Aquatic Species Biological Assessment for the Lee Creek Cattle and Horse Allotment

LEADORE RANGER DISTRICT

SALMON-CHALLIS NATIONAL FOREST

LEMHI COUNTY, IDAHO

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Date: 16 June 2010

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1 INTRODUCTION

The Leadore Ranger District of the Salmon-Challis National Forest is proposing to authorize livestock grazing activities associated with the Lee Creek Allotment. This biological assessment describes the proposed action, discusses the probable impacts of that action on listed species and makes an effect determination for any listed species that may be affected by the proposed action. And this biological assessment forms the basis for any necessary consultation with the Fish and Wildlife Service and the National Marine Fisheries Service (Services) pursuant to section 7 of the Endangered Species Act of 1973 (as amended) and its implementing regulations. This biological assessment replaces all previous consultations associated with this allotment. The regulations for consultation require the action agency to re-initiate consultation if certain triggers are met (50 CFR 402.16). Occasionally during the implementation of a proposed action, changes in circumstances, situations or information can raise the question as to whether those re-initiation thresholds have been reached. Should that situation occur the Salmon-Challis National Forest, will assess the changes and any potential impacts to listed species, review the re-initiation triggers, coordinate with Services for advice (if needed) and arrive at a determination whether re-initiation of consultation is necessary.

2 BACKGROUND INFORMATION

Lee Creek Allotment grazing activities are conducted within portions of the Lee Creek (HUC 1706020406) and the Big Eight Mile watersheds (HUC1706020404) of the Lemhi River Subbasin.

The Lee Creek watershed lies approximately 42 miles southeast of Salmon, Idaho. Lee Creek forms in the Lemhi Range and flows in a northeasterly direction to converge with the Lemhi River. The watershed encompasses 15,855 acres of combined private, State, and federally managed lands. The watershed is bordered to the east by the Big Eightmile Creek watershed and to the west by the Mill Creek watershed. The higher elevations of the watershed are managed by the United States Forest Service (USFS), while the lower elevations of Lee Creek lie primarily on private land. The Bureau of Land Management (BLM) administers the land that lies in between the USFS and private land.

The Lee Creek watershed varies in elevation from 5,650 feet at the Lemhi River to the peaks of the Lemhi Range that tower in excess of 10,000 feet. The lower levels are comprised of valley floors and fan terraces. The land slowly builds into foothills and then ultimately into the Lemhi Range. The watershed has a fairly gentle slope to it with only 15- 30% of the area in excess of 40% slope. The greater slopes occur in the higher elevations on USFS administered land.

The lower portion of the Lee Creek watershed is nearly flat sagebrush/grass communities dominated by Wyoming big sagebrush with bluebunch wheatgrass the primary forage. The area near the Salmon National Forest boundary is dominated by three-tip sagebrush with an understory of Idaho fescue. The Lee Creek watershed is heavily timbered in the upper elevations of USFS administer lands.

Lee Creek watershed drains the west side of the Lemhi valley and originates in the Lemhi Mountain Range. The two tributaries which drain the southern half of the upper watershed, Stroud Creek and Everson Creek, flow from lakes on Forest Service land. Lee Creek and Porcupine Creek, which drain the northern half of the upper watershed, are spring fed. Estimated average annual flow for Lee Creek is currently unknown, but stream gradients are generally less than 4% below the Forest boundary and 4-10% above the boundary. Mean annual flows for Everson Creek and Stroud Creek are 3.0 cfs and 3.4 cfs, respectively . There are four claims to Lee Creek water that withdraw a combined total of 2.26 cfs from March 15 to November 15. There is one water right for .02 cfs year round.

The Big Eightmile Creek watershed is 41,183 acres of combined private, State and federally managed lands. The USFS manages the vast majority (46.3 %) of the land holdings within the watershed. Big Eightmile Creek flows northeast out of the Lemhi Range. Watershed aspect varies from north to east with increasing distance from the headwaters. The watershed is fairly narrow along the lower, privately owned section, and much broader up on the Salmon National Forest. It is bounded by the Lee Creek watershed to the north and the Timber Creek watershed to the south.

Topography is reflective of the higher elevation Lemhi Range, ranging from 5,680 to 10,530 feet in elevation. As with most other watersheds, the lower, private holdings are relatively flat, while 20% of BLM managed lands have 40% or greater slope. The USFS managed lands are increasingly steep.

The dominant upland vegetation is based upon the soil type, elevation, aspect, slope and precipitation level. On the very deep soils associated with the nearly level to rolling fan terraces derived primarily from quartzite, the dominant vegetation is Wyoming big sagebrush and bluebunch wheatgrass. The dominant vegetation on the drier sites, generally south slopes, is three-tip sagebrush and Idaho fescue. Moister sites, generally north slopes, have mountain big sagebrush and Idaho fescue. Aspen are common throughout the watershed. The headwaters are heavily forested and felt to be in to be in Proper Functioning Condition.

Big Eightmile Creek has an estimated before diversion mainstem base flow of >5 cfs and a mean annual flow of 16.5 cfs. It is characterized by stream gradients between 0.5 and 5%. The channel types vary with stream gradient, with B and C channels on the private and BLM lands, and B and A up higher on the Salmon National Forest. The stream begins high up on the Salmon National Forest near the hydrologic divide. As it flows down to the northeast, it is joined by Dairy and Devils Canyon Creeks, as well as several smaller tributaries draining the sidehills to the north and south. Shortly after these tributaries join the mainstem, the watershed narrows significantly in the same area as the land patterns change from Forest to BLM and private holdings. It is in this area that large areas of irrigated pastureland occupy the viewers eye.

Multiple diversions dewater sections Big Eightmile Creek, preventing from reaching the Lemhi River during the irrigation season. Subsurface water recharges the lower quarter mile, but not enough to provide access to fish.

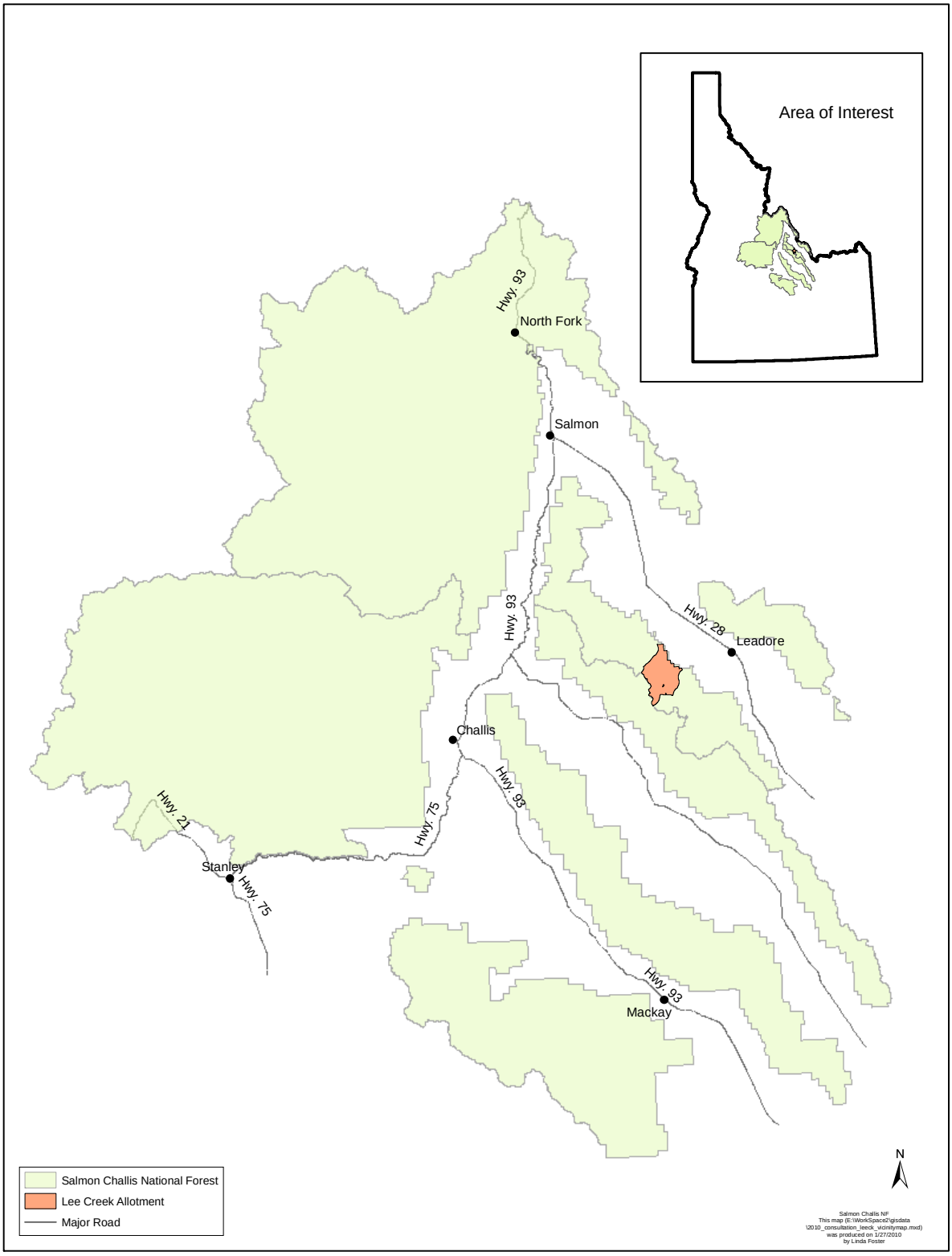
3 PROPOSED ACTION

3.1 PROJECT AREA

The Lee Creek Cattle & Horse (C&H) Allotment is located on the Leadore Ranger District of the Salmon Challis National Forest and encompasses approximately 18,484 acres. The allotment is divided into 4 units: the Walters Creek, Everson, Lee Creek, and Big Eightmile Creek Units.

The allotment contains important Bull Trout habitat; Stroud Creek (Everson unit), Everson Creek (Everson unit), and Big Eightmile Creek (Big Eight Mile unit).

FIGURE 1 - LEE CREEK ALLOTMENT VICINITY MAP



3.2 PROPOSED ACTION

3.2.1 CURRENT PERMIT

The Lee Creek C&H Allotment is currently permitted for 463 cow/calf pair (929 Head Months) from 6/16 to 8/15. Permits are held by three permittees as follows:

Permit Number	Expiration Date
80082	12/31/2013
80086	12/31/2014
80077	12/31/2012

3.2.2 GRAZING SYSTEM

- The Lee Creek C&H Allotment will continue to use a deferred rotation grazing system.
- Range readiness (Bluebunch wheatgrass in the first boot stage) will be monitored to determine if the on-date is appropriate and adjusted as necessary. Forest staff and permittee will do the monitoring to determine the on-date.
- Annual use indicators (see section 3.2.6) will dictate when unit moves or the off date occurs with unit move dates being approximate. Permittees are responsible for moving livestock to meet annual use indicators. Annual use indicators will be monitored by Forest Service personnel.

The following rotations will be used on this allotment:

TABLE 1 – LEE CREEK ALLOTMENT UNIT ROTATIONS

Year 1	Year 2
Walters Creek	Big Eight Mile
Lee Creek	Everson Creek
Everson Creek	Lee Creek
Big Eight Mile	Walters Creek

Walters Creek:

- Unit has no listed ESA fish streams.

Lee Creek:

- Unit has no listed ESA fish streams.

Everson Creek:

- Bull Trout: Livestock will be out of the unit before August 15th every year.

Big Eight Mile:

- Bull Trout: Livestock will be in the unit after August 15th every year.

Entry: In year 1 two permittees enter the allotment from BLM allotment directly into the Walters Unit. The other permittee enters the allotment from private land and livestock are trailed through the bottom 1/3 of

the Big Eight Mile Unit, Everson Unit, and Lee Creek Unit (approximately one day). In the second year two permittees enter the allotment from BLM allotment. Livestock are trailed through the bottom 1/3 of the Walters Unit, Lee Creek Unit, and Everson Unit. The other permittee enters the allotment from private land directly into the Big Eight Mile Unit.

Unit Movements:

Year 1: Livestock are moved from the Walters Creek Unit to the adjoining Lee Creek Unit via a pre-established livestock trail. After leaving the Lee Creek Unit, livestock are moved into the adjoining Everson Creek Unit via pre-established livestock trail. After leaving the Everson Creek Unit, livestock are moved into the adjoining Big Eight Mile Creek Unit via pre-established livestock trail. Duration of moves is approximately one day per move.

Year 2: Livestock are moved from the Big Eight Mile Creek Unit to the adjoining Everson Creek Unit via a pre-established livestock trail. After leaving the Everson Creek Unit, livestock are moved into the adjoining Lee Creek Unit via pre-established livestock trail. After leaving the Lee Creek Unit, livestock are moved into the adjoining Walters Creek Unit via pre-established livestock trail. Duration of moves is approximately one day per move.

Exit: Livestock are trailed from last unit to adjoining private land or BLM land.

Total removal from NFS lands: All livestock will be removed by 8/15.

3.2.3 CONSERVATION MEASURES

The following measures will be implemented as part of the Lee Creek Allotment's Annual Operating Instructions (AOI) to avoid and reduce potential impacts to ESA-listed fish. Chinook salmon, steelhead and bull trout considerations are

- A deferred rotation grazing system will continue to be used. Early season use provides benefits to riparian vegetation. This will help meet our long term riparian resource objective for greenline successional status.
- The on date will be varied so that livestock will be placed on the allotment at range readiness. This will reduce potential for bank alteration. This will help meet our long term riparian resource objective for bank stability.
- Annual use indicators will dictate when livestock are moved between units or off the allotment within the terms of the term grazing permit including moves in response to fish spawning. This will help us meet our long term riparian resource objectives. Annual use indicators will be monitored by Forest Service personnel.
- Permittees will continue to salt at least ¼ mile away from creeks. This will continue to reduce potential impacts on spawning areas and designated critical habitat.
- Permittees will continue to distribute livestock away from streams and associated riparian areas (ride) at least five days a week, reducing potential impacts on spawning areas and designated critical habitat.
- Fences and water developments have been placed to reduce livestock use on streams and their associated riparian areas. This will continue to reduce impacts on spawning areas and designated critical habitat.

3.2.4 CHANGES FROM EXISTING MANAGEMENT

- The monitoring attribute of browse use will be added to sites that are dominated by woody browse species. Greenline stubble will continue to be monitored at these sites.
- A bank alteration use annual use indicator will be added to ESA fish streams.

3.2.5 RESOURCE OBJECTIVES AND STANDARDS

Resource Objectives and Effectiveness Monitoring: The allotment is being managed to achieve the following resource conditions in riparian areas. Resource objectives are the Forest's description of the desired land, plant, and water resources condition within riparian areas in the allotment. Some resource objectives are Riparian Management Objectives (RMOs) from PACFISH and its corresponding Biological Opinions (U.S Department of Commerce, National Marine Fisheries Service, 1998). PACFISH is an interim strategy for managing anadromous fish-producing watersheds that was amended into the Salmon and Challis Forest Plans in 1995.

Effectiveness monitoring for resource objectives will be monitored every 3-5 years at Designated Monitoring Areas (DMAs) using the Multiple Indicator Monitoring (MIM) technical reference or other best available science as it becomes available. DMAs are areas representative of grazing use specific to the riparian area being accessed and reflect what is happening in the overall riparian area as a result of on-the-ground management actions. They should reflect typical livestock use where they enter and use vegetation in riparian areas immediately adjacent to the stream (Burton et al 2008). Results from monitoring will be available at (http://www.fs.fed.us/r4/sc/projects/range/index.shtml).

Resource Objectives:

- Greenline Successional Status: A greenline successional status value of at least 61 (late seral) or the current value, whichever is greatest (Winward 2000, Burton et al. 2008).
- Woody Species Regeneration: A stable trend at sites with desired condition and an upward trend at sites not at desired condition (Winward 2000, Burton et al. 2008).
- Bank Stability RMO: A bank stability of at least 80% or the current value, whichever is greatest outside of priority watersheds. Within priority watersheds a bank stability of at least 90% or the current value, whichever is greatest (U.S Department of Commerce, National Marine Fisheries Service, 1998).
- Water Temperature RMO: No measureable increase in maximum temperature; <64°F in (Chinook, steelhead) migration and rearing areas and <60°F in spawning areas except in steelhead priority watersheds with a <45°F in spawning area (PACFISH BO; - U.S Department of Commerce, National Marine Fisheries Service, 1998). No measureable increase in maximum water temperature (7 day moving average of daily maximum temperature measured as the average of the maximum daily temperature of the warmest consecutive 7-day period) Maximum water temperatures below 59° F within (bull trout) adult holding habitat and below 48° F within spawning and rearing habitats. (INFISH BO; - U.S. Department of the Interior, U.S. Fish and Wildlife Service, 1998).
- Width:depth ratio RMO: <10 mean wetted width divided by mean depth by channel type (PACFISH BO; - U.S Department of Commerce, National Marine Fisheries Service, 1998). Identification of width:depth ratio objective values will also consider values and ranges identified within the document Descriptions that Represent Natural Conditions in the Salmon River Basin, Idaho (Overton et al, 1995)
- Sediment RMO: <20% surface fine sediment which is substrate <0.25 in (6.4 mm) in diameter in spawning habitat or <30% cobble embeddedness in rearing habitat.

Resource Standards (PACFISH):

- GM-1 - Modify grazing practices (e.g., accessibility of riparian area to livestock, length of grazing season, stocking levels, timing of grazing, etc.) that retard or prevent attainment of Riparian Management Objectives or are likely to adversely affect listed anadromous fish. Suspend grazing if adjusting practices is not effective in meeting Riparian Management Objectives and avoiding adverse effects on listed anadromous fish (PACFISH).
- GM-2 – Locate new livestock handling and/or management facilities outside of Riparian Habitat Conservation Areas. For existing livestock handling facilities inside the Riparian Habitat Conservation Areas, assure that facilities do not prevent attainment of Riparian Management Objectives or adversely affect listed anadromous fish. Relocate or close facilities where these objectives cannot be met.

- GM-3 – Limit livestock trailing, bedding, watering, salting, loading, and other handling efforts to those areas and times that will not retard or prevent attainment of Riparian Management Objectives or adversely affect listed anadromous fish.

3.2.6 ANNUAL GRAZING USE INDICATORS

Annual Use Indicators and Implementation Monitoring: Annual use indicators are used to ensure that grazing does not prevent the attainment of the riparian resource objectives. Riparian annual use indicators used on the Salmon-Challis National Forest generally include greenline stubble height, bank alteration, and woody browse. In general, greenline stubble height is used to regulate grazing impacts on greenline ecological status, bank alteration is used to regulate grazing impacts on bank stability, and woody browse is used to regulate impacts on woody recruitment. The specific indicators selected for a specific unit should be those that correspond with the riparian resources that are most sensitive to the impacts of livestock grazing. For example, if bank stability was the riparian feature most likely to be impacted by livestock grazing in a unit, then bank alteration would be selected as the annual use indicator for that unit.

The annual use indicators and triggers for grazing use in Table 2 below will be used until the next trend reading is completed to determine which annual use indicators address attaining the resource objectives.

Annual Indicator will be adjusted if resource objectives are not being met.

TABLE 2 - LEE CREEK ALLOTMENT KEY AREA ATTRIBUTES, INDICATORS, AND TRIGGERS -TABLE WILL BE ADJUSTED AS NEEDED TO REFLECT IF CURRENT RESOURCE OBJECTIVES ARE OR ARE NOT BEING MET

Key Area Locations	Unit – Creek	Monitoring Attribute	Annual Use Indicator	Key Species	Trigger
MIM M257	Everson Unit – Stroud Creek	Greenline stubble	4 in.	Hydric spp.	5 in.
		Bank Alteration	<20%	n/a	15%
MIM M292	Everson Unit –Everson Creek	Greenline stubble	4 in.	Hydric spp.	5 in.
		Bank Alteration	<20%	n/a	15%
MIM M256	Big 8mile Unit – Big 8mile Creek	Greenline stubble[1]	4 in.	Hydric spp.	5 in.
		Browse use	50%	Willow	45%
		Bank Alteration	20%	n/a	15%
MIM M315	Big 8mile Unit – Dairy Creek	Greenline stubble	4 in.	Hydric spp.	5 in.
		Browse use	50%	Willow	45%
		Bank Alteration	20%	n/a	15%
Upland Sites	All Units	Utilization	Up to 50%	Upland grass species	45%
Riparian Areas	All Units	Utilization by Key Species	50%	Riparian grass species	45%

Annual use indicators will be measured at key areas by key species (on uplands) and at DMA greenlines annually. Key areas are monitoring sites chosen to reflect the effects of grazing over a larger area

(Burton et al 2008). Key species are preferred by livestock and an important component of a plant community, serving as an indicator of change (Utilization Studies and Residual Measurements, Interagency Technical Reference 1734-3). The Interagency Technical Reference or other best available science would be used to monitor grazing use. The MIM Interagency Technical Bulletin (Burton et al 2008) or other best available science would be used to monitor grazing use at DMAs. Annual use indicators will be monitored by the Forest Service. Triggers will be used by permittees as a tool to help ensure annual use indicators are met. Results from monitoring will be available at (http://www.fs.fed.us/r4/sc/projects/range/index.shtml).

3.2.7 IMPROVEMENTS

New Improvements: There are no new improvements proposed at this time.

Existing Improvements: Existing improvements are shown on Figure 2 and will be maintained in accordance with the term grazing permit.

Potential Future Improvements: There are no new improvements proposed at this time.

3.3 MONITORING

Implementation Monitoring: The designated indicators (e.g. - stubble height, bank alteration, and woody browse) will be periodically monitored while livestock are in each grazing unit to evaluate the status of the standards and to determine when livestock need to be moved from the unit. The specific triggers for moving livestock from the unit will be based on the time needed to move the livestock from the unit and may vary between units and years. The designated indicators (e.g. - stubble height, bank alteration, and woody browse) will be monitored utilizing MIM protocols or other best available science at DMAs within each unit at the end of the grazing season to ensure that the standards have been met.

Effectiveness Monitoring: The condition of resource objectives will be evaluated in the following manner. The Forest will monitor greenline successional status, bank stability, width:depth ratio, water temperature, and woody recruitment every three to five years to evaluate resource conditions. Monitoring results will be available at (http://www.fs.fed.us/r4/sc/projects/range/index.shtml

3.4 INTERDEPENDENT ACTIONS

Interdependent actions are actions that have “no independent utility apart from the action under consideration” (50 CFR§402.02). The Forest has not identified any interdependent actions associated with the proposed action.

3.5 INTERRELATED ACTIONS

Interrelated actions are actions that “are part of a larger action and depend on the larger action for their justification” (50 CFR§402.02). The Forest has not identified any interrelated actions associated with the proposed action.

3.6 ADAPTIVE MANAGEMENT

The adaptive management strategy described below and depicted in Appendix F diagrams 1.0 (Long-term) and 2.0 (Annual) is intended for allotments requiring consultation. It will be used to ensure: 1) sites at desired condition remain in desired condition; 2) sites not in desired condition have an upward trend or an acceptable static trend to be agreed upon with the Services and the Forest Service; and 3) direction from consultation with the Services is met. The overall strategy consists of a long-term adaptive management strategy and an annual adaptive management strategy. The long-term strategy describes how adaptive management will be used to ensure the three objectives previously stated are achieved and to maintain consistency with Forest Plan level direction. The annual adaptive management strategy describes how adjustments will be made within the grazing season to ensure annual use indicators and

other direction from consultation is met. Both strategies describe when and how regulatory agencies will be contacted in the event direction from consultation is not going to be met.

Ideally, the value associated with the annual use indicator is customized to the specific circumstances in each unit. However, customizing this value generally requires a significant amount of data and/or experience with a particular unit. When sufficient data and/or experience are not available to establish the annual use indicators values, the forest has provided general guidelines for establishing the values. These guidelines will be used until such time as sufficient data and/or experience are available to customize the annual indicator values. The general guidelines are:

- Livestock grazing in the uplands and riparian areas will be limited to 50% use on key herbaceous species within key areas of the allotment during the grazing season.
- When the relevant resource objectives are being met (section 3.2.5) annual use indicators, within riparian areas will be 50% browse on multi-stemmed species, 30% browse on single-stemmed species, and 4" residual stubble height.
- When the relevant resource objectives (see section 3.2.5) are not being met annual endpoint indicators, allowable use, will be 30% browse on multi-stemmed species, 20% browse on single-stemmed species, and 6" residual stubble height.
- In priority watersheds, when bank stability is 90% or greater the bank alteration **annual use indicator** will be 20%
- In priority watersheds, when bank stability is 70-89% the bank alteration **annual use indicator** will be 10-20%
- In priority watersheds, when bank stability is less than 70% the bank alteration **annual use indicator** will be 10%

4 ESA ACTION AREA DESCRIPTION

The ESA 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 other words, this is the area where the action and any interdependent and interrelated actions will result in direct or indirect effects to listed species or designated critical habitat. Our analysis indicates that the proposed action has the potential to generate direct or indirect affects to aquatic species and aquatic habitats on National Forest System lands within the boundaries of the Lee Creek Allotment, including portions of Walter Creek, Lee Creek, Everson Creek and Big Eight Mile Creek (Figure 2).

Priority Watersheds are those watersheds that have been identified per direction in the 1995 PACFISH Biological Opinion, that require a different management strategy because of their importance to listed fish. Priority Watersheds within the action area are identified in Figure 3. All units of the Lee Creek Allotment lie within Priority Watersheds for Chinook salmon and steelhead. Management direction for Priority Watersheds is identified in section 3.2.5.

FIGURE 2 – LEE CREEK ALLOTMENT ACTION AREA MAP

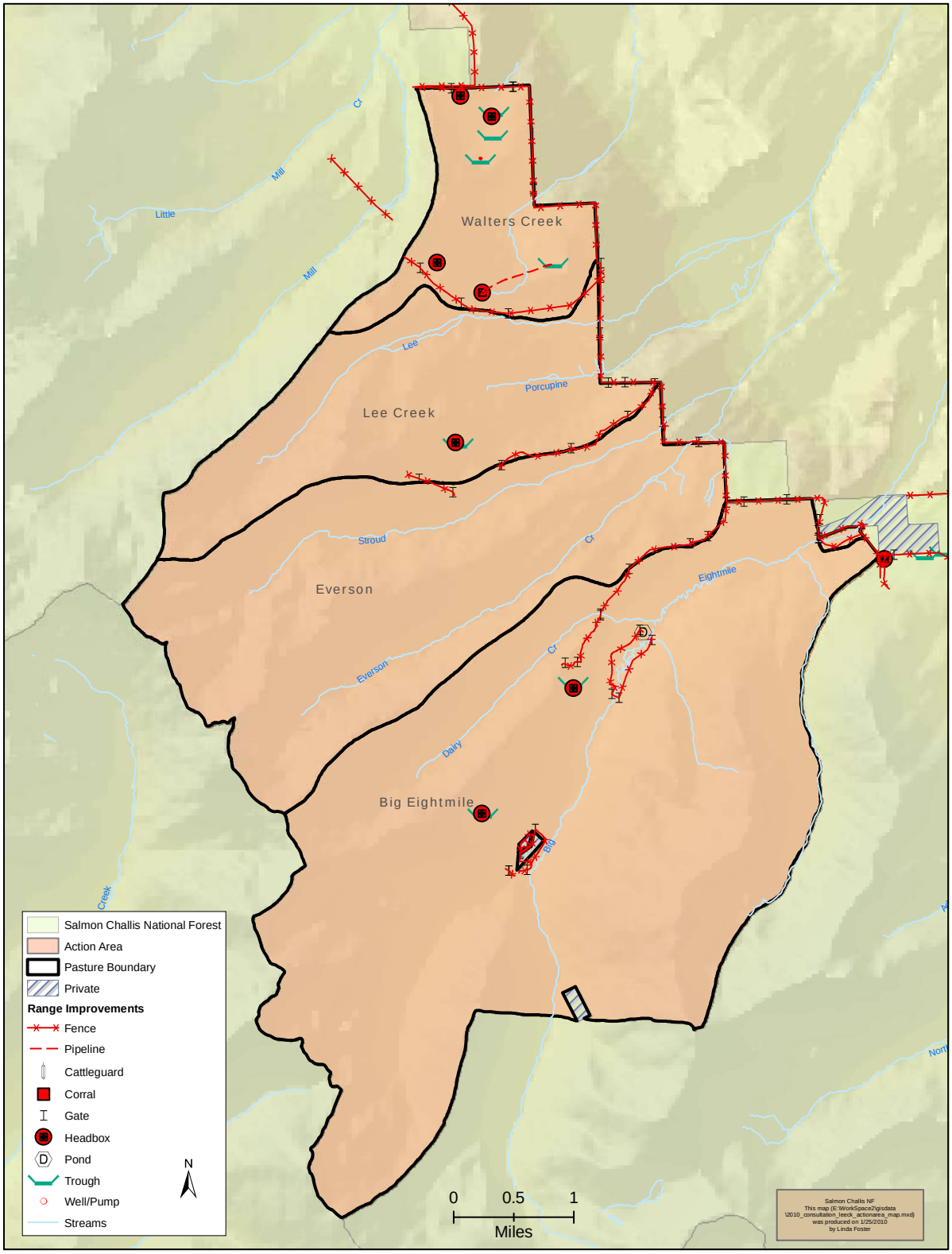
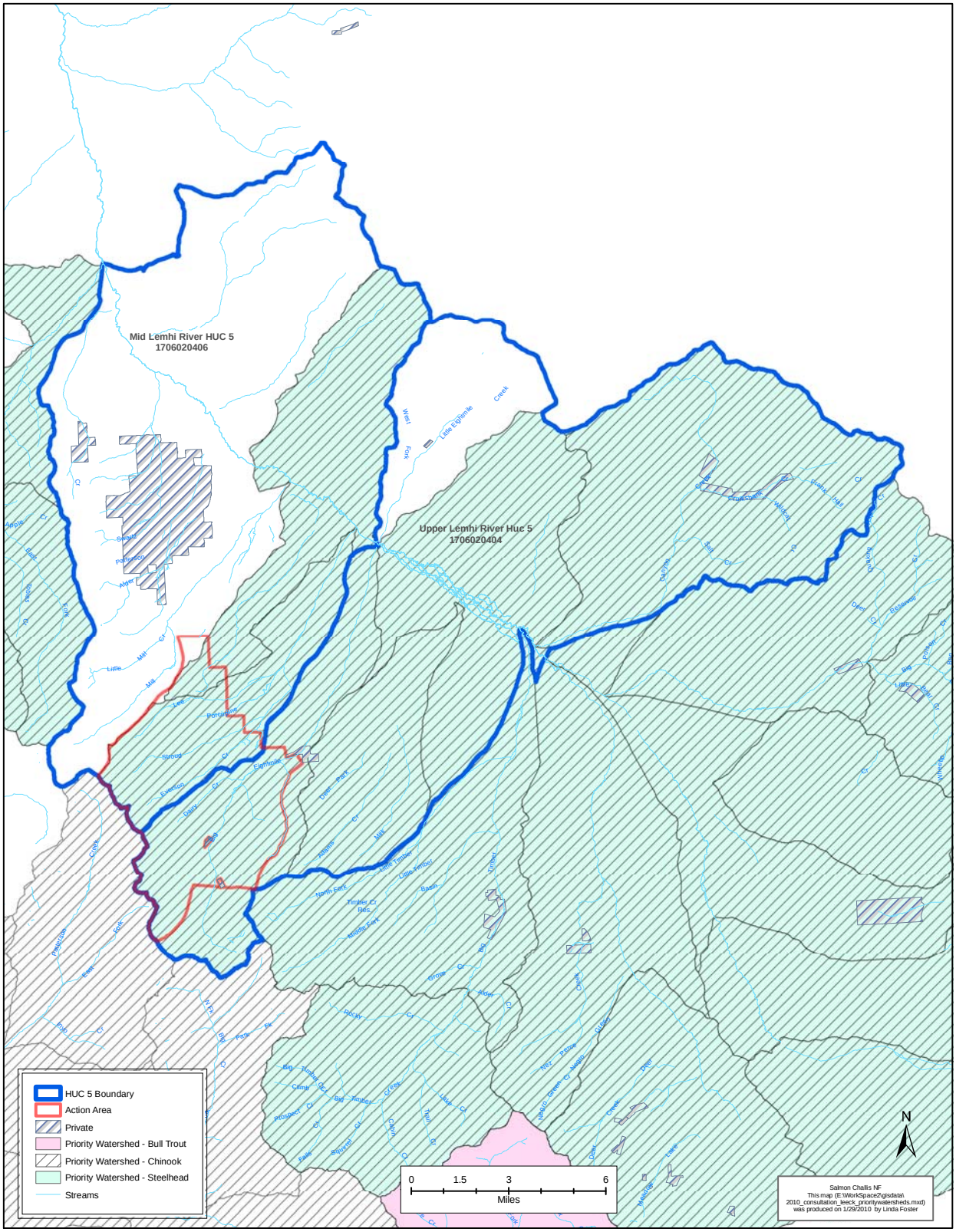


FIGURE 3 – LEE CREEK ALLOTMENT PRIORITY WATERSHEDS MAP AND HUCS



5 LISTED SPECIES REVIEW

5.1 SPECIES OCCURRENCE

The current semi-annual Species List issued by the U.S. Fish and Wildlife Service (List #14420-2010-SL-0089, issued December 30, 2009) identifies four ESA listed fish species as occurring on and adjacent to the Salmon-Challis National Forest. These are:

- Snake River Sockeye Salmon (Endangered) (Federal Register 56FR58619)
- Snake River Spring/Summer Chinook Salmon (Threatened) (Federal Register 57FR14653)
- Snake River Steelhead (Threatened) (Federal Register 62FR43937)
- Bull Trout (Threatened) (Federal Register 63FR31647)

Salmon-Challis National Forest and Idaho Department of Fish and Game surveys indicate that bull trout occurs within the action area. Chinook salmon and steelhead utilize mainstem Lemhi River reaches near the mouth of Lee Creek and Big Eight Mile Creek for spawning and rearing but do not currently utilize any on-Forest habitats for spawning or rearing. If, in future years, Chinook salmon or steelhead utilization of the Big Eight Mile and Lee Creek drainages is found to extend to Forest lands within the Lee Creek Allotment, the Salmon-Challis National Forest will reinitiate consultation for these species. Sockeye salmon utilize the mainstem Salmon River as a migration corridor to and from spawning and juvenile rearing areas within lakes of the Salmon River headwaters, but do not occupy or use waters within the Lemhi River Subbasin (Federal Register 56FR58619).

5.2 CRITICAL HABITAT

5.2.1 SNAKE RIVER SPRING/SUMMER CHINOOK SALMON

Critical habitat has been designated for Snake River spring/summer Chinook salmon and includes “river reaches presently or historically accessible…to Snake River spring/summer Chinook salmon” (Federal Register 58FR68543). The Salmon-Challis National Forest has mapped Chinook salmon critical habitat designations within Forest streams following the process identified in Appendix D. Utilizing this process, the Forest has not identified Chinook salmon critical habitat in any streams of the Lee Creek allotment.

5.2.2 SOCKEYE SALMON

Critical habitat has been designated for Snake River sockeye salmon (Federal Register 58FR68543). This designation does not include any waters within the action area.

5.2.3 SNAKE RIVER BASIN STEELHEAD

Critical habitat has been designated for Snake River Basin steelhead (Federal Register 70FR52630). The Lee Creek Allotment action area does not contain any designated critical habitat for steelhead.

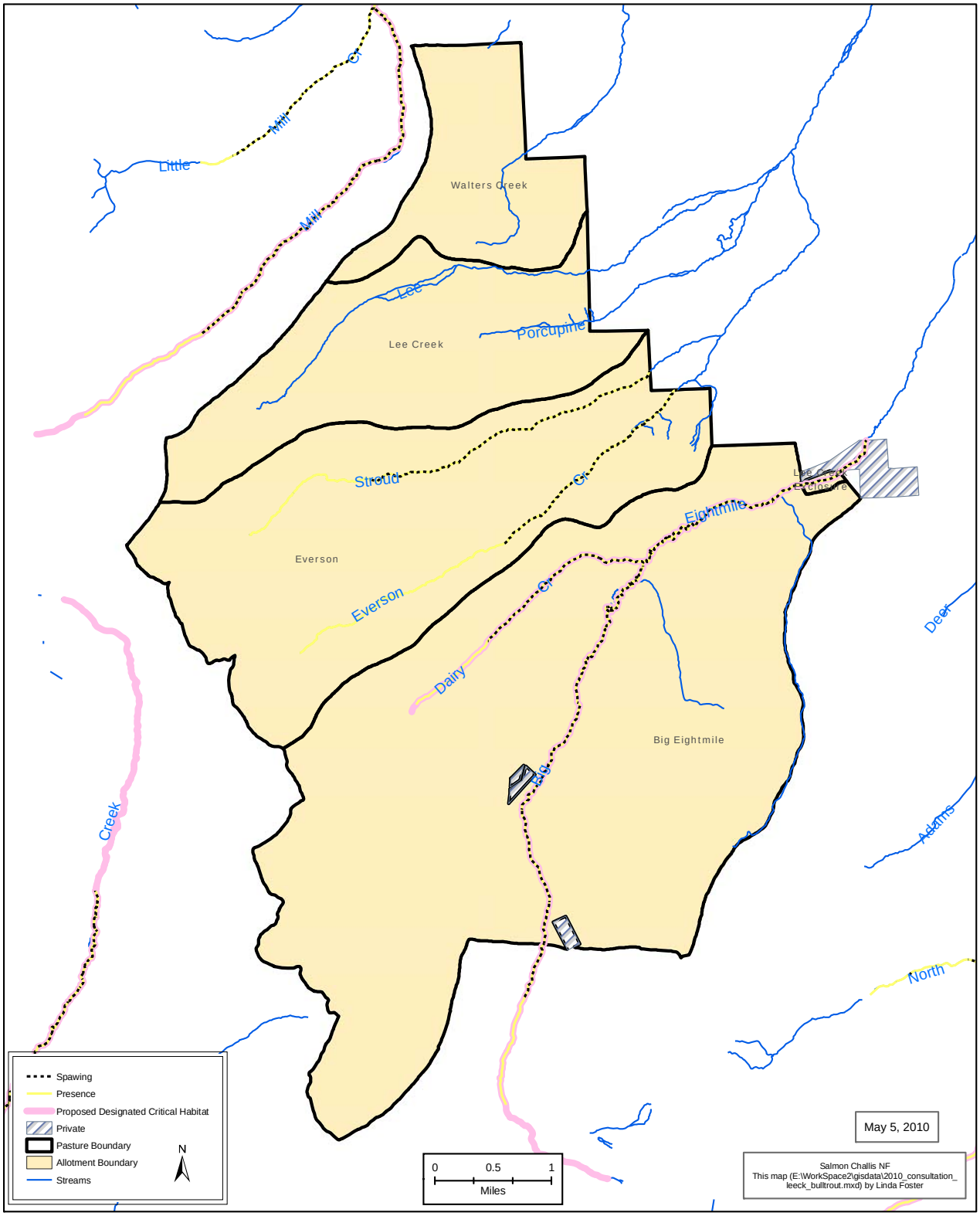
5.2.4 COLUMBIA RIVER BULL TROUT

Critical habitat was designated for bull trout on September 26, 2005. This designation did not include any areas encompassed by the proposed action. Currently, however, the U.S. Fish and Wildlife Service has published public notice (January13, 2010, Federal Register 75FR2270) that it is proposing to revise the 2005 designated critical habitat. While the Lee Creek Allotment action area does not contain any currently designated critical habitat for bull trout, it does contain proposed critical habitat. Proposed bull trout critical habitat within the Lee Creek Allotment action area includes mainstem reaches of Big Eight Mile Creek and its tributary Dairy creek (Figure 4).

The Forest desires to assess the potential impact to the Primary Constituent Elements (PCEs) of proposed bull trout critical habitat. These are defined on page 2360 of the referenced Federal register

notice. Because these elements are important to areas on the Forest where bull trout are present, the Forest would like to demonstrate that potential impacts to the PCEs have been assessed and considered in the proposed action (Appendix E).

FIGURE 4 – BULL TROUT DISTRIBUTION, SPAWNING HABITAT AND PROPOSED CRITICAL HABITAT WITHIN THE LEE CREEK ALLOTMENT ACTION AREA



6 ENVIRONMENTAL BASELINE DESCRIPTION

The action area lies within the Big Eight Mile Creek and Lee Creek Watershed (HUC 1706020404 and 1706020406). The Baseline Matrix of Diagnostic Pathways and Indicators for these watersheds is provided in Appendix B.

Below is a general summary of baseline conditions within the action area. While the baseline matrix included in Appendix B reflects aquatic/riparian condition and trend at the watershed scale, the baseline descriptions provided below focus only on baseline conditions within the action area. This is done to focus analysis emphasis on those habitat parameters most likely to be influenced by grazing activities and set the context for analyzing the effects of the proposed action on these conditions.

6.1 GENERAL DESCRIPTION OF LISTED FISH POPULATIONS

This section provides a general description of the distribution, status and trend of listed fish populations within the action area.

The Lee Creek Allotment encompasses four streams which support populations of, and/or designated or proposed critical habitat for listed fish species. These include mainstem reaches of Lee Creek, Stroud Creek, Everson Creek, Dairy Creek, and Big Eight mile Creek. Other small tributary streams within the analysis area will be grazed, but do not contain listed fish or support designated or proposed critical habitat. However, livestock grazing in these areas may indirectly affect listed fish and designated or proposed critical habitat in other streams within the allotment.

6.1.1 CHINOOK SALMON

Chinook salmon are not currently found within the Lee Creek Allotment action area.

6.1.2 STEELHEAD

Steelhead are not currently found within the Lee Creek Allotment action area.

6.1.3 BULL TROUT

Within the Lee Creek Allotment, bull trout populations are supported in mainstem Big Eight Mile Creek, Dairy Creek, Stroud Creek and Everson Creek. Bull trout are the most abundant salmonid species present in the Lee Creek and Big Eight Mile Creek drainages but populations in these streams are limited to resident life forms (IDFG, 2004 and 2006). While the watershed probably supported fluvial fish historically, migratory bull trout are currently precluded from mid and upper reaches of the drainage by dewatering of the lower reaches of each stream (ibid).

Idaho Department of Fish and Game's fish surveys of the Big Eight Mile Creek watershed found bull trout densities that ranged from to 12.22 fish per 100m^2, with a mean of 7.23 individuals per 100m^2. Bull trout sampled ranged in length from 40 mm to 239 mm, with a mean of 123.17 (IDFG, 2004).

In 2006 the IDFG found Bull trout were present in three (29%) of the 12 Lee Creek stream sample sites all in Stroud Creek. These three sites are all upstream of the segment that is dewatered by irrigation demand. The highest number of bull trout sampled was 33 fish in one pass of electrofishing. Fork lengths ranged from 50 mm up to 210 mm (IDFG 2006).

6.2 GENERAL DESCRIPTION OF HABITAT CONDITIONS

This section provides a general description of the status and trend of listed species habitat within the action area. More specific information on habitat conditions, including specific habitat data, is provided later in the document and in Appendices B and C.

6.2.1 LEE AND BIG EIGHT MILE CREEK DRAINAGES

The Lee Creek Allotment encompasses portions of mainstem Lee Creek and Big Eight Mile Creek and small tributary streams, Everson Creek, and Stroud Creek and Dairy Creek. Fisheries habitats within the allotment are supported almost entirely within these streams. Overall aquatic and riparian habitat conditions within these streams are generally considered good, with thirteen of nineteen habitat indicators, (sediment, chemical contaminants and nutrients, substrate embeddedness, large woody debris, pool frequency and quality, off channel habitat, refugia, streambank condition, floodplain connectivity, increase in drainage network, disturbance history, riparian conservation areas, and disturbance regime) considered to be functioning appropriately. Habitat connectivity is considered to be functioning at risk, however because of irrigation diversions on and off National Forest System lands. Within the allotment action area, connectivity is maintained between upper and lower reaches of Lee Creek, Stroud Creek and Everson Creek.

6.3 MAJOR LIMITING FACTORS

Factors most likely to be limiting fisheries resources from achieving full carrying capacity are physical barriers and changes in peak and/or base flows.

There are 13 active diversions in the Lee Creek Drainage and 14 diversions in the Big Eight Mile Drainage. None of the diversions within the watershed are screened to prevent access by fish. If fish could enter the creek to spawn, fish loss would occur as the juveniles could enter the ditches on their downstream migration.

More specific details on status and trends of habitat within the action area are provided below.

6.4 GRAZING FOCUS INDICATORS

One tool developed to assist in describing the condition of watersheds and streams which listed Chinook salmon, steelhead and bull trout depend on is; *A Framework to assist in Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Subpopulation Watershed Scale* (Appendix 9 in Lee et al., 1997). It is commonly referred to as the Matrix of Pathways and Indicators, and at its most basic level is a table which identifies the important elements or indicators of a listed salmonid habitat. Using this table assists in consistent organization an assessment of current condition and judging how those indicators may be impacted by a proposed action (Lee et al. 1997). The Forest has included a matrix for this allotment as Appendix B of this Biological Assessment. Because the Matrix of Pathways and Indicators was developed to operate at several spatial scales (Lee et al. 1997) the Forest has selected six indicators from the matrix table as their “Focus Indicators”, on which analysis of livestock impacts to fish and designated habitat will be based. These are 1) spawning and incubation, 2) temperature, 3) sediment, 4) width: depth ratio, 5) streambank condition, and 6) riparian conservation areas. These are the indicators that the Forest can easily monitor, have the most specificity with a long running data set, and most closely reflect the aquatic/riparian baseline pathway and indicator elements considered most likely to be impacted by grazing activities within a watershed.

The Forest has utilized this “Focus Indicator” set to characterize the condition of the habitat for listed fish species in the occupied streams in this allotment. If stream specific information is not available, then observational information or information from similar streams was used. If one (or several) of the focus indicators showed a habitat condition was potentially limiting the ability of listed fish species to thrive; the Forest presented an opinion of the most likely causal factor for that limiting condition. By identifying those potentially limiting factors, the Forest and the Service can focus their analysis of the proposed action’s effects on that habitat component.

These indicators encompass the recently published draft PCEs for Chinook salmon, steelhead and proposed bull trout critical habitat, and therefore our analysis of these elements will serve as an analysis of impacts to designated and proposed critical habitat.

A description of the condition of the Focus Indicators within the action area is provided below.

6.4.1 SPAWNING AND INCUBATION:

6.4.1.1 CHINOOK SALMON SPAWNING AND INCUBATION

Chinook salmon are not currently present within the Lee Creek Allotment and no Chinook salmon spawning or incubation currently occurs within the allotment action area.

6.4.1.2 STEELHEAD SPAWNING AND INCUBATION

Steelhead are not currently present within the Lee Creek Allotment, and no steelhead spawning or incubation currently occurs within the allotment action area.

6.4.1.3 BULL TROUT SPAWNING AND INCUBATION

Big Eight Mile Creek, Dairy Creek, Stroud Creek and Everson Creek support bull trout populations within the Lee Creek Allotment action area. It is considered that these streams additionally support bull trout spawning. Table 3 displays the amount of bull trout habitat in these streams in the Lee Creek Allotment.

TABLE 3 - LEE CREEK ALLOTMENT FISH INFORMATION

Bull Trout Present	Sum of LENGTH	Bull Trout Spawning	Sum of LENGTH
Big Eightmile Unit	**8.88**	**Big Eightmile Unit**	**8.03**
Big Eightmile Creek	**6.33**	**Big Eightmile Creek**	**6.33**
Dairy Creek	**2.54**	**Dairy Creek**	**1.70**
Everson Unit	**8.36**	**Everson Unit**	**4.86**
Everson Creek	**4.25**	**Everson Creek**	**2.10**
Stroud Creek	**4.12**	**Stroud Creek**	**2.76**
Lee Creek Exclosure Unit	**0.40**	**Lee Creek Exclosure Unit**	**0.40**
Big Eightmile Creek	**0.40**	**Big Eightmile Creek**	**0.40**
Grand Total	**17.64**	**Grand Total**	**13.29**

The Upper Salmon Basin Watershed Project Technical Team work window and fish periodicity document (Upper Salmon Basin Watershed Project Technical Team, 2005) does not identify a general bull trout spawning periodicity for Lemhi River tributary streams. Discussions with Idaho Department of Fish and Game, however, indicate that the general spawning period Big Eight Mile Creek and Lee Creek bull trout would be expected to be similar to that identified for the Lemhi River tributary Hayden Creek, spanning mid-August to mid October, with incubation extending through the third week of April of the following year (Tom Curet, IDFG, personal communication).

Access is limited within this allotment to the spawning due to topography and vegetation. The Big Eightmile Unit has 4.2 miles of Big Eightmile Creek and .63 miles of Dairy Creek accessible to livestock. The Everson Unit has .35 miles of Everson Creek and .47 miles of Stroud Creek are accessible to livestock. The Lee Creek Exclosure Unit is not accessible to livestock.

6.4.2 WATER TEMPERATURE

Water temperature influences many aspects of salmonid fish life history, including reproduction, growth, and migration (Bjornn and Reiser, 1991). PACFISH identifies water temperature criteria for salmon and steelhead species of less than 64 degrees F (17.8 degrees C) for rearing, and less than 60 degrees F (15.6 degrees C) for spawning and incubation. In identified steelhead priority watersheds, PACFISH identifies an additional water temperature criteria of less than 45 degrees F (7.2 degrees C) during steelhead spawning periods (U.S Department of Commerce, National Marine Fisheries Service, 1998).

PACFISH and INFISH additionally identify a bull trout water temperature criteria of maximum temperatures below 59 degrees F (15 .0 degrees C) within adult holding habitats, and less than 48 degrees F (8.9 degrees C) within spawning and rearing habitats (ibid; U.S. Department of the Interior, U.S. Fish and Wildlife Service, 1998). Overall, water temperature regimes across the Big Eight Mile/Lee Creek Watershed are considered to be Functioning at Risk relative to these criteria due to elevated water temperatures in lowermost reaches of the watershed (see Water Temperature discussion, Appendix B).

Water temperature monitoring data is available for all the streams containing bull trout in the Lee Creek Allotment. Data indicate that water temperature criteria are generally being met in stream reaches within the allotment. In 2009, Big Eight Mile water temperatures averaged 6.5 degrees C with a maximum of 9.8 degrees C, and a maximum 7 day moving maximum of 9.6 degrees C. Dairy Creek water temperatures averaged 8.2 degrees C with a maximum of 12.9 degrees C, and a maximum 7 day moving maximum of 12.2 degrees C. In 2009, Everson Creek water temperatures averaged 6.9 degrees C with a maximum of 11.0 degrees C, and a maximum 7 day moving maximum of 10.5 degrees C. Stroud Creek water temperatures had a maximum of 12.9 degrees C, and a maximum 7 day moving maximum of 12.5 degrees C.

6.4.3 SEDIMENT

Stream sediment conditions can influence fish incubation success as well as rearing habitat quantity and quality and fish food base productivity (Bjornn and Reiser, 1991).

Stream sediment levels have only been monitored in the Big Eight Mile Creek stream reaches within the Lee Creek Allotment. Monitoring at two sites between 1993 and 2009 has identified a significant decrease in levels of fines from 32 and 23 percent in 1993 to around 16 percent in 2009 (figures 5 and 6 and appendix C table 1). These sites have met the Salmon National Forest's identified objective level of ≤ 20 percent fines at depth for volcanic or mixed geology soils in 83 percent of its samplings since 2000.

FIGURE 5 – PERCENT DEPTH FINES TREND FOR BIG EIGHT MILE CREEK MONITORING SITE 1R

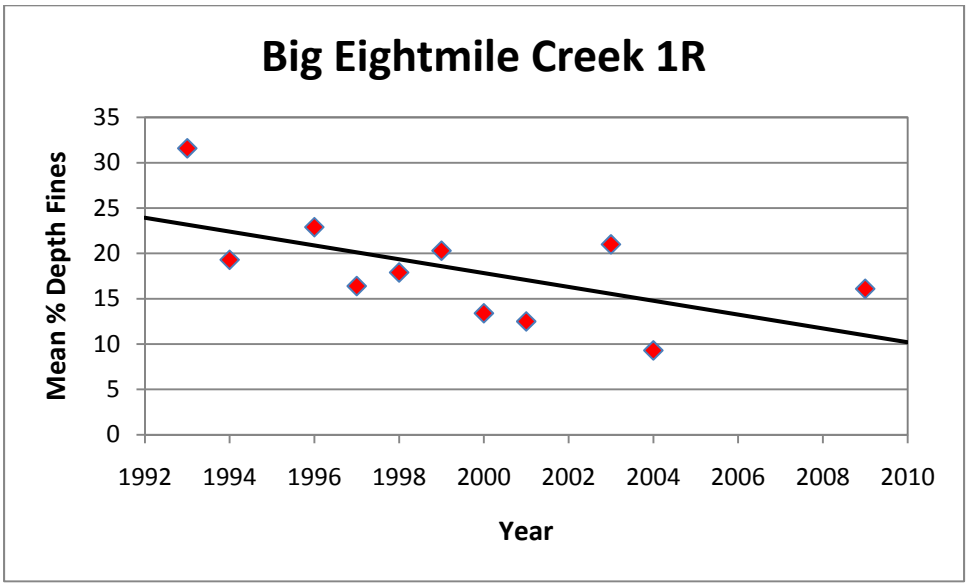
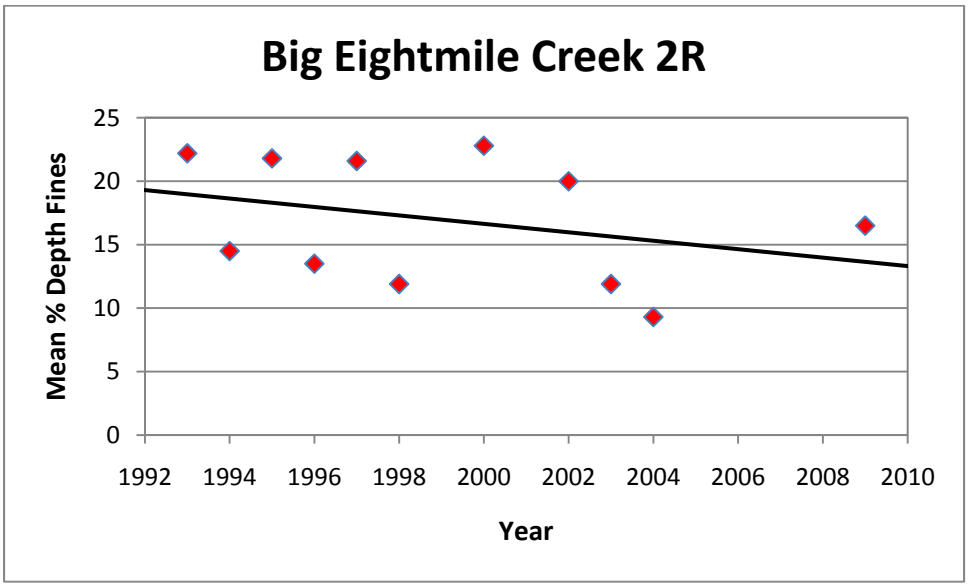


FIGURE 6 – PERCENT DEPTH FINES TREND FOR BIG EIGHT MILE CREEK MONITORING SITE 2R



Substrates in the other stream in the allotments appears to have a similar levels of sediment with an improvement trend observed.

6.4.4 WIDTH:DEPTH RATIO

Stream width:depth ratios influence available living space within stream habitats. Stream channel widening results in shallower depths which reduce habitat suitability (Platts and Nelson, 1989).

PACFISH identifies a stream channel width:depth ratio RMO of 10 by channel type while natural ranges of width:depth ratios over a variety of geologic and morphological conditions have been identified in a Natural Condition database, by Overton et al, (1995). The Salmon-Challis National Forest has utilized both criteria to assess morphologic condition of Forest stream channels.

Channel geometry has not been monitored in Big Eight Mile Creek and Dairy Creek stream reaches within the Lee Creek Allotment. Monitoring indicates that stream channel width:depth ratios have been in excess of the PACFISH RMO, being 20.9 for Big Eight Mile Creek and 17.0 for Dairy Creek. These values are within the range of variability for “B” channel streams (Rosgen, 1994) within volcanic geology, and all width:depth ratios were less than the mean value of 20 identified in the Natural Condition Database for this channel type and geology. The observed values have also been reflective of Rosgen’s general identified characterization of B type channels as displaying width:depth metrics greater than 12 (Rosgen, 1996).

6.4.5 STREAMBANK CONDITION

Streambank condition can influence the overall stability and resilience of stream channels. Reduced streambank stability can result in reduced structural stability of the stream channel resulting in negative impacts on fish productivity (Platts, 1991).

Bank stability has been monitored in Big Eight Mile Creek in the Lee Creek Allotment. Trend data indicate that bank stability is greater than 92% and has generally remained static or improved with some variation (Figures 7 and 8, appendix C table 2). Other streams in the allotments appear to have similar bank stabilities. The small nature of streams in the Allotment, high gradient and flowing through timbered stands appear to protect these streams from livestock bank trampling.

FIGURE 7 – STREAM BANK STABILITY TREND FOR BIG EIGHT MILE CREEK MONITORING SITE 1R

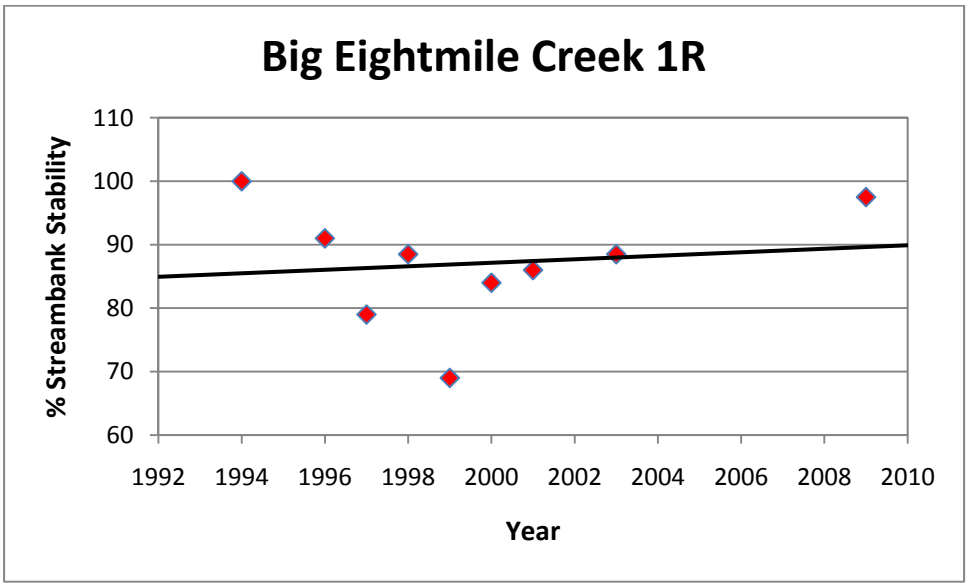
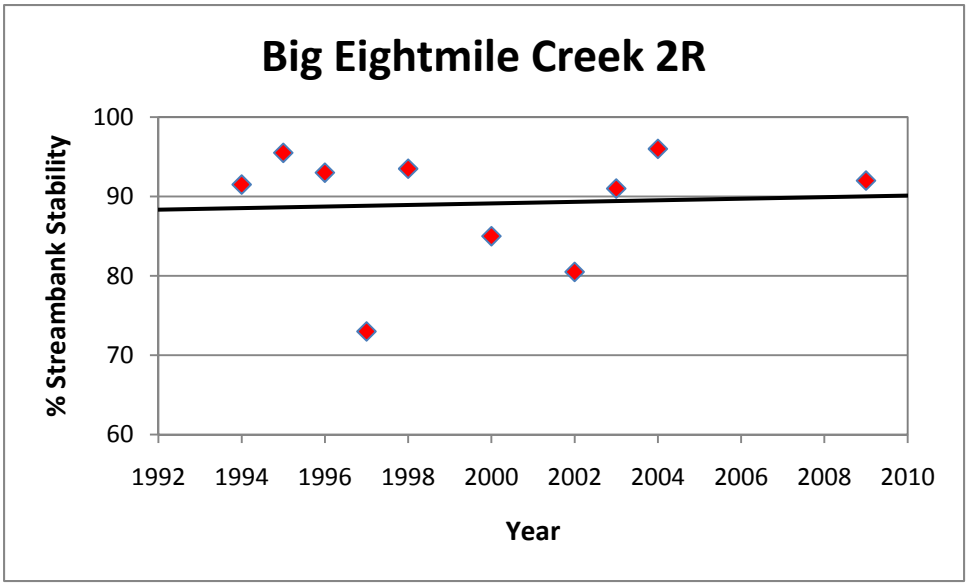


Figure 8 – Depth Fines Trend for Big Eight Mile Creek Monitoring Site 2R



6.4.6 RIPARIAN CONSERVATION AREAS

Condition of riparian vegetation can strongly influence aquatic habitat quality and fish productivity. Removal of riparian vegetation can result in negative impacts to fish populations (Platts and Nelson, 1989).

Monitoring sites were established and subsequent monitoring has occurred on the Lee Creek Allotment since the mid 90's. Since that time, grazing management has evolved based upon management in reference to listed fish species which occur within the allotment. Greenline Ecological Status (GES) typically is the element in which interpretations of ecological status and trend is displayed and described in Table 4.

TABLE 4 – GREENLINE ECOLOGICAL STATUS

Unit	Creek Name	Site Number	Year	Greenline Ecological Status (GES)	GES Trend	Summary of Trend
Lee Creek	Upper Lee Cr.		1989	75/LS	Base	GES is in a downward trend at Mid Seral. Site is dominated by willow and very rocky.
			1999	47/MS	Down	
	Lower Lee Cr.	M294	1998	69/LS	Base	GES is static at PNC. Site is dominated by conifers. Livestock have limited access to the stream.
			2004	108/PNC	Up	
			2009	PNC	Static	
Everson	Everson Cr.	M292	1989	57/MS	Base	GES is static at PNC. Site is dominated by conifers and willows. Livestock have limited access to the stream.
			2000	95/PNC	Up	
			2009	PNC	Static	
	Stroud Cr.	M257	1996	32/ES	Base	GES is static at LS. Site is dominated by conifers. Livestock have limited access to the stream.
			2001	82/LS	Up	
			2009	LS	Static	
Big 8-Mile	Big 8-Mile Cr.	M256	1990	63/LS	Base	GES is static at PNC. Site is dominated by Willows. Livestock have limited access to the stream.
			1996	78/LS	Static	
			2001	98/PNC	Up	
			2009	PNC	Static	
	Dairy Creek	M315	1989	57/MS	Base	GES is upward at Late Seral. Site is dominated by Willows and Alder. Access is limited to a few open areas along stream.
			1999	58/MS	Static	
			2004	62/LS	Up	
Walters	Walters Cr.	M294	1999	79/LS	Base	GES is static at LS. Site is dominated by Willows with a Carex understory. Site needs to be revisited to get bank stability data.
			2004	LS	Static	

6.4.7 ANNUAL USE INDICATORS AND OBJECTIVES AND THEIR RELATIONSHIP TO FOCUS INDICATORS

Annual use indicators were selected because of their documented ability to maintain and/or achieve riparian objectives described in section 3.2.5. There is considerable overlap; the riparian system effectively integrates vegetation cover, flow regimes, sediment and nutrients (DeBano 1989). The goal is to manage livestock grazing so as not to prevent the attainment and maintenance of healthy aquatic and riparian communities (Gamett et al 2008).

TABLE 5 – RELATIONSHIP MATRIX

Focus Indicator	Riparian Resource Objective	Related Element Affected by Livestock Grazing	Related Annual Use Indicator
Streambank Condition	Greenline Successional Status	Greenline Status	Greenline Stubble
	Woody Species Regeneration	Woody Species Regeneration	Browse Use
	Bank Stability	Greenline Status, Woody Species Regeneration, Current Year Alteration	Stubble Height, Browse Use, Bank Alteration
Temperature	Water Temperature	Greenline Status, Woody Species Regeneration, Vegetation Overhang	Greenline Stubble, Browse Use, Bank Alteration
Width:Depth	Width:Depth Ratio	Greenline Status, Current Year Alteration	Greenline Stubble, Browse Use, Bank Alteration
Sediment	Sediment	Greenline Status, Bank Stability, Current Year Alteration	Greenline Stubble, Browse Use, Bank Alteration
Riparian Conservation Areas	Greenline Successional Status	Greenline Status	Greenline Stubble
	Woody Species Regeneration	Woody Species Regeneration	Browse Use
	Bank Stability	Greenline Status, Woody Species Regeneration, Current Year Alteration	Stubble Height, Browse Use, Bank Alteration
Spawning and Incubation	N/A	N/A	N/A

Livestock will affect riparian vegetation and physical conditions differently depending on many factors, including the site's physical characteristics and conditions, the stage of plant development, the nature of the plant communities in both the riparian zone and the uplands, and current weather. There are tradeoffs in potential impacts with regard to time of grazing (Erhart and Hansen 1997). These are grazing and livestock management considerations, and while important to implementing sound riparian grazing management, are generally excluded from the following discussion.

The focus of this section is on the annual use indicators and how managing by them will help maintain or achieve the riparian resource objectives and grazing focus indicators.

Annual Use Indicators and Vegetation in Riparian Areas. How much and what type of vegetation exists in a riparian plant community, particularly on the greenline, determines how well the riparian system performs its function of reducing flow velocity, trapping sediment, building banks and protecting against erosion. The susceptibility of streambanks to damage is influenced by vegetation. Woody vegetation has an essential role in maintaining riparian function; reducing browsing pressure on riparian trees and shrubs is a significant benefit. Roots and rhizomes of herbaceous vegetation provide much of the compressive strength and soil stability for streambanks in meadow situations such as on the Challis National Forest (Clary and Kinney 2000).

Streamside vegetation strongly includes the quality of habitat for anadromous and resident coldwater fishes including shade to prevent adverse water temperatures fluctuations, roots that lend stability to overhanging banks, and the capability to filter sediment and debris (Kauffman and Krueger 1984).

Stubble height on the greenline is directly related to the health of herbaceous plants (Burton et al 2008). Dense vegetation on the floodplain during spring flooding events to trap sediment plus vigorous plant growth to stabilize sediment deposits is critical for bank building and maintenance. Residual herbaceous vegetation of six inches in a 20 year comparison study in southwestern Montana resulted in dense vigorous riparian vegetation as well as a diversity of age classes of vigorous woody riparian species (Myers 1989). In Idaho, maintaining stubble heights of 4 to 5.5 inches allowed streambank recovery (Clary 1999). Shorter stubble heights (up to six inches) are most effective in improving sediment entrapment during the deposition phase while even longer lengths retain a larger portion of deposited sediment (Clary and Leininger 2000). Four inch stubble in either late June or early July resulted in no difference in bank angle or stream width compared to no grazing in the Sawtooth Valley (Clary and Kinney 2000).

Most measurements of streamside variables moved closer to those beneficial for salmonid fisheries when pastures were grazed to four inches of graminoid stubble height; virtually all measurements improved when pastures were grazed to six inches stubble height, or when pastures were not grazed (Clary 1999). The residual stubble or regrowth should be at least four to six inches in height to provide sufficient herbaceous forage biomass to meet the requirements of plant vigor maintenance, bank and sediment entrapment (Clary and Webster 1989). This is a recommended grazing practice for “B” channel types with medium to fine easily eroded soil materials and most “C” channel types, in mid seral conditions. Special situations may require stubble heights of greater than six inches (Clary and Webster 1989, Myers 1989).

Cattle are destructive to willow stands when they congregate in them (Kovalchik and Elmore 1991, Schulz and Leininger 1990). When herbaceous forage quality diminishes, by either utilization or curing, cattle switch from grazing to browsing (Hall and Bryant 1995, Clary and Leininger 2000). The degree to which browsing of willows is compatible with maintaining willow stands depends on the relative number of willows present. Where willow browsing is light and seedling survival is high the vigor of willows is high. (Kovalchik and Elmore 1991). There is a loop between vigorous willow [and sedge] regrowth, excellent streambank protection and soil and water relationships favorable to continued willow [and sedge] production (Kovalchik and Elmore 1991).

Resistance of common riparian woody plants to defoliation has not been investigated. However, genera commonly represented in riparian areas such as dogwood, maple, cottonwood, willow and birch appear to be more resistant to foliage and twig removal than genera common to xeric uplands (Clary and Webster 1989). Many upland species can tolerate 50 – 60% use, including desirable browse species such as antelope bitterbrush, rose and aspen (Ehrhart and Hansen 1997). Less than half of heavily clipped or browsed willow stems survive into the following year (Smith 1980 and Kindschy 1989 as cited in Kovalchik and Elmore). Willow use is most critical (most likely to occur) when grazing extends into the hot summer season or fall (Myers 1989, Clary and Webster, 1989, Kovalchik and Elmore 1991). Removing cattle before 45 - 50% forage use improves the response of willows (Edwards 2009, Kovalchik and Elmore 1991). The Bureau of Land Management has concluded that exceeding 50% use of current year browse leaders would likely reduce woody vegetation vigor, modify normal growth form, and in the longer-term diminish the age class structure, all of which could affect riparian habitat conditions. Where there is current upward trend of ecological condition it is expected to continue by managing for no more than 50% browse use (USDI BLM 2009).

A study on Stanley Creek in central Idaho (Clary and Kinney 2000) applied three levels of forage use - moderate (50%), light (25%) and no grazing - on mountain meadows in the last half of June. Results were an increase in willow height and cover. Other studies cited in Clary and Kinney show that by maintaining an adequate herbaceous forage supply, and controlling the period of grazing, impacts on the willow community are reduced.

Annual Use Indicators and Streambank Alteration. Grazing along streambanks does as much or more damage to stream-riparian habitats through bank alteration as through changes in vegetation biomass. Overuse by cattle can easily destabilize and break down streambanks as vegetation is weakened and hoofs shear bank segments (Clary and Kinney 2000). A major resource management need is to consider the maintenance of streambank structure and channel form as key factors in fisheries habitat and hydrologic function.

It is widely known that bank alteration by trampling, shearing, and exposure of bare soil can be an important source of stream channel and riparian area degradation (Clary and Webster, 1989, Belsky et al., 1999). Impacts of bank alteration may include channel widening (and loss access to floodplains by peak flows), loss of riparian vegetation (which then makes banks more vulnerable to further erosion), localized lowering of water tables in riparian areas (and loss of water storage in floodplains and stream channels), and changes in sediment transport capacity of stream channels (Clary and Webster 1989).

Literature such as Clary and Webster (1989) often refers to the indirect effect on streambank trampling. A number of other authors who reviewed the literature summarized that careful control of grazing duration and season results in maintenance of the streambank vegetation and limitation of trampling, hoof slide, and accelerated streambank cave-in (Erhart and Hansen 1997, Clary and Leininger 2000).

Some researchers have concluded that bank alteration, taking natural channel stability into account, is the most important factor to consider in evaluating physical stream channel conditions and impacts from land use. Streambank alterations of 20% or less are expected to allow for upward trend of streams with stream widths narrowing and depths increasing (Bengeyfield, 2006).

In southwestern Montana, stream channels narrowed and deepened when streambank disturbance from cattle did not exceed 30 feet per 100 feet of stream reach (Dallas 1997 cited in Mosley et al., 1997). Based on Cowley's literature review, "it appears that 70 percent unaltered streambanks (i.e., 30 percent altered streambanks) is the minimum level that would maintain stable conditions. All of [the] authors consider both natural and accelerated alteration in the totals". Cowley suggested that 80% unaltered streambanks should allow for "making significant progress" toward stream channel improvement, and that this value should be the maximum allowable streambank alteration (Cowley 2002 cited in Simon 2008).

7 ANALYSIS OF EFFECTS

This section contains the effects analysis. The effects of the proposed action are described below and summarized in Table 3. Analysis emphasizes effects to the six focus indicators previously identified as being susceptible to impacts of grazing activities.

7.1 DIRECT AND INDIRECT EFFECTS

Direct effects are those effects that are a direct result of the action. Indirect effects are "caused by the proposed action and are later in time, but still are reasonably certain to occur" (50 CFR§402.02).

Direct effects of livestock grazing may occur when livestock enter streams occupied by listed salmonids to loaf, drink, or cross the stream. Livestock entering fish-spawning areas can trample redds, and destroy or dislodge embryos and alevins (Belsky et al 1997). During the early phases of their life cycle, juvenile salmonids have little or no capacity for mobility, and large numbers of embryos or young are concentrated in small areas.

Improperly managed grazing can additionally have adverse indirect effects to streams and riparian areas (Menke 1977; Meehan and Platts 1978; Clary and Webster 1989;, Belsky et al. 1997). These effects can include streambank damage, removal of shade-providing vegetation, widening of stream channels, introduction of fine sediment and channel incision.

A variety of conservation measures can be implemented to minimize or eliminate potential grazing related effects to listed fish and their aquatic and riparian habitats. These include:

- Strategic Rotation: Unit rotation strategies designed to move livestock off streams during critical spawning periods can avoid direct impact to spawning fish or their incubating redds.
- Fencing: Fencing sensitive riparian areas can be an effective way of protecting riparian resources, fish habitat and fish populations. Platts (1991) found that, in 20 of 21 studies, stream and riparian habitats improved when grazing was prohibited in fenced riparian zones.
- Salting: Placing salt or mineral supplements in upland areas can decrease the amount of time livestock spend in riparian areas. Ehrhart and Hansen (1997) provide evidence that salt, when used in conjunction with alternate water sources, can help distribute livestock over open range
- Off-Stream Water Development: McInnis and McIver (2001) found that off-stream water and salt can attract cows to the uplands enough to significantly reduce uncovered and unstable streambanks.
- Herding: Utilizing riders to keep livestock away from riparian areas can avoid direct impacts to spawning fish and incubating redds.
- Utilization Standards: Establishing utilization standards for forage utilization and moving livestock when these standards are approached or reached, can help avoid many of the adverse effects that livestock grazing can have on fish and their habitat.

All of the six measures identified above have been integrated into the grazing strategy for the Lee Creek Allotment to reduce the potential for adverse effects to listed fish and aquatic and riparian habitats within the action area. Rotation strategies avoid livestock presence during bull trout spawning periods in all years of the grazing rotation cycle. The allotment contains a significant amount of fencing which, in combination with topographical and continuous vegetation corridors, preclude livestock access to much of the streams. Salting is employed in the allotment to keep livestock off stream areas, and troughs in various units provide off-stream watering opportunities. Riders additionally keep livestock in upland areas and off stream channels and riparian areas. Utilization standards have been identified and revised for the various units of the allotment to promote attainment of riparian objectives.

Information on the effectiveness of the proposed conservation measures is limited. Erhart and Hansen (1997) found mixed success when only one technique was applied. However, when applied collectively, this suite of measures has been shown to be effective in minimizing direct livestock impact to spawning habitats and avoiding indirect impacts to aquatic and associated riparian habitats.

The likely impacts of the proposed action on the six grazing focus indicators are discussed below.

7.1.1 SPAWNING AND INCUBATION

Livestock can trample salmonid redds when grazing occurs at times and places where redds are present (Gregory and Gamett, 2009). Factors which can lessen the degree of effects from grazing include active measures to keep cattle off stream channels such as fencing, off channel salting or employment of riders, or natural inaccessibility of streams channels due to topography or dense riparian vegetation.

Listed fish species spawn within a number of streams of the Lee Creek Allotment, and it is possible that livestock could trample redds in these streams if grazing occurs when fish are spawning or eggs are incubating within stream substrates. Effects to listed-species spawning and incubation within the Lee Creek Allotment are discussed individually below.

7.1.1.1 CHINOOK SALMON

Chinook salmon are not currently present within the Lee Creek Allotment action area. Grazing operations therefore have no current potential to effect Chinook salmon spawning or incubation.

7.1.1.2 STEELHEAD

Steelhead are not currently present within the Lee Creek Allotment action area. Grazing operations therefore have no current potential to effect steelhead spawning or incubation.

7.1.1.3 BULL TROUT

Big Eight Mile Creek, Dairy Creek, Stroud and Everson Creeks bull trout populations within the Lee Creek Allotment. It is considered that these streams additionally support spawning habitat for the species.

Based upon proposed grazing rotations within the allotment, and spawning and incubation periodicities identified for these streams, potential livestock impacts to spawning bull trout and or incubating bull trout redds is insignificant. Under the proposed rotation strategy, livestock would be removed from the allotment prior to August 15. This should avoid all potential impacts that could occur from livestock redd trampling.

7.1.2 WATER TEMPERATURE

Stream temperatures can have important effects on fish distribution and abundance. Livestock grazing can impact aquatic and riparian habitats by reducing streamside vegetation or reducing stability of streambanks, both of which can result in channel widening and increased solar exposure leading to elevated stream temperatures (Platts, 1991). Livestock grazing can impact stream temperatures both in areas that are grazed by livestock and in areas downstream from where grazing occurs.

Available monitoring data indicate that water temperatures within the Lee Creek Allotment are meeting all applicable PACFISH and State of Idaho water temperature criteria in most years but may exceed seasonal maxima for bull trout in the lower mainstem reaches of Lee Creek and Big Eight Miles Creek off Forest during warm years.

Since streams in the allotment appear to have healthy riparian areas and with average good width:depth ratios, it is unlikely that livestock grazing has produced measureable impacts to water temperatures in these streams. Livestock will also graze along several tributary streams that are not occupied by listed fish but that flow into streams with listed fish, but these streams are relatively small, generally less than 1.0 m in width, and any potential impacts to water temperatures in these streams resulting from grazing likely could not be meaningfully measured, detected, or evaluated within the allotment streams.

In the absence of observed impacts to stream temperature influencing habitat parameters, it is concluded that recent and future livestock grazing within the Lee Creek Allotment has not and will not result in detectable effects to water temperatures or water temperature regimes within the streams of the action area. Conservation measures of the proposed action, including use of riders to keep livestock away from critical stream reaches, fencing, salting will further serve to reduce potential livestock impact on water temperatures by minimizing riparian vegetation use and livestock impact to streambanks within allotment streams. Because of the expected effectiveness of the project design and associated Conservation Measures in reducing near-stream livestock activity, grazing along these streams is not expected to generate any measurable increases in water temperatures which could be meaningfully measured, detected or evaluated. We, therefore, expect the impact of livestock grazing on stream temperatures within the Lee Creek Allotment action area to be insignificant, and expect that the proposed action will maintain the condition of the Water Temperature focus indicator.

Proposed ongoing MIM monitoring will be effective in identifying future trends of riparian vegetative status and trend within the action area. In combination with additional periodic water temperature monitoring within the watershed, these monitoring operations will be effective in identifying both the occurrence and causal mechanisms of any changed conditions which would initiate responsive modification of grazing management strategies for the allotment under the adaptive management strategy.

7.1.3 SEDIMENT

Elevated levels of stream sediment can affect the survival of salmonid eggs and alevins (Bjornn, et al, 1998). Livestock grazing can increase sediment levels by altering bank stability, riparian vegetation, and

upland vegetation. Livestock grazing and unmanaged trailing activities can impact sediment levels in areas that are grazed by livestock and in areas downstream from where grazing occurs.

Livestock activity within the Lee Creek Allotment is not considered to be a significant factor influencing sediment levels. Stream sediment conditions at the Forests monitoring sites Big Eight Mile Creek identified 16 percent fines at depth during these site's most recent sampling. Monitoring data, including streambank stability and width:depth data, do not indicate or suggest any exacerbation of sediment levels due to cattle grazing within the drainage. Most riparian monitoring sites within the action area are all at Late Seral or PNC.

Conservation Measures associated with the proposed grazing action are considered to be effective in minimizing potential generation of sediment to stream channels of the Lee Creek Allotment action area, and stream sediment conditions are expected to be maintained under the proposed grazing action. Measures including salting, fencing, and use of range riders to keep livestock in upland areas all contribute to minimizing near stream livestock activity which could result in sediment generation to action area streams through direct streambank impact or reduction of stabilizing riparian vegetation.

There will likely be some generation of turbidity in association with incidental livestock crossing of stream channels within the allotment. Turbidities associated with incidental livestock crossing of these sites are expected to be limited to areas immediately below the crossing locations and short-term in nature. Direct and indirect effects of livestock disturbances associated with stream crossings is not expected to be of a magnitude or duration which could produce meaningfully measured, detected or evaluated effects to surface or at-depth substrate sediment levels in areas of existing or future salmonid redds.

Livestock will also graze along tributaries that are not occupied with listed fish but that flow into streams with listed fish. However, the grazing standards in place for these areas should limit grazing impacts to sediment levels in these streams. Furthermore, these streams are relatively small, generally less than 1.0 meter in width, and any increases in sediment levels in these streams resulting from grazing likely could not be meaningfully measured, detected, or evaluated.

In summary, livestock grazing activities within the Lee Creek Allotment action area are not expected to generate any measurable increases to sediment levels in streams containing listed fish or supporting designated critical habitat. Overall, it is believed that the impact of livestock grazing on sediment levels within the action area streams cannot be meaningfully measured, detected, or evaluated. Therefore, we expect the impact of livestock grazing on sediment levels to be insignificant. Because of the expected effectiveness of the project design and associated conservation measures in reducing livestock presence near streams, we believe any livestock related impacts to sediment would be widely distributed across the landscape, individually minor in nature, and cumulatively immeasurable at the watershed scale. The proposed action is expected to maintain the condition of the Sediment Focus Indicator.

Ongoing sediment monitoring will be employed to continue to identify trends of stream substrate conditions within the Lee Creek Allotment. These monitoring operations, supplemented by ongoing MIM monitoring, will be effective in identifying both the occurrence and causal mechanisms of any significant change in substrate conditions which would initiate responsive modification of grazing management strategies for the allotment under the adaptive management strategy.

7.1.4 WIDTH:DEPTH RATIO

Width:depth ratios can have important effects on fish populations and livestock grazing can impact width:depth ratios. Livestock impact width: depth ratios by altering bank stability. Livestock reduce bank stability through direct bank trampling or by modifying the amount or type of riparian vegetation. As bank stability declines, the banks are more susceptible to lateral erosion which can lead to a wider, shallower stream (Platts and Nelson, 1989). Livestock grazing primarily impacts width: depth ratios in the areas that are grazed by livestock. If localized disturbances are severe, however, effects can additionally occur further downstream, as stream channels respond to upstream impact.

Streams of the Lee Creek Allotment are considered to be functioning appropriately with respect to width:depth ratios. Considering both observed width: depth ratios and supplemental streambank stability data and trend, it is concluded that livestock grazing activities have not directly produced or contributed to

any significant impacts on width:depth ratios of streams within the Lee Creek Allotment which can be meaningfully measured, detected or evaluated. The grazing strategies and Conservation Measures of the proposed action serve to minimize potential livestock impacts to channel morphology of action area streams. Use of range riders to keep livestock in upland areas, salting and fencing all contribute to minimizing near stream livestock activity and the potential for direct streambank impacts which could affect channel morphology.

In summary, it is concluded that direct and indirect effects of the proposed livestock grazing action on channel morphology of allotment area streams are insignificant, and are not expected to have any meaningfully measureable or discernable influence on stream channel width:depth ratios within the action area. We recognize there could be localized impacts to both streambanks and stream sediment levels when livestock occasionally step on streambanks and introduce minor qualities of sediment to the stream. However, because of the expected effectiveness of the project design and associated conservation measures in reducing livestock presence near streams, we believe those impacts will be widely distributed across the landscape, individually minor in nature, and cumulatively immeasurable at the watershed scale. The proposed action is therefore expected to maintain the condition of the Width:Depth focus indicator.

Proposed ongoing MIM monitoring will be effective in identifying both the occurrence and causal mechanisms of any significant changes in width:depth ratios of action area streams which would initiate responsive modification of grazing management strategies for the allotment under the Adaptive Management Strategy.

7.1.5 STREAMBANK CONDITION

Streambank conditions can have important effects on fish populations and livestock grazing can impact streambank conditions by direct alteration of the bank or by modifying riparian vegetation (Platts and Nelson, 1989)

Livestock activity within the Lee Creek Allotment is not currently considered to be a significant factor influencing streambank stability. Stream bank conditions appear above stream bank stability goals with most recent readings indicating mid to high 90 percent stabilities. Supplemental monitoring data from within the action area, including stream sediment and width:depth data, do not indicate or suggest impact to stream stabilities due to cattle grazing within the drainage.

The grazing strategies and Conservation Measures associated with the proposed grazing action are considered to be effective in minimizing potential generation of sediment to stream channels of the allotment action area, and streambank conditions are expected to be maintained under the proposed grazing action. Measures including use of range riders to keep livestock in upland areas, salting and fencing all contribute to minimizing near-stream livestock activity which could result in impacts to streambank stability of action area streams. The virtually continuous extensive willow and alder riparian zone of all streams is additionally effective in limiting livestock access and avoiding streambank impacts on this stream.

Given consideration of streambank stability condition and trends and the effectiveness of the identified conservation measures in preventing or minimizing livestock access to allotment stream channels, it is concluded that direct and indirect effects of the proposed livestock grazing actions on streambank conditions within streams of the Lee Creek Allotment are insignificant, and not expected to have any meaningfully measureable or discernable influence on streambank stability levels within the action area. The proposed action is therefore expected to maintain the condition of the Streambank Condition focus indicator. We recognize there could be localized impacts when livestock occasionally step on streambanks. However, because of the expected effectiveness of the project design and associated conservation measures in reducing livestock presence near streams, we believe those impacts will be widely distributed across the landscape, individually minor in nature, and cumulatively immeasurable at the watershed scale.

Future field data collections will continue to identify trends of streambank conditions within grazed portions of the Lee Creek Allotment. Monitoring operations will additionally employ assessments of streambank alteration to identify effectiveness of livestock movement triggers. These monitoring

operations will be effective in identifying both the occurrence and causal mechanisms of any significant change in streambank conditions which would initiate responsive modification of grazing management strategies for the allotment under the Adaptive Management Strategy.

7.1.6 RIPARIAN CONSERVATION AREAS

The condition of riparian areas can have important affects on fish populations. Livestock grazing can impact riparian areas by direct reduction or altering of riparian vegetation and/or by impacting protective streambank cover (Platts and Nelson, 1989). Livestock grazing primarily impacts the riparian conditions in the areas that are grazed by livestock.

Current livestock grazing activities are not considered to be negatively impacting riparian conditions within the Lee Creek Allotment ESA Action Area. Overall riparian conditions within the allotment are good, with the five MIM monitoring sites identifying either full PNC or Late Seral stage. Data for other associated focus indicators, including streambank stability width:depth ratios and substrate sediment levels suggest healthy condition of riparian areas across the allotment. Conservation Measures associated with the proposed action, including salting, water developments and use of riders, are designed to reduce potential impacts of livestock on allotment streams and their associated riparian areas.

Given consideration of overall condition of riparian condition and trends and the effectiveness of these identified conservation measures in preventing or minimizing livestock impacts to allotment stream channels, it is expected that the direct and indirect effects of the proposed actions on riparian conservation areas are not able to be meaningfully measured, detected or evaluated, and are therefore insignificant. The proposed action is expected to maintain the condition of the Riparian Conservation Area focus indicator. We recognize there could be localized impacts when livestock graze within riparian conservations areas. However, because of the expected effectiveness of the project design and associated conservation measures in reducing livestock presence within riparian areas, we believe those impacts will be widely distributed across the landscape, individually minor in nature, and cumulatively immeasurable at the watershed scale.

Future MIM monitoring will continue to identify trends of riparian vegetation conditions within the Lee Creek Allotment. These monitoring operations will be effective in identifying any significant change in riparian conditions which would initiate responsive modification of grazing management strategies for the allotment under the Adaptive Management Strategy.

7.2 CUMULATIVE EFFECTS

The definition of cumulative effects as used for Section 7 consultation under the Endangered Species Act are “those effects of *future State or private activities*, not involving Federal activities, that are *reasonably certain to occur* within the action area” (50 CFR§402.02, emphasis added). This definition should not be confused with the definition that is used for the National Environmental Policy Act and other environmental laws. In this context, cumulative effects apply only to future state and private activities that are reasonably certain to occur. Furthermore, if an activity is currently occurring and will likely continue to occur in the future with similar effects, it is not considered under cumulative effects because it has already been considered in the description of baseline conditions. Agricultural and ranching activities have occurred and are expected to continue to occur on adjacent private lands. However, no potential new State or private activities have been identified within the action area.

7.3 SUMMARY OF EFFECTS

The effects analysis identifies a discountable potential for direct impact of livestock on spawning bull trout and their incubating eggs. Impacts of proposed grazing activities to aquatic and riparian habitat focus indicators within designated or proposed critical habitat portions of the allotment, including water temperature, sediment, width:depth ratio, streambank condition and riparian habitat conservation areas are all identified as insignificant or discountable, The proposed action would maintain these indicators at their current levels of functionality.

Livestock will also graze along tributaries that are not occupied with listed fish but that flow into streams with listed fish. However, the grazing standards in place for these areas should limit grazing impacts in these streams.

Table 6 summarizes effects of proposed Lee Creek grazing operations on aquatic/riparian Pathways and Indicators, including the six identified Focus Indicators (highlighted) addressed in the Effects section of this document.

TABLE 6 – EFFECTS SUMMARY FOR LEE CREEK ALLOTMENT GRAZING ACTIVITIES

Pathway	Indicators	Functionality Of Baseline 1/	**Response Column A** Will the proposed action or any interrelated or interdependent actions likely generate any direct or indirect effects to this indicator?			**Response Column B** Are these effects expected to exceed beneficial, insignificant, or discountable?		
			CH	SH	BT	CH	SH	BT
Subpopulation Characteristics	Subpopulation Size	FR	NO	NO	NO			
	Growth and Survival (including incubation survival)	FA	NO	NO	NO			
	Life History Diversity and Isolation	FUR	NO	NO	NO			
	Persistence and Genetic Integrity	FR	NO	NO	NO			
Water Quality	Temperature	FR	NO	NO	YES			NO
	Sediment	FA	NO	NO	YES			NO
	Chemical Characteristics	FA	NO	NO	NO			
Habitat Access	Physical Barriers	FUR	NO	NO	NO			
Habitat Elements	Substrate Embed.	FA	N/A	N/A	N/A			
	LWD	FA	NO	NO	NO			
	Pool Frequency and Quality	FA	NO	NO	NO			
	Off-channel Habitat	FA	NO	NO	NO			
	Refugia	FA	NO	NO	NO			

Channel Condition and Dynamics	Width:Depth Ratio	FR	NO	NO	YES			NO
	Streambank Condition	FA	NO	NO	YES			NO
	Floodplain Connectivity	FA	NO	NO	NO			
Flow/Hydrology	Change in Peak/Base Flows	FUR	NO	NO	NO			
	Increase in Drainage Networks	FA	NO	NO	NO			
Watershed Conditions	Road Density and Location	FR	NO	NO	NO			
	Disturbance History	FA	NO	NO	NO			
	Riparian Conservation Areas	FA	NO	NO	YES			NO
	Disturbance Regime	FA	NO	NO	NO			
Integration of Species and Habitat Conditions	Habitat Quality and Connectivity	FR	NO	NO	NO			

Non-highlighted elements refer to overall conditions within the Big Eight Mile/Lee Creek Watershed as identified in Matrix Table (Appendix B)

Highlighted elements refer to functionality conditions of Lee Creek Allotment action area Focus Indicators

8 EFFECTS DETERMINATION

The effects determination for each species was made using the above analysis and the effects determination key (Table 6). The specific determinations are identified below and summarized in Table 7.

8.1 SNAKE RIVER SPRING/SUMMER CHINOOK SALMON

The action area does not currently support Chinook salmon. Therefore, the proposed action results in a "NO EFFECT" determination for Chinook salmon. Designated critical habitat for Chinook salmon does not exist within the action area, therefore, the proposed action results in a "NO Affect" designated Chinook salmon critical habitat.

8.2 SNAKE RIVER STEELHEAD

The action area does not currently support steelhead. Therefore, the proposed action results in a "NO EFFECT" determination for steelhead. The action area does not support Designated Critical Habitat for steelhead. Therefore the proposed action results in a NO EFFECT determination for designated steelhead critical habitat.

8.3 COLUMBIA RIVER BULL TROUT

The effects analysis concluded that the proposed action would not have direct effects to bull trout or bull trout redds within the action area which are not considered insignificant or discountable. Potential for direct trampling of bull trout redds within action area streams is considered insignificant and discountable. Therefore, the proposed action results in a "Not LIKELY TO ADVERSELY AFFECT" determination for bull trout.

The action area contains proposed critical habitat for bull trout and, and the effects analysis concluded that the proposed action may have some effects proposed bull trout critical habitat. However, these effects are expected to be insignificant or discountable. In addition, all vegetation pathway indicators, PCEs, and the grazing focus indicators are being met with current livestock management practices. Therefore, the proposed action results in a "NOT LIKELY TO ADVERSELY AFFECT" determination for proposed bull trout critical habitat.

8.4 SNAKE RIVER SOCKEYE SALMON

The action area does not contain sockeye salmon or sockeye salmon designated critical habitat. Therefore, the proposed action results in a "NO EFFECT" determination for sockeye salmon and a "NO EFFECT" determination for designated sockeye salmon critical habitat.

8.5 ESSENTIAL FISH HABITAT

The Magnuson-Stevens Fishery Conservation and Management Act requires federal agencies to evaluate the impact of actions authorized, funded, or undertaken by the agency that may adversely affect the essential fish habitat of commercially harvested species. Within the scope of this action this includes Chinook salmon. Based on the above analysis, the proposed action will have "NO EFFECT" to Chinook salmon Essential Fish Habitat.

TABLE 7 – EFFECTS DETERMINATION SUMMARY FOR LEE CREEK ALLOTMENT GRAZING ACTIVITIES

	Chinook Salmon		**Steelhead**		**Bull Trout**	
	Species	**Designated Critical Habitat**	**Species**	**Designated Critical Habitat**	**Species**	**Proposed Critical Habitat**
Determination[1]	No Effect	No Effect	No Effect	No Effect	Not Likely to Adversely Affect	Not Likely to Adversely Affect

[1] The 'Species' column is for determining effects to the species. The 'Habitat' column is for determining effects to designated or proposed critical habitat. The species determinations are made as follows: No Effect (NE) if the species is not present in the action area or the proposed action or any interrelated or interdependent actions will not affect any individuals, May Affect- Not Likely to Adversely Affect (MA-NLAA) if the proposed action or any interrelated or interdependent actions may affect but will likely not adversely affect any individuals, and May Affect- Likely to Adversely Affect (MA-LAA) if the proposed action or any interrelated or interdependent actions will result in take of individuals. The habitat determinations are made as follows: NE if the action area does not contain designated critical habitat or all of the responses associated with habitat in 'Response Column A' are 'NO', NLAA if all of the responses associated with habitat in 'Response Column B' are 'NO', LAA if any of the responses associated with habitat in 'Response Column B' are 'YES'.

APPENDIX A
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APPENDIX B
WATERSHED BASELINES WITH
MATRICES OF DIAGNOSTIC PATHWAYS AND INDICATORS

BIG EIGHT MILE/LEE CREEK WATERSHED BASELINE

Agency: USDA Forest Service, Salmon-Challis National Forest	**HU Code and Name: 1706020404/17060200406 Big Eight Mile Creek/Lee Creek**
Unit: Leadore Ranger District	**Spatial Scale of Matrix:** Two HUC 6s
Fish Species Present: Bull Trout	**Designated Critical Habitat Present:** Bull trout (Proposed)
Anadromous Species Population: N/A	**Anadromous Species Subpopulation:** N/A
Bull Trout Core Area: Lemhi River	**Local Population:** Upper Lemhi River
Management Actions: Ongoing	**Updated:** 02-05-2010

Subpopulation Characteristics		
Pathways Indicators	**Baseline**	**Discussion of Baseline – Current Condition**
Subpopulation Size	FR	PJ; there is limited data available on population sizes in this subwatershed; UCRB identified it as a bull trout stronghold area; fluvial populations likely absent due to seasonal dewatering. Surveys of Big Eight Mile documented bull trout present in all suitable and accessible habitat.
Growth and Survival	FA	PJ; fish are present in all suitable habitat providing sources for recovery from short term disturbances; overall habitat conditions in the watershed are good.
Life History Diversity and Isolation	FUR	There are numerous unscreened irrigation diversion structures which may be barriers to migration.
Persistence and Genetic Integrity	FR	Limited potential for fluvial populations due to seasonal dewatering, but bull trout are present throughout Big Eight Mile Creek; no brook trout known, although present in the upper Lemhi River.
Water Quality		

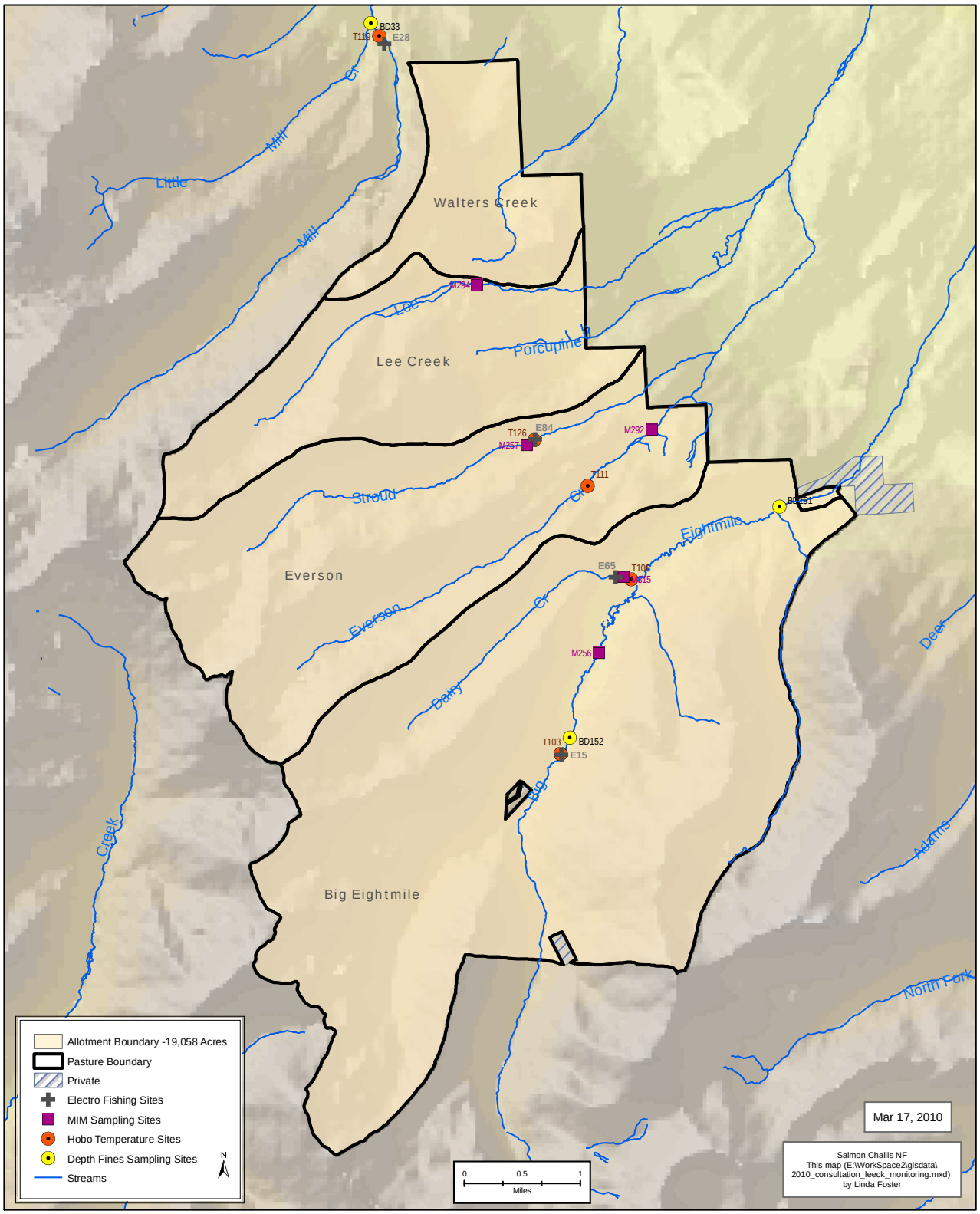
Pathways Indicators	Baseline	Discussion of Baseline – Current Condition
Temperature (7day average. Maximum, ^{o}C)	FR	As is typical for most systems in the Lemhi, stream temperature increase moving downstream. Monitoring data off Forest is not available , but given water withdrawals and similar situations in the Lemhi indicate that water temperatures are functioning at risk in the lower portions of the watershed.
Sediment	FA	Core sampling has been done by the USFS at 2 sites in the watershed since 1993. The averages for the Big Eight Mile Creek (18%) are within norms of a functioning system.
Chemical Contaminants/Nutrients	FA	Although on the 1996 303(d) list for nutrients, IDEQ did not undertake any nutrient sampling during BURP analysis in 1997; no evidence of increased nutrient loading observed (IDEQ, 1998) The stream has not appeared on any subsequent Section 303(d) list.
Habitat Access		
Pathways Indicators	**Baseline**	**Discussion of Baseline – Current Condition**
Physical Barriers	FUR	There are 13 active diversions in the Lee Creek Drainage and 14 diversions in the Big Eight Mile Drainage. Big Timber Creek, including the Carey Act Dam, and another five on its tributary streams (see Physical All of these 18 diversions have the potential to be barriers to fish migration at some life stage. None of the diversions within the watershed are screened to prevent access by fish. If fish could enter the creek to spawn, fish loss would occur as the juveniles could enter the ditches on their downstream migration.
Habitat Elements		
Pathways Indicators	**Baseline**	**Discussion of Baseline – Current Condition**
Substrate Embeddedness	FA	Occasionally exceeds standards on lower BLM; likely due to seasonal release of fines stored behind Carey Act dam; data available. PJ; the most recent embeddedness data (IDEQ, 1996) showed that embeddedness was less than 20% at several sites.
Large Woody Debris	FA	Big Timber Creek and tributaries are almost entirely a meadow/willow dominated stream, and except in the headwaters for which no data exists, LWD criteria do not apply (PIBO, 2003a; 2003b).
Large Pools or Pool	FA	PIBO (2003b) shows that Big Timber Creek at the BLM integrator site meets PACFISH criteria for this parameter. R1/R4 data for Big Timber as compared to the Natural Conditions

Frequency and Quality		Database supports this determination.
Off-channel Habitat	FA	PJ inferred from numerous field visits by BLM biologists; the upper watershed has a few old beaver complexes; the existing habitat provides a variety of habitats and flow regimes for all life stages..
Refugia	FA	PJ; much of habitat is generally unimpacted.
Channel Condition & Dynamics		
Pathways Indicators	**Baseline**	**Discussion of Baseline – Current Condition**
Average Wetted Width/Maximum Depth Ratio	FR	PJ: Width depth rations range from 12-18. Although NMFS (1996) criteria for Proper Functioning are not met, Rosgen (1996) states that the w/d ratio at all B and C channel types generally exceed 12. However, these values are probably still high.
Streambank Condition	FA	USFS sampling sites typically exceed 90% stable.
Floodplain Connectivity	FA	Nothing precludes access by the stream to its floodplain. During high water events Big Timber actively accesses its floodplain.
Flow/Hydrology		
Pathways Indicators	**Baseline**	**Discussion of Baseline – Current Condition**
Change in Peak/base Flows	FUR	Diversion of water by private irrigation practices alters flow regime, particularly in the lower few miles, but stream is seasonally connected. Flow regime in upper half of watershed is minimally impacted by irrigation diversions.
Increase in Drainage Network	FA	PJ; due to limited roads within riparian areas
Watershed Condition		
Pathways Indicators	**Baseline**	**Discussion of Baseline – Current Condition**
Road Density and Location	FR	Road density is 1.0 mi/mi^2. The watershed has approximately 20.3 miles of roads within an RHCA, which is 24.1% of the roads within the watershed.

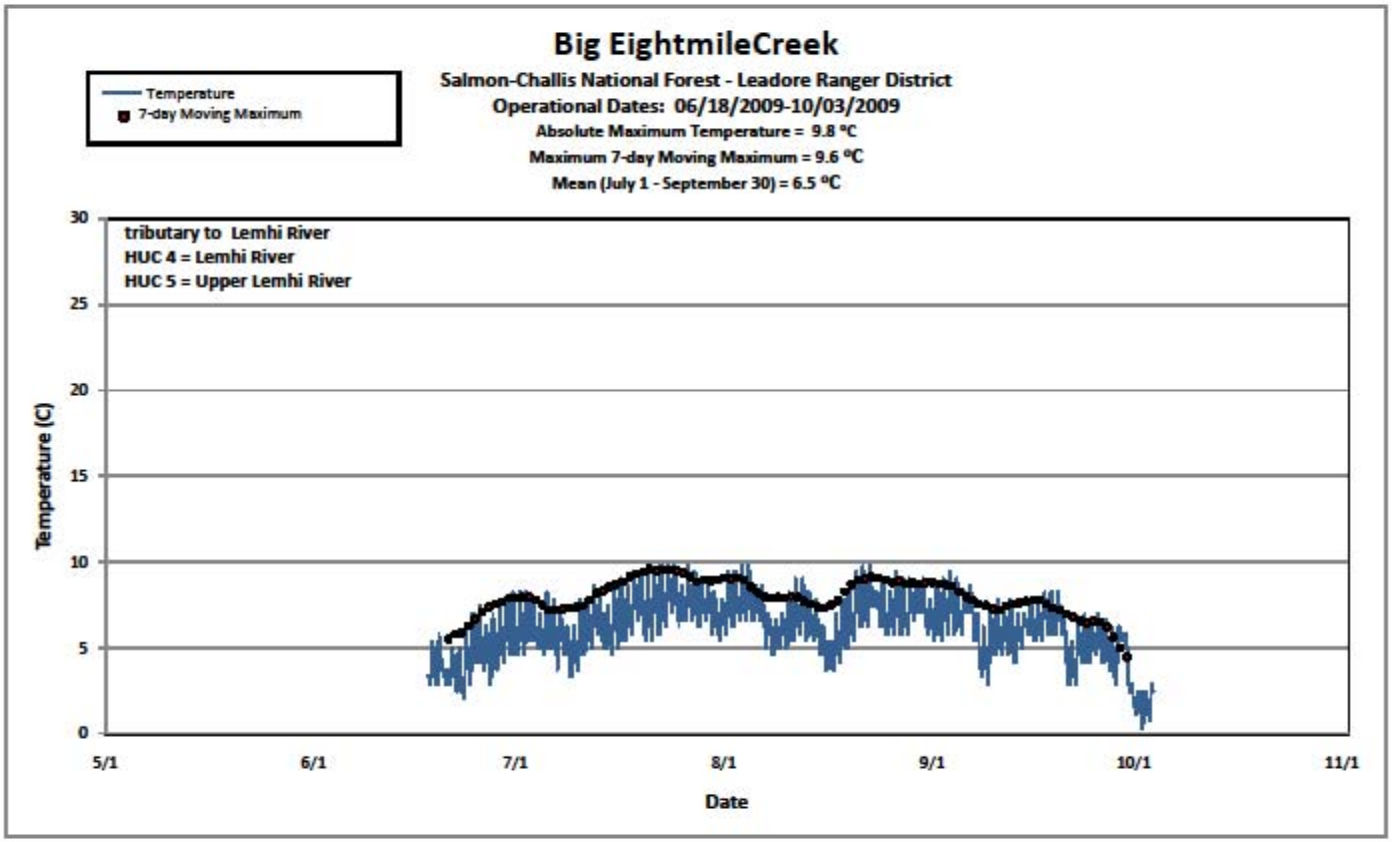
Disturbance History	FA	Overall ECA is 1.8%. No timber harvest in RHCA or potentially unstable areas. Potential for cumulative effects is classed as low.
Riparian Conservation Areas	FA	PJ; inferred from multiple field visits and BLM PFC data: PFC data shows an upward trend, but some areas are still “at risk”; impacts exist from irrigation, roads, mining, beaver, grazing and recreation, but given the scope of these impacts against the scale of the watershed, they are minimal in nature.
Disturbance Regime	FA	PJ; due to limited roading and disturbance.
Integration of Species and Habitat Conditions		
Pathways Indicators	**Baseline**	**Discussion of Baseline – Current Condition**
Habitat Quality and Connectivity	FR	This stream is seasonally disconnected from the Lemhi River with numerous diversions which alter flow regimes and have resulted in areas of decadent riparian vegetation. Fisheries inventories in the upper watershed on the BLM and IDFG documented a very functional system with very limited impacts from livestock grazing. Impacts were typically limited to stream crossings along fencelines and some open meadow areas. The uppermost portions of the headwater tributaries are non-fishbearing, but bull trout dominated most other streams in the area.

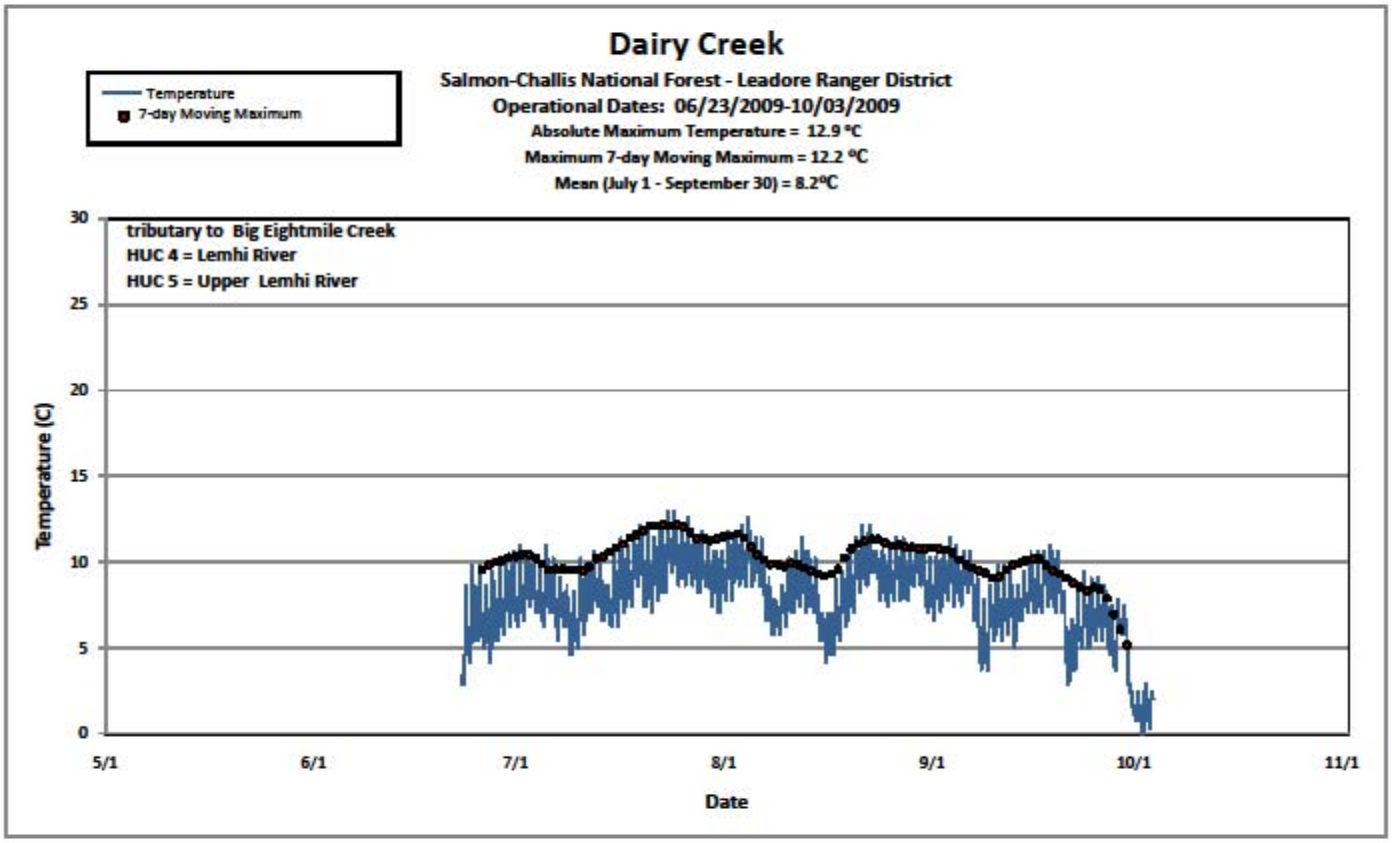
APPENDIX C
MONITORING DATA AND SUMMARIES

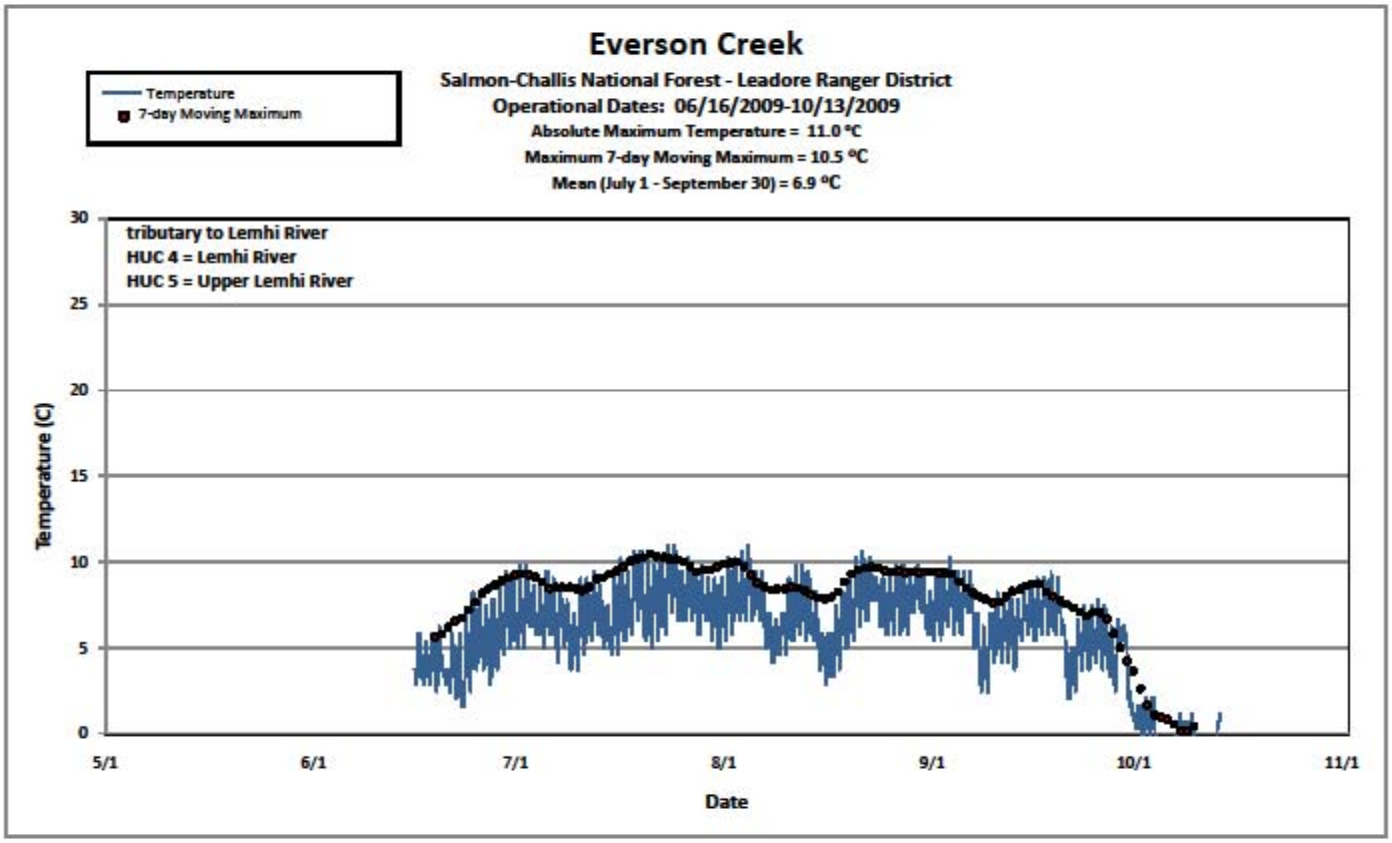
APPENDIX C FIGURE 1 – MONITORING LOCATIONS WITHIN THE LEE CREEK ALLOTMENT ACTION AREA

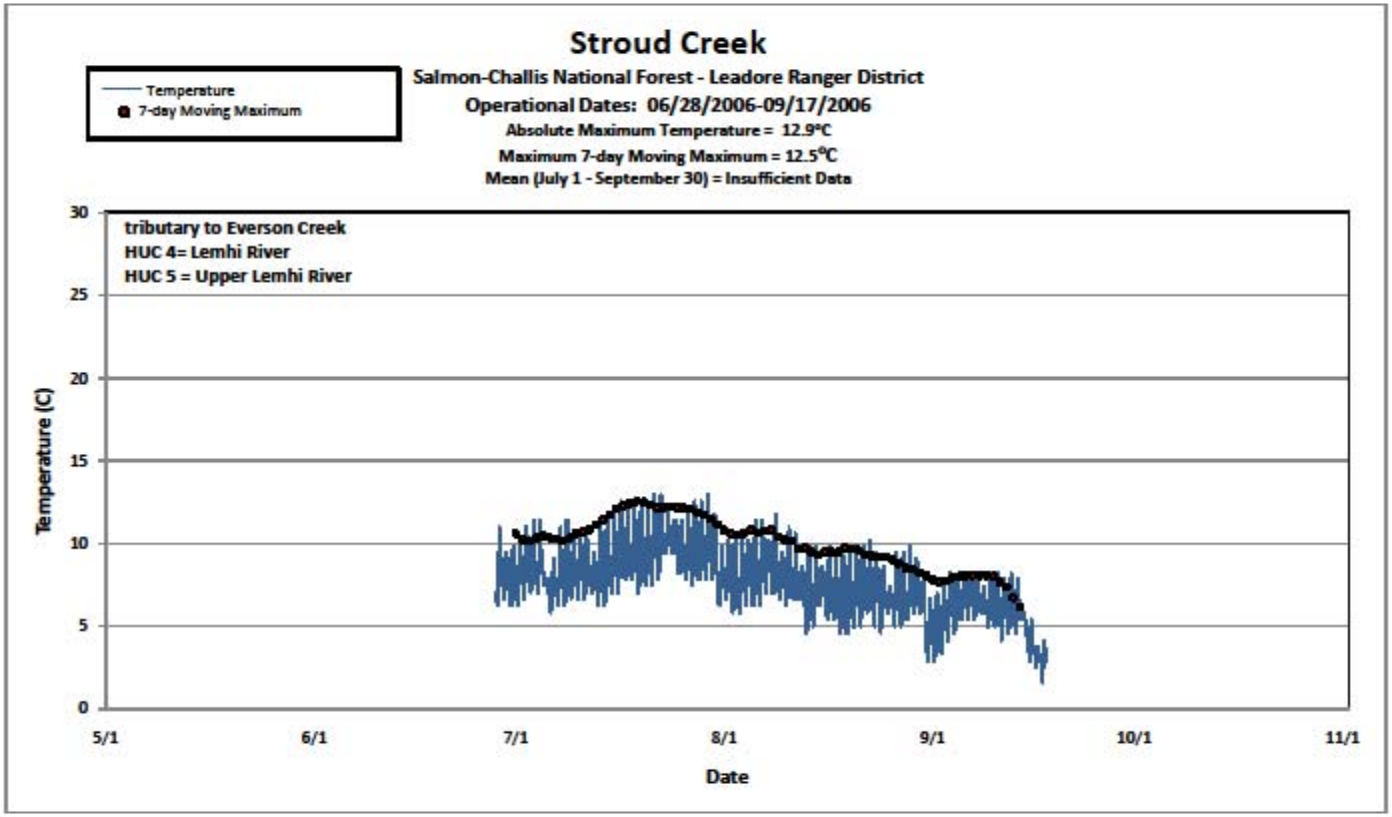


APPENDIX C FIGURE 2 – BIG EIGHT MILE AND LEE CREEK WATER TEMPERATURES 2009




Dairy Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 06/23/2009-10/03/2009
Absolute Maximum Temperature = 12.9 °C
Maximum 7-day Moving Maximum = 12.2 °C
Mean (July 1 - September 30) = 8.2°C
Temperature
7-day Moving Maximum
tributary to Big Eightmile Creek
HUC 4 = Lemhi River
HUC 5 = Upper Lemhi River
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date


Everson Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 06/16/2009-10/13/2009
Absolute Maximum Temperature = 11.0 °C
Maximum 7-day Moving Maximum = 10.5 °C
Mean (July 1 - September 30) = 6.9 °C
Temperature
7-day Moving Maximum
tributary to Lemhi River
HUC 4 = Lemhi River
HUC 5 = Upper Lemhi River
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date


Stroud Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 06/28/2006-09/17/2006
Absolute Maximum Temperature = 12.9°C
Maximum 7-day Moving Maximum = 12.5°C
Mean (July 1 - September 30) = Insufficient Data
Temperature
7-day Moving Maximum
tributary to Everson Creek
HUC 4= Lemhi River
HUC 5 = Upper Lemhi River
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date

APPENDIX C TABLE 1 – SEDIMENT - MEAN PERCENT FINES <.25 AT DEPTH

Mean Percent Fines <.25" at Depth

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Big Eightmile Creek 1R	31.6	19.3		22.9	16.4	17.9	20.3	13.4	12.5		21.0	9.3					16.1
Big Eightmile Creek 2R	22.2	14.5	21.8	13.5	21.6	11.9		22.8		20.0	11.9	9.3					16.5

APPENDIX C TABLE 2 – PERCENT BANK STABILITY

Percent Bank Stability

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Big Eightmile Creek 1R		100.0		91.0	79.0	88.5	69.0	84.0	86.0		88.5						97.5
Big Eightmile Creek 2R		91.5	95.5	93.0	73.0	93.5		85.0		80.5	91.0	96					92

APPENDIX C TABLE 3 – GREENLINE ECOLOGICAL STATUS

Unit	Creek Name	Site Number	Year	Greenline Ecological Status (GES)	GES Trend	Summary of Trend
Lee Creek	Upper Lee Cr.		1989	75/LS	Base	GES is in a downward trend at Mid Seral. Site is dominated by willow and very rocky.
			1999	47/MS	Down	
	Lower Lee Cr.	M294	1998	69/LS	Base	GES is static at PNC. Site is dominated by conifers. Livestock have limited access to the stream.
			2004	108/PNC	Up	
			2009	PNC	Static	
Everson	Everson Cr.	M292	1989	57/MS	Base	GES is static at PNC. Site is dominated by conifers and willows. Livestock have limited access to the stream.
			2000	95/PNC	Up	
			2009	PNC	Static	
	Stroud Cr.	M257	1996	32/ES	Base	GES is static at LS. Site is dominated by conifers. Livestock have limited access to the stream.
			2001	82/LS	Up	
			2009	LS	Static	
Big 8-Mile	Big 8-Mile Cr.	M256	1990	63/LS	Base	GES is static at PNC. Site is dominated by Willows. Livestock have limited access to the stream.
			1996	78/LS	Static	
			2001	98/PNC	Up	
			2009	PNC	Static	
	Dairy Creek	M315	1989	57/MS	Base	GES is upward at Late Seral. Site is dominated by Willows and Alder. Access is limited to a few open areas along stream.
			1999	58/MS	Static	
			2004	62/LS	Up	
Walters	Walters Cr.	M294	1999	79/LS	Base	GES is static at LS. Site is dominated by Willows with a Carex understory. Site needs to be revisited to get bank stability data.
			2004	LS	Static	

APPENDIX C FIGURE 3 – BIG EIGHTMILE CREEK

APPENDIX C FIGURE 4 – DAIRY CREEK

APPENDIX C FIGURE 5 – EVERSON CREEK

APPENDIX C FIGURE 6 – STROUD CREEK

APPENDIX D

PROTOCOL FOR MAPPING CHINOOK SALMON CRITICAL HABITAT CURRENTLY DESIGNATED

ON THE SALMON-CHALLIS NATIONAL FOREST

PROTOCOL FOR MAPPING CHINOOK SALMON CRITICAL HABITAT CURRENTLY DESIGNATED

ON THE SALMON-CHALLIS NATIONAL FOREST

This document summarizes the process that will be used by the Salmon-Challis National Forest (SCNF) to map Chinook salmon critical habitat (CSCH) as currently designated by NOAA Fisheries on the SCNF. Critical habitat has been designated for Snake River spring/summer Chinook salmon and includes "river reaches presently or historically accessible…to Snake River spring/summer Chinook salmon" (Federal Register 58(247):68543-68554). However, this designation did not provide a detailed description of the specific areas included in the designation. Such a description is essential when completing site specific consultations to determine if CSCH is present within the action areas. The purpose of this project is to create a GIS layer that delineates the specific areas that are designated as CSCH in this rule. It should be emphasized that this process is not to "designate" CSCH but to portray the SCNFs interpretation, using the identified process, of those areas that have already been designated by the rule. For the purposes of the project, we assume CSCH to be all areas currently or historically occupied by Chinook salmon. This process includes only those areas within the administrative boundary of the SCNF.

The process will use the NHD stream layer as the base layer. By default, all streams will initially be considered to not be CSCH. The following steps will then be used to map designated CSCH.

Step 1: Add reaches identified by the Intrinsic Potential Model

An Intrinsic Potential Model (IPM) developed by the National Marine Fisheries Service (Cooney and Holzer 2006) has been used to model potential spawning and rearing habitat within the SCNF. All stream reaches identified by the IPM shall be mapped as CSCH.

Step 2: Remove reaches that were inappropriately identified by the IPM

The IPM has the potential to identify streams or portions of streams where Chinook salmon could not have occurred. This step involves identifying these reaches and removing them from the CSCH layer. Forest fish staff will review stream reaches selected by the IPM and identify those that were inappropriately included. This may include, but not be limited to, stream reaches that are a) ephemeral, b) above natural barriers, or c) too small to support Chinook salmon. Documentation supporting the removal of each stream reach must be provided.

Step 3: Add reaches where Chinook salmon have occurred based on redd data, but have not been identified in previous steps as CSCH

Chinook salmon redd surveys have been conducted by various organizations. These data will be reviewed by Forest fish staff and all sites where Chinook salmon redds have occurred that have not already been identified as CSCH shall be mapped. Documentation supporting the inclusion of each stream reach must be provided.

Step 4: Add reaches where Chinook salmon have been observed during SCNF fisheries assessments, but have not been identified in previous steps as CSCH

The SCNF has conducted various fisheries assessments and resulting data contain site-specific information regarding Chinook presence in streams. These data may include, but not be limited to, a) general fish population assessments, b) fish population monitoring, c) project specific monitoring, d) observation by Forest Service personnel, and e) R1/R4 surveys. These data will be reviewed by Forest fish staff and all sites where Chinook salmon have occurred that have not already been

identified as CSCH shall be mapped. Documentation supporting the inclusion of each stream reach must be provided.

Step 5: Add reaches where Chinook salmon have been observed during fisheries assessments conducted by external organizations, but have not been identified in previous steps as CSCH

Various organizations other than the SCNF have conducted fisheries assessments and resulting data are valuable for identifying areas where Chinook salmon have occurred within the SCNF. Such organizations may include, but not be limited to a) the Idaho Department of Fish and Game, b) the Department of Environmental Quality, and c) Native American Tribes. These data will be reviewed by Forest fish staff and all sites where Chinook salmon have occurred that have not already been identified as CSCH shall be mapped. Documentation supporting the inclusion of each stream reach must be provided.

Step 6: Add reaches that may provide or may have provided tributary refugia to Chinook salmon, but have not been identified in previous steps as CSCH

Chinook salmon may occupy portions of tributary streams that are not directly associated with spawning areas. Chinook salmon can encounter water temperature or turbidity conditions that are temporarily less than optimal or are lethal (Torgersen et al. 1999; Scrivener et al. 1993). When this occurs, the fish may move to tributary streams that have more suitable conditions but that the fish would not otherwise occupy. We refer to these areas as tributary refugia.

It is important to know how far Chinook salmon may move up tributary refugia. However, most of the information that we found (e.g. – Scrivener et al. 1994, Malsin et al. 1996-1999, Murray and Rosenau 1989) was not directly applicable to the set of conditions present on the SCNF in central Idaho. Those studies with data most closely representing conditions found in central Idaho show that fish seeking refugia primarily use confluence areas (Strange 2007; Torgersen et al. 1999). Since we were not able to locate information on use-patterns in tributary refugia, we used professional judgment to estimate how far up these tributaries Chinook salmon might move. Based on our review of fish population and stream habitat data from the Salmon River basin, we concluded that Chinook salmon likely do not move more than 0.25 miles up a tributary if the only reason they are in the stream is to seek refugia.

Although the previous steps in this process have likely identified most stream reaches that are tributary refugia, it is possible that some of these areas have still not yet been included. This step allows the addition of tributary refugia using the following set of criteria as a guideline for mapping. Professional judgment shall be used and documentation supporting the addition of each stream reach must be provided.

a) **Proximity to CSCH:** The tributary must connect to a stream or river currently included as CSCH.

b) **Watershed Size:** An evaluation of the smallest tributaries where Chinook salmon presence was confirmed within the SCNF can be useful in estimating the lower limits to watershed size constraining use of streams by Chinook. The average lower limit to watershed size where Chinook were present or presumed likely to use as refuge on the South Zone of the SCNF was approximately seven square miles. This value or a value that is appropriate for a given geographic area may be used to identify tributaries where it is reasonable to assume that Chinook salmon can access and use as refuge.

c) **Fish-Bearing Streams:** Streams accessible to other salmonids can reasonably be assumed to be accessible to Chinook. Tributaries that contain other salmonids and are not smaller that the lower limit to watershed size shall be considered for inclusion as CSCH for 0.25 miles upstream from the confluence. Tributaries meeting this criterion, but exhibiting barriers to migration at the confluence shall be considered for exclusion from CSCH.

d) **Non-Fish-Bearing Streams:** Streams inaccessible to other salmonids can reasonably be assumed to be inaccessible to Chinook and shall generally be considered for exclusion from CSCH.

***** Streams lacking fish occurrence data shall be evaluated for inclusion in or exclusion from CSCH based upon the watershed size and professional judgment.

Step 7: Add reaches that, based on professional judgment, may be currently or may have been historically occupied by Chinook salmon, but have not been identified in previous steps as CSCH

It is possible that the previous steps have not identified all reaches that either currently contain or historically contained Chinook salmon. This step allows Forest fish staff to use professional judgment to identify any additional CSCH that may have been missed in the previous steps. Documentation supporting the addition of each stream reach must be provided.

Step 8: Add reaches that are downstream from CSCH identified in the previous steps

Since Chinook salmon migrate to the Pacific Ocean, they will occur at least seasonally in all areas downstream of the stream reaches identified as CSCH in the previous steps. Therefore, all reaches downstream of areas identified in the previous steps as CSCH shall also be mapped as CSCH.

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APPENDIX E

BULL TROUT CONSTITUENT ELEMENTS OF CRITICAL HABITAT

Primary Constituent Elements of Critical Habitat

The Forest has utilized six "Focus Indicators" to characterize the condition of the habitat for listed fish species on streams within allotments on the Salmon-Challis National Forest. These are: 1) spawning and incubation, 2) temperature, 3) sediment, 4) width: depth ratio, 5) streambank condition, and 6) riparian conservation areas. These indicators also serve to form the basis for potential impacts to the Primary Constituent Elements (PCEs) for Chinook salmon, steelhead and proposed bull trout critical habitat.

The following are the specific PCEs for the proposed bull trout critical habitat (January13, 2010, Federal Register 75FR2270) and examples of habitat indicators that can be used to assess the condition of the PCEs. Many of the Forest "focus indicators" match the examples (highlighted in the Associated Habitat Indicators). They have been thoroughly addressed within the environmental baseline conditions and the site specific effects analysis. Therefore, they form the basis for the Forest's determination for effects to the species and potential critical habitat.

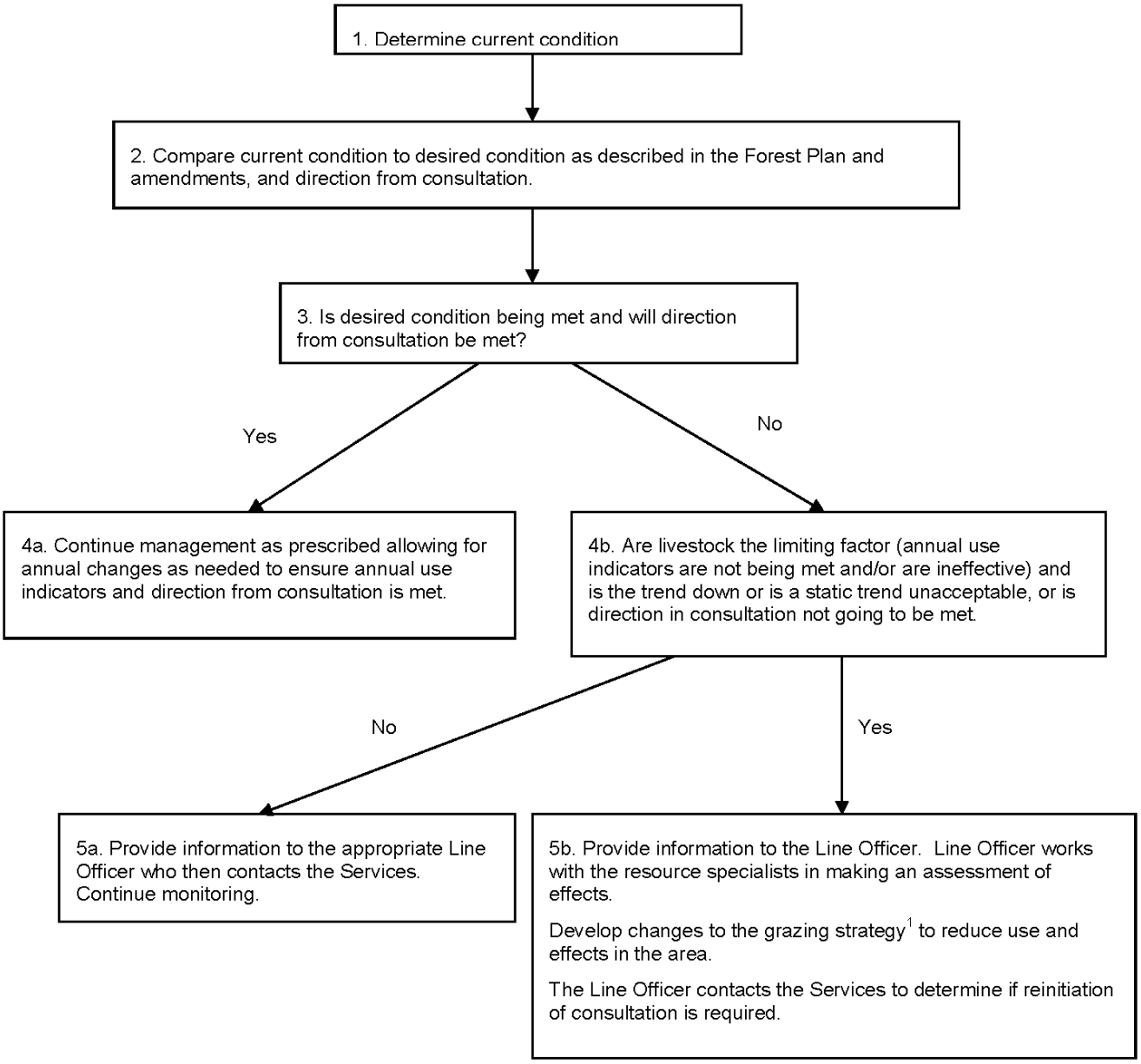
Primary Constituent Elements for Proposed Bull Trout Critical Habitat and Associated Habitat Indicators

PCE #	PCE Description	Associated Habitat Indicators
1.	Springs, seeps, groundwater sources, and subsurface water connectivity (hyporehic flows) to contribute to water quality and quantity and provide thermal refugia.	floodplain connectivity, change in peak/base flows, increase in drainage network, **riparian conservation areas**, chemical contamination/nutrients
2.	Migratory 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.	life history diversity and isolation, persistence and genetic integrity, **temperature**, chemical contamination/nutrients, physical barriers, **average wetted width/maximum depth ratio in scour pools in a reach**, change in peak/base flows, refugia
3.	An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.	growth and survival, life history diversity and isolation, **riparian conservation areas**, floodplain connectivity (importance of aquatic habitat condition indirectly covered by previous seven PCEs)
4.	Complex river, stream, lake, reservoir, and marine shoreline aquatic environments and processes with features such as large wood, side channels, pools, undercut banks and substrates, to provide a variety of depths, gradients, velocities, and structure.	large woody debris, pool frequency and quality, large pools, off channel habitat, refugia, **average wetted width/maximum depth ratio in scour pools in a reach**, **streambank condition**, floodplain connectivity, **riparian conservation areas**
5.	Water temperatures ranging from 2 to 15 °C (36 to 59 °F), with adequate thermal refugia available for temperatures at the upper end of this range. Specific temperatures within this range will vary depending on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shade, such as that provided by riparian habitat; and local groundwater influence.	**temperature**, refugia, **average wetted width/maximum depth ratio in scour pools in a reach**, streambank **condition**, change in peak/base flows, **riparian conservation areas**, floodplain connectivity
6.	Substrates 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 (e.g., less than 12 percent) of fine substrate less than 0.85 mm (0.03 in.) in diameter and minimal embeddedness of these fines in larger substrates are characteristic of these conditions.	**sediment**, **substrate embeddedness**, large woody debris, pool frequency and quality

7.	A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, they minimize departures from a natural hydrograph.	change in pea k/base flows, increase in drainage network, disturbance history*, disturbance regime (* Information relative to disturbance history is often found in the baseline narrative)
8.	Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.	**sediment**, chemical contamination/nutrients, change in peak/base flows
9.	Few or no nonnative predatory (e.g., lake trout, walleye, northern pike, smallmouth bass; inbreeding (e.g., brook trout); or competitive (e.g., brown trout) species present.	persistence and genetic integrity, physical*barriers* (* Information relative to disturbance history is often found in the baseline narrative)

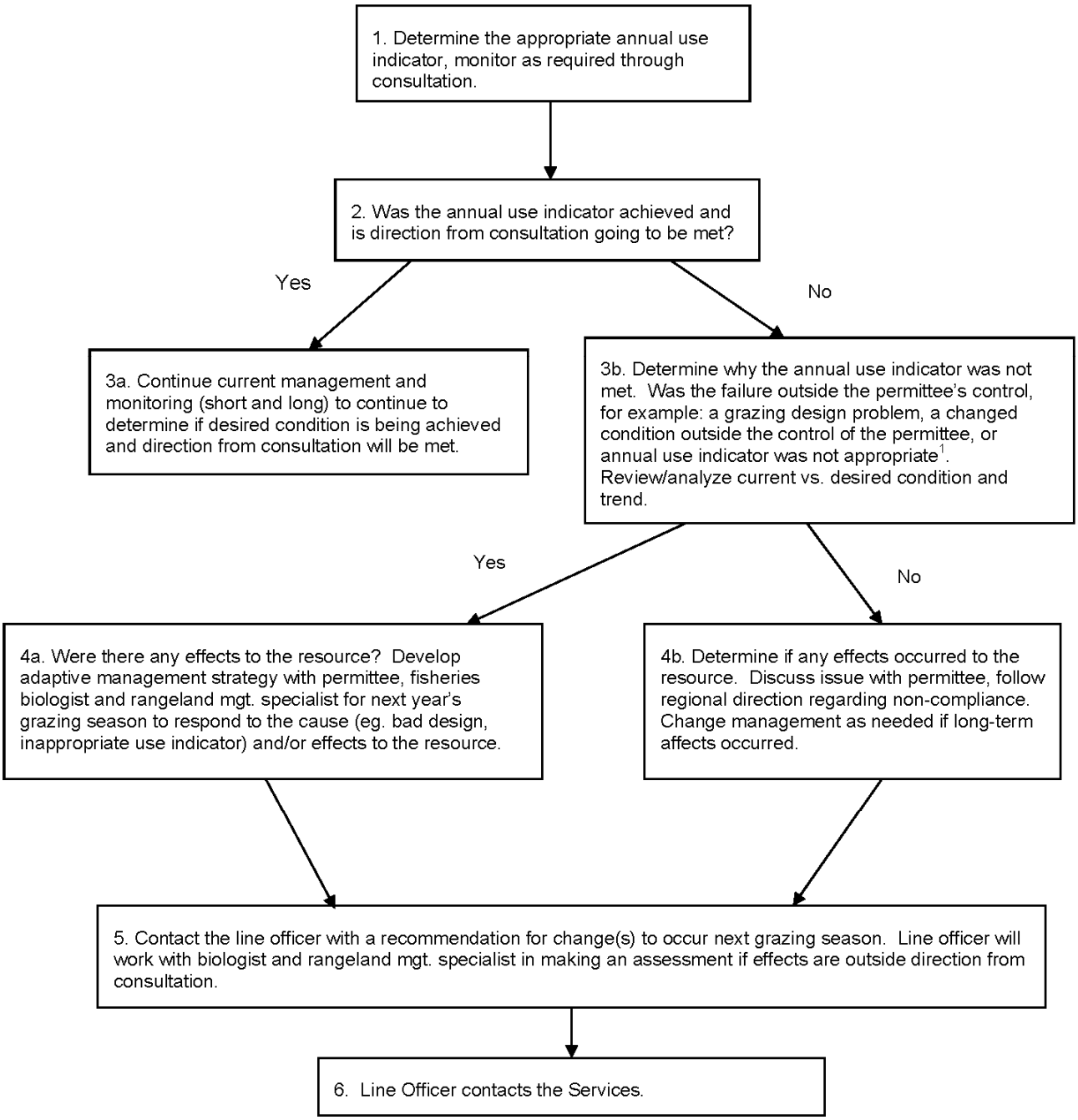
APPENDIX F
ADAPTIVE MANAGEMENT DIAGRAMS

Diagram 1.0 – Implementation of Long-Term Adaptive Management Strategy for Allotments Requiring Consultation.



[1]Management actions will initially reduce use in the area. It is expected this may occur in any number of ways including but not limited to changing the season of use, reducing numbers, changing amount of use on annual indicator, changing herding practices, changing salting practices and/or reconstructing/constructing range improvements. If use can't be reduced and livestock continue to be the limiting factor total removal of livestock from the area may be necessary. Effectiveness of changed management will be monitored through adjusted annual use indicators and effectiveness monitoring.

Diagram 2.0 - Implementation of Annual Adaptive Management Strategy for Allotments Requiring Consultation.



[1]An inappropriate annual use indicator is an indicator that does not most accurately identify the weak link or first attribute that would indicate excessive livestock impacts. In this situation, changing to a more appropriate indicator will help achieve or maintain desired conditions.