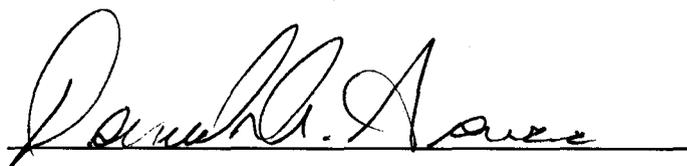


Aquatic Species Biological Assessment for the Hawley Creek Cattle & Horse Allotment

LEADORE RANGER DISTRICT
SALMON-CHALLIS NATIONAL FOREST
LEMHI COUNTY, IDAHO

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Date: _____

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1 INTRODUCTION

The Leadore Ranger District of the Salmon-Challis National Forest (SCNF) authorizes livestock grazing activities within the Hawley Creek Cattle & Horse Allotment. This biological assessment describes the proposed action and discusses the probable impacts of that action on listed species and designated and proposed 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 Hawley Creek Allotment grazing activities are conducted within one 5th field hydrologic unit code, Hawley Creek (HUC 1706020402).

The following is a general description of the Hawley Creek Allotment. The Hawley Creek Allotment is located approximately 7 miles east of Leadore, Idaho. In the Hawley Creek 5th field HUC the Hawley Creek Allotment is entirely within the Hawley Creek drainage. Within the Hawley Creek Allotment boundary there are private lands but no State lands.

Natural Physical Characteristics

Hydrology

Hawley Creek drainage: Hawley Creek is the largest tributary to Eighteenmile Creek but is often completely diverted before it reaches their confluence. Hawley Creek is formed at the confluence of Reservoir and Big Bear Creek, both of which have numerous tributaries.

Land Description

Hawley Creek drainage: Slopes range from 2 to 8 percent in the lower elevation fan terraces and outwash areas. At the higher elevations, slopes vary from 20 to 80 percent. Headwater streams are located in high to very high gradient U-shaped and V-shaped valley bottoms. At mid-elevations, the streams flow through low gradient alluvial valleys. Below the Forest boundary, Hawley Creek flows through a moderate gradient, steep-sided canyon until it reaches the broad, alluvial Lemhi River valley.

Soils and Geology

Hawley Creek drainage: Landtypes, parent material and soils of this area are highly variable. Landtypes range from fan terrace and outwash fans at the lower elevations to

fluvial types throughout the central portion of the area to cryic lands along the Continental Divide and glaciated lands in the southern portion.

Soils in these landtypes are derived mainly from quartzite, volcanic and sedimentary parent materials. On the southwestern boundary is a small inclusion of granitic parent material. Surface soil textures in the quartzite are generally loam with loamy sands in the subsoil with greater than 35 percent coarse gravels and stones. Soil textures in the volcanics range from clay; loams to silty clay loams with 20 to 50% coarse gravels and cobbles. Approximately 30 to 40 percent of the area within the forest boundary contains slumpy, benchy and unstable soils which occur on sedimentary and volcanic landtypes.

Vegetative Characteristics (see Figure 7)

Riparian Vegetation

Hawley Creek drainage: Vegetation in the riparian areas is typical of the rest of the valley and consists of several willow, *Carex*, *Juncus* and *Poa* species. There is little to no typical riparian vegetation remaining along most of the historic channel below the Forest boundary. Past grazing practices have impacted several of the smaller headwater streams. Current management is focused on improving the conditions in these areas.

Upland Vegetation

Hawley Creek drainage: Two-thirds of the watershed is considered shrub/grass rangeland, with the remainder classified as non-range timber and barren. Elevation differences appear to cause little change in vegetation cover types. Major plant communities are made up of mountain big sagebrush/Idaho fescue, with areas of mountain big sagebrush/bluebunch wheatgrass. Lower elevation areas contain Wyoming big sagebrush/bluebunch wheatgrass and low sagebrush/bluebunch wheatgrass. Less than one-third of the watershed is forested. Most forested lands contain Douglas fir, Lodgepole pine, Engelmann spruce, whitebark pine, subalpine fir and mixtures of these. Smaller portions of the forested lands contain deciduous trees, primarily aspen.

Human Uses

Intensive camping and fishing occurs on Hawley Creek, primarily on lands on the Forest. This area is used heavily, receiving approximately 22,000 recreational visits annually. There are three semi-developed sites within the Hawley Creek canyon. The well-maintained road allows access to most recreational vehicles. This heavy dispersed recreational use is having a significant negative impact on the riparian vegetation along Hawley Creek and some of its tributaries, especially Reservoir Creek. There is one designated trail in the watershed, which travels up Rocky Canyon.

The National Outdoor Leadership School began educational backpacking trips through the watershed in 1996; this practice is expected to continue.

Logging has never occurred on a large scale within the watershed. Operations to supply railroad ties for the Gilmore and Pittsburgh Railroad, small portable mills to supply lumber for local homes, outbuildings and businesses, and small post and pole harvests have been the norm for the area.

Hawley Creek drainage: The human influences within this drainage are associated with existing roads, mining, private land, logging, firewood gathering and recreation. Access is limited in the Hawley Creek drainage and is essentially tied to existing logging roads and trails.

3 PROPOSED ACTION

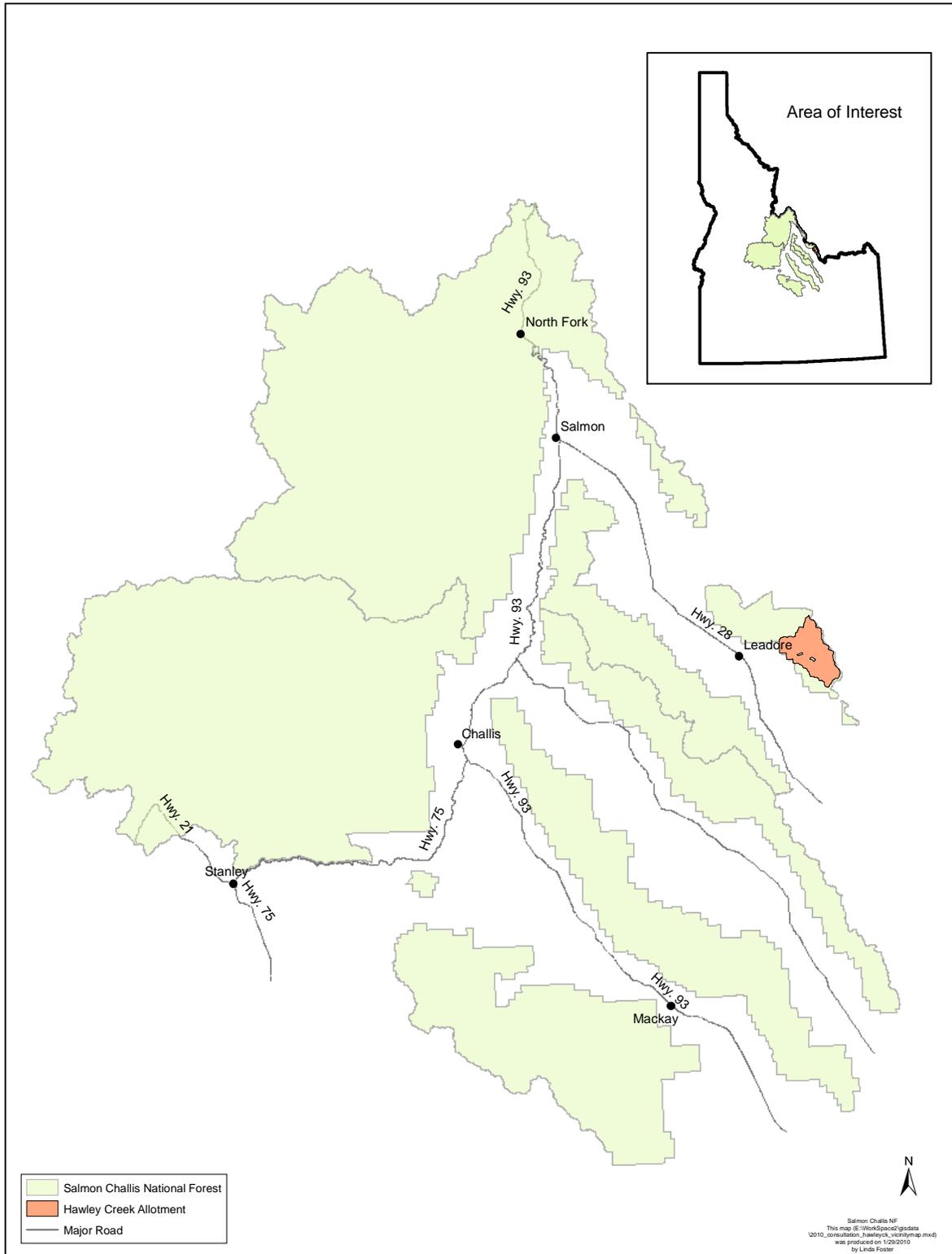
3.1 PROJECT AREA

The Hawley Creek Allotment is located on the Leadore Ranger District approximately 7 air miles east of Leadore, Idaho on National Forest System lands within the Hawley Creek drainage (Figure 1). This allotment contains 30,681 acres of National Forest System lands. The proposed project area is located within the Hawley Creek (HUC 1706020402) 5th field HUCs of the Lemhi River 4th field HUC (17060204).

The allotment is divided into 6 units: Lower Ranch Unit, Little Bear/Stove Creek Unit, Upper Ranch Unit, Big Bear Unit, Little Bear Unit/Little Bear Riparian Unit, and Fish Pasture Unit.

The allotment contains ESA fish or ESA Designated or Proposed Critical Habitat in: Reservoir Creek (Lower Ranch, Upper Ranch, and Little Bear/Stove Creek Units), Hawley Creek (Lower Ranch Unit, Fish Pasture, Big Bear, and Little Bear Units), Quaking Aspen (Upper Ranch, Lower Ranch, and Little Bear/Stove Creek Units), Big Bear Creek (Big Bear Unit), Meadow Creek (Big Bear Unit) and Horsethief Creek (Big Bear Unit) (see Tables 13 – 16).

Figure 1 - Hawley Creek Allotment Vicinity Map



3.2 PROPOSED ACTION

3.2.1 CURRENT PERMIT

The Hawley Creek C&H Allotment is currently permitted for 1,161 cow/calf pairs (3,511 Head Months) from 7/1 to 9/30. Since 2002 the permittees on this allotment have been turning out around mid June and exiting the allotment mid September. This on date change will minimize potential impact to spawning bull trout, their redds and stream/riparian habitat. This Biological Assessment's analysis will consider grazing activities on the Hawley Creek Allotment from June 15th through September 30th. Permits are held by four permittees as follows:

Permit Number	Expiration Date
80101	12/31/2016
80098	12/31/2015
80089	12/31/2015
80104	12/31/2017

3.2.2 GRAZING SYSTEM

The allotment is divided into 6 units: the Lower Ranch, Little Bear/Stove Creek, Upper Ranch, Big Bear, Little Bear, and Fish Pasture Units.

The Hawley Creek C&H Allotment will continue to use a deferred rotation grazing system.

Range readiness (Bluebunch wheatgrass in the first boot stage) will be monitored to determine if the on-date is appropriate and adjusted as necessary. 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 with unit move dates being approximate. Permittees are responsible for moving livestock to meet annual use indicators. Annual use indicators will be monitored by Forest Service personnel.

Little Bear Riparian Unit was established in the early 2000s in preparation of a potential prescribed burn project. The fencing would be used to exclude livestock from the area for two years after burning. To date, the prescribed burn project has not happened and this fencing is now used to manage use along Little Bear Creek in conjunction with the Little Bear Unit. The gate is left open in the Little Bear Riparian Unit while livestock are in the Little Bear Unit. When annual use indicators are met within the Little Bear Riparian Unit the livestock are removed, the gate is closed and the livestock are then only within the Little Bear Unit. See table 1 below for unit rotations.

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

Year 1	Year 2
Fish Pasture Unit (every year intermittent use 2-3 days before August 15th)	Lower Ranch Unit
Little Bear/Stove Creek Unit	Upper Ranch Unit
Upper Ranch Unit	Little Bear/Stove Creek Unit
Lower Ranch Unit	Fish Pasture Unit (every year intermittent use 2-3 days before August 15th)
Little Bear Unit & Little Bear Riparian Unit	Big Bear Unit
Big Bear Unit	Little Bear Unit & Little Bear Riparian Unit

Little Bear/Stove Creek Unit:

- Unit has no listed ESA fish but has ESA Proposed Critical Habitat for bull trout.

Upper Ranch Unit:

- Unit has no listed ESA fish but has ESA Proposed Critical Habitat for bull trout.

Lower Ranch Unit:

- **Bull Trout:** Following the above unit rotation schedule livestock will be moved out of the unit before August 15th every year.
- **Trailing:** There are no identified livestock trailing crossing sites on ESA fish streams. Active trailing occurs every year through this unit at the end of the grazing season when moving livestock off of the allotment. This end of the year active trailing through this Unit takes approximately 1 to 2 days total and the trailing route is on FS rd # 60275.

Little Bear Unit:

- **Bull Trout:** Following the above unit rotation schedule livestock will be in the unit after August 15th between 2 and 4 weeks every year.
- **Trailing:** There are no identified livestock trailing crossing sites on ESA fish streams. Active trailing occurs every year through this unit at the end of the grazing season when moving livestock off of the allotment. This end of the year active trailing through this Unit takes approximately 1 to 2 days total and the trailing route is on FS rd# 60177.

Big Bear Unit:

- **Bull Trout:** Following the above unit rotation schedule livestock will be in the unit after August 15th between 2 and 5 weeks every year.
- **Trailing:** There are no identified livestock trailing crossing sites on ESA fish streams.

Fish Pasture Unit:

- Bull Trout: Following the above unit rotation schedule livestock will be moved out of the unit before August 15th every year.
- Trailing: There are no identified livestock trailing crossing sites on ESA fish streams. Active trailing occurs every year through this unit at the end of the grazing season when moving livestock off of the allotment. This end of the year active trailing through this Unit takes approximately 1 to 2 days total and the trailing route is on FS rd# 60177.

Entry:

One permittee has a permit with the BLM to the south of the Hawley Creek Allotment. BLM land is used in the spring and fall. From the BLM Allotment, livestock are trailed up the Hawley Creek road #60275 and FS rd# 60177 staying on the road until reaching the allotment boundary and onto the first unit depending on the rotation. The three other permittee's livestock are trailed from home ranches in the Lemhi Valley across BLM land and up the Hawley Creek road #60275 and FS rd# 60177 staying on the road until reaching the allotment boundary and onto the first unit depending on the rotation. The permittees trail their livestock onto the allotment at different times. The move for each permittee should take approximately one day. During year one of the grazing rotation, the permittees mother cows and calves in the Lower Ranch Unit.

Unit Movements:

The permittees or hired riders will move livestock from one unit to the next. The moves should take one to two days. Every year, the permittees or hired riders will use the Fish Pasture Unit, prior to August 15th (see Table 1). In the first year of the rotation, the permittees or hired riders will trail livestock through the Fish Pasture and the Lower Ranch Unit to remove livestock from the allotment. In the second year of the rotation, the permittees or hired riders will trail livestock through the Lower Ranch Unit (see Table 1).

Exit:

One permittee's livestock are trailed down the FS rd# 60177 and the Hawley Creek road #60275 staying on the road until reaching the allotment boundary to BLM land. After completing fall use on the BLM Allotment, livestock are trailed across the BLM to the home ranch. The three other permittees', livestock are trailed down the FS rd# 60177 and Hawley Creek road #60275 across the BLM Allotment to home ranches. This end of the year active trailing off the allotment takes approximately 1 to 2 days total.

Total Removal from NFS Lands:

All livestock will be removed from the allotment by 09/30.

3.2.3 CONSERVATION MEASURES

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

1. A deferred rotation grazing system will continue to be used. Early season use provides benefits to riparian vegetation. This will help meet our long term riparian resource objective for greenline successional status.

2. 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.
3. 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.
4. 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 and proposed critical habitat.
5. 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 and proposed critical habitat.
6. 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 and proposed critical habitat.
7. Little Bear Riparian Unit has a fence around Little Bear Creek. The fence helps manage use along Little Bear Creek.

3.2.4 CHANGES FROM EXISTING MANAGEMENT

- The two sites on Reservoir Creek, annual use indicators have been raised from 5 inches to 6 inches greenline stubble due to sites being at mid seral successional status.
- The Fish Pasture will not be changed even though it is at late seral because more use is not authorized in the unit.

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 (MIM, Technical Manual). Results from monitoring will be available at (<http://www.fs.fed.us/r4/sc/projects/range/index.shtml>).

Resource Objectives:

- Greenline Successional Status: A greenline successional status value of at least 61 (late seral) or the current value, whichever is greatest (Winward 2000, Burton et al. 2008).

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

Resource Standards (PACFISH):

- GM-1 - Modify grazing practices (e.g., accessibility of riparian area to livestock, length of grazing season, stocking levels, timing of grazing, etc.) that retard or prevent attainment of Riparian Management Objectives or are likely to adversely affect listed anadromous fish. Suspend grazing if adjusting practices is not effective in meeting Riparian Management Objectives and avoiding adverse effects on listed anadromous fish (PACFISH).
- GM-2 – Locate new livestock handling and/or management facilities outside of Riparian Habitat Conservation Areas. For existing livestock handling facilities inside the Riparian Habitat Conservation Areas, assure that facilities do not prevent attainment of Riparian Management Objectives or adversely affect listed anadromous fish. Relocate or close facilities where these objectives cannot be met.
- GM-3 – Limit livestock trailing, bedding, watering, salting, loading, and other handling efforts to those areas and times that will not retard or prevent attainment of Riparian Management Objectives or adversely affect listed anadromous fish.

3.2.6 ANNUAL GRAZING USE INDICATORS

Annual Use Indicators and Implementation Monitoring: Annual use indicators are used to ensure that grazing does not prevent the attainment of the riparian resource objectives. Riparian annual use indicators used on the Salmon-Challis National Forest generally include greenline stubble height, bank alteration, and woody browse. In general, greenline stubble height is used to regulate grazing impacts on greenline ecological status, bank alteration is used to regulate grazing impacts on bank stability, and woody browse is used to regulate impacts on

woody recruitment. The specific indicators selected for a specific unit should be those that correspond with the riparian resources that are most sensitive to the impacts of livestock grazing. For example, if bank stability was the riparian feature most likely to be impacted by livestock grazing in a unit, then bank alteration would be selected as the annual use indicator for that unit.

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

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

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

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

Table 2 - Annual Use Indicators

Key Area Location	Unit – Creek	Monitoring Attribute	Annual Use Indicator	Key Species	Trigger
MIM M302	Little Bear/Stove Creek Unit – Reservoir Creek	Greenline stubble	6 in	Carex	7 in
		Bank alteration	20%	N/A	15%
MIM M276	Big Bear Unit – Big Bear Creek	Greenline stubble	5 in	Carex	6 in
		Bank alteration	10%	N/A	10%
MIM M304	Fish Pasture Unit – Big Bear Creek	Greenline stubble	6 in	Carex	7 in
		Bank alteration	15%	N/A	10%
MIM M303	Lower Ranch Unit – Reservoir Creek	Greenline stubble	6 in.	Carex	7 in.
		Bank alteration	10%	N/A	10%
MIM M298	Little Bear Unit – Little Bear Creek	Greenline stubble	5 in	Carex	6 in
		Bank alteration	20%	N/A	15%
MIM M280	Big Bear Unit – Meadow Creek	Greenline stubble	5 in	Carex	6 in
		Bank alteration	20%	N/A	15%
Upland sites	All Units	Utilization	Up to 50%	Upland grass species	45%
Riparian Areas	All Units	Utilization by Key Species	50%	Riparian grass species	45%

* Site will also have a bank alteration annual use indicator, not to exceed 15%, due to low bank stability.

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

3.2.7 IMPROVEMENTS

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

Existing improvements: Existing improvements, 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 (ie. no holes in the trough) and to have a functioning float system so water does not continuously over flow the trough.

Potential Future Improvements:

The following is a list of potential future improvement projects that would benefit ESA listed fish by providing water for livestock on the uplands to pull them away from ESA fish streams or reduce potential livestock impacts on stream channels that drain into an ESA fish stream. These projects were identified on field reviews and in office meetings in coordination with NMFS,

USFWS and the permittees. Implementation of these potential future improvements will require NEPA analyses, Biological Assessments/Biological Evaluations and are dependent upon available funding.

- West Fish Pasture Trough – to draw livestock away from Fish Pasture fence and improve upland utilization.
- Lower Ranch Pipeline-replace bladders with steel storage tanks and replace pipeline to reduce livestock watering pressure on Lower Reservoir Creek.
- Little Bear Spring-replace bladder with steel tank to reduce livestock watering pressure on Little Bear Creek
- Upper Wheetip Spring and Trough – to reduce livestock watering pressure on Wheetip Creek.
- Identify and Take Corrective Actions to Minimize or Eliminate Unacceptable Impacts associated with Recreationists – Identify those recreation activities and locations within the ESA Action Area where there are unacceptable impacts to ESA fish and fish habitat. Develop an interdisciplinary plan to minimize or eliminate those unacceptable impacts to ESA fish and fish habitat from recreation activities.

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 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.

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 Hawley Creek 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. Priority Watersheds within the action area are identified in Figure 3. . The entire Hawley Creek Allotment is within a Chinook salmon and steelhead priority watershed. Management direction for priority watersheds is identified in section 3.2.5.

The ESA fish bearing streams within the ESA Action Area include: Big Bear Creek, Hawley Creek, Quaking Aspen Creek, Reservoir Creek and Meadow Creek (see Tables 13 - 16). The streams within the ESA Action Area that have designated or proposed critical habitat include: Big Bear Creek, Hawley Creek, Horsethief Creek, Meadow Creek, and Reservoir Creek (see Tables 13 - 16).

Figure 2 - Hawley Creek Allotment ESA Action Area Map

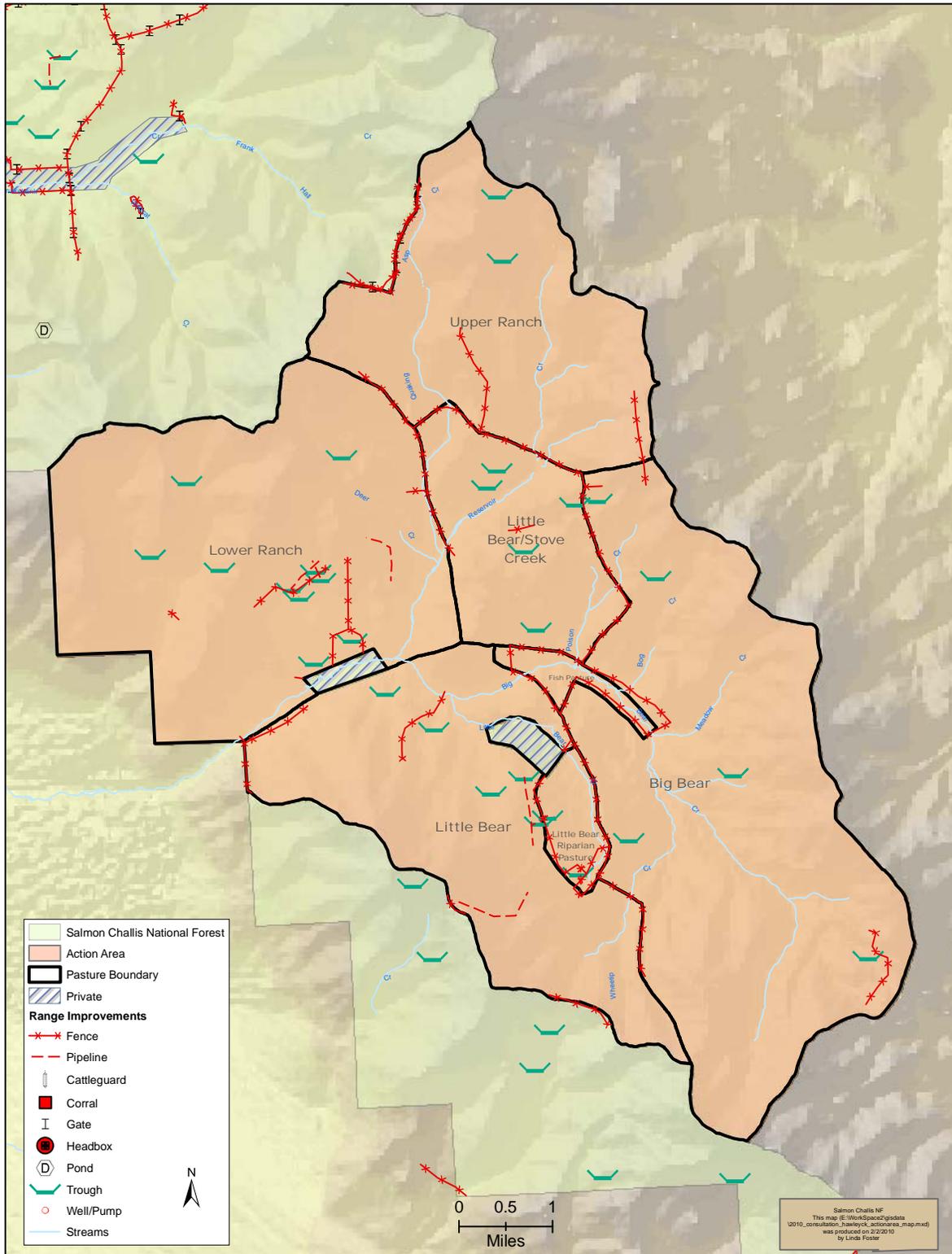
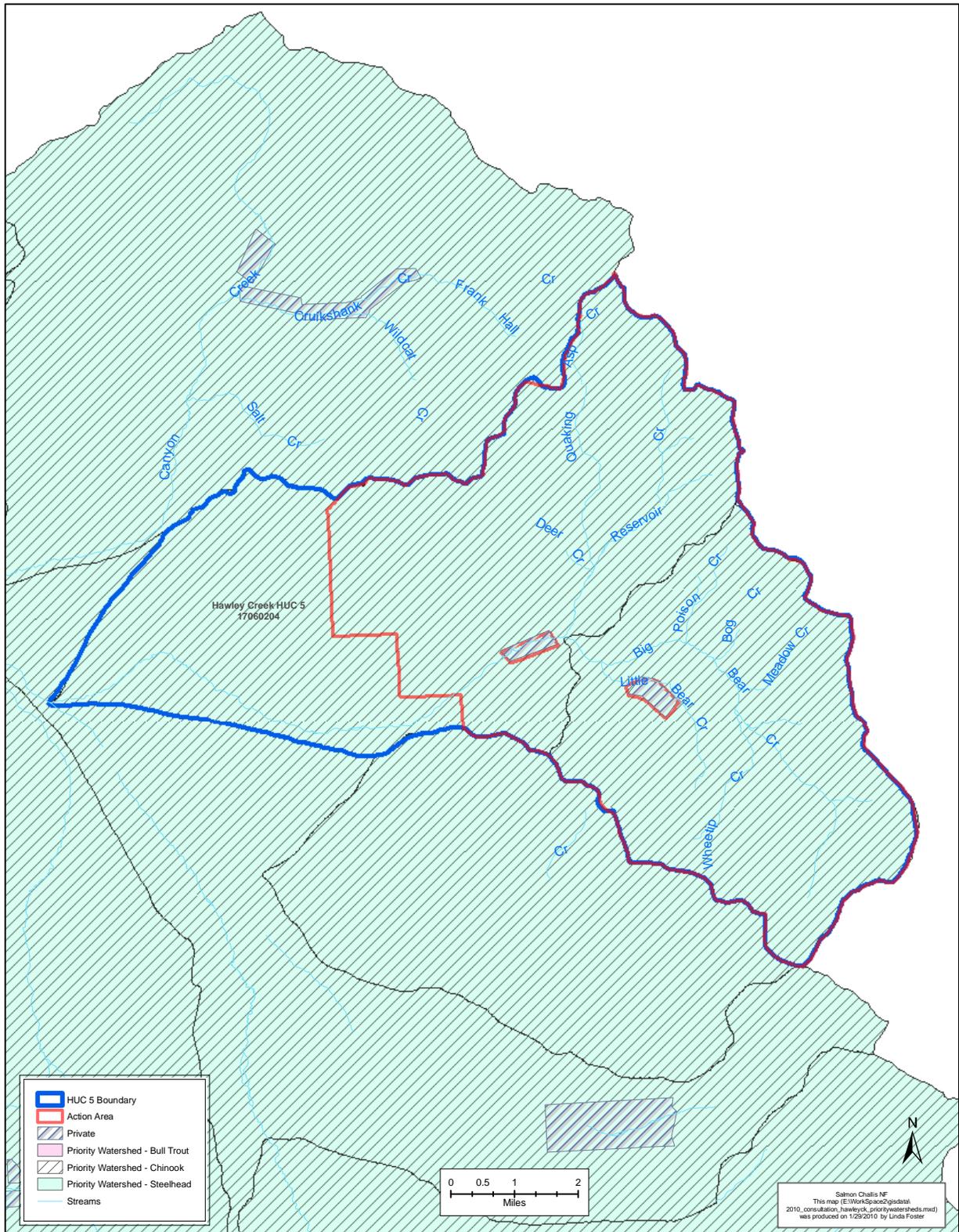


Figure 3 – Hawley Creek HUC 5 Map with Priority Watersheds



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)

Salmon-Challis National Forest and Idaho Department of Fish and Game fish surveys indicate that only one ESA fish species occurs within the ESA Action Area. This species is the bull trout (Figure 5). 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. Historically, spawning and rearing habitat were supported within the Hawley Creek drainage for Chinook salmon and steelhead. At this time, the Forest Service does not consider Chinook salmon and steelhead present within the ESA Action Area for the Hawley Creek Allotment. This is in large part due to Hawley Creek not being connected to the Lemhi River because of irrigation practices. 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 identified 1.26 miles of Hawley Creek, within the ESA Action Area, as supporting critical habitat for Chinook salmon (Figure 4).

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**

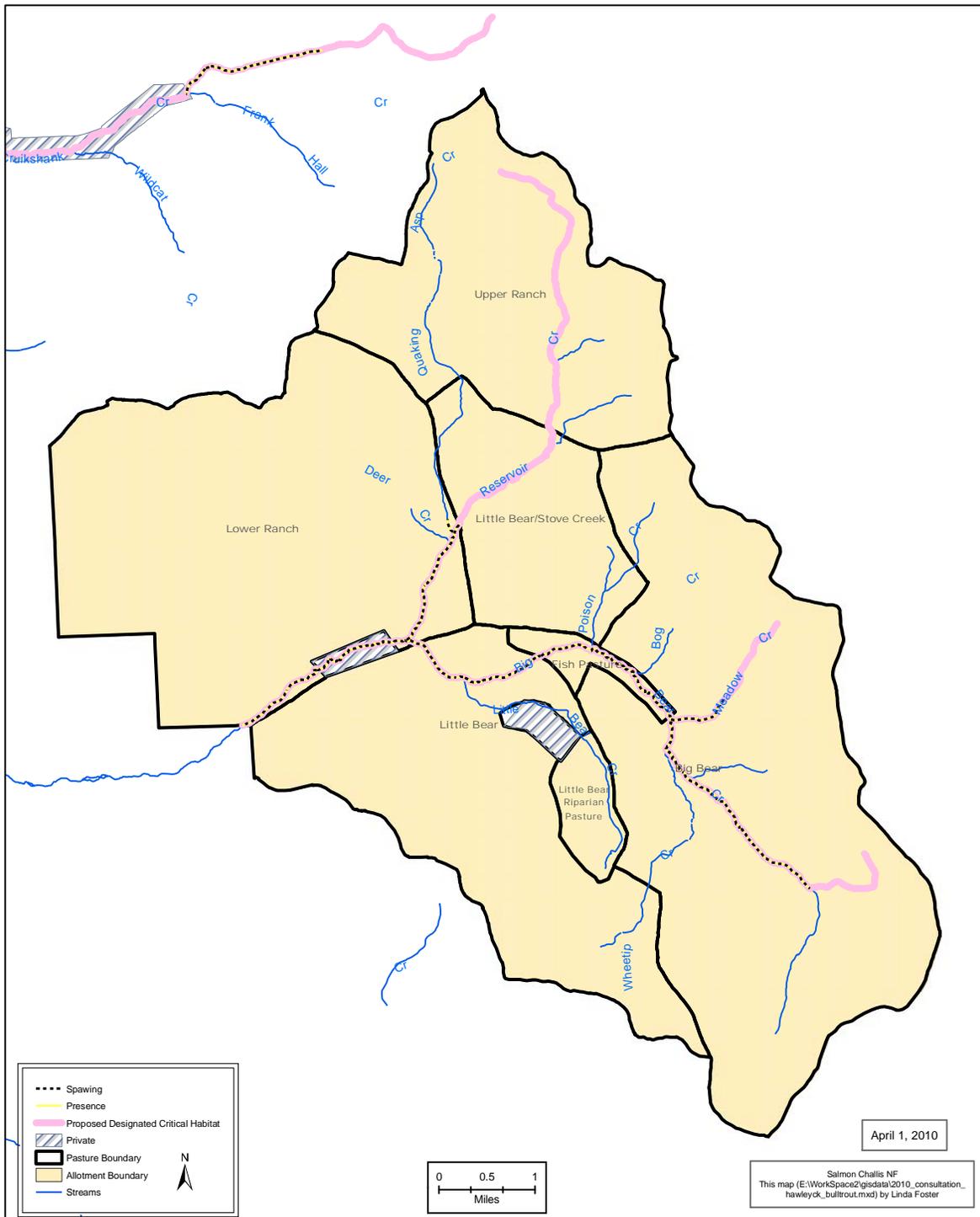
Critical habitat was designated for bull trout on September 26, 2005. This designation did not include any areas encompassed by the proposed action. Currently, however, the U.S. Fish and Wildlife Service has published public notice (January 13, 2010, Federal Register 75FR2270) that it is proposing to revise the 2005 designated critical habitat. While the Hawley Creek Allotment ESA Action Area does not contain any currently designated critical habitat for bull trout, it does contain proposed critical habitat. Proposed bull trout critical habitat is present within the ESA Action Area and includes Big Bear Creek, Hawley Creek, Horsethief Creek, Meadow Creek and Reservoir Creek (Figure 4).

The Forest desires to assess the potential impact to the Primary Constituent Elements (PCEs) of proposed bull trout critical habitat. These are defined on page 2360 of the referenced Federal register notice. Because these elements are important to areas on the Forest where bull trout are present, the Forest would like to demonstrate that potential impacts to the PCEs have been assessed and considered in the proposed action (Appendix E).

Figure 4 - Hawley Creek Allotment Chinook salmon Map



Figure 5 - Hawley Creek Allotment bull trout Map



6 ENVIRONMENTAL BASELINE DESCRIPTION

The ESA Action Area is within one 5th field hydrologic unit code, Hawley Creek (HUC 1706020402). Baseline Matrices of Diagnostic Pathways and Indicators for this 5th field HUC is 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 five streams within the ESA Action Area with bull trout proposed critical habitat. Those streams are Big Bear Creek, Hawley Creek, Horsethief Creek, Meadow Creek and Reservoir Creek.

Historically, spawning and rearing habitat was supported within the Hawley Creek drainage for Chinook salmon and steelhead. Because Hawley Creek has not been connected to the Lemhi River for what could be around 100 years there are no streams within the ESA Action Area that have documented Chinook salmon presence or support Chinook salmon populations. Hawley Creek is the only stream within the ESA Action Area with Chinook salmon Designated Critical Habitat. Because Hawley Creek has not been connected to the Lemhi River for what could be around 100 years there are no streams within the ESA Action Area that have documented steelhead presence or support steelhead populations. There are no streams within the ESA Action Area that have steelhead Designated Critical Habitat. At this time, the Forest Service does not consider Chinook salmon and steelhead present within the ESA Action Area for the Hawley Creek Allotment. This is in large part due to Hawley Creek not being connected to the Lemhi River because of irrigation practices.

The Hawley Creek Allotment encompasses five streams where bull trout have been documented using back pack electro-shockers. Those streams are Big Bear Creek, Hawley Creek, Meadow Creek, Quaking Aspen Creek and Reservoir Creek.

Idaho Fish and Game completed a comprehensive Hawley 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 the 2005 they electro-fished twenty-one sites on seven streams and only found bull trout in Hawley Creek and Big Bear Creek (IDFG, 2006). In 2009, the SCNF electro-fished six streams within the ESA Action Area and only found bull trout present in Big Bear Creek.

The other streams, within the ESA Action Area, that have had electro-fishing surveys since 2005 by IDFG and/or the USFS and found not to be supporting the presence of Chinook salmon, steelhead and bull trout include: Bog Creek, Deer Creek, Little Bear Creek, Meadow Creek, Poison Creek, Quaking Aspen Creek, Reservoir Creek, and Wheetip Creek.

6.1.1 **CHINOOK SALMON**

Within the ESA Action Area there is no documentation of the presence of Chinook salmon, juvenile or adult, at this time. Hawley Creek is currently not connected to the Lemhi River. There is currently an effort underway to reconnect Hawley Creek with the Lemhi River. Because of the disconnect with the Lemhi River and other human caused physical migration barriers, at this time, we do not consider streams within the ESA Action Area as supporting Chinook salmon populations. At the time Idaho Fish and Game and the Salmon-Challis National Forest considers streams within the ESA Action Area as supporting Chinook salmon populations the SCNF will reinitiate consultation with National Marine Fisheries Service.

There is an estimated 1.26 miles of Chinook salmon Designated Critical Habitat within the ESA Action Area (see Tables 13 - 14).

6.1.2 **STEELHEAD**

Within the ESA Action Area there is no documentation of the presence of steelhead, juvenile or adult, at this time. Hawley Creek is currently not connected to the Lemhi River. There is currently an effort underway to reconnect Hawley Creek with the Lemhi River. Because of the disconnect with the Lemhi River and other human caused physical migration barriers, at this time, we do not consider streams within the ESA Action Area as supporting steelhead populations. At the time Idaho Fish and Game and the Salmon-Challis National Forest considers streams within the ESA Action Area as supporting steelhead populations the SCNF will reinitiate consultation with National Marine Fisheries Service.

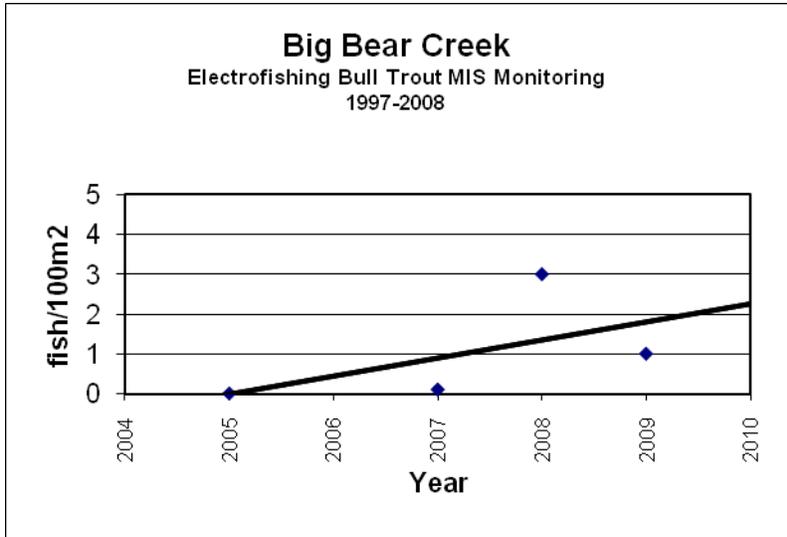
There is no steelhead Designated Critical Habitat within the ESA Action Area.

6.1.3 **BULL TROUT**

Within the ESA Action Area, bull trout are currently present or have been documented present in the past within Big Bear Creek, Hawley Creek, Meadow Creek, Quaking Aspen Creek and Reservoir Creek. There is an estimated 9.81 miles of bull trout presence and spawning habitat and 16.69 miles of Proposed Critical Habitat within the ESA Action Area (see Table 15 - 16).

The Salmon-Challis National Forest completed a Forest Plan Amendment for its Management Indicator Species (MIS) in 2004. In this Forest Plan Amendment the bull trout is the MIS fish species on the Salmon-Challis Forest. There is one stream within the ESA Action Area which the Forest monitors long term population trends for bull trout. This one bull trout MIS monitoring site, within the ESA Action Area, shows bull trout populations of approximately 2 fish/100 m².

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 Hawley Creek with the Lemhi River. There is currently an effort underway to reconnect Hawley Creek with the Lemhi River. Along with the reconnect project there are planning efforts to fix all of the migration barriers on public and private land as funding becomes available. Because of the disconnect with the Lemhi River and other human caused physical migration barriers, at this time fluvial forms are not present 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 Hawley Creek Allotment encompasses five streams which support populations of, and/or habitat for, ESA listed fish species. Those streams are Big Bear Creek, Hawley Creek, Quaking Aspen Creek and Reservoir Creek. All other streams within areas that will be grazed do not contain ESA listed fish or support designated critical habitat. However, livestock grazing in these areas may indirectly affect ESA listed fish and designated critical habitat in other streams within the allotment. There are also two other streams that have not been documented as having ESA listed fish but have recently been proposed as critical habitat for bull trout. Those two streams are Horsethief Creek and Meadow Creek.

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
Big Bear Creek 1R	23.73	10.5	31.8	8	8	8	12	14	20	12	10	10	8	8	8	0.012	10.7	12.46	1.16	9.2
Hawley Creek 1R	42.21	15.75	40.9	10	10	10	17	25	40	22	13	12	10	10	10	0.015	20.56	13.27	0.65	31.9
Reservoir Creek 1R	12.99	5.72	14.23	2.7	2.6	2.9	6.1	12	14	10.6	4.5	3.6	3.5	3.2	2.9	0.014	9.7	5.35	0.55	17.6

Stream Stats Calculations																				
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
Meadow Creek	2.06	1.15	6.02	0.21	0.2	0.26	0.69	2.91	2.48	1.05	0.53	0.37	0.29	0.27	0.23	unknown	unknown	unknown	unknown	unknown
Quaking Aspen Creek	5.13	2.62	7.51	0.52	0.51	0.66	1.6	5.02	6.41	5.78	1.47	1.03	0.72	0.67	0.57	unknown	unknown	unknown	unknown	unknown

6.2.1 BIG BEAR CREEK

All life stages of bull trout are considered to be present in Big Bear Creek. Fish habitat conditions of Big Bear Creek within the ESA Action Area are generally in fair to good condition. Overall physical habitat quality, including the elements of water quality, flow/hydrology, channel conditions and structural habitat elements is considered fair to good. There is some connectivity problems associated with private land irrigation practices in lower Hawley Creek below the ESA Action Area. There are also eight human caused physical barriers associated with private land diversions and public land road crossings (culverts). Of those eight human caused physical barriers two are partial barrier culverts within the ESA Action Area and one is in the lower reaches of Big Bear Creek. These two culverts, within the ESA Action Area, do not totally block upstream fish migration but they both would be considered partial migration barriers at lower flows and for smaller fish.

6.2.2 HAWLEY CREEK

All life stages of bull trout are considered to be present in Hawley Creek. Fish habitat conditions of Hawley Creek within the ESA Action Area are generally in fair to good condition. Overall physical habitat quality, including the elements of water quality, flow/hydrology, channel conditions and structural habitat elements is considered fair to good. There is some connectivity problems associated with private land irrigation practices in lower Hawley Creek below the ESA Action Area. There are also eight human caused physical barriers associated with private land diversions and public land road crossings (culverts). Of those eight human caused physical barriers two are partial barrier culverts within the ESA Action Area and one is on Hawley Creek within the ESA Action Area. This one culvert, on Hawley Creek, does not totally block upstream fish migration but would be considered a partial migration barrier at lower flows and for smaller fish.

6.2.3 QUAKING ASPEN CREEK

One adult bull trout one time has been observed in Quaking Aspen Creek. We do not consider Quaking Aspen Creek as supporting bull trout spawning and incubation habitat. Fish habitat conditions of Quaking Aspen Creek within the ESA Action Area are generally in poor to fair condition. Overall physical habitat quality, including the elements of water quality, flow/hydrology, channel conditions and structural habitat elements is considered poor to fair. There is some connectivity problems associated with private land irrigation practices in lower Hawley Creek below the ESA Action Area. There are also eight human caused physical barriers associated with private land diversions and public land road crossings (culverts). Of those eight human caused physical barriers two are partial barrier culverts within the ESA Action Area. These two culverts, on Hawley Creek and Big Bear Creek within the ESA Action Area, do not totally block upstream fish migration but they both would be considered partial migration barriers at lower flows and for smaller fish.

6.2.4 RESERVOIR CREEK

One adult bull trout one time has been observed in Reservoir Creek. We do not consider Reservoir Creek as supporting bull trout spawning and incubation habitat. Fish habitat conditions of Reservoir within the ESA Action Area are generally in poor to fair condition. Overall physical habitat quality, including the elements of water quality, flow/hydrology, channel conditions and structural habitat elements is considered fair to good. There is some connectivity problems associated with private land irrigation practices in lower Hawley Creek below the ESA Action Area. There are also eight human caused physical barriers associated with private land diversions and public land road crossings (culverts). Of those eight human caused physical barriers two are partial barrier culverts within the ESA Action Area. These two culverts, on Hawley Creek and Big Bear Creek within the ESA Action Area, do not totally block upstream fish migration but they both would be considered partial migration barriers at lower flows and for smaller fish.

6.2.5 MEADOW CREEK

One adult bull trout one time has been observed in Meadow Creek. We do not consider Meadow Creek as supporting bull trout spawning and incubation habitat. Fish habitat conditions of Meadow Creek within the ESA Action Area are generally in fair to good condition. Overall physical habitat quality, including the elements of water quality, flow/hydrology, channel conditions and structural habitat elements is considered fair to good. There is some connectivity

problems associated with private land irrigation practices in lower Hawley Creek below the ESA Action Area. There are also eight human caused physical barriers associated with private land diversions and public land road crossings (culverts). Of those eight human caused physical barriers two are partial barrier culverts within the ESA Action Area. These two culverts, on Hawley Creek and Big Bear Creek within the ESA Action Area, do not totally block upstream fish migration but they both would be considered partial migration barriers at lower flows and for smaller fish.

6.2.6 OTHER STREAMS WITHIN THE ESA ACTION AREA

The following is a list of streams within the ESA Action Area that has had electro-fishing surveys completed by the SCNF, IDFG or the BLM and no ESA fish species were found: Bog Creek, Deer Creek, Little Bear Creek, Poison Creek, and Wheetip Creek.

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:

- Within the ESA Action Area dispersed recreation activities, which includes motorized travel and camping with and without horses/mules, are having a direct significant negative impact to at least two of the focus indicators, streambank condition and riparian conservation areas.
- 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.
- Hawley Creek, on private land downstream of the ESA Action, has unscreened diversion. 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.
- At least six points of diversion take water out of the Hawley Creek for irrigation purposes. One diversion at the mouth of the Hawley Creek canyon annually dewateres the streambed throughout the irrigation season. There is stream connectivity problems associated with private land irrigation practices in lower Hawley Creek below the ESA Action Area. At this time Hawley Creek is not considered connected to the Lemhi River. There is currently an effort underway to reconnect Hawley Creek with the Lemhi River. Along with the reconnect project, in the near future, there will be planning efforts to fix all of the migration barriers on public and private land as funding becomes available.
- There are eight human caused physical barriers associated with private land diversions and public land road crossings (culverts). Of those eight human caused physical barriers two are partial barrier culverts within the ESA Action Area. These two culverts, on Hawley Creek and Big Bear Creek within the ESA Action Area, do not totally block upstream fish migration but they both would be considered partial migration barriers at lower flows and for smaller fish.
- 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 Hawley Creek 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.

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

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

6.4.1 SPAWNING AND INCUBATION:

6.4.1.1 CHINOOK SALMON SPAWNING AND INCUBATION

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 Hawley Creek drainage. For the purpose of this analysis the periodicity identified for Hayden Creek will be used for the Hawley Creek 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

Big Bear Creek	5.45 miles
Hawley Creek	2.06 miles
Meadow Creek	0.68 miles
Quaking Aspen Creek	0.17 miles
Reservoir Creek	1.45 miles

At least one bull trout has been observed in five streams within the ESA Action Area (see Table 4). Therefore we mapped those five streams as having bull trout presence and potential spawning habitat. These potential spawning habitat 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 support fluvial bull trout spawning because the Hawley Creek streamflows are not currently connected to 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 (see Figure 4). At this time we consider there are five streams within the ESA Action Area that have known or potential bull trout spawning and incubation habitat. Those five streams are Hawley Creek, Big Bear Creek, Meadow Creek, Reservoir Creek and Quaking Aspen Creek. In 1999 there were two streams where a single bull trout was electro-fished, Meadow Creek and Reservoir Creek. In 2004 there was one bull trout electro-fished in Quaking Aspen Creek. Therefore, at this time it is my professional judgment Meadow Creek, Reservoir Creek and Quaking Aspen Creek may have the potential to support bull trout spawning and incubation. Because those streams have been surveyed over multiple years and in each stream, one time, there was only one fish documented while electrofishing I believe the number of potential bull trout redds constructed in a given year in those three streams would be very low. In 2005, IDFG electro-fished twenty-one sites on seven streams and only found bull trout in Hawley Creek and Big Bear Creek (IDFG, 2006). In 2009, the SCNF electro-fished six streams and only found bull trout present in Big Bear Creek.

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/INFISH identifies rearing temperature criteria of less than 64 degrees F (17.8 degrees C) and spawning temperature criteria of less than 60 degrees F (15.6 degrees C) as components of its suite of Riparian Management Objectives. Water temperature conditions within the ESA Action Area are considered to be Functioning Appropriately for rearing, spawning and incubation relative to these criteria.

Seasonal water temperature regimes have been monitored on four ESA fish streams within the ESA Action Area. The stream temperature graphs for those four streams, plus one non ESA fish stream, can be seen in Appendix G. It is my professional judgment that year to year stream temperature variations seen in the Appendix G graphs are due to natural stream temperature fluctuations caused by year to year different winter snow pack levels, year to year different spring time temperatures and precipitation, and year to year variations in seasonal air temperature regimes rather than due to any identifiable land management-related influences.

Big Bear Creek had stream temperature data collected in 2004, 2005, 2006, 2007, and 2009. The Mean Temperature between 7/1 to 9/30 in 2004, 2005 and 2009 was 7.3°C, 7.6°C, and 7.7°C respectively. In 2006 and 2007 the data logger was not in the stream for the entire period between 7/1 and 9/30. Looking at those two years of data and comparing streams with similar stream temperature readings for the Maximum Daily Temperature and Maximum of 7 day Moving Maximum it is my professional judgment that Big Bear Creek in 2006 and 2007 would have had a Mean Temperature between 7/1 and 9/30 of less than 10.0°C.

Hawley Creek had stream temperature data collected in 2004, 2007, 2008 and 2009. The Mean Temperature between 7/1 to 9/30 in 2004 and 2009 was 9.5°C, and 9.0°C respectively. In 2007 and 2008 the data logger was not in the stream for the entire period between 7/1 and 9/30. Looking at those two years of data and comparing streams with similar stream temperature readings for the Maximum Daily Temperature and Maximum of 7 day Moving Maximum it is my professional judgment that Hawley Creek in 2007 and 2008 would have had a Mean Temperature between 7/1 and 9/30 of less than 10.0°C or very close to 10.0°C.

Quaking Aspen Creek had stream temperature data collected in 2009. In 2009 the data logger was not in the stream for the entire period between 7/1 and 9/30 to calculate a Mean Temperature reading between 7/1 and 9/30. Looking at the 2009 stream temperature Quaking Aspen Creek data with 2005 Reservoir Creek data for the Maximum Daily Temperature and Maximum of 7 day Moving Maximum it is my professional judgment that Quaking Aspen Creek in 2009 would have had a Mean Temperature between 7/1 and 9/30 close to 10.0°C.

Reservoir Creek had stream temperature data collected in 2004, 2005, and 2009. The Mean Temperature between 7/1 to 9/30 in 2004, 2005 and 2009 was 9.7°C, 10.1°C, and 10.3°C respectively.

Overall, observed water temperature regimes within the Hawley Creek Allotment have all fallen within the PACFISH water temperature criteria. There are no streams within the ESA Action Area that are listed as an IDEQ 303(d) streams with a pollutant, which includes water temperature (IDEQ, 2008). Bull trout are not present when an observed mean water temperature is greater than 12.0°C (Gamett, 2002). Water temperature is not considered a major limiting factor to fish production within the ESA Action Area.

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 a volcanic and sedimentary 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 evaluation criteria for stream sediment analysis based wholly or primarily in granitic, volcanic or sedimentary:

<25% depth fines (<1/4" diameter) = Properly Functioning

26-29% depth fines (<1/4" diameter) = Functioning at Risk

>30% depth fines (<1/4" diameter) = Not Properly Functioning

Within the ESA Action Area there are three long term core sampling monitoring sites. 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.

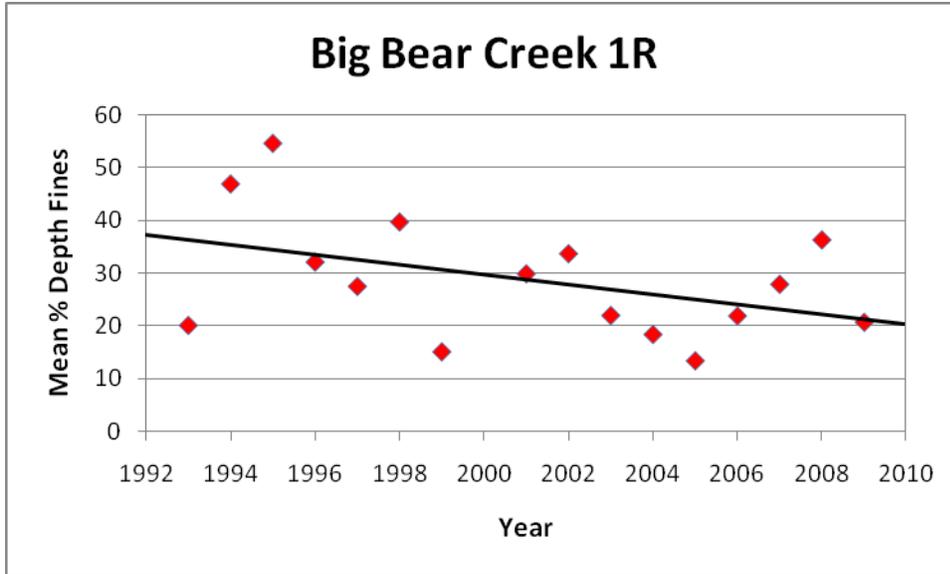
Forest wide analysis of data collected since 1993 shows a wide range of variability for stream sediment. Stream sediment data is highly influenced by natural processes such as geology, stream gradient, winter snow pack, springtime runoff, summer time high intensity storms and human impacts associated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

Table 5 - Core Sampling Mean % Fines by Depth

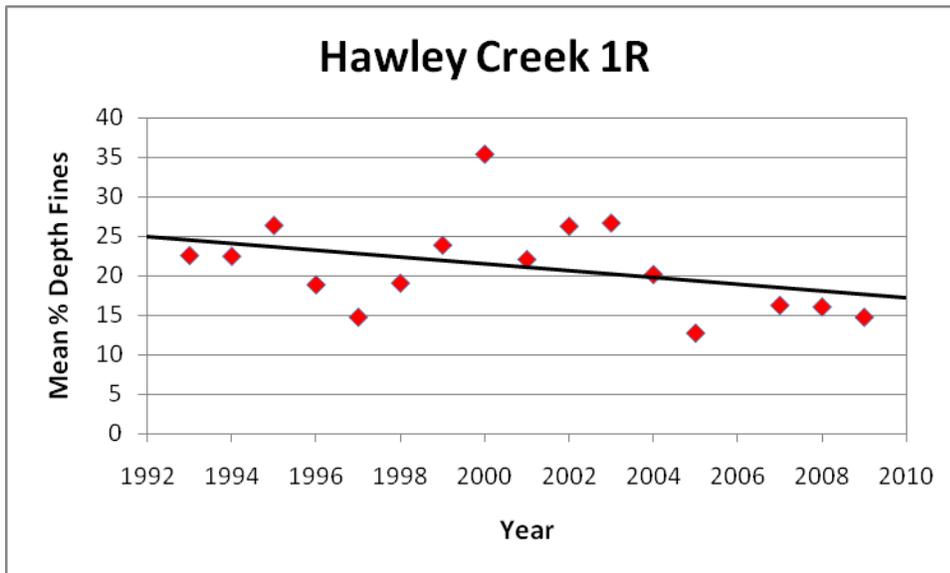
Summary of Depth Fines Measurements Recorded on the Salmon-Challis National Forest from 1993 through 2009.																	
Mean Percent Fines < 0.25" at Depth																	
Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Big Bear Creek 1R	20.1	46.9	54.6	32.1	27.5	39.7	15.1	no data	29.9	33.7	22.0	18.4	13.4	21.9	27.9	36.3	20.7
Hawley Creek 1R	22.6	22.5	26.4	18.9	14.8	19.1	23.9	35.4	22.1	26.3	26.7	20.2	12.8	no data	16.3	16.1	14.8
Reservoir Creek 1R	40.1	30.7	34.4	37.6	24.2	29.2	no data	41.5	no data	44.0	32.3	41.0	no data	17.3	31.6	25.9	23.9

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

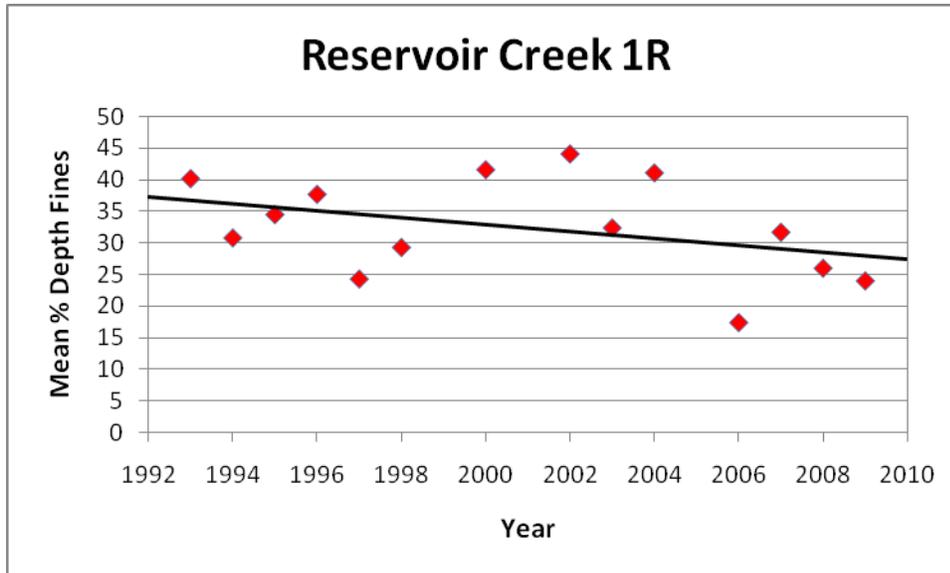
Big Bear Creek has one site that has been monitored sixteen out of the last seventeen years. Using local knowledge of Big Bear Creek and sixteen years of actual data, it is my professional judgment that Big Bear Creek is “Functioning Appropriately” in part because the 2009 reading was less than 25%. This data and its trend graph indicate stream sediment is not a major limiting factor for fish production in Big Bear Creek.



Hawley Creek has one site that has been monitored sixteen out of the last seventeen years. Using local knowledge of Hawley Creek and sixteen years of actual data, it is my professional judgment that Hawley Creek is “Functioning Appropriately” in part because the 2009 reading was less than 25%. This data and its trend graph indicate stream sediment is not a major limiting factor for fish production in Hawley Creek.



Reservoir Creek has one site that has been monitored fourteen out of the last seventeen years. Using local knowledge of Reservoir Creek and fourteen years of actual data, it is my professional judgment that Reservoir Creek is “Functioning at Risk” in part because the trend line is over 25%. This data and its trend graph indicate stream sediment may in part be a limiting factor for fish production in Reservoir Creek.



There are no streams within the ESA Action Area that are listed as an IDEQ 303(d) streams with a pollutant, which includes sediment (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 2009 stream sediment on the three long term trend monitoring sites are all below 25%.

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).

Data is limited for average wetted width/maximum depth ratio on streams within the ESA Action Area. There are seven sites on six ESA fish stream within the ESA Action Area with Range program MIM monitoring data that includes width:depth measurements (see Appendix C Table 18). Each of these seven sites have only been measured one year or width:depth ratios. PACFISH and Range MIM width:depth ratio is measured using the mean wetted width divided by depth. When measuring using mean wetted width there can be a great variance in your calculated width:depth ratio because of different stream flows from year to year and from the beginning of your summer field monitoring season to the end of your summer field monitoring season.

A more accurate monitoring methodology for calculating width:depth ratios would be using bankfull widths divide by bankfull depths where your monitoring site's bankfull width is determined by an experienced hydrologist who permanently marks the location of bankfull using a permanent monument marker like rebar. This will ensure the year to year measurements recorded are more reflective of the width:depth ratio change or lack of change that is taking place at the monitoring site. This will not only give you a more accurate

description of the current stream's width:depth ratio at your monitoring site it will also make a more accurate comparison of the change and trend taking place with width:depth ratios at the monitoring site over the years.

There are no current width:depth ratios, using bankfull width, on streams within the ESA Action Area, but there is historic stream habitat data collected, within the ESA Action Area, for the Snake River Adjudication process that includes three sites that have been permanently marked on three streams within the ESA Acton Area (see Table 6). This stream habitat data was collected between 1988 and 1990 and measured and located bankfull width and bankfull depths. 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).

Table 6 - Width:Depth Ratio (1988-1990 Snake River Adjudication Sites)

Station	BF Channel Slope	Bankfull Width	X-Sectional Area	Bankfull Depth	Width/Depth Ratio	Rosgen Channel Type	Natural Condition Database Width:Depth Ratio
Big Bear Creek 1R	0.012	10.7	12.46	1.16	9.2	"C"	28
Hawley Creek 1R	0.015	20.56	13.27	0.65	31.9	"C"	28
Reservoir Creek 1R	0.014	9.7	5.35	0.55	17.6	"C"	28

Table 7 - Width:Depth Ratio (SCNF Range MIM Sites)

Unit	Station	Site Number	Year	Width/Depth Ratio	PACFISH RMO Width/Depth Ratio
Little Bear Unit	Little Bear Creek	M298	2007	5.95	< 10
Little Bear/Stove Creek Unit	Reservoir Creek	M302	2009	11.25	< 10
Big Bear Unit	Big Bear Creek	M276	2009	6.56	< 10
	Wheetip Creek	M277	2009	4.15	< 10
	Bog Creek	M278	2008	8.57	< 10
Fish Pasture Unit	Big Bear Creek	M304	2009	7.05	< 10
Upper Ranch Unit	Quaking Aspen Creek	M297	2008	6.96	< 10

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 helped 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 have increased average wetted width/maximum depth ratio. Current streambank conditions at two of the three long term trend monitoring site shows high streambank stability (Table 8). The third site, on Reservoir Creek, did show high streambank stability from 2002-2008 until the 2009 measurement of 56%. This 56% streambank stability measurement is the direct result of very high spring runoff flows causing bank scouring and erosion.

Stream width:depth ratios are not considered a major limiting factor to fish production within the ESA Action Area because overall streambanks on ESA fish streams within the ESA Action Area show high streambank stability and the measured width:depth ratios in Table 6 and Table 7 above show measurements that fall within the PACFISH RMO for width:depth ratios or fall within or come very close to the Natural Condition Database's width:depth ratios. Based on local knowledge of the five ESA fish bearing streams within the ESA Action Area and the bankfull width:depth ratios at the three Snake River Adjudication sites (Table 6) and the seven Range MIM sites (Table 7) 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.

6.4.5 **STREAMBANK CONDITION**

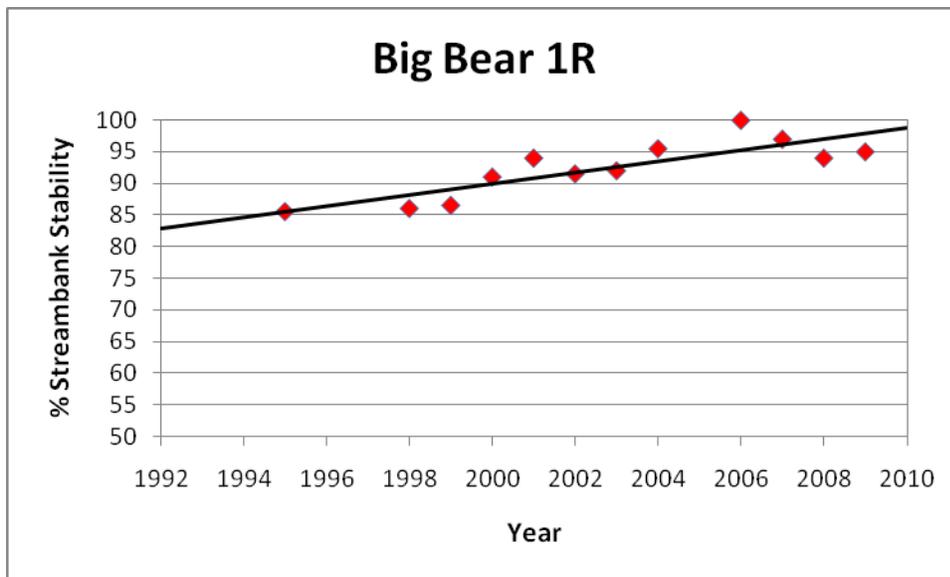
Streambank condition can influence the overall stability and resilience of stream channels. Reduced streambank stability can result in reduced structural stability of the stream channel resulting in negative impacts on fish productivity (Platts,1991).

The Hawley Creek drainage is considered to be a PACFISH priority watershed, with an identified Riparian Management Objective (RMO) of 90 percent or greater bank stability. Therefore we used a PACFISH RMO of 90 percent or greater bank stability. Streambank stability was monitored by the Forest's Watershed Program at their core sampling locations. Based upon the Matrix of Pathway and Indicator functionality criteria of 90 percent or greater streambank stability, streambank conditions are considered to be "Functioning Appropriately" to "Functioning at Risk" on ESA fish streams within the ESA Action Area.

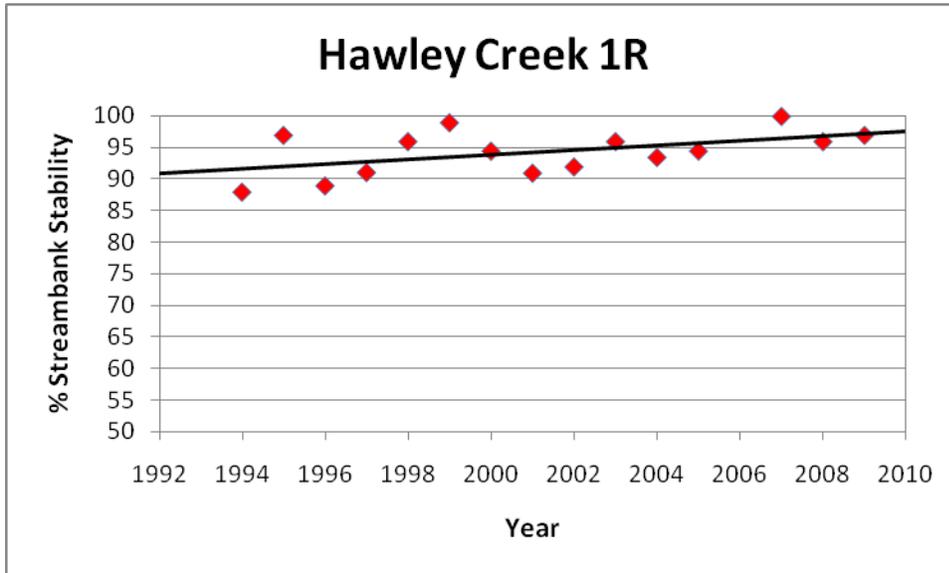
Table 8 - Percent Bank Stability

Summary Bank Stability Measurements Recorded on the Salmon-Challis National Forest from 1994 through 2009																	
Percent Bank Stability																	
Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Big Bear Creek 1R			85.5			86.0	86.5	91.0	94.0	91.5	92.0	95.5		100.0	97.0	94	95
Hawley Creek 1R		88.0	97.0	89.0	91.1	96.0	99.0	94.5	91.0	92.0	96.0	93.5	94.5		100.0	96	97
Reservoir Creek 1R		84.0	94.0	68.0	90.5	78.0		64.0		91.5	86.0	89		90.0	95.5	88	56

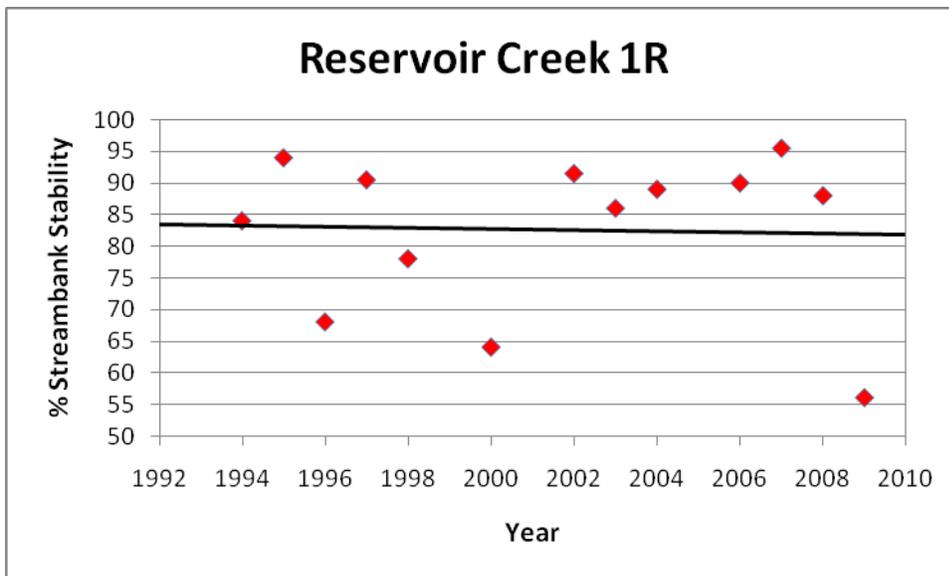
Streambank conditions within the ESA Action Area have been monitored in association with sediment monitoring operations since 1994. The Big Bear Creek trend line is increasing and shows streambank stability above 95%. The data and its trend graph indicate bank stability is not a major limiting factor for fish production in Big Bear Creek.



The Hawley Creek trend line is increasing and shows streambank stability above 95%. The data and its trend graph indicate bank stability is not a major limiting factor for fish production in Hawley Creek.



The Reservoir Creek trend line is slightly decreasing and shows streambank stability above 85% from 2002-2008. But it also shows in 2009 a streambank stability measurement of 56%. This large decrease in streambank stability over one year is a direct result of very high spring runoff flows causing bank scouring and erosion. The data and its trend graph indicate overall bank stability is not a major limiting factor for fish production in Reservoir Creek. Pictures of the 2009 high spring runoff flows can be seen in Appendix I. These pictures were taken July 1, 2009 and show the bank erosion and bank scouring taking place in Reservoir Creek because of the high spring runoff flows. These pictures do not show signs of bank alteration and trampling caused by livestock.



Bank stability data has also been monitored at six Range MIM sites between 1994 and 2009 on four of the five ESA fish streams (see Appendix C Table 18). The Upper Reservoir Creek MIM site (M302) went from 86% stabile in 2002 to 95% stabile in 2009. The Big Bear Creek MIM site, in the Big Bear Unit, (M276) went from 61% stabile in 2002 to 76% stabile in 2009. The Meadow Creek MIM site (M280) went from 73% stabile in 1998 to 88% in 2002. The Big Bear Creek MIM site, in the Fish Pasture Unit, (M304) went from 85% stabile in 1995 to 78% stabile in 2009. The Lower Reservoir Creek MIM site, in the Lower Ranch Unit, went from 62% stabile in 1998 to 70% stabile in 2009. The Quaking Aspen Creek MIM site, in the Upper Ranch Unit, went from 44% stabile in 2002 to 68% stabile in 2008. There are five other MIM sites in Appendix C Table 18 but they are on non-fish bearing or non-ESA fish bearing streams. All six of these MIM monitoring sites on ESA fish bearing streams have a Greenline Ecological Status Trend of "Static" or "Up". The one stream that bank stability could be a limiting factor to fish production is Quaking Aspen Creek. The Range MIM monitoring site on Quaking Aspen Creek (M297) has shown an improvement in bank stability from 44% stabile in 2002 to 68% stabile in 2008. This monitoring site is also showing a significant improvement in Greenline Ecological Status from Early Seral in 2002 to Late Seral in 2008. Using the limited MIM bank stability data from the Range program and the long term trend bank stability readings from the Watershed Program it is my professional judgment that the overall streambank stability conditions are not considered a major limiting factor to fish production on ESA fish streams within the ESA Action Area.

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).

The monitoring sites were established and subsequent monitoring has occurred on the Hawley Creek Allotment since the early 90's. Since that time, grazing management has evolved based upon management in reference to listed fish species, specifically bull trout, 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, of the eleven sites monitored since the early 90's, 10 are in upward trend or at Late Seral/ PNC. The monitoring site on Lower Reservoir is static at Mid Seral.

Lower Little Bear Creek: The GES trend is static at Late Seral. The site is very timbered and rocky. Livestock have limited access to the stream. 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 5 inches.

Upper Little Bear Creek: The GES trend is static at PNC. The site is inside the Little Bear Riparian Unit. Very little livestock use if any occurs within this Unit. The site is dominated by Carex and Willow. 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 5 inches. A bank alteration monitoring attribute with an annual use indicator of 20% will also be used.

Upper Wheetip Creek: The GES trend is up PNC. The GES trend is up, but two readings are not enough to make a good determination. Need to revisit site to get a better trend analysis. Due to the well established Carex under growth, the best monitoring attribute to manage the site is stubble height with an annual use indicator of 5 inches.

Upper Reservoir Creek: The GES trend is up at Mid Seral. The original site was located near a fence line. Because that is not an appropriate location to take greenline readings the site was moved ~1/4 mile upstream in 2009. The stream historically has been washed out by high water flow events. The potential of the stream may only be Mid Seral because of the scouring associated with the high flow events does not allow the vegetation community to develop Late Seral or PNC plant species. 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 6 inches. A bank alteration monitoring attribute with an annual use indicator of 20% will also be used.

Big Bear Creek: The GES trend is static at Late Seral. The site has shown little change in GES from 2002 to 2009. The bank stability has improved from 2002. The improvement could be attributed to better livestock management by limiting the time livestock spend in the riparian area. 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 5 inches. A bank alteration monitoring attribute with an annual use indicator of 10% will also be used.

Meadow Creek: The GES trend is static at Late Seral. The site has shown little change in GES. The bank stability has improved from the previous reading. The improvement could be attributed to better livestock management by limiting the time livestock spend in the riparian area. 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 5 inches. A bank alteration monitoring attribute with an annual use indicator of 20% will also be used.

Lower Wheetip Creek: The GES trend is static at Late Seral. The site has shown little change in the GES. Woody regeneration indicates the site is moving to a more mixed age class instead of being dominated by young seedlings. The bank stability is improving and is heading towards 80%. 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 5 inches. A bank alteration monitoring attribute with an annual use indicator of 15% will also be used.

Bog Creek: The GES trend is static at Late Seral. The site has shown little change in the GES and woody regeneration. The bank stability has not improved from the last reading and is at 66%. However, efforts have been made to improve bank stability by adding hardened crossings. Bank alteration is at 12%. 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 5 inches. A bank alteration monitoring attribute with an annual use indicator of 10% will also be used.

Big Bear Creek (Fish Pasture Unit): The GES trend is static at Late Seral. The site has been used intermittently since the 1990's. The riparian fence enclosure prevents livestock from using the area except for intermittent use at the end of the season for 2-3 days while the permittees gather their livestock before heading off the allotment. Because this area is only used for 2-3 days a season livestock use would not be the key disturbance associated with changes in GES. 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 6 inches. A bank alteration monitoring attribute with an annual use indicator of 15% will also be used.

Lower Reservoir Creek: The GES trend is static at Mid Seral. The stream has historically been washed out by high water flow events. Low bank stability readings are attributed to high water flow events. The potential of the stream may only be Mid Seral because of the scouring associated with the high flow events does not allow the vegetation community to develop Late Seral or PNC plant species. 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 6 inches. A bank alteration monitoring attribute with an endpoint indicator of 10% will also be used.

Quaking Aspen Creek: The GES trend is up at Late Seral. This monitoring site is showing a significant improvement in Greenline Ecological Status from Early Seral in 2002 to Late Seral in 2008. This site is also showing good improvement in bank stability from 44% in 2002 to 68% in 2008. This site is used heavily by large elk herds. Livestock are not actively trailed into area. 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 5 inches. A bank alteration monitoring attribute with an annual use indicator of 10% will also be used.

Riparian areas are considered to be Functioning Appropriately within the ESA Action Area therefore it is my professional judgment that Stream Riparian Conservation Areas are not considered a major limiting factor to 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 9 - Relationship Matrix

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

Riparian Conservation Areas	Greenline Successional Status	Greenline Status	Greenline Stubble
	Woody Species Regeneration	Woody Species Regeneration	Browse Use
	Bank Stability	Greenline Status, Woody Species Regeneration, Current Year Alteration	Stubble Height, Browse Use, Bank Alteration
Spawning and Incubation	N/A	N/A	N/A

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

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

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

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

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

Most measurements of streamside variables moved closer to those beneficial for salmonid fisheries when pastures were grazed to four inches of graminoid stubble height; virtually all measurements improved when pastures were grazed to six inches stubble height, or when

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

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

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

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

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

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

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

Some researchers have concluded that bank alteration, taking natural channel stability into account, is the most important factor to consider in evaluating physical stream channel conditions and impacts from land use. Streambank alterations of 20% or less are expected to allow for upward trend of streams with stream widths narrowing and depths increasing (Benneyfield, 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 10. 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.
- **Herdin:** 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 each of these measures into its grazing strategy for the Hawley Creek 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. All of the existing water developments improvements, displayed in Figure 2, will help distribute livestock throughout a given unit to minimize the time livestock need to spend down in a given stream's riparian area.

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 Hawley Creek Allotment are discussed individually below.

7.1.1.1 CHINOOK SALMON

Conclusion:

Hawley Creek is currently not connected to the Lemhi River. There is currently an effort underway to reconnect Hawley Creek with the Lemhi River. At this time, because of the disconnect with the Lemhi River and other human caused physical migration barriers, we do not consider streams within the ESA Action Area as supporting Chinook salmon populations. At the time Idaho Fish and Game and the Salmon-Challis National Forest considers any stream within the ESA Action Area as supporting Chinook salmon populations the SCNF will reinitiate consultation with National Marine Fisheries Service. Therefore it is my professional judgment that the Hawley Creek Allotment's livestock grazing activities have No Effect on Chinook salmon spawning and incubation in streams within the ESA Action Area because there no Chinook salmon present within the ESA Action Area.

7.1.1.2 STEELHEAD

Conclusion:

Hawley Creek is currently not connected to the Lemhi River. There is currently an effort underway to reconnect Hawley Creek with the Lemhi River. At this time, because of the disconnect with the Lemhi River and other human caused physical migration barriers, we do not consider streams within the ESA Action Area as supporting steelhead populations. At the time Idaho Fish and Game and the Salmon-Challis National Forest considers any stream within the ESA Action Area as supporting steelhead populations the SCNF will reinitiate consultation with National Marine Fisheries Service. Therefore it is my professional judgment that the Hawley Creek Allotment's livestock grazing activities have No Effect on steelhead spawning and incubation in streams within the ESA Action Area because there no steelhead present within the ESA Action Area.

7.1.1.3 BULL TROUT

Bull trout have the potential to spawn in five 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 fluvial bull trout spawning because the Hawley Creek drainage is currently disconnected to the Lemhi River. If there were no fish migration barriers from the Lemhi River to the ESA Action Area fluvial bull trout would migrate from the Lemhi River into the Hawley Creek drainage and 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 (see Figure 4). At this time we consider there are five streams within the ESA Action Area that have known or potential bull trout spawning and incubation habitat. Those five streams are Hawley Creek, Big Bear Creek, Meadow Creek, Reservoir Creek and Quaking Aspen Creek. In 1999 there were two streams where a single bull trout was electro-fished, Meadow Creek and Reservoir Creek. In 2004 there was one bull trout

electro-fished in Quaking Aspen Creek. Therefore, at this time it is my professional judgment Meadow Creek, Reservoir Creek and Quaking Aspen Creek may have the potential to support bull trout spawning and incubation but because those streams have been surveyed over multiple years and in each stream, one time, there was only one fish documented while electrofishing I believe the number of potential bull trout redds constructed in a given year in those three streams would be very low. In 2005, IDFG electro-fished twenty-one sites on seven streams and only found bull trout in Hawley Creek and Big Bear Creek (IDFG, 2006). In 2009, the SCNF electro-fished six streams and only found bull trout present in Big Bear Creek.

Analysis Assumptions:

- Hawley Creek starts at the confluence of Reservoir Creek and Big Bear Creek
- 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).
- Although bull trout may begin to spawn around August 15th, the peak spawning period is later depending upon water temperatures. Some bull trout redds will be constructed after the cattle are removed from a bull trout unit. This means in any given year not all bull trout redds are susceptible to cattle trampling within the Hawley Creek Allotment since the cattle are off the allotment by September 30th and some small percentage of bull trout redds may be constructed after September 30th
- 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 Ranch Unit: The Lower Ranch Unit has bull trout spawning occurring in 1.26 miles of Hawley Creek. There is also approximately one mile of Hawley Creek inside of the ESA Action Area, within private land, where permitted livestock do not graze. Every year livestock are moved out of the Lower Ranch Unit prior to August 15th but, every year at the end of the grazing season livestock are actively trailed back through the Lower Ranch Unit along the Hawley Creek road (FS rd #60275) off the Forest Service Allotment and on to a BLM Allotment. This end of the year active trailing off the allotment takes approximately 1 to 2 days total. There are no fences and limited natural physical barriers to keep livestock out of Hawley Creek during active trailing within this unit. Because this is active trailing, with riders and dogs, at the end of the season on FS rd #60275 there is limited opportunity for livestock to get off the road, down to Hawley Creek and trample bull trout redds or disturb/harass spawning adults. Although there is limited opportunity for livestock to get off the road and into Hawley Creek one cannot say there is no

opportunity for livestock to get off the road and into Hawley Creek. Therefore it is my professional judgment that end of the season livestock trailing through the Lower Ranch Unit provides an opportunity for livestock to trample bull trout redds and/or disturb or harass spawning adults.

Big Bear Unit: The Big Bear Unit has bull trout spawning occurring in 2.65 miles of Big Bear Creek. Every year livestock are grazing in the Big Bear Unit after August 15th. Because livestock are grazing in the Big Bear Unit past August 15th there is the potential for livestock to step on bull trout redds and/or disturb/harass spawning adults. There are no fences and limited natural physical barriers to keep livestock out of Big Bear Creek within this unit. Therefore it is my professional judgment that livestock have an opportunity to trample bull trout redds and/or disturb or harass spawning adults every year within this unit.

Fish Pasture Unit: The Fish Pasture Unit has bull trout spawning occurring in 1.90 miles of Big Bear Creek. The potential exposure of bull trout redds and/or spawning adult bull trout from livestock exists every other year in this unit for 1-2 days at the end of the season when the Big Bear Unit is the last unit grazed in the rotation schedule. The livestock are moved out of the Big Bear Unit and actively trailed through the Fish Pasture Unit on FS rd #60177. This active trailing takes approximately 1-2 days. There are no fences and no natural physical barriers to keep livestock out of Big Bear Creek during active trailing within this unit. Because this is active trailing, with riders and dogs, at the end of the season on FS rd #60177 there is limited opportunity for livestock to get off the road, down to Big Bear Creek and trample bull trout redds or disturb/harass spawning adults. Although there is limited opportunity for livestock to get off the road and into Big Bear Creek one cannot say there is no opportunity for livestock to get off the road and into Big Bear Creek. Therefore it is my professional judgment that end of the season livestock trailing, every other year, through the Fish Pasture Unit provides an opportunity for livestock to trample bull trout redds and/or disturb or harass spawning adults.

Little Bear Unit: The Little Bear Unit has bull trout spawning occurring in 0.90 miles of Big Bear Creek. In year one of the unit rotation schedule livestock could be grazing in this unit for approximately one to two weeks after August 15th. In year two of the unit rotation schedule livestock could be grazing in this unit for approximately two to four weeks after August 15th. Every year at the end of the grazing season livestock are actively trailed through this unit on FS rd #60177 and FS rd #60275. This end of the year active trailing out of this unit and off the allotment takes approximately 1 to 2 days total. Because this is active trailing, with riders and dogs, at the end of the season on FS rd #60177 and FS rd #60275 there is limited opportunity for livestock to get off the road, down to Big Bear Creek and trample bull trout redds or disturb/harass spawning adults. Although there is limited opportunity for livestock to get off the road and into Big Bear Creek one cannot say there is no opportunity for livestock to get off the road and into Big Bear Creek. Therefore it is my professional judgment that every year during this unit's grazing rotation schedule and every year during the end of the season livestock active trailing through this unit there is an opportunity for livestock to trample bull trout redds and/or disturb or harass spawning adults.

Little Bear/Stove Creek Unit: This unit does not support a bull trout spawning and incubation stream. Therefore there are no active trailing concerns. Because there are no bull trout spawning and incubation streams within this unit it is my professional judgment that there is no potential for livestock to trample bull trout redds and/or disturb or harass spawning adults within this unit.

Upper Ranch Unit: This unit does not support a bull trout spawning and incubation stream. Therefore there are no active trailing concerns. Because there are no bull trout spawning and incubation streams within this unit it is my professional judgment that there is no potential for livestock to trample bull trout redds and/or disturb or harass spawning adults within this unit.

Little Bear Riparian Unit: This unit does not support a bull trout spawning and incubation stream. Therefore there are no active trailing concerns. Because there are no bull trout spawning and incubation streams within this unit it is my professional judgment that there is no potential for livestock to trample bull trout redds and/or disturb or harass spawning adults within this 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 because of the time bull trout are suspected to begin spawning in Hawley Creek and Big Bear Creek and the time when livestock are grazing or are actively being trailed through the Lower Ranch Unit, Fish Pasture Unit, Big Bear Unit and the Little Bear Unit. Spawning adult bull trout and their redds will be at risk between August 15th through September 30th every 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 within the ESA Action Area.

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).

While some streams within the Hawley Creek Allotment's ESA Action Area display short periodic exceedences of salmonid spawning temperature criteria, 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. Monitoring data indicates that these four focus indicators are overall functioning appropriately and are not major limiting factors to fish production within the ESA Action Area.

In a 2002 study on the Lost River Ranger District it was found that bull trout were always present where mean temperature, between July 1 and September 30, was less than 10.0°C (Gamett, 2002). This indicates stream temperatures would not be a major limiting factor to fish production when a stream has a Mean Temperature (July 1 - September 30) of less than 10.0°C. There are four ESA fish streams within the ESA Action Area with stream temperature data (see Appendix C Table 17). Those streams are Big Bear Creek, Hawley Creek, Quaking Aspen Creek and Reservoir Creek.

Big Bear Creek had stream temperature data collected in 2004, 2005, 2006, 2007, and 2009. The Mean Temperature between 7/1 to 9/30 in 2004, 2005 and 2009 was 7.3°C, 7.6°C, and 7.7°C respectively. In 2006 and 2007 the data logger was not in the stream for the entire period between 7/1 and 9/30. Looking at those two years of data and comparing streams with similar stream temperature readings for the Maximum Daily Temperature and Maximum of 7 day Moving Maximum it is my professional judgment that Big Bear Creek in 2006 and 2007 would have had a Mean Temperature between 7/1 and 9/30 of less than 10.0°C.

Hawley Creek had stream temperature data collected in 2004, 2007, 2008 and 2009. The Mean Temperature between 7/1 to 9/30 in 2004 and 2009 was 9.5°C, and 9.0°C respectively. In 2007 and 2008 the data logger was not in the stream for the entire period between 7/1 and 9/30. Looking at those two years of data and comparing streams with similar stream temperature readings for the Maximum Daily Temperature and Maximum of 7 day Moving Maximum it is my professional judgment that Hawley Creek in 2007 and 2008 would have had a Mean Temperature between 7/1 and 9/30 of less than 10.0°C or very close to 10.0°C.

Quaking Aspen Creek had stream temperature data collected in 2009. In 2009 the data logger was not in the stream for the entire period between 7/1 and 9/30 to calculate a Mean Temperature reading between 7/1 and 9/30. Looking at the 2009 stream temperature Quaking Aspen Creek data with 2005 Reservoir Creek data for the Maximum Daily Temperature and Maximum of 7 day Moving Maximum it is my professional judgment that Quaking Aspen Creek in 2009 would have had a Mean Temperature between 7/1 and 9/30 close to 10.0°C.

Reservoir Creek had stream temperature data collected in 2004, 2005, and 2009. The Mean Temperature between 7/1 to 9/30 in 2004, 2005 and 2009 was 9.7°C, 10.1°C, and 10.3°C respectively.

Overall, observed water temperature regimes within the Hawley Creek Allotment have fallen within the PACFISH water temperature criteria. 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.

Conclusion:

While short periodic exceedences of salmonid spawning temperature criteria may exist along some stream reaches on some streams in some years, contributing impacts on water temperature related to grazing activities 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 Hawley Creek 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 Hawley Creek Allotment is not currently considered to be a significant factor influencing sediment levels. Long term trend stream sediment levels measured in Hawley Creek, Big Bear Creek and Reservoir are well below the 25% depth fines which are considered "Properly Functioning". The 2009 stream sediment data collected for Big Bear Creek, Hawley Creek and Reservoir Creek are all below the 25% fines. Monitoring data indicates that overall stream sediment within the ESA Action Area is "Functioning Appropriately" and is not major limiting factors to fish production within the ESA Action Area

Strategies and Conservation Measures of the proposed action, while designed in part to avoid livestock presence within stream channels during critical spawning periods; additionally serve to minimize potential sediment generation to allotment streams from near-stream livestock activity.

Turbidities associated with active or passive trailing at a stream crossing site are expected to be limited to areas immediately below the crossing locations and short-term in nature. Associated suspended sediment 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.

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.

Livestock activity within the Hawley Creek Allotment is not currently considered to be a significant factor influencing width:depth ratios. Recent monitoring data indicates width:depth ratios meet the PACFISH Riparian Management Objective of <10 or are significantly less than similar streams found in the Natural Condition Database (Overton, 1995).

Strategies and Conservation Measures of the proposed action, while designed in part to avoid livestock presence within stream channels during critical spawning periods; additionally serve to minimize potential sediment generation to allotment streams from near-stream livestock activity.

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 is not expected to produce or contribute to any significant impacts on width:depth ratios of streams within the Hawley Creek 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 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).

Streambank stability monitoring on three ESA fish stream within the Hawley Creek Allotment indicate streambanks are very stable at these long term trend monitoring sites. Data has been collected on these three streams over the last 16 years.

In the last nine years twenty-two of twenty three streambank stability readings have been high (86% to 100%). The one exception is Reservoir Creek in 2009 had a reading of 56%. The previous six years of readings in Reservoir Creek saw bank stability between 86% and 95.5%. This large decrease in streambank stability over one year is a direct result of very high spring runoff flows causing bank scouring and erosion. The data and its trend graph indicate overall bank stability is not a major limiting factor for fish production in Reservoir Creek. Pictures of the 2009 high spring runoff flows can be seen in Appendix I. These pictures were taken July 1, 2009 within close proximity to the core sampling site where the 56% bank stability was measured. The pictures show bank erosion and bank scouring taking place in Reservoir Creek after the high spring runoff flows. In 2009 the livestock were put on this unit June 16th. These pictures do not show signs of bank alteration and trampling caused by livestock. Therefore it is my

professional judgment that livestock did not cause the 56% low bank stability rating at this monitoring site.

Conclusion:

Considering both observed width: depth ratios and streambank stability data and trends, it is concluded that livestock grazing activities have not directly produced or contributed to any significant impacts on streambank conditions of streams within the Hawley Creek Allotment which can be meaningfully measured, detected or evaluated.

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, use of range improvements such as fencing and water developments 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 Hawley Creek 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.

There are eleven sites being monitored for Greenline Ecological Status within the ESA Action Area since the early 1990's (see Table 15). Ten of those sites are in an upward trend or at Late Seral/PNC. There is one monitoring site on lower Reservoir Creek that is static at Mid Seral. Riparian areas are considered to be "Functioning Appropriately" within the ESA Action Area.

Current livestock grazing activities within the ESA Action Area are not considered to be negatively impacting riparian conditions.

Conclusion:

Stream Riparian Conservation Areas are not considered a major limiting factor to fish production 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 streams. Measures including rapid movement of livestock through trailing areas, riding to

distribute livestock away from riparian areas, salting, use of range improvements such as fencing and water developments 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 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 Hawley Creek Allotment streams are 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 is no State land within the ESA Action Area. There are two private land parcels within the ESA Action Area. There are no known private land activities within the ESA Action Area, that along with the Hawley Creek 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 Chinook salmon or steelhead present within the ESA Action Area. There is no steelhead Designated Critical Habitat within the ESA Action Area. There is Chinook salmon Designated Critical Habitat within the ESA Action Area. There is bull trout Proposed 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 10 summarizes the effects of the proposed Hawley Creek 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 10 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 10 - Effects Summary for the Hawley Creek 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	FR	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 to FR	NO	NO	NO	NO	NO	NO
	Pool Frequency and Quality	FA to FR	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			Response Column B		
			Will the proposed action or any interrelated or interdependent actions likely generate any direct or indirect effects to this indicator?			Are these effects expected to exceed beneficial, insignificant, or discountable?		
			CH	SH	BT	CH	SH	BT
Channel Condition and Dynamics	Width:Depth Ratio	FA to FR	NO	NO	YES	NO	NO	NO
	Streambank Condition	FA to FR	NO	NO	YES	NO	NO	NO
	Floodplain Connectivity	FA	NO	NO	NO	NO	NO	NO
Flow/Hydrology	Change in Peak/Base Flows	FR	NO	NO	NO	NO	NO	NO
	Increase in Drainage Networks	FA	NO	NO	NO	NO	NO	NO
Watershed Conditions	Road Density and Location	FR	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 Hawley Creek Watershed as identified in Matrix Table (Appendix B)

Highlighted elements refer to functionality conditions of Hawley Creek Allotment ESA Action Area Focus Indicators

Hawley Creek - Salmon 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 10). The specific determinations are identified below and summarized in Table 11.

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 may have effects on Chinook salmon designated 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 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 one 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 proposed 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 proposed 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 steelhead.

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 the ESA Action Area. But the effects analysis concluded that the proposed action may have effects on Chinook salmon designated 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” on Chinook salmon Essential Fish Habitat.

Table 11 - Effects Determination Summary for the Hawley Creek Allotment's Grazing Activities

	Chinook Salmon			Steelhead		Bull Trout		Sockeye Salmon	
	Species	Designated Critical Habitat	Essential Fish Habitat	Species	Designated Critical Habitat	Species	Proposed Critical Habitat	Species	Designated Critical Habitat
Determination ¹	No Effect	Not Likely to Adversely Affect	Not Likely to Adversely Affect	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, proposed critical habitat or essential fish habitat.

All of the above effects determinations in Table 11 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 HAWLEY CREEK (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: Hawley Creek - 1706020305
Unit: Leadore Ranger District	Spatial Scale of Matrix: One 5 th field HUC
Fish Species Present: Bull Trout	Designated or Proposed Critical Habitat Present: Chinook Salmon and Bull Trout
Anadromous Species Population: Lemhi River	Anadromous Species Subpopulation: Lemhi River
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) - Hawley Creek Allotment	Updated: 3/30/2010

Pathway - Subpopulation Characteristics (Bull Trout Only)		
Pathways Indicators	Status of Baseline	Discussion of Baseline – Current Condition
Subpopulation Size	FR _{BT}	<p>Bull Trout -Bull Trout have been found in five streams within the Hawley Creek 5th field HUC and within the ESA Action Area. All life stages have been documented in two streams. Fluvial individuals are not present within the Hawley Creek 5th field HUC. Bull trout is currently listed as “Threatened” under ESA.</p> <p>Therefore it is my professional judgment that the Environmental Baseline for this indicator is <i>Functioning at Risk</i>. 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 <i>Maintain</i> this environmental baseline condition because of the action’s design criteria and following required standard and guidelines.</p>

<p>Growth and Survival</p>	<p>FUR_{BT}</p>	<p>Bull Trout - The sub population, within the Hawley Creek 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 five bull trout streams within the Hawley Creek 5th field HUC and the ESA Action Area currently have no connectivity to the Lemhi River and the Salmon River. Two of the five 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).</p> <p>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 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.</p>
<p>Life History Diversity and Isolation</p>	<p>FUR_{BT}</p>	<p>Bull Trout - The migratory form of bull trout, within the Hawley Creek 5th field HUC, is not present and 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. The five bull trout streams within the Hawley Creek 5th field HUC and the ESA Action Area currently have no connectivity to the Lemhi River and the Salmon River.</p> <p>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.</p>
<p>Persistence and Genetic Integrity</p>	<p>FUR_{BT}</p>	<p>Bull Trout – Bull Trout stream connectivity is low to moderate within the Hawley Creek 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. The five bull trout streams within the Hawley Creek 5th field HUC and the ESA Action Area currently have no connectivity to the Lemhi River and the Salmon River.</p> <p>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.</p>

Pathway - Water Quality		
Pathway Indicators	Status of Baseline	Discussion of Baseline – Current Condition
Temperature (7day average. Maximum, °C)	FA BT	<p>Since 1993 the BLM has collected stream temperature data on three streams within the Hawley Creek 5th field HUC. Since 2004 the Forest has collected stream temperature data on 5 streams within the Hawley Creek 5th field HUC. Data indicates that stream temperatures are not a limiting factor for fish production and meets PACFISH spawning and rearing criteria. PACFISH page C-6. Water temperatures are below 64°F within migration and rearing habitats and below 60°F within spawning habitats. There is no measurable increase in maximum water temperature using the 7-day moving average of daily maximum temperature measured as the average of the maximum daily temperature of the warmest consecutive 7-day period.</p> <p>Therefore it is my professional judgment that the Environmental Baseline for this indicator is <u>Functioning Appropriately</u>. 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 <u>Maintain</u> this environmental baseline condition because of the action’s design criteria and following required standard and guidelines.</p>
Sediment	FA BT	<p>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).</p> <p>Since 1993 stream sediment data has been collected on three streams within the Hawley Creek 5th field HUC. Those three monitoring sites are also within the ESA Action Area. The uplands of these three streams are primarily volcanic and sedimentary geology. For streams based wholly or primarily in granitic, volcanic or sedimentary geology the baseline conditions are rated as follows:</p> <ul style="list-style-type: none"> ▪ < 25 % depth fines (<1/4” diameter) = Functioning Appropriately; ▪ 26-29% depth fines = Functioning at Risk; ▪ >30% depth fines = Functioning at Unacceptable Risk <p>Therefore it is my professional judgment that the Environmental Baseline for this indicator within the Hawley Creek 5th field HUC and the ESA Action Area is <u>Functioning Appropriately</u>. The effects of the proposed project will not play a role in decreasing or increasing steam sediment within the Hawley Creek 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 <u>Maintain</u> this environmental baseline condition because of the action’s design criteria and following required standard and guidelines.</p>

<p>Chemical Contaminants/Nutrients</p>	<p>FR_{BT}</p>	<p>There is one 303d stream listed within the Hawley Creek 5th field HUC. That stream reach is located on BLM land below the Forest boundary and outside of the ESA Action Area. The stream listed as 303d is Hawley Creek and the pollutant is for Unknown - Nutrients suspected. There are no 303d streams listed within the ESA Action Area.</p> <p>Therefore it is my professional judgment that the Environmental Baseline for this indicator is <u>Functioning Appropriately</u> within the ESA Action Area and <u>Functioning at Risk</u> 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 Hawley Creek 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 <u>Maintain</u> this environmental baseline condition because of the action's design criteria and following required standard and guidelines.</p>
<p>Pathway - Habitat Access</p>		
<p>Pathway Indicator</p>	<p>Status of Baseline</p>	<p>Discussion of Baseline – Current Condition</p>
<p>Physical Barriers</p>	<p>FUR_{BT}</p>	<p>There are at least eight human caused physical barriers (ie culverts, diversion structures and dewatering) within the Hawley 5th field HUC on both public and private lands. There are two road crossing culverts that would be considered partial barriers within the ESA Action Area.</p> <p>Therefore it is my professional judgment that the Environmental Baseline for this indicator is <u>Functioning at Unacceptable Risk</u> when considering the entire 5th field HUC and <u>Functioning at Risk</u> within the ESA Action Area. The effects of the proposed project will not play a role in decreasing or increasing human caused physical barriers within the Hawley Creek 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 <u>Maintain</u> this environmental baseline condition because of the action's design criteria and following required standard and guidelines.</p>
<p>Habitat Elements</p>		
<p>Pathway Indicators</p>	<p>Baseline</p>	<p>Discussion of Baseline – Current Condition</p>
<p>Substrate Embeddedness</p>	<p>NA</p>	<p>The Salmon-Challis National Forest does not collect substrate embeddedness data. Refer to Sediment.</p>

<p>Large Woody Debris</p>	<p>FA to FR BT</p>	<p>Data is limited for large woody debris within the Hawley Creek 5th field HUC and within the ESA Action Area.</p> <p>It is my professional judgment that large woody debris is <u>Functioning Appropriately</u> to <u>Functioning at Risk</u> within the ESA Action Area and <u>Functioning Appropriately</u> to <u>Functioning at Risk</u> within the entire 5th field HUC. For those streams adjacent to motorized road corridors there is some amount of unauthorized fuelwood gathering that takes place. Some of those trees removed for personal fuelwood could have made it to the stream channel as large woody debris. Those are the stream reaches that would have a <u>Functioning at Risk</u> call. The effects of the proposed project will not play a role in decreasing or increasing large woody debris within the Hawley Creek 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 <u>Maintain</u> this environmental baseline condition because of the action's design criteria and following required standard and guidelines.</p>
<p>Pool Frequency and Quality</p>	<p>FA to FR BT</p>	<p>Data is limited for pool frequency and quality within the Hawley Creek 5th field HUC and within the ESA Action Area.</p> <p>It is my professional judgment that pool frequency and quality is <u>Functioning Appropriately</u> to <u>Functioning at Risk</u> within the ESA Action Area and <u>Functioning Appropriately</u> to <u>Functioning at Risk</u> within the entire 5th field HUC. For those streams adjacent to motorized road corridors there is some amount of unauthorized fuelwood gathering that takes place. Some of those trees removed for personal fuelwood could have made it to the stream channel as large woody debris and created more quality pools. Those are the stream reaches that would have a <u>Functioning at Risk</u> call. The effects of the proposed project will not play a role in decreasing or increasing pool frequency and quality within the Hawley Creek 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 <u>Maintain</u> this environmental baseline condition because of the action's design criteria and following required standard and guidelines.</p>

<p>Off-channel Habitat</p>	<p>FA_{BT}</p>	<p>Data is limited for off-channel habitat within the Hawley Creek 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.</p> <p>It is my professional judgment that off-channel habitats are <i>Functioning Appropriately</i> 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 Hawley Creek 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 <i>Maintain</i> this environmental baseline condition because of the action's design criteria and following required standard and guidelines.</p>
<p>Refugia</p>	<p>FA_{BT}</p>	<p>Quantifiable data is limited for refugia habitat within the Hawley Creek 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.</p> <p>It is my professional judgment that refugia habitat is <i>Functioning Appropriately</i> 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 Hawley Creek 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 <i>Maintain</i> this environmental baseline condition because of the action's design criteria and following required standard and guidelines.</p>

Channel Condition & Dynamics		
Pathways Indicators	Status of Baseline	Discussion of Baseline – Current Condition
Average Wetted Width/Maximum Depth Ratio	FA to FR BT	<p>Data is limited for average wetted width/maximum depth ratio within the Hawley Creek 5th field HUC and within the ESA Action Area (see sections 6.4.4 & 7.1.4 above).</p> <p>It is my professional judgment that average wetted width/maximum depth ratio is <u>Functioning Appropriately</u> to <u>Functioning at Risk</u> on ESA stream reaches within the Hawley Creek 5th field HUC and <u>Functioning Appropriately</u> to <u>Functioning at Risk</u> within the ESA Action Area. The effects of the proposed project could play a role in decreasing or increasing average wetted width/maximum depth ratio within the Hawley Creek 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 <u>Maintain</u> this environmental baseline condition because of the action’s design criteria and following required standard and guidelines.</p>
Streambank Condition	FA to FR BT	<p>Data is limited for streambank condition within the Hawley Creek 5th field HUC and within the ESA Action Area (see sections 6.4.5 & 7.1.5 above).</p> <p>It is my professional judgment that streambank condition is <u>Functioning Appropriately</u> to <u>Functioning at Risk</u> on ESA stream reaches within the Hawley Creek 5th field HUC and <u>Functioning Appropriately</u> to <u>Functioning at Risk</u> within 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. 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 stable 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 <u>Maintain</u> this environmental baseline condition because of the action’s design criteria and following required standard and guidelines.</p>

<p>Floodplain Connectivity</p>	<p>FA_{BT}</p>	<p>Most all stream reaches within the Hawley Creek 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.</p> <p>It is my professional judgment that floodplain connectivity is <i>Functioning Appropriately</i> on ESA stream reaches within the Hawley Creek 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 stable 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 <i>Maintain</i> this environmental baseline condition because of the action’s design criteria and following required standard and guidelines.</p>
<p>Flow/Hydrology</p>		
<p>Pathways Indicators</p>	<p>Status of Baseline</p>	<p>Discussion of Baseline – Current Condition</p>
<p>Change in Peak/Base Flows</p>	<p>FR_{BT}</p>	<p>Within the entire Hawley Creek 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.</p> <p>It is my professional judgment that change in peak/base flows is <i>Functioning at Risk</i> for the Hawley Creek 5th field HUC but would be <i>Functioning Appropriately</i> 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 Hawley Creek 5th field HUC or within the ESA Action Area. Therefore the effects of this action will <i>Maintain</i> this environmental baseline condition because of the action’s design criteria and following required standard and guidelines.</p>

<p>Increase in Drainage Network</p>	<p>FA_{BT}</p>	<p>There has been a zero or minimum increase in active channel length correlated with human caused disturbance within the Hawley Creek 5th field HUC.</p> <p>It is my professional judgment that increase in drainage network is <i>Functioning Appropriately</i> for the Hawley Creek 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 Hawley Creek 5th field HUC or within the ESA Action Area. Therefore the effects of this action will <i>Maintain</i> this environmental baseline condition because of the action’s design criteria and following required standard and guidelines.</p>
<p>Watershed Condition</p>		
<p>Pathway Indicators</p>	<p>Status of Baseline</p>	<p>Discussion of Baseline – Current Condition</p>
<p>Road Density and Location</p>	<p>FR_{BT}</p>	<p>The Hawley Creek 5th field HUC has 82.1 miles of roads, a road density of 1.3 (mi/mi²) with some valley bottom roads (20.5 miles of road within a PACFISH RHCA and 25.0% of the roads are within a PACFISH RHCA).</p> <p>It is my professional judgment that road density and location is <i>Functioning at Risk</i> for the Hawley Creek 5th field HUC. The effects of the proposed project’s activities will not play a role in road density or location in the Hawley Creek 5th field HUC or within the ESA Action Area. Therefore the effects of this action will <i>Maintain</i> this environmental baseline condition because of the action’s design criteria and following required standard and guidelines.</p>
<p>Disturbance History</p>	<p>FA_{BT}</p>	<p>The ECA for the Hawley Creek 5th field HUC is 1.4 percent with an overall cumulative effects rating of Low. This rating is caused by timber harvest and historic fires within the Hawley Creek 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.</p> <p>It is my professional judgment that disturbance history is <i>Functioning Appropriately</i> for the Hawley Creek 5th field HUC. The effects of the proposed project’s activities will not play a role in disturbance history within the Hawley Creek 5th field HUC or within the ESA Action Area. Therefore the effects of this action will <i>Maintain</i> this environmental baseline condition because of the action’s design criteria and following required standard and guidelines.</p>

<p>Riparian Conservation Areas</p>	<p>FA_{BT}</p>	<p>The riparian conservation areas provide adequate shade, large woody debris recruitment and habitat protection and connectivity within the Hawley Creek 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%.</p> <p>It is my professional judgment that riparian conservation areas are <u>Functioning Appropriately</u> for the Hawley Creek 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 <u>Maintain</u> this environmental baseline condition because of the action's design criteria and following required standard and guidelines.</p>
<p>Disturbance Regime (bull trout only)</p>	<p>FA_{BT}</p>	<p>The disturbance regime, within the Hawley Creek 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.</p> <p>It is my professional judgment that disturbance regimes are <u>Functioning Appropriately</u> for the Hawley Creek 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 <u>Maintain</u> this environmental baseline condition because of the action's design criteria and following required standard and guidelines.</p>

Integration of Species and Habitat Conditions		
Pathway Indicators	Status of Baseline	Discussion of Baseline – Current Condition
(bull trout only)	FR _{BT}	<p>Within the Hawley Creek 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.</p> <p>It is my professional judgment that integration of species and habitat conditions are <u>Functioning at Risk</u> for the Hawley Creek 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 Hawley Creek 5th field HUC and the ESA Action Area. 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.</p>

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 6 - Hawley Creek Allotment Monitoring Sites Map

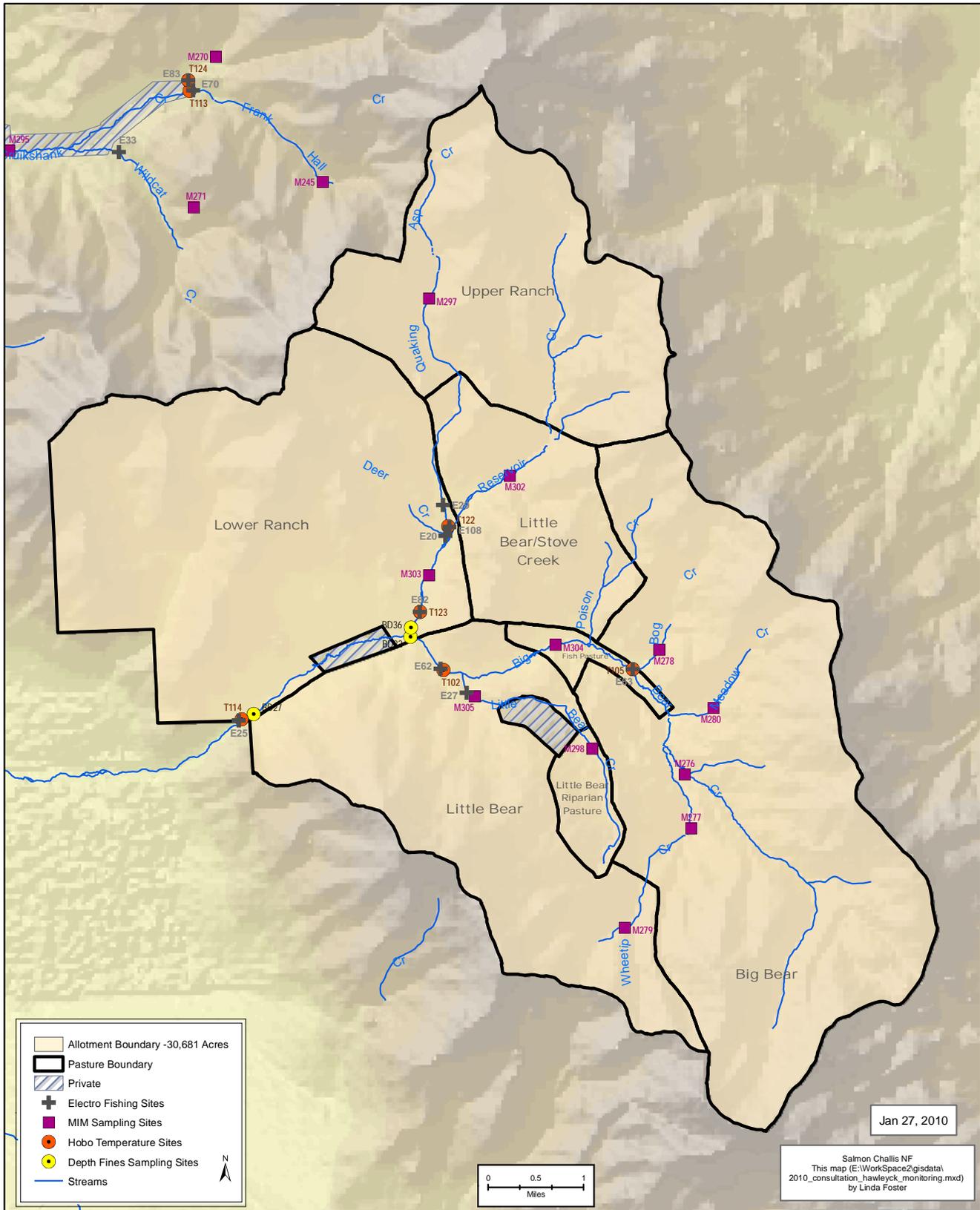


Figure 7 - Hawley Creek Allotment Vegetation Map

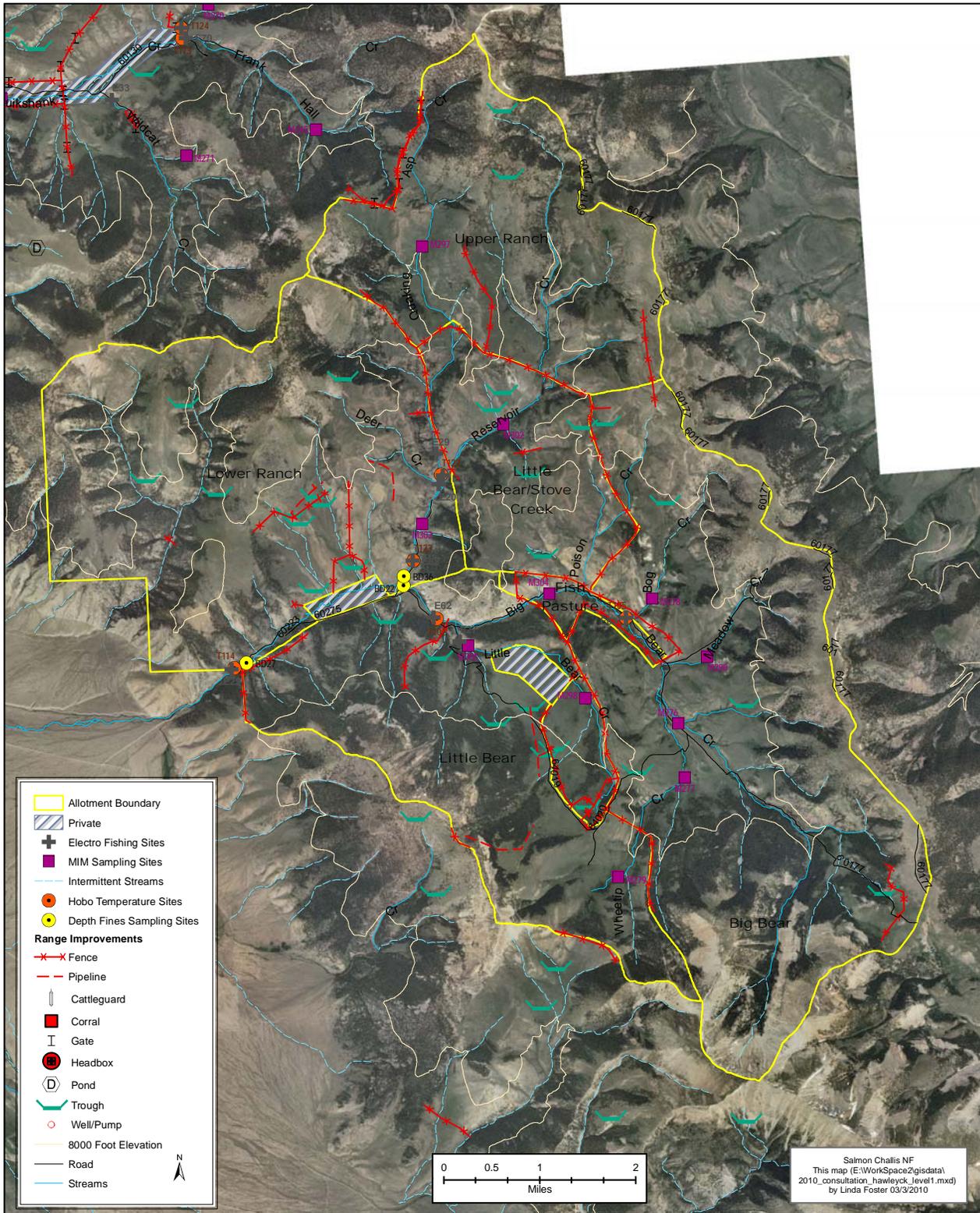


Table 12 - Hawley Creek Allotment Summary of Monitoring Data Collected

<i>Hawley Creek Allotment - (11)</i>	Chinook salmon	Chinook Salmon Presence Miles	Spawning Miles	Chinook salmon DCH Miles	steelhead	Steelhead Presence Miles	Spawning Miles	steelhead DCH Miles	bull trout	Bull Trout Presence Miles	Spawning Miles	bull trout Proposed CH Miles	Temperature	Sediment	Electrofishing	Width to Depth Ratio	Streambank Condition	Greenline Ecological Status
Big Bear Creek (MIS)	No	0	0	0	No	0	0	0	Yes	5.45	5.45	5.45	04-07, 09	93-99, 01-09	05, 07-09	09	93, 95, 02, 09	90, 93, 95, 00, 02, 09
Bog Creek	No	0	0	0	No	0	0	0	No	0	0	0	09	No	09	08	98, 02, 08	94, 98, 02, 08
Deer Creek	No	0	0	0	No	0	0	0	No	0	0	0	No	No	09	No	No	No
Hawley Creek	No	0	0	1.26	No	0	0	0	Yes	2.06	2.06	2.06	04, 07-09	93-05, 07-09	07-09	No	No	No
Little Bear Creek	No	0	0	0	No	0	0	0	No	0	0	0	No	No	09	07	00, 07	94, 99, 00, 07
Meadow Creek	No	0	0	0	No	0	0	0	No	0	0	1.7	No	No	No	No	94, 98, 02	94, 98, 02
Poison Creek	No	0	0	0	No	0	0	0	No	0	0	0	No	No	No	No	No	No
Quacking Aspen Creek	No	0	0	0	No	0	0	0	Yes	0.17	0.17	0	09	No	09	08	02, 08	02, 08
Reservoir Creek	No	0	0	0	No	0	0	0	Yes	1.45	1.45	6.38	04, 05, 09	98, 00, 02-04, 06	09	09	93, 97, 98, 02, 09	93, 97, 98, 02, 09
Wheetip Creek	No	0	0	0	No	0	0	0	No	0	0	0	No	No	No	09	94, 96, 98, 02, 09	94, 96, 98, 02, 04, 09
Horsethief Creek	No	0	0	0	No	0	0	0	No	0	0	1.09	No	No	No	No	No	No

Table 13 - Hawley Creek Allotment (Chinook salmon)

Chinook DCH	
Row Labels	Sum of LENGTH
+ Hawley Creek	1.26
Grand Total	1.26

Table 14 - Hawley Creek Allotment's Units (Chinook salmon)

Chinook DCH	
Row Labels	Sum of LENGTH
- Lower Ranch Unit	1.26
+ Hawley Creek	1.26
Grand Total	1.26

Table 15 - Hawley Creek Allotment (bull trout)

Bull Trout Presence		Bull Trout Spawning		Bull Trout Proposed CH	
Row Labels	Sum of LENGTH	Row Labels	Sum of LENGTH	Row Labels	Sum of LENGTH
+ Big Bear Creek	6.25	+ Big Bear Creek	6.25	+ Big Bear Creek	6.26
+ Hawley Creek	1.26	+ Hawley Creek	1.26	+ Hawley Creek	1.25
+ Meadow Creek	0.68	+ Meadow Creek	0.68	+ Horsethief Creek	1.09
+ Quaking Aspen Creek	0.17	+ Quaking Aspen Creek	0.17	+ Meadow Creek	1.70
+ Reservoir Creek	1.45	+ Reservoir Creek	1.45	+ Reservoir Creek	6.38
Grand Total	9.81	Grand Total	9.81	Grand Total	16.69

Table 16 - Hawley Creek Allotment's Units (bull trout)

Bull Trout Presence		Bull Trout Spawning		Bull Trout Proposed CH	
Row Labels	Sum of LENGTH	Row Labels	Sum of LENGTH	Row Labels	Sum of LENGTH
[-] Big Bear Unit	3.33	[-] Big Bear Unit	3.33	[-] Big Bear Unit	5.44
+ Big Bear Creek	2.65	+ Big Bear Creek	2.65	+ Big Bear Creek	2.65
+ Meadow Creek	0.68	+ Meadow Creek	0.68	+ Horsethief Creek	1.09
[-] Fish Pasture Unit	1.90	[-] Fish Pasture Unit	1.90	+ Meadow Creek	1.70
+ Big Bear Creek	1.90	+ Big Bear Creek	1.90	[-] Fish Pasture Unit	1.90
[-] Little Bear Unit	1.57	[-] Little Bear Unit	1.57	+ Big Bear Creek	1.90
+ Big Bear Creek	1.57	+ Big Bear Creek	1.57	[-] Little Bear Unit	1.57
[-] Little Bear/Stove Creek Unit	0.01	[-] Little Bear/Stove Creek Unit	0.01	+ Big Bear Creek	1.57
+ Reservoir Creek	0.01	+ Reservoir Creek	0.01	[-] Little Bear/Stove Creek Unit	1.59
[-] Lower Ranch Unit	3.00	[-] Lower Ranch Unit	3.00	+ Reservoir Creek	1.59
+ Big Bear Creek	0.13	+ Big Bear Creek	0.13	[-] Lower Ranch Unit	2.83
+ Hawley Creek	1.26	+ Hawley Creek	1.26	+ Big Bear Creek	0.14
+ Quaking Aspen Creek	0.17	+ Quaking Aspen Creek	0.17	+ Hawley Creek	1.25
+ Reservoir Creek	1.44	+ Reservoir Creek	1.44	+ Reservoir Creek	1.44
Grand Total	9.81	Grand Total	9.81	[-] Upper Ranch Unit	3.35
				+ Reservoir Creek	3.35
				Grand Total	16.69

Table 17 - Water Temperature 2004 – 2009

Unit	Site ID	Year	Monitoring Period	Maximum Daily Temperature	Maximum of 7 day Moving Maximum	Mean Temperature 7/1 to 9/30
Little Bear Unit	Big Bear Creek	2004	6/16 – 10/03	11.3°C	10.8°C	7.3°C
		2005	6/24– 10/04	12.7°C	11.9°C	7.6°C
		2006	7/12 – 9/17	12.2°C	11.9°C	Insufficient Data
		2007	6/27 – 9/25	13.3°C	12.8°C	Insufficient Data
		2009	6/20 – 10/06	12.2°C	11.8°C	7.7°C

Unit	Site ID	Year	Monitoring Period	Maximum Daily Temperature	Maximum of 7 day Moving Maximum	Mean Temperature 7/1 to 9/30
Fish Pasture Unit	Bog Creek	2009	6/30 – 10/06	15.6°C	14.9°C	8.9°C

Unit	Site ID	Year	Monitoring Period	Maximum Daily Temperature	Maximum of 7 day Moving Maximum	Mean Temperature 7/1 to 9/30
Lower Ranch Unit	Hawley Creek	2004	6/16 – 10/03	17.2°C	16.4°C	9.5°C
		2007	7/27 – 9/24	17.9°C	16.6°C	Insufficient Data
		2008	7/06 – 11/01	16.0°C	15.6°C	Insufficient Data
		2009	6/20 – 10/06	15.2°C	14.6°C	9.0°C
Unit	Site ID	Year	Monitoring Period	Maximum Daily Temperature	Maximum of 7 day Moving Maximum	Mean Temperature 7/1 to 9/30
Lower Ranch Unit	Quaking Aspen Creek	2009	6/23 – 9/21	18.3°C	17.5°C	Insufficient Data
Unit	Site ID	Year	Monitoring Period	Maximum Daily Temperature	Maximum of 7 day Moving Maximum	Mean Temperature 7/1 to 9/30
Lower Ranch Unit	Reservoir Creek	2004	6/16 – 10/03	19.1°C	18.1°C	9.7°C
		2005	6/24 – 10/04	18.6°C	17.4°C	10.1°C
		2009	6/20 – 10/06	17.1°C	16.7°C	10.3°C

Table 18 - Multiple Indicators Monitoring (MIM) Summary

Hawley Creek 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 (#/%)			
Little Bear Unit	Lower Little Bear Creek	M 305	1994	N/A	N/A	63/53%	56/47%	LS	Base	Site is very timbered and rocky. Livestock have limited access to the stream.
			1999	N/A	N/A	92/30%	220/70%	83/LS	Static	
	Upper Little Bear Creek	M 298	2000	N/A	99	2/15%	1/85%	126/PNC	Base	Site is inside Little Bear Riparian Enclosure. Very little livestock use if any. Site is dominated by Carex and Willow.
			2007	5.95	100	3/19%	13/81%	94/PNC	Static	
	Upper Wheetip Creek	M 279	1994	N/A	86	14/23%	47/77%	LS	Base	GES trend is up at PNC, but two readings are not enough to make a good determination. Need to revisit site to get better trend analysis.
			2004	N/A	N/A	N/A	N/A	95/PNC	Up	
Little Bear/Stove Creek Unit	Upper Reservoir Creek	M 302	1993	N/A	N/A	56/62%	35/38%	VES	Base	Original site located near fence line. Site was moved ~1/4 mile up stream in 2009. The stream historically has been washed out by high water flows. The potential of the stream may only be Mid Seral.
			1997	N/A	55	57/40%	87/60%	34/ES	Up	
			2002	N/A	86	13/87%	19/13%	39/ES	Static	
			2009	1125	95	10/30%	22/69%	53/MS	Up	
Big Bear Unit	Big Bear Creek	M 276	1993	N/A	95	11/13%	77/87%	24/ES	Base	Site has shown little change in GES from 2002 to 2009. Bank stability has improved from 2002. Improvement could be attributed to better livestock management by limiting the time livestock spend in the riparian area.
			2002	N/A	61	10/25%	30/75%	69/LS	Up	
			2009	6.56	76	22/19%	97/81%	72/LS	Static	
	Meadow Creek	M 280	1994	N/A	63	45/67%	22/33%	LS	Base	Site has shown little change in GES. Bank stability has improved. Improvement could be attributed to better livestock management by limiting the time livestock spend in the riparian area.
1998			N/A	73	N/A	N/A	79/LS	Static		
2002			N/A	88	57/75%	19/25%	69/LS	Static		
	Lower Wheetip Creek	M 277	1996	N/A	38	12/81%	30/19%	LS	Base	Site has shown little change in the GES. Woody regeneration indicates the site is moving to a more mixed age class instead of being dominated by seedling/young. Bank stability is improving and may be heading towards 80%.
			1998	N/A	50	8/4%	210/96%	70/LS	Static	
			2002	N/A	69	67/74%	23/26%	63/LS	Static	
			2009	4.15	76	19/48%	21/52%	66/LS	Static	
	Bog Creek	M 278	1994	N/A	N/A	N/A	N/A	ES	Base	Site has shown little change in the GES and woody regeneration. Bank stability has not improved. However, efforts have been made to improve bank stability by adding hardened crossings. Bank alteration is at 12%.
			1998	N/A	87	38/15%	219/85%	71/LS	Up	
			2002	N/A	67	42/36%	74/64%	62/LS	Static	
			2008	8.57	66	25/34%	48/66%	71/LS	Static	
Fish Pasture Unit	Big Bear Creek	M 304	1990	N/A	N/A	63/53%	56/47%	79/LS	Base	Site has been used intermittently since the 1990's. Enclosure prevents livestock from using area exempt for intermittent use. Livestock use would not be the key disturbance associated with changes in GES.
			1995	N/A	85	76/49%	78/50%	81/LS	Static	
			2000	N/A	N/A	96/70%	41/30%	90/PNC	Static	
			2009	7.05	78	22/34%	43/66%	85/LS	Static	
Lower Ranch Unit	Lower Reservoir Creek	M 303	1993	N/A	82	70/69%	31/31%	ES	Base	The stream has historically been washed out by high water flows. Low bank stability could be attributed to bank erosion from highflow events. The potential of the stream may only be Mid Seral.
			1998	N/A	62	114/56%	88/44%	44/MS	Up	
			2002	N/A	70	79/47%	89/53%	46/MS	Static	
Upper Ranch Unit	Quaking Aspen Creek	M 297	2002	N/A	44	46/46%	54/54%	20/ES	Base	Site has shown good improvement in both GES and bank stability. Site is used heavily by elk. Livestock are not actively trailed into area.
			2008	6.96	68	85/55%	68/45%	76/LS	Up	

*0-15 Very Early Seral; 16-40 Early Seral; 41-60 Mid Seral; 61-85 Late Seral; 86+ PNC (Potential Natural Community)

Hawley Creek Allotment Riparian Discussion:

The monitoring sites were established and subsequent monitoring has occurred on the Hawley Creek Allotment since the early 90's. Since that time, grazing management has evolved based upon management in reference to listed fish species, specifically bull trout, 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, of the eleven sites monitored since the early 90's, 10 are in upward trend or at Late Seral/ PNC. The monitoring site on Lower Reservoir is static at Mid Seral.

Lower Little Bear Creek: The GES trend is static at Late Seral. The site is very timbered and rocky. Livestock have limited access to the stream. Due to the well established Carex under growth, the best monitoring attribute to manage the site is stubble height with an annual use indicator of 5 inches.

Upper Little Bear Creek: The GES trend is static at PNC. The site is inside the Little Bear Riparian Unit. Very little livestock use if any occurs within this Unit. The site is dominated by Carex and Willow. Due to the well established Carex under growth, the best monitoring attribute to manage the site is stubble height with an annual use indicator of 5 inches.

Upper Wheatip Creek: The GES trend is up PNC. The GES trend is up, but two readings are not enough to make a good determination. Need to revisit site to get a better trend analysis. Due to the well established Carex under growth, the best monitoring attribute to manage the site is stubble height with an annual use indicator of 5 inches.

Upper Reservoir Creek: The GES trend is up at Mid Seral. The original site was located near a fence line. Because that is not an appropriate location to take greenline readings the site was moved ~1/4 mile upstream in 2009. The stream historically has been washed out by high water flow events. The potential of the stream may only be Mid Seral because of the scouring associated with the high flow events does not allow the vegetation community to develop Late Seral or PNC plant species. Due to the well established Willows, the best monitoring attribute to manage the site is browse use with an annual use indicator of 30%. The monitoring attribute of greenline stubble with an annual use indicator no less than 6 inches will also be used.

Big Bear Creek: The GES trend is static at Late Seral. The site has shown little change in GES from 2002 to 2009. The bank stability has improved from 2002. The improvement could be attributed to better livestock management by limiting the time livestock spend in the riparian area. Due to the well established Carex under growth, the best monitoring attribute to manage the site is stubble height with an annual use indicator of 5 inches. A bank alteration monitoring attribute with an annual use indicator not to exceed 20% will also be used. The bank alteration monitoring attribute is being used due to the 76% bank stability.

Meadow Creek: The GES trend is static at Late Seral. The site has shown little change in GES. The bank stability has improved from the previous reading. The improvement could be attributed to better livestock management by limiting the time livestock spend in the riparian area. Due to the well established Carex under growth, the best monitoring attribute to manage the site is stubble height with an annual use indicator of 5 inches.

Lower Wheatip Creek: The GES trend is static at Late Seral. The site has shown little change in the GES. Woody regeneration indicates the site is moving to a more mixed age class instead of being dominated by young seedlings. The bank stability is improving and is heading towards 80%. Due to the well established Carex under growth, the best monitoring attribute to manage the site is stubble height with an annual use indicator of 5 inches. A bank alteration monitoring attribute with an annual use indicator not to exceed 20% will also be used. The bank alteration monitoring attribute is being used due to the 76% bank stability.

Bog Creek: The GES trend is static at Late Seral. The site has shown little change in the GES and woody regeneration. The bank stability has not improved from the last reading and is at 66%. However, efforts have been made to improve bank stability by adding hardened crossings. Bank alteration is at 12%. Due to the well established Carex under growth, the best monitoring attribute to manage the site is stubble height with an annual use indicator of 5 inches. A bank alteration monitoring attribute with an annual use indicator not to exceed 20% will also be used. The bank alteration monitoring attribute is being used due to the 66% bank stability reading in 2008.

Big Bear Creek (Fish Pasture Unit): The GES trend is static at Late Seral. The site has been used intermittently since the 1990's. The riparian fence enclosure prevents livestock from using the area except for intermittent use at the end of the season for 2-3 days while the permittees gather their livestock before heading off the allotment. Because this area is only used for 2-3 days a season livestock use would not be the key disturbance associated with changes in GES. Due to the well established Carex under growth, the best monitoring attribute to manage the site is stubble height with an endpoint indicator of 6 inches.

Lower Reservoir Creek: The GES trend is static at Mid Seral. The stream has historically been washed out by high water flow events. Low bank stability readings are attributed to high water flow events. The potential of the stream may only be Mid Seral because of the scouring associated with the high flow events does not allow the vegetation community to develop Late Seral or PNC plant species. Due to the well established Carex under growth, the best monitoring attribute to manage the site is stubble height with an annual use indicator of 5 inches. A bank alteration monitoring attribute with an annual use indicator not to exceed 20% will also be used. The bank alteration monitoring attribute is being used due to the 70% bank stability reading in 2002.

Quaking Aspen Creek: The GES trend is up at Late Seral. The site has shown good improvement in both GES and bank stability. This site is used heavily by large elk herds. Livestock are not actively trailed into area. Due to the well established Carex under growth, the best monitoring attribute to manage the site is stubble height with an annual use indicator of 5 inches. A bank alteration monitoring attribute with an annual use indicator not to exceed 20% will also be used. The bank alteration monitoring attribute is being used due to the 68% bank stability reading in 2008.

**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 than 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 proposed bull trout critical habitat (January 13, 2010, Federal Register 75FR2270) and examples of habitat indicators that can be used to assess the condition of the PCEs. Many of the Forest “focus indicators” match the examples (highlighted in the Associated Habitat Indicators). They have been thoroughly addressed within the environmental baseline conditions and the site specific effects analysis. Therefore, they form the basis for the Forest’s determination for effects to the species and potential critical habitat.

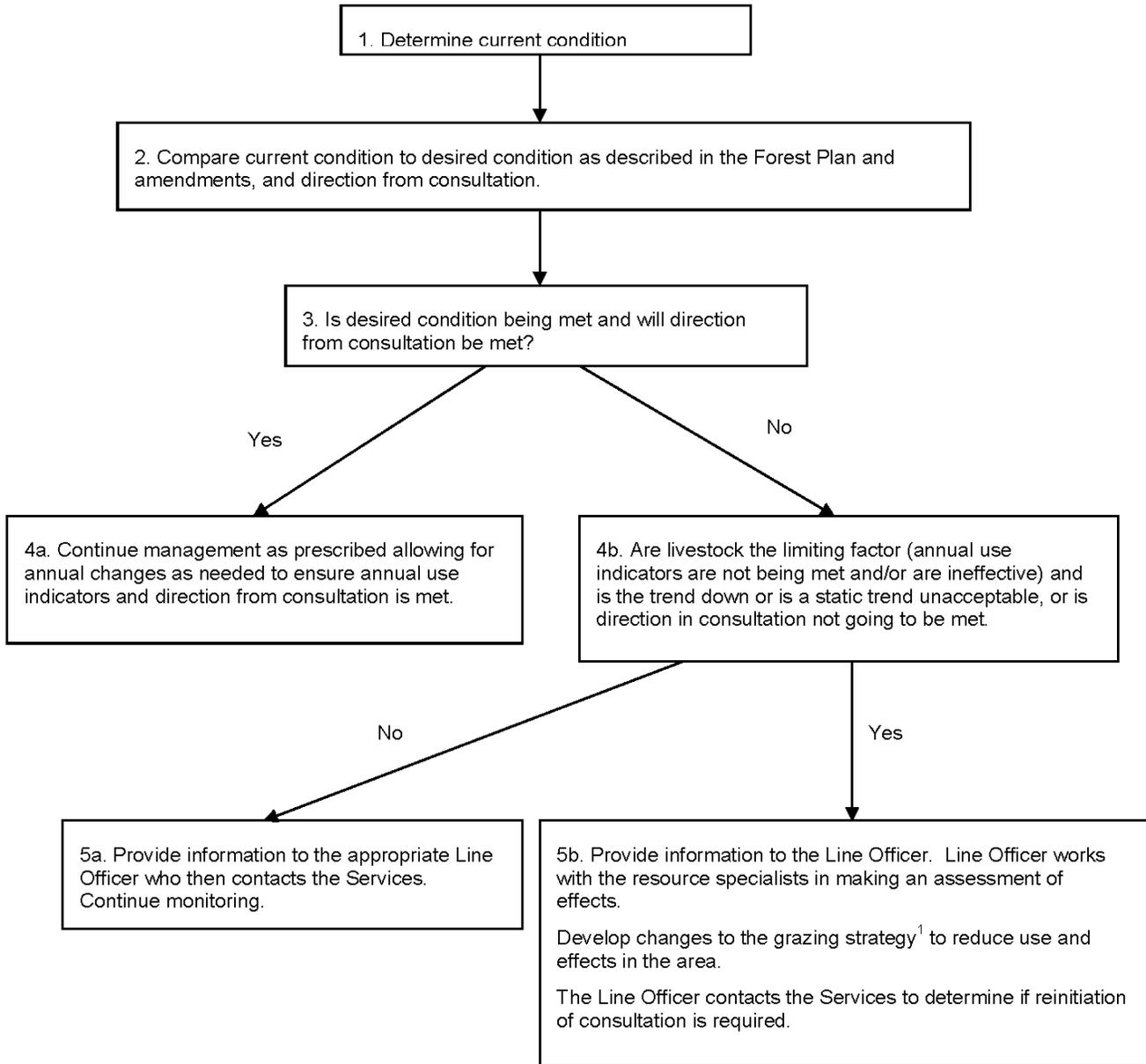
Primary Constituent Elements for Proposed Bull Trout Critical Habitat and Associated Habitat Indicators

PCE #	PCE Description	Associated Habitat Indicators
1.	Springs, seeps, groundwater sources, and subsurface water connectivity (hyporehic flows) to contribute to water quality and quantity and provide thermal refugia.	floodplain connectivity, change in peak/base flows, increase in drainage network, riparian conservation areas , chemical contamination/nutrients
2.	Migratory habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.	life history diversity and isolation, persistence and genetic integrity, temperature , chemical contamination/nutrients, physical barriers, average wetted width/maximum depth ratio in scour pools in a reach , change in peak/base flows, refugia
3.	An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.	growth and survival, life history diversity and isolation, riparian conservation areas , floodplain connectivity (importance of aquatic habitat condition indirectly covered by previous seven PCEs)
4.	Complex river, stream, lake, reservoir, and marine shoreline aquatic environments and processes with features such as large wood, side channels, pools, undercut banks and substrates, to provide a variety of depths, gradients, velocities, and structure.	large woody debris, pool frequency and quality, large pools, off channel habitat, refugia, average wetted width/maximum depth ratio in scour pools in a reach , streambank condition , floodplain connectivity, riparian conservation areas

5.	Water temperatures ranging from 2 to 15 °C (36 to 59 °F), with adequate thermal refugia available for temperatures at the upper end of this range. Specific temperatures within this range will vary depending on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shade, such as that provided by riparian habitat; and local groundwater influence.	temperature , refugia, average wetted width/maximum depth ratio in scour pools in a reach , streambank condition , change in peak/base flows, riparian conservation areas , floodplain connectivity
6.	Substrates of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount (e.g., less than 12 percent) of fine substrate less than 0.85 mm (0.03 in.) in diameter and minimal embeddedness of these fines in larger substrates are characteristic of these conditions.	sediment , substrate embeddedness , large woody debris, pool frequency and quality
7.	A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, they minimize departures from a natural hydrograph.	change in peak/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)

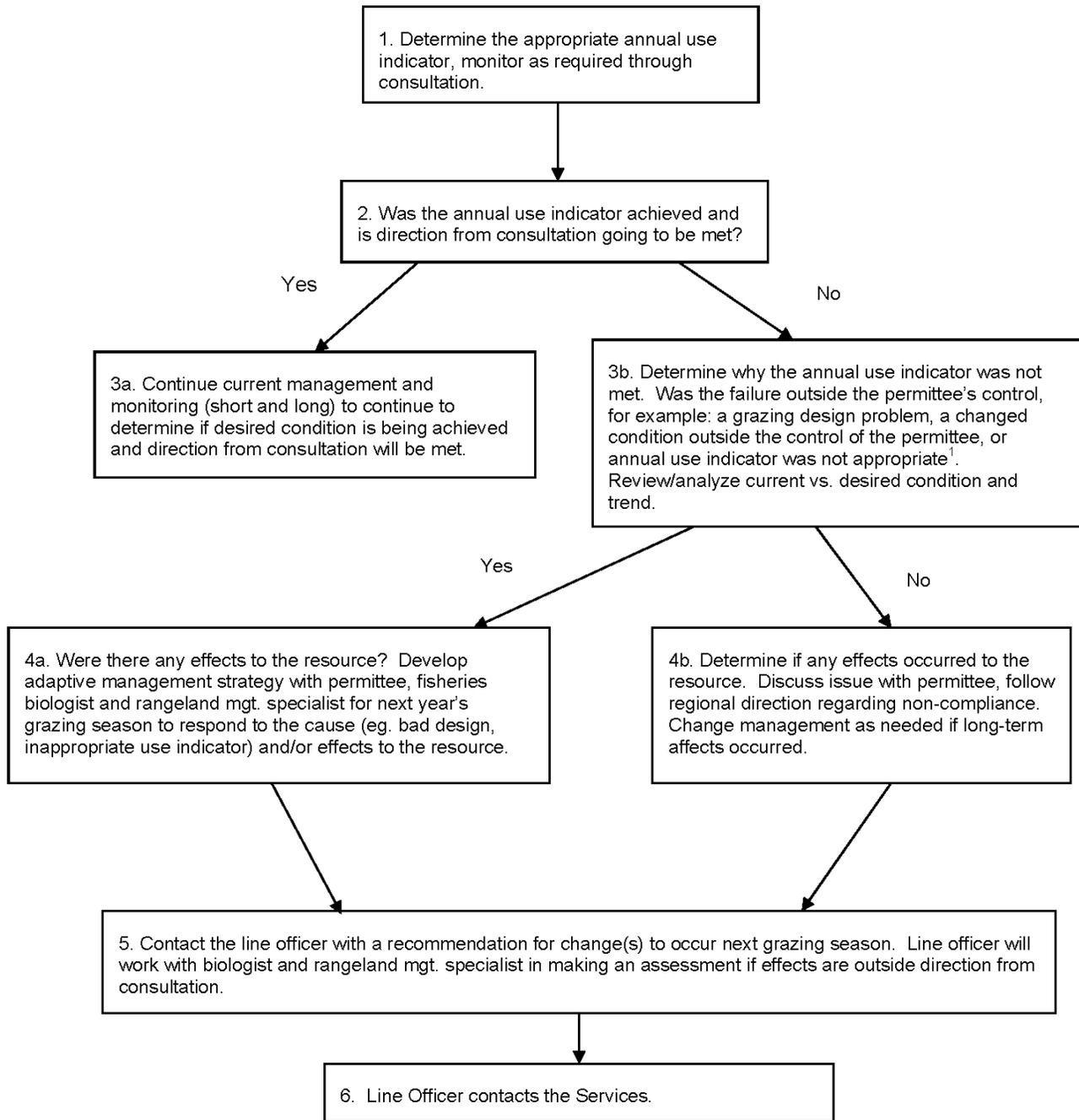
APPENDIX F – ADAPTIVE MANAGEMENT DIAGRAMS

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



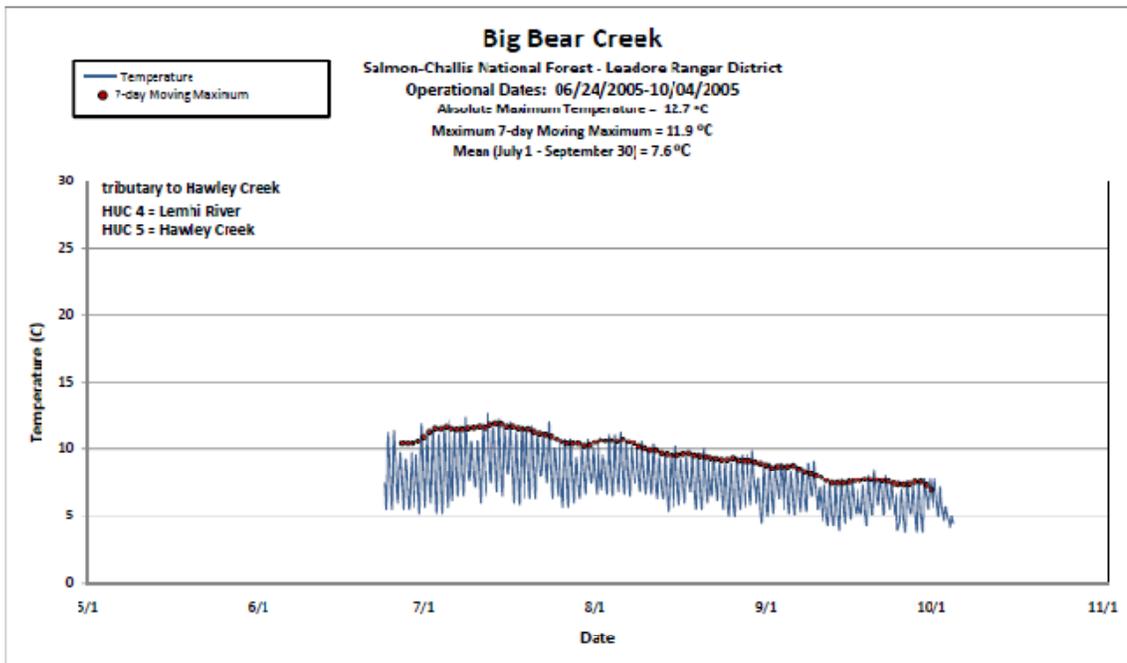
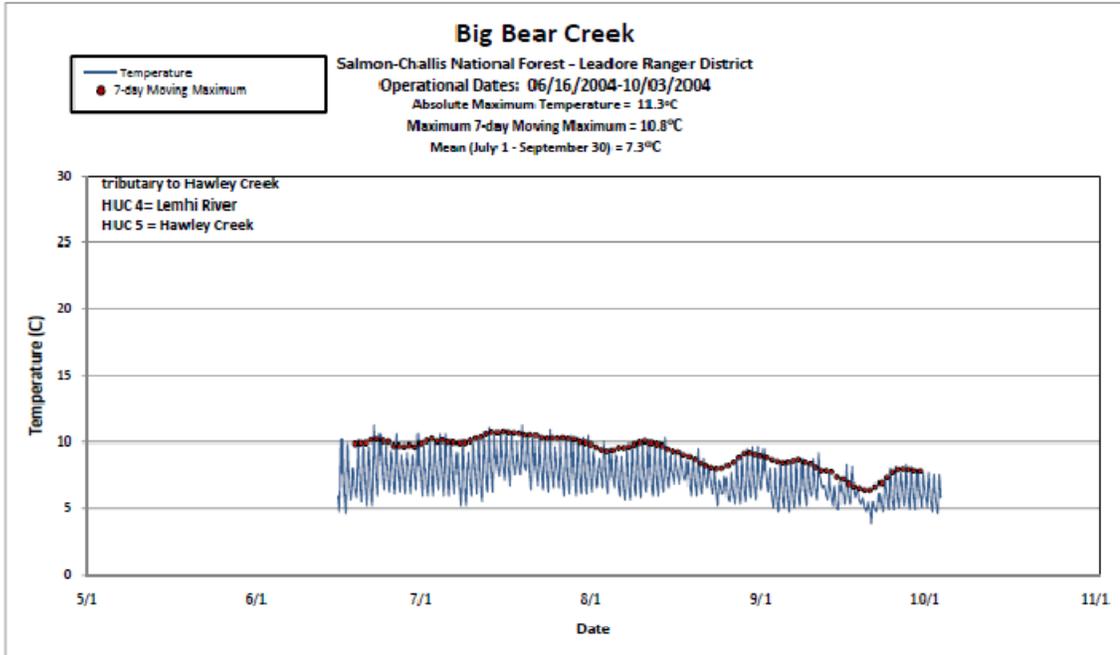
¹Management actions will initially reduce use in the area. It is expected this may occur in any number of ways including but not limited to changing the season of use, reducing numbers, changing amount of use on annual indicator, changing herding practices, changing salting practices and/or reconstructing/constructing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

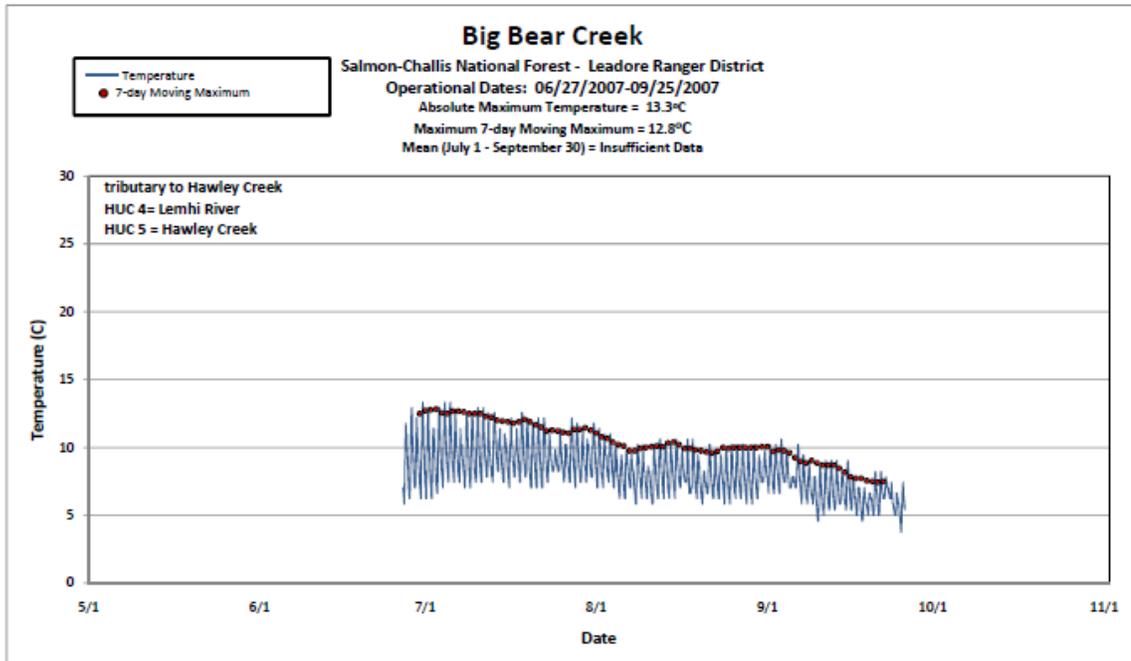
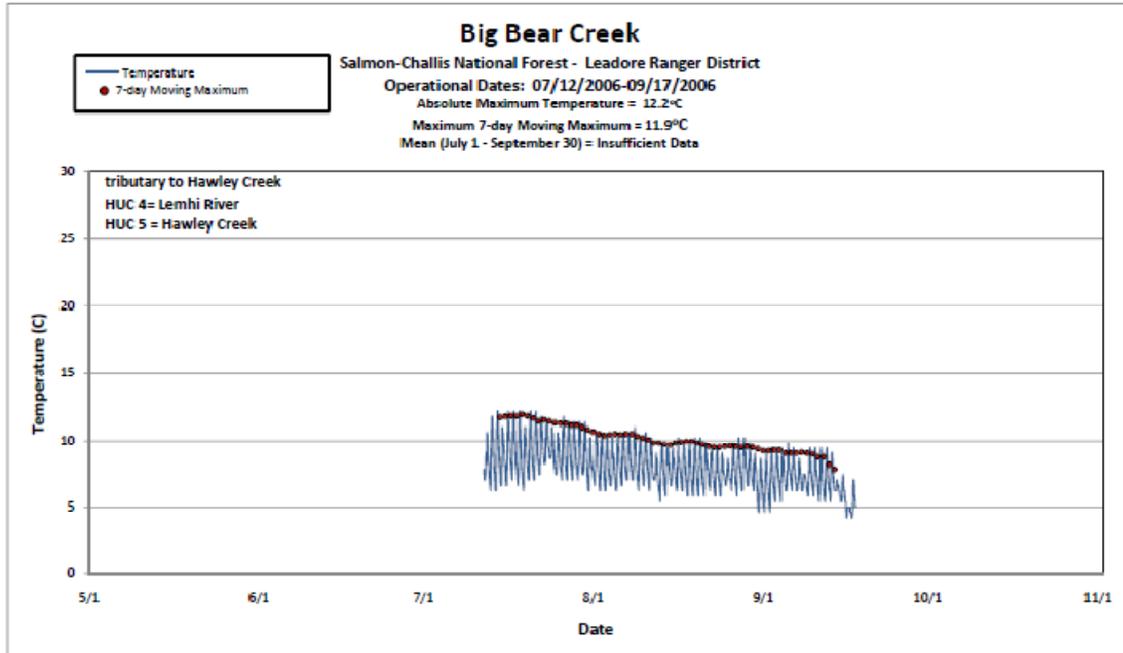
Diagram 2.0 - Implementation of Annual Adaptive Management Strategy for Allotments Requiring Consultation.

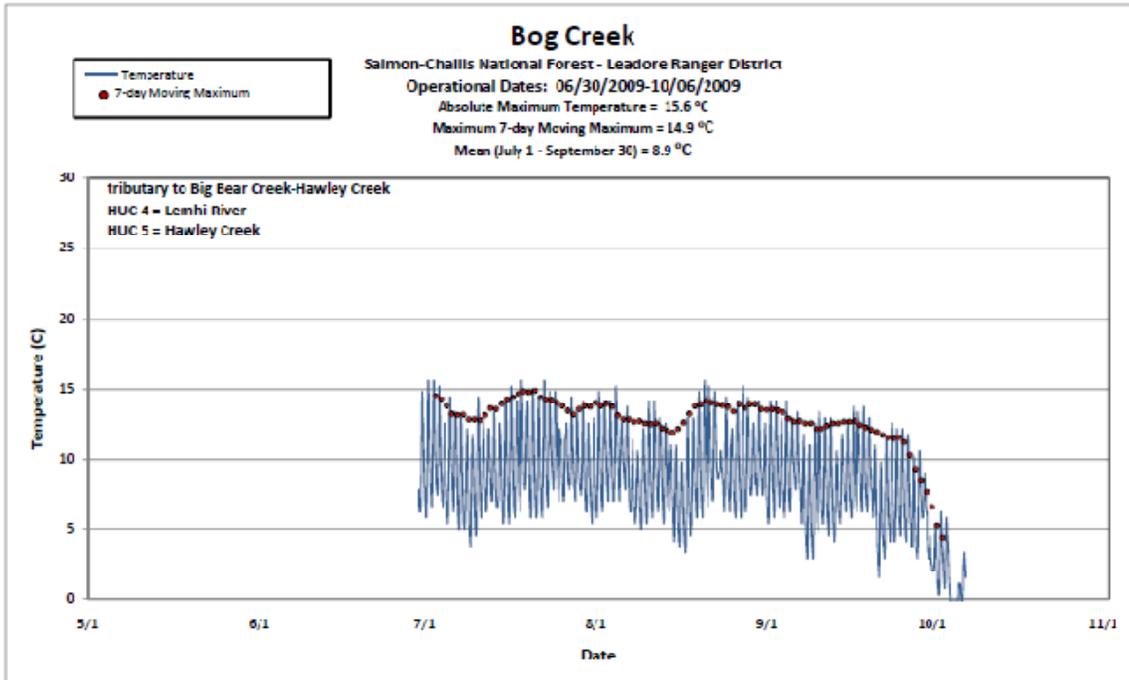
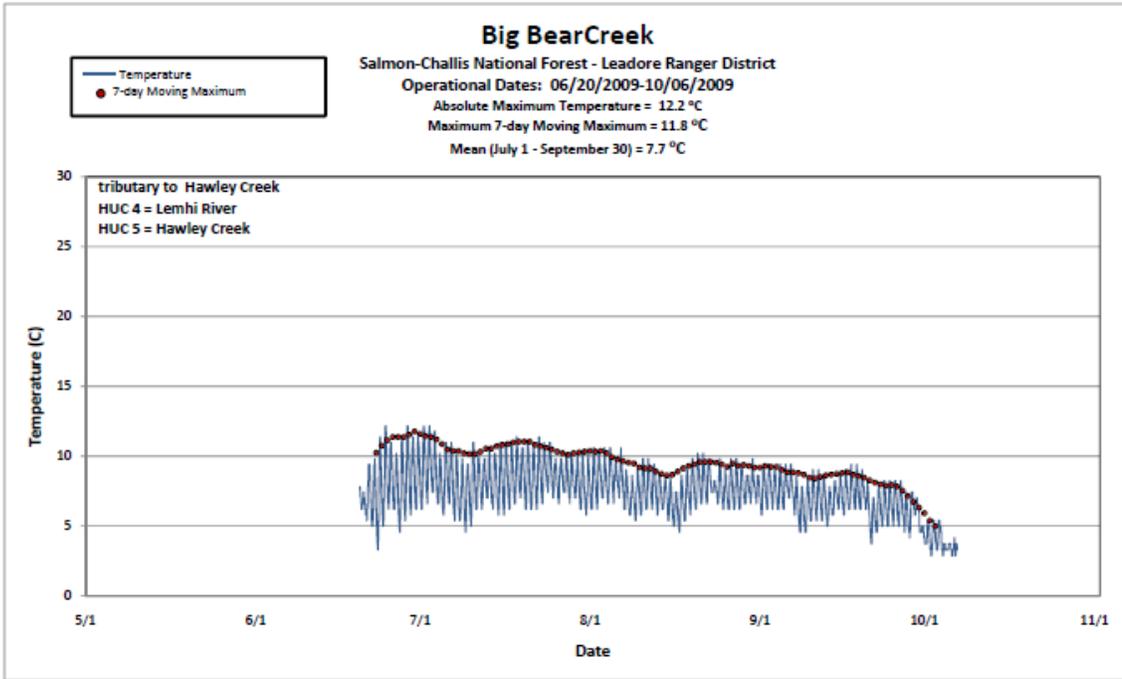


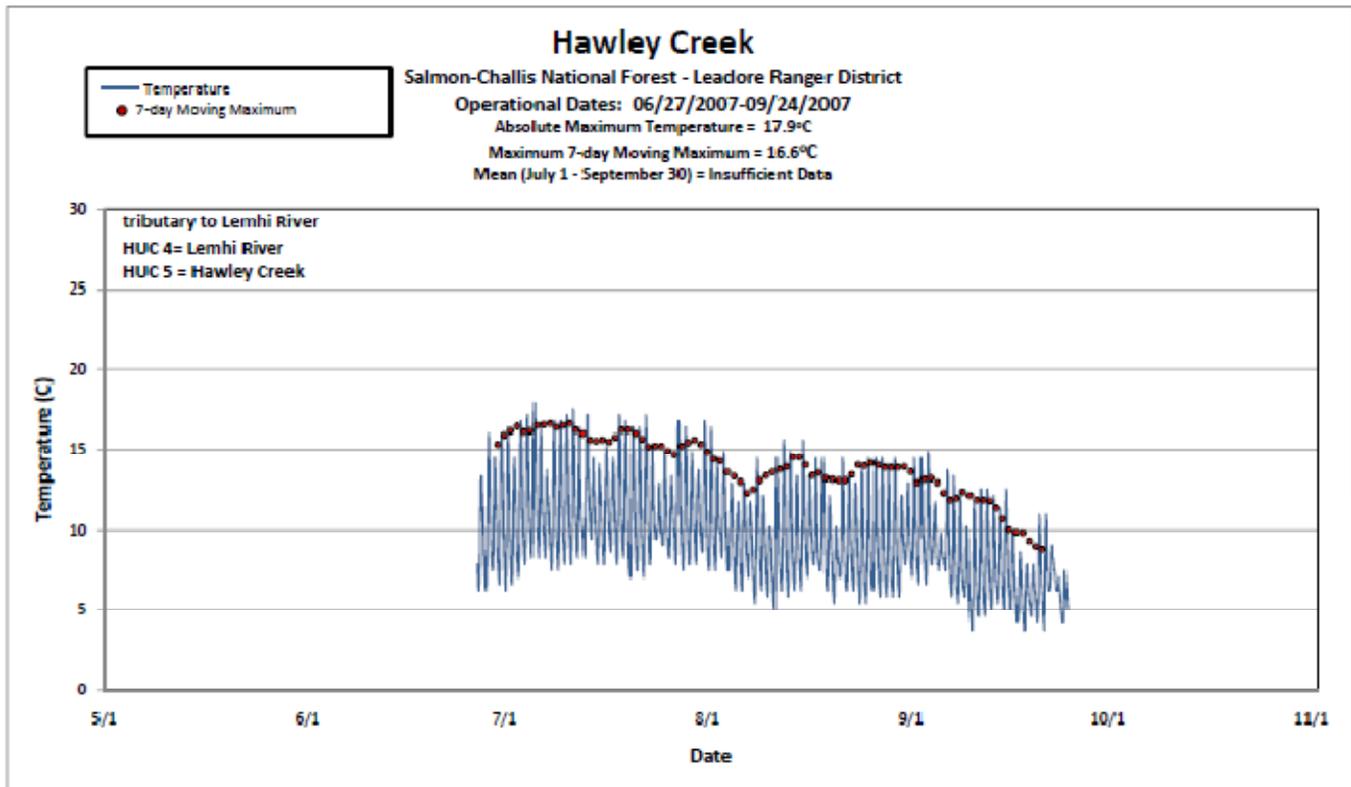
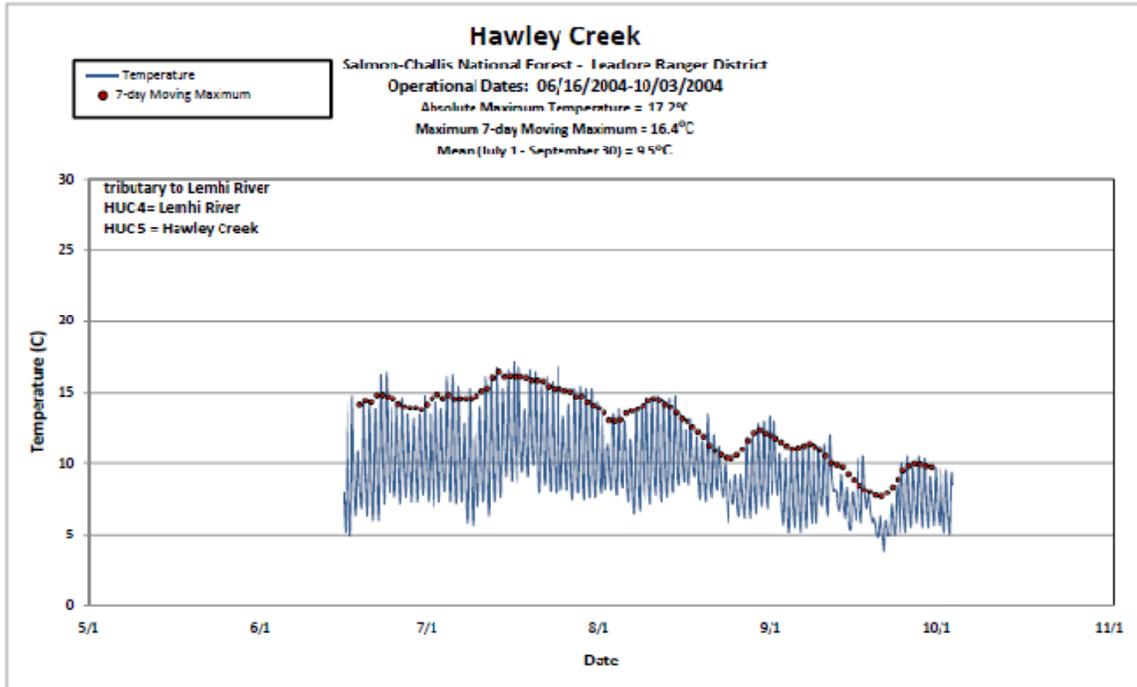
¹An inappropriate annual use indicator is an indicator that does not most accurately identify the weak link or first attribute that would indicate excessive livestock impacts. In this situation, changing to a more appropriate indicator will help achieve or maintain desired conditions.

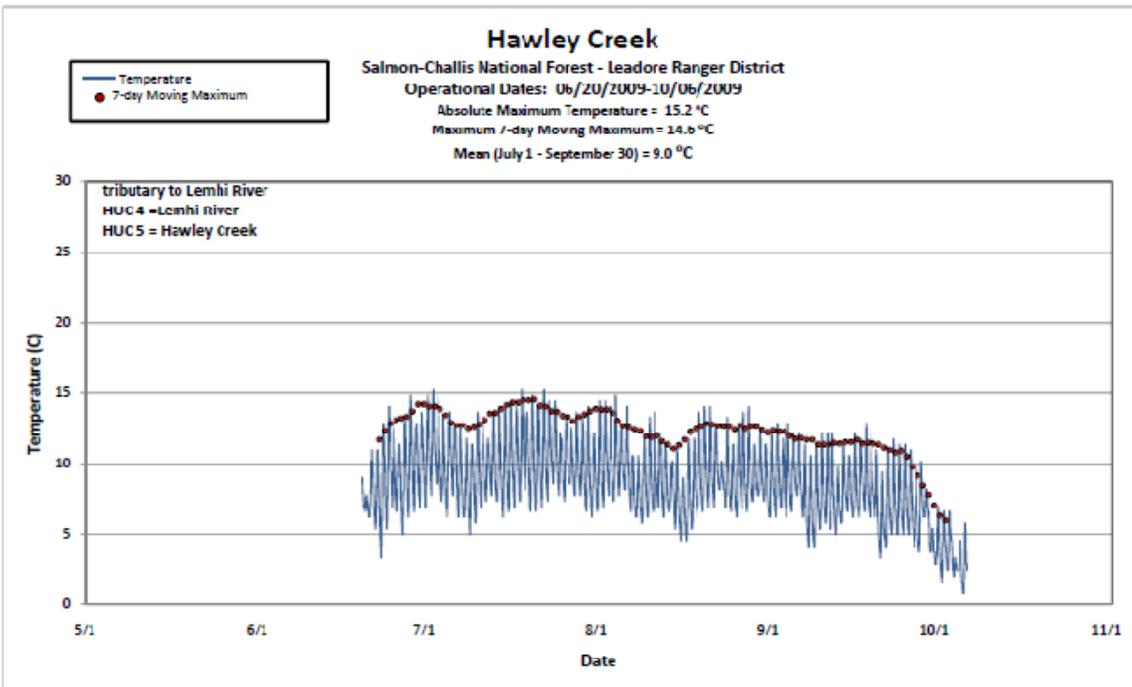
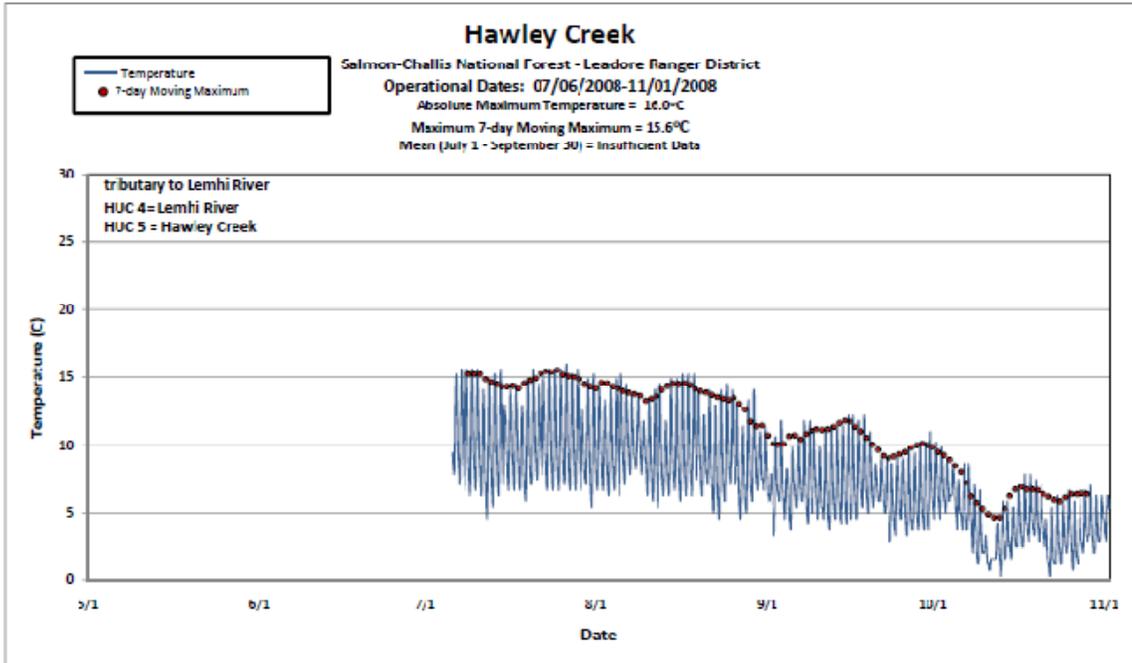
APPENDIX G – STREAM TEMPERATURE GRAPHS

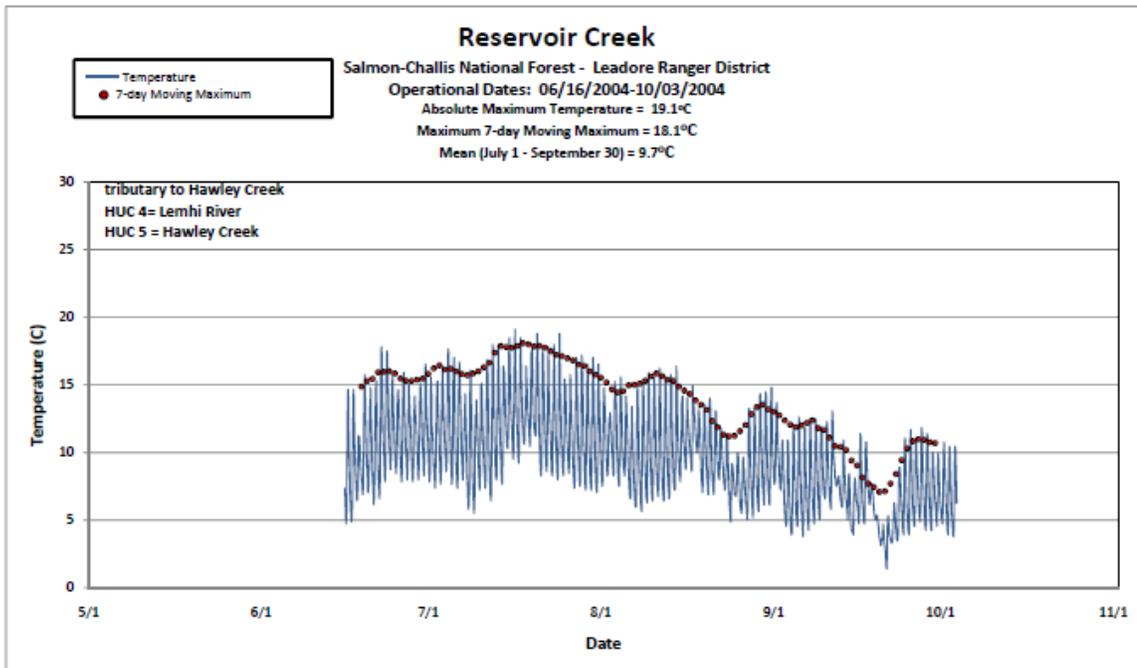
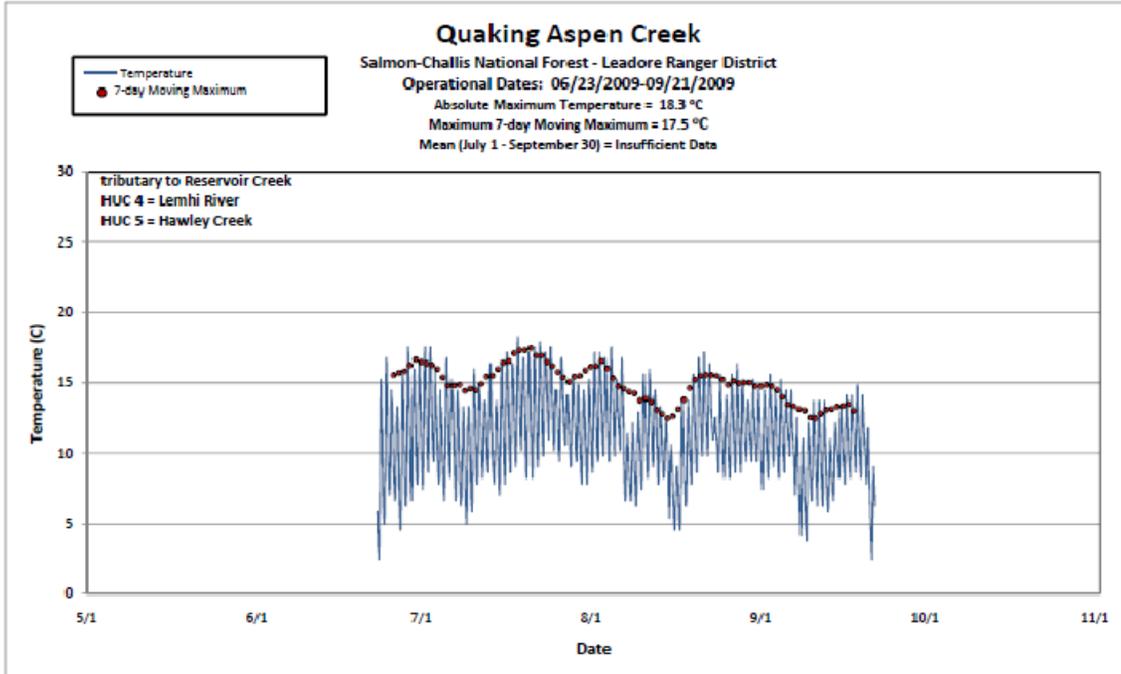


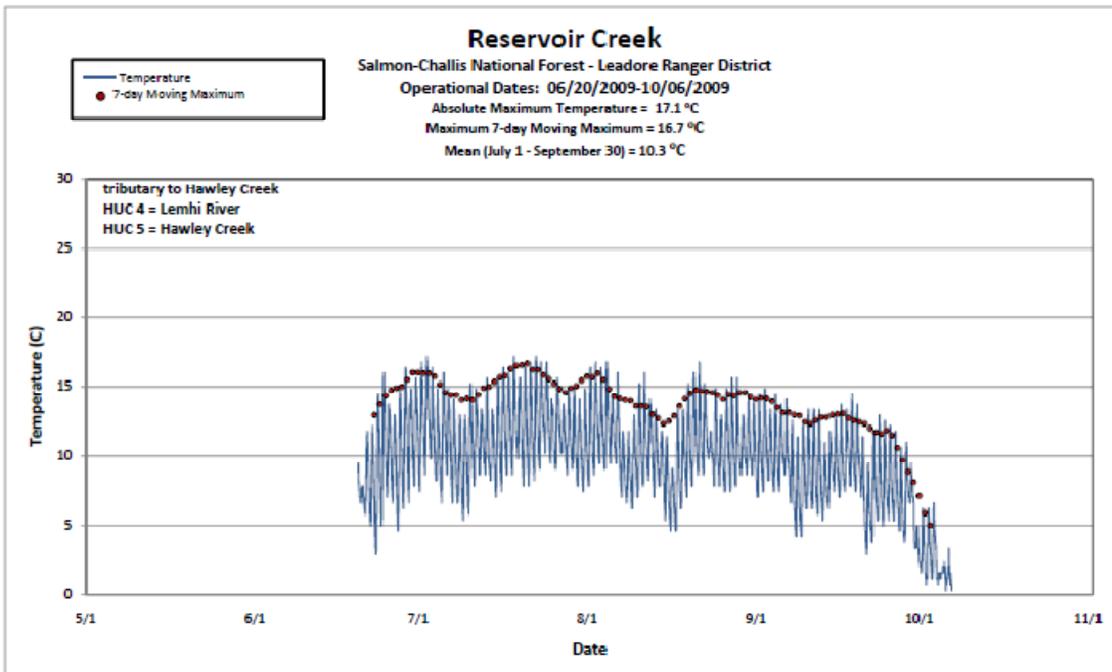
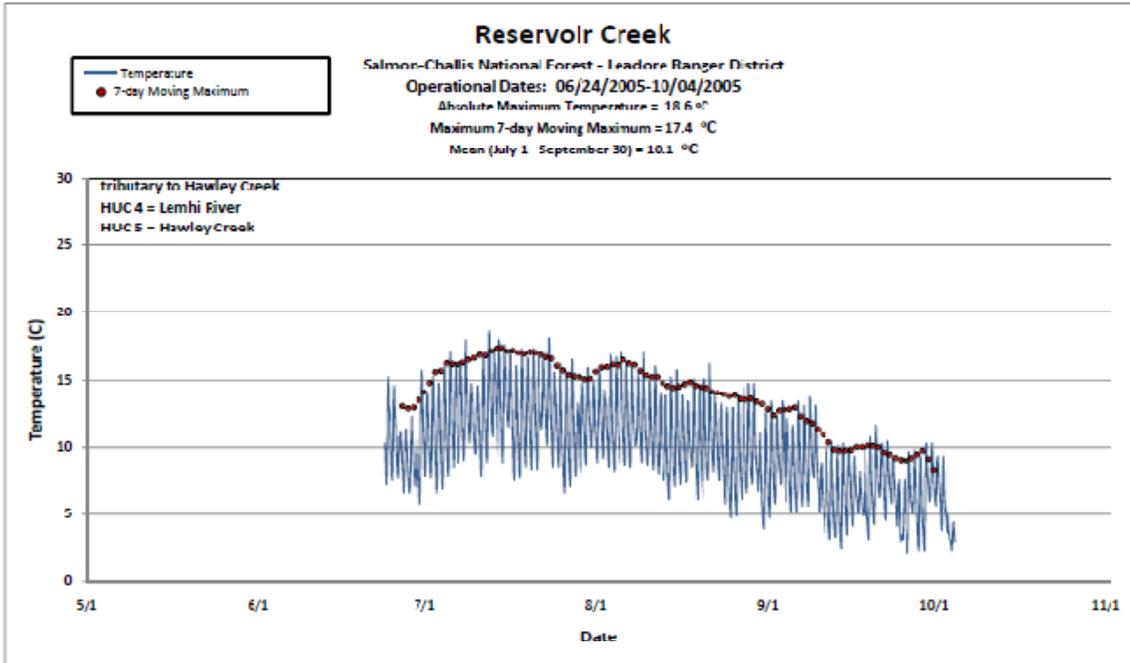












APPENDIX H – ELECTROFISHING STREAM SUMMARY WITHIN ESA ACTION AREA

Fish/100m² population density is calculated using fish 70mm or greater in length.

Stream Name	Year								
Big Bear Creek	2009			2009			2009		
	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	2	1	1
	2008			2008			2008		
	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	6	1	3
	2007			2007			2007		
	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	2	0	observed
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	0	

Stream Name	Year								
Bog Creek	2009			2009			2009		
	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	0	0	NA	0	0	NA	0

Stream Name	Year								
Deer Creek	2009			2009			2009		
	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	0	0	NA	0	0	NA	0

Stream Name	Year								
	Hawley Creek	2009			2009			2009	
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	0
2008			2008			2008			
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	0
2007			2007			2007			
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	0	

2004 Hawley Creek Allotment Biological Opinion Monitoring Report

August 17-19, 1999 (BLM survey)

STREAM	BULL TROUT	AVE. LENGTH
Big Bear Cr above Little Bear Cr (53 deg)	3	306 mm
Big Bear Cr above Wheetip Cr (48 deg)	2	149 mm
Meadow Cr (54 deg)	1	175 mm
Reservoir Cr above Big Bear Cr (62 deg)	1	Approx 229 mm
Total	7	

July 1- 15, 2004 (Early Sample) (USFS Survey)

STREAM	BULL TROUT	LENGTH RANGE
Big Bear Cr above Little Bear Cr (60 deg)	1	160 mm
Big Bear Cr above Wheetip Cr (50 deg)	2	130 -200 mm
Quaking Asp Cr (54 deg)	1	125 mm
Total	4	

Aug 24, 2004 (Late Resampling of Population Reference Stations) (USFS Survey)

STREAM	BULL TROUT	LENGTH RANGE
Big Bear Cr above Little Bear (48 deg)	0	-
Big Bear Cr in Fish Pasture (44 deg)	0	-
Reservoir Cr above Big Bear Cr (61 deg))	0	-
Total	0	

Stream Name	Year								
	2009			2009			2009		
Little Bear Creek	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	0	0	NA	0	0	NA	0

Stream Name	Year								
	2009			2009			2009		
Quaking Aspen Creek Sept 3rd	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	0	0	NA	0	0	NA	0
Quaking Aspen Creek Sept 22nd	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	0	0	NA	0	0	NA	0

Stream Name	Year								
	2009			2009			2009		
Reservoir Creek	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	0

Additional fish species and population summary data and raw data used in this Biological Assessment analysis can be found in the Salmon-Challis National Forest north zone fisheries files located on the Salmon/Cobalt Ranger District. Two other documents used in this analysis that includes fish species and population data are referenced as (1) **USDA, Forest Service, 2004**. Biological Opinion Monitoring Report Hawley Creek Allotment Leadore Ranger District 2004. Prepared by Robert Rose Fishery Biologist and (2) **Idaho Department of Fish and Game, 2006**. Hawley Creek Fisheries Report February, 2006.

APPENDIX I – STREAM PICTURES WITHIN THE ESA ACTION AREA

Big Bear Creek –Fish Pasture



Bog Creek



Deer Creek



Hawley Creek



Little Bear Creek



Quacking Aspen Creek



Reservoir Creek



Reservoir Creek 7/1/2009 (2009 high spring runoff flows negatively impacting bank stability)

Photo is taken within close proximity of Forest core sampling site BD36 (figure 6)



Reservoir Creek 7/1/2009 (2009 high spring runoff flows negatively impacting bank stability)

Photo is taken within close proximity of Forest core sampling site BD36 (figure 6)



Reservoir Creek 7/1/2009 (2009 high spring runoff flows negatively impacting bank stability)

Photo is taken within close proximity of Forest core sampling site BD36 (figure 6)



Reservoir Creek 7/1/2009 (2009 high spring runoff flows negatively impacting bank stability)

Photo is taken within close proximity of Forest core sampling site BD36 (figure 6)



Wheetip Creek

