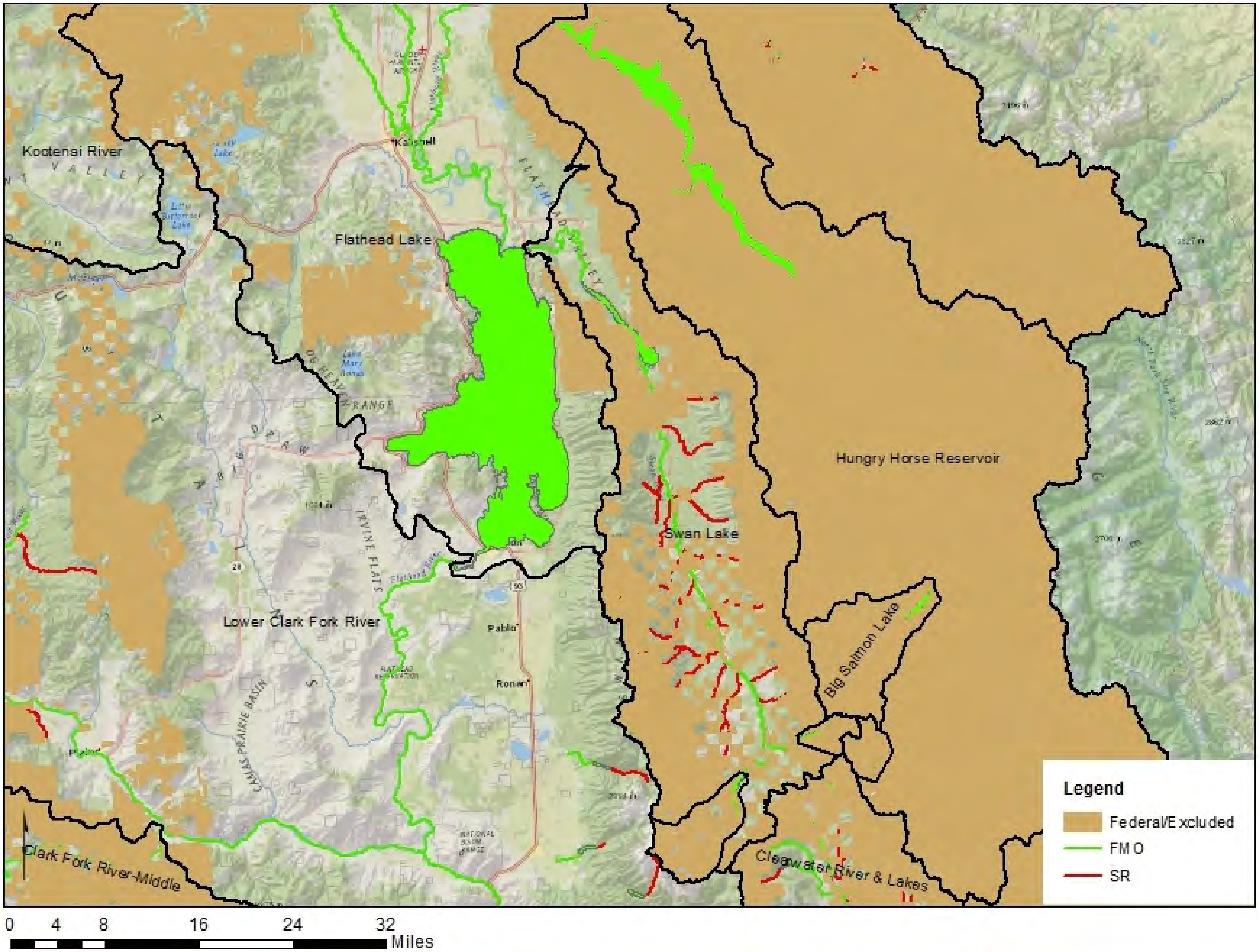
Map 5a: Bull trout occupied waters and action area (unshaded) in Flathead Lake (north portion), Whitefish Lake, Upper Whitefish Lake, Upper Stillwater Lake, Cyclone Lake, Lee Creek, and St. Mary River Core Areas.



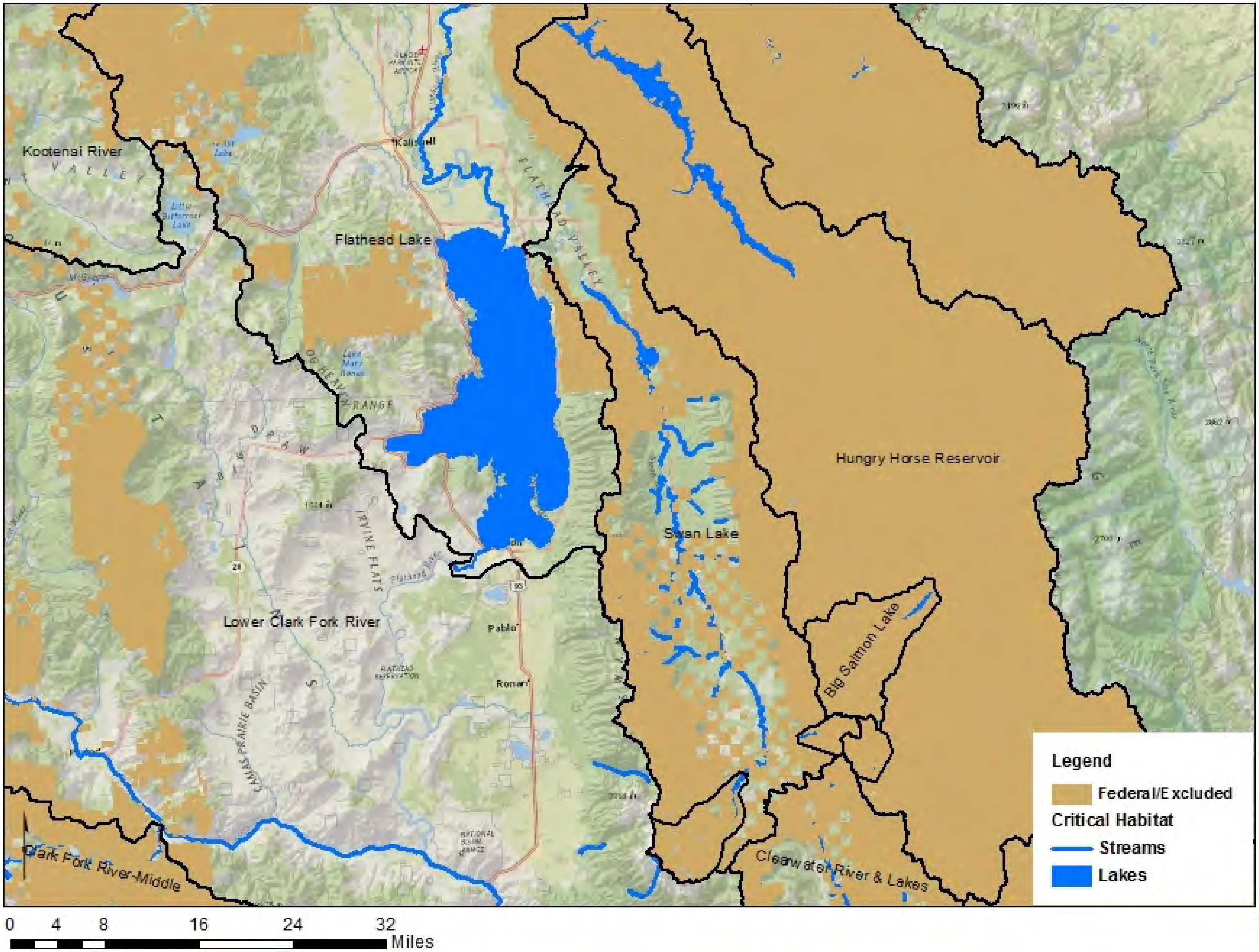
Map 5b: Designated critical habitat and action area (unshaded) in Flathead Lake (north portion), Whitefish Lake, Upper Whitefish Lake, Upper Stillwater Lake, Cyclone Lake, Lee Creek, and St. Mary River Core Areas.



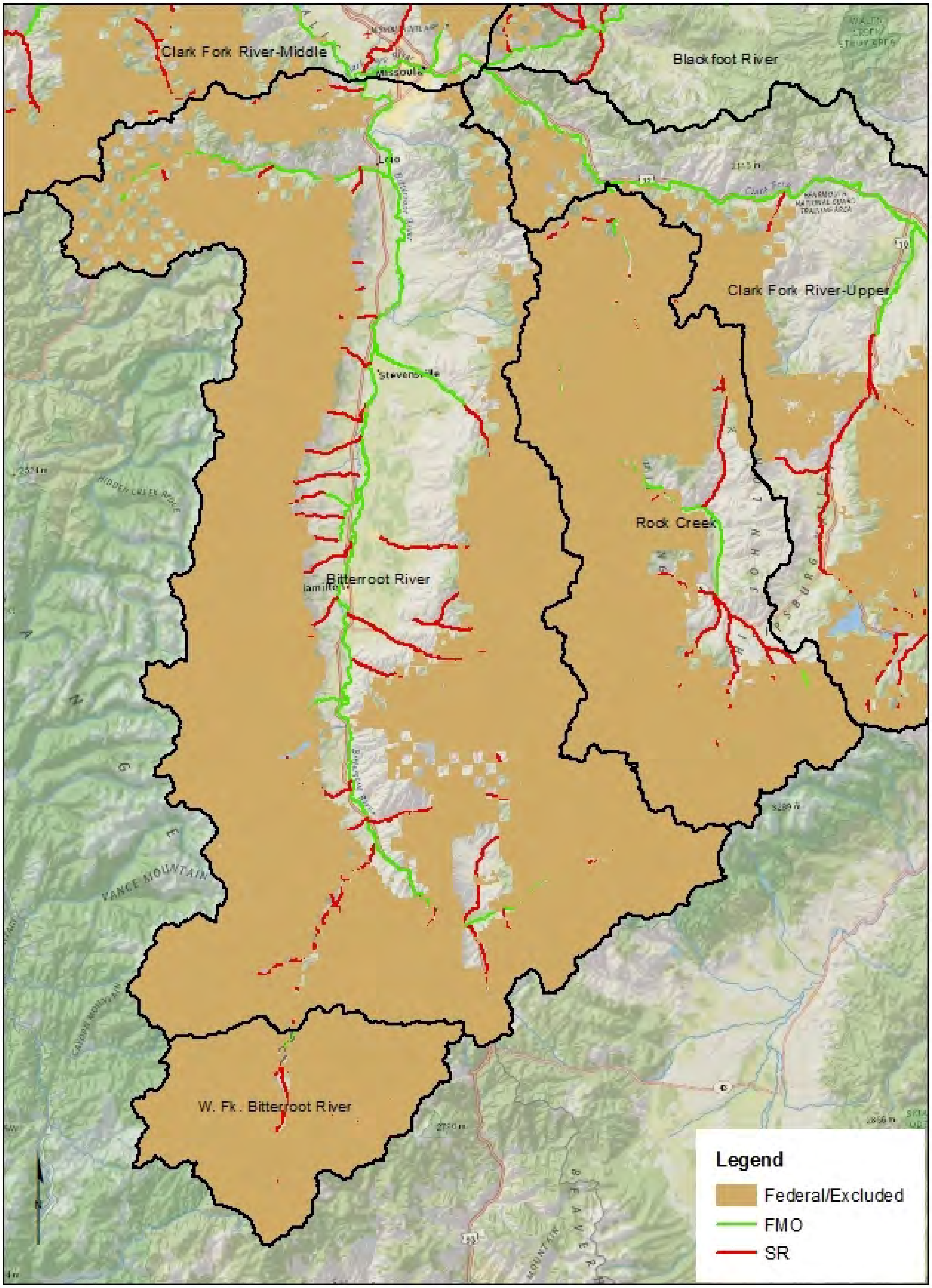
Map 6a: Bull trout occupied waters and action area (unshaded) in Flathead Lake (south portion), Swan Lake, and Lindbergh Lake Core Areas.



Map 6b: Designated critical habitat and action area (unshaded) in Flathead Lake (south portion), Swan Lake, and Lindbergh Lake Core Areas.

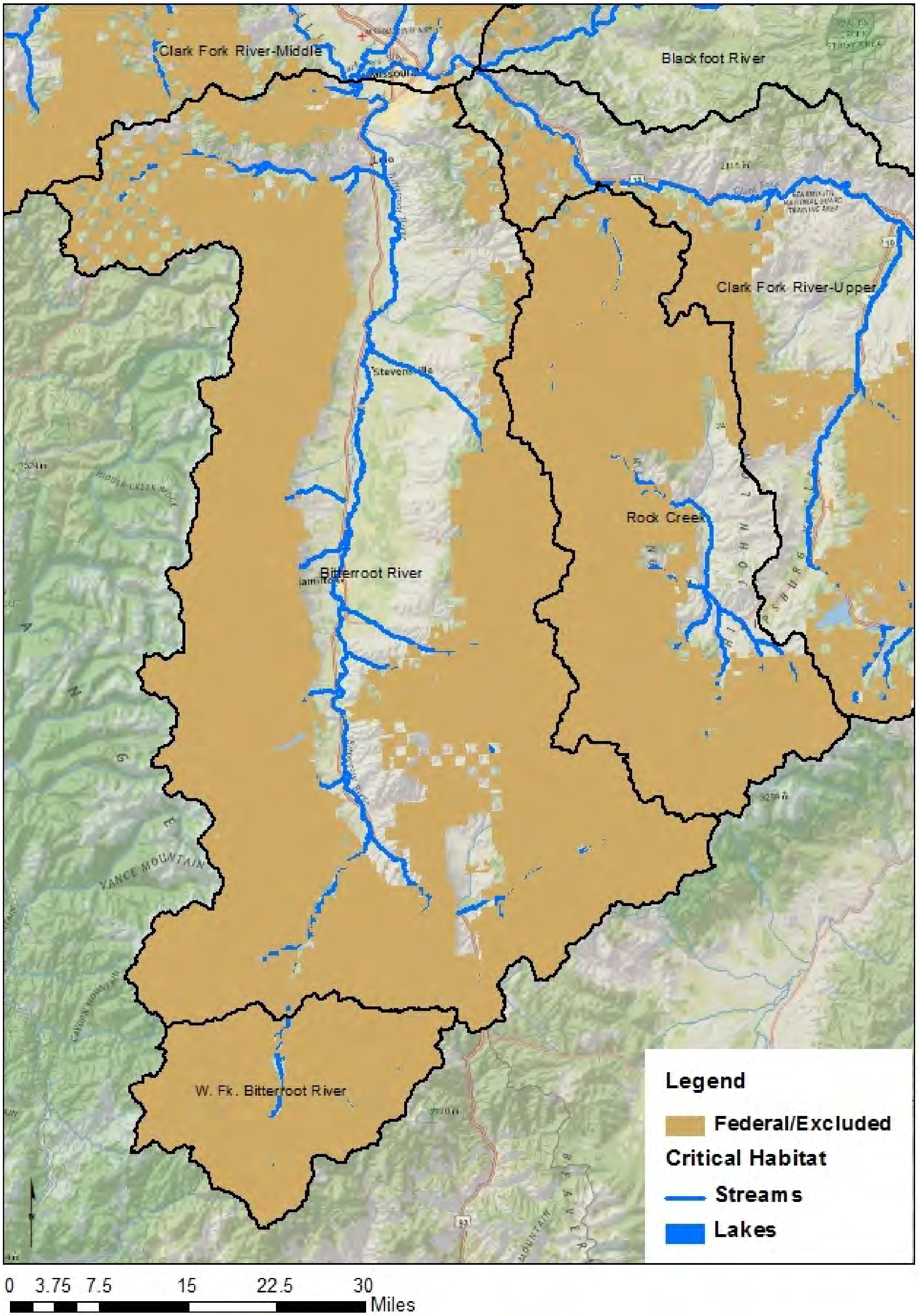


Map 7a: Bull trout occupied waters and action area (unshaded) in Bitterroot River, West Fork Bitterroot River, and Rock Creek Core Areas.

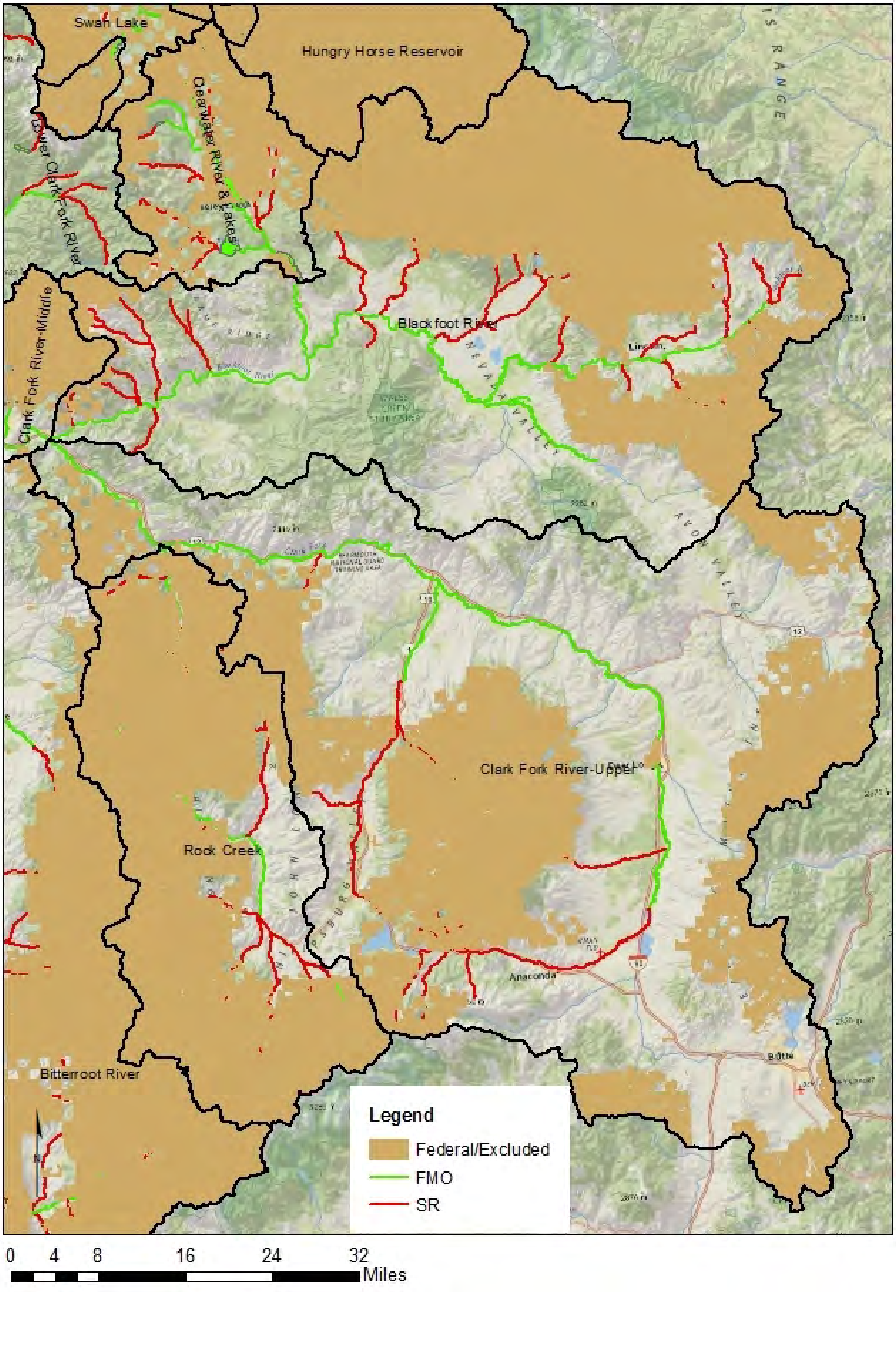


0 3.75 7.5 15 22.5 30 Miles

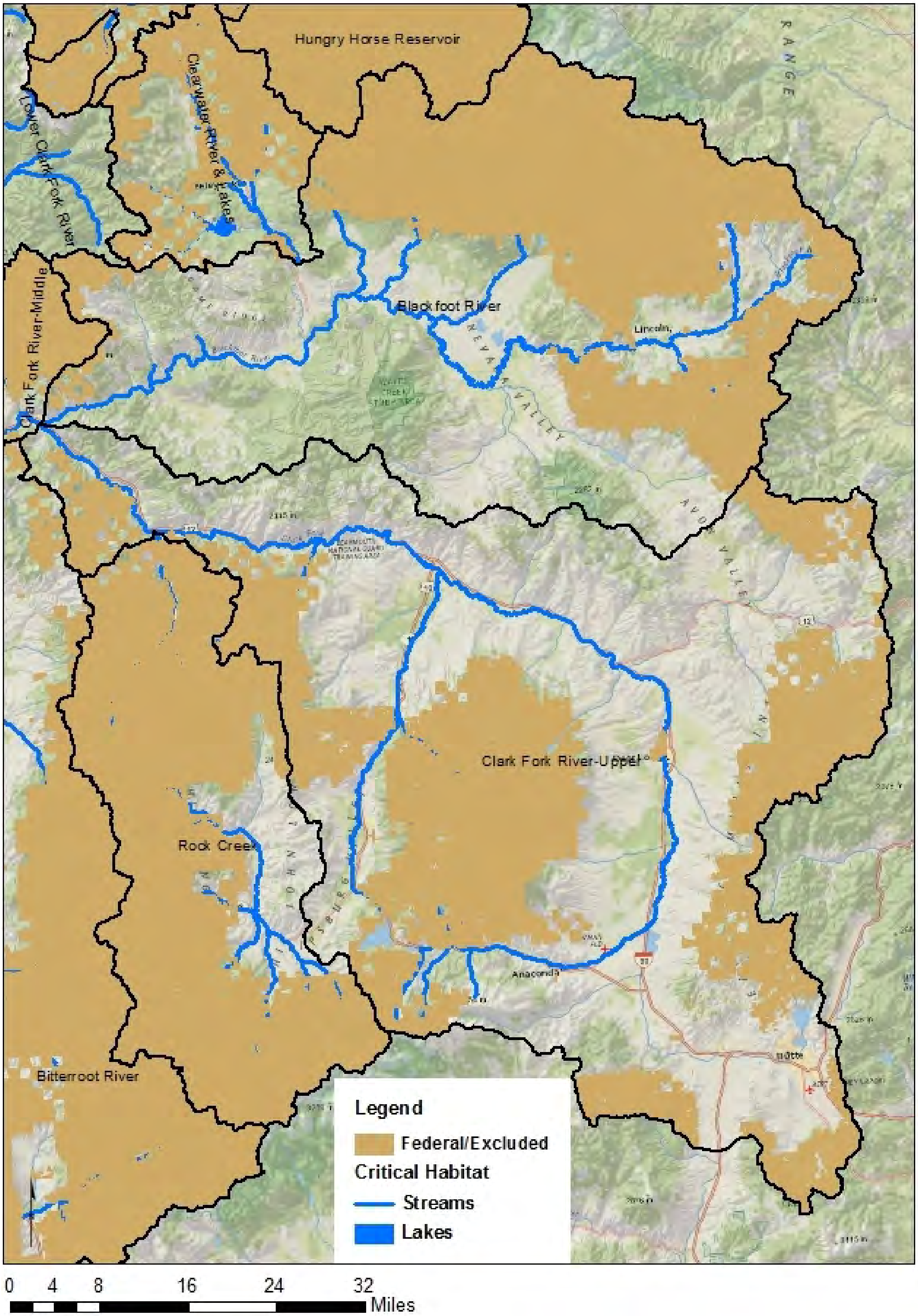
Map 7b: Designated critical habitat and action area (unshaded) in Bitterroot River, West Fork Bitterroot River, and Rock Creek Core Areas.



Map 8a: Bull trout occupied waters and action area (unshaded) in Blackfoot River and Upper Clark Fork River Core Areas.



Map 8b: Designated critical habitat and action area (unshaded) in Blackfoot River and Upper Clark Fork River Core Areas.



Appendix C: Effects Screen for Projects Meeting SLOPES Requirements

Effects to Bull Trout

1. Project is outside of a bull trout HUC6, based on IPaC or list.
    a. Project stream is not directly connected to an occupied stream…………….**NO EFFECT**
    b. Project stream is directly connected to an occupied stream………………**MAY AFFECT**

2. Project is within a bull trout HUC6, based on IPaC or list………………………….. **MAY AFFECT**
    a. Project is in an occupied lake…………………………………………………………………**NLAA**
    b. Project is in an unoccupied stream and directly connected to an occupied stream
        1. Project location is one mile or more from occupied stream……………**NLAA**
        2. Project location is less than one mile from occupied stream……………**LAA**
    c. Project is in an occupied stream………………………………………………………………**LAA**

Effects to Bull Trout Critical Habitat

3. Project is not in designated critical habitat, based on critical habitat maps.
    a. Project stream is not directly connected to critical habitat……………………..**NO EFFECT**
    b. Project stream is directly connected to critical habitat………………………**MAY AFFECT**
        i. Project location is one mile or more from critical habitat……………………….**NLAA**
        ii. Project location is less than one mile from critical habitat…………………….**LAA**

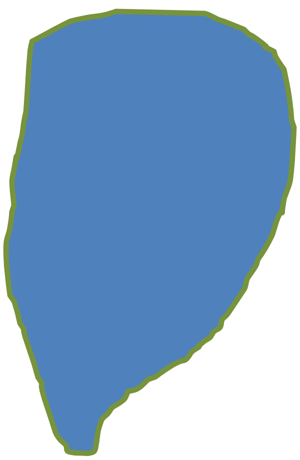
Effects Screen Illustration

No Effect: Project occurs outside of bull trout watersheds (based on IPaC or list) and project stream does not directly empty into an occupied stream (i.e., is not a primary tributary to an occupied stream, but may have a higher order connection).

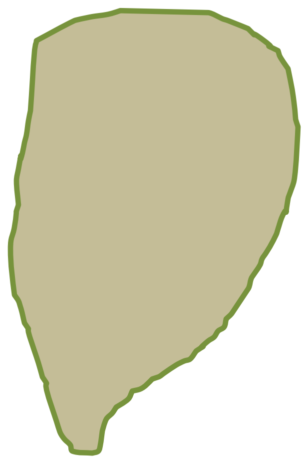
NLAA: Project occurs in lake or reservoir or in an unoccupied stream with direct downstream connectivity to an occupied stream and one stream-mile or more from the confluence with the occupied stream.

LAA: Project occurs in an occupied stream OR in an unoccupied stream with direct downstream connectivity to an occupied stream and less than one stream-mile from the confluence with the occupied stream.

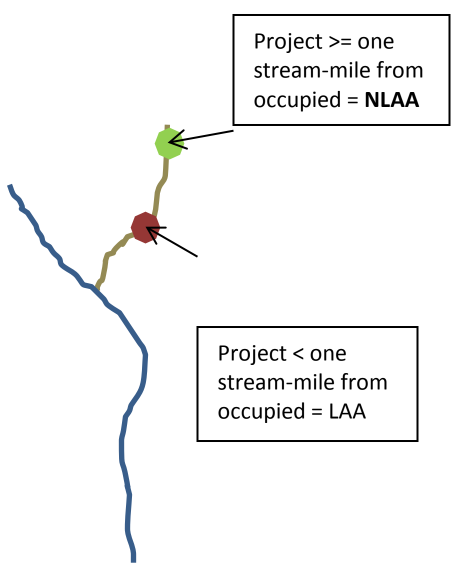
HUC6 with bull trout present



HUC6 with NO bull trout present



Unoccupied streams with direct connectivity to occupied



Unoccupied stream with NO direct connectivity to occupied