



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Eastern Washington Field Office
7421 E. Appleway Blvd.
Spokane Valley, WA 99212



In Reply Refer To:
01EWF00-2021-F-1069

Rodney Smoldon
Colville Forest Supervisor
U. S. Forest Service
765 South Main Street
Colville, Washington 99114

Dear Mr. Smoldon:

Subject: Biological Opinion on the LeClerc Creek Allotment Permit Reissuance

This letter transmits the U. S. Fish and Wildlife Service's (Service) Biological Opinion on the proposed LeClerc Creek Allotment Permit Reissuance located in Pend Oreille County, Washington, and its effects on critical habitat for the bull trout (*Salvelinus confluentus*). Formal consultation on the proposed action was conducted in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act). Your May 4, 2021, request for formal consultation was received on May 4, 2021.

The enclosed Biological Opinion is based on information provided in the April 29, 2021, Biological Assessment, telephone conversations, field investigations, and other sources of information cited in the Biological Opinion. A complete record of this consultation is on file at the Service's Eastern Washington Field Office in Spokane, Washington. An electronic copy of this Biological Opinion will be available to the public approximately 14 days after it is finalized and signed. A list of Biological Opinions completed by the Service since October 1, 2017 can be found on the Service's Environmental Conservation Online System website at <https://ecos.fws.gov/ecp/report/biological-opinion.html>.

The Biological Assessment also included a request for Service concurrence with "not likely to adversely affect" determinations for certain listed resources. The enclosed document includes a section separate from the Biological Opinion that addresses your concurrence requests. We included a concurrence for bull trout (*Salvelinus confluentus*), Canada lynx (*Lynx canadensis*), grizzly bear (*Ursus arctos*), and southern mountain caribou (*Rangifer tarandus caribou*). The rationale for these concurrences is included in the concurrence section.

INTERIOR REGION 9 COLUMBIA-PACIFIC NORTHWEST

IDAHO, MONTANA*, OREGON*, WASHINGTON

*PARTIAL

If you have any questions regarding the enclosed Biological Opinion, our response to your concurrence requests, or our shared responsibilities under the Act, please contact Ben Solvesky at 509-393-5667, or Julie Campbell Hansen at 509-393-5883.

Sincerely,

**JEFFREY
KRUPKA**

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JEFFREY KRUPKA
Date: 2021.06.25 16:40:02
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for Brad Thompson, State Supervisor
Washington Fish and Wildlife Office

Enclosure(s)

cc:

USFS, Republic, WA (B. Weinmann)

USFS, Kettle Falls, WA (C. Merritt)

USFS, Colville, WA (K. Honeycutt)

Endangered Species Act - Section 7 Consultation

BIOLOGICAL OPINION

U.S. Fish and Wildlife Service Reference:
01EWW00-2021-F-1069

LeClerc Creek Allotment Permit Reissuance Project

Pend Oreille County, Washington

Federal Action Agency:

U.S. Forest Service

Consultation Conducted By:

U.S. Fish and Wildlife Service
Washington Fish and Wildlife Office
Spokane, Washington

JEFFREY KRUPKA

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KRUPKA
Date: 2021.06.25 16:40:32 -07'00'

for Brad Thompson, State Supervisor
Washington Fish and Wildlife Office

Date

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ACRONYMS AND ABBREVIATIONS

Act Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*)
AUM Animal Unit Month
BA Biological Assessment
BMU Bear Management Unit
CH Critical Habitat
CHU Critical Habitat Unit
CNF Colville National Forest
DAM Destruction or Adverse Modification
Forest Plan Landscape Resource Management Plan
FMO Foraging Migration Overwintering
LAU Lynx Analysis Unit
LCAS Lynx Conservation Assessment Strategy
LPO Lake Pend Oreille
MA Management Area
Opinion Biological Opinion
PBF Physical and Biological Features
SE Selkirk Ecosystem Recovery Zone
Service U. S. Fish and Wildlife Service

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1 INTRODUCTION

This document represents the U. S. Fish and Wildlife Service's (Service) Biological Opinion (Opinion) and concurrence based on our review of the proposed LeClerc Creek Allotment Permit Reissuance Project located in Pend Oreille County, Washington. The Opinion addresses effects to critical habitat for the bull trout (*Salvelinus confluentus*), and the Concurrence section addresses effects to bull trout (*Salvelinus confluentus*), Canada lynx (*Lynx canadensis*), grizzly bear (*Ursus arctos*), and southern mountain caribou (*Rangifer tarandus caribou*) in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act). Your May 4, 2021, request for formal consultation was received on May 4, 2021.

This Opinion is based on information provided in the April 29, 2021, Biological Assessment (BA), telephone conversations, field investigations, and other sources of information as detailed below. A complete record of this consultation is on file at the Service's Eastern Washington Field Office in Spokane, Washington.

2 CONSULTATION HISTORY

The following is a summary of important events associated with this consultation:

- The Service issued an Opinion for the LeClerc Grazing Allotment (Service Reference: 1-9-99-F-002) on May 12, 1999.
- The Service issued an Opinion for the LeClerc Creek Cattle Grazing Allotment Project on March 11, 2016 (Service Reference: 01EWF00-2015-F-0285).
- The Service completed an informal consultation on the LeClerc Creek Horse and Cattle Grazing: Revised Alternative Project on February 28, 2018 (Service Reference: 01EWF00-2018-I-0673).
- The BA was received on May 4, 2021.
- Formal consultation was initiated on May 4, 2021.
- Additional information necessary to complete consultation was received on May 11, 2021, May 14, 2021, and May 28, 2021.

3 CONCURRENCE

3.1 Grizzly Bear

The revised grizzly bear recovery plan (Service 1993) delineated six grizzly bear recovery zones in the United States, including the Selkirk Ecosystem Recovery Zone (SE). Recovery zones generally provide all seasonal habitat needs for grizzly bears, and most grizzly bears occur within these zones. To aid in managing habitat and monitoring population trends, Bear Management Units (BMUs) were delineated within each recovery zone. Bear Management Units are analysis areas that approximate the lifetime size of a female's home range. Core habitat for grizzly bears is defined as areas greater than 500 meters from open or restricted roads within BMUs. Grizzly BMUs are managed to maintain pre-defined amounts of core habitat.

The SE supports low densities of grizzly bears, estimated to be 88 individuals, with 30 in the United States and 58 in Canada (Proctor et al. 2012). According to Kasworm et al. (2020, p. 2), there is a 78 percent probability the SE population was stable or increasing from 1983 through 2019. Recent genetic sampling in the U.S. suggest this number may be higher and, in 2019, there were 180 reported credible grizzly bear sightings in the SE (Kasworm et al. 2020, p. 12). Subadult and adult female grizzly bear survival have the largest influence on population trends (Mace and Waller 1998; Wakkinen and Kasworm 2004). Male grizzly bears tend to have larger and more variable annual (2 to 3 times) and lifetime (3 to 5 times) home ranges than females (LeFranc et al. 1987), with reproductive females having the smallest home ranges.

The LeClerc Creek Allotment lies entirely within the LeClerc BMU. Dozens of potential and confirmed observations of grizzly bears or their sign have been documented in the LeClerc Creek Allotment, dating back to 1976, including use by a female grizzly bear with cubs in 2015 through 2018. The project area provides high quality spring, summer, and fall grizzly bear foraging habitat for males, females, and females with cubs.

Grizzly bears tend to dig their dens on sheltered slopes where the wind and topography is likely to cause an accumulation of snow, and where the snow is unlikely to melt during warm periods (Service 1993). Higher elevation northerly aspects in the LeClerc Creek Allotment are relatively isolated, but they tend to be on exposed southerly aspects. The best denning habitat in the LeClerc BMU is located on the north side of Molybdenite Ridge, just north of the LeClerc Creek Allotment. A grizzly bear was documented to have excavated a den on the north side of this ridge in the 1990s. Therefore, the project provides post-denning grizzly bear habitat and may provide denning habitat. However, cattle are moved off the LeClerc Allotment prior to denning and no impacts to suitable denning sites are anticipated from management of the allotment.

Grizzly bears may be affected by direct and indirect effects of human activities, including: avoidance/displacement of individuals away from roads and road activity; habitat loss, modification, and fragmentation due to road use and road construction, including vegetative and topographic disturbances; and direct mortality from road kills, legal and illegal harvest, and other factors resulting from increased human-bear encounters (Interagency Grizzly Bear Committee 1994). Within the LeClerc BMU, the Colville National Forest's (CNF) Landscape Resource Management Plan (Forest Plan) requires that Federal actions shall not result in a net reduction of core habitat below 27 percent of the unit and if livestock grazing occurs within areas used by threatened and endangered species, the CNF is to manage for the conditions for the species or its prey. The proposed action will not affect the amount or location of core habitat within the LeClerc BMU. As part of our not likely to adversely affect concurrence for grizzly bear, we are assuming that guidelines included in the Forest Plan will be implemented in a manner that fulfills the conservation purpose of the guideline, avoiding or mitigating undesirable effects to grizzly bears.

In the absence of implementing conservation measures to minimize and avoid effects to grizzly bears, the proposed action could result in livestock-grizzly bear conflicts and the loss of grizzly bear forage. Grizzly bears may feed on sick, injured, young, or dead cattle, and associate the

herd as a potential source of food. To minimize and avoid effects to grizzly bears from the proposed action, calving occurs outside of the allotment area, eliminating the potential for grizzly bear access to young calves or afterbirth. Sick, injured, or dying cattle are identified and removed from the allotment in a timely manner, reducing the potential for grizzly bears to associate livestock with food. The proposed action also includes turning cattle on to the allotment no earlier than June 15th each year, beginning in 2022. The later turn-on date allows grizzly bears to use important lower elevation spring forage areas during the post-denning period and to move to higher elevation summer foraging areas prior to the cattle entering the LeClerc Allotment, providing grizzly bears with spring forage that has not been affected by seasonal grazing pressures. The later turn-on date also results in calves being larger when they are turned on to the allotment, further reducing the likelihood the calves would be targeted by grizzly bears for food. Although cattle may be turned on June 1 in 2021, the low snowpack in 2021 has likely resulted in earlier emergence for hibernating grizzly bears, allowing grizzly bears to use the lower-elevation spring foraging areas prior to cattle use. To date, no livestock depredation events by grizzly bears or interactions between cattle and grizzly bears have been documented by the CNF on the LeClerc Creek Allotment.

Due to the later start of the grazing season beginning in 2022, proposed measures to minimize the potential for interactions between grizzly bears and livestock, and lack of changes to core habitat from roads or increased human presence over existing conditions, effects to grizzly bears from the reauthorization the LeClerc Creek Allotment Permit are expected to be insignificant and discountable.

3.2 Canada Lynx

The 2013 Lynx Conservation Assessment and Strategy (Interagency Lynx Biology Team 2013) stratified lynx habitat across the lower 48 states into three categories: Core Areas, Secondary Areas, and Peripheral Areas. Core Areas are geographic regions that have strong evidence of long-term persistence of lynx populations and/or historical records of lynx occurrence over time, including evidence of persistence and reproduction. A Core Area contains large, connected patches of boreal forest, encompassing at least 480 square miles. Core Areas are sub-divided into individual Lynx Analysis Units (LAUs), approximating the size of a lynx home range. Secondary Areas are geographic regions that have historical records of lynx presence, but no recent documentation of presence or evidence of persistence and reproduction. The status of lynx in Secondary Areas may be unknown due to a lack of recent surveys. Peripheral Areas are regions with sporadic historical records of lynx, generally corresponding to dispersing individuals during cyclical population highs in Canada.

Canada lynx are associated with Engelmann spruce, subalpine fir, and lodgepole pine forest types on flat- to moderate-slopes from 4,100 feet to 6,600 feet elevation (Interagency Lynx Biology Team 2013, page 60). Dry forest cover types (e.g., ponderosa pine, dry Douglas-fir), large unforested areas, recent silvicultural openings (e.g., regenerating harvest), and recent high severity burned areas are typically avoided.

The availability of snowshoe hare prey, particularly during the winter months, appears to limit lynx populations. Common attributes of winter lynx habitat include mature multistory forest

stands with moderate to dense horizontal cover, persistent snow, and moderate to high snowshoe hare densities (greater than 0.2 hares per acre). Lynx home ranges that provide for consistent, abundant, temporally stable, and accessible snowshoe hares have been found to include high proportions of well-connected mature forests with intermediate amounts of small-diameter regenerating forest (Kosterman et al. 2018, p. 1037). Although small diameter regenerating forests can produce high densities of snowshoe hares, hares may be difficult for lynx to access due to high stem densities (Fuller et al. 2007, Ivan and Shenk 2016).

The Selkirk Mountain Range on the CNF was designated a Secondary Area for lynx by the Interagency Lynx Biology Team (2013). There are 3,843 acres of Canada lynx habitat in the LeClerc Creek Allotment (BA, p. 19). Biologists with the Washington Department of Fish and Wildlife documented lynx tracks during snow track surveys completed in 1998 and 2004, and a set of possible tracks was reported from the area in 2008. Although the LeClerc Creek Allotment provides lynx habitat and lynx have occasionally been observed in the area, reproduction has never been documented in the Selkirk Mountains south of the Canadian border.

According to the Interagency Lynx Biology Team (2013, p. 83), there is little empirical data on the potential dietary overlap between livestock and snowshoe hares or the potential effects of livestock grazing on snowshoe hare habitat. High-elevation riparian areas dominated by willows may provide important summer and fall habitat for lynx and there is potential for these areas to be over-grazed and browsed by domestic livestock. Within the mapped lynx habitat in the action area, older plantations appear to provide the highest quality habitat for snowshoe hares, but these older plantations are typically too dense to receive much use by cattle. In cases where significant forage competition between hares and livestock occurs, livestock foraging could have an indirect effect on lynx by reducing its prey base. However, livestock grazing and browsing on federal lands is unlikely to significantly reduce the snowshoe hare prey base or have a substantial effect on lynx (Interagency Lynx Biology Team 2013, p. 83).

Due to the sporadic use of the action area by Canada lynx, the extremely low level of effects to lynx foraging habitat as a result of livestock grazing, the availability of alternative foraging habitat within and adjacent to the action area, and conservation measures designed to limit brows of willows in riparian areas, the effects of the proposed action to Canada lynx are expected to be insignificant.

3.3 Southern Mountain Caribou

The southern mountain caribou distinct population segment was listed as endangered in 2019, and included the already listed southern Selkirk Mountains population of woodland caribou. The southern Selkirk Mountains population of woodland caribou is 1 of 17 woodland caribou subpopulations that share distinct foraging, migration, and habitat use behaviors. The subpopulations all occur in steep mountainous terrain in central and southeastern British Columbia, Canada, and in extreme northeastern Washington and northern Idaho, United States. Designated Southern Mountain Caribou Critical Habitat is located more than 12 miles north of the LeClerc Creek Allotment and will not be affected by the proposed action. Approximately 8,244 acres of the LeClerc Creek Allotment overlaps the Selkirk Mountains Woodland Caribou Recovery Area.

Based on past telemetry and census location data, caribou habitat use across the CNF's portion of the recovery area is well-distributed. However, the population of caribou in the southern Selkirks has been in steep decline and no individuals have been documented south of the Salmo-Priest Wilderness in over a decade, including the LeClerc Creek Allotment. The 2018 South Selkirk Caribou Census (DeGroot 2018, p. 2) identified only 3 individuals, all female. In 2019, a single individual remained, was captured, and relocated to one of the northern subpopulations in Canada. As a result, the southern Selkirk Mountains subpopulation of southern mountain caribou is believed to be extirpated.

Southern mountain caribou move seasonally between elevations. Seasonal habitats occur primarily within mature and older (100+ years) western hemlock - western red cedar and subalpine fir - Engelmann spruce forests. In the winter, caribou forage on lichen at higher elevations. Cattle have little effect on lichens. In addition, cattle have poor access to the high-elevation ridge systems that provide late winter habitat for caribou in the LeClerc Creek Allotment. The only foraging habitat where cattle and caribou have significant overlap is lower-elevation pastures during the summer. No sites have been documented within the caribou recovery area where cattle appear to be over-utilizing green forage resources and grazing has not been identified as a significant threat to woodland caribou.

Due to the limited effects of cattle on caribou habitat quality and because it is extremely unlikely southern mountain caribou occur within the LeClerc Creek Allotment, the potential effects of the proposed action on the species will be insignificant and discountable.

3.4 Bull Trout

The proposed reauthorization of the LeClerc Creek Allotment occurs within the LeClerc Creek drainage of the Pend Oreille River. The watershed falls within the Lake Pend Oreille Core Area of the Columbia Headwater Recovery Unit (Service 2015). Due to its large size and multi-state jurisdiction, the Lake Pend Oreille Core Area is divided into three segments in the Bull Trout Recovery Plan: Lake Pend Oreille (LPO) A, LPO B, and LPO C. The proposed LeClerc Creek Allotment occurs within LPO C. Bull trout in the Lake Pend Oreille Core Area exhibit an adfluvial life history, where adults spawn in tributaries and then return to lake habitat to forage and overwinter. In LPO C, expression of this life history trait has been hindered by the installation of Albeni Falls Dam, which completely blocked passage to the lake from spawning tributaries downstream.

Bull trout in LPO C are rare and typically only observed in the mainstem of the Pend Oreille River or at the mouths of tributaries. These observed fish are entrained individuals from populations upstream of Albeni Falls Dam (Service 2015). Currently, no known spawning populations occur within LPO C. Historically, bull trout spawning occurred throughout the LeClerc Creek drainage and project area. The last documented spawning in the drainage occurred in 2000, when a single female was observed spawning with a male brook trout. Since 2000, surveys for bull trout within LeClerc Creek have been sporadic and typically associated with other resident fish surveys and electrofishing. Most fish presence data within the watershed

is collected during fish salvage or relocation activities associated with restoration work completed during summer months (June, July, August, and September). The Service completed redd surveys in West Branch LeClerc and Fourth of July Creeks in early October 2014, and 2015. In 2014, a single adult bull trout was observed in West Branch LeClerc Creek. No other observations of bull trout within the drainage have occurred in more than a decade. More recently, eDNA surveys on CNF lands have resulted in positive bull trout detections in West Branch LeClerc Creek, indicating some level of use may occur in the fall months. However, overall use is unknown.

Grazing within riparian areas has the potential to have significant effects to bull trout or bull trout habitat in the form of trampling, water quality degradation, loss of vegetation and riparian cover, and channel modifications for cattle crossings (bridge or hardened crossings). When banks are destabilized, sediment levels and fines increase, eggs smother, and habitat for invertebrates and forage reduces. Cattle can trample redds and eggs in the substrate when crossing or drinking from the stream. Loss of vegetation from browsing and trampling in the riparian reduces cover, allochthonous input (external sources of organic debris such as leaves) and increase stream temperatures. Structures for cattle may also impact bull trout habitat or individuals. Hardened cattle crossings can create seasonal or temporary barriers, if not designed properly or damaged by flood or human activities. It is expected that significant effects to water quality, habitat complexity, and prey base may occur in localized areas of the proposed LeClerc Creek Allotment where cattle have access to the stream. While significant effects to habitat are expected because of the reauthorization of the LeClerc Creek Allotment, effects to bull trout are not expected to be measurable, for reasons described below.

Bull trout are extremely rare within the entire LeClerc Creek watershed. Spawning and rearing does not occur based on recent redd surveys. Current conditions of the Pend Oreille and LeClerc Creek watersheds are unlikely to support spawning populations in the foreseeable future without direct intervention (Dunham et al. 2014). Individual bull trout may enter the watershed during certain times of the year to forage or seek refugia when water temperatures in the mainstem Pend Oreille River are too warm to inhabit, typically in late July, August, and September. These bull trout are most likely found in the lower reaches of the watershed, generally downstream of the action area. During July, August, and September, grazing will occur in the upper areas of the watershed limiting the potential for interaction with bull trout. If bull trout do enter the action area, effects would be difficult to measure due to the rare event of bull trout presence coinciding with small isolated areas affected by grazing activities. Due to grazing rotations, and other factors that minimize the extent and duration of effects in any one area and the very low likelihood of bull trout presence, the effects to individual bull trout will not be measurable. For these reasons, effects to bull trout from the reauthorization of the LeClerc Creek Allotment are expected to be insignificant.

4 BIOLOGICAL OPINION

5 DESCRIPTION OF THE PROPOSED ACTION

A federal action means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies in the United States or upon the high seas (50 CFR 402.02). The conservation measures proposed for the LeClerc Creek Grazing Allotment are standards and guidelines included in the CNF Forest Plan. Although guidelines are not written in a manner that compels or prohibits project activities, the 2012 Forest Planning Rule defines a guideline as: “a constraint on project and activity decision-making that allows for departure from its terms, so long as the purpose of the guideline is met. (§ 219.15(d)(3)). Guidelines are established to help achieve or maintain a desired condition or conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements. (36 CFR 219.7(e)(1)(iv)).”

The LeClerc Creek Grazing Allotment is located east of the Pend Oreille River about three miles southeast of the town of Ione, Washington. The allotment includes National Forest System lands, Washington State Department of Natural Resources lands, and private lands primarily owned by Stimson Lumber Company. The allotment includes portions of the West, Middle, and East Branches of LeClerc Creek Watersheds. Topography in the area is mountainous with gentle to moderately steep slopes. The area is predominantly timbered. A few grassy meadows exist in the allotment, typically associated with old homesteads or mill sites (ex., Hanlon, Ballpark, and Fourth of July Meadows).

An Animal Unit Month (AUM) is defined as the amount of forage required to feed a 1,000-pound cow for a one-month period. The AUMs authorized for the LeClerc Creek allotment has varied widely over its documented history, especially in the 1930’s through the 1950’s. In 2010, the authorized AUMs were reduced from 731 (138 cow / calf pairs) to 535 (101 cow / calf pairs), where it remains today. This reduction in stocking resulted when Stimson Lumber Company opted not to renew the grazing lease on their lands. This allotment is a cattle and horse grazing allotment that is currently permitted to the Fountain Ranch.

The proposed action includes continued grazing under the existing 1982 management plan for the LeClerc Creek allotment and the recently revised CNF Forest Plan. The allotment permit will be issued for 10 years (ending in 2031 and, is tiered to the Forest Plan and is subject to the standards and guidelines contained therein. No changes are proposed to the permitted AUMs.

The Forest Plan divides the Forest into discrete Management Areas (MAs). Each MA has its own management emphasis, desired conditions, objectives, and standards and guidelines. Livestock grazing is a permitted activity in all MAs, but if grazing conflicts with the primary emphasis, grazing practices should be modified. The Le Clerc Creek allotment area’s three MAs include backcountry, focused restoration, and riparian.

There are five separate pastures in the LeClerc allotment: Dry Canyon, Mineral Creek, Upper Bunchgrass, Lower Bunchgrass, and Fourth of July (Table 1). Cattle move between and within

pastures on roads, and on a few trails maintained by the permittee. Cattle movement between pastures is intended to be controlled by existing sections of fencing, cattle guards in roadbeds, and by natural barriers such as steep slopes, rock features, and heavy timber.

The allotment is currently managed under a “deferred rotation” grazing system. This means that one portion of the allotment is grazed early in the season, thereby deferring grazing on the remainder of the allotment to allow plant growth and seed production to occur. This strategy helps to maintain plant health and vigor, as well as plant species diversity. The current timing and sequence of pastures grazed are displayed in the following table.

Table 1 - LeClerc Creek Range Allotment - existing grazing schedule and pasture data

Pasture	Approximate season of use	Days of use	Approximate acres
Lower Bunchgrass	June 1 - July 6, 2021	36	5,621
Lower Bunchgrass	June 15 - July 6, 2022 and 2031	21	5,621
Mineral Creek and Upper Bunchgrass	July 7 - Sept. 15	71	5,603, 6,692
Dry Canyon and Fourth of July	September 16 - 30	15	3,037, 2,460
Total - 2021	June 1 - Sept. 30	122	23,413
Total - 2022	June 15 - Sept. 30	107	23413

The LeClerc Creek Allotment occurs in an area with a checkerboard ownership pattern, a situation that requires a more complex cattle containment infrastructure than might otherwise be needed in a contiguous ownership. Over the years, livestock drift outside of designated pastures has occurred. In 2020, the Forest Service made several infrastructure improvements to mitigate cattle drift, including reconstructing the perimeter fence around Hanlon Meadow and reconstructing the Hanlon Meadow handling facility to reduce livestock access to the stream.

5.1 Conservation Measures

The following are the standards and guidelines included in the CNF Forest Plan that affect range management in the LeClerc Creek allotment:

FW-GDL-IS-01. Invasive Species Prevention - The method, timing, and intensity of land use activities should not promote the introduction, establishment, or spread of invasive species. Instruments such as grazing annual operating instructions, special use operating plans, contract clauses, and other specifications, should address site-specific invasive species prevention measures such as vehicle and equipment cleaning, sequencing of activities, and treatment requirements.

FW-GDL-LG-01. Threatened and Endangered Species Habitat in Riparian Areas in Grazing Allotments - If livestock grazing occurs within areas used by threatened and endangered species, manage for conditions for the species or its prey.

FW-GDL-LG-03. Recreation Conflicts - Braided trails resulting from grazing should have reassurance markers installed at intersections or the non-system trail, where practical, should be restored or blocked if doing so would successfully reduce livestock use and trail braiding over the long term. Salting, water development design, and turn-out/gathering locations should be addressed in the development of annual grazing plans to avoid livestock impacts to system trails, recreation areas, scenic vistas, etc.

FW-GDL-SOIL-01. Total Soil Resource Commitment - The Total Soil Resource Commitment is no more than 5 percent of the Colville National Forest. The soil stability and support function is maintained within the Total Soil Resource Commitment. Total Soil Resource Commitment is the conversion of a productive site to an essentially non-productive site (0 to 40 percent of natural productivity) for a period of more than 50 years. Examples include system roads, administrative sites, developed campgrounds, rock quarries, mine sites, and livestock watering facilities.

FW-GDL-VEG-01. Threatened, Endangered, and Sensitive Plant Species - Disturbance in Occupied Habitat - Soil and habitat disturbance should be managed within occupied habitat and suitable whitebark pine habitat to the extent practicable to maintain or enhance threatened, endangered, and sensitive plant populations and avoid invasive plant species establishment or spread. Consequently, occupied habitat should not be used for timber harvest, fuel breaks or developments associated with wildfire suppression, delivery of fire retardant or petroleum products, placement of stock-handling facilities, recreation, or special use developments. A 100-foot buffer between the occupied habitat and these management activities should be maintained, unless habitat restoration activities are designed to benefit threatened, endangered, and sensitive plant species.

FW-GDL-VEG-01. Threatened, Endangered, and Sensitive Plant Species - Disturbance in Occupied Habitat - Grazing management (including timing, intensity, duration, frequency of use, and type and class of livestock) should allow for completion of threatened, endangered, and sensitive plant species annual life cycle and development and dispersal of reproductive materials like seed and spores. Salting or water developments should not be authorized or allowed such that they reduce threatened, endangered, or sensitive plant populations.

FW-STD-IS-01. Invasive Plant Prevention - Use only pelletized or certified weed-free feed for pack, saddle and livestock on all National Forest System lands.

MA-GDL-RMA-12. Recreational and Permitted Grazing Management – Livestock Handling Activities - Livestock trailing, bedding, loading, and other handling activities should be avoided in Riparian Management Areas, except for those that inherently must occur in Riparian Management Areas.

MA-GDL-RMA-13. Recreational and Permitted Grazing Management - Fish Redds - Avoid livestock trampling of federally listed threatened or endangered fish redds.

MA-STD-RMA-08. Management of Livestock Grazing to Attain Desired Conditions - Manage livestock grazing to move toward aquatic and riparian desired conditions. Where livestock grazing is found to prevent or retard attainment of aquatic and riparian desired conditions, modify grazing management. If adjusting practices is not effective, remove livestock from that area using appropriate administrative authorities and procedures.

MA-STD-RMA-09. Recreational and Permitted Grazing Management - Livestock Handling, Management, and Water Facilities - New and replaced livestock handling and/or management facilities and livestock trailing, salting, and bedding are prohibited in Riparian Management Areas unless they do not prevent or retard attainment of aquatic and riparian desired conditions, inherently must be located in a Riparian Management Area, or are needed for resource protection.

FW-STD-WL-07. Grizzly Bear Recovery Area - Road Densities - Within the grizzly bear recovery area, Federal actions shall not result in a net reduction of core habitat below the levels in the following table. Discrete core areas shall remain in place for a minimum of 10 years for bears to find and use these areas. Federal actions shall not result in a net increase in open or total road densities above the levels in table 15. Total road densities do not include physically undrivable roads (e.g., bermed, brushed-in).

Table 2 - Grizzly bear core habitat standards for the grizzly bear management units of the Colville National Forest

Bear Management Unit	Maximum open roads >1 miles/square mile	Maximum total roads >2 miles/square mile	Minimum percent core habitat
Salmo-Priest (99% NFS land)	33%	26%	64%
Sullivan-Hughes (99% NFS land)	24%	19%	61%
LeClerc (64% NFS land)	48%	60%	27%

FW-STD-WL-08. Proper Storage of Human Food, Garbage, and Other Wildlife Attractants - Forest Service contracts, permits, and agreements that include camping on NFS lands shall incorporate the requirement to follow the current Food Storage Order for the Colville National Forest.

MA-GDL-RMA-12. Annual Grazing Use Indicators - The purpose of this guideline is to manage livestock grazing to help attain and maintain aquatic and riparian desired conditions over time. Specifically, it is intended to maintain or improve vegetative and stream conditions, help ensure the viability of aquatic species, provide important contributions to the recovery of Federally listed species, and facilitate attainment of State water quality standards.

The annual livestock use and disturbance indicators described below should be applied to help achieve, over longer timeframes, conditions at site and watershed scales that enable attainment and maintenance of desired conditions. The values specified below are starting points for management. Only those indicators and numeric values that are appropriate to the site and necessary for maintaining or moving towards desired conditions should be applied. Specific indicators and indicator values should be prescribed and adjusted, if needed, in a manner that reflects existing and desired conditions and the natural potential of the specific geo-climatic, hydrologic, and vegetative setting in which they are being applied. Indicators and indicator values should be adapted over time based on long-term monitoring and evaluation of conditions and trends. Alternative use and disturbance indicators and values, including those in current ESA consultation documents or non-ESA allotment management plans or allotment NEPA decisions, may be used if they are based on best available science and monitoring data and meet the purpose of this guideline.

1. Where desired conditions for water quality, aquatic habitat, and riparian vegetation have been attained and riparian vegetation is in late-seral conditions, protect or maintain those conditions by managing annual livestock grazing use and disturbance as follows:
 - maintain a minimum of 4-inch residual stubble height of key herbaceous species on the greenline;
 - utilize no more than 30 to 45 percent of deep-rooted herbaceous vegetation in the active floodplain and, as needed, in other critical portions of the Riparian Management Area;
 - limit streambank alteration to no more than 20 to 25 percent; and
 - limit use of woody species to no more than 30 to 40 percent of current year's leaders along streambanks and, as needed, in other critical portions of the Riparian Management Area.
2. Where desired conditions for water quality, aquatic habitat, and/or riparian vegetation have not yet been attained, but conditions are moving towards those desired conditions, enable continued recovery by managing annual livestock grazing use and disturbance as follows:

- maintain a minimum of 4-inch to 6-inch residual stubble height of key herbaceous species on the greenline;
 - follow the criteria for utilization of deep-rooted herbaceous vegetation, streambank alteration, and use of woody species described in (1).
3. Where desired conditions for water quality, aquatic habitat, and/or riparian vegetation have not been attained and conditions are not moving towards those desired conditions, enable recovery by managing annual livestock grazing use and disturbance as follows:
- maintain a minimum of 6-inch residual stubble height of key herbaceous species on the greenline;
 - utilize no more than 30 to 35 percent of deep-rooted herbaceous vegetation in the active floodplain and, as needed, in other critical portions of the Riparian Management Area;
 - limit streambank alteration to no more than 15 to 20 percent; and
 - limit use of woody species to no more than 20 to 30 percent of current year's leaders along streambanks and, as needed, in other critical portions of the Riparian Management Area.

In addition to the forest plan components listed above, the U.S. Forest Service proposes to implement the following conservation measures to minimize and avoid potential adverse effects to listed species:

1. Livestock will be managed according to the Wolf Conservation and Management Plan. The Wolf Conservation and Management Plan specifies measures for the timely removal, destruction, or treatment of livestock carcasses. The timely removal, destruction, or treatment of livestock carcasses will avoid the positive conditioning of grizzly bears to livestock carrion as food.
2. The range permit will require that the U.S. Forest Service food storage order is followed. The food storage order requires human food, prepared livestock and pet food, and refuse associated with livestock operations be made unavailable to wildlife through proper storage (normally in a hard-sided vehicle). A copy of the Forest's food storage order and brochures on living and working in grizzly bear occupied habitat would be given to the permittee.
3. The range permit will require the permittee to limit the number of motorized entries on restricted (gated) roads to those necessary for managing the allotment (i.e. salting, maintaining fences, moving stock, etc.). The range permit will require the permittee

to track the number of motorized entries on closed roads in the LeClerc allotment and return the completed permit and key to the district biologist within one month of the end of the grazing season.

4. The range permit will include a clause providing for cancellation or temporary cessation of activities if needed for protection or air, water, soils, and vegetation, fish and wildlife and other environmental values such as to resolve a grizzly-human conflict situation.

5.2 Action Area

The action area is defined as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR 402.02). In delineating the action area, we evaluated the farthest reaching physical, chemical, and biotic effects of the action on the environment. The action area for this proposed federal action is based on the geographic extent of grazing within the LeClerc Creek Allotment boundary and expected increases to instream sedimentation downstream of the allotment boundary.

It is expected that habitat changes, specifically related to sedimentation, will be observed some distance downstream into the LeClerc Creek drainage. Due to the variability in how sediment moves seasonally with given flows, amounts released into the stream, frequency and duration of bank disturbance, and other factors affecting sediment disbursement (e.g., roads), it is difficult to quantify how far downstream sediment disruption and water quality impacts as a result of grazing activities will occur. Conservatively, the Service estimates that effects from sedimentation could reach up to 0.5 mile downstream of the LeClerc Allotment boundary, specifically during high flows and rain events which mobilize sediment and scour unstable stream banks within the allotment.

6 ANALYTICAL FRAMEWORK FOR THE ADVERSE MODIFICATION DETERMINATION

6.1 Adverse Modification Determination

A final rule revising the regulatory definition of “destruction or adverse modification” (DAM) of critical habitat (CH) was published on August 27, 2019 (84 FR 44976). The final rule became effective on October 28, 2019. The revised definition states:

“Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species.”

In accordance with policy and regulation, the destruction or adverse modification determination in this Biological Opinion relies on the following components:

1. The *Status of Critical Habitat*, which describes the range-wide condition of the CH in terms of essential habitat features, primary constituent elements, or physical and

biological features that provide for the conservation of the listed species, the factors responsible for that condition, and the intended value of the CH as a whole for the conservation/recovery of the listed species;

2. The *Environmental Baseline*, which refers to the current condition of CH in the action area absent the consequences to CH caused by the proposed action, the factors responsible for that condition, and the conservation value of CH in the action area for the conservation/recovery of the listed species;
3. The *Effects of the Action*, which represents all consequences to CH that are reasonably certain to be caused by the proposed action, including the consequences of other activities that are caused by the proposed action, and how those impacts are likely to influence the conservation value of the affected CH; and
4. *Cumulative Effects*, which represent the consequences to CH of future, non-federal activities that are reasonably certain to occur in the action area and how those impacts are likely to influence the conservation value of the affected CH.

For purposes of making the DAM determination, the Service evaluates if the consequences of the proposed federal action on CH, taken together with cumulative effects, when added to the current range-wide condition of CH, are likely to impair or preclude the capacity of CH as a whole to serve its intended function for the conservation of the listed species. The key to making this finding is clearly establishing the role of CH in the action area relative to the value of CH as a whole, and how the effects of the proposed action, taken together with cumulative effects, are likely to alter that role.

7 STATUS OF CRITICAL HABITAT: Bull Trout

For a detailed account of the status of the designated bull trout critical habitat, refer to Appendix A: Status of Designated Critical Habitat: bull trout

8 ENVIRONMENTAL BASELINE: Designated Bull Trout Critical Habitat

Regulations implementing the Act (50 CFR 402.02) define the environmental baseline as the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline.

8.1 Current Condition of the Bull Trout Critical Habitat in the Action Area

8.1.1 Factors Responsible for the Condition of Critical Habitat

The Service designated critical habitat for the Columbia River bull trout population on September 25, 2005 (70 FR 56212). On October 18, 2010, the Service revised the 2005 critical habitat designation (75 FR 63898) based on extensive review of the previous critical habitat proposals and designation, as well as new information received during the 2010 public review process. The action area is within the Clark Fork River Critical Habitat Unit (CHU). The final rule designated the Pend Oreille River from the crest of Boundary Dam to Albeni Falls Dam, and several tributaries within this range, as critical habitat for bull trout.

Bull trout from Lake Pend Oreille historically migrated downstream into the Pend Oreille River and spawned in tributaries. With the construction of the Albeni Falls and Box Canyon Dams, this life history form in the Pend Oreille River has been mostly lost. Currently this life history only exists in the East River of the Priest River drainage, upstream of Albeni Falls Dam. The Clark Fork River CHU also has the second largest adfluvial core habitat area in its range. The bull trout population size within the Clark Fork River CHU is above 10,000 individuals. However, in the Lower Pend Oreille River below Albeni Falls, which includes the action area in LeClerc Creek, the population of bull trout is less than 500, with no known spawning population existing.

Designated critical habitat for bull trout is comprised of nine Physical and Biological Features (PBF, a term used interchangeably with Primary Constituent Elements). All nine PBFs are found within the action area.

PBF 1: Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.

There are numerous small seeps, springs, and areas of groundwater influence scattered throughout the LeClerc Creek drainage and its tributaries. Within several of the pastures in the LeClerc Creek Allotment, wetlands associated with pastures are hyporheically connected to LeClerc Creek. These areas provide upwelling and cold water refugia necessary for bull trout spawning and rearing.

Degradation of riparian vegetation exists along the banks of the East and Middle Branches of LeClerc Creek. A density of 4.3 miles of road per square mile exists within the East Branch LeClerc Creek subwatershed and a density of 2.4 miles of road per square mile exists within the West Branch LeClerc Creek subwatershed of all ownerships. Although not calculated, the drainage density has been increased by the existing road system. While recent road relocations and habitat improvements have improved floodplain connectivity in the watershed and action area, conditions that benefit cool water refugia and water connectivity are slow to improve. Off channel areas are limited in the watershed, as is consistent overland flows which

create off-channel areas and filter contaminants and sediment. Considering the scale of the entire subunit, the average baseline condition of PBF 1 within the action area and across Clark Fork CHU is “functioning at risk.”

- PBF 2: Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and foraging habitats including but not limited to permanent, partial, intermittent, or seasonal barriers.

Barriers to movement are considered high across the Clark Fork CHU due to mainstem Pend Oreille River dams as well as localized manmade and natural barriers in the CHU. Within the LeClerc Creek drainage and action area, barriers to movement are primarily associated with antiquated log crib dams from historical logging practices and road crossings containing undersized bridges or culverts. In West Branch LeClerc Creek, upper portions of the watershed have areas that naturally go subsurface creating seasonal barriers to movement. Lower portions of the Middle Branch LeClerc Creek seasonally do not currently provide habitat for bull trout due to inhospitable water temperatures. Recent road decommissioning and culvert replacements have removed all passage barriers on Forest Service and county roads that were blocking upstream fish passage on the Middle Branch LeClerc Creek. Natural falls are found in several of the tributaries to Middle Branch LeClerc Creek. The presence of natural seasonally dewatered stream segments, waterfall barriers, and anthropogenic barriers in the LeClerc Creek drainage contribute to a “not properly functioning” baseline condition for migration habitat in the action area.

- PBF 3: An abundant food base, including terrestrial organisms of riparian origin, aquatic macro invertebrates, and forage fish.

The action area likely provides a sufficient food base for juvenile, subadult, and adult bull trout. Numerous non-native and native species in the action area, including macro invertebrates, sculpin, brook trout, and cutthroat trout, provide the forage base for bull trout. However, the degraded condition of much of the watershed and the reduced abundance of native forage fish (sculpins, minnows) and cutthroat trout is probably the most serious and persistent effect on bull trout food availability in the CHU. Interspecific competition with non-native species for forage fish limits bull trout access to forage fish and other food sources. High embeddedness levels exist in most of the reaches surveyed within the analysis area. High levels of embeddedness reduce the diversity and abundance of aquatic invertebrates, thereby reducing the survival and fitness of the juvenile forage fish that bull trout prey on. This factor leads us to consider PBF 3 as “functioning at risk.”

- PBF 4: Complex river, stream, lake, and reservoir shoreline aquatic environments and processes that establish and maintain the aquatic environment with features such as large wood, side channels, pools, undercut banks and unembedded substrates, to provide a variety of depths, gradients, velocities, and structure.

The riparian corridors within the action area are highly degraded by activities occurring in the watershed and the entire CHU, including but not limited to roads,

forest practices, grazing, and recreation. Historic logging, historic crib dams, historic and ongoing grazing, and road construction, have reduced channel complexity, increased sediment, destabilized banks, and constricted the floodplain. Restoration actions such as cattle fencing, riparian harvest buffers, barrier removal projects, road relocations, and woody debris projects have improved conditions in the LeClerc Creek watershed. However, much of the watershed is still below benchmarks identified for forest management and providing complexity in the watershed. This PBF is “not properly functioning” within the action area.

High variability among watersheds regarding the condition of PBF 4 makes it challenging to specify a cohesive rating for the entire CHU. Because bull trout require complexity in foraging, migration, and overwintering (FMO, lower watershed) habitat and spawning and rearing (upper watershed) habitat, we consider this PBF to be “functioning at risk,” overall.

- PBF 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.

Water temperatures in the CHU and LeClerc Creek are influenced by several natural and manmade factors. In the greater CHU, hydropower operations, loss of riparian condition, reduced floodplain connectivity, development, forest practices, and other factors influence overall water temperatures. In LeClerc Creek, the loss of riparian cover and wetland and floodplain connectivity likely have the greatest influence on temperatures in the basin. Temperatures in late July through September are often well above 15°C (59°F). The Forest Service has collected water temperatures in all three Branches of LeClerc Creek since 2002. The trend in Middle Branch and East Branch of LeClerc Creek has been consistent, with temperatures exceeding the state water quality standard of 12°C by early July and continuing to exceed this threshold into late August. The Kalispel Tribe has also collected water temperature data in LeClerc Creek. Their data shows that East Branch, West Branch, and Middle Branch LeClerc Creek are consistently over the 12°C standard for Washington State water quality. For these reasons, this PBF is “not properly functioning” within the action area and the entire CHU.

- PBF 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.

Although no documented spawning currently occurs within the LeClerc Creek watershed or any tributary to the Lower Pend Oreille River portion of the CHU, spawning occurred in the watershed as recently as the early 2000’s. Suitable potential spawning gravels and rearing areas occur throughout much of the LeClerc Creek drainage. Sedimentation from historical forest practices, road development, recreation, and grazing have increased embeddedness and fine materials and reduced areas of suitable substrates. High embeddedness levels exist in most of the reaches surveyed within the analysis area (data in project files). Recent restoration actions,

including wood placement and road relocations have begun to improve the condition of PBF 6 in the watershed. Given these factors, this PBF is considered “functioning at risk” overall in the CHU.

- PBF 7: A natural hydrograph, including peak, high, low, and base flows within historic and season ranges, or if flows are controlled, minimal flow departure from a natural hydrograph.

Base flows throughout most tributaries of the CHU are regulated by snowmelt and natural conditions. However, the mainstem Pend Oreille River is highly regulated by hydropower dams. Within the action area, small log crib dams may modify or slow natural high flow periods or reduce downstream flows during low flow periods. For these reasons, this PBF is “functioning at risk” within the action area and the entire CHU.

- PBF 8: Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.

The condition of this PBF is variable across the CHU. In spawning areas, water quality and quantity are generally good. In rearing areas, conditions are variable, with some degradation in both water quality (primarily due to increased sedimentation and temperature) and quantity. In FMO habitat in the lower portions of the CHU, numerous reaches are listed as impaired due to sediment, temperature, dissolved oxygen, total dissolved gas, and other parameters. Overall, PBF 8 is “functioning at risk” across the entire CHU. Within LeClerc Creek, temperature and sediment are problematic. The watershed is included on the 303(d) list of water bodies impaired by pollutants due to temperature, pH, and dissolved oxygen (Washington State Department of Ecology 2021). A Total Maximum Daily Load was developed for temperature in the Pend Oreille River basin, including LeClerc Creek (Pickett 2004).

- PBF 9: Sufficiently low levels of occurrence of nonnative predatory, interbreeding, or competing species that, if present, are adequately temporally and spatially isolated from bull trout.

A variety of non-native fish have been stocked throughout the CHU in the past for a variety of purposes including increased recreational angling opportunities. While this no longer occurs in connected waterways, several species of non-native fish are present throughout the CHU and the LeClerc Creek watershed. These include brook trout, brown trout, and rainbow trout. All likely have negative effects to bull trout, including competition, hybridization, and predation. Brook trout are widely distributed in LeClerc Creek. While we know that negative interactions are occurring with non-native fish species, we cannot quantify the magnitude of this effect. Given this uncertainty, we assume this PBF to be “functioning at risk” within the action area and the entire CHU.

Integrating across PBFs, the overall condition of the Clark Fork River CHU is “functioning at risk,” as is the LeClerc Creek watershed itself. Spawning and rearing areas throughout the entire CHU are generally in more functional condition than FMO habitat. However, in LeClerc Creek, spawning and rearing as well as FMO are significantly degraded for PBFs associated with water temperature, sedimentation, and complexity.

8.1.2 Previously Consulted on Federal Actions

The Service has consulted on the effects to bull trout critical habitat throughout its range. Section 7 consultations include actions that continue to degrade or alter the environmental baseline in many cases. However, long-term restoration efforts have also been implemented that provide some improvement in the existing functions within critical habitat designated in the LeClerc Creek watershed.

The environmental baseline includes several ongoing federal actions including restoration activities funded and implemented by the Pend Oreille Public Utility District under the Box Canyon Dam FERC License. Over the last decade the Forest Service has consulted with the Service on many actions in the LeClerc Creek watershed and vicinity; actions included but were not limited to, culvert replacements, road relocations, and timber harvest. In most cases, these projects resulted in insignificant or discountable effects to bull trout and designated critical habitat for bull trout, and the Service provided letters of concurrence. The Service also consulted on the Revised Colville National Forest Plan (October 24, 2017; Reference number: 01EWF00-2017-F-0456). This framework biological opinion evaluated the overarching expectations of the revised Forest Plan, and determined that implementation of the revised plan would not jeopardize bull trout or adversely modify designated critical habitat for bull trout. The Service anticipates improved conditions of critical habitat for bull trout to occur under the plan.

8.2 Conservation Role of the Action Area

The primary function of individual bull trout 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, p. 19); 2) provide for persistence of strong local populations, in part, by providing habitat conditions that encourage movement of migratory fish (Rieman and McIntyre 1993, pp. 22-23); 3) are large enough to incorporate genetic and phenotypic diversity, but small enough to ensure connectivity between populations (Hard 1995, pp. 314-315; Healey and Prince 1995, p. 182; Rieman and McIntyre 1993, pp. 22-23); and 4) are distributed throughout the historic range of the species to preserve both genetic and phenotypic adaptations (Hard 1995, pp. 321-322; Rieman and McIntyre 1993, p. 23; Rieman and Allendorf 2001, p. 763).

In the absence of providing safe and effective migratory bull trout passages around Albeni Falls Dam and Box Canyon Dam, the action area contributes little to the range-wide viability of the species, as bull trout have been functionally extirpated from the action area due to the construction of these dams. Fish passage around Box Canyon Dam is being completed and should become operational sometime in 2021. Plans for fish passage around Albeni Falls Dam is in the design phase. If safe and effective migratory bull trout passages are provided around

Albeni Falls Dam and Box Canyon Dam, the action area will likely support bull trout spawning and rearing, contributing the reproductive output of the adfluvial population in Lake Pend Oreille and increasing population redundancy. The current condition of the action area is “functioning at-risk” and the adverse factors responsible for the current condition (described above) should be ameliorated to increase habitat quality and quantity within the area.

8.3 Climate Change

Consistent with Service policy, our analyses under the Act include consideration of ongoing and projected changes in climate. The term “climate” refers to the mean and variability of different types of weather conditions over time, with 30 years being a typical period for such measurements, although shorter or longer periods may be used (Intergovernmental Panel on Climate Change 2014a, pp. 119-120). The term “climate change” thus refers to a change in the mean or variability of one or more measures of climate (e.g., temperature or precipitation) that persists for an extended period, typically decades or longer, whether the change is due to natural variability, human activity, or both (Intergovernmental Panel on Climate Change 2014a, p. 119). Various types of changes in climate can have direct or indirect effects on species and critical habitats. These effects may be positive, neutral, or negative, and they may change over time. The nature of the effect depends on the species’ life history, the magnitude and speed of climate change, and other relevant considerations, such as the effects of interactions of climate with other variables (e.g., habitat fragmentation) (Intergovernmental Panel on Climate Change 2014b, pp. 64, 67-69, 94, 299). In our analyses, we use our expert judgment to weigh relevant information, including uncertainty, in our consideration of various aspects of climate change and its effects on species and their critical habitats. We focus on how climate change affects the capability of species to successfully complete their life cycles, and the capability of critical habitats to support that outcome.

Over a period of decades, climate change may directly threaten the integrity of the essential physical or biological features described in PBFs 1, 2, 3, 5, 7, 8, and 9. Warmer temperatures will lead to more precipitation falling as rain rather than snow. As the seasonal amount of snowpack diminishes, the timing and volume of stream flows are likely to change and peak river flows are likely to increase in affected areas. Maximum temperatures on the Colville National Forest are projected to increase by 3.74 degrees Fahrenheit over the next 30 years, while annual precipitation is project to be slightly above normal. Higher air temperatures are likely to increase water temperatures. For example, stream gauge data from western Washington over the past 5 to 25 years indicate a marked increasing trend in water temperatures in most major rivers.

Climate change has the potential to profoundly alter the aquatic ecosystems on which bull trout depend via alterations in water yield, peak flows, and stream temperature, and an increase in the frequency and magnitude of catastrophic wildfires in adjacent terrestrial habitats. All life stages of bull trout rely on cold water. Increasing air temperatures are likely to affect the availability of suitable cold-water habitat. For example, ground water temperature is generally correlated with mean annual air temperature, and has been shown to strongly influence the distribution of other charrs. Ground water temperature is linked to bull trout selection of spawning sites and has been shown to influence the survival of embryos and early juvenile rearing. Protecting bull trout strongholds and cold water refugia from disturbance and ensuring connectivity among

populations are important to address the potential effects of climate change. Additionally, climate change may exacerbate habitat degradation effects, physically (e.g., decreased base flows, increased water temperatures) and biologically (e.g., increased competition with non-native fishes).

9 EFFECTS OF THE ACTION: Designated Bull Trout Critical Habitat

Effects of the action are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action. (See § 402.17).

While significant effects to PBFs in the action area are expected because of the proposed action, the action area represents less than 0.1% of the entire Clark Fork River CHU. Below, we list each critical habitat PBF and discuss the effects to each. As part of this effects analysis, we are assuming that guidelines included in the Forest Plan will be implemented in a manner that fulfills the conservation purpose of the guideline, avoiding or mitigating undesirable effects.

PBF 1: Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.

The proposed action will continue to degrade this PBF in unfenced areas due to effects to adjacent wetlands and seeps, confinement and hardening of the floodplain at hardened crossings. Channel entrenchment can be indirectly caused from livestock trampling and grazing of vegetation when these actions are at a greater intensity than the vegetation (including root structure) has the resiliency to recover before the next grazing season. This results in a reduction in water infiltration and increased runoff leading to greater erosion and downcutting over time.

With adaptive management provided in the forest plan, these effects are unlikely to produce a long-term negative trend because the perturbations caused by the proposed action are minor in distribution, duration, and intensity and observed effects will be addressed over time. For these reasons, the Service concludes that the proposed action will not have a measurable effect on hyporheic connectivity either within the LeClerc Creek watershed or the entire CHU.

PBF 2: Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and foraging habitats including but not limited to permanent, partial, intermittent, or seasonal barriers.

Effects to riparian vegetation and streambanks can reduce water quality conditions, causing temporary, seasonal, or physical barriers to movement. The proposed livestock use has the potential to result in minor increases in water temperature in certain stream reaches as a result of reducing the height of shade-producing

vegetation. Grazing effects are expected to be concentrated in low-gradient stream channels less than 10-feet wide with grass/grass-like vegetation and small shrubs (i.e. snowberry, thimbleberry, willow, etc.) providing shade. Water temperatures in these areas will be affected by lack of shade and vegetative cover. However, in many areas, larger trees provide most of the shade and larger trees will not be affected by the proposed action. While changes to temperature may occur, the perturbations caused by the proposed action are minor in distribution, duration, and intensity and increases in water temperature is expected to be minimized by through compliance with the annual grazing use indicators defined in the Forest Plan. For these reasons, the Service concludes that implementation of the proposed action is not likely to adversely affect PBF 2 in the action area.

PBF 3: An abundant food base, including terrestrial organisms of riparian origin, aquatic macro invertebrates, and forage fish.

The proposed LeClerc Allotment reauthorization is likely to result in minor long-term changes to food sources within the watershed that are indistinguishable over existing conditions. While sufficient food sources are present within the watershed, diversity is reduced due to ongoing and legacy land management actions throughout the watershed. Disturbance of banks, increased sedimentation, loss of riparian vegetation, and decreases in allochthonous inputs are all potential effects from grazing in the riparian (Quist and Schultz 2014, p.449, 457; Kauffman and Krueger 1984, p. 430; Cummins and Spengler 1978). Several studies indicate that as aquatic invertebrate diversity decreases, rare species become rarer, and generalist populations increase in disturbed areas where grazing occurs (Quist and Schultz 2014; Kauffman and Krueger 1984, p. 430; Herbst et al 2012). The extent to which these changes in diversity effect bull trout is not completely understood. However, it is expected that continued minor changes in diversity over the duration of the LeClerc Allotment may reduce feeding opportunities for bull trout over the long-term.

The total affected riparian area within the LeClerc Creek Allotment is highly dependent on existing fencing and methods to minimize cattle access (e.g. slash and rocky banks). Given current condition of this PBF, implementation of proposed conservation measures, and small potential for significant changes to existing conditions, the proposed LeClerc Allotment will have small localized adverse effects on PBF 3 in the action area.

PBF 4: Complex river, stream, lake, and reservoir shoreline aquatic environments and processes that establish and maintain the aquatic environment with features such as large wood, side channels, pools, undercut banks and unembedded substrates, to provide a variety of depths, gradients, velocities, and structure.

The existing condition of this PBF is not properly functioning within the action area. The operation of the proposed LeClerc Creek Allotment is likely to result in adverse changes in localized areas where cattle have access to the stream. Livestock use of the riparian has been shown to modify channel shape, dimension, and profile, which

ultimately can alter wood recruitment, side-channel formation, pool formation, width-depth profiles, vegetation communities, and breaking off undercut banks.

Approximately 38.2 miles of fish bearing streams will be accessible to livestock, including 12.9 miles of designated bull trout critical habitat. There are no developed water sources within this allotment, so cattle are required to water at streams and undeveloped springs. The lack of off-stream water causes cattle to concentrate in riparian areas, which is exacerbated later in the grazing season as upland forage cures and becomes less palatable. The proposed LeClerc Creek Allotment management includes compliance with the annual grazing use indicators defined in the Forest Plan, reducing the effects to PBF 4. In theory, over the long-term, the management under the forest plan standards and guidelines should allow for development of a better functioning riparian areas and more complex stream habitat, which in turn will increase the amount of cover available to bull trout. However, without off-stream water, significant adverse effects to PBF 4 are likely to occur in stream reaches livestock concentrate to drink.

- PBF 5: Water temperatures ranging from 2 °C to 15 °C (36 to 59 °F), with adequate thermal refugia available for temperatures that exceed the upper end of this range.

Existing temperature data indicates that temperatures within the action area are elevated and exceed the upper end of tolerance for bull trout during summer months. Grazing reduces cover and understory vegetation bordering streams and may alter the growth of shade trees within the riparian corridor. The proposed livestock use has the potential to result in minor increases in water temperature in certain stream reaches as a result of reducing the height of shade-producing vegetation. Grazing effects are expected to be concentrated in lower-gradient stream channels. Water temperatures in these areas will be affected by reduced shade from the loss of vegetative cover. While changes to temperature will occur, the effects are expected to be minor in distribution, duration, and intensity; and increases in water temperature are expected to be minimized through compliance with the annual grazing use indicators defined in the Forest Plan. The Service expects the small localized increases in stream temperature will be insignificant and not likely to adversely affect PBF 5.

- PBF 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.

Suitable spawning gravels and habitat for rearing occur within the action area, but there is no recent documentation or observation of use by bull trout. Historically, bull trout spawning occurred throughout the LeClerc Creek drainage and project area. Grazing has the potential to significantly affect potential spawning gravels and rearing areas. The removal of streamside vegetation influences suspended sediment concentrations, especially in small headwater streams. In addition, cattle in the stream can trample eggs and compact substrate. Due to existing sedimentation within the LeClerc Creek drainage, PBF 6 in the action area is functioning at risk. It is

expected that some localized areas within the LeClerc Creek Allotment, where cattle have access, may be significantly affected by trampling, substrate compaction, sedimentation, bank erosion, and changes in vegetation community. It is expected that the existing degraded condition of PBF 6 in the action area will be maintained and adverse effects to PBF 6 will occur from the proposed action.

PBF 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.

Both watersheds affected by the proposed action are “functioning at risk” for PBF 7. Livestock grazing can compact soils, reducing infiltration and increasing runoff, and potentially limiting vegetation growth by increasing the resistance of soils to penetration by roots. Many site-specific variables influence the degree of compaction, including stocking rate, vegetation type and age, soil type and texture, soil water content, and climate (Broersma et al. 2000, p. 89). Based primarily on stocking rates and existing vegetation on the LeClerc Creek Allotment, the proposed grazing will increase soil bulk density, runoff, and root penetration resistance compared to a non-grazed condition. However, we expect the scope and intensity of these effects to result in insignificant changes in peak or base flow at the reach scale. These slight hydrologic changes are unlikely to result in changes in patterns of bull trout habitat use. This expectation derives from our review of pertinent, but limited, literature indicating that significant changes in hydrology do not occur consistently even under intensive grazing schemes (Pierson et al. 2002, p. 569), and that light to moderate grazing results in compaction effects that are well below critical ranges that trigger ecologic and hydrologic changes (Broersma et al. 2000, p. 92). For these reasons, we do not expect the proposed action to result in adverse effects to PBF 7.

PBF 8: Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.

Livestock presence in and adjacent to riparian areas is expected to affect water quality throughout the action area. One of the more significant hydrologic and water quality effects associated with overgrazing results from impacts on soil from livestock hoof action and trampling. Hoof action and trampling can disrupt natural soil conditions, cause soil compaction, and increase bank sloughing, which leads to increased width/depth ratio, increased water temperature, increased turbidity, increased runoff and associated soil erosion and loss. The removal of plant cover by grazing increases these problems by exposing more soil to disruption and compaction, which affects water quality due to an increased amount of sedimentation. The reduction in plant cover can also affect water temperature by increasing exposure to solar radiation, affecting water temperature range and the maximum temperature.

When livestock enter riparian systems in the LeClerc Creek Allotment, they are likely to introduce nutrients that may affect water quality. Despite the existing fencing on the allotment that was intended to discourage cattle drift, there are areas on the

allotment where cattle drift is a recurring problem. Lack of natural barriers and timber harvest activities on private lands within and adjacent to the allotment and pasture boundaries also contribute to the drift problem, which makes keeping the cattle in the prescribed pasture during the prescribed season of use difficult at times.

Adaptive management and existing fencing are expected to help reduce livestock presence along and within streams. Although water quality issues have occurred in the past at Hanlon Meadows, newly installed fencing has greatly mitigated these effects. Due to the expected compliance with the annual grazing use indicators defined in the Forest Plan, nutrient levels are unlikely to be high enough to affect the quality of PBF 8, beyond small localized areas. Therefore, the effects on nutrient levels is expected to be insignificant.

Trampling and bank shear are likely to continue in localized areas, accelerating bank erosion, decreasing soil cover, and increasing sediment and turbidity levels within the action area. However, compliance with the annual grazing use indicators defined in the Forest Plan will help mitigate bank erosion.

Hauling of cattle in transport trucks along unpaved roads can generate dust. Where roads used for hauling are adjacent to streams, some of the dust produced may enter the water column and contribute to increased turbidity. The Service expects that cattle hauling to and from the LeClerc Allotments will contribute dust inputs to bull trout critical habitat, but the amount of dust is expected to be minor and the effects are expected to be insignificant. This expectation is based on haul routes being relatively short, and the low number of trips needed to deliver and remove cattle.

The existing condition for water quality in the LeClerc Creek drainage is “not properly functioning” due to high sediment content and temperature. The continued operation of the LeClerc Creek Allotment will contribute to the maintenance of the overall degraded condition of this PBF within the drainage and impede the speed at which the system trends toward functioning at risk. Due to impacts on soil from livestock hoof action and trampling, it is expected that significant adverse effects to PBF 8 will occur in localized areas where cattle have access to streams.

PBF 9: Sufficiently low levels of occurrence of nonnative predatory, interbreeding, or competing species that, if present, are adequately temporally and spatially isolated from bull trout.

Numerous nonnative predatory, competitive, and interbreeding fish species are found within the action area. The proposed LeClerc Creek Allotment will not affect populations of nonnative predatory, interbreeding, or competing species within the LeClerc Creek watershed.

9.1 Summary of Effects

The proposed action area includes approximately 13 miles of designated critical habitat within the Clark Fork River CHU. While adverse effects are expected at the local level, the action area

represents less than 0.1% of total critical habitat in the CHU. Localized significant adverse effects to critical habitat in the action area are expected to affect PBFs 3 (food base), 4 (habitat complexity), 6 (spawning and rearing areas), and 8 (water quality). Short-term insignificant effects, or effects that are not measurable, may affect PBFs 1, 2, 5, and 7. In addition, the ability of PBFs 1 through 8 to trend toward a property function condition will be reduced as a result of implementing the proposed action.

10 CUMULATIVE EFFECTS: Designated Bull Trout Critical Habitat

Cumulative effects include the effects of future state or private activities, not involving federal activities that are reasonably certain to occur in the action area considered in this 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 Act.

Lands within and adjacent to the action area are owned by a mixture of public and private entities. Timber harvest and recreation are the primary activities occurring within the action area. Rural residential development occurs in the lower reaches of the LeClerc Creek watershed, but not within the LeClerc Allotment boundaries. Commercial timber harvest and recreational activities have the potential to increase sedimentation, impact riparian areas, and reduce vegetation and wood recruitment within the LeClerc Creek watershed and the action area. In addition, timber harvest and road construction on private lands can increase livestock access to areas where dense forest cover and lack of roads limit access. Several agencies are working to complete multiple restoration actions throughout the watershed. Most of the future restoration actions include a federal nexus and thus are covered under Section 7 of the Act. Because most of the foreseeable future activities in the action area will have a federal nexus, few cumulative effects to bull trout critical habitat are anticipated within the action area.

11 INTEGRATION AND SYNTHESIS OF EFFECTS: Designated Bull Trout Critical Habitat

The Integration and Synthesis section is the final step in assessing the risk posed to species and critical habitat as a result of implementing the proposed action. In this section, we add the effects of the action and cumulative effects to the environmental baseline and, in light of the status of the species and critical habitat, formulate the Service's opinion as to whether the action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. In this consultation, the adverse effects are to the critical habitat for bull trout, not to the species.

The proposed action area includes approximately 13 miles of designated critical habitat within the Clark Fork River CHU. While adverse effects are expected at the local level, the action area represents less than 0.1% of total critical habitat in the CHU. Short-term effects, or effects that are not measurable, may affect PBFs 1, 2, 5, and 7. Localized significant adverse effects to critical habitat in the action area are expected to affect the function of PBFs 3 (food base), 4 (habitat complexity), 6 (spawning and rearing areas), and 8 (water quality), and continue to degrade the aquatic system in a portion of the CHU.

However, due to the relatively small percentage of critical habitat within the action area and the implementation of the standards and guidelines provided in the forest plan, which require monitoring and limited effects to riparian habitat, the proposed action is not expected to appreciably alter critical habitat by altering the PBFs to such an extent that critical habitat in Unit 31 (Clark Fork River Basin) could no longer serve the intended conservation role for the species. Further, the effects of the proposed livestock grazing in the LeClerc Creek Allotment to critical habitat will not extend to a level that will result in diminishment of designated critical habitat for the bull trout as a whole.

12 CONCLUSION: Designated Bull Trout Critical Habitat

After reviewing the current status of bull trout, the environmental baseline for the action area, the effects of the proposed LeClerc Allotment and the cumulative effects, it is the Service's Opinion that the LeClerc Allotment, as proposed, is not likely to destroy or adversely modify designated critical habitat.

13 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 defined by the Service as an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering (50 CFR 17.3). *Harass* is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR 17.3). 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 accompanying Opinion only addresses adverse effects to designated critical habitat for bull trout. The take prohibition under Section 9 of the ESA does not apply to critical habitat. As such, the Service has not anticipated nor exempted incidental take associated with the proposed action, and no Reasonable and Prudent Measures, or implementing Terms and Conditions are included herein.

14 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.

1. To conserve and more quickly recover bull trout critical habitat in the action area, the CNF should modify the LeClerc Creek Allotment so that livestock do not have access to areas where grazing adversely affects or retards the recovery of bull trout critical habitat.
2. If the CNF is unable to modify the LeClerc Creek Allotment to avoid affects to bull trout critical habitat, the CNF should fence or exclude cattle from riparian and wetland areas where adverse effects to bull trout critical habitat from grazing occur. In addition, private property where grazing standards cannot be enforced should also be fenced.
3. The CNF should ensure the annual grazing use indicators provided guideline MA-GDL-RMA-12 are being implemented through consistent and rigorous monitoring and that corrective actions are taken if livestock disturbance exceeds defined thresholds.
4. The CNF should implement more frequent and well-distributed monitoring of grazing effects on all pastures during the grazing season and immediately post-grazing.
5. The CNF should complete an annual post-season grazing assessment report that includes monitoring results and modifications to range management in the following year if any grazing thresholds were exceeded at any time during the grazing season.
6. The CNF should complete a new Allotment Management Plan for the LeClerc Creek Allotment, as much of the grazing management described in the 1982 Allotment Management Plan is outdated and inconsistent with the proposed action.
7. The CNF should work with private landowners to plan vegetation management projects in a manner that limits cattle access to unfenced sensitive riparian areas.

For the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

15 REINITIATION NOTICE

This concludes formal consultation on the action outlined in the request for formal consultation. As provided in 50 CFR 402.16, reinitiation of formal consultation is required and shall be requested by the federal agency or by the Service, where discretionary federal involvement or control over the action has been retained or is authorized by law and: (a) if the amount or extent of taking specified in the incidental take statement is exceeded; (b) if

new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (c) if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or (d) if a new species is listed or critical habitat designated that may be affected by the identified action.

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APPENDIX A
STATUS OF DESIGNATED CRITICAL HABITAT: BULL TROUT

Appendix A

Status of Designated Critical Habitat: Bull Trout

Past designations of critical habitat have used the terms "primary constituent elements" (PCEs), "physical and biological features" (PBFs) or "essential features" to characterize the key components of critical habitat that provide for the conservation of the listed species. The new critical habitat regulations (81 FR 7214) discontinue use of the terms "PCEs" or "essential features" and rely exclusively on use of the term PBFs for that purpose because that term is contained in the statute. To be consistent with that shift in terminology and in recognition that the terms PBFs, PCEs, and essential habitat features are synonymous in meaning, we are only referring to PBFs herein. Therefore, if a past critical habitat designation defined essential habitat features or PCEs, they will be referred to as PBFs in this document. This does not change the approach outlined above for conducting the "destruction or adverse modification" analysis, which is the same regardless of whether the original designation identified PCEs, PBFs or essential features.

Current Legal Status of the Critical Habitat

Current Designation

The U.S. Fish and Wildlife Service (Service) published a final critical habitat designation for the coterminous United States population of the bull trout on October 18, 2010 (USFWS 2010, entire); 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 Coastal, Klamath, Mid-Columbia, Upper Snake, Columbia Headwaters and St. Mary's Recovery Unit population segments. Rangelwide, the Service designated reservoirs/lakes and stream/shoreline miles as bull trout critical habitat (Table 1). Designated bull trout critical habitat is of two primary use types: 1) spawning and rearing, and 2) foraging, migration, and overwintering (FMO).

Table 1. Stream/Shoreline Distance and Reservoir/Lake Area Designated as Bull Trout Critical Habitat.

State	Stream/Shoreline Miles	Stream/Shoreline Kilometers	Reservoir/Lake Acres	Reservoir/Lake Hectares
Idaho	8,771.6	14,116.5	170,217.5	68,884.9
Montana	3,056.5	4,918.9	221,470.7	89,626.4
Nevada	71.8	115.6	-	-
Oregon ¹	2,835.9	4,563.9	30,255.5	12,244.0
Oregon/Idaho ²	107.7	173.3	-	-
Washington	3,793.3	6,104.8	66,308.1	26,834.0
Washington (marine)	753.8	1,213.2	-	-
Washington/Idaho	37.2	59.9	-	-
Washington/Oregon	301.3	484.8	-	-
Total ³	19,729.0	31,750.8	488,251.7	197,589.2

¹ No shore line is included in Oregon

² Pine Creek Drainage which falls within Oregon

³ Total of freshwater streams: 18,975

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.

The final rule also identifies and designates as critical habitat approximately 1,323.7 km (822.5 miles) of streams/shorelines and 6,758.8 ha (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.

The final rule continues to exclude some critical habitat segments based on a careful balancing of the benefits of inclusion versus the benefits of exclusion. Critical habitat does not include: 1) waters adjacent to non-Federal lands covered by legally operative incidental take permits for habitat conservation plans (HCPs) issued under section 10(a)(1)(B) of the Endangered Species Act of 1973, as amended (Act), in which bull trout is a covered species on or before the publication of this final rule; 2) waters within or adjacent to Tribal lands subject to certain commitments to conserve bull trout or a conservation program that provides aquatic resource protection and restoration through collaborative efforts, and where the Tribes indicated that inclusion would impair their relationship with the Service; or 3) waters where impacts to national security have been identified (USFWS 2010, p. 63903). Excluded areas are approximately 10 percent of the stream/shoreline miles and 4 percent of the lakes and reservoir acreage of designated critical habitat. Each excluded area is identified in the relevant Critical Habitat Unit (CHU) text, as identified in paragraphs (e)(8) through (e)(41) of the final rule. It is important to

note that the exclusion of waterbodies from designated critical habitat does not negate or diminish their importance for bull trout conservation. Because exclusions reflect the often complex pattern of land ownership, designated critical habitat is often fragmented and interspersed with excluded stream segments.

The Physical and Biological Features

Conservation Role and Description of Critical Habitat

The conservation role of bull trout critical habitat is to support viable core area populations (USFWS 2010, p. 63898). 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. 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 physical and biological features (PBFs) 5 and 6, 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, p. 19); 2) provide for persistence of strong local populations, in part, by providing habitat conditions that encourage movement of migratory fish (MBTSG 1998, pp. 48-49; Rieman and McIntyre 1993, pp. 22-23); 3) are large enough to incorporate genetic and phenotypic diversity, but small enough to ensure connectivity between populations (Hard 1995, pp. 314-315; Healey and Prince 1995, p. 182; MBTSG 1998, pp. 48-49; Rieman and McIntyre 1993, pp. 22-23); and 4) are distributed throughout the historic range of the species to preserve both genetic and phenotypic adaptations (Hard 1995, pp. 321-322; MBTSG 1998, pp. 13-16; Rieman and Allendorf 2001, p. 763; Rieman and McIntyre 1993, p. 23).

Physical and Biological Features for Bull Trout

Within the designated critical habitat areas, the PBFs 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 PBFs, as described within USFWS 2010, are essential for the conservation of bull trout. A summary of those PBFs follows:

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

Note that only PBFs 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 PBFs 1 and 6. Additionally, all except PBF 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.

In marine nearshore areas, the inshore extent of critical habitat is the mean higher high-water (MHHW) line, including the uppermost reach of the saltwater wedge within tidally influenced freshwater heads of estuaries. The MHHW line refers to the average of all the higher high-water heights of the two daily tidal levels. Marine critical habitat extends offshore to the depth of 10 meters (m) (33 ft) relative to the mean low low-water (MLLW) line (zero tidal level or average of all the lower low-water heights of the two daily tidal levels). This area between the MHHW line and minus 10 m MLLW line (the average extent of the photic zone) is considered the habitat most consistently used by bull trout in marine waters based on known use, forage fish availability, and ongoing migration studies and captures geological and ecological processes important to maintaining these habitats. This area contains essential foraging habitat and migration corridors such as estuaries, bays, inlets, shallow subtidal areas, and intertidal flats.

Adjacent shoreline riparian areas, bluffs, and uplands are not designated as critical habitat. However, it should be recognized that the quality of marine and freshwater habitat along streams, lakes, and shorelines is intrinsically related to the character of these adjacent features, and that human activities that occur outside of the designated critical habitat can have major effects on physical and biological features of the aquatic environment.

Activities that cause adverse effects to critical habitat are evaluated to determine if they are likely to “destroy or adversely modify” critical habitat by no longer serving the intended conservation role for the species or retaining those PBFs that relate to the ability of the area to at least periodically support the species. Activities that may destroy or adversely modify critical habitat are those that alter the PBFs to such an extent that the conservation value of critical habitat is appreciably reduced (USFWS 2010, pp. 63898:63943; USFWS 2004a, pp. 140-193; USFWS 2004b, pp. 69-114). The Service’s evaluation must be conducted at the scale of the entire critical habitat area designated, unless otherwise stated in the final critical habitat rule (USFWS and NMFS 1998, Ch. 4 p. 39). Thus, adverse modification of bull trout critical habitat is evaluated at the scale of the final designation, which includes the critical habitat designated for the Klamath River, Jarbidge River, Columbia River, Coastal-Puget Sound, and Saint Mary-Belly River population segments. However, we consider all 32 CHUs to contain features or areas essential to the conservation of the bull trout (USFW 2010, pp. 63898:63901 , 63944). Therefore, if a proposed action would alter the physical or biological features of critical habitat

to an extent that appreciably reduces the conservation function of one or more critical habitat units for bull trout, a finding of adverse modification of the entire designated critical habitat area may be warranted (USFWS 2010, pp. 63898:63943).

Current Critical Habitat Condition Rangewide

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 (Ratliff and Howell 1992, entire; Schill 1992, p. 40; Thomas 1992, p. 28; Buchanan et al. 1997, p. vii; Rieman et al. 1997, pp. 15-16; Quigley and Arbelbide 1997, pp. 1176-1177). 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 (USFWS 1998, pp. 31648-31649; USFWS 1999, p. 17111).

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 PBFs, those which appear to be particularly significant and have resulted in a legacy of degraded habitat conditions are as follows: 1) 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, p. 652; Rieman and McIntyre 1993, p. 7); 2) 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, p. 141; MBTSG 1998, pp. ii - v, 20-45); 3) 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, p. 857; Rieman et al. 2006, pp. 73-76); 4) in the Coastal-Puget Sound region where amphidromous bull trout occur, degradation of mainstem river FMO habitat, and the degradation and loss of marine nearshore foraging and migration habitat due to urban and residential development; and 5) degradation of FMO habitat resulting from reduced prey base, roads, agriculture, development, and dams.

Effects of Climate Change on Bull Trout Critical Habitat

One objective of the final rule 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 PBFs 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).

Many of the PBFs for bull trout may be affected by the presence of toxics and/or increased water temperatures within the environment. The effects will vary greatly depending on a number of factors which include which toxic substance is present, the amount of temperature increase, the likelihood that critical habitat would be affected (probability), and the severity and intensity of any effects that might occur (magnitude).

The ability to assign the effects of gradual global climate change bull trout critical habitat or to a specific location on the ground is beyond our technical capabilities at this time.

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