Aquatic Species Biological Assessment for the Little Eightmile Cattle & Horse Allotment

LEADORE RANGER DISTRICT

SALMON-CHALLIS NATIONAL FOREST

LEMHI COUNTY, IDAHO

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1 INTRODUCTION

The Leadore Ranger District of the Salmon-Challis National Forest (SCNF) authorizes livestock grazing activities within the Little Eightmile Cattle & Horse Allotment. This biological assessment describes the proposed action and discusses the probable impacts of that action on listed species and designated critical habitat that may be affected. This biological assessment forms the basis for any necessary consultation with the Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) (collectively the "Services") pursuant to section 7 of the Endangered Species Act (ESA) 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

The Little Eightmile Allotment grazing activities are conducted within one 5th field hydrologic unit codes, the Upper Lemhi River 5th field HUC (1706020405).

The following is a general description of the Little Eightmile Allotment. The Little Eightmile Allotment is located approximately 7 miles northwest of Leadore, Idaho. Within the Little Eightmile Allotment boundary there are no State lands and approximately 20 acres of a private land parcel.

Natural Physical Characteristics

Hydrology – There are two main drainages within the Little Eightmile Allotment. The following information was calculated using the USGS Idaho StreamStats web based program and the Forest's Snake River Adjudication data.

> Little Eightmile Creek: Little Eightmile Creek, within the allotment, is a high gradient mountain stream that drains an estimated 14.05 square miles and has a yearly average discharge estimated at 5.5 cfs. There is an estimated mean annual precipitation of 18.8 inches.
>
> There are eight diversions that take water from the drainage. At certain times of the year enough water is diverted from the stream to prevent its reaching the convergence with the Lemhi River. A total of three claims to the water exist, totaling 4.58 cfs for the period of March 15 through November 15 (USDI BLM, 2003).
>
> unnamed tributary to Little Eightmile Creek: This unnamed tributary to Little Eightmile Creek, within the allotment, is a small high gradient mountain stream that drains an estimated 6.98 square miles and has a yearly average discharge estimated at 5.3 cfs. There is an estimated mean annual precipitation of 20.5 inches.

Land Description

Little Eightmile Creek: The Little Eightmile Creek drainage, within the allotment, at the bottom of the Little Eightmile Allotment has an elevation of approximately 6,060 feet and at the top of the allotment the elevation is approximately 9,940 feet. It is estimated that 74% of the slopes are greater than 30 percent, 45 % of the slopes are greater than 50% and that 39% of the area is covered by forest.

unnamed tributary to Little Eightmile Creek: This unnamed tributary to Little Eightmile Creek is entirely within the allotment. This drainage has a lower elevation of approximately 6,840 feet and at the top of the drainage the elevation is approximately 9,940 feet. It is estimated that 74% of the slopes are greater than 30 percent, 49 % of the slopes are greater than 50% and that 28% of the area is covered by forest.

Soils and Geology

Little Eightmile Creek: Soils within the Little Eightmile Allotment are derived mainly from quartzite and sedimentary parent materials.

Unnamed tributary to Little Eightmile Creek: Soils within the Little Eightmile Allotment are derived mainly from volcanic parent materials.

Vegetative Characteristics (see Figure 6)

Riparian Vegetation

Little Eightmile Allotment: Woody riparian vegetation along the streams in the watershed is composed primarily of several willow species, dogwood, aspen, birch and alder, which are interspersed with numerous berry-producing shrubs such as rose, currant and raspberry. Herbaceous riparian vegetation consists primarily of various *Carex*, *Juncus* and *Poa* species, with basin wild rye found only in the lowermost portions of the watershed. In the canyon and headwaters of Little Eightmile Creek and portions of Cedar Gulch, conifers are a dominant feature. Extensive patches of young aspen dominate the slopes in the headwaters of the North Fork, and in other locations downstream where springs arise between the channel and the slumpy volcanic soils that dominate the middle of the Little Eightmile sub-watershed (USDI BLM, 2003).

Riparian vegetation on Little Eightmile Creek can be considered at, or very near, the potential natural community (PNC), from the Lower Unit pasture fence at the upper end of the canyon, down to the USFS/private boundary fence. Conditions in this reach have not been impacted by human activities, even though limited grazing still occurs below the canyon. The incisement of the stream through this reach has protected the channel and vegetation from the impacts of grazing (USDI BLM, 2003).

Upland Vegetation

Little Eightmile Allotment: Approximately 70% of the watershed is considered shrub/grass rangeland and riparian, with the remainder considered non-range timber and barren areas (rock faces). Elevation differences in the upper watershed seem to cause little change in vegetative cover types. Major plant communities are made up of Mountain big sagebrush/Idaho fescue/wild rye, with areas of Mountain big sagebrush/bluebunch wheatgrass. Lower elevation areas contain Wyoming big

sagebrush/bluebunch wheatgrass and low sagebrush/bluebunch wheatgrass. (USDI BLM, 2003).

Human Uses

Little Eightmile Allotment: As with the rest of the Lemhi valley there is dispersed camping, hunting, fishing, picnicking, and outfitter/guide operations in the Little Eightmile Creek Drainage. The Continental Divide National Scenic Trail crosses through the drainage at its highest elevations. The USFS also maintains trail #195, the Little Eightmile Trail. There are no other trails or sites on federally managed lands that are maintained for recreational purposes.

There is currently no active mineral exploration or timber harvest, except personal use fuelwood gathering, within the allotment.

3 PROPOSED ACTION

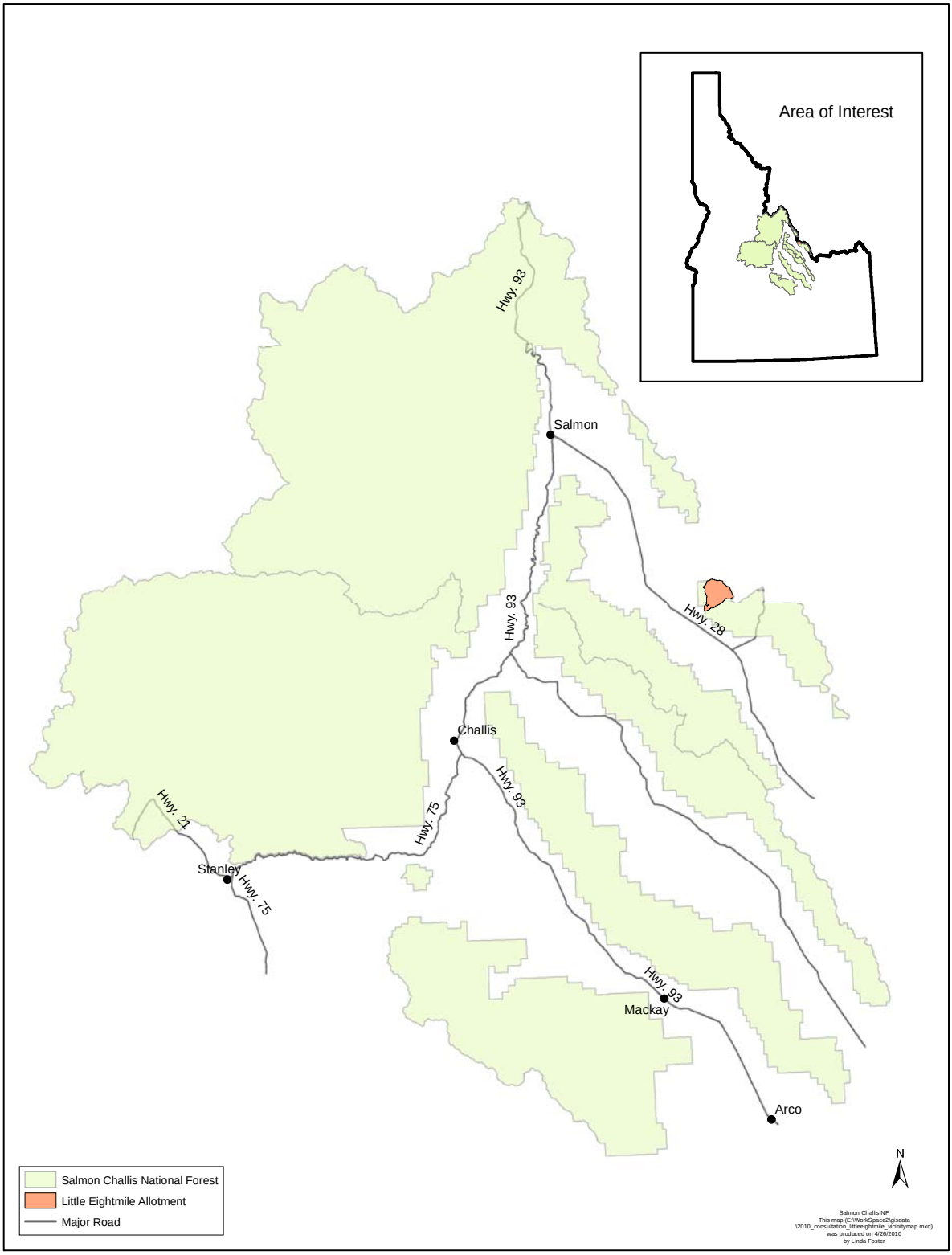
3.1 PROJECT AREA

The Little Eightmile Allotment is located on the Leadore Ranger District approximately 7 air miles northwest of Leadore, Idaho on National Forest System lands (Figure 1). This allotment contains approximately 8,676 acres of National Forest System lands. The proposed project area is located primarily within the Upper Lemhi River (HUC 1706020405).

This allotment is divided into 3 units: Lower Pasture, Upper North and Upper South.

This allotment contains ESA fish (bull trout) in Little Eightmile Creek and an unnamed tributary to Little Eightmile Creek. There is ESA bull trout Designated Critical Habitat in Little Eightmile Creek (see Tables 11 – 12). This allotment does not support any other ESA fish species or ESA fish habitat.

Figure 1 - Little Eightmile Allotment Vicinity Map



3.2 PROPOSED ACTION

3.2.1 CURRENT PERMIT

The Little Eightmile C&H Allotment is currently permitted for 159 yearlings (341 Head Months) from 6/26 to 9/20. The permit number is 80098 and expires on 12/31/2015.

3.2.2 GRAZING SYSTEM

This allotment is divided into 3 units: Lower Pasture, Upper North and Upper South.

The Little Eightmile C&H Allotment's grazing rotation system will continue to use a deferred rotation 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. The 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. Permittees are responsible for moving livestock to meet annual use indicators. Annual use indicators will be monitored by Forest Service personnel.

Table 1 - Unit Rotations (see figure 2 for Unit locations)

Year 1	Year 2
Lower Unit	Lower Unit
Upper North Unit	Upper South Unit
Upper South Unit	Upper North Unit

<u>Lower Unit:</u>

- Bull Trout: Livestock will be off of the unit before August 15th every year, but livestock will have riders on horseback supervised trailing home through this unit at the end of every year.
- Trailing: There are potential trailing impacts occurring in this unit when livestock are moving off of the allotment which takes approximately 1 to 2 days every year. There is one stream crossing during supervised trailing off the allotment. The location of the stream crossing is near the confluence of Little Eightmile Creek and the unnamed tributary to Little Eightmile Creek. The potential trailing impact occurs in Year 1 when livestock are trailed off the allotment from the Upper South Unit into the Lower Unit. Livestock will need one stream crossing in Year 1 on their way home off the allotment. Livestock will not need to cross a bull trout stream on their way home off the allotment in Year 2. The route from the Upper North Unit through the Lower Unit is along an existing trail that does not require crossing a bull trout stream.

Upper North Unit:

- There are no bull trout streams in the Upper North Unit
- Trailing: Because there are no bull trout streams in the Upper North Unit there are no trailing impacts.

Upper South Unit:

- Bull Trout: Livestock will be in the unit after August 15th up to 5 weeks one out of two years. There is only 0.18 miles of bull trout presence and spawning habitat in the Upper South Unit. Because of steep topography, vegetation and fences livestock have no accessibility to the 0.18 miles of bull trout presence and spawning habitat in the Upper South Unit.
- Trailing: Because livestock have no accessibility to the 0.18 miles of bull trout presence and spawning habitat in the Upper South Unit there are no trailing impacts.

Entry:

Livestock are trailed from the home ranch on road 188. The livestock are then trailed through BLM to enter the Lower Unit via a pre-established livestock trail.

Unit Movements:

Year 1: Livestock are moved from the Lower Unit to the adjoining Upper North Unit via a pre-established livestock trail. After leaving the Upper North Unit, livestock are moved into the adjoining Upper South Unit via pre-established livestock trail. Duration of moves is approximately one day per move. See Table 1.

Year 2: Livestock are moved from the Lower Unit to the adjoining Upper South Unit via a pre-established livestock trail. After leaving the Upper South Unit, livestock are moved into the adjoining Upper North Unit via pre-established livestock trail. Duration of moves is approximately one day per move. See Table 1.

Exit:

Livestock are trailed from either the Upper South Unit or Upper North Unit through the Lower Unit via a pre-established livestock trail. Livestock are then trailed to the home ranch in the same manner as entry.

Total removal from NFS lands:

All livestock will be removed from the allotment by 9/20.

3.2.3 CONSERVATION MEASURES

The following measures will be implemented as part of the Little Eightmile Allotment's annual operating instructions (AOI) to avoid and reduce potential impacts to ESA listed fish:

1. 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.
2. 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.
3. Permittees will continue to salt at least ¼ mile away from streams. This will continue to reduce potential impacts on riparian areas, spawning areas and designated critical habitat.
4. Permittees will continue to distribute livestock away from streams and associated riparian areas (ride) at least five days a week, reducing potential impacts on riparian areas, spawning areas and designated critical habitat.
5. 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 riparian areas, spawning areas and designated critical habitat.

3.2.4 CHANGES FROM EXISTING MANAGEMENT

- A bank alteration annual use indicator will be added to all ESA fish streams.
- A browse use annual use indicator will be added to the site on Lower Little Eightmile Creek.

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: Because the allotment where there is ESA fish is not within a priority watershed a bank stability of at least 80% (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 Use Indicators will be adjusted if resource objectives are not being met.

Table 2 - Annual Use Indicators

Key Area Location	Unit – Creek	Monitoring Attribute[2]	Annual Use Indicator	Key Species	Trigger
No Key Area[1]	Upper South Unit- Upper Little Eightmile Creek	Browse use	50%	Willow	45%
		Greenline stubble	4in	Hydric ssp	5in
		Bank Alteration	20%	N/A	15%
MIM M268	Lower Unit – Lower Little Eightmile Creek	Browse use	30%	Willow	25%
		Greenline stubble	6 in	Carex	7 in
		Bank Alteration	10%	N/A	10%
MIM M267	Lower Unit – Upper Little Eightmile Creek	Greenline stubble	4 in	Carex	5 in
		Bank Alteration	20%	N/A	15%
Upland sites	All Units	Utilization by Key Species	50%	Upland grass species	45%
Riparian Areas	All Units	Utilization by Key Species	50%	Riparian grass species	45%

1 No long term trend monitoring sites have been established on allotment. Key areas will be established to monitor trend.

2 Browse use/bank alteration and greenline stubble will be used until next trend reading is completed to determine which attribute will be best suited to attain long term objectives.

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 (Coulloudon et al 1999). 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, as displayed in Figure 2, will be maintained in accordance with the term grazing permit. For example; 1) fences will be maintained to function as designed (ie. to keep livestock in or out of an area. 2) water troughs will be maintained to keep water within the trough and those water troughs with a float system will be maintained to have a functioning float system so water does not continuously over flow the trough.

Potential Future Improvements: There have been no potential future improvements proposed at this time.

3.3 GRAZING MONITORING

Two types of monitoring will be used, implementation and effectiveness monitoring. Both qualitative and quantitative monitoring methods will be used in accordance with the following:

1. 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 by the SCNF 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.
2. Effectiveness Monitoring: The condition of resource objectives will be evaluated in the following manner. Greenline successional status, bank stability, width:depth ratio, water temperature, and woody recruitment will be monitored 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 non-priority watersheds, when bank stability is 80% or greater the bank alteration **annual use indicator** will be 20%
- In non-priority watersheds, when bank stability is 60-79% the bank alteration **annual use indicator** will be 10-20%
- In non-priority watersheds, when bank stability is less than 60% 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. This project’s ESA Action Area is defined as the entire Little Eightmile Allotment (see 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. The entire Little Eightmile Allotment is within a priority watershed (see Figure 3). Management direction for a priority watershed is identified in section 3.2.5.

This allotment contains ESA fish (bull trout) in Little Eightmile Creek and an unnamed tributary to Little Eightmile Creek (see Tables 11 – 12). Little Eightmile Creek also has bull trout Critical Habitat (see Tables 11 – 12). There are no sockeye salmon, Chinook salmon or steelhead present within the ESA Action Area. There are no sockeye salmon, Chinook salmon or steelhead Critical Habitat or Essential Habitat present within the ESA Action Area.

Figure 2 - Little Eightmile Allotment ESA Action Area Map

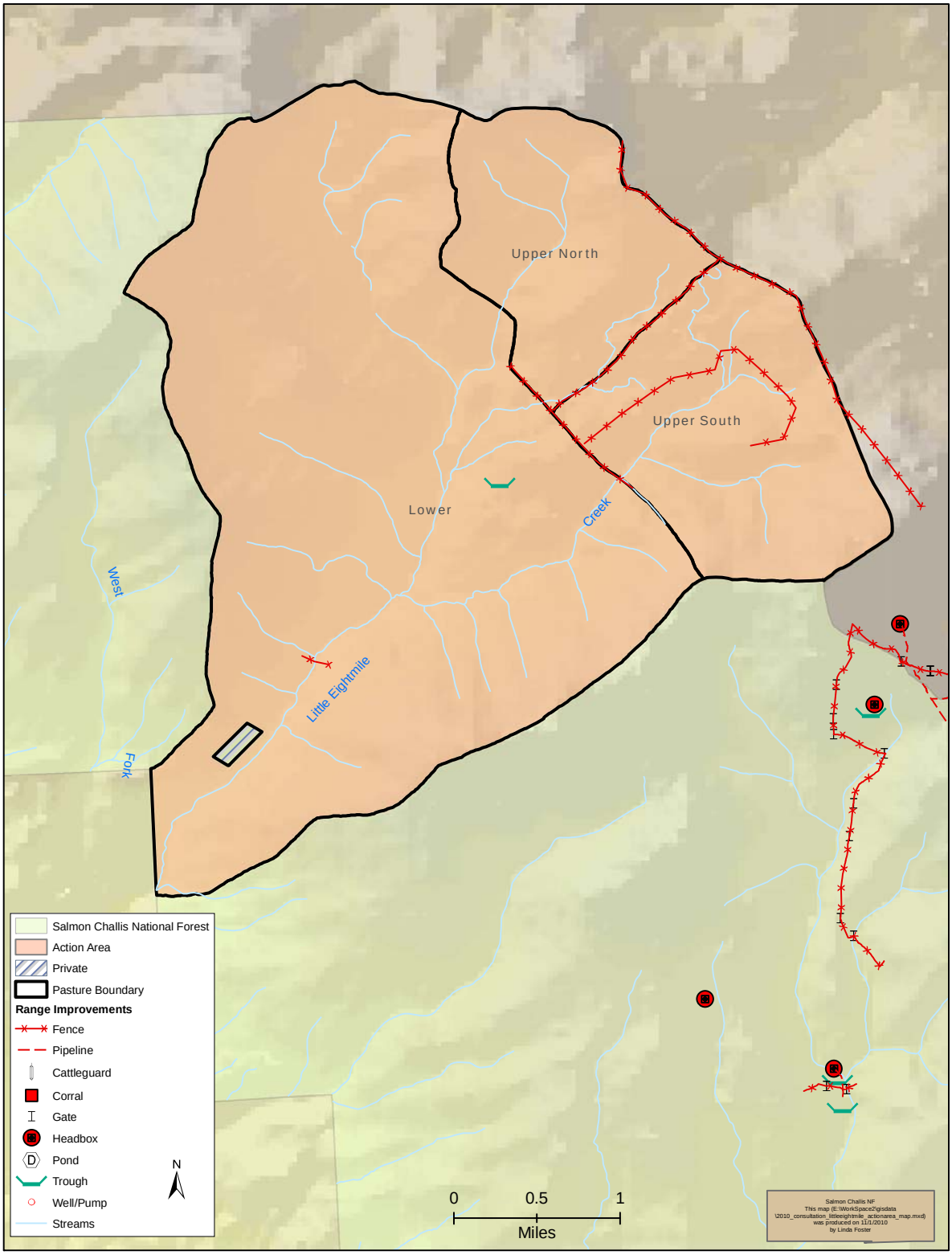
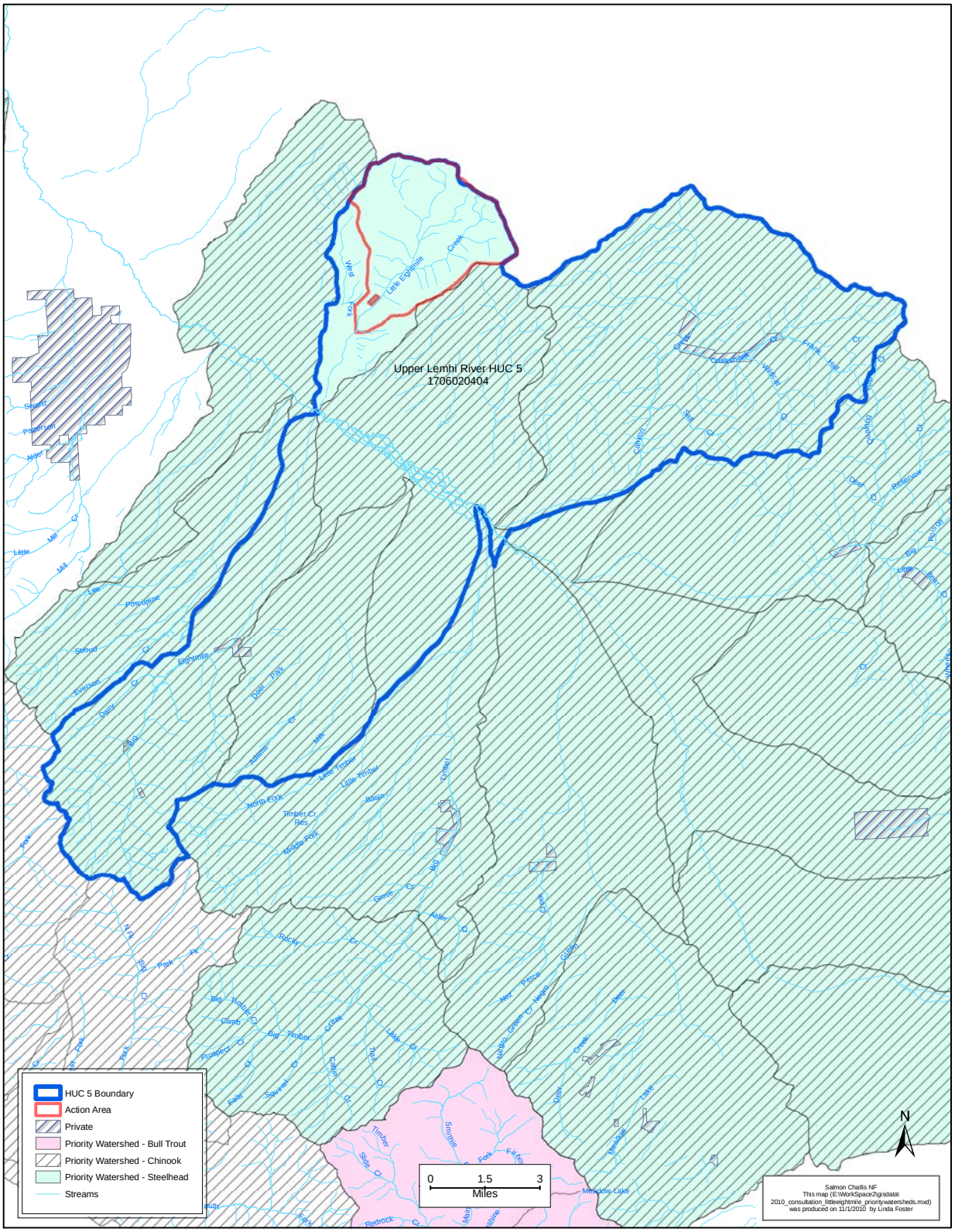


Figure 3 – Little Eightmile HUC 5 Map with Priority Watersheds



5 LISTED SPECIES REVIEW

5.1 SPECIES OCCURRENCE

According to the U.S. Fish and Wildlife Service's (USFWS's) Semi-annual Species List Update Letter, 14420-2010-SL-0089 received December 30, 2009 to Harv Forsgren, R4 - Regional Forester, the federally listed or proposed listed fish species occurring within the Salmon-Challis NF administered boundaries include;

- Snake River sockeye salmon (Oncorhynchus nerka) (Endangered) (Federal Register 56FR58619)
- Snake River spring/summer Chinook salmon (Oncorhynchus tshawytscha) (Threatened) (Federal Register 57FR14653)
- Snake River steelhead (Oncorhynchus mykiss) (Threatened) (Federal Register 62FR43937)
- Columbia River bull trout (Salvelinus confluentus) (Threatened) (Federal Register 63FR31647)

The U.S. Fish and Wildlife Service recently updated there Semi-annual Species List in a July 8, 2010 letter to Harv Forsgren, titled Semi-annual Species List Update CONS-250c. There is one change from the December 30, 2009 letter that states Lemhi County has ESA Threatened bull trout and ESA Proposed bull trout Critical Habitat. The other change is that the USFWS Semi-annual Species List Updates no longer contain species under the National Marine Fisheries Service's (NMFS) jurisdiction. At this time there are no changes from the December 30, 2009 Semi-Annual Species List Update letter for NMFS ESA listed fish species. There are also no changes to the NMFS ESA listed species critical habitat and essential habitat. Since the July 8, 2010 letter the US Fish and Wildlife Service came out with a final rule designating bull trout critical habitat.

Salmon-Challis National Forest and Idaho Department of Fish and Game (Idaho Department of Fish and Game, 2006) fish surveys indicate that only one ESA fish species occurs within the ESA Action Area. This species is the bull trout (Figure 4). Salmon-Challis National Forest and Idaho Department of Fish and Game surveys indicate that bull trout are spawning and rearing within the ESA Action Area in Little Eightmile Creek and an unnamed tributary to Little Eightmile Creek. There are no streams within the ESA Action Area that have the presence of Chinook salmon or steelhead. Sockeye salmon use the mainstem Salmon River as a migration corridor to and from spawning and juvenile rearing habitat within lakes of the Salmon River headwaters, but do not occupy or use waters within the Lemhi River 4th field HUC (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 as identified in Appendix D. Using this process, the Forest has not identified Chinook salmon designated critical habitat within the ESA Action Area.

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 ESA Action Area.

5.2.3 SNAKE RIVER BASIN STEELHEAD

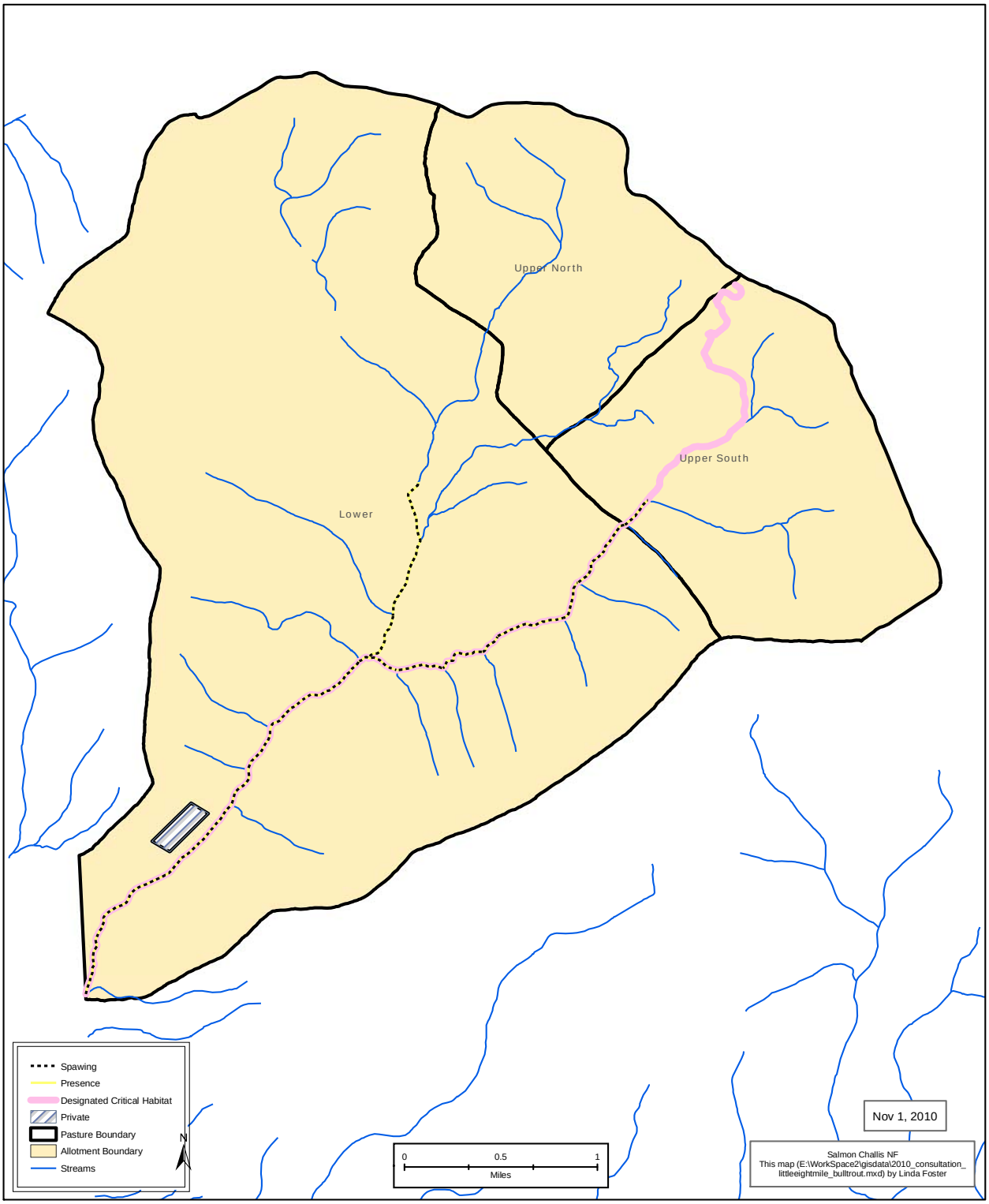
Critical habitat has been designated for Snake River Basin steelhead (Federal Register 70FR52630). Steelhead designated critical habitat is not present within the ESA Action Area.

5.2.4 COLUMBIA RIVER BULL TROUT

Critical habitat has been designated for Columbia River Basin bull trout (Federal Register 75FR63898). The Little Eightmile Allotment ESA Action Area contains 6.24 miles of critical habitat in Little Eightmile Creek (Figure 4).

The Forest desires to assess the potential impact to the Primary Constituent Elements (PCEs) of bull trout critical habitat. These are defined on page 63928 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 - Little Eightmile Allotment bull trout Map



6 ENVIRONMENTAL BASELINE DESCRIPTION

The ESA Action Area is primarily within one 5th field hydrologic unit codes, the Upper Lemhi River 5th field HUC (1706020405). Baseline Matrices of Diagnostic Pathways and Indicators for these 5th field HUCs are provided in Appendix B.

Below is a general summary of baseline conditions within the ESA Action Area. Because of the different scales of baseline, there may be times when there is disagreement between Appendix B and this assessment's narrative on ESA Action Area conditions. While the baseline matrix included in Appendix B reflects aquatic/riparian condition and trend at the 5th field HUC scale, the baseline descriptions provided below focus only on baseline conditions within the ESA 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 ESA Action Area.

There are two streams, Little Eightmile Creek and an unnamed tributary to Little Eightmile Creek, within the ESA Action Area that currently supports one ESA listed fish population, bull trout. There is one stream, Little Eightmile Creek, within the ESA Action Area that has designated critical habitat for bull trout.

There are no streams within the ESA Action Area that have documented sockeye salmon, Chinook salmon or steelhead presence or support sockeye salmon, Chinook salmon or steelhead populations. There are no streams within the ESA Action Area that have sockeye salmon , Chinook salmon or steelhead Designated Critical Habitat.

The Salmon-Challis National Forest has not electrofished streams within the ESA Action Area, but Idaho Fish and Game completed a comprehensive Little Eightmile Creek watershed inventory in 2005. The objective of the survey was to document the presence of fish species and life histories in the watershed and determine management directions for improving irrigation practices for fisheries benefits (Idaho Department of Fish and Game, 2006). In 2005, IDFG electro-fished three sites on Little Eightmile Creek two sites on an unnamed tributary to Little Eightmile Creek within the ESA Action Area. They found bull trout on two of the Little Eightmile Creek sites and at one site on the unnamed tributary to Little Eightmile Creek.

6.1.1 CHINOOK SALMON

Within the ESA Action Area there is no documentation of the presence of Chinook salmon, juvenile or adult.

There is no Chinook salmon Designated Critical Habitat within the ESA Action Area.

6.1.2 STEELHEAD

Within the ESA Action Area there is no documentation of the presence of steelhead, juvenile or adult.

There is no steelhead Designated Critical Habitat within the ESA Action Area.

6.1.3 BULL TROUT

Within the ESA Action Area, a bull trout population is currently present in Little Eightmile Creek and an unnamed tributary to Little Eightmile Creek. (see Table 11 - 12). Idaho Fish and Game completed a comprehensive Little Eightmile Creek watershed inventory in 2005. The objective of the survey was to document the presence of fish species and life histories in the watershed and determine management directions for improving irrigation practices for fisheries benefits (Idaho Department of Fish and Game, 2006). In 2005, IDFG electro-fished three sites on Little Eightmile Creek two sites on an unnamed tributary to Little Eightmile Creek within the ESA Action Area. They found bull trout on two of the Little Eightmile Creek sites and at one site on the unnamed tributary to Little Eightmile Creek.

Distribution of the species appears to be limited to the mainstem of Little Eightmile Creek downstream of the forks of the two upper tributaries, within and upstream of the canyon. The highest density of bull trout at least 70 mm in fork length sampled in the first pass of electrofishing was 2.1 fish/100 m^2 at site LLEC-02. Fork lengths of bull trout sampled ranged from 50 mm up to 240 mm (Idaho Department of Fish and Game, 2006).

It is my professional judgment that bull trout populations within the ESA Action Area are depressed from historic numbers in part because of public and private land migration barriers, unscreened diversions associated with irrigation practices and dewatering and disconnecting Little Eightmile Creek with the Lemhi River. Because of the limited stream flows in Little Eightmile Creek below the Forest boundary and other human caused physical migration barriers, at this time fluvial bull trout, from the Lemhi River and Salmon River are not present within the ESA Action Area. The Salmon-Challis National Forest considers spawning to be occurring in the proximity of the electrofishing site whenever salmonids less than 100mm are found to be present. For this analysis we are only assessing bull trout presence and spawning in Little Eightmile Creek and an unnamed tributary to Little Eightmile Creek within the ESA Action Area.

6.2 GENERAL DESCRIPTION OF HABITAT CONDITIONS

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

The Little Eightmile Allotment encompasses two streams which support a population of and habitat for an ESA listed fish species, bull trout. Those streams are Little Eightmile Creek and an unnamed tributary to Little Eightmile Creek. The following table provides stream flow and stream channel data collected in 1988 at the SCNF's Little Eightmile Creek 1R core sampling site (BD 31, Figure 5) along with the other stream's Stream Stats Calculations.

Table 3 - Mean Annual Monthly Flows

Snake River Adjudication Sites

Station	DA (sq. mi.) (drainage area)	QA (cfs) Yearly Average Discharge	QB (cfs) Bankfull Discharge (flood stage)	Mean Monthly Flows JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	Bankfull Channel Slope	Bankfull Width	X-Sectional Area	Bankfull Depth	Width/Depth Ratio
Little Eightmile Creek 1R	14.05	5.5	35.4	1.7	1.7	1.9	4	16.1	22.1	6.9	3	2.4	2.3	2.1	1.9	0.029	10.5	9.29	0.88	11.9

Stream Stats Calculations

Station	DA (sq. mi.) (drainage area)	QA (cfs) Yearly Average Discharge	QB (cfs) Bankfull Discharge (flood stage)	Mean Monthly Flows (cfs) JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	Bankfull Channel Slope	Bankfull Width	X-Sectional Area	Bankfull Depth	Width/Depth Ratio
unnamed tributary to Little Eight Mile Creek	6.98	5.3	20	1.4	1.38	1.53	2.43	5.84	6.65	5.76	3.14	2.28	2.17	1.77	1.55	unknown	unknown	unknown	unknown	unknown

6.2.1 LITTLE EIGHTMILE CREEK

All life stages of bull trout are considered to be present in Little Eightmile Creek. Fish habitat conditions of Little Eightmile Creek, within the ESA Action Area, are generally in good condition. Overall physical habitat quality, including the elements of water quality, flow/hydrology, channel conditions and structural habitat elements is considered good. There is some connectivity problems associated with private land irrigation practices in Little Eightmile Creek below the ESA Action Area.

6.2.2 unnamed tributary to LITTLE EIGHTMILE CREEK

All life stages of bull trout are considered to be present in the unnamed tributary to Little Eightmile Creek. Fish habitat conditions of the unnamed tributary to Little Eightmile Creek, within the ESA Action Area, are generally in good condition. Overall physical habitat quality, including the elements of water quality, flow/hydrology, channel conditions and structural habitat elements is considered good. There is some connectivity problems associated with private land irrigation practices in Little Eightmile Creek below the ESA Action Area.

6.3 MAJOR LIMITING FACTORS

Factors most likely to be limiting ESA listed fisheries resources, within the ESA Action Area, from achieving full carrying capacity are:

- IDWR water rights database indicates the presence of at least seven points of diversion for irrigation purposes on Little Eightmile Creek (Idaho Department of Fish and Game, 2006). The LLEC-07 diversion, 23 approximately three miles upstream of the Little Eightmile Creek confluence with the Lemhi River, is the uppermost known point of diversion on the stream and was observed dewatering the stream channel during surveys in early August (Idaho Department of Fish and Game, 2006). These diversions create fish migration barriers and reduce stream flows within Little Eightmile Creek. Unscreened diversions can affect fish by entrainment and impact fish passage. Fish entrainment is associated with flow alterations. This occurs when water is removed from the stream and fish are subsequently stranded in dewatered habitats.
- Year to year stream flow conditions associated with good or bad snowpack levels.
- Nutrient deficiencies associated with high mountain, high gradient streams. Some of these nutrient deficiencies can be attributed to the decline in the number of anadromous fish, both steelhead and Chinook salmon, returning to streams within the ESA Action Area to spawn, die and decay in the stream.

More specific details on status and trends of habitat within the ESA 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 used 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 PCEs for Chinook salmon, steelhead and bull trout designated critical habitat, and therefore our analysis of these elements will serve as an analysis of impacts to designated 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

There is NO Chinook salmon spawning and incubation within the ESA Action Area.

6.4.1.2 STEELHEAD SPAWNING AND INCUBATION

There is NO steelhead spawning and incubation within the ESA Action Area.

6.4.1.3 BULL TROUT SPAWNING AND INCUBATION

Data developed by the Upper Salmon Basin Watershed Project Technical Team (Upper Salmon Basin Watershed Project Technical Team, 2005) does not identify a general spawning periodicity for bull trout in the Little Eightmile Creek drainage. For the purpose of this analysis the periodicity identified for Hayden Creek will be used for the Upper Lemhi River 5th field HUC. This would identify a general spawning periodicity ranging from the second week of August through the second week of October, with egg incubation through the third week of April. For the purpose of this analysis August 15th will be used for the start of bull trout spawning.

Table 4 - Bull Trout Spawning Streams and Miles

Little Eightmile Creek	**4.44 miles**
unnamed tributary to Little Eightmile Creek	**1.05 miles**

Information on bull trout spawning within the ESA Action Area is limited. This analysis basis potential bull trout spawning streams on known or suspected presence of bull trout through electrofishing surveys. No streams within the ESA Action Area support Lemhi River and Salmon River fluvial bull trout spawning because Little Eightmile Creek streamflows are not currently sufficient for large migrating fish from the Lemhi River.

The SCNF has mapped stream lengths that could contain bull trout spawning habitat, within the ESA Action Area, based on electrofishing surveys and professional judgment. We considered a stream to support or have the potential to support spawning habitat when a stream has been documented to have at least one bull trout less than 100mm in length (see Figure 4). At this time we consider there are two streams within the ESA Action Area that have known or potential bull trout spawning and incubation habitat. Those two streams are Little Eightmile Creek and an unnamed tributary to Little Eightmile Creek.

Based on electrofishing survey data collected by the Idaho Fish and Game (Idaho Department of Fish and Game, 2006), it is my professional judgment that bull trout are currently spawning within the ESA Action because there is suitable spawning habitat, adult and juvenile bull trout are present and a juvenile bull trout less than 100 mm has been documented. Therefore for this

analysis we will assume bull trout are spawning in Little Eightmile Creek and an unnamed tributary to Little Eightmile Creek within the ESA Action Area.

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 criterion 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 criterion 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). Little Eightmile Creek is the only stream within the ESA Action Area with more than instantaneous temperature readings. The overall, water temperature regimes in Little Eightmile Creek are considered to be Functioning Appropriately relative to these criteria (see Table 13 and Appendix G). It is believed the overall, water temperature regimes in an unnamed tributary to Little Eightmile Creek are also considered to be Functioning Appropriately relative to these criteria because the Little Eightmile Creek stream temperature readings are downstream of the unnamed tributary to Little Eightmile Creek

It is believed that any short term temperature exceedences are reflective of yearly variations in seasonal air temperature regimes rather than due to any identifiable land management-related influences.

It is my professional judgment that water temperature is not considered a major limiting factor to fish production within the ESA Action Area because

- within the ESA Action Area there are no streams listed as an IDEQ 303(d) streams with a pollutant, which includes Sedimentation/Siltation, Other Flow Alterations and Unknown (IDEQ, 2008).
- the 2008 and 2009 stream sediment data has been 20% and 19.8%, respectively.
- the 2008 and 2009 stream bank stability data has been 85% and 88%, respectively.
- the recorded 2009 and 2010 streams temperatures in Little Eightmile Creek meet the July 1-Sept 30 Mean of 10°C. A mean of 10°C is identified by Gamett (2002) for optimum habitation by bull trout.

Therefore water temperature conditions within the ESA Action Area are considered to be Functioning Appropriately for rearing, spawning and incubation relative to these criteria.

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). The Salmon-Challis National Forest's Watershed Program has collected stream sediment data, using the core sampling methodology, since 1993.

Analysis of core sampling data correlates measured levels of depth fines in spawning habitats to predicted egg incubation success values determined by Stowell, et al (1983). Results of all

assessments are expressed as percent fines less than ¼ inch in diameter. Analysis of depth fines additionally considers drainage geology. The ESA fish streams within the ESA Action Area are primarily in quartzite geology. As used by the Salmon-Challis National Forest, during ESA informal consultation on steelhead and bull trout Watershed Biological Assessments for Ongoing Activities (1998-2000), the following are the evaluation criteria for stream sediment based wholly or primarily in quartzite geology:

<20% depth fines (<1/4” diameter) = Properly Functioning

21-25% depth fines (<1/4” diameter) = Functioning at Risk

>25 depth fines (<1/4” diameter) = Not Properly Functioning

Core sampling is used in trend monitoring to determine the amount of percent fines within the stream's substrate. Anadromous streams receive a 6-inch dig and resident fish streams receive a 4-inch dig. The amount of percent fines is used in determining the stream's biotic potential (Stowell, et al. 1983). Biotic potential is the condition of spawning substrate quality, which maximizes survival and emergence of fish embryos.

Forest wide analysis of data collected since 1993 shows a wide range of variability for stream sediment. Stream sediment data is highly influenced by natural processes such as geology, stream gradient, winter snow pack, springtime runoff, summer time high intensity storms and human impacts associated with roads. The variability in stream sediment data shows from year to year at some stations streams may naturally fluctuate between Properly Functioning, Functioning at Risk, and Not Properly Functioning.

Little Eightmile Creek has one site that has been monitored six out of the last seventeen years (see Table 5). The last two years of data collected shows 20% and 19.8% fines by depth which is “Properly Functioning”. This data and its trend graph indicate stream sediment over the years could be a limiting factor for fish production in Little Eightmile Creek. Using local knowledge of Little Eightmile Creek and focusing on the most recent data collected, it is my professional judgment that Little Eightmile Creek is currently “Properly Functioning”.

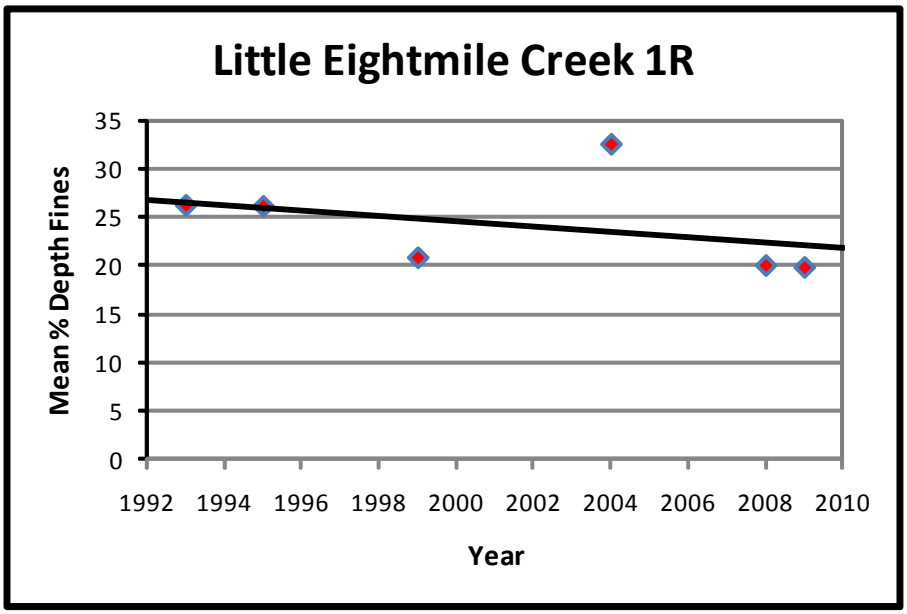
Table 5 - Core Sampling Mean % Fines by Depth

Summary of Depth Fines Measurements Recorded on the Salmon-Challis National Forest from 1993 through 2010.

Mean Percent Fines < 0.25" at Depth

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Little Eightmile Creek 1R	26.2		26.1				20.8					32.5				20	19.8	

A = Anadromous fish spawning site
R = Resident fish spawning site



Within the ESA Action Area there are no streams listed as an IDEQ 303(d) streams with a pollutant, which includes Sedimentation/Siltation, Other Flow Alterations and Unknown (IDEQ, 2008).

It is my professional judgment that overall stream sediment conditions are not considered a major limiting factor to fish production within the ESA Action Area because the last two years of data collected were 20% and 19.8% fines which is “Properly Functioning”. The overall trend line from 1993-2009 is trending towards 20% which is considered “Properly Functioning”.

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 reduces habitat suitability (Platts and Nelson, 1989).

PACFISH identifies a stream channel width:depth ratio RMO of 10, 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 used both criteria to assess morphologic condition of Forest stream channels.

Data is limited for average wetted width/maximum depth ratio on streams within the ESA Action Area. Channel geometry has been monitored at one site within the ESA Action Area. That site is the range programs MIM site, Little Eightmile Creek (M268) with a 5.43 width:depth ratio.

The *User’s Guide to Fish Habitat: Descriptions that Represent Natural Conditions in the Salmon River Basin, Idaho* (Overton, 1995) shows a mean width to depth ratio of 28 for “C” channel types (Rosgen, 1994). The observed Little Eightmile Creek stream channel is also reflective of Rosgen’s general identified characterization of C type channels as displaying width:depth metrics greater than 12 (Rosgen, 1996). In the late 1980’s during the Snake River Adjudication process Little Eightmile Creek had a reading of 11.9 at the Forest boundary. This 11.9 reading

falls within the Natural Condition Database Width:Depth ratio of 28 for a Rosgen Channel Type of “C”.

The past and current effects of the proposed project can play a role in decreasing or increasing average wetted width/maximum depth ratio within the ESA Action Area. The direct correlation between the proposed project’s past and current activities and a negative increase in average wetted width/maximum depth ratio would be if livestock grazing activities were allowed to break down streambanks and significantly decrease the stability of streambanks. Range improvements such as fences and water developments that help to minimize and keep livestock grazing activities away from riparian areas and streambanks can also help to restore degraded stream reaches where the average wetted width/maximum depth ratio is greater than 10. Recent past and current livestock grazing activities were and are being managed so as not to degrade riparian areas and bank stability which could lead to increased average wetted width/maximum depth ratio.

Stream width:depth ratios are not considered a major limiting factor to fish production on ESA fish streams within the ESA Action Area as shown in the data collected. Livestock are also estimated to have very limited accessibility to Little Eightmile Creek (1.18 miles out of the 4.44 miles) and the unnamed tributary to little Eightmile Creek (0.28 miles out of the 1.05 miles). Livestock accessibility to ESA fish streams was calculated and estimated by Ben Goodin (Range Management Specialist) using GIS, Google Earth and local knowledge. Therefore it is my professional judgment that stream width:depth ratios are considered to be Functioning Appropriately and are not a major limiting factor to fish and fish production within the ESA Action Area.

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).

The Little Eightmile Creek drainage is considered not to be a PACFISH Priority Watershed for both Chinook salmon and steelhead (Figure 3). The PACFISH Biological Opinion (USDA, National Marine Fisheries Service, 1998) identifies a Riparian Management Objective of 80 percent or greater bank stability for streams not within a PACFISH Priority Watershed.

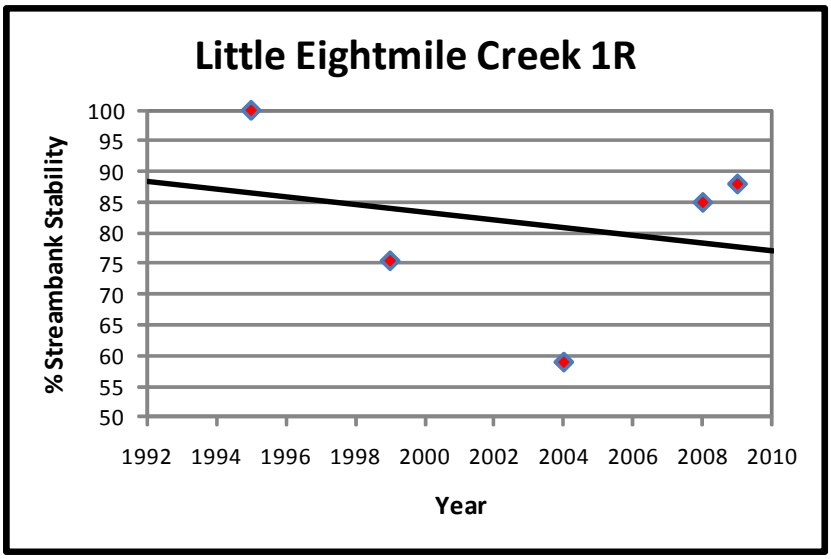
Range improvements such as fences and water developments help to minimize and keep livestock grazing activities away from riparian areas and streambanks. Recent past and current livestock grazing activities were and are being managed so as not to degrade riparian areas and bank stability.

There is one long term trend streambank stability monitoring site, within the ESA Action Area, which was started in 1994 and continues to be surveyed by the Forest’s Watershed Program. This site is Little Eightmile Creek 1R (see BD31 Figure 5). Little Eightmile Creek streambank stability has been monitored five out of sixteen years at this site. Three of the readings, including the last two readings have been over 80% stable.

Table 6 - Percent Streambank Stability

Percent Streambank Stability Recorded in the South Hayden Allotment from 1994 through 2009

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Little Eightmile Creek 1R			100.0				75.5					59				85	88	



There is also one range program MIM site that has bank stability data. That site is M268 which had a reading of 79% stable in 1999, 65% stable in 2004 and 68% stable in 2009. These last two low bank stability readings may in part be due to errors in interpreting the protocol for reading bank stability. Some of the unstable readings were inaccurate and could change the reading up by 20%. Until the Forest gets a more accurate bank stability reading at this MIM site we have used the more restrictive bank alteration annual use indicator of 10% (personal communications with Ben Goodin, 2010) or because the MIM site is only 500 meters upstream from a drift fence that crosses Little Eightmile Creek. This drift fence is to keep livestock from drifting back down to the lower parts of the Lower Unit to make it easier to move the livestock up into the Upper South and Upper North Units somewhere around the second week of July. Since 1999 the greenline ecological status at this MIM site is in an upward trend and has gone from very early seral to early seral to mid seral condition. The Forest will continue assess the need for adaptive management to meet or exceed 80% bank stability.

Because the Forest's long term monitoring site, BD31, has had two recent readings above 80%, the probability of monitoring error at the MIM site #268 could raise those readings by as much as 20%, and the fact livestock have very limited access to the two ESA fish bearing streams because of topography and dense riparian vegetation it is my professional judgment that streambank stability, within the ESA Action Area, is considered to be "Functioning Appropriately" and is not a major limiting factor to fish production.

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).

Little Eightmile Allotment Riparian Discussion:

Monitoring sites were established and subsequent monitoring has occurred on the Little Eightmile Allotment since the early 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 will be discussed in the following:

Generally, the two sites monitored since the early 90's, both are in upward trend or at Late Seral/ PNC.

> Upper Little Eightmile Creek: The GES is static at PNC. The site is dominated by Carex with an overstory of Willow and Alder. Due to the well established Carex under growth, the best monitoring attribute to manage the site is greenline stubble with an annual use indicator of 4 inches. The monitoring attribute of bank alteration with an annual use indicator of 20% will also be used.
>
> Lower Little Eightmile Creek: The GES is in an upward trend at Mid Seral. The site is dominated by Willow. Sage brush has begun to encroach on the site. This sage brush encroachment may be contributing to the lower than desired Mid Seral Ecological status. Due to the woody dominance, the best monitoring attribute to manage this site is browse use with an annual use indicator not to exceed 30% on Willow. The monitoring attribute of greenline stubble with an annual use indicator of 5 inches will also be used. The monitoring attribute of bank alteration with an annual use indicator of 10% will also be used.

Using riparian conservation area data within the ESA Action Area, based on stream photos within the ESA Action Area, local knowledge of the riparian areas and conversations with the Forest Service rangeland management specialists it is my professional judgment that the overall riparian conservation areas within the ESA Action Area are Functioning Appropriately and are not a major limiting factor to fish production. There are some areas of concern, like the MIM 268 site, that will need close monitoring and the use of adaptive management to bring the greenline ecological status up towards late seral/PNC conditions. Overall Riparian Conservation Areas are not considered a major limiting to fish and fish production within the ESA Action Area.

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 7 - 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., 1997). 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 8. 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; 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 livestock to the uplands enough to significantly reduce uncovered and unstable streambanks.

- Herding: Using 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.

The Forest has integrated some of these measures into its grazing strategy for the Little Eightmile Allotment to reduce the potential for adverse effects to listed fish and aquatic and riparian habitats, within the ESA Action Area. Rotation schedules have been refined to best avoid direct impact to spawning fish and incubating redds. All of the existing fences and range improvements, displayed in Figure 2, will help keep livestock in areas where they are suppose to be and keep livestock out of areas they are not suppose to be grazing as directed by the signed Annual Operating Instructions.

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 livestock 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.

The only ESA fish species that spawn in stream reaches within the ESA Action Area is bull trout (see Figure 4). It is possible that livestock could trample redds in streams if grazing occurs when fish are spawning or eggs are incubating within stream substrates during a time when livestock have accessibility to the stream. Effects to ESA listed fish species spawning and incubation within the Little Eightmile Allotment are discussed individually below.

7.1.1.1 CHINOOK SALMON

Conclusion:

Within the ESA Action Area there is no documentation of the presence of Chinook salmon, juvenile or adult. Little Eightmile Creek is not connected to the Lemhi River to provide fish passage to and from the Little Eightmile Allotment.

Therefore it is my professional judgment that the Little Eightmile Allotment’s livestock grazing activities have No Effect on Chinook salmon spawning and incubation in streams within the ESA Action Area because there are no Chinook salmon present within the ESA Action Area.

7.1.1.2 STEELHEAD

Conclusion:

Within the ESA Action Area there is no documentation of the presence of steelhead, juvenile or adult. Little Eightmile Creek is not connected to the Lemhi River to provide fish passage to and from the Little Eightmile Allotment.

Therefore it is my professional judgment that the Little Eightmile Allotment’s livestock grazing activities have No Effect on steelhead spawning and incubation in streams within the ESA Action Area because there are no steelhead present within the ESA Action Area.

7.1.1.3 BULL TROUT

Bull trout are known to or have the potential to spawn in two streams within the ESA Action Area (see Table 4). These lengths reflect continuous mapping reaches and are likely a significant overestimate of actual spawnable area within the allotment's streams.

Information on bull trout spawning within the ESA Action Area is limited. This analysis basis potential bull trout spawning streams on known or suspected presence of bull trout through electrofishing surveys. No streams within the ESA Action Area currently support Lemhi River or Salmon River fluvial bull trout spawning because the Little Eightmile Creek streamflows are currently not sufficient for large fluvial bull trout to migrate from the Lemhi River up Little Eightmile Creek and into the ESA Action Area.

The SCNF has mapped stream lengths that could contain bull trout spawning habitat, within the ESA Action Area, based on electrofishing surveys and professional judgment. We considered a stream to support or have the potential to support spawning habitat when a stream has been documented to have at least one bull trout less than 100mm (see Figure 4). At this time we consider there are two streams within the ESA Action Area that have known or potential bull trout spawning and incubation habitat. Those two streams are Little Eightmile Creek and an unnamed tributary to Little Eightmile Creek.

Analysis Assumptions:

- Bull trout begin spawning within the allotment on August 15th.
- A bull trout stream does not have 100% available spawning habitat.
- Bull trout redds are below 8000 feet in elevation in the Lemhi River Watershed, based on Idaho Fish and Game (IDFG) bull trout redd surveys conducted in the Lemhi River Watershed.
- In the Lemhi River Watershed it can be estimated that 80% of the bull trout redds are constructed by 9/15 and 95% of the bull trout redds are constructed by 9/30. (personal communication with Tom Curet, Idaho Fish and Game 5/29/09).
- If livestock are grazing in a unit past August 15th that has a bull trout stream there is the potential for livestock to step on bull trout redds and/or disturb/harass spawning adults unless there is a natural physical barrier or a human constructed physical barrier, like a fence, between the stream and where the livestock can graze.
- When livestock step on a bull trout redd not every egg within the redd will be destroyed. There may be some eggs within a trampled redd that can survive and become juvenile and adult bull trout.

Lower Unit:

The Lower Unit has bull trout spawning occurring in an estimated 4.26 miles of Little Eightmile Creek and 1.05 miles of an unnamed tributary to Little Eightmile Creek. Livestock will be out of this unit every year before August 15th. There will however be end of the season riders on horseback supervised trailing through this unit every year.

There are potential trailing impacts occurring in this unit when livestock are moving off of the allotment which takes approximately 1 to 2 days every year. There is one stream crossing during supervised trailing off the allotment. The location of the stream crossing is near the confluence of Little Eightmile Creek and the unnamed tributary to Little Eightmile Creek. The potential trailing impact occurs in Year 1 when livestock are trailed off the allotment from the Upper South Unit into the Lower Unit. Livestock will need one stream crossing in Year 1 on their

way home off the allotment. Livestock will not need to cross a bull trout stream on their way home off the allotment in Year 2. The route from the Upper North Unit through the Lower Unit is along an existing trail that does not require crossing a bull trout stream.

Livestock are estimated to have very limited accessibility to Little Eightmile Creek because of topography and dense vegetation (1.18 miles out of the 4.26 miles of bull trout spawning habitat). The Forest tried to conduct a bull trout redd survey in the lower one mile of Little Eightmile Creek within the allotment on September 30, 2009. The vegetation was very dense and the steep and rocky terrain made it very difficult to impossible for livestock to access the stream (Dan Garcia, personal observation). At the few sites we had stream access we did not see any bull trout redds and there were no signs of livestock use after August 25th. Livestock are estimated to have very limited accessibility to an unnamed tributary to Little Eightmile Creek because of topography and dense vegetation (0.28 miles out of the 1.05 miles of bull trout spawning habitat).

Therefore it is my professional judgment that livestock will have an opportunity, be it very minimal, to trample bull trout redds and/or disturb or harass spawning adults during the 1-2 days of end of the season trailing off the allotment every other year in the Lower Unit.

Conclusion:

There is the potential for livestock to trample bull trout redds and/or disturb or harass spawning adult bull trout within the ESA Action Area and the Lower Unit because of the time bull trout are suspected to begin spawning in Little Eightmile Creek and the time when livestock are being trailed home off the allotment within the Unit. Spawning adult bull trout and their redds will be at risk for 1-2 days every other year. Therefore it is my professional judgment that there is some potential, but it is difficult to quantify, for livestock to step on bull trout redd(s) and/or disturb/harass spawning adults for one to two days every other year in Little Eightmile Creek within the ESA Action Area.

Upper South Unit: Livestock will be in the unit after August 15th up to 5 weeks one out of two years. There is only 0.18 miles of bull trout presence and spawning habitat in the Upper South Unit. Because of steep topography, vegetation and a fence livestock have no accessibility to the 0.18 miles of bull trout presence and spawning habitat in the Upper South Unit.

Upper North Unit:

There are no bull trout streams in the Upper North Unit.

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 (see section 6.4.7).

There is one stream within the ESA Action Area with stream temperature data. This data indicates stream temperatures meet the salmonid spawning temperature criteria. Stream temperature monitoring data does not suggest any significant contribution of temperature impacts as a result of livestock grazing. Sediment, width:depth ratios, streambank conditions, and riparian conservation areas are four focus indicators that can affect stream temperatures.

These four focus indicators are functioning appropriately within the ESA Action Area and are not major limiting factors to fish production within the ESA Action Area.

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 (see section 6.4.7).

In the absence of observed impacts to stream temperature influencing habitat parameters, it is concluded that recent and future livestock grazing within the Little Eightmile Allotment has not and will not result in detectable effects to water temperatures or water temperature regimes in Little Eightmile Creek and an unnamed tributary to Little Eightmile Creek within the ESA Action Area. Conservation measures of the proposed action, including the use of riders to keep livestock away from critical stream reaches, water developments, fencing and salting will further serve to reduce potential livestock impacts on water temperatures by minimizing riparian vegetation use and livestock impacts to ESA fish streams and streambanks within the ESA Action Area.

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 Little Eightmile Allotment's ESA Action Area to be insignificant, and expect that the proposed action will maintain the condition of the Water Temperature focus indicator.

Proposed and ongoing MIM and utilization monitoring will be effective in identifying future trends of riparian vegetative status and trend within the ESA Action Area. In combination with additional water temperature monitoring in ESA fish streams, these range 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.

The proposed action includes conservation measures that will help minimize or eliminate livestock grazing away from some stream reaches. This will result in livestock grazing activities having minimal potential impact on stream temperatures (see Section 3.2.3). Those conservation measures designed in part to avoid livestock exposure to spawning areas will additionally serve to reduce potential livestock impact on water temperatures by minimizing riparian vegetation use and livestock impact to streambanks within the ESA fish bearing streams. Maintaining existing fences and water developments are an important conservation measure that will continue to help distribute livestock use across a larger area to minimize or eliminate livestock grazing impacts on riparian vegetation that directly or indirectly help keep stream temperatures cooler.

<u>Conclusion:</u>

The ESA fish bearing streams within the ESA Action Area meet the salmonid spawning temperature criteria. There may exist along some stream reaches on some streams in some years, contributing impacts on water temperature related to grazing activities that are considered to be insignificant, and are not expected to be, in and of themselves, generating any additional measureable increases in water temperatures. We recognize there could be localized impacts to stream temperatures when livestock graze riparian shrubs that provide localized

streamside shading. However, because of the expected effectiveness of the project design and associated conservation measures in reducing livestock presence near streams, it is my professional judgment those impacts will 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 Water Temperature Focus Indicator both within the ESA Action Area and at the 5th field HUC scale.

In the absence of observed impacts to stream temperature influencing habitat parameters, it is concluded that current and future livestock grazing within the Little Eightmile Allotment is not and will not result in detectable effects to water temperatures or water temperature regimes within the streams of the ESA Action Area.

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 (see section 6.4.7). 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 Little Eightmile Allotment is not considered to be a significant factor influencing sediment levels. Stream sediment conditions at the Forests monitoring site on Little Eightmile Creek, within the ESA Action Area, has recorded percent depth fines at or below 20% the last two years. Supplemental monitoring data, including streambank stability and width:depth data, do not indicate or suggest any exacerbation of sediment levels due to livestock grazing within the drainage.

Conservation Measures associated with the proposed grazing action are considered to be effective in minimizing potential generation of sediment to stream channels within the ESA Action Area. Stream sediment conditions are expected to be maintained under the proposed grazing action. Measures including salting, water developments, fencing, annual use indicators 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 passive (not supervised) and supervised livestock crossing of stream channels within the allotment. Turbidities associated with 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 grazing activities within the ESA 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 ESA Action Area stream 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 in Little Eightmile Creek within the Little Eightmile Allotment. These monitoring operations, supplemented by ongoing MIM and Utilization 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.

Livestock activity within the Little Eightmile Allotment is not currently considered to be a significant factor influencing sediment levels. Long term trend stream sediment levels depth fines measured in Little Eightmile Creek, near the bottom of the ESA Action Area, was 20% in 2008 and 19.8% in 2009 which are considered “Properly Functioning”. Since 1993 the overall sediment levels are trending towards 20% which is considered “Properly Functioning”. Monitoring data indicates that overall stream sediment within the ESA Action Area is “Functioning Appropriately” and is not major limiting factor to fish production within the ESA Action Area

Conclusion:

The Conservation Measures associated with the proposed grazing action are considered to be effective in minimizing potential generation of sediment to stream channels within the ESA Action Area. Contributing impacts on stream sediment from grazing activities under the proposed action are considered to be insignificant, and are not expected to be, in and of themselves, generating any additional measureable increases in sediment levels. We recognize there could be localized impacts to streambanks when livestock occasionally step on streambanks and introduce minor quantities 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, it is my professional judgment those impacts will 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 both within the ESA Action Area and at the 5th field HUC scale.

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 (see section 6.4.7). 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.

Data is limited for average wetted width/maximum depth ratio on streams within the ESA Action Area. Channel geometry has been monitored at one site within the ESA Action Area. That site is the range programs MIM site, Little Eightmile Creek (M268) with a 5.43 width:depth ratio. In the late 1980’s during the Snake River Adjudication process Little Eightmile Creek had a reading of 11.9 at the Forest boundary. This 11.9 reading falls within the Natural Condition Database Width:Depth ratio of 28 for a Rosgen Channel Type of “C”.

The past and current effects of the proposed project can play a role in decreasing or increasing average wetted width/maximum depth ratio within the ESA Action Area. The direct correlation between the proposed project’s past and current activities and a negative increase in average

wetted width/maximum depth ratio would be if livestock grazing activities were allowed to break down streambanks and significantly decrease the stability of streambanks. Range improvements such as water developments and fences help to minimize and keep livestock grazing activities away from riparian areas and streambanks can also help to restore degraded stream reaches where the average wetted width/maximum depth ratio is greater than 10. Recent past and current livestock grazing activities were and are being managed so as not to degrade riparian areas and bank stability which could lead to increased average wetted width/maximum depth ratio.

Stream width:depth ratios are not considered a major limiting factor to fish production within the ESA Action Area based on stream photos, high percent stable streambank stability readings on and local knowledge of the ESA fish streams within the ESA Action Area. Therefore it is my professional judgment that stream width:depth ratios are considered to be Functioning Appropriately and are not a major limiting factor to fish production.

Livestock are also estimated to have very limited accessibility to Little Eightmile Creek (1.18 miles out of the 4.44 miles) and the unnamed tributary to little Eightmile Creek (0.28 miles out of the 1.05 miles). Livestock accessibility to ESA fish streams was calculated and estimated by Ben Goodin (Range Management Specialist) using GIS, Google Earth and local knowledge. The general inaccessibility or very little use of livestock in Little Eightmile Creek and an unnamed tributary to little Eightmile Creek stream reaches within the ESA Action Area suggest that stream channel conditions within the ESA Action Area are not greatly affected by livestock grazing activities.

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 on ESA fish streams, within the ESA Action Area, 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 ESA Action Area streams. Use of annual grazing use indicators, range riders to keep livestock in upland areas, water developments, salting and fencing all contribute to minimizing near stream livestock activity and the potential for direct streambank impacts which could negatively affect channel morphology.

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

Conclusion:

The 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 ESA Action Area. Considering width: depth ratios, stream sediment and streambank stability data and their trends, it is concluded that livestock grazing activities are not expected to produce or contribute to any significant impacts on width:depth ratios of streams within the Little Eightmile Allotment which can be meaningfully measured, detected or evaluated.

Low streambank stability and high stream sediment levels can have a negative impact in a stream’s width:depth ratio. The Grazing Strategies and Conservation Measures associated with the proposed grazing action are considered to be effective in minimizing potential streambank impacts and in reducing sediment impacts to stream channels within the ESA Action Area. We

recognize there could be localized impacts to both streambanks and stream sediment levels, which could negatively affect width:depth ratios, when livestock occasionally step on streambanks and introduce minor quantities 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, it is my professional judgment those impacts will 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 Width:Depth Focus Indicator both within the ESA Action Area and at the 5th field HUC scale.

7.1.5 STREAMBANK CONDITION

Streambank conditions can have important effects on fish populations and livestock grazing can impact streambank conditions (see section 6.4.7) by direct alteration of the bank or by modifying riparian vegetation (Platts and Nelson, 1989).

Livestock activity within the ESA Action Area is not currently considered to be a significant factor influencing streambank stability. Supplemental monitoring data, such as sediment and stream temperature, does not indicate or suggest impact to stream stabilities due to livestock grazing within the drainage. This is also supported by the greater than 80 percent stable streambanks in Little Eightmile Creek at the Forest's long term trend monitoring site BD31 in 2008 and 2009.

Future field data collections will continue to identify trends of streambank conditions for the Little Eightmile Allotment. 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.

Conclusion:

Considering the observed width:depth ratios, streambank stability condition and trends, the effectiveness of the identified conservation measures in preventing or minimizing livestock access to allotment stream channels and the general inaccessibility or very little use of livestock in Little Eightmile Creek and an unnamed tributary to little Eightmile Creek stream reaches within the ESA Action Area, it is concluded that direct and indirect effects of the proposed livestock grazing activities on streambank conditions within the ESA Action Area are insignificant, and not expected to have any meaningfully measureable or discernable influence on streambank stability levels within the ESA Action Area.

The Grazing Strategies and Conservation Measures of the proposed action, designed in part to avoid livestock presence within stream channels during critical spawning periods, additionally serve to minimize potential livestock impacts to streambanks of ESA Action Area streams. Measures including rapid movement of livestock through trailing areas, salting and use of range improvements such as water developments and fencing all contribute to minimizing near stream livestock activity and the potential for direct streambank impacts on ESA Action Area streams. The Grazing Strategies and Conservation Measures associated with the proposed grazing action are considered to be effective in minimizing potential degradation of streambank stability on stream channels within the ESA Action Area.

The direct and indirect effects of the proposed livestock grazing actions on streambank conditions within the Little Eightmile Allotment streams are insignificant, and not expected to have any meaningfully measureable or discernable influence on streambank stability levels

within the ESA Action Area. We recognize there could be localized impacts to streambanks 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, it is my professional judgment those impacts will 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 Streambank Focus Indicator both within the ESA Action Area and at the 5th field HUC scale.

7.1.6 RIPARIAN CONSERVATION AREAS

The condition of riparian areas can have important affects on fish populations. Livestock grazing can impact riparian areas (see section 6.4.7) 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 ESA Action Area. Overall riparian conditions along ESA fish streams within the allotment are good. Data for other associated focus indicators, including stream temperature, streambank condition and stream sediment levels suggest healthy condition of riparian areas along the two ESA fish streams within the ESA Action Area.

Historic grazing activities did not have the same Resource Objectives and Standards as described in section 3.2.5. Those historic resource objectives and standards would have allowed grazing activities to have more negative impacts to riparian areas and fish habitat which would have contributed to past habitat capability limitations within the Little Eightmile Allotment and the ESA Action Area. It is my professional judgment that improvements in grazing management strategies implemented on this allotment within recent years, since the mid 1990's, have greatly reduced any livestock impacts to riparian areas, fish and fish habitat parameters within the ESA Action Area.

Ongoing MIM and utilization monitoring will continue to identify trends of riparian vegetation conditions within the Little Eightmile 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.

<u>Conclusion:</u>

Stream Riparian Conservation Areas are not considered a major limiting factor to fish production within the ESA Action Area.

Because of topography and dense riparian vegetation livestock in general are limited in inaccessibility or there is very little use of livestock in Little Eightmile Creek and an unnamed tributary to little Eightmile Creek ESA fish stream reaches within the ESA Action Area. The Grazing Strategies and Conservation Measures of the proposed action, designed in part to avoid livestock presence within stream channels during critical spawning periods, additionally serve to minimize potential livestock impacts to riparian conservation areas of ESA Action Area stream. Measures including rapid movement of livestock through trailing areas, riding to distribute livestock away from riparian areas, salting and use of range improvements such as water developments and fencing all contribute to minimizing near stream livestock activity and the potential for direct streambank impacts on the one ESA Action Area stream. The Grazing Strategies and Conservation Measures associated with the proposed grazing action are considered to be effective in minimizing potential degradation of riparian conservation areas on stream channels within the ESA Action Area.

The direct and indirect effects of the proposed livestock grazing actions on riparian conservation areas within the Little Eightmile Allotment's ESA fish streams is insignificant, and not expected to have any meaningfully measureable or discernable influence on riparian conservation areas within the ESA Action Area. We recognize there could be localized impacts to riparian conservation areas when are grazing near a stream. However, because of the expected effectiveness of the project design and associated conservation measures in reducing livestock presence near streams, it is my professional judgment those impacts will 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 Riparian Conservation Area Focus Indicator both within the ESA Action Area and at the 5th field HUC scale.

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 ESA 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.

There are no State lands within the ESA Action Area. There is approximately 19 acres of private land within the Little Eightmile Allotment and the ESA Action Area. There are no known private land activities within the ESA Action Area that along with the Little Eightmile Allotment activities, will pose a risk of adverse cumulative effects to the fisheries resource.

7.3 SUMMARY OF EFFECTS

The effects analysis identifies a non-discountable potential for direct impact of livestock on spawning bull trout and their incubating eggs. These potential impacts could directly affect the Growth and Survival Indicator of the Subpopulation Characteristics Pathway, which could produce related indirect effects to the Subpopulation Size and Persistence and Genetic Integrity Indicators. There is no sockeye salmon, Chinook salmon or steelhead present within the ESA Action Area**.** There is no sockeye salmon, Chinook salmon or steelhead Designated Critical Habitat within the ESA Action Area. There is bull trout Critical Habitat within the ESA Action Area. Impacts of proposed grazing activities to aquatic and riparian habitat focus indicators, 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 focus indicators at their current levels of functionality.

Table 8 summarizes the effects of the proposed Little Eightmile Allotment's grazing operations on aquatic/riparian Pathways and Indicators, including the six identified Focus Indicators (highlighted) addressed in the Effects section of this document.

The Matrix of Diagnostic Pathways and Indicators (Appendix B) and Table 8 below are completed following two documents, the NMFS August 1996 *Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale* (NMFS, 1996) and the USFWS February 1998 *A Framework to Assist in Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Bull Trout Subpopulation Watershed Scale (USFWS, 1998).*

Table 8 - Effects Summary for the Little Eightmile Allotment's Grazing Activities

Pathway	Indicators	Functionality Of Baseline	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 (bull trout only)	Subpopulation Size	FR	NA	NA	YES	NA	NA	YES
	Growth and Survival (including incubation survival)	FUR	NA	NA	YES	NA	NA	YES
	Life History Diversity and Isolation	FUR	NA	NA	NO	NA	NA	NO
	Persistence and Genetic Integrity	FUR	NA	NA	NO	NA	NA	NO
Water Quality	Temperature	FA	NO	NO	YES	NO	NO	NO
	Sediment	FA	NO	NO	YES	NO	NO	NO
	Chemical Characteristics	FA	NO	NO	NO	NO	NO	NO
Habitat Access	Physical Barriers	FUR	NO	NO	NO	NO	NO	NO
Habitat Elements	Substrate Embed.	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	LWD	FA	NO	NO	NO	NO	NO	NO
	Pool Frequency and Quality	FA	NO	NO	NO	NO	NO	NO
	Off-channel Habitat	FA	NO	NO	NO	NO	NO	NO
	Refugia	FA	NO	NO	NO	NO	NO	NO

Pathway	Indicators	Functionality Of Baseline	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
Channel Condition and Dynamics	Width:Depth Ratio	FA	NO	NO	YES	NO	NO	NO
	Streambank Condition	FA	NO	NO	YES	NO	NO	NO
	Floodplain Connectivity	FA	NO	NO	NO	NO	NO	NO
Flow/Hydrology	Change in Peak/Base Flows	FUR	NO	NO	NO	NO	NO	NO
	Increase in Drainage Networks	FA	NO	NO	NO	NO	NO	NO
Watershed Conditions	Road Density and Location	FUR	NO	NO	NO	NO	NO	NO
	Disturbance History	FA	NO	NO	NO	NO	NO	NO
	Riparian Conservation Areas	FA	NO	NO	YES	NO	NO	NO
	Disturbance Regime (bull trout only)	FA	NA	NA	Yes	NA	NA	NO
Integration of Species and Habitat Conditions	Habitat Quality and Connectivity (bull trout only)	FR	NA	NA	Yes	NA	NA	NO

Non-highlighted elements refer to overall conditions within the Little Eightmile Watershed as identified in Matrix Table (Appendix B)

Highlighted elements refer to functionality conditions of Little Eightmile Allotment ESA Action Area Focus Indicators

Upper Lemhi River 5th field HUC

Status of Baseline: Functioning Appropriately – **FA** Functioning at Risk – **FR** Functioning at Unacceptable Risk – **FUR**

8 EFFECTS DETERMINATION

The effects determination for each species was made using the above analysis and the effects determination key (Table 8). The specific determinations are identified below and summarized in Table 9.

8.1 SNAKE RIVER SPRING/SUMMER CHINOOK SALMON

The effects analysis concluded that the proposed action will have no direct, indirect or cumulative effects on Chinook salmon or Chinook salmon habitat because the species and occupied habitat are not found within the ESA Action Area. Therefore, it is my determination the proposed action results in a “NO EFFECT” determination for Chinook salmon.

The effects analysis concluded that the proposed action will have no effect on Chinook salmon designated critical habitat because there is no Chinook salmon designated critical habitat within the ESA Action Area. Therefore, it is my determination the proposed action results in a “NO EFFECT” determination for Chinook salmon designated critical habitat.

8.2 SNAKE RIVER STEELHEAD

The effects analysis concluded that the proposed action will have no direct, indirect or cumulative effects on steelhead or steelhead habitat because the species and the habitat are not found within the ESA Action Area. Therefore, it is my determination the proposed action results in a “NO EFFECT” determination for steelhead.

The effects analysis concluded that the proposed action will have no effect on steelhead designated critical habitat because there is no designated critical habitat within the ESA Action Area. Therefore, it is my determination the proposed action results in a “NO EFFECT” determination for steelhead designated critical habitat.

8.3 COLUMBIA RIVER BULL TROUT

The effects analysis concluded that the proposed action may have direct effects to bull trout or bull trout redds which are not considered insignificant or discountable. Although proposed conservation measures limit the adverse effects of grazing activities, there exists a remaining potential for direct trampling of bull trout redds and/or the potential for livestock to disturb or harass potential spawning adult bull trout within an ESA Action Area stream. Therefore, it is my determination the proposed action results in a “MAY AFFECT, LIKELY TO ADVERSELY AFFECT” determination for bull trout.

The effects analysis concluded that the proposed action may have some effects on bull trout critical habitat. However, these effects are expected to be insignificant or discountable. Therefore, it is my determination the proposed action results in a “MAY AFFECT, NOT LIKELY TO ADVERSELY AFFECT” determination for bull trout designated critical habitat.

8.4 SNAKE RIVER SOCKEYE SALMON

The effects analysis concluded that the proposed action will have no direct, indirect or cumulative effects on sockeye salmon or sockeye salmon habitat because the species and the habitat are not found within the ESA Action Area. Therefore, it is my determination the proposed action results in a “NO EFFECT” determination for sockeye salmon.

The effects analysis concluded that the proposed action will have no effect on sockeye salmon

designated critical habitat because there is no designated critical habitat within the ESA Action Area. Therefore, it is my determination the proposed action results in a “NO EFFECT” determination for sockeye salmon designated 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. There is no Chinook salmon occupied habitat within and no identified Chinook salmon designated critical habitat within the ESA Action Area. Therefore, it is my determination the proposed action results in a “NO EFFECT” determination on Chinook salmon Essential Fish Habitat.

Table 9 - Effects Determination Summary for the Little Eightmile Allotment's Grazing Activities

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

[1] The ‘Species’ column is for determining effects to the species. The ‘Habitat’ column is for determining effects to designated critical habitat or essential fish habitat.

All of the above effects determinations in Table 9 consider the Analysis of Effects in Section 7 of this BA. The species determinations are made as follows: No Effect (NE) if the species is not present in the ESA Action Area or the proposed action or any interrelated or interdependent actions will not effect on 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 or when the action’s effects cannot meet the criteria for a MA-NLAA determination.

The habitat determinations are made as follows: NE if the ESA 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 - REFERENCES

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

1 UPPER LEMHI RIVER (5TH FIELD HUC) WATERSHED BASELINE

1.1 MATRIX OF DIAGNOSTIC PATHWAYS AND INDICATORS

Agency: USDA Forest Service, Salmon-Challis National Forest	**Watershed 5th field HUC: Upper Lemhi River - 1706020405**
Unit: Leadore Ranger District	**Spatial Scale of Matrix:** One 5th field HUC
Fish Species Present: Bull Trout	**Designated Critical Habitat Present:** Bull Trout
Anadromous Species Population: N/A	**Anadromous Species Subpopulation:** N/A
Bull Trout Recovery Unit: Upper Snake	**Bull Trout Critical Habitat Unit:** Salmon River Basin
Bull Trout Core Area: Lemhi River	**Bull Trout Local Population:** Upper Lemhi River
Management Actions: Range (Ongoing) - Little Eightmile Allotment	**Updated:** 8/17/2010

Pathway - Subpopulation Characteristics (Bull Trout Only)		
Pathways Indicators	**Status of Baseline**	**Discussion of Baseline – Current Condition**
Subpopulation Size	**FR $_{BT}$**	**Bull Trout - Bull Trout have been found in nine streams within the Upper Lemhi River 5th field HUC and within in two streams within the ESA Action Area. All life stages are believed to be present in nine streams. Fluvial individuals are present within the Upper Lemhi River 5th field HUC. Bull trout is currently listed as "Threatened" under ESA.** **Therefore it is my professional judgment that the Environmental Baseline for this indicator is *Functioning at Risk*. The effects of the proposed project is likely to impact individuals but may not have a trend in decreasing or increasing the bull trout population in the 5th field HUC or the ESA Action Area because the project's activities will not restore nor degrade stream habitat elements within the next 5 to 10 years. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**

Growth and Survival	**FUR $_{BT}$**	**<u>Bull Trout</u> - The sub population, within the Upper Lemhi River 5th field HUC, has the resilience to recover from short term disturbances or subpopulation declines within one to two generations (5 to 10 years). The subpopulation is characterized as increasing or stable. The eight of the nine bull trout streams within the Upper Lemhi River 5th field HUC and the two bull trout stream within the ESA Action Area currently have no connectivity to the Lemhi River and the Salmon River for large anadromous fish or fluvial bull trout. All bull trout streams: 1) Conserve opportunity for diverse life-history expression, 2) Conserve opportunity for genetic diversity, 3) Ensure bull trout are distributed across representative habitats, 4) Ensure sufficient connectivity among populations, and 5) Ensure sufficient habitat to support population viability (e.g., abundance, trend indices).** **Therefore it is my professional judgment that the Environmental Baseline for this indicator is *<u>Functioning at Unacceptable Risk</u>* because eight of the nine bull trout streams are disconnected to the Lemhi River. The effects of the proposed project is likely to impact individuals but may not have a trend in decreasing or increasing the bull trout growth and survival in the ESA Action Area because the project's activities will not measurably restore nor degrade stream habitat elements or population size within the next 5 to 10 years. Therefore the effects of this action will *<u>Maintain</u>* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**
Life History Diversity and Isolation	**FUR $_{BT}$**	**<u>Bull Trout</u> - The migratory form of bull trout, within the Upper Lemhi River 5th field HUC, is only present in the Lemhi River. The local populations are not in close proximity to other spawning and rearing groups. Migratory corridors and rearing habitat are in fair to good condition for the species but all tributaries are disconnected to the Lemhi River for large anadromous fish and fluvial bull trout. Eight of the nine bull trout streams within the Upper Lemhi River 5th field HUC including the one within the ESA Action Area currently have no connectivity to the Lemhi River and the Salmon River for large anadromous fish or fluvial bull trout.** **Therefore it is my professional judgment that the Environmental Baseline for this indicator is *<u>Functioning at Unacceptable Risk</u>*. The effects of the proposed project is likely to impact individuals but may not have a trend in decreasing or increasing the bull trout life history diversity and Isolation in the ESA Action Area because the project's activities will not measurably restore nor degrade stream habitat elements or population size within the next 5 to 10 years. Therefore the effects of this action will *<u>Maintain</u>* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**
Persistence and Genetic Integrity	**FUR $_{BT}$**	**<u>Bull Trout</u> – Bull Trout stream connectivity is low to moderate within the Upper Lemhi River 5th field HUC. Each of the relevant subpopulations is at a moderate risk of extinction. The probability of hybridization or displacement by competitive species is low to nonexistent. Eight of the nine bull trout streams within the Upper Lemhi River 5th field HUC including the two within the ESA Action Area currently have no connectivity to the Lemhi River and the Salmon River.** **Therefore it is my professional judgment that the Environmental Baseline for this indicator is *<u>Functioning at Unacceptable Risk</u>*. The effects of the proposed project is likely to impact individuals but may not have a trend in decreasing or increasing the bull trout persistence and genetic integrity in the ESA Action Area because the project's activities will not measurably restore nor degrade stream habitat elements, population size or the probability of hybridization with eastern brook trout within the next 5 to 10 years. Therefore the effects of this action will *<u>Maintain</u>* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**

Pathway - Water Quality		
Pathway Indicators	**Status of Baseline**	**Discussion of Baseline – Current Condition**
Temperature (7day average. Maximum, ^{o}C)	**FA $_{BT}$**	**As is typical for most stream systems in the Lemhi River watershed, stream temperature increases as one moves downstream. Steam temperatures on National Forest System lands are always cooler than those downstream of National Forest System Lands. There are a number of streams on National Forest System lands that have water withdrawals that will lead to warmer than historical stream temperatures prior to water withdrawals.** **Therefore it is my professional judgment that the Environmental Baseline for this indicator is *Functioning At Risk*. The effects of the proposed project will not play a role in decreasing or increasing steam temperatures within the ESA Action Area because the project's activities will not measurably restore nor degrade stream habitat elements that effect stream temperatures. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**

Chemical Contaminants/Nutrients	**FA $_{BT}$**	**There are twelve 303d streams listed within the Upper Lemhi River 5th field HUC and none within the ESA Action Area.** **Therefore it is my professional judgment that the Environmental Baseline for this indicator is *Functioning Appropriately* within the ESA Action Area and *Functioning at Risk* when considering the entire 5th field HUC. The effects of the proposed project will not play a role in decreasing or increasing chemical contaminants/nutrients within the Upper Lemhi River 5th field HUC and the ESA Action Area because the project's activities will not measurably add any chemical contaminants/nutrients into the stream. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**
Sediment	**FA $_{BT}$**	**Salmon-Challis National Forest Watershed program uses McNeil core sampling methodologies to monitor substrate % depth fines annually on selected streams. Analysis of core sampling data correlates measured levels of depth fines in spawning habitats to predicted egg incubation success values determined by Stowell, et al (1983).** **Core sampling has been done by the USFS at 5 sites in the Upper Lemhi River 5th field HUC since 1993. Four of the five sites are trending 20% fines by depth. The fifth site's last two reading were just below 30% by over all is trending towards 25% fines by depth.** **Therefore it is my professional judgment that the Environmental Baseline for this indicator within the Upper Lemhi River 5th field HUC and the ESA Action Area is *Functioning Appropriately*. The effects of the proposed project will not play a role in decreasing or increasing steam sediment within the Upper Lemhi River 5th field HUC and the ESA Action Area because the project's activities will not measurably restore nor degrade upland and riparian habitats that influence overland sediment flow into the stream. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**

Pathway - Habitat Access		
Pathway Indicator	**Status of Baseline**	**Discussion of Baseline – Current Condition**
Physical Barriers	**FUR BT**	**There are numerous irrigation diversions throughout the Upper Lemhi River 5th field HUC that either physically block fish migration with a structure or dewater stream channels that block fish migration.** **Therefore it is my professional judgment that the Environmental Baseline for this indicator is *Functioning at Unacceptable Risk* when considering the entire 5th field HUC. The effects of the proposed project will not play a role in decreasing or increasing human caused physical barriers within the Upper Lemhi River 5th field HUC and the ESA Action Area because the project's activities will not remove nor create any human caused physical barriers within any ESA fish bearing streams. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**

Habitat Elements		
Pathway Indicators	**Baseline**	**Discussion of Baseline – Current Condition**
Substrate Embeddedness	**NA**	**The Salmon-Challis National Forest does not collect substrate embeddedness data. Refer to Sediment.**
Large Woody Debris	**FA $_{BT}$**	**Data is limited for large woody debris within the Upper Lemhi River 5th field HUC and within the ESA Action Area. On National Forest System lands there are very few roads along the streams that allow access to firewood gathers. Below National Forest System lands there is not much natural large woody debris recruitment because of the type of riparian vegetation.** **Therefore it is my professional judgment that large woody debris is *Functioning Appropriately* within the entire 5th field HUC. The effects of the proposed project will not play a role in decreasing or increasing large woody debris within the Upper Lemhi River 5th field HUC and the ESA Action Area because the project's activities will not remove any overstory trees that could create large woody debris in any ESA fish bearing stream within the ESA Action Area. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**
Pool Frequency and Quality	**FA $_{BT}$**	**Data is limited for pool frequency and quality within the Upper Lemhi River 5th field HUC and within the ESA Action Area. On National Forest System lands stream channels and riparian vegetation are functioning naturally and there are very few roads along the streams that allow access to firewood gathers. Below National Forest System lands there is not much natural large woody debris recruitment because of the type of riparian vegetation.** **Therefore it is my professional judgment that pool frequency and quality is *Functioning Appropriately* within the entire 5th field HUC. The effects of the proposed project will not play a role in decreasing or increasing pool frequency and quality within the Upper Lemhi River 5th field HUC and the ESA Action Area because the project's activities will not remove any overstory trees that could create quality pools in any ESA fish bearing stream within the ESA Action Area. Also, livestock grazing is being managed so as not to degrade bank stability which could degrade quality pool habitat. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**

Off-channel Habitat	**FA $_{BT}$**	**Data is limited for off-channel habitat within the Upper Lemhi River 5th field HUC and within the ESA Action Area. On non confined stream channel reaches where there should be off-channel habitat there are backwaters with cover and low energy off channel areas.** **It is my professional judgment that off-channel habitats are *Functioning Appropriately* and naturally within the 5th field HUC. The effects of the proposed project will not play a role in decreasing or increasing off channel habitat within the Upper Lemhi River 5th field HUC and the ESA Action Area because the project's activities will not measurably restore nor degrade stream habitat elements that create and maintain off channel habitats. Also, livestock grazing is being managed so as not to degrade bank stability which could degrade off channel habitat. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**
Refugia	**FA $_{BT}$**	**Quantifiable data is limited for refugia habitat within the Upper Lemhi River 5th field HUC and within the ESA Action Area. It is my professional judgment that Refugia Habitat (important remnant habitat for sensitive aquatic species) does exist and are adequately buffered with intact riparian areas. Existing refugia are sufficient in size, number and connectivity to maintain viable populations or sub-populations.** **It is my professional judgment that refugia habitat is *Functioning Appropriately* and naturally within the 5th field HUC. The effects of the proposed project will not play a role in decreasing or increasing Refugia Habitat within the Upper Lemhi River 5th field HUC and the ESA Action Area because the project's activities will not measurably restore nor degrade stream habitat elements or riparian areas that create and maintain Refugia Habitat. Also, livestock grazing is being managed so as not to degrade riparian areas and bank stability which could create and maintain Refugia Habitat. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**

Channel Condition & Dynamics		
Pathways Indicators	**Status of Baseline**	**Discussion of Baseline – Current Condition**
Average Wetted Width/Maximum Depth Ratio	**FR $_{BT}$**	**Data is limited for average wetted width/maximum depth ratio within the Upper Lemhi River 5th field HUC and within the ESA Action Area (see sections 6.4.4 & 7.1.4 above).** **It is my professional judgment that average wetted width/maximum depth ratio is *Functioning at Risk* within the Upper Lemhi River 5th field HUC because stream channels in the lower parts of drainages are impacted by roads and private land activities that include irrigation practices that negatively affect average wetted width/maximum depth ratios . The effects of the proposed project could play a role in decreasing or increasing average wetted width/maximum depth ratio within the Upper Lemhi River 5th field HUC and the ESA Action Area. The direct correlation between the proposed project's activities and a negative increase in average wetted width/maximum depth ratio would be if livestock grazing activities are allowed to break down streambanks and significantly decrease the stability of streambanks. Range improvements such as fences and water developments that help to minimize and keep livestock grazing activities away from riparian areas and streambanks can help to restore degraded stream reaches where the average wetted width/maximum depth ratio is greater than 10. Current and future livestock grazing activities are being managed so as not to degrade riparian areas and bank stability which overtime could improve average wetted width/maximum depth ratio. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**
Streambank Condition	**FA $_{BT}$**	**Data is limited for streambank condition within the Upper Lemhi River 5th field HUC and within the ESA Action Area (see sections 6.4.5 & 7.1.5 above). USFS sampling sites typically exceed 80-90% stable** **It is my professional judgment that streambank condition is *Functioning Appropriately* within the Upper Lemhi River 5th field HUC. The effects of the proposed project's activities could play a role in decreasing streambank conditions within the ESA Action Area. The direct correlation between the proposed project's activities and a negative decrease in streambank conditions would be if livestock grazing activities are allowed to break down streambanks and significantly decrease the stability of streambanks. Range improvements such as fences and water developments that help to minimize and keep livestock grazing activities away from riparian areas and streambanks can help to maintain and restore degraded stream reaches where the percent stabile streambanks area higher than desired. Current and future livestock grazing activities are being managed so as not to degrade riparian areas and bank stability. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**

Floodplain Connectivity	**FA $_{BT}$**	**Most all stream reaches within the Upper Lemhi River 5th field HUC and within the ESA Action Area can access their floodplains. Off channel areas are frequently hydrologically linked to main channels. Overbank flows occur and maintain wetland functions, riparian vegetation and succession.** **It is my professional judgment that floodplain connectivity is *Functioning Appropriately* on ESA stream reaches within the Upper Lemhi River 5th field HUC and the ESA Action Area. The effects of the proposed project's activities could play a role in decreasing streambank conditions, within the ESA Action Area, which in turn could negatively affect floodplain connectivity. The direct correlation between the proposed project's activities and a negative decrease in streambank conditions would be if livestock grazing activities are allowed to break down streambanks and significantly decrease the stability of streambanks. Range improvements such as fences and water developments that help to minimize and keep livestock grazing activities away from riparian areas and streambanks can help to maintain and restore degraded stream reaches where the percent stabile streambanks area higher than desired. Current and future livestock grazing activities are being managed so as not to degrade riparian areas and bank stability. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**
Flow/Hydrology		
Pathways Indicators	**Status of Baseline**	**Discussion of Baseline – Current Condition**
Change in Peak/Base Flows	**FUR $_{BT}$**	**Within the entire Upper Lemhi River 5th field HUC, below National Forest System lands there are water diversions that take water out of the stream. This would show some evidence of altered peak flow, baseflow and/or flow timing relative to an undisturbed watershed of similar size, geology and geography. Within the ESA Action Area the watershed hydrograph would indicate peak flow, baseflow and/or flow timing characteristics comparable to an undisturbed watershed of similar size, geology and geography.** **It is my professional judgment that change in peak/base flows is *Functioning at Unacceptable Risk* for the Upper Lemhi River 5th field HUC but would be *Functioning Appropriately* on ESA stream reaches within the ESA Action Area. The effects of the proposed project's activities will not play a role in changing peak flows and base flows in the Upper Lemhi River 5th field HUC or within the ESA Action Area. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**

Increase in Drainage Network	**FA $_{BT}$**	**There has been a zero or minimum increase in active channel length correlated with human caused disturbance within the Upper Lemhi River 5th field HUC.** **It is my professional judgment that increase in drainage network is *Functioning Appropriately* for the Upper Lemhi River 5th field HUC. The effects of the proposed project's activities will not play a role in changing or increasing the drainage network in the Upper Lemhi River 5th field HUC or within the ESA Action Area. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**
Watershed Condition		
Pathway Indicators	**Status of Baseline**	**Discussion of Baseline – Current Condition**
Road Density and Location	**FUR $_{BT}$**	**The Upper Lemhi River 5th field HUC has 784.3 miles of roads, a road density of 2.4 (mi/mi^2) with some valley bottom roads (196.3 miles of road within a PACFISH RHCA and 25% of the roads are within a PACFISH RHCA).** **It is my professional judgment that road density and location is *Functioning at Unacceptable Risk* for the Upper Lemhi River 5th field HUC. The effects of the proposed project's activities will not play a role in road density or location in the Upper Lemhi River 5th field HUC or within the ESA Action Area. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**
Disturbance History	**FA $_{BT}$**	**The ECA for the Upper Lemhi River 5th field HUC is 9.4 percent with an overall cumulative effects rating of Moderate. This rating is caused by timber harvest and historic fires within the Upper Lemhi River 5th field HUC. There are no concentrations of disturbance in unstable areas, and/or refugia, and or riparian areas. An ECA rating of greater than 15 percent is considered functioning at risk.** **It is my professional judgment that disturbance history is *Functioning Appropriately* for the Upper Lemhi River 5th field HUC. The effects of the proposed project's activities will not play a role in disturbance history within the Upper Lemhi River 5th field HUC or within the ESA Action Area. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**

Riparian Conservation Areas	**FA $_{BT}$**	**The riparian conservation areas provide adequate shade, large woody debris recruitment and habitat protection and connectivity within the Upper Lemhi River 5th field HUC, buffers or includes known refugia for sensitive aquatic species (>80% intact) and adequately buffer impacts on rangelands. The percent similarity of riparian vegetation to the potential natural community/composition is >50%.** **It is my professional judgment that riparian conservation areas are *Functioning Appropriately for* the Upper Lemhi River 5th field HUC. The effects of the proposed project's activities could play a role in negatively affecting riparian conservation areas. Range improvements such as fences and water developments help to minimize or eliminate livestock grazing activities within some riparian areas. Current and future livestock grazing activities are being managed so as not to degrade riparian conservation areas. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**
Disturbance Regime **(bull trout only)**	**FA $_{BT}$**	**The disturbance regime, within the Upper Lemhi River 5th field HUC, has short lived environmental disturbances with a predictable hydrograph, high quality habitat and watershed complexity providing refuge and rearing space for all life stages or multiple life-history forms. Natural processes are stable.** **It is my professional judgment that disturbance regimes are *Functioning Appropriately for* the Upper Lemhi River 5th field HUC. The effects of the proposed project's activities could play a role in negatively affecting disturbance regimes. Range improvements such as fences and water developments help to minimize or eliminate livestock grazing activities within some riparian areas. Current and future livestock grazing activities are being managed so as not to degrade riparian areas and stream habitat within the ESA Action Area. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**

Integration of Species and Habitat Conditions		
Pathway Indicators	**Status of Baseline**	**Discussion of Baseline – Current Condition**
Habitat Quality and Connectivity **(bull trout only)**	**FR** $_{BT}$	**Within the Upper Lemhi River 5th field HUC habitat quality and connectivity among subpopulations is low to moderate. Fine sediments, stream temperatures or the availability of suitable habitats have been altered and will not recover to pre-disturbance conditions within one generation (5 years). Survival or growth rates have been reduced from those in the best habitats. The subpopulation is reduced in size, but the reduction does not represent a long-term trend. The subpopulation is stable or fluctuating in a downward trend. Connectivity among subpopulations occurs but habitats are more fragmented.** **The drainages within the Upper Lemhi River 5th field HUC are disconnected from the Lemhi River with numerous diversions which alter flow regimes and have resulted in areas of decadent riparian vegetation.** **It is my professional judgment that integration of species and habitat conditions are *Functioning at Risk for* the Upper Lemhi River 5th field HUC. The effects of the proposed project's activities could play a role in negatively affecting integration of species and habitat conditions. Range improvements such as fences and water developments help to minimize or eliminate livestock grazing activities within some riparian areas and stream reaches. Current and future livestock grazing activities are being managed so as not to degrade riparian areas and stream habitat within the Upper Lemhi River 5th field HUC and the ESA Action Area. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**

Status of Baseline: Functioning Appropriately – **FA** Functioning at Risk – **FR** Functioning at Unacceptable Risk – **FUR**
$_{BT}$ Bull Trout, $_{CK}$ Chinook, $_{SH}$ Steelhead, $_{1}$ Rearing, $_{2}$ Spawning/Incubation, $_{TRIB}$ Tributaries,

Effects of the Action:
Restore – the action will result in a positive change in the indicator evaluated
Maintain – the action will have no effect on the status of the indicator evaluated
Degrade – the action will result in a negative change in the indicator evaluated
Professional Judgment – **PJ**

APPENDIX C – MONITORING DATA AND SUMMARIES

Figure 5 - Little Eightmile Allotment Monitoring Sites Map

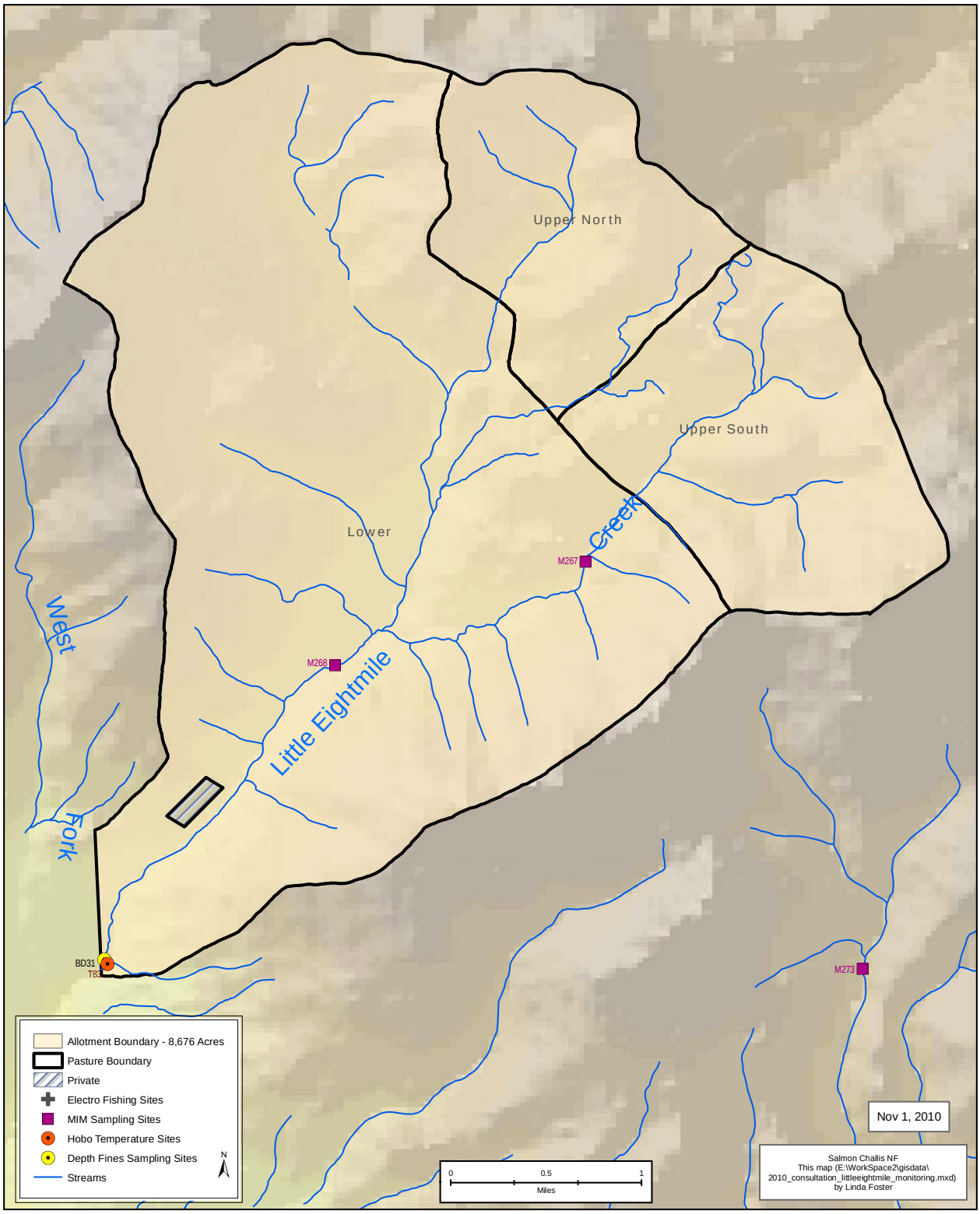

Figure 6 - Little Eightmile Allotment Vegetation Map

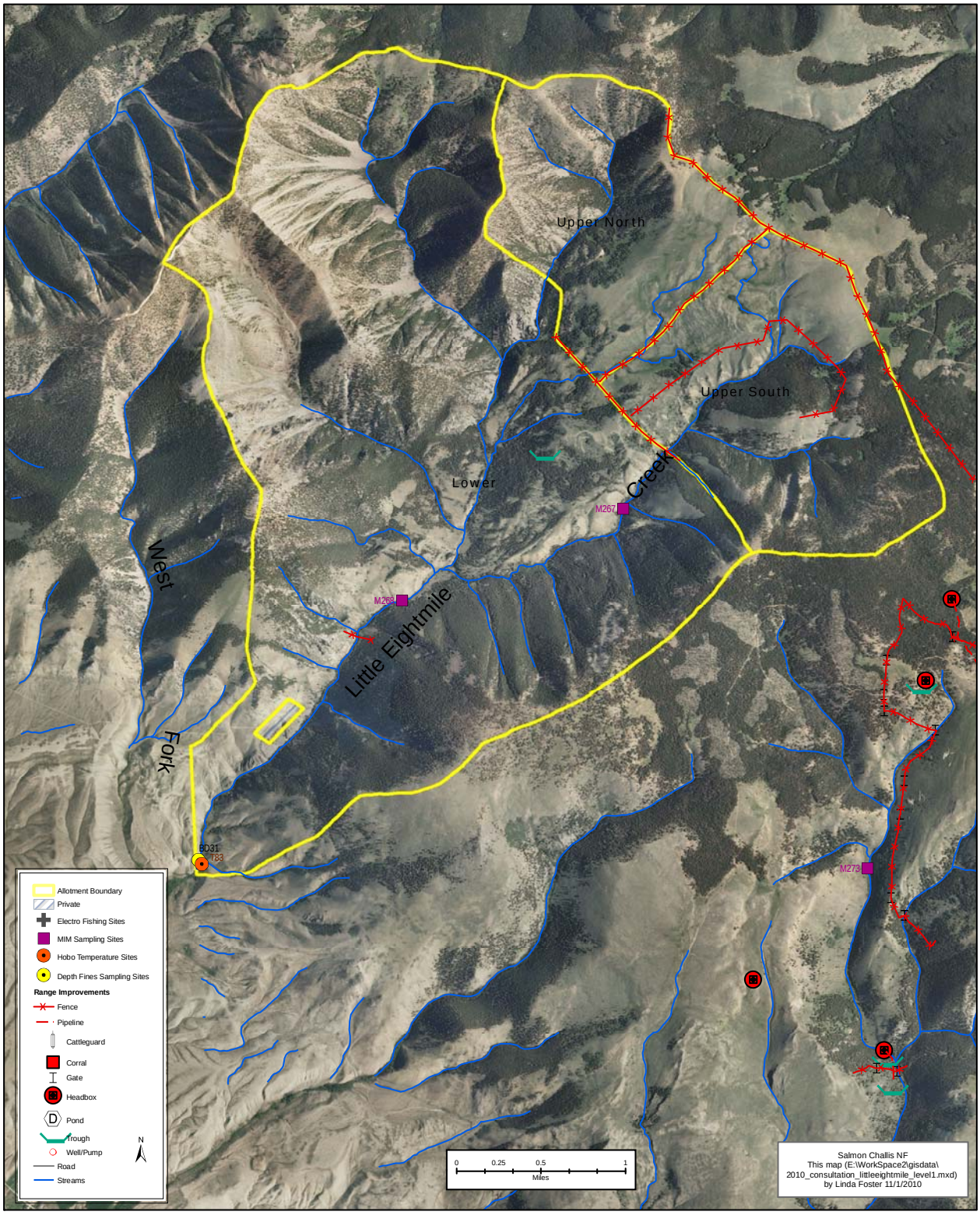

Table 10 - Little Eightmile Allotment Summary of Monitoring Data Collected

Little Eightmile Allotment - (2 ESA Fish Streams)	Chinook salmon	Chinook Salmon Presence Miles	Chinook salmon Spawning Miles	Chinook salmon DCH Miles	steelhead	steelhead Presence Miles	steelhead Spawning Miles	steelhead DCH Miles	bull trout	bull Trout Presence Miles	bull trout Spawning Miles	bull trout DCH Miles	Temperature	Sediment	Electrofishing	Width to Depth Ratio	Streambank Condition	Greenline Ecological Status
Little Eightmile Creek	No	No	No	No	No	No	No	No	Yes	4.44	4.44	6.24	09,10	93,95,99,04,08,09	No	09	99, 04, 09	93,96 99,04,09,10
unnamed tributary Little Eightmile Creek	No	No	No	No	No	No	No	No	Yes	1.05	1.05	NO	NO	NO	NO	NO	NO	NO

Table 11 - Little Eightmile Allotment (bull trout)

Bull Trout Present	
Row Labels	Sum of LENGTH
Little Eightmile Creek	4.44
unnamed trib to Little Eightmile Creek	1.05
Grand Total	5.49

Bull Trout Spawning	
Row Labels	Sum of LENGTH
Little Eightmile Creek	4.44
unnamed trib to Little Eightmile Creek	1.05
Grand Total	5.49

Bull Trout DCH	
Row Labels	Sum of LENGTH
Little Eightmile Creek	6.24
Grand Total	6.24

Table 12 - Little Eightmile Allotment's Units (bull trout)

Bull Trout Present	
Row Labels	Sum of LENGTH
Lower	5.31
Little Eightmile Creek	4.26
unnamed trib to Little Eightmile Creek	1.05
Upper South	0.18
Little Eightmile Creek	0.18
Grand Total	5.49

Bull Trout Spawning	
Row Labels	Sum of LENGTH
Lower	5.31
Little Eightmile Creek	4.26
unnamed trib to Little Eightmile Creek	1.05
Upper South	0.18
Little Eightmile Creek	0.18
Grand Total	5.49

Bull Trout DCH	
Row Labels	Sum of LENGTH
Lower	4.26
Little Eightmile Creek	4.26
Upper South	1.98
Little Eightmile Creek	1.98
Grand Total	6.24

Table 13 - Water Temperature 2009 - 2010

Unit	Site ID	Year	Monitoring Period	Maximum Daily Temperature	Maximum of 7 day Moving Maximum	Mean Temperature 7/1 to 9/30
Lower	Little Eightmile Creek T83	2010	6/24 – 10/26	13.7^{o}C	13.1^{o}C	8.6^{o}C
		2009	7/1 – 9/29	13.7^{o}C	13.2^{o}C	Insufficient Data

Table 14 - Multiple Indicators Monitoring (MIM) Summary

Little Eightmile Greenline Summary

Unit	Stream Name	Site #	Year	Width:Depth	Bank Stability	Woody Species Regeneration		Greenline Ecological Status	GES Trend	Summary of Trend
						Seedling/Young (#/%)	Mature/Dead (#/%)			
Lower	Little Eightmile Creek (upper)	M267	1993	N/A	N/A	29/35%	54/65%	44/MS	Base	GES is static at PNC. Site is dominated by Carex with an overstory of Willow and Alder.
			1996	N/A	N/A	137/70%	60/30&	88/PNC	Up	
			2004	N/A	N/A	97/57%	74/43%	109/PNC	Static	
			2010	N/A	88%	8/29%	20/71%	80/PNC	Static	
Lower	Little Eightmile Creek (lower)	M268	1999	N/A	79	155/78%	43/22%	0/VES	Base	GES is in a upward trend at Mid Seral. Site is dominated by Willow. Sage brush has begun to encroach site. The encroachment may be contributing to the Mid Seral Ecological status.
			2004	N/A	65	181/76%	56/24%	39/ES	Up	
			2009	5.43	68	10/36%	18/64%	53/MS	Up	

Little Eightmile Allotment Riparian Discussion :

Monitoring sites were established and subsequent monitoring has occurred on the Little Eightmile Allotment since the early 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 will be discussed in the following:

Generally, the two sites monitored since the early 90's, both are in upward trend or at Late Seral/ PNC.

Little Eightmile Creek (upper) - M267: GES is static at PNC. Site is dominated by Carex with an overstory of Willow and Alder. Due to the well established Carex under growth, the best monitoring attribute to manage the site is greenline stubble with an annual use indicator of 4 inches. The monitoring attribute of bank alteration with an annual use indicator of 20% will also be used.

Little Eightmile Creek (lower) - M268: GES is in a upward trend at Mid Seral. Site is dominated by Willow. Sage brush has begun to encroach site. The encroachment may be contributing to the Mid Seral Ecological status. Due to woody dominance, the best monitoring attribute to manage site is browse use with an annual use indicator not to exceed 30% on Willow. The monitoring attribute of greenline stubble with an annual use indicator of 5 inches will also be used. The monitoring attribute of bank alteration with a annual use indicator of 10% will also be used.

APPENDIX D – 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 PRIMARY 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 bull trout designated critical habitat (October 10, 2010, Federal Register 75FR63898) 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.

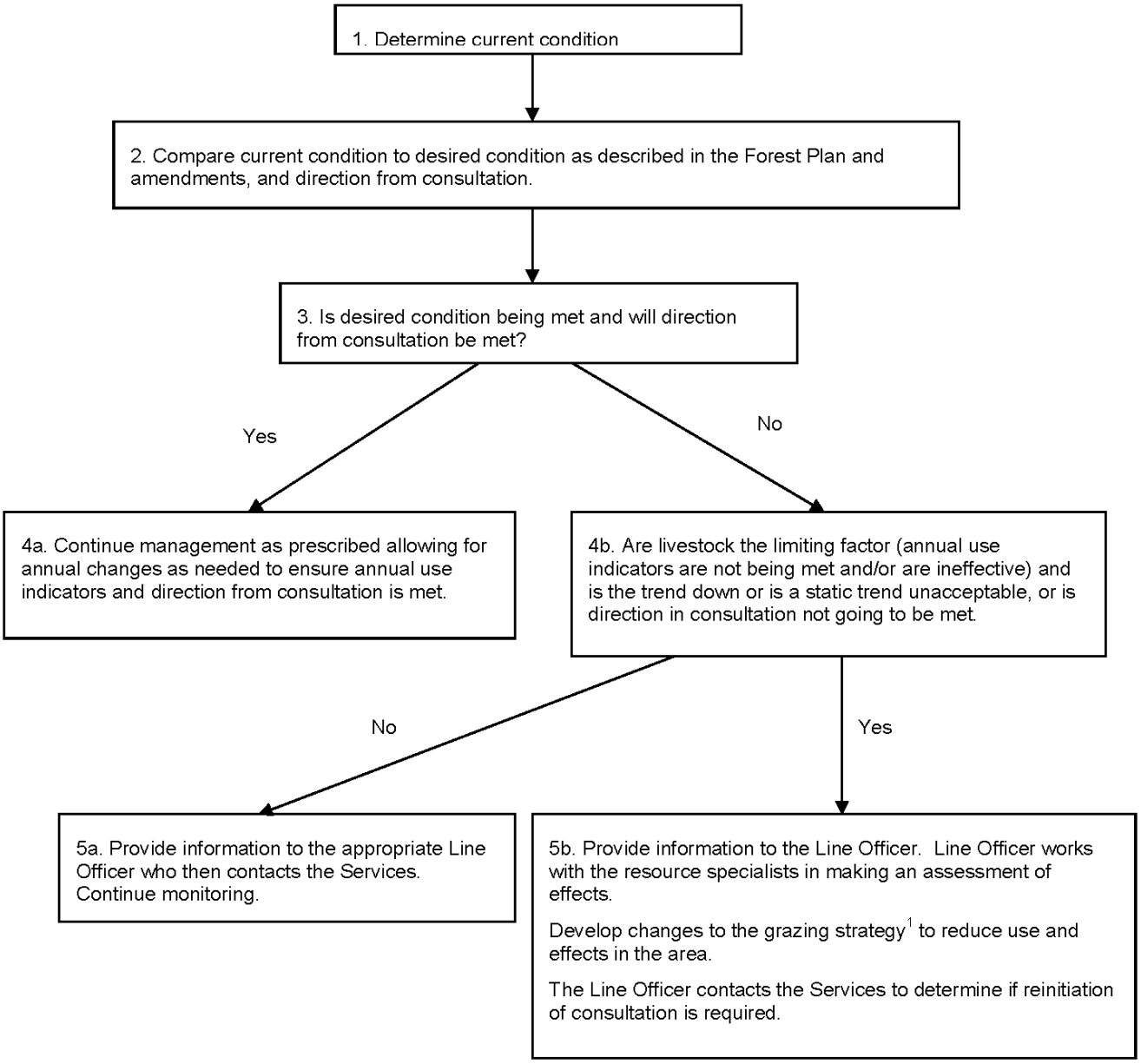
Primary Constituent Elements for Proposed Bull Trout Critical Habitat and Associated Habitat Indicators

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)

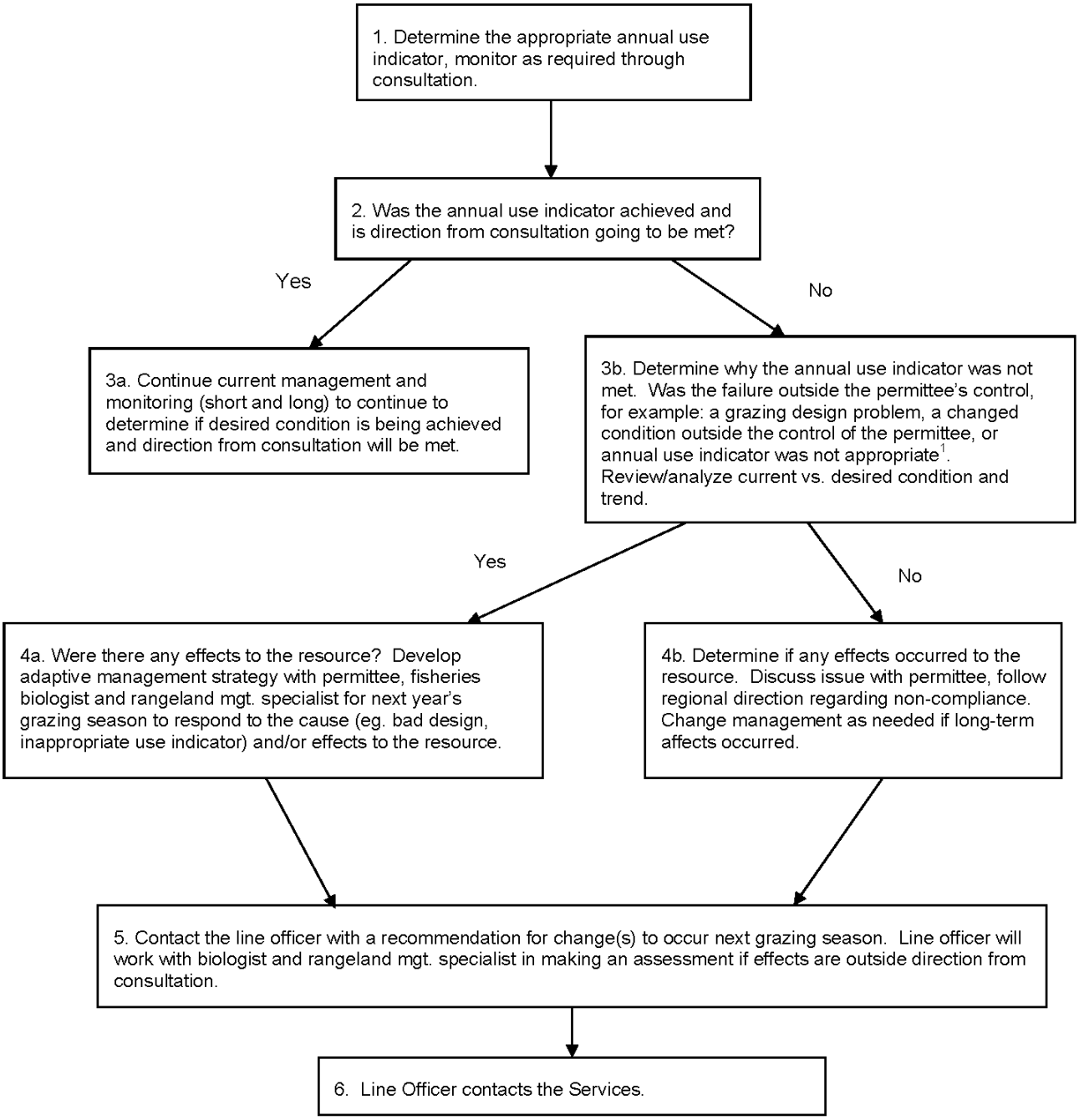
APPENDIX F – ADAPTIVE MANAGEMENT DIAGRAMS

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



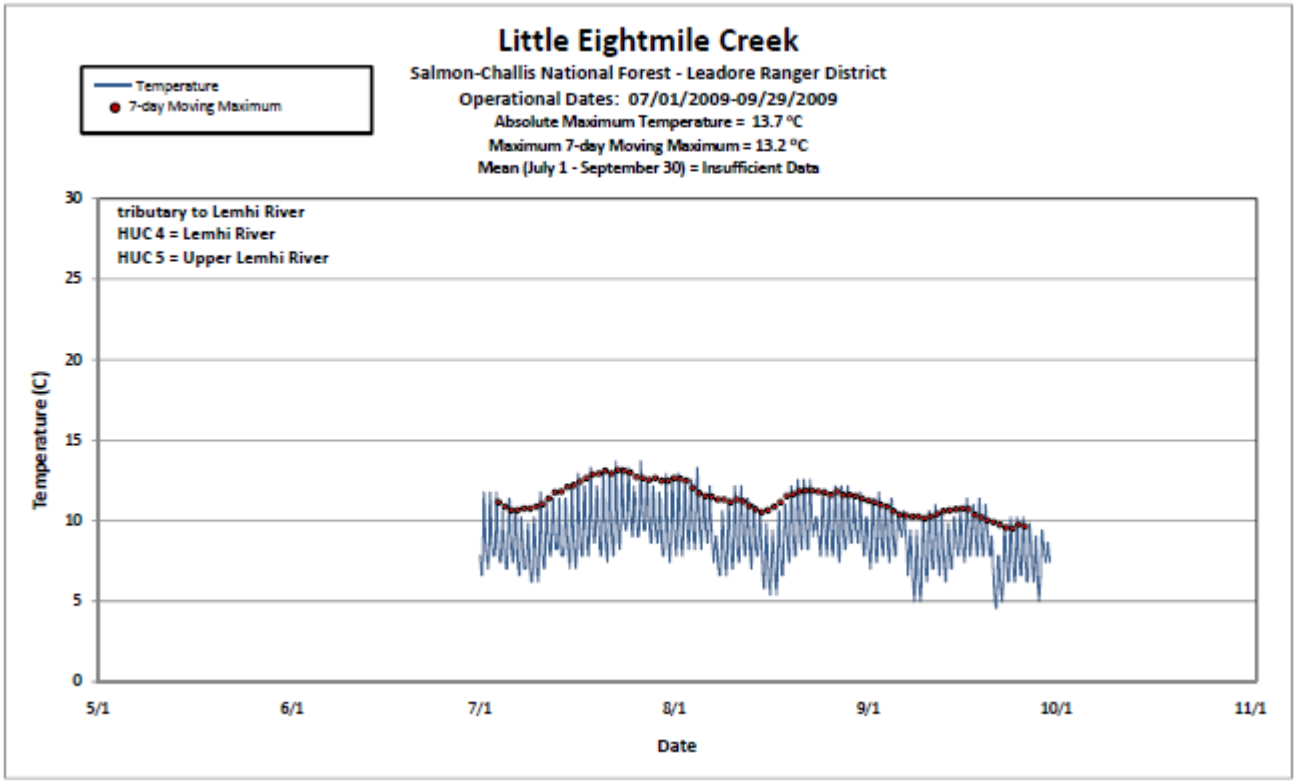
[1]Management actions will initially reduce use in the area. It is expected this may occur in any number of ways including but not limited to changing the season of use, reducing numbers, changing amount of use on annual indicator, changing herding practices, changing salting practices and/or reconstructing/constructing 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.

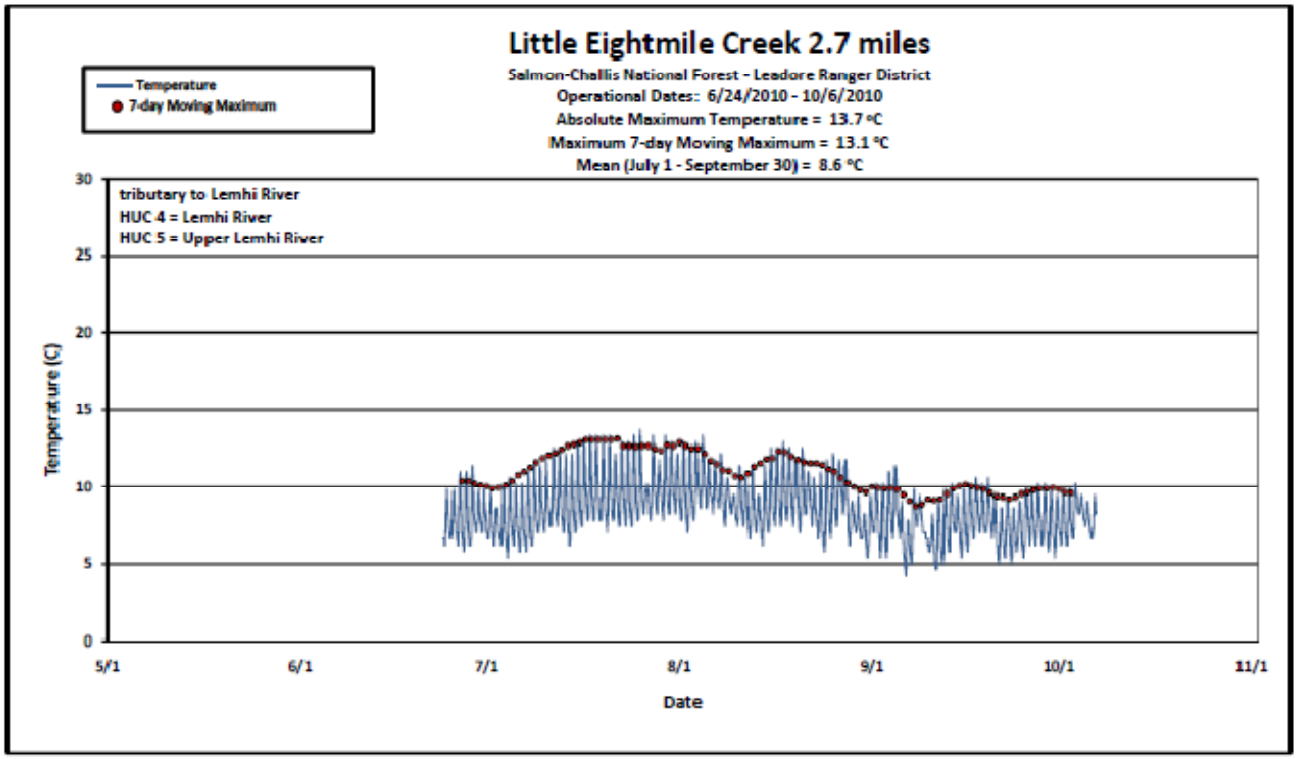
Diagram 2.0 - Implementation of Annual Adaptive Management Strategy for Allotments Requiring Consultation.



[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.

APPENDIX G – STREAM TEMPERATURE GRAPHS


Little Eightmile Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 07/01/2009-09/29/2009
Absolute Maximum Temperature = 13.7 °C
Maximum 7-day Moving Maximum = 13.2 °C
Mean (July 1 - September 30) = Insufficient Data
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


Little Eightmile Creek 2.7 miles
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 6/24/2010 - 10/6/2010
Absolute Maximum Temperature = 13.7 °C
Maximum 7-day Moving Maximum = 13.1 °C
Mean (July 1 - September 30) = 8.6 °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

APPENDIX H – ELECTROFISHING STREAM SUMMARY WITHIN ESA ACTION AREA

Fish/100m^2 population density is calculated using fish 70mm or greater in length.

The Forest has not electrofished Little Eightmile Creek or the unnamed tributary to Little Eightmile Creek. The fish data used in this analysis that includes fish species and population data is referenced as **Idaho Department of Fish and Game. 2006.** Little Eightmile Creek Fisheries Report - March, 2006.

Idaho Fish and Game 2005 Electrofishing Surveys

Stream Name	2005			2005			2005		
Little Eightmile Creek 02	Chinook salmon			steelhead			bull trout		
	1st pass	2nd/3rd pass	fish/100m^2	1st pass	2nd/3rd pass	fish/100m^2	1st pass	2nd/3rd pass	fish/100m^2
	0	0/0		0	0/0	0	6	NA	NA
Little Eightmile Creek 03	2005			2005			2005		
	Chinook salmon			steelhead			bull trout		
	1st pass	2nd/3rd pass	fish/100m^2	1st pass	2nd/3rd pass	fish/100m^2	1st pass	2nd/3rd pass	fish/100m^2
	0	0/0	0	0	0/0	0	3	0/0	1.6

Stream Name	2005			2005			2005		
unnamed tributary to Little Eightmile Creek 01	Chinook salmon			steelhead			bull trout		
	1st pass	2nd/3rd pass	fish/100m^2	1st pass	2nd/3rd pass	fish/100m^2	1st pass	2nd/3rd pass	fish/100m^2
	0	NA	NA	0	NA	NA	4	NA	NA

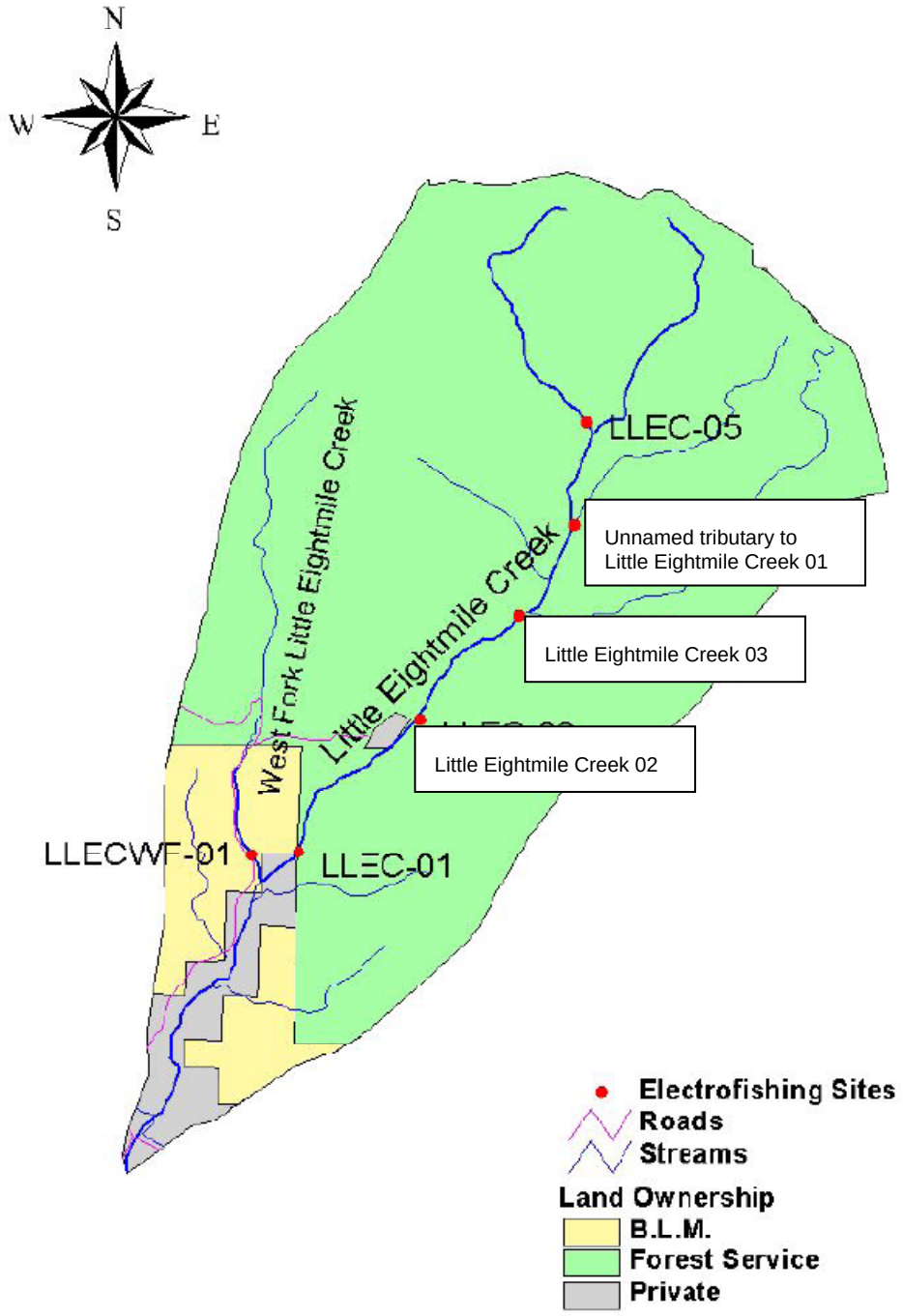


Figure 1. Locations of electrofishing sites completed by Idaho Department of Fish and Game, 2005, Little Eightmile Creek watershed, Lemhi County, Idaho.

APPENDIX I – STREAM PICTURES WITHIN THE ESA ACTION AREA

Little Eightmile Creek 2.7 miles upstream from the confluence with the Lemhi River
June 24, 2010 (2009 & 2010 stream temperature monitoring site at T83)

Little Eightmile Creek 7/14/2009 near M268

Little Eightmile Creek 7/14/2009 at M267

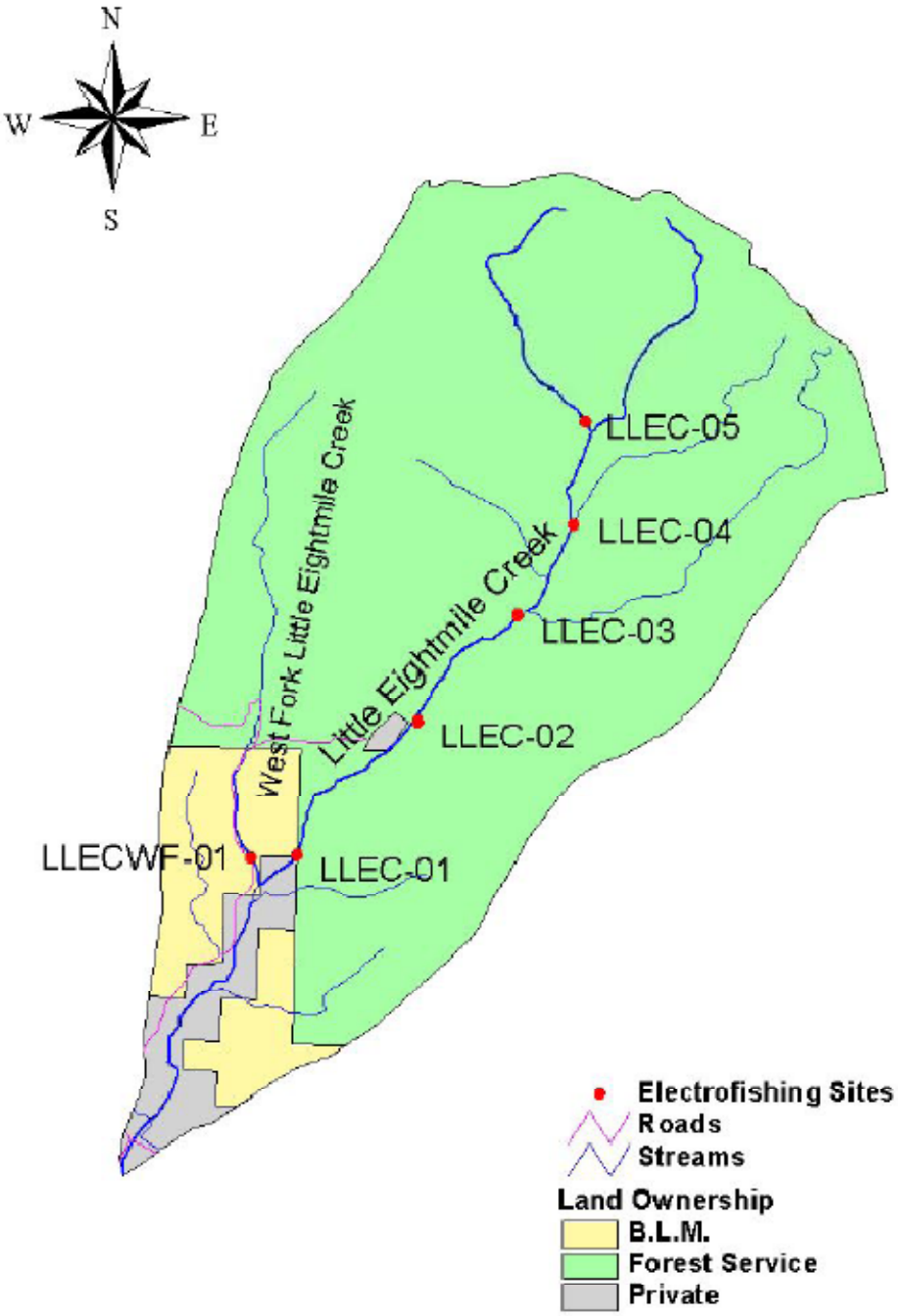


Figure 1. Locations of electrofishing sites completed by Idaho Department of Fish and Game, 2005, Little Eightmile Creek watershed, Lemhi County, Idaho.

Photo 5. Lower boundary of Little Eightmile Creek electrofishing site LLEC-01.

Photo 6. Upper boundary of Little Eightmile Creek electrofishing site LLEC-02.

Photo 7. Upper boundary of Little Eightmile Creek electrofishing site LLEC-03.

Photo 8. Lower boundary of Little Eightmile Creek electrofishing site LLEC-03.

Photo 9. Lower boundary of Little Eightmile Creek electrofishing site LLEC-04.

Photo 10. Lower boundary of Little Eightmile Creek electrofishing site LLEC-05.

Little Eightmile Creek bull trout redd survey 9/30/2009 upstream of monitoring site BD31