USDA United States Department of Agriculture | Forest Service | Salmon-Challis National Forest Supervisor's Office | 1206 S. Challis Salmon, ID 83467 208 756-5100

File Code: 2670
Date: March 10, 2010

Dave Mabe
State Director, Idaho State Habitat Office
National Marine Fisheries Service
10095 W. Emerald
Boise, ID 83704

Dear Dave:

Enclosed you will find the *Aquatic Species Biological Assessment for the Upper Hayden Cattle and Horse Allotment*. The Biological Assessment (BA) evaluates all potential effects of livestock grazing on federally listed fishes for all creeks included in the action area. This action received early coordination and a field review with the Salmon-Challis Level 1 Team. In addition, the enclosed Biological Assessment has been developed with ongoing participation and review by Level 1 Team members, and has now been deemed acceptable by them for initiation of Streamlined Consultation.

In this BA, the Salmon-Challis National Forest has analyzed and determined the effects of livestock grazing. We have analyzed the potential effects based on the best available information either published or unpublished. We are committed to working with the permittees and other partners to minimize effects where possible. As always we will continue to consult with you when appropriate regarding this permitted activity.

This Assessment's determinations of effects include "May Affect" determinations for individual fish species within the action area, as well as determinations for each species and their Critical and/or Essential Habitats. Determinations have concluded there would likely be 'Adverse Effects' to Chinook salmon, steelhead and bull trout. Determinations have concluded there would be 'Not Likely to Adversely Affect' on Chinook salmon and steelhead designated critical habitat and 'Not Likely to Adversely Affect' on bull trout proposed critical habitat.

We believe that we have complied with the requirements and at this time would like to initiate formal consultation and request conference on bull trout Proposed Designated Critical Habitat on the *Aquatic Species Biological Assessment for the Upper Hayden Cattle and Horse Allotment* with the (U.S. Fish and Wildlife Service/National Marine Fisheries Service). If you have any questions please contact Stefani Melvin at (208) 756-5290.

Sincerely,

FRANK V. GUZMAN
Forest Supervisor
Encl. Aquatic Species Biological Assessment for the Upper Hayden Cattle and Horse Allotment
cc: Stefanie Melvin, Karen E Dunlap, Dan Garcia

USDA United States Department of Agriculture | Forest Service | Salmon-Challis National Forest Supervisor's Office | 1206 S. Challis Salmon, ID 83467 208 756-5100

File Code: 2670
Date: March 10, 2010

Acting Supervisor – East Idaho Field Office
U.S. Fish and Wildlife Service
4425 Burley Dr. – Suite A
Chubbuck, ID 83201

Dear Acting Supervisor:

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Forest Supervisor

Encl. Aquatic Species Biological Assessment for the Upper Hayden Cattle and Horse Allotment
cc: Stefanie Melvin, Karen E Dunlap, Dan Garcia

Aquatic Species Biological Assessment for the Upper Hayden Cattle & Horse Allotment

LEADORE RANGER DISTRICT

SALMON-CHALLIS NATIONAL FOREST

LEMHI COUNTY, IDAHO

Prepared by: Daniel A. Garcia
North Zone District Fishery Biologist

Signature: Daniel A. Garcia

Date: 3/9/2010

Salmon-Challis National Forest

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1 INTRODUCTION

The Leadore Ranger District of the Salmon-Challis National Forest (SCNF) authorizes livestock grazing activities within the Upper Hayden 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 Upper Hayden Allotment grazing activities are conducted within the Hayden Creek 5th field hydrologic unit code (HUC 1706020406).

The following is a description of the Upper Hayden Allotment, in part taken from the March 2003 Biological Assessment for Ongoing Activities Lemhi River Section 7 Watershed (BLM, 2003). The Hayden Creek watershed, located approximately 25 miles southeast of Salmon, is the second largest watershed in the Lemhi River watershed, encompassing 97,031 acres of combined private, State and federally managed lands. This watershed is bounded by the Muddy and McDevitt Creek watersheds to the north, and the Zeph and Mill Creek watersheds to the south. The area is riddled with a multitude of springs, seeps, bogs, perennial and ephemeral streams. It is one of a few watersheds presently maintaining perennial flows below the Forest boundary to the Lemhi River.

Natural Physical Characteristics

Hydrology

Hayden Creek is the single largest contributor to the Lemhi River, with an after diversion base flow of 25 cfs and a mean annual flow of approximately 60 cfs, at the Hayden Creek 1A monitoring site which is approximately 1.5 miles from the Forest boundary. Though the watershed area is not the largest in the Lemhi Basin, the large amount of area drained along the high Salmon range with its north-facing peaks, provide a significant, continuous source of snowmelt and flowing springs.

Bear Valley Creek, a tributary to Hayden Creek with a mean annual flow of approximately 25 cfs at the Bear Valley Creek 1A monitoring site which is approximately 2 miles upstream from the confluence with Hayden Creek, sources at 9135' at one of the many high elevation lakes in the upper watershed and drops 3385' over 25.4 miles including small tributaries such as Buck, Deer, Short, Wright, Kadletz, Ford and Payne Creeks.

The East Fork of Hayden Creek has a mean annual flow of approximately 11 cfs at the East Fork of Hayden Creek 1A monitoring site which is approximately 60 meters above the confluence with Hayden Creek. This sub-watershed drains the area toward Mill Mountain. Apple Creek is the only significant tributary to the East Fork of Hayden Creek. This stream is also diverted down near its confluence with Hayden Creek. The East Fork of Hayden Creek has 11.7 cfs consumptive water rights for irrigation and stockwater use.

Land Description

The topography of the watershed is characterized by a broad basin of gently rolling hills, surrounded by increasingly steeper hills and mountains leading up to the hydrologic divide between the Pahsimeroi Valley and Lemhi Valley on the west side of the watershed. Hayden Creek drains into the Lemhi River from the east, and aspects are generally easterly to northeasterly. The mouth of Hayden Creek reaches the Lemhi at about 4,500 feet, while the highest peaks in the watershed top 11,000 feet in elevation. The slopes are generally steep, with 37% of slopes over 40%.

Soils and Geology

Approximately 30% of the subwatershed has mountain soils; rolling or hilly, very deep soils on foothills derived primarily from lacustrine sediments. The upper portions of the subwatershed have a small portion of cold mountain soils; steep to very steep, very deep soils on mountains derived primarily from quartzite. The vast majority of soils in the uppermost portions of the subwatershed are mountain soils; hilly to very steep, very deep soils on mountains and foothills derived primarily from extrusive igneous volcanics. These soils are moderate to highly erosive with moderate to moderately slow infiltration and slow to very slow permeability rates. The water holding capacity is high, as is soil compaction, especially when the ground is wet. Roads become very rutted and slippery when wet due to the high clay content.

Vegetative Characteristics

Riparian Vegetation

Riparian vegetation in the Upper Hayden Allotment is mixed between that typical of higher elevation, forested systems and that of lower elevation, rangeland systems. With the exception of small areas like the meadow complex on upper Bear Valley Creek and portions of the East Fork, vegetation in the upper watershed is generally comprised of a shrub (willow, dogwood) understory and a conifer overstory, with little herbaceous vegetation. Aspen stands are prevalent in many areas where subsurface water is readily available. Riparian vegetation in the lower watershed is generally comprised of willows with an understory of sedges and bluegrasses. Cottonwoods, alder and dogwood are found along the mainstem in this area.

Upland Vegetation

Elevation, aspect, precipitation and soil type are the primary factors determining the upland vegetative community present on a given site. In general, the south facing slopes in the Upper Hayden Allotment are predominantly vegetated with a sagebrush community mixed with Idaho fescue or bluebunch wheatgrass. Stands of mountain mahogany vegetate the side slopes with a vigorous understory of bluebunch wheatgrass. Lower elevations are vegetated with a sagebrush/grass community. The majority of this allotment is dominated by a forested overstory community.

Human Uses

This watershed fell entirely within the original Lemhi Indian Reservation boundaries. There are seven sites documented within the watershed, three of which are eligible for listing in the

National Register of Historic Places, two are not eligible, and two have not been evaluated for eligibility. Areas within the watershed, especially along Bear Valley Creek, are considered sacred to or possess a significance based on the beliefs, customs and cultural practices of, the Shoshone-Bannock Tribes. This watershed was part of the original Lemhi Reservation. Any activity occurring within the watershed must consider the significance of any identified cultural site before proceeding. The sacred value of areas within the watershed is harder to consider since little information is given by the native peoples familiar with the area.

Recreational values in the Hayden Creek watershed are predominantly tied to unconfined, dispersed use. Big game hunting and associated camping along with trail riding and off highway vehicle riding are the most significant recreational activities in the watershed. Use occurs primarily in the fall, coinciding with hunting seasons.

Two developed recreation sites exist on Bear Valley Creek that see an estimated combined total of 2000 visitor days, and another site on mainstem Hayden Creek at the confluence with Bear Valley Creek, which received an estimated 350 visitor days per year was closed in 2001. All facilities were removed from the mainstem Hayden Creek site and the access road was obliterated and blocked. The site was located entirely within the RHCA of both streams and had direct impacts to both channels. The access road was located on the outside of a blind corner of the heavily traveled road and presented increasing safety problems.

The Bear Valley Creek sites contain areas for horse camping and tenting and have potable water and developed sanitary facilities. They are used as staging areas for the high elevation lakes in the watershed. Only the non-equestrian trailhead site has the potential to impact aquatic habitat due to its location adjacent to and within the floodplain.

Impacts from recreational use at this time are most evident in and immediately adjacent to the riparian areas, and on the numerous, unmentioned "two-track" roads in the watershed, which is typical of most of the Lemhi River Subbasin. Monitoring of these impacts should continue. Education of the recreating public through personal contact should be emphasized.

3 PROPOSED ACTION

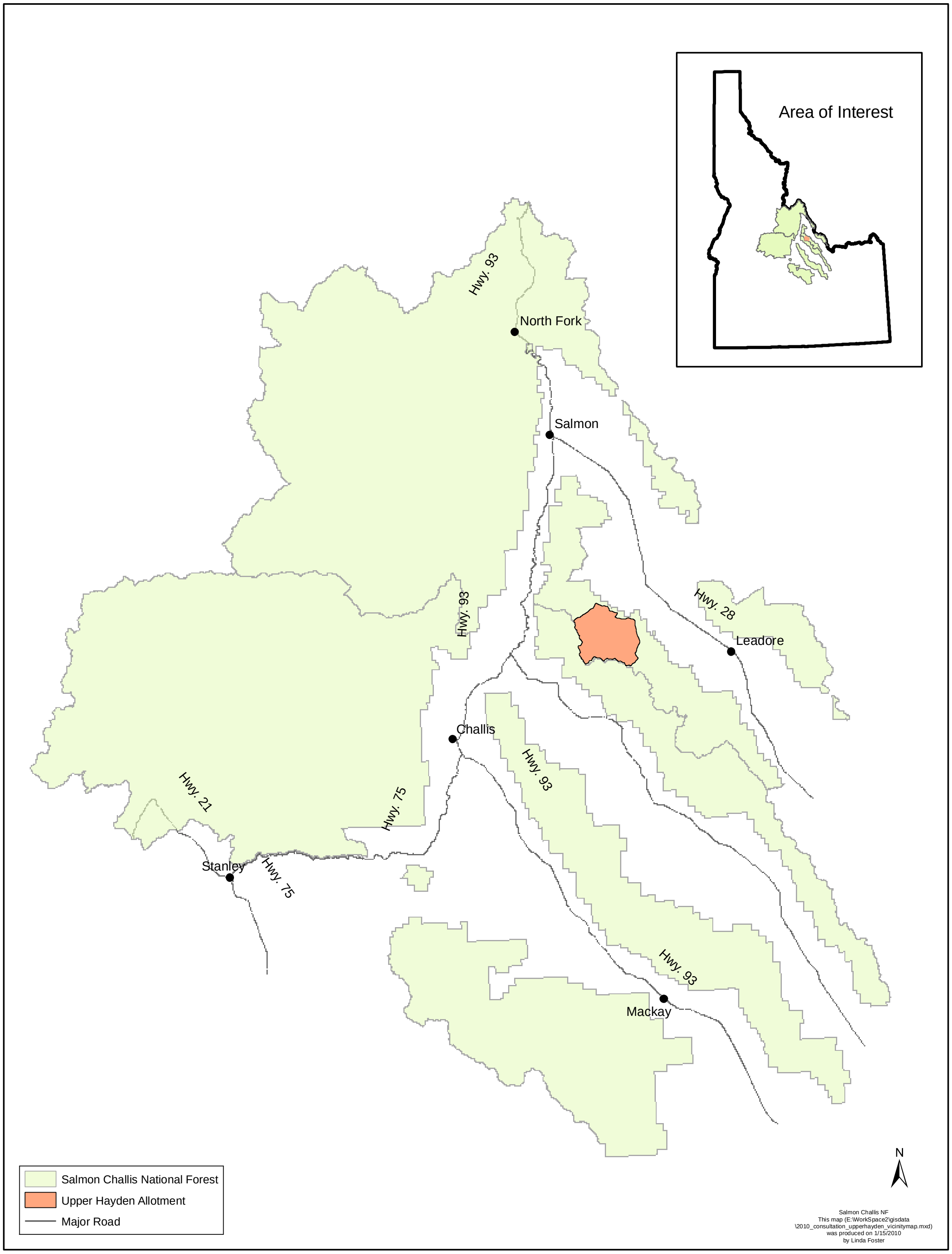
3.1 PROJECT AREA

The Upper Hayden Cattle & Horse (C&H) Allotment is located on the Leadore Ranger District of the Salmon Challis National Forest within the Hayden Creek drainage (Figure 1). The Upper Hayden Creek C&H Allotment is 42,359 acres on National Forest System lands with 0 acres of private in-holding. The project area is located within the Hayden Creek 5th field HUC (1706020406) of the Lemhi River 4th field HUC (17060204).

The allotment is divided into 6 units on National Forest System lands: Apple Creek Unit, Tobias/Mogg Unit, Upper Hayden Unit, Payne/Ford Unit, Boulder Flat Unit, and Kadletz Creek Unit.

This allotment contains ESA fishery habitat in Bear Valley Creek, Bray Creek, Carol Creek, Cooper Creek, Deer Creek, East Fork Hayden Creek, Hayden Creek, Kadletz Creek, Mogg Creek, Paradise Creek, Short Creek, West Fork Hayden Creek and Wright Creek (see Tables 15 – 20).

Figure 1 - Upper Hayden Allotment Vicinity Map



3.2 PROPOSED ACTION

3.2.1 CURRENT PERMIT

The Upper Hayden Allotment is currently permitted for 500 cow/calf pairs (1510 Head Months) from 7/1 to 9/30. The permit number is 80104 and expires on 12/31/2017.

3.2.2 GRAZING SYSTEM

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

The following rotations will be used on this allotment:

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

Year 1	Year 2	Year 3	Year 4	Year 5
Payne/Ford Unit	Kadletz Creek Unit	Apple Creek Unit	Boulder Flat Unit	Apple Creek Unit
Kadletz Creek Unit	Tobias/Mogg Unit	Kadletz Creek Unit	Payne/Ford Unit	Tobias/Mogg Unit
Tobias/Mogg Unit	Upper Hayden Unit	Upper Hayden Unit	Upper Hayden Unit	Upper Hayden Unit
Apple Creek Unit	Boulder Flat Unit	Payne/Ford Unit	Kadletz Creek Unit	Payne/Ford Unit
Boulder Flat Unit	Apple Creek Unit	Boulder Flat Unit	Tobias/Mogg Unit	Boulder Flat Unit
Upper Hayden Unit (rest)	Payne/Ford Unit (rest)	Tobias/Mogg Unit (rest)	Apple Creek Unit (rest)	Kadletz Creek Unit (rest)

<u>Payne/Ford Unit:</u>

- Chinook: Livestock will be in the unit after August 23rd between 2 and 5 weeks two out of five years.

- Steelhead: Livestock will be in the unit up to 1 week during steelhead spawning & incubation one out of five years.
- Bull Trout: Livestock will be in the unit after August 15th between 3 and 6 weeks two out of five years.

Kadletz Creek Unit:

- Chinook: Livestock will be in the unit after August 23rd for up to 3 weeks one out of five years.
- Steelhead: Livestock will be in the unit up to 1 week during steelhead spawning & incubation one out of five years.
- Bull Trout: Livestock will be in the unit after August 15th for up to 4 weeks one out of five years.

Tobias/Mogg Unit:

- Chinook: Livestock will be in the unit after August 23rd between 1 and 2 weeks four out of five years.
- Steelhead: Livestock will not be in the unit at any time during steelhead spawning & incubation.
- Bull Trout: Livestock will be in the unit after August 15th between 2 and 3 weeks four out of five years.

Boulder Flat Unit:

- Chinook: Livestock will be in the unit after August 23rd between 1 and 2 weeks three out of five years.
- Steelhead: Livestock will be in the unit up to 1 week during steelhead spawning & incubation one out of five years.
- Bull Trout: Livestock will be in the unit after August 15th between 2 and 3 weeks three out of five years.

Upper Hayden Unit:

- Chinook: Livestock will be in the unit after August 23rd between 1 and 4 weeks three out of five years.
- Steelhead: Livestock will not be in the unit at any time during steelhead spawning & incubation.
- Bull Trout: Livestock will be in the unit after August 15th between 2 and 6 weeks four out of five years.
- Only 100 cow/calf pairs will be in the unit any year, the remainder of the herd will be in another unit at the same time

Trailing Impacts to ESA Fish from Unit Moves:

- Chinook: Trailing across Hayden Creek from the Payne/Ford unit to the Boulder Flat unit will occur during spawning and incubation. Duration of move is less than ½ day.

Trailing across Hayden Creek from the Payne/Ford unit exiting the allotment to the home ranch will occur during spawning and incubation. Duration of move is less than ½ day.

- Steelhead: Trailing across Hayden Creek from BLM allotment to the Kadletz or Payne/Ford units will occur during spawning and incubation two out of five years. Duration of move is less than ½ day.
- Bull Trout: Trailing of livestock across spawning and incubation areas occurs every year in almost every move.

Entry on to the Allotment:

Permittees have two different options for entry onto the allotment with option 1 being used ~90% of the time or 9 out of 10 years:

Option 1: Livestock enter the allotment on and/or after July 1. The permittee trails livestock from the home ranch southeast of Lemhi, Idaho across Highway 28. Then using upland trails, livestock are trailed to the BLM Meadow Creek Unit. Livestock are then trailed through the BLM South Hayden Unit to access to forest land. On years when the Payne/Ford Unit or Kadletz Creek Unit is used first, livestock are trailed across Hayden Creek in the Boulder Flat area. Duration of the move is about one day. Where the cattle cross Hayden Creek is at a ford crossing that is located on an existing road prism.

Option 2: Livestock enter the allotment on and after July 1.The permittee trails livestock from the home ranch southeast of Lemhi, Idaho across Highway 28 and then up the Hayden Creek road (FS road# 60008) to the BLM Meadow Creek Unit that the permittee grazes first each year in the grazing rotation. Duration of the move is about one day.

Unit Movements:

Depending on the grazing rotation, livestock are trailed from one unit to the next. Duration of each move is approximately one day.

Exit:

Livestock are actively trailed from the last unit in the rotation off the allotment going through the Apple Creek unit, through the BLM allotment and then to the home ranch.

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 Upper Hayden Allotment's annual operating instructions (AOI) to avoid and reduce potential impacts to ESA listed fish. Chinook, steelhead and bull trout considerations are:

1. The Bear Valley Riparian Exclosure will continue to be maintained by SCNF to be excluded from livestock grazing. Any livestock found in the exclosure will be promptly removed by permittee.
2. A deferred-rest 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.

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

   Fences and water developments have been placed to reduce livestock use on streams and their associated riparian areas. This will continue to reduce impacts on spawning areas and designated critical habitat.

3.2.4 CHANGES FROM EXISTING MANAGEMENT

- The annual use indicators for East Fork Hayden Creek (M261), Tobias Creek (M260), Squaw Creek (M307), and Ford Creek (M259) have been changed from 5 inch to 4 inch greenline stubble because these sites are meeting resource objectives.
- The long term monitoring site on Kadletz Creek is being moved to a different location and the annual use indicator will be changed from 5 inch greenline stubble to either 4 inch or 6 inch greenline stubble depending on the site meeting or not meeting resource objectives.
- All units will have an annual use indicator for bank alteration.
- The monitoring attribute of browse use will be added to East Fork Hayden Creek and Ford Creek because they are dominated by woody browse species. Greenline stubble will continue to be monitored at these sites.

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 resource conditions within riparian areas in the allotments. Some resource objectives are Riparian Management Objectives (RMOs) from PACFISH (U.S Department of Commerce, National Marine Fisheries Service, 1998).

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

Resource Objectives:

- Greenline Successional Status: A greenline successional status value of at least 61 (late seral) or the current value, whichever is greatest (Winward 2000, Burton et al. 2008).
- Woody Species Regeneration: A stable trend at sites with desired condition and an upward trend at sites not at desired condition (Winward 2000, Burton et al. 2008).
- Bank Stability RMO: A bank stability of at least 80% or the current value, whichever is greatest outside of priority watersheds. Within priority watersheds a bank stability of at least 90% or the current value, whichever is greatest (U.S Department of Commerce, National Marine Fisheries Service, 1998).
- Water Temperature RMO: No measureable increase in maximum temperature; <64^{o}F in (Chinook, steelhead) migration and rearing areas and <60^{o}F in spawning areas except in steelhead priority watersheds with a <45^{o}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^{o} F within (bull trout) adult holding habitat and below 48^{o} 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 (U.S Department of Commerce, National Marine Fisheries Service, 1998).
- 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: The purpose of annual use indicators are to ensure grazing effects do not limit attaining the riparian resource objectives. Livestock grazing on key herbaceous species, in key areas other than the greenline, will be limited to 50% use by weight, during the grazing season.

Other annual use indicators follow:

- 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.
- When the bank stability objective (RMO) is being met the annual use indicator is 20% streambank alteration.
- When the bank stability is 75-99% of the RMO objective the annual use indicator is 15% streambank alteration.
- When the bank stability is <75% of the RMO objective the annual use indicator is 10% streambank alteration.

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.

Table 2 - Annual Use Indicators

Key Area/DMA Locations	Unit – Creek	Monitoring Attribute	Use Indicator	Key Species	Trigger
MIM/ M226	Boulder Flat Unit – Hayden Creek	Greenline stubble	6 in	*Carex*	7 in
		Bank Alteration	<20%	n/a	15%
MIM/ M262	Apple Creek Unit– Apple Creek	Greenline stubble[3]	5 in.	Hydric spp	6 in.
		Bank Alteration	<20%	n/a	15%
MIM/ M261	Tobias/Mogg Unit– East Fork Hayden Creek	Greenline stubble[3]	4 in.	Hydric spp	5 in.
		Browse Use	30% 50%	Alder Willow	25% 45%
		Bank Alteration	<20%	n/a	15%
MIM/ M260	Boulder Flat Unit– Tobias Creek	Greenline stubble	4 in	Carex	5 in
		Bank Alteration	<20%	n/a	15%
MIM/ M307	Tobias/Mogg Unit – Squaw Creek	Greenline stubble[3]	4 in.	Hydric spp	5 in.
		Bank Alteration	<20%	n/a	15%
MIM/ M259	Payne/Ford Unit – Ford Creek	Greenline stubble[3]	4 in.	Hydric spp	5 in.
		Browse Use	30% 50%	Alder Willow	25% 45%
		Bank Alteration	<15%	n/a	10%
MIM/ M258	Kadletz Unit– Kadletz Creek[1]	Greenline stubble	4 or 6 in[2]	Carex	5 or7 in
		Bank Alteration	<20%	n/a	15%
Upland Areas	All Units	Utilization by Key Species	50%	Upland grass species	45%
Riparian Areas (on DMA)	All Units	Utilization by Key Species	50%	Riparian grass species	45%

[1] Site does not meet current greenline protocol. New site in upper meadow will be established.

[2] Endpoint indicator will be 4” if the resource objective for the Greenline Ecological Status is being met (≥61). Endpoint indicator will be 6” if this resource objective is not being met.

[3] Browse use/bank alteration and greenline stubble will be used until next trend reading is completed to determine which attribute will be best suited to for attaining long term objectives.

Annual use indicators will be measured at key areas by key species (on uplands) and at DMA greenline sites 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 and prevent redds from being developed at a heavily used cattle crossing. 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.

- Wright Creek Troughs-Pumping water out of Wright Creek to two troughs
- Lower Payne Ridge Spring
- Ford Pipeline and Trough
- Bike Gate Spring with one trough
- Short Creek Spring with one trough
- Cooper Creek Spring with one trough
- Hardening of stream and streambanks on Hayden Creek at one cattle crossing

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 from unit to unit and year. The designated indicators (e.g. - stubble height, bank alteration, and woody browse) will be

monitored 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.

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). This is the area where the action and any interdependent and interrelated actions will result in direct, indirect or cumulative affects to listed species or designated critical habitat. This project’s ESA Action Area is defined as the entire Upper Hayden Allotment (see Figure 2). Priority Watersheds within the ESA Action Area are identified in Figure 3. The ESA fish bearing streams within the ESA Action Area include: Bear Valley Creek, Bray Creek, Carol Creek, Cooper Creek, East Fork Hayden Creek, Hayden Creek, Kadletz Creek, Mogg Creek, Paradise Creek, West Fork Hayden Creek and Wright Creek (see Tables 15 - 20).

Priority Watersheds in the action area are identified in Figure 3. The entire Hayden Creek Allotment is within a priority watershed. Management direction for priority watershed is identified in section 3.2.5.

Figure 2 - Upper Hayden Allotment ESA Action Area

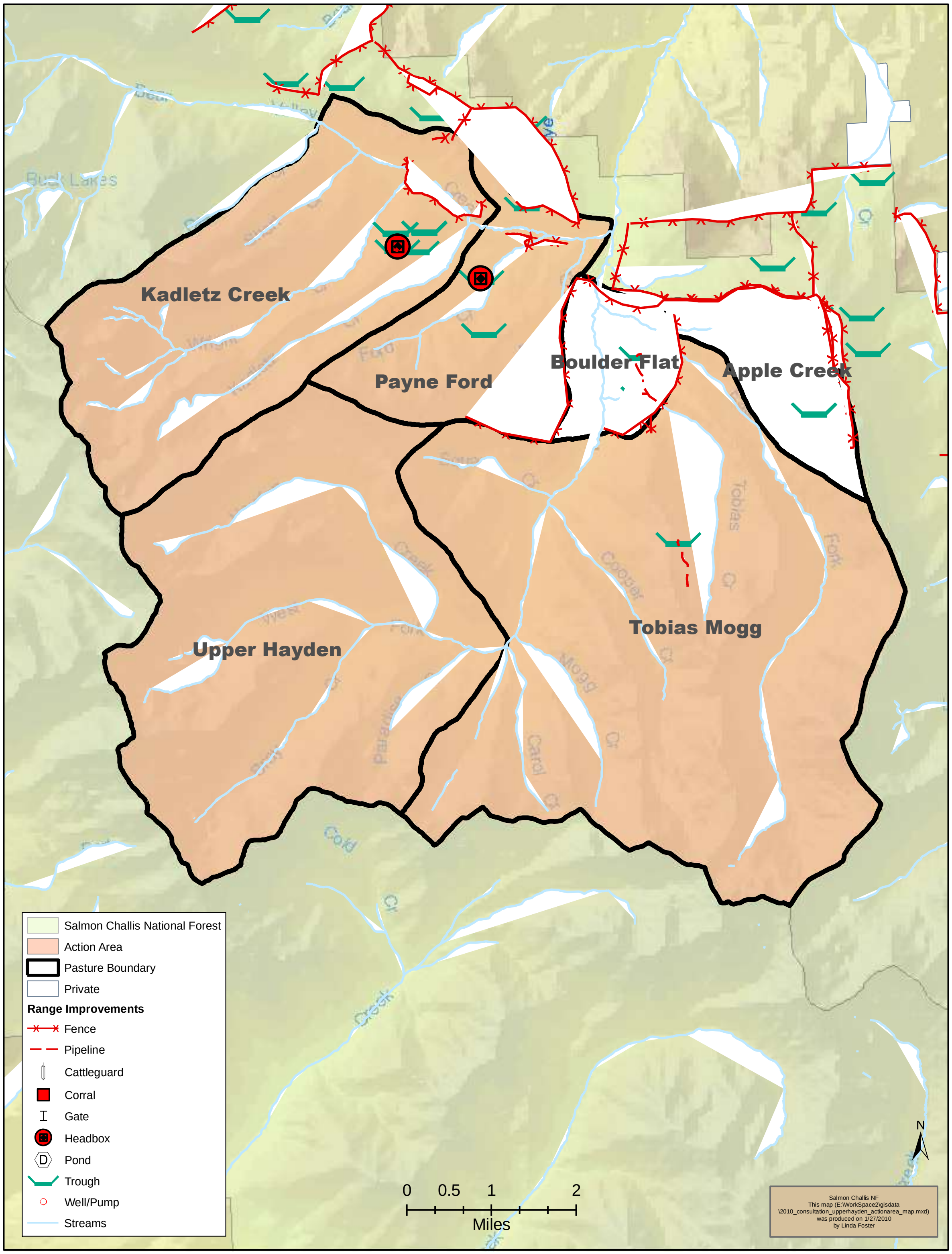
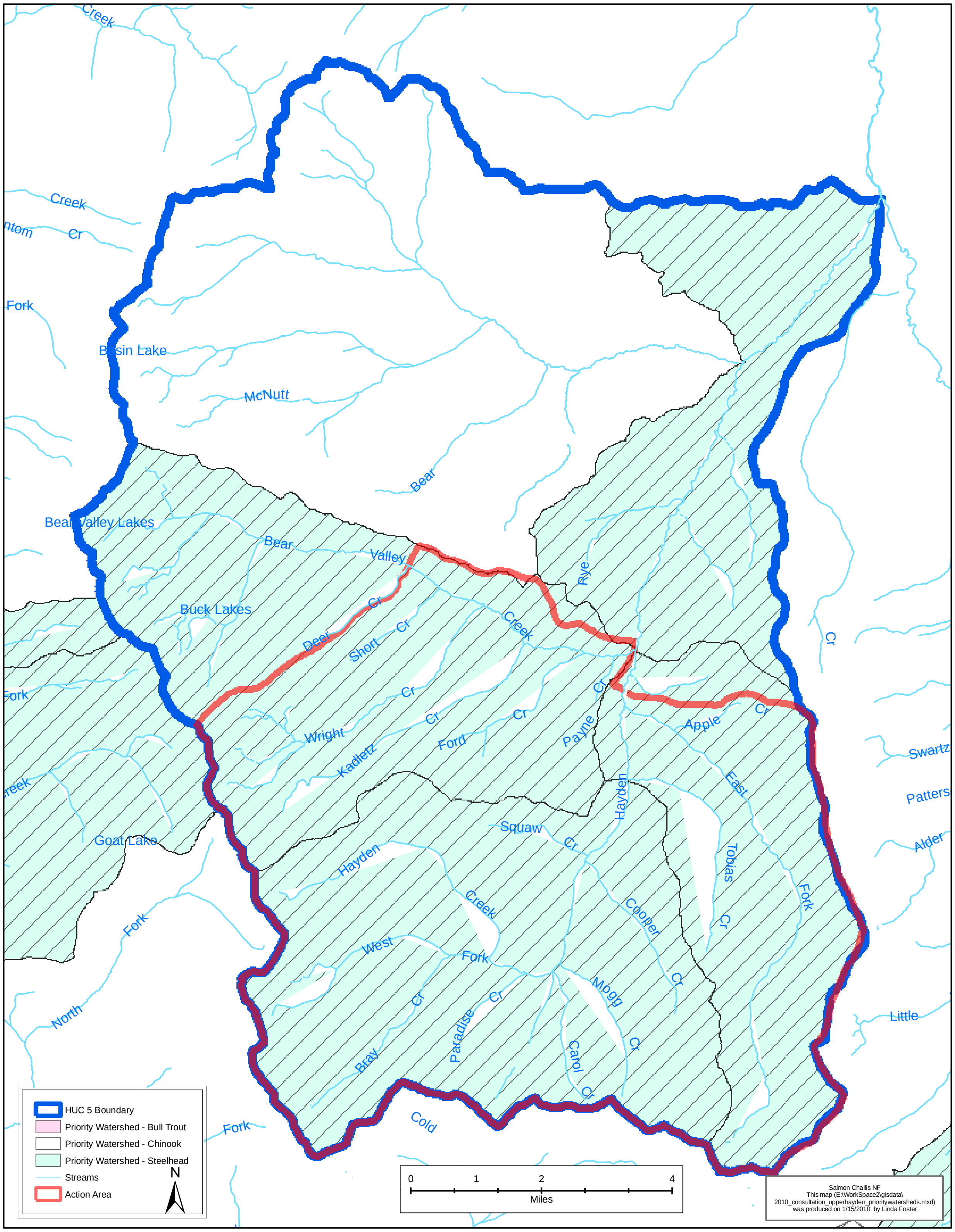


Figure 3- Hayden Creek HUC 5 and Priority Watershed



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 three of these species occur within the ESA Action Area. These species are Chinook salmon (Figure 4), steelhead (Figure 5), and bull trout (Figure 6). Sockeye salmon do not occur within either the ESA Action Area or the larger Lemhi River 4th field HUC (17060204).

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 Hayden Creek up to the confluence with Cooper Creek, Bear Valley Creek and at the request of NMFS in the 2/17/2010 Level I Team meeting added the first 0.25 miles of the East Fork of Hayden Creek as ESA Action Area streams 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 present within the ESA Action Area and includes Bear Valley Creek, Wright Creek, Kadletz Creek, Hayden Creek, East Fork of Hayden Creek, and West Fork of Hayden Creek (Figure 5).

5.2.4 COLUMBIA RIVER BULL TROUT

Critical habitat has been proposed for designation (Federal Register75FR2270). Proposed bull trout critical habitat is present within the ESA Action Area and includes Bear Valley Creek, Deer Creek, Short Creek, Wright Creek, Kadletz Creek, Hayden Creek, East Fork Hayden Creek, Cooper Creek, Bray Creek, and West Fork Hayden Creek (Figure 6). This Biological Assessment will assess the potential impact to the Primary Constituent Elements (PCEs) of bull trout proposed critical habitat. These are defined on page 2360 of the referenced Federal register notice.

Because these elements are important to the analysis determination for bull trout this Biological Assessment analyzes the potential impacts to the PCEs as they relate to the ESA Action Area (Appendix E).

Figure 4 - Upper Hayden Allotment Chinook salmon Map

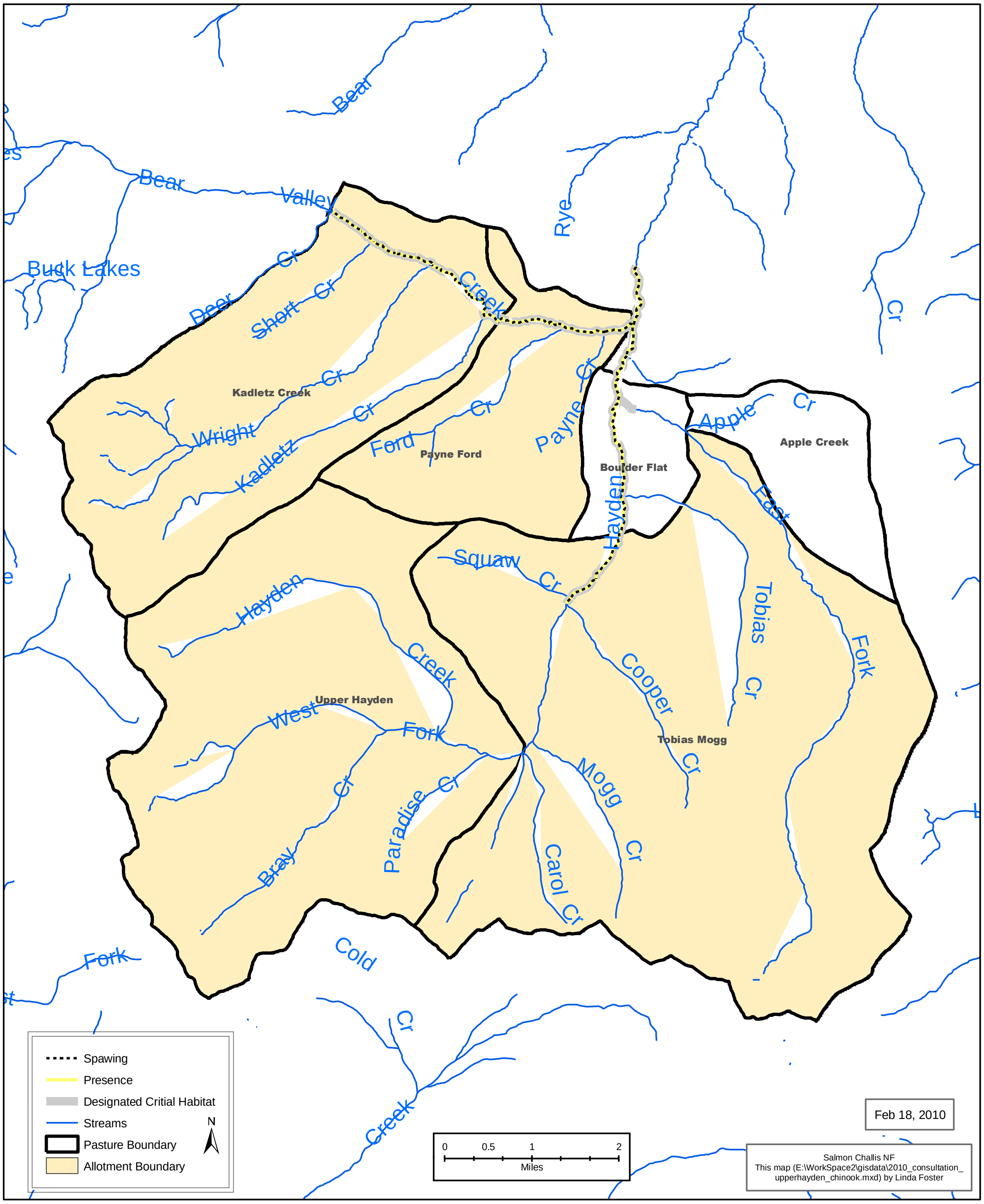


Figure 5 - Upper Hayden Allotment Steelhead Map

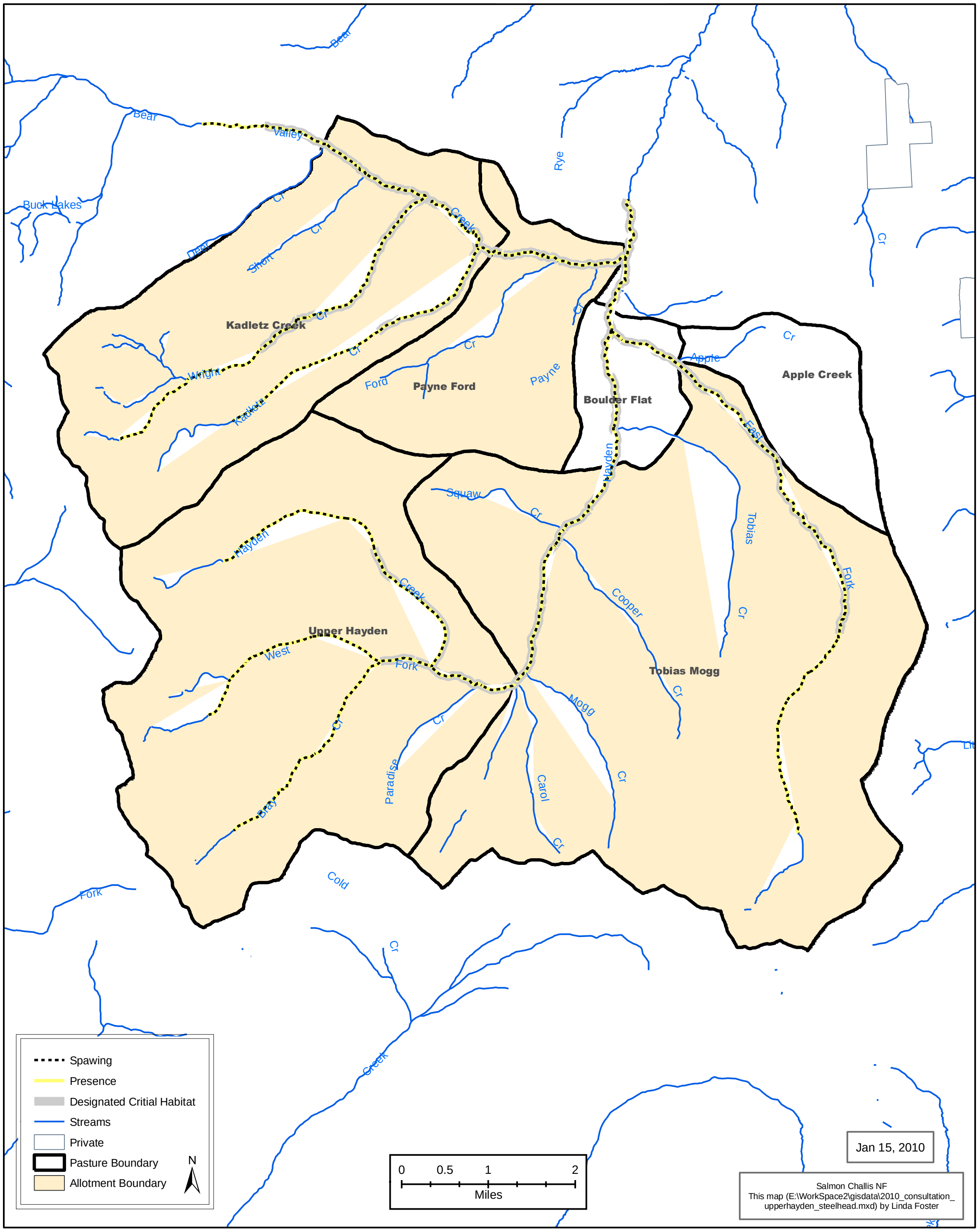
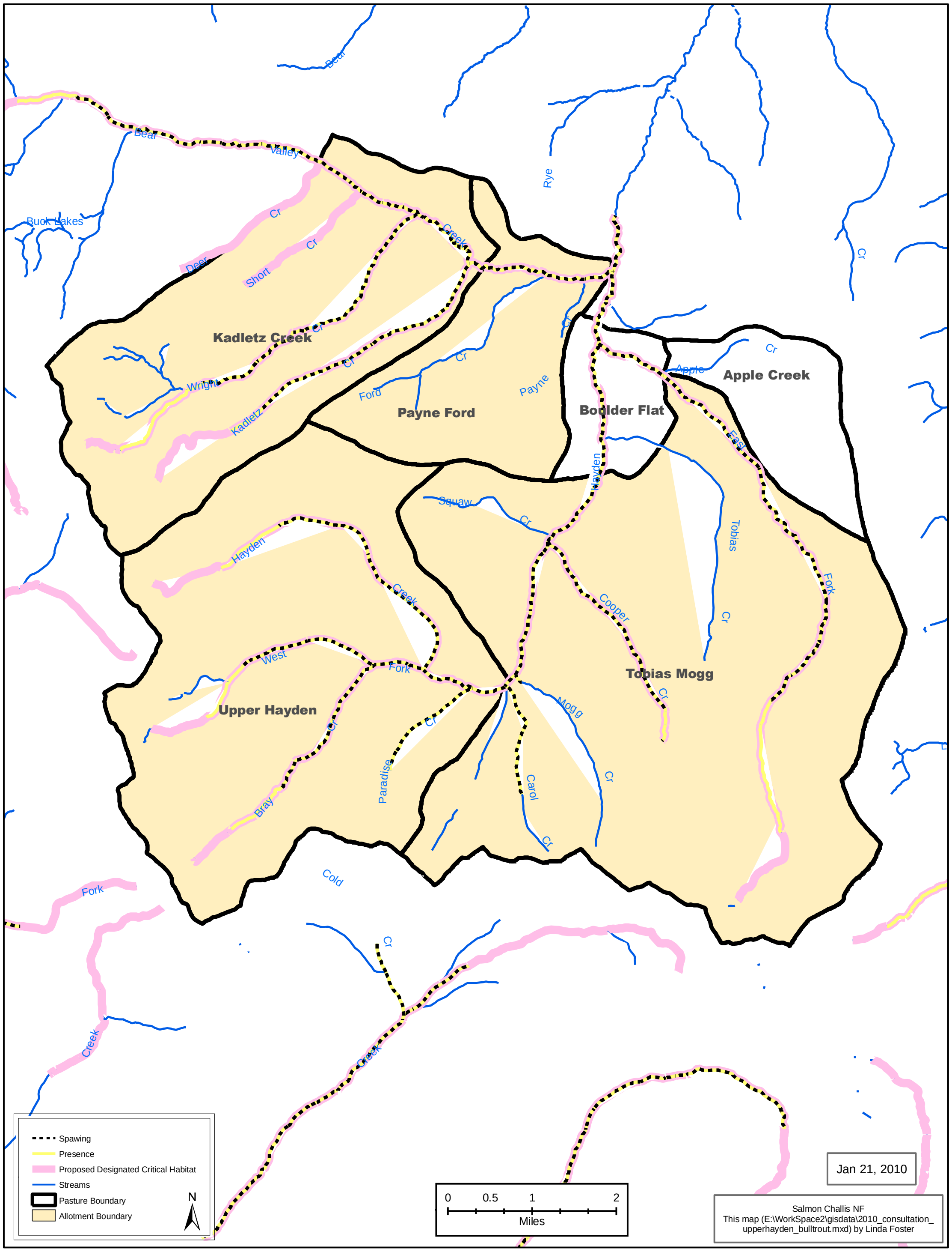


Figure 6 – Upper Hayden Allotment Bull Trout Map



6 ENVIRONMENTAL BASELINE DESCRIPTION

The ESA Action Area is within the Hayden Creek 5th field hydrologic unit code (HUC 1706020406). Baseline Matrices of Diagnostic Pathways and Indicators for these one 5th field HUC is provided in Appendix B.

Below is a general summary of baseline conditions within the ESA Action Area. 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.

The Upper Hayden Allotment encompasses eleven streams which support populations of, and/or habitat for, ESA listed fish species. These include Bear Valley Creek, Bray Creek, Carol Creek, Cooper Creek, East Fork Hayden Creek, Hayden Creek, Kadletz Creek, Mogg Creek, Paradise Creek, West Fork Hayden Creek, and Wright 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.

Table 3 - Mean Annual Monthly Flows

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
Bear Valley Creek 1A	28.64	25.50	140.70	8.1	8.0	8.9	18.4	74.4	102.3	32.0	13.8	10.9	10.6	9.7	8.7	0.010	19.70	35.63	1.81	10.9
Bear Valley Creek 2A	21.56	20.50	97.40	6.5	6.4	7.1	14.8	59.8	82.3	25.7	11.1	8.8	8.5	7.8	7.0	0.003	29.40	29.54	1.00	29.3
EF Hayden Creek 1A	11.92	11.00	52.70	3.5	3.5	3.8	7.9	32.1	44.1	13.8	6.0	4.7	4.6	4.2	3.8	0.039	11.62	13.61	1.17	9.9
Hayden Creek 1A	80.59	59.95	266.00	19.0	18.8	20.9	43.2	175.1	240.8	75.3	32.5	25.7	24.8	22.7	20.6	0.006	33.90	104.94	3.10	11.0

6.1.1 CHINOOK SALMON

Within the ESA Action Area, Chinook salmon are currently present in Bear Valley Creek and Hayden Creek to the confluence with Cooper Creek. Chinook salmon adults enter the upper Lemhi River during the summer and spawn during late August and early September (Bjornn, 1978). September 1 is designated as the end of the growth period for Chinook salmon (Bjornn, 1978). Very little Chinook salmon spawning habitat occurs in Hayden Creek within the ESA Action area from above Cooper Creek downstream approximately 3 miles (Trapani, 2002 &

2004). There is an estimated 7.44 miles of Chinook salmon presence and spawning habitat and 7.69 miles of Chinook salmon Designated Critical Habitat within the ESA Action Area (see Tables 19 - 20).

6.1.2 STEELHEAD

Within the ESA Action Area, steelhead are currently present in Bear Valley Creek, Bray Creek, East Fork Hayden Creek, Hayden Creek, Kadletz Creek, West Fork Hayden Creek and Wright Creek. There is an estimated 36.2 miles of steelhead presence and spawning habitat and 22.16 miles of steelhead Designated Critical Habitat within the ESA Action Area (see Table 15 -16).

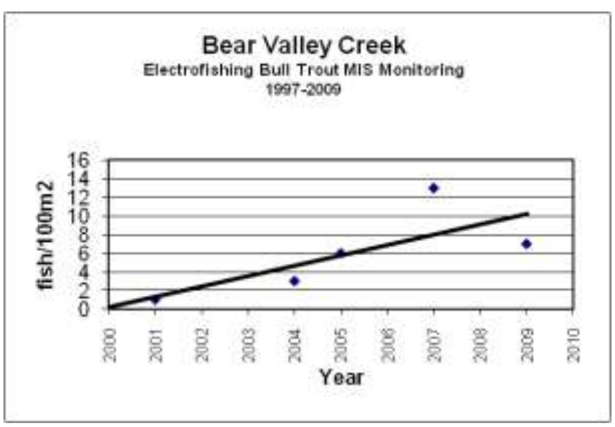
There is known presence of naturally reproducing steelhead within the Hayden Creek drainage. Both the Forest Service and IDFG have electrofishing survey data documenting juvenile rainbow trout/steelhead within the Hayden Creek drainage and the ESA Action Area. But at present, relatively little is known of the status or trend of adult steelhead populations within the Hayden Creek drainage and the ESA Action Area.

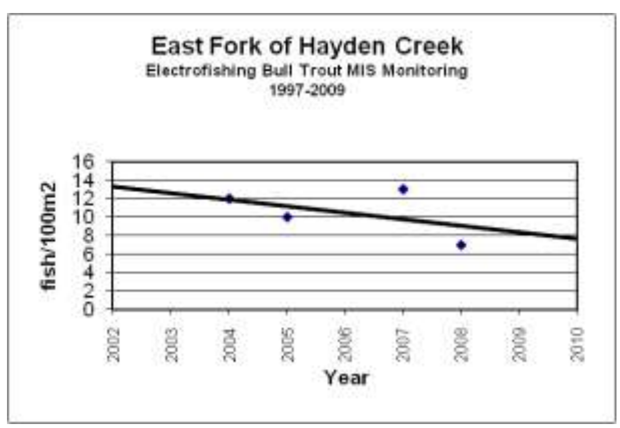
6.1.3 BULL TROUT

Within the ESA Action Area, bull trout are currently present in Bear Valley Creek, Bray Creek, Carol Creek, Cooper Creek, East Fork Hayden Creek, Hayden Creek, Kadletz Creek, Mogg Creek, Paradise Creek, West Fork Hayden Creek and Wright Creek. There is an estimated 42.16 miles of bull trout presence habitat, 35.86 miles of bull trout spawning habitat and 46.69 miles of bull trout proposed Critical Habitat within the ESA Action Area (see Table 17 - 18).

The resident populations within the ESA Action Area at the two bull trout MIS monitoring sites have fish population trends above 6 fish/100m^2. Fluvial forms are known to use Bear Valley Creek and Hayden Creek within the ESA Action Area. Migratory corridors and rearing habitat are considered to be in good to excellent condition for the species with a few exceptions of a road crossing passage barrier problems in Kadletz Creek, Wright Creek and Cooper Creek. The Kadletz Creek and Wright Creek culverts are both scheduled to be replaced with fish passable structures in 2010 or 2011, depending upon funding.

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 are two streams within the ESA Action Area which the Forest monitors long term population trends for bull trout. The two streams are Bear Valley Creek and the East Fork of Hayden Creek.





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.

6.2.1 HAYDEN CREEK

Fish habitat conditions of Hayden Creek within the ESA Action Area are in generally good condition. Overall physical habitat quality, including the elements of water quality, flow/hydrology, channel conditions and structural habitat elements is considered good, and connectivity is excellent, with no mainstem passage barriers. Hayden Creek within the ESA Action Area supports limited suitable spawning habitat for Chinook salmon (Trapani, 2002 & 2004). This is supported by the 2005-2007 and 2009 IDFG Chinook salmon redd counts in mainstem Hayden Creek. In those four years only one Chinook salmon redd was observed within the ESA Action Area. That redd was in 2007 and located near the confluence of Hayden Creek and the East Fork of Hayden Creek. Chinook salmon and steelhead have similar needs for suitable spawning habitat. Therefore it is my professional judgment there is limited suitable spawning habitat for steelhead within the ESA Action Area. Mainstem Hayden Creek supports higher quality spawning and rearing habitat for resident fish, like bull trout, than that of anadromous fish. This is supported by the 2006-2008 IDFG bull trout redd survey data (see Table 10). Mainstem Hayden Creek does support high quality rearing habitat for all three ESA listed fish.

6.2.2 BEAR VALLEY CREEK

Fish habitat conditions of Bear Valley Creek, a tributary to Hayden Creek, within the ESA Action Area are in generally good condition. Overall physical habitat quality, including the elements of water quality, flow/hydrology, channel conditions and structural habitat elements is considered good, and connectivity is excellent, with no mainstem passage barriers. Bear Valley Creek within the ESA Action Area supports high quality spawning and rearing habitat for all three ESA listed fish. Bear Valley Creek has high quality spawning and rearing habitat for bull trout. This is supported by the observation of high numbers of bull trout redds (see Table 10).

6.2.3 EAST FORK HAYDEN CREEK

Fish habitat conditions of East Fork Hayden Creek, a tributary to Hayden Creek, within the ESA Action Area are in generally good condition. Overall physical habitat quality, including the elements of water quality, flow/hydrology, channel conditions and structural habitat elements is considered good, and connectivity is excellent, with no mainstem passage barriers. East Fork Hayden Creek within the ESA Action Area supports limited quality spawning habitat for anadromous fish. No Chinook salmon have been documented spawning in the East Fork of Hayden Creek. There is no electrofishing, snorkeling or redd survey data showing juvenile or adult Chinook salmon are, currently or in the recent past, in the East Fork of Hayden Creek. There is suitable but limited spawning habitat for steelhead because of higher gradient reaches within the East Fork of Hayden Creek. There is high quality rearing habitat for steelhead which juvenile *O.mykiss* have been documented rearing in the East Fork of Hayden Creek. The East Fork of Hayden Creek has high quality spawning and rearing habitat for bull trout. This is supported by the observation of high numbers of bull trout redds (see Table 10).

6.2.4 OTHER HAYDEN CREEK TRIBUTARIES

The other Hayden Creek tributaries Bray Creek, Carol Creek, Cooper Creek, Kadletz Creek, Mogg Creek, Paradise Creek, West Fork Hayden Creek, and Wright Creek all have suitable spawning and rearing habitat for bull trout with limited spawning and rearing habitat for steelhead. The limitations are associated with higher stream gradients and smaller stream sizes associated with headwater streams. Fish habitat conditions for these tributaries, all within the ESA Action Area, are in generally good condition. Overall physical habitat quality, including the elements of water quality, flow/hydrology, channel conditions and structural habitat elements is considered good, and connectivity is excellent, with the exception of Kadletz Creek and Wright Creek. Both of these streams have a fish migration barrier culvert in the lower reaches. Both of these culverts are scheduled to be replaced with a fish passable structure in 2010 or 2011, depending upon funding.

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:

- 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 the Hayden Creek watershed to spawn, die and decay in the stream.
- Kadletz Creek and Wright Creek fish migration barrier culverts preventing connectivity of ESA listed fish streams to Bear Valley Creek. Both of these culverts are scheduled to be replaced with a fish passable structure in 2010 or 2011, depending upon funding.
- Historic grazing activities may have contributed to past habitat capability limitations within the Upper Hayden Allotment and the ESA Action Area, but 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 continuing contribution of impacts to 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 utilized this “Focus Indicator” set to characterize the condition of the habitat for listed fish species in the occupied streams in this allotment. If stream specific information is not available, then observational information or information from similar streams was used. If one (or several) of the focus indicators showed a habitat condition was potentially limiting the ability of listed fish species to thrive; the Forest presented an opinion of the most likely causal factor for that limiting condition. By identifying those potentially limiting factors, the Forest and the Service can focus their analysis of the proposed action’s effects on that habitat component.

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

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

6.4.1 SPAWNING AND INCUBATION:

6.4.1.1 CHINOOK SALMON SPAWNING AND INCUBATION

Chinook salmon adults enter the upper Lemhi River during the summer and spawn during late August and early September (Bjornn, 1978). September 1 is designated as the end of the growth period for Chinook salmon (Bjornn, 1978). Spawning periodicity data developed by the Upper Salmon Basin Watershed Project Technical Team (Upper Salmon Basin Watershed Project Technical Team, 2005) identify a general initiation date for Chinook salmon spawning activity in the Hayden Creek drainage in the fourth week of August. Incubation of eggs can occur through the end of April (Upper Salmon Basin Watershed Project Technical Team, 2005).

Within the Upper Hayden Allotment, Chinook salmon spawning habitat has been identified in a 4.39 mile reach of Bear Valley Creek and a 3.04 mile reach of mainstem Hayden Creek (see Table 4 and Figure 4). Table 4 is a stream measurement of what the Forest considers the starting point and ending point for spawning habitat. The habitat within these stream reaches do not provide 100% available spawning habitat. Some reaches within each of these streams have to steep of a stream gradient, have the wrong size substrate or are just not suitable for Chinook salmon spawning. The Table 4 stream miles reflect continuous mapping reaches and therefore are likely a significant overestimate of actual spawnable area within the allotment’s streams. Within the Bear Valley Creek total Chinook salmon spawning miles there is approximately 1.2 stream miles that are within the Bear Valley Creek Exclosure. This exclosure is three sided but there are other fences along a northeastern ridge, tallace slopes and steep terrain that allow this three sided fence to function as a total exclosure. There is also a drift fence that parallels Bear Valley Creek in the lower reaches of the Payne Ford Unit that helps keep cows in the upland away from Bear Valley Creek.

The identified Chinook salmon spawning occurring within the ESA Action Area occurs primarily in Bear Valley Creek. Very little Chinook salmon spawning habitat occurs in Hayden Creek within the ESA Action area from above Cooper Creek downstream approximately 3 miles (Trapani, 2002 & 2004).

Table 4 - Chinook salmon Spawning Stream Miles

Bear Valley Creek	**4.39 miles**
Hayden Creek	**3.04 miles**

6.4.1.2 STEELHEAD SPAWNING AND INCUBATION

Data developed by the Upper Salmon Basin Watershed Project Technical Team (Upper Salmon Basin Watershed Project Technical Team, 2005) identify a general spawning periodicity for steelhead in the Hayden Creek drainage ranging from the third week of March through the second week of June, with egg incubation through the first week of July.

Table 5 - Steelhead Spawning Miles

Bear Valley Creek	**4.36 miles**
Bray Creek	**2.75 miles**
East Fork Hayden Creek	**7.60 miles**
Hayden Creek	**9.86 miles**
Kadletz Creek	**3.64 miles**
West Fork Hayden Creek	**3.09 miles**
Wright Creek	**4.91 miles**

Steelhead have the potential to spawn in seven streams within the ESA Action Area (see Table 5 and Figure 5). Table 5 is a stream measurement of what the Forest considers the starting point and ending point for spawning habitat. The habitat within these stream reaches do not provide 100% available spawning habitat. Some reaches within each of these streams have to steep of a stream gradient, have the wrong size substrate or are just not suitable for steelhead spawning. The Table 5 stream miles reflect continuous mapping reaches and therefore are likely a significant overestimate of actual spawnable area within the allotment's streams. Within the Bear Valley Creek total there is approximately 1.2 stream miles that are within the Bear Valley Creek Exclosure.

Information on steelhead spawning within the Upper Hayden Allotment's ESA Action Area is largely lacking due to the difficulty in conducting redd surveys while stream flows are high, turbid and unsafe to walk in during spring runoff.

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) identify a general spawning periodicity for bull trout in the Hayden Creek drainage ranging from the third 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 6 - Bull Trout Spawning Streams and Miles

Bear Valley Creek	**4.43 miles**
Bray Creek	**1.94 miles**
Carol Creek	**1.41 miles**
Cooper Creek	**2.54 miles**
East Fork Hayden Creek	**5.96 miles**
Hayden Creek	**9.02 miles**
Kadletz Creek	**3.19 miles**
Mogg Creek	**0.11 miles**
Paradise Creek	**1.37 miles**
West Fork Hayden Creek	**2.32 miles**
Wright Creek	**3.56 miles**

Bull trout have the potential to spawn in eleven streams within the ESA Action Area (see Table 6 and Figure 6). Table 6 is a stream measurement of what the Forest considers the starting point and ending point for spawning habitat. The habitat within these stream reaches do not provide 100% available spawning habitat. Some reaches within each of these streams have to steep of a stream gradient, have the wrong size substrate or are just not suitable for bull trout spawning. The Table 6 stream miles reflect continuous mapping reaches and therefore are likely a significant overestimate of actual spawnable area within the allotment's streams. Within the Bear Valley Creek total there is approximately 1.2 stream miles that are within the Bear Valley Creek Exclosure.

Information on bull trout spawning within the ESA Action Area comes primarily from Idaho Fish and Game's Annual Bull Trout Redd Surveys in Bear Valley Creek, East Fork of Hayden Creek and Hayden Creek (see Table 10). Idaho Fish and Game considers Bear Valley Creek and the lower reaches of mainstem Hayden Creek, within the ESA Action Area, to support fluvial bull trout spawning.

6.4.2 WATER TEMPERATURE

Water temperature influences many aspects of salmonid fish life history, including reproduction, growth, and migration (Bjornn and Reiser, 1991). PACFISH identifies water temperature criteria for salmon and steelhead species of less than 64 degrees F (17.8 degrees C) for rearing, and less than 60 degrees F (15.6 degrees C) for spawning and incubation. In identified steelhead priority watersheds, PACFISH identifies an additional water temperature criteria of less than 45 degrees F (7.2 degrees C) during steelhead spawning periods (U.S Department of Commerce, National Marine Fisheries Service, 1998). PACFISH and INFISH additionally identify a bull trout water temperature criteria of maximum temperatures below 59 degrees F (15 .0 degrees C) within adult holding habitats, and less than 48 degrees F (8.9 degrees C) within spawning and rearing habitats (ibid; U.S. Department of the Interior, U.S. Fish and Wildlife Service, 1998). 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 10 streams within the ESA Action Area. The stream temperature graphs for those streams can be seen in Appendix G. The streams, with the years water temperature data was collected include the following: Bear Valley Creek (2005-2009), Cooper Creek (2006, 2007, 2009), Deer Creek (2004, 2006, 2009), East Fork Hayden Creek (2005-2009), Ford Creek (2004, 2009), Hayden Creek (2004-2006, 2009), Kadletz Creek (2004, 2009), Short Creek (2004, 2009), Tobias Creek (2006) and Wright Creek (2009).

Overall, observed water temperature regimes within the Upper Hayden Allotment have all fallen within the PACFISH water temperature criteria. There are no streams within the Hayden Creek 5th field HUC 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^{o}C (Gamett, 2002). It is my professional judgment that 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. Stream sediment analysis used in this BA is the same as used during ESA informal consultation on steelhead and bull trout Watershed Biological Assessments for Ongoing Forest Service Activities. The following are the evaluation criteria for stream sediment based wholly or primarily in quartzite geology:

20% depth fines (<1/4" diameter) = Properly Functioning
21-25% depth fines (<1/4" diameter) = Functioning at Risk
>25% depth fines (<1/4" diameter) = Not Properly Functioning

Within the ESA Action Area there are seven 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, and summer time high intensity storms. 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. There are three long term trend sediment monitoring sites, within the ESA Action Area, that was started in 1993 and continue to be surveyed by the Forest's Watershed Program. These three sites are Bear Valley Creek 1A, East Fork Hayden Creek 2R and Hayden Creek 1A.

Table 7 - Core Sampling Mean % Fines by Depth

Core Sampling Mean Percent Depth Fines Recorded in the Upper Hayden Allotment from 1993 through 2009.

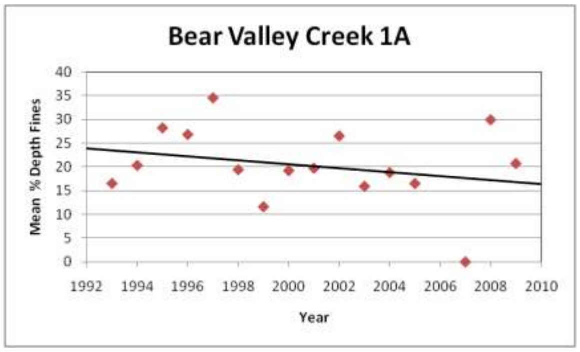
Mean Percent Fines <.25" at Depth

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Bear Valley Creek 1A	16.5	20.3	28.2	26.8	34.5	19.4	11.6	19.2	19.7	26.5	15.9	18.8	16.5		12.0	29.9	20.7
EF Hayden Creek 2R	34.0	40.5			34.2	40.5	46.5	43.1	48.8	43.7	52.7	46.9	44.4				
Hayden Creek 1A	14.3	21.8	16.8	15.8	20.5	12.7	13.5	17.4	19.3	13.7	8.7	23.6			7.3	23.6	27.1

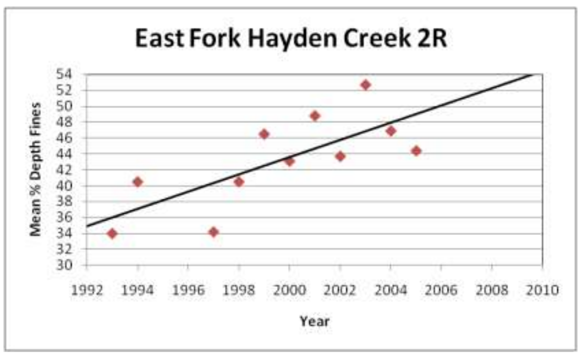
A = Anadromous fish spawning site

R = Resident fish spawning site

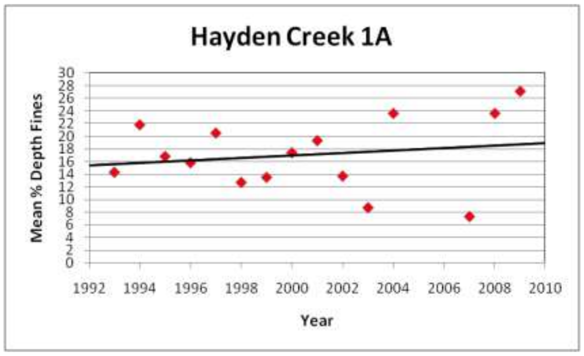
There is one Bear Valley Creek long term trend sediment monitoring site within the ESA Action Area and this site is within the Bear Valley Creek Exclosure. The Bear Valley Creek 1A site has been monitored from 1993-2009. This site since 2003 has been entirely below 20% depth fines. It is my professional judgment that Bear Valley Creek within the ESA Action Area is "Functioning Appropriately". This data and its trend graph indicate stream sediment is not a major limiting factor for fish production in Bear Valley Creek.



There is one East Fork Hayden Creek long term trend sediment monitoring site within the ESA Action Area. The data and trend indicate stream sediment levels are on an increasing trend and at a level where it would be considered “Not Properly Functioning”. The geomorphology of this reach explains the high sediment levels in this area. This is a low gradient, depositional area below the glacial headlands and is a natural response or depositional reach. The banks in this reach have been very stable with excellent, vigorous riparian vegetation. There is no evidence of livestock concentration in this reach or adverse effects on the streambank from livestock. Field reviews above the East Fork/Mill Creek Road have not identified any areas of livestock concentration or adverse channel effects from livestock (Rieffenberger personal communications, 2010).



There is one Hayden Creek long term trend sediment monitoring site within the ESA Action Area. This site has 15 years worth of monitoring data. The last two years worth of data show sediment levels greater than 20%. This site is adjacent to a dispersed recreation camping site. Dispersed recreation is an important factor and the largest impact to the riparian area at this monitoring site. The trend line from 1993-2009 for the Hayden Creek 1A sediment monitoring site is entirely below 20%. It is my professional judgment that Hayden Creek within the ESA Action Area is “Functioning Appropriately”. The data and its trend graph indicate stream sediment is not a major limiting factor for fish production in Hayden Creek.



There are no streams within the Hayden Creek 5th field HUC that are listed as an IDWR 303(d) streams with pollutants, that includes sediment/siltation (IDEQ, 2008). It is my professional judgment that stream sediment conditions are not considered a major limiting factor to fish production within the ESA Action Area.

6.4.4 WIDTH: DEPTH RATIO

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

Data is limited for average wetted width/maximum depth ratio on streams within the ESA Action Area. The only ESA fish bearing stream with Range Program MIM monitoring of width:depth ratio (see Appendix C Table 22) is Hayden Creek at 20.4. This is higher than the PACFISH RMO of less than 10 (PACFISH EA, 1995), but below the 28.0 mean width:depth ratio for all geology “C” channel reach types (Rosgen, 1994) found in the *User’s Guide to Fish Habitat: Descriptions that Represent Natural Conditions in the Salmon River Basin, Idaho* (Overton, 1995). 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, from the Snake River Adjudication process that includes sites that have been permanently marked on three streams within the ESA Acton Area. This stream habitat data was collected between 1988 and 1990 and measured and located bankfull width and bankfull depths. The three streams and four monitoring sites within the ESA Action Area include Bear Valley Creek 1 (10.9), Bear Valley Creek 2 (29.3), East Fork of Hayden Creek 1A (9.9) and Hayden Creek 1A (11.0) (see Appendix C Table 14). The Bear Valley Creek 2 monitoring site has a high width to depth ratio because it is located on a reach of stream that includes a large gravel bar. This type of gravel bar is natural in this stream size with a low gradient "C" channel type. This Snake River Basin adjudication site is not a good representation of the Bear Valley Creek width:depth ratio and will not be a monitoring site for range analysis in the future. Even with the higher than desired 29.3 width:depth ratio it is only slight higher than the 28.0 mean width:depth ratio for all geology "C" channel reach types found in the *User's Guide to Fish Habitat: Descriptions that Represent Natural Conditions in the Salmon River Basin, Idaho* (Overton, 1995).

The past and current effects of the proposed project could have played 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 cattle 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 cattle 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 cattle 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 the three long term trend monitoring sites show high bank stability. It is my professional judgment that stream width:depth is *Functioning Appropriately* to *Functioning at Risk* on ESA stream reaches within the ESA Action Area.

It is my professional judgment that stream width:depth ratios are not considered a major limiting factor to fish production within the ESA Action Area.

6.4.5 STREAMBANK CONDITION

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

The Hayden Creek drainage is considered to be a PACFISH priority watershed, with an identified Riparian Management Objective (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" within Bear Valley Creek, East Fork of Hayden Creek and Hayden Creek.

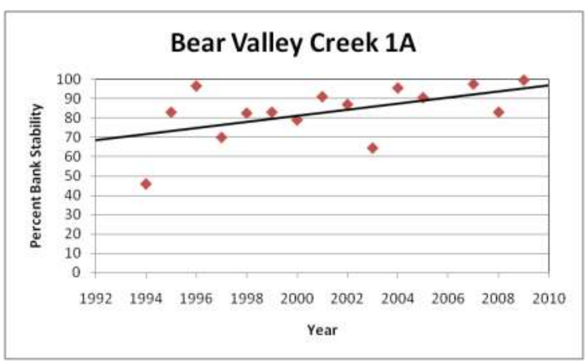
There are three long term trend streambank stability monitoring sites, within the ESA Action Area, that was started in 1994 and continue to be surveyed by the Forest's Watershed Program. These three sites are Bear Valley Creek 1A, East Fork Hayden Creek 2R and Hayden Creek 1A.

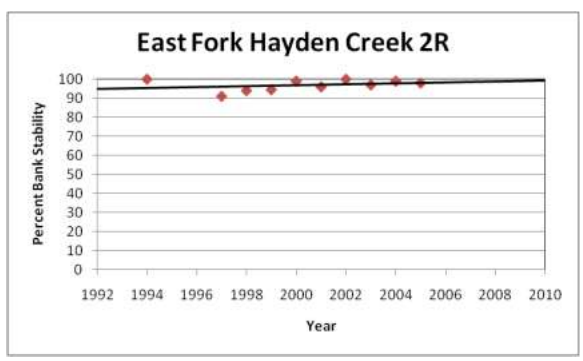
Table 8 - Percent Streambank Stability

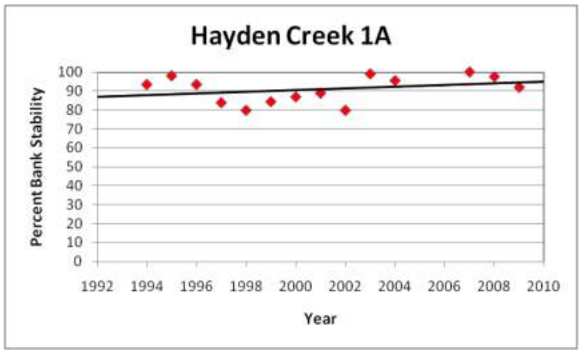
Percent Streambank Stability Recorded in the Upper Hayden Allotment from 1994 through 2009

Station	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Bear Valley Creek 1A		46.0	83.0	96.5	70.0	82.5	83.0	79.0	91.0	87.0	64.5	95.5	90.5		97.5	83	99.5
EF Hayden Creek 2R		100.0			91.0	94.0	94.5	99.0	96.0	100.0	97.0	99	98.0				
Hayden Creek 1A		93.5	98.0	93.5	84.0	80.0	84.5	87.0	89.0	80.0	99.0	95.5			100.0	97.5	92

Streambank conditions within the ESA Action Area have been monitored in association with sediment monitoring operations since 1994. Bank stability data has been above 90% at the Bear Valley Creek 1A monitoring site within the Bear Valley Creek exclosure four of the five last readings since 2004. In 2003 the low streambank stability reading is attributed to the Forest having the Upper Hayden Allotment permittee move cattle into the Bear Valley Creek Exclosure during the 2003 Tobias Fire. This scenario where a wildfire emergency requires permitted cattle to be moved into any exclosure is not being analyzed within this Biological Assessment and would require additional ESA consultation with NMFS and the USFWS. Bank stability data has been above 90% in easy East Fork Hayden Creek 2R in all ten readings since 1994. Bank stability data has been above 90% in Hayden Creek 1A in five out of five readings since 2003. The data and its trend graphs indicate bank stability is not a major limiting factor for fish production in Bear Valley Creek, East Fork Hayden Creek and Hayden Creek.







The ESA fish bearing streams with Range program MIM monitoring of stream bank stability (see Appendix C Table 22) in general show good bank stability. The MIM monitoring of bank stability does not always show bank stability greater than 90%, but in most all cases shows bank stability greater than 80%. There is not alot of MIM bank stability data on ESA fish streams within the ESA Action Area. At best there were three readings over an 18 year period. Using the limited MIM bank stability data from the Range program and the bank stability readings from the Watershed Program it is my professional judgment that streambank stability conditions are not considered a major limiting factor to fish production 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).

Riparian areas are considered to be Functioning Appropriately within the ESA Action Area. The riparian habitat conservation areas (RHCA) within the headwaters of Hayden Creek and its tributaries are largely untouched. These conservation areas provide adequate shade, large woody debris, habitat protection, and connectivity.

One RHCA location along Hayden Creek at the lower end of the ESA Action Area is largely influenced by motorized dispersed recreation camping. There are also two motorized developed recreation sites within an RCHA in the ESA Action Areas upper reaches of Bear Valley Creek. Motorized routes play an important role with negatively impacting RHCAs within the ESA Action Area.

Monitoring operations within the ESA Action Area indicate that of the seven sites monitored since 1992, five are in a static Greenline Ecological Status (GES) trend and two are in an upward GES trend.

Monitoring sites were established and subsequent monitoring has occurred on the Upper Hayden Allotment since the early 90's. Since that time, grazing management has evolved based upon management in reference to listed fish species which occur within the allotment. Greenline Ecological Status (GES) typically is the element in which interpretations of ecological status and trend will be discussed in the following:

Generally, of the seven sites monitored since the early 90's, 6 are in upward trend or at Late Seral/ PNC. The monitoring site on Hayden Creek is static at Mid Seral.

All sites will also have a monitoring attribute for bank alteration with an endpoint indicator not to exceed 20% (see Table 22).

Hayden Creek (M226): The downward trend on Hayden Creek in 2007 and static trend in 2009 is attributed to the 2003 Tobias Fire. Bank Alteration in 2009 was 4%. Low bank alteration indicates livestock use adjacent to the stream channel is minimal. In order to aid site recovery after the fire, the monitoring attribute is stubble height with an endpoint indicator of 6 inches.

Apple Creek (M262): GES is in an upward trend at Late Seral since the last reading in 1999. The streamside riparian area is heavily timbered and bouldered. Livestock do not use the riparian area except in small water gaps. The greenline is dominated by Spruce trees. Due to the conifer dominance, the best monitoring attribute to manage the site is bank alteration with an endpoint indicator not to exceed 20%.

Squaw Creek (M307): GES is static at Late Seral. The streamside riparian area is heavily timbered and bouldered. Livestock do not use the riparian area except in small water gaps. The greenline is dominated by Spruce trees. Due to the conifer dominance, the best monitoring attribute to manage the site is bank alteration with an endpoint indicator not to exceed 20%.

East Fork Hayden Creek (M261): GES is static at PNC. The streamside riparian area is dominated by Willows. Livestock have limited access to stream because the riparian area is dominated by conifer overstory with downfall and thick willow areas. Due to the willow dominance, the best monitoring attribute to manage the site is browse use with an endpoint indicator not to exceed 30%.

Tobias Creek (M260): GES is static at PNC. The streamside riparian area is woody and bouldered with under growth of Carex. Livestock do not use the riparian area except in small water gaps. Due to the well established Carex under growth, the best monitoring attribute to manage the site is stubble height with an endpoint indicator of 5 inches.

Kadletz Creek (M258): GES is static at Late Seral. The streamside riparian area is heavily timbered and bouldered. Livestock do not use the riparian area except in small water gaps. This monitoring site does not meet current greenline protocol. This monitoring site will continue to be a photo trend site. A new greenline site will be established in an upper meadow area on Kadletz Creek. This new site will have a monitoring attribute of stubble height with an endpoint indicator of 5 inches.

Ford Creek (M259): GES is in an upward trend at PNC. The streamside riparian area is very woody and the streambanks are armored with boulders. Livestock do not use the riparian area except in small water gaps. Due to woody dominance, the best monitoring attribute to manage the site is browse use with an endpoint indicator not to exceed 30%.

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 (Bengeyfield, 2006).

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

7 ANALYSIS OF EFFECTS

This section contains the effects analysis. The effects of the proposed action are described below and summarized in Table 11. 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 cows to the uplands enough to significantly reduce uncovered and unstable streambanks.

- Herding: Using riders to keep livestock away from riparian areas can avoid direct impacts to spawning fish and incubating redds.

- Utilization Standards: Establishing utilization standards for forage utilization and moving livestock when these standards are approached or reached, can help avoid many of the adverse effects that livestock grazing can have on fish and their habitat.

The Forest has integrated each of these measures into its grazing strategy for the Upper Hayden 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 fence range improvements, displayed in Figure 2, will help keep cows in areas where they are suppose to be and keep cows 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 cows throughout a given unit to minimize the time cows 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 cattle off stream channels such as fencing, off channel salting or employment of riders, or natural inaccessibility of streams channels due to topography or dense riparian vegetation.

Chinook salmon, steelhead and bull trout all spawn within certain stream reaches of the Upper Hayden Allotment (see Figures 4, 5 & 6) and it is possible that livestock could trample redds in these streams if grazing occurs when fish are spawning or eggs are incubating within stream substrates. Effects to ESA listed fish species spawning and incubation within the Upper Hayden Allotment are discussed individually below.

7.1.1.1 CHINOOK SALMON

There is currently Chinook salmon spawning in two streams within the ESA Action Area (see Figure 4). Chinook salmon spawning currently occurs in Bear Valley Creek. Since 2005, IDFG has only found one Chinook salmon redd in Hayden Creek within the ESA Action Area (Appendix C Figures 8-11). A breakdown of Chinook salmon stream miles, within the ESA Action Area, and by unit can be seen in Table 19 and Table 20.

<u>Analysis Assumptions:</u>

- Chinook salmon begin spawning within the allotment in the fourth week of August.
- Chinook salmon eggs are incubating in the stream through the end of April.
- When cattle are grazing in the Tobias/Mogg, Payne/Ford, Boulder Flat or Kadletz Creek units starting the fourth week of August there is the potential for cattle to step on Chinook salmon 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 cows can graze.
- A Chinook salmon stream does not have 100% available spawning habitat.

- When a cow steps on a Chinook salmon 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 Chinook salmon.
- Mapped range improvements will help minimize and/or eliminate potential cattle impacts to Chinook salmon (see Figure 2).

Bear Valley Creek:

Bear Valley Creek has more and better suitable spawning habitat for Chinook salmon compared to Hayden Creek, within the ESA Action Area. During the last nine years Idaho Fish and Game has completed Chinook salmon redd surveys in Bear Valley Creek they found the following number of redds per year: 2001 (7), 2002 (1), 2003-2007 (0), 2008 (1) and 2009 (0). The BLM/Forest Service documented two Chinook salmon redds in Bear Valley Creek in 2002 (Trapani, 2002).

The Bear Valley Creek Fence Exclosure was built to specifically keep cows out of the highest quality spawning and rearing fish habitat in Bear Valley Creek. This exclosure will be maintained to keep cows out the approximate 1.2 miles of Bear Valley Creek.

There is also a Ford drift fence that was built to keep cows grazing in the Payne/Ford unit in Year 1 and Year 4, in the Unit Rotation Scheme, from drifting down off a hot dry grassy slope in late summer to the cooler wet more lush vegetation along Bear Valley Creek downstream of the exclosure. Although this drift fence does help keep cows up and away from Bear Valley Creek it does not totally prevent cows from accessing Bear Valley Creek below the exclosure.

There is some potential for cattle to step on a Chinook salmon redd and/or disturb or harass spawning adults in Bear Valley Creek within the ESA Action Area. There are conservation measures built into the management of this allotment to prevent or minimize the potential for cattle to trample Chinook salmon redd(s) (see Section 3.2.4). Although the potential for a cow to step on a Chinook salmon redd(s) is low one cannot say there is no potential for a cow to step on a Chinook salmon redd in Hayden Creek.

There are potential impacts to spawning Chinook salmon and redd(s) from active trailing when cattle cross Hayden Creek while moving from the Payne/Ford unit to the Boulder Flat unit during spawning and incubation. Duration of move is less than ½ day. Trailing across Hayden Creek while exiting the allotment to the home ranch will occur during spawning and incubation. Duration of move is less than ½ day.

Hayden Creek:

There is one cattle crossing area, at a ford crossing along an existing road prism, on the lower reaches of Hayden Creek within the ESA Action Area. This crossing is used nine out of ten years to move cattle on to the allotment and every year to move cattle off the allotment. Chinook salmon have the potential to spawn at this Hayden Creek crossing area. If a Chinook salmon redd(s) was constructed at this crossing area there would be a high potential that the redd(s) would be trampled while cattle were using the crossing to go home off the allotment before September 30th. Outside of the cattle crossing area, there is very little potential for cattle to step on a Chinook salmon redd and/or disturb or harass spawning adults because steep terrain, stream gradient, and dense riparian vegetation limit cattle access in Hayden Creek, within the ESA Action Area,. Although the potential is low one cannot say there is no potential for cattle to step on a Chinook salmon redd and/or disturb/harass spawning adults in Hayden Creek.

<u>Payne/Ford Unit:</u>

- Livestock will be in the unit after August 23rd between 2 and 5 weeks two out of five years.
- Livestock will be in the unit between July 7th and August 15th one out of five years.
- There are no active trailing concerns with Bear Valley Creek, the only ESA fish spawning stream within this unit.

<u>Kadletz Creek Unit:</u>

- Livestock will be in the unit after August 23rd for up to 3 weeks two out of five years.
- Livestock will be in the unit between July 7th and August 15th two out of five years.
- There are three ESA fish spawning streams within this unit; Bear Valley Creek, Kadletz Creek and Wright Creek. Bear Valley Creek has no active trailing concerns. There will be the potential for cattle to trample bull trout redds in both Kadletz Creek and Wright Creek two out of five years during active trailing.

<u>Tobias/Mogg Unit:</u>

- Livestock will be in the unit after August 23rd between 1 and 2 weeks four out of five years.
- There are five ESA fish spawning streams within this unit; Carol Creek, Cooper Creek, East Fork of Hayden Creek, Hayden Creek and Mogg Creek. There are no active trailing concerns associated with the five ESA fish spawning streams within this unit.

<u>Boulder Flat Unit:</u>

- Livestock will be in the unit after August 23rd between 1 and 2 weeks three out of five years.
- There are two ESA fish spawning streams within this unit; East Fork of Hayden Creek and Hayden Creek. Every year cattle are actively trailed off the allotment at a crossing on Hayden Creek and on the East Fork of Hayden Creek. This active trailing takes place along an existing road prism. These two crossings take place on Hayden Creek approximately 400 feet upstream of the confluence with the East Fork of Hayden Creek and on the East Fork of Hayden Creek approximately 800 feet upstream from the confluence with Hayden Creek. There is potential spawning habitat in Hayden Creek at this crossing. The crossing on the East Fork of Hayden Creek does not provide potential spawning habitat because the stream gradient is too steep and the substrate is too large.

<u>Upper Hayden Unit:</u>

- Only 100 cow/calf pairs will be in the unit any year, the remainder of the herd will be in another unit at the same time.
- There are five ESA fish spawning streams within this unit; Bray Creek, Carol Creek, Hayden Creek, Paradise Creek and West Fork of Hayden Creek. There are no active trailing concerns associated with the five ESA fish spawning streams within this unit.

<u>Conclusion:</u>

Cattle have some potential to access both Hayden Creek and Bear Valley Creek at a time when there could be spawning Chinook salmon or constructed redds with eggs in the gravel. Therefore it is my professional judgment cattle have the potential to step on Chinook salmon redd(s) and/or disturb/harass spawning adults within the ESA Action Area.

7.1.1.2 STEELHEAD

Steelhead spawning is currently believed to occur in Bear Valley Creek, Bray Creek, East Fork Hayden Creek, Hayden Creek, Kadletz Creek, West Fork Hayden Creek and Wright Creek within the ESA Action Area. Very little is known about steelhead spawning within the ESA Action Area. Steelhead spawning surveys are very difficult to effectively or safely accomplish because of the time of the year steelhead spawn. Steelhead spawn at a time when higher elevation streams on National Forest System lands are difficult to get to because of snow and ice conditions both on the roads and in the riparian areas. When steelhead are spawning, streams are on the rise and most of the time turbid making it difficult to see redds. There is suitable steelhead spawning habitat on seven streams within the ESA Action Area (see Figure 5).

A breakdown of steelhead stream miles, within the ESA Action Area, and by units can be seen in Table 15 and Table 16.

<u>Analysis Assumptions:</u>

- Steelhead begin spawning within the allotment in the third week in March.
- Steelhead eggs are incubating in the stream through the first week of July.
- When cattle are grazing in the Boulder Flat, Kadletz Creek, Payne/Ford, Tobias/Mogg and Upper Hayden units before the second week of July there is the potential for cattle to step on steelhead redds unless there is a natural physical barrier or a human constructed physical barrier, like a fence, between the stream and where the cattle can graze.
- Cattle are put on the allotment July 1 and steelhead stop spawning the second week in June so there is no potential for cattle to disturb or harass spawning adult steelhead within the ESA Action Area.
- A steelhead stream does not have 100% available spawning habitat.
- When a cow steps on a 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 steelhead.
- Steelhead eggs are incubating in the stream through the first week in July. Cattle are put on the allotment July 1. This potentially allows for cattle to only have one week to step on steelhead redds.
- The first few weeks the cattle are on the allotment there is plenty of quality upland forage for cattle. The air temperatures are not extremely high which might have forced cows down to cooler riparian areas. There are ample water supplies for cows this time of year. The steelhead spawning streams in early July usually have higher stream flows which tend to discourage cows and calves from walking in the stream as they would later in the summer when the air temperatures are hotter and the stream flows are lower. All of this assumes there is very little potential for a cow to trample a steelhead redd within the ESA Action Area. Although there is very little

potential for a cow to step on a steelhead one can't say there is no potential for a cow to step on a steelhead redd.

- Mapped range improvements will help minimize and/or eliminate potential cattle impacts to steelhead.

Bear Valley Creek:

Bear Valley Creek has more and better suitable spawning habitat for steelhead compared to Hayden Creek, within the ESA Action Area.

The Bear Valley Creek Fence Exclosure was built to specifically keep cows out of the highest quality spawning and rearing fish habitat in Bear Valley Creek. This exclosure will be maintained to keep cows out the approximate 1.2 miles of Bear Valley Creek.

There is also a Ford drift fence that was built to keep cows grazing in the Payne/Ford unit in Year 1 and Year 4, in the Unit Rotation Scheme, from drifting down off a hot dry grassy slope in late summer to the cooler wet more lush vegetation along Bear Valley Creek downstream of the exclosure. Although this drift fence does help keep cows up and away from Bear Valley Creek it does not totally prevent cows from accessing Bear Valley Creek below the exclosure.

There is some potential for cattle to step on a steelhead redd and/or disturb or harass spawning adults in Bear Valley Creek within the ESA Action Area. There are conservation measures built into the management of this allotment to prevent or minimize the potential for cattle to trample steelhead redd(s) (see section 3.2.4). Although the potential for cattle to step on a steelhead redd(s) is low one cannot say there is no potential for cattle to step on a steelhead redd in Hayden Creek.

Hayden Creek:

There is one cattle crossing area, at a ford crossing along an existing road prism, on the lower reaches of Hayden Creek within the ESA Action Area. This crossing is used nine out of ten years to move cattle on to allotment and every year to move cattle off the allotment. Although there has not been a steelhead redd documented at the crossing area you cannot discount the possibility that in the future there could be a redd(s) constructed at this crossing. If a steelhead redd(s) was constructed at this crossing area there would be a high potential that the redd(s) would be trampled while cattle were using the crossing to come on to the allotment July 1st.

Outside of the cattle crossing area, there is very limited potential for cattle to step on a steelhead redd and/or disturb or harass spawning adults because steep terrain, stream gradient, and dense riparian vegetation limit cattle access in Hayden Creek, within the ESA Action Area,. Although the potential is low one cannot say there is no potential for cattle to step on a steelhead redd and/or disturb/harass spawning adults in Hayden Creek.

Potential Spawning within Units

Payne/Ford Unit:

- Steelhead: Livestock will be in the unit up to 1 week during steelhead spawning & incubation one out of five years.
- Livestock will be in the unit between July 7th and August 15th one out of five years.
- There are no active trailing concerns with Bear Valley Creek, the only ESA fish spawning stream within this unit.

Kadletz Creek Unit:

- Livestock will be in the unit up to 1 week during steelhead spawning & incubation one out of five years.
- Livestock will be in the unit between July 7th and August 15th two out of five years.
- Bear Valley Creek has no active trailing concerns. There will be the potential for cattle to trample steelhead redds in both Kadletz Creek and Wright Creek one out of five years during active trailing.

Tobias/Mogg Unit:

- Livestock will never be in the unit before July 7th.
- There are five ESA fish spawning streams within this unit; Carol Creek, Cooper Creek, East Fork of Hayden Creek, Hayden Creek and Mogg Creek. There are no active trailing concerns associated with the five ESA fish spawning streams within this unit.

Boulder Flat Unit:

- Livestock will be in the unit up to 1 week during steelhead spawning & incubation one out of five years.
- There are two ESA fish spawning streams within this unit; East Fork of Hayden Creek and Hayden Creek. There are no active trailing concerns associated with the two ESA fish spawning streams within this unit.

Upper Hayden Unit:

- Only 100 cow/calf pairs will be in the unit any year, the remainder of the herd will be in another unit at the same time.
- There are five ESA fish spawning streams within this unit; Bray Creek, Carol Creek, Hayden Creek, Paradise Creek and West Fork of Hayden Creek. There are no active trailing concerns associated with the five ESA fish spawning streams within this unit.

Conclusion:

There is no potential for cattle to disturb or harass spawning adult steelhead within the ESA Action Area because of the time steelhead are done spawning and the time when the cattle are moved on to the allotment. There is a short window, approximately one week, of opportunity for a cow to step on a steelhead redd within the ESA Action Area. The steelhead spawning streams, within the ESA Action Area, in early July usually have higher stream flows which tend to discourage cows and calves from walking in the stream as they would later in the summer when the air temperatures are hotter and the stream flows are lower. This factor greatly reduces the potential for a cow to step on a steelhead redd within the ESA Action Area.

Although there is no potential for cattle to disturb or harass spawning adult steelhead within the ESA Action Area, it is my professional judgment there is some potential for cattle to step on steelhead redds within the ESA Action Area.

7.1.1.3 BULL TROUT

Bull trout spawning is currently known or believed to occur in Bear Valley Creek, Bray Creek, Carol Creek, Cooper Creek, East Fork Hayden Creek, Hayden Creek, Kadletz Creek, Mogg Creek, Paradise Creek, West Fork Hayden Creek and Wright Creek within the ESA Action Area. There is suitable bull trout spawning habitat on eleven streams within the ESA Action Area (see Figure 6).

There have been bull trout redd survey data collected by IDFG since 2006 in Bear Valley Creek, East Fork of Hayden Creek, Hayden Creek and Wright Creek (see 10). A breakdown of bull trout stream miles, within the ESA Action Area, and by units can be seen in Table 17 and Table 18.

<u>Analysis Assumptions:</u>

- Bull trout begin spawning within the allotment on August 15th.
- If cattle are grazing in a unit past August 15th that has a bull trout stream there is the potential for cows 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 cows can graze.
- 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.
- When a cow steps 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 bull trout.
- 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 the bull trout unit. This means in any given year not all bull trout redds are susceptible to cattle trampling within the Upper Hayden 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.

Table 10 - Hayden Creek Drainage Bull Trout Redd Count Summary, 2006-2009. (IDFG, 2008 pg.55 & IDFG, 2009)

Stream	2006 bull trout redds	2007 bull trout redds	2008 bull trout redds	2009 bull trout redds	3 or 4 year average bull trout redds	Miles Surveyed by IDFG	Estimated bull trout redds/mile
Hayden Creek	113	141	49	22	81	16.6	5
East Fork Hayden Creek	49	52	61	65	57	0.5	114
Bear Valley Creek	86	140	48	51	81	3.1	26
Wright Creek	10	6	4	No Data	7	0.2	35

The Apple Creek Unit is the only unit on the allotment that does not have a bull trout stream.

Bear Valley Creek:

Bear Valley Creek has documented fluvial bull trout spawning. The Bear Valley Creek Fence Exclosure was built to specifically keep cows out of the highest quality spawning and rearing fish habitat in Bear Valley Creek. This exclosure will be maintained to keep cows out the approximate 1.2 miles of Bear Valley Creek.

There is also a Ford drift fence that was built to keep cows grazing in the Payne/Ford Unit in Year 1 and Year 4, in the Unit Rotation Scheme, from drifting down off a hot dry grassy slope in late summer to the cooler wet more lush vegetation along Bear Valley Creek downstream of the exclosure. Although this drift fence does help keep cows up and away from Bear Valley Creek it does not totally prevent cows from accessing Bear Valley Creek below the exclosure.

Hayden Creek:

Hayden Creek has documented fluvial bull trout spawning. There is one cattle crossing area, at a ford crossing along an existing road prism, on the lower reaches of Hayden Creek within the ESA Action Area. This crossing is used nine out of ten years to move cattle on to the allotment and every year to move cattle off the allotment. Although there has not been a bull trout redd documented at the crossing area you cannot discount the possibility that in the future there could be a redd constructed at this crossing. If a bull trout redd(s) was constructed at this crossing area there would be a high potential that the redd(s) would be trampled while cattle were using the crossing to go home off the allotment before September 30th. Although the potential for cattle to trample a bull trout redd(s) at this location is low, since no redds have ever been documented at this crossing, one cannot say there is no potential for cattle to step on a bull trout redd at this active trailing crossing on Hayden Creek.

Potential Spawning within Units

Payne/Ford Unit:

- Livestock will be in the unit after August 15th between 3 and 6 weeks two out of five years.
- Livestock will be in the unit between July 7th and August 15th one out of five years.
- There are no active trailing concerns with Bear Valley Creek, the only ESA fish spawning stream within this unit.

Kadletz Creek Unit:

- Livestock will be in the unit after August 15th for up to 4 weeks one out of five years.
- Livestock will be in the unit between July 7th and August 15th two out of five years.
- Bear Valley Creek has no active trailing concerns. There will be the potential for cattle to trample bull trout redds in both Kadletz Creek and Wright Creek two out of five years during active trailing.

Tobias/Mogg Unit:

- Livestock will be in the unit after August 15th between 2 and 3 weeks four out of five years.
- There are five ESA fish spawning streams within this unit; Carol Creek, Cooper Creek, East Fork of Hayden Creek, Hayden Creek and Mogg Creek. There are no active trailing concerns associated with the five ESA fish spawning streams within this unit.

Boulder Flat:

- Livestock will be in the unit after August 15th between 2 and 3 weeks three out of five years.
- There are two ESA fish spawning streams within this unit; East Fork of Hayden Creek and Hayden Creek. Every year cattle are actively trailed off the allotment at a crossing on Hayden Creek and on the East Fork of Hayden Creek. This active trailing takes place along an existing road prism. These two crossings take place on Hayden Creek approximately 400 feet upstream of the confluence with the East Fork of Hayden Creek and on the East Fork of Hayden Creek approximately 800 feet upstream from the confluence with Hayden Creek. There is potential spawning habitat in Hayden Creek at this crossing. The crossing on the East Fork of Hayden Creek does not provide potential spawning habitat because the stream gradient is too steep and the substrate is too large. Because there is potential spawning habitat at the Hayden Creek crossing there is potential at some time in the future for a bull trout to spawn at this crossing. Therefore there is potential for cattle to trample a bull trout redd(s) and/or disturb/harass spawning adults at this crossing when cattle are actively trailed home at the end of the season.

Upper Hayden:

- Livestock will be in the unit after August 15th between 2 and 6 weeks four out of five years.

- Only 100 cow/calf pairs will be in the unit any year, the remainder of the herd will be in another unit at the same time.
- There are five ESA fish spawning streams within this unit; Bray Creek, Carol Creek, Hayden Creek, Paradise Creek and West Fork of Hayden Creek. There are no active trailing concerns associated with the five ESA fish spawning streams within this unit.

Conclusion:

Five out of the six units within the Allotment will at some time over the 5 year unit rotation scheme present the opportunity for cattle to disturb or harass spawning adult bull trout or to step on bull trout redds because cattle will be grazing in a unit that has a stream where bull trout are spawning. It is my professional judgment that there is some potential, but it is difficult to quantify, for cattle 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 Upper Hayden 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. Monitoring data indicates that riparian conditions are generally in static to upward trend, and width:depth ratios are within the natural range of variability. Both of those focus indicators can play a part in stream temperatures.

The proposed action includes conservation measures that will help minimize or eliminate cattle grazing away from some stream reaches, which will result in livestock having even less potential impact on stream temperatures than has occurred in the past (see Section 3.2.4). 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 cattle use across a larger area to minimize or eliminate cattle grazing impacts on riparian vegetation that directly or indirect 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 cattle graze riparian shrubs that provide localized streamside shading. However, because of the expected effectiveness of the project design and associated conservation measures in reducing cattle 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 recent and future livestock grazing within the Upper Hayden 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 Upper Hayden Allotment is not currently considered to be a significant factor influencing sediment levels. Large stretches of many streams within the ESA Action Area are excluded from livestock use because access to these streams and riparian areas are limited and undesirable because of steep channel topography, riparian areas that have dense overstory conifer riparian areas with blow down making cattle movement difficult to impossible and generally unsuitable forage conditions.

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.

Periodic elevated sediment levels observed within the Hayden Creek monitoring site are considered attributable to high flow impacts to depositional areas of the stream.

Turbidities associated with active 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. While elevated stream sediment levels have periodically occurred at locations within the Upper Hayden Allotment in response to high flow events, 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 cows 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 cattle 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. The proposed action is expected to maintain the condition of the Sediment Focus Indicator.

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.

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 Upper Hayden 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 cows 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 cattle 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 streams within the Upper Hayden Allotment indicate percent streambank stability data shows that all three streams are in an upward trend with ten out eleven readings, since 2004, over 90% and one reading at 83%.

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 Upper Hayden 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 alternating unit rotations, 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 Upper Hayden 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 cows occasionally step on streambanks. However, because of the expected effectiveness of the project design and associated conservation measures in reducing cattle presence near streams, it is my professional judgment those impacts will be widely distributed across the landscape, individually minor in nature, and cumulatively immeasurable at the watershed scale. The proposed action is expected to maintain the condition of the Streambank Focus Indicator both within the ESA Action Area and at the 5th field HUC scale.

7.1.6 RIPARIAN CONSERVATION AREAS

The condition of riparian areas can have important affects on fish populations. Livestock grazing can impact riparian areas (see section 6.4.7) by direct reduction or altering of riparian vegetation and/or by impacting protective streambank cover (Platts and Nelson, 1989). Livestock grazing primarily impacts the riparian conditions in the areas that are grazed by livestock.

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

Conclusion:

Generally, of the seven sites monitored since the early 90's, 6 are in an upward trend or at Late Seral/ PNC. The monitoring site on Hayden Creek is static at Mid Seral because the 2003 Tobias Fire burned hot through the riparian area removing most all streamside vegetation. In order to aid the riparian site recovery after the fire, the monitoring attribute is stubble height with an end point indicator of 6 inches instead of 4 inches.

The direct and indirect effects of the proposed actions on riparian conservation areas are not able to be meaningfully measured, detected or evaluated, and are therefore insignificant. We recognize there could be localized impacts to riparian conservation areas when cows graze within a riparian conservation area. However, because of the expected effectiveness of the project design and associated conservation measures in reducing cattle 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 Focus Indicator both within the ESA Action Area and at the 5th field HUC scale.

7.2 CUMULATIVE EFFECTS

The definition of cumulative effects as used for Section 7 consultation under the Endangered Species Act are "those effects of *future State or private activities*, not involving Federal activities, that are *reasonably certain to occur* within the ESA Action Area" (50 CFR§402.02, emphasis added). This definition should not be confused with the definition that is used for the National Environmental Policy Act and other environmental laws. In this context, cumulative effects apply only to future state and private activities that are reasonably certain to occur. Furthermore, if an activity is currently occurring and will likely continue to occur in the future with similar effects, it is not considered under cumulative effects because it has already been considered in the description of baseline conditions.

There are no State or private lands within the ESA Action Area. Therefore, there are no cumulative effects associated with this proposed action.

7.3 SUMMARY OF EFFECTS

The effects analysis identifies a non-discountable potential for direct impact of livestock on spawning Chinook salmon, steelhead and 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. 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 indicators at their current levels of functionality.

Table 11 summarizes the effects of the proposed Upper Hayden 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 11 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 11 - Effects Summary for Upper Hayden Allotment Grazing Activities

Pathway	Indicators	Functionality Of Baseline 1/	Response Column A Will the proposed action or any interrelated or interdependent actions likely generate any direct or indirect effects to this indicator?			Response Column B Are these effects expected to exceed beneficial, insignificant, or discountable?		
			CH	SH	BT	CH	SH	BT
Subpopulation Characteristics (bull trout only)	Subpopulation Size	FR	NA	NA	YES	NA	NA	YES
	Growth and Survival (including incubation survival)	FA	NA	NA	YES	NA	NA	YES
	Life History Diversity and Isolation	FA	NA	NA	NO	NA	NA	NO
	Persistence and Genetic Integrity	FA	NA	NA	NO	NA	NA	NO
Water Quality	Temperature	FA	YES	YES	YES	NO	NO	NO
	Sediment	FA to FUR	YES	YES	YES	NO	NO	NO
	Chemical Characteristics	FA	NO	NO	NO	NO	NO	NO
Habitat Access	Physical Barriers	FR	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 1/	Response Column A Will the proposed action or any interrelated or interdependent actions likely generate any direct or indirect effects to this indicator?			Response Column B Are these effects expected to exceed beneficial, insignificant, or discountable?		
			CH	SH	BT	CH	SH	BT
Channel Condition and Dynamics	Width:Depth Ratio	FA to FR	YES	YES	YES	NO	NO	NO
	Streambank Condition	FA	YES	YES	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	FUR	NO	NO	NO	NO	NO	NO
	Riparian Conservation Areas	FA	YES	YES	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)	FA	NA	NA	Yes	NO	NO	NO

1/ Hayden Creek 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 11). The specific determinations are identified below and summarized in Table 12.

8.1 SNAKE RIVER SPRING/SUMMER CHINOOK SALMON

The effects analysis concluded that the proposed action may have direct effects on Chinook salmon or Chinook salmon 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 Chinook salmon redds and/or the potential for cattle to disturb or harass potential spawning adult Chinook salmon within ESA Action Area streams. Therefore, it is my determination the proposed action results in a “MAY AFFECT, LIKELY TO ADVERSELY AFFECT” 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 may have direct effects on incubating steelhead 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 steelhead redds and/or the potential for cattle to disturb or harass potential spawning adult steelhead within ESA Action Area streams. Therefore, it is my determination the proposed action results in a “MAY AFFECT, LIKELY TO ADVERSELY AFFECT” determination for steelhead.

The effects analysis concluded that the proposed action may have some effects on steelhead 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 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 cattle to disturb or harass potential spawning adult bull trout within ESA Action Area streams. 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 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 bull trout proposed designated critical habitat.

8.4 SNAKE RIVER SOCKEYE SALMON

The ESA Action Area does not contain sockeye salmon or sockeye salmon designated critical habitat. Therefore, it is my determination the proposed action results in a “NO EFFECT” determination for sockeye salmon and a “NO EFFECT” determination for designated sockeye salmon critical habitat.

8.5 ESSENTIAL FISH HABITAT

The Magnuson-Stevens Fishery Conservation and Management Act requires federal agencies to evaluate the impact of actions authorized, funded, or undertaken by the agency that may adversely affect the essential fish habitat of commercially harvested species. Within the scope of this action this includes Chinook salmon. Based on the above analysis, the proposed action “WILL NOT ADVERSELY AFFECT” Chinook salmon Essential Fish Habitat.

Table 12 - Effects Determination Summary for Upper Hayden Allotment Grazing Activities

	Chinook Salmon			Steelhead		Bull Trout		Sockeye Salmon	
	Species	Designated Critical Habitat	Essential Fish Habitat	Species	Designated Critical Habitat	Species	Designated Critical Habitat	Species	Designated Critical Habitat
Determination [1]	Likely to Adversely Affect	Not Likely to Adversely Affect	Not Likely to Adversely Affect	Likely to Adversely Affect	Not Likely to Adversely Affect	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 or proposed critical habitat.

All of the above effects determinations in Table 12 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.

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

References

Belsky, J., A. Matzke, and S. Uselman. 1997. Survey of livestock influences on stream and riparian ecosystems in the western United States. Oregon Natural Desert Association. 38 p.

Bengeyfield, P. 2006. Managing cows with streams in mind. Rangelands, 28(1). pp. 3-6.

Bjorn, T.C., 1978 Survival, Production, and Yield of Trout and Chinook Salmon in the Lemhi River, Idaho. College of Forestry, Wildlife and Range Sciences, University of Idaho, February 1978 Bulletin Number 27

Bjornn, T.C. and Reiser, D.W. 1991. Habitat Requirements of Salmonids in Streams IN Meehan, W.R. ed Influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitats, American Fisheries Society. Bethesda, Maryland

Bjornn, T.C., C.A. Perry and L.M. Garmann, 1998 Deposition of fine sediments in substrates and their effects on survival of trout embryos. Idaho Cooperative Fish and Wildlife Research Unit Technical Report 98-1. University of Idaho. February 1998

Burton, T.A., S.J. Smith and E.R. Crowley. 2008. Monitoring Stream Channels and Riparian Vegetation Multiple Indicators. Interagency Technical Bulletin Version 5.0. USDA Forest Service, USDI Bureau of Land Management. April,2008.

Clary, W. P. and B. F. Webster. 1989. Managing grazing of riparian areas in the Intermountain Region. General Technical Report INT-263, U.S. Dept.of Agriculture, USFS, Intermountain Research Station, Ogden, Utah. 11 p.

Clary, Warren P. 1999. Stream channel and vegetation responses to late spring cattle grazing. Journal of Range Management, Vol. 52, No. 3 (May, 1999), pp. 218-227.

Edwards, Joshua. 2009. Upper Big Lost Grazing Effectiveness of Annual Indicators. Draft powerpoint available at the Lost River Ranger Station, Salmon-Challis NF, Mackay, ID.

Ehrhart, R.C. and P.L. Hansen. 1997. Effective cattle management in riparian zones: a field survey and literature review. USDI, Bureau of Land Management, Montana State Office. November

Gamett, B, L. 2002. The relationship between water temperature and bull trout distribution and abundance. Utah State University. Logan, Utah. 2002.

Gregory, J.S. and B.L. Gamett. 2009. Cattle trampling of simulated bull trout redds. North American Journal of Fisheries Management 29:361.

Idaho Department of Environmental Quality. 2008.

Hall, Frederick C., and Larry Bryant. 1995. Herbaceous stubble height as a warning of impending cattle grazing damage to riparian areas. Gen. Tech. Rep. PNW-GTR-362. Portland, OR. U.S. Department of agriculture, Forest Service, Pacific Northwest Research Station. 9 p.

Kauffman, J. B. and W. C. Krueger. 1984. Livestock impacts on riparian ecosystems and streamside management implications - a review. Journal of Range Management 37(5):430-438.

Kovalchik, Bernard L., and Wayne Elmore. 1991. Effects of cattle grazing systems on willow dominated plant associations in central Oregon. In: Proceedings-Symposium on ecology and management of riparian shrub communities. Compiled by Warren P Clary, E. Durant McArthur, Don Bedunah, and Carl L.Wambolt. May 29-31 1991, Sun Valley, ID. USDA Forest Service General Technical Report INT-289, Intermountain Research Station, Ogden, UT. pp. 111-119.

Lee, D. C., J. R. Sedell, B. R. Rieman, R. F. Thurow, J. E. Williams, [and others]. 1997. In: Quigley, T.M.; S.J. Arbelbide, An assessment of ecosystem components in the interior Columbia basin and portions of the Klamath and Great Basins: vol. 3, ch. 4. Gen. Tech. Rep. PNW-GTR-405. Portland, Oregon: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 1058–1496.

McInnis, M.L. and J. McIver. 2001. Influence of off-stream supplements on streambanks of riparian pastures. Journal of Range Management 54(4). 4p.

Menke, J. (ed.). 1977. Symposium on livestock interactions with wildlife, fish and the environment. Sparks, Nevada. USDA Forest Service Pacific Southwest Forest and Range Experiment Station. Berkeley, California.

Mosley, J.C., P.S. Cook, A.J. Griffis, and J. O'Laughlin. 1997. Guidelines for managing cattle grazing in riparian areas to protect water quality: review of research and best management practices policy. Idaho Forest, Wildlife and Range Policy Analysis Group, Report No. 15. Idaho Forest, Wildlife and Range Experiment Station, University of Idaho. 67pp. Available at http://www.cnrhome.uidaho.edu/pag/.

Myers, Lewis H.1989. Grazing and riparian management in southwestern Montana. In: Practical approaches to riparian resource management: An educational workshop. Edited by Robert E. Gresswell, Bruce A. Barton, and Jeffrey L. Kershner, Editors). May 8-11, Billings, MT BLM-MT-PT-89-00l-4351. Bureau of Land Management, Washington, DC. pp. 117-120.

Overton, K. et.al, 1995. User's Guide to Fish Habitat: Descriptions that Represent Natural Conditions in the Salmon River Basin, Idaho USDA Forest Service, Intermountain Research Station, General Technical Report INT-GTR-322, August 1995 page 68

Platts, W.S and R.L. Nelson, 1989. Stream Canopy and its relation to salmonid biomass in the Intermountain West. North American Journal of Fisheries Management 9:446-457

Platts, W.S. 1991. Livestock Grazing. IN Meehan, W.R. ed Influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitats, American Fisheries Society. Bethesda, Maryland

Rieffenberger, B. 2010. Personal Communication email regarding East Fork of Hayden Creek Stream Sediment Data; February 1, 2010

Rosgen, D.L., 1994. A classification of natural rivers. In: Catena. An interdisciplinary journal of soil science, hydrology, geomorphology focusing on geoecology and landscape evolution. Vol 22. No 3. June 1994.

Schultz, T. T. and W. C. Leininger. 1990. Differences in riparian vegetation structure between grazed areas and exclosures. Joumal of Range Management 43: 295-299.

Simon, Ronna. 2008. Streambank Alteration Measurement and Implementation, Final, Bridger-Teton National Forest. Unpublished paper on file at the Bridger-Teton NF Supervisor's Office, Jackson, WY. 19 pp.

Stowell, R. et.al. 1983. Guide for Predicting Salmonid Response to Sediment Yields in Idaho Batholith Watersheds. August 1983

Trapani, J. 2002. Hayden Creek Chinook salmon Spawning Survey; September 5, 2002

Trapani, J. 2004. Hayden Creek Chinook salmon Spawning Survey; September 9, 2004

Upper Salmon Basin Watershed Project Technical Team, 2005. Upper Salmon River Recommended Instream Work Windows and Fish Periodicity. For River Reaches and Tributaries Above the Middle Fork Salmon River Including the Middle Fork Salmon River Drainage. Revised November 30, 2005.

USDA, Forest Service, 1995. Goals, objectives, and standard/guidelines as described in the EA and subsequent FONSI and DN/DR for the Interim Strategies for Managing Anadromous Fish Producing Watersheds on Federal Lands in eastern Oregon, Washington, Idaho, and Portions of California, PACFISH (February 24, 1995).

USDC, National Marine Fisheries Service 1995. Endangered Species Act Section 7 Consultation Biological Opinion for Implementation of Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California (PACFISH). January 23, 1995

USDC, NMFS, 1996. Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale - Attachment 3

USDI, Bureau of Land Management, 2003. Biological Assessment for Ongoing Activities Lemhi River Section 7 Watershed Bull Trout Snake River Steelhead Trout Snake River Spring/Summer Chinook Salmon Snake River Sockeye Salmon. March 2003

USDI, Bureau of Land Management, 2009. Challis Field Office Biological Assessment and Consultation Request on Rock Creek. Cited in NOAA/NFMS January 26, 2010 letter of concurrence on file at Public Lands Office, Salmon, ID.

USDI, USFWS, 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 (February 1998)

USDI, USFWS, 2009. US Fish and Wildlife Service Semi Annual Species List Update 14420-2010-SL-0089, issued December 30, 2009.

U.S. Office of the Federal Register. 1991. 56FR58619 - Endangered and Threatened Species; Endangered status for Snake River sockeye salmon. [See Fed Reg. November 20, 1991 (Vol.56, Number 225)]. Effective December 20, 1991.

U.S. Office of the Federal Register. 1992. 57FR14653 - Endangered and Threatened Species; Threatened status for Snake River spring and summer Chinook salmon. [See Fed Reg. April 22, 1992 (Vol.57, Number 78)]. Effective May 22, 1992.

U.S. Office of the Federal Register. 1993. 58FR68543 –Sockeye Salmon and Chinook Salmon Critical Habitat designation) [See Fed Reg. December 28, 1993 (Vol.58, Number 247)]. Effective January 27, 1994.

U.S. Office of the Federal Register. 1997. 62FR43937 - Endangered and Threatened Species; Threatened status for Snake River steelhead. [See 62 Fed Reg. August 18, 1997 (Vol.62, Number 159)]. Effective October 17, 1997.

U.S. Office of the Federal Register. 1998. 63FR31647 - Endangered and Threatened Species; Threatened status for bull trout. [See Fed Reg. June 10, 1998 (Vol.63, Number 111)]. Effective July 10, 1998.

U.S. Office of the Federal Register. 1999. 58FR68543 – Designated Critical Habitat: Revision of Critical Habitat for Snake River Spring/Summer Chinook Salmon) [See Fed Reg. October 25, 1999 (Vol.64, Number 205)]. Effective November 24, 1999.

U.S. Office of the Federal Register. 2002. 67FR2343 - Magnuson-Stevens Act Provisions; Essential Fish Habitat (EFH) [See Fed Reg. January 17, 2002 (Vol.67, Number 12)]. Effective February 19, 2002.

U.S. Office of the Federal Register. 2005. 70FR52630 – Endangered and Threatened Species; Designation of Critical Habitat for 12 Evolutionarily Significant Units of West Coast Salmon and Steelhead in Washington, Oregon, and Idaho [See Fed Reg. September 2, 2005 (Vol.70, Number 170)]. Effective January 2, 2006.

U.S. Office of the Federal Register. 2005. 70FR56212 –Bull Trout Critical Habitat designation [See Fed Reg. September 26, 2005 (Vol.70, Number 185)]. Effective October 26, 2005.

U.S. Office of the Federal Register. 2006. 71FR834 - Endangered and Threatened Species: Final Listing Determinations for 10 Distinct Population Segments of West Coast Steelhead. [See Fed Reg. January 5, 2006 (Vol.71, Number 3)]. Effective February 6, 2006.

U.S. Office of the Federal Register. 2010. 75FR2270 Endangered and Threatened Wildlife and Plants; Revised designation of Critical Habitat for Bull Trout in the Coterminous United States. Proposed Rule. [See Fed Reg. January 14, 2010 (Vol.75, Number 9)]. Effective February 14, 2010.

Winward, A.H. 1995. Monitoring the Vegetation Resources in Riparian Areas. USDA Forest Service. Rocky Mountain Research Station. General Technical Report GTR-47 April, 2000.

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

Hayden Creek (5th field HUC) Watershed Baseline

MATRIX OF DIAGNOSTIC PATHWAYS AND INDICATORS

Agency: USDA Forest Service, Salmon-Challis National Forest	**Watershed 5th field HUC: Hayden Creek 1706020406**
Unit: Salmon-Cobalt Ranger District	**Spatial Scale of Matrix:** One 5th field HUC
Fish Species Present: Chinook Salmon, Steelhead, Bull Trout	**Designated or Proposed Critical Habitat Present:** Chinook Salmon, Steelhead, Bull Trout
Anadromous Species Population: Lemhi River	**Anadromous Species Subpopulation:** Hayden Creek
Bull Trout Recovery Unit: Upper Snake	**Bull Trout Critical Habitat Unit:** Salmon River Basin
Bull Trout Core Area: Lemhi River	
Management Actions: Range (Ongoing) - Upper Hayden Allotment	**Updated:** 1/27/2010

Pathway - Subpopulation Characteristics (Bull Trout Only)		
Pathways Indicators	**Status of Baseline**	**Discussion of Baseline – Current Condition**
Subpopulation Size	**FR $_{BT}$**	**<u>Bull Trout</u> -Bull Trout are distributed throughout the Hayden Creek 5th field HUC and in eleven streams within the ESA Action Area. All life stages are present within those eleven streams. Fluvial individuals are present in mainstem Hayden Creek and Bear Valley Creek within the ESA Action Area. Bull trout is currently listed as "Threatened" under ESA.** **Therefore it is my professional judgment that the Environmental Baseline for this indicator is *<u>Functioning at 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 population in the ESA Action Area or the Hayden Creek 5th field HUC 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 *<u>Maintain</u>* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**

Growth and Survival	**FA $_{BT}$**	**<u>Bull Trout</u> - The sub population, within the Hayden 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. Bull trout streams within the ESA Action Area have good connectivity to the Lemhi River and the Salmon River. These eleven bull trout streams: 1) Conserve opportunity for diverse life-history expression, 2) Conserve opportunity for genetic diversity, 3) Ensure bull trout are distributed across representative habitats, 4) Ensure sufficient connectivity among populations, and 5) Ensure sufficient habitat to support population viability (e.g., abundance, trend indices).** **Therefore it is my professional judgment that the Environmental Baseline for this indicator is *<u>Functioning Appropriately</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 or the Hayden Creek 5th field HUC 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 *<u>Maintain</u>* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**
Life History Diversity and Isolation	**FA $_{BT}$**	**<u>Bull Trout</u> - The migratory form of bull trout, within the Hayden Creek 5th field HUC, is present and local populations are in close proximity to others spawning and rearing groups. Migratory corridors and rearing habitat are in good to excellent condition for the species.** **Therefore it is my professional judgment that the Environmental Baseline for this indicator is *<u>Functioning Appropriately</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 or the Hayden Creek 5th field HUC because the project's activities will not measurably restore nor degrade stream habitat elements or population size within the next 5 to 10 years. Therefore the effects of this action will *<u>Maintain</u>* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**
Persistence and Genetic Integrity	**FA $_{BT,}$**	**<u>Bull Trout</u> – Bull Trout stream connectivity is high within the Hayden Creek 5th field HUC. Each of the relevant subpopulations has a low risk of extinction. The probability of hybridization or displacement by competitive species is low to nonexistent.** **Therefore it is my professional judgment that the Environmental Baseline for this indicator is *<u>Functioning Appropriately</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 or the Hayden Creek 5th field HUC because the project's activities will not measurably restore nor degrade stream habitat elements, population size or the probability of hybridization with eastern brook trout within the next 5 to 10 years. Therefore the effects of this action will *<u>Maintain</u>* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**

Pathway - Water Quality		
Pathway Indicators	**Status of Baseline**	**Discussion of Baseline – Current Condition**
Temperature (7day average. Maximum, °C)	FA BT, CK, SH	Stream temperature data was collected sporadically on ten streams within the Hayden Creek 5th field HUC and the ESA Action Area from 2004 through 2009. 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. Therefore it is my professional judgment that the Environmental Baseline for this indicator is ***Functioning Appropriately***. The effects of the proposed project will not play a role in decreasing or increasing steam temperatures within the ESA Action Area because the project's activities will not measurably restore nor degrade stream habitat elements that effect stream temperatures. Therefore the effects of this action will ***Maintain*** this environmental baseline condition because of the action's design criteria and following required standard and guidelines.
Sediment	Bear Valley Creek and Hayden Creek FA BT, CK, SH East Fork Hayden Creek FUR BT, CK, SH	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). Sediment data was collected between 1993 and 2009 on three streams within the Hayden Creek 5th field HUC and the ESA Action Area. The uplands within the ESA Action Area are primarily quartzite geology. In quartzite geology baseline conditions are rated as follows: ▪ < 20 % depth fines (<1/4" diameter) = Functioning Appropriately; ▪ 21-25% depth fines = Functioning at Risk; ▪ >25% depth fines = Functioning at Unacceptable Risk Therefore it is my professional judgment that the Environmental Baseline for this indicator is ***Functioning Appropriately*** for two streams and ***Functioning at Unacceptable Risk*** on one stream. The effects of the proposed project will not play a role in decreasing or increasing steam sediment within the Hayden 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 ***Maintain*** this environmental baseline condition because of the action's design criteria and following required standard and guidelines.

Chemical Contaminants/Nutrients	**FA** BT, CK, SH	**There are no 303d streams listed for chemical contaminants within the Hayden Creek 5th field HUC or the ESA Action Area.** **Therefore it is my professional judgment that the Environmental Baseline for this indicator is *Functioning Appropriately*. The effects of the proposed project will not play a role in decreasing or increasing chemical contaminants/nutrients within the Hayden 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 *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**
Pathway - Habitat Access		
Pathway Indicator	**Status of Baseline**	**Discussion of Baseline – Current Condition**
Physical Barriers	**FR** BT, CK, SH	**There is a fish migration barrier culvert on both Kadletz Creek and Wright Creek. They are both scheduled to be replaced with fish passable structures in 2010 or 2011, depending upon funding. All of the other ESA fish streams within the ESA Action Area do not have any man made barriers to fish migration.** **Therefore it is my professional judgment that the Environmental Baseline for this indicator is *Functioning at Risk*. The effects of the proposed project will not play a role in decreasing or increasing man made barriers within the Hayden Creek 5th field HUC and the ESA Action Area because the project's activities will not create any man made barriers within any ESA fish bearing streams. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**
Habitat Elements		
Pathway Indicators	**Baseline**	**Discussion of Baseline – Current Condition**
Substrate Embeddedness	**NA**	**The Salmon-Challis National Forest does not collect substrate embeddedness data. Refer to Sediment.**

Large Woody Debris	**FA to FR** **BT, CK, SH**	**Data is limited for large woody debris within the Hayden Creek 5th field HUC and within the ESA Action Area.** **It is my professional judgment that large woody debris is *Functioning Appropriately* to *Functioning at Risk*. 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 *Functioning at Risk* call. The effects of the proposed project will not play a role in decreasing or increasing large woody debris within the Hayden 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 *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**
Pool Frequency and Quality	**FA to FR** **BT, CK, SH**	**Data is limited for pool frequency and quality within the Hayden Creek 5th field HUC and within the ESA Action Area.** **It is my professional judgment that pool frequency and quality is *Functioning Appropriately* to *Functioning at Risk*. 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 *Functioning at Risk* call. The effects of the proposed project will not play a role in decreasing or increasing pool frequency and quality within the Hayden 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, cattle grazing is being managed so as not to degrade bank stability which could degrade quality pool habitat. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**

Off-channel Habitat	**FA** **$_{BT, CK, SH}$**	**Data is limited for off-channel habitat within the Hayden Creek 5th field HUC and within the ESA Action Area. On non confined stream channel reaches where there should be off-channel habitat (ie. Bear Valley Creek and East Fork of Hayden Creek there are backwaters with cover and low energy off channel areas.** **It is my professional judgment that off-channel habitats are *Functioning Appropriately* and naturally. The effects of the proposed project will not play a role in decreasing or increasing off channel habitat within the Hayden 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, cattle grazing is being managed so as not to degrade bank stability which could degrade off channel habitat. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**
Refugia	**FA** **$_{BT, CK, SH}$**	**Quantifiable data is limited for refugia habitat within the Hayden 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.** **It is my professional judgment that refugia habitat is *Functioning Appropriately* and naturally. The effects of the proposed project will not play a role in decreasing or increasing Refugia Habitat within the Hayden 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, cattle grazing is being managed so as not to degrade riparian areas and bank stability which could create and maintain Refugia Habitat. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**

Channel Condition & Dynamics		
Pathways Indicators	**Status of Baseline**	**Discussion of Baseline – Current Condition**
Average Wetted Width/Maximum Depth Ratio	**FA to FR** **BT, CK, SH**	**Data is limited for average wetted width/maximum depth ratio within the Hayden Creek 5th field HUC and within the ESA Action Area (see sections 6.4.4 & 7.1.4 above).** **It is my professional judgment that average wetted width/maximum depth ratio is *Functioning Appropriately* to *Functioning at Risk* on ESA stream reaches within the Hayden Creek 5th field HUC and 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 Hayden 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 cattle 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 cattle 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 cattle grazing activities are being managed so as not to degrade riparian areas and bank stability which would increase average wetted width/maximum depth ratio. Current streambank conditions at the three monitored sites show high bank stability. Therefore the effects of this action will *Maintain or Restore* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**
Streambank Condition	**FA BT, CK, SH**	**Data is limited for streambank condition within the Hayden Creek 5th field HUC and within the ESA Action Area (see sections 6.4.5 & 7.1.5 above).** **It is my professional judgment that streambank condition is *Functioning Appropriately* on ESA stream reaches within the Hayden 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. The direct correlation between the proposed project's activities and a negative decrease in streambank conditions would be if cattle 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 cattle grazing activities away from riparian areas and streambanks can help to maintain and restore degraded stream reaches where the percent stabile streambanks area higher than desired. Current and future cattle grazing activities are being managed so as not to degrade riparian areas and bank stability. Current streambank conditions at the three monitored sites show high bank stability. Therefore the effects of this action will *Maintain or Restore* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**

Floodplain Connectivity	FA BT, CK, SH	Most all stream reaches within the Hayden 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. It is my professional judgment that floodplain connectivity is ***Functioning Appropriately*** on ESA stream reaches within the Hayden 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 cattle 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 cattle grazing activities away from riparian areas and streambanks can help to maintain and restore degraded stream reaches where the percent stabile streambanks area higher than desired. Current and future cattle grazing activities are being managed so as not to degrade riparian areas and bank stability. Current streambank conditions at the three monitored sites show high bank stability. Therefore the effects of this action will ***Maintain*** this environmental baseline condition because of the action's design criteria and following required standard and guidelines.
Flow/Hydrology		
Pathways Indicators	**Status of Baseline**	**Discussion of Baseline – Current Condition**
Change in Peak/Base Flows	FR BT, CK, SH	Within the entire Hayden Creek 5th field HUC, below National Forest System lands there are a number of water diversions that take water out of the stream. This would show some evidence of altered peak flow, baseflow and/or flow timing relative to an undisturbed watershed of similar size, geology and geography. Within the ESA Action Area the watershed hydrograph would indicate peak flow, baseflow and/or flow timing characteristics comparable to an undisturbed watershed of similar size, geology and geography. It is my professional judgment that change in peak/base flows is ***Functioning at Risk*** for the Hayden Creek 5th field HUC but would be ***Functioning Appropriately*** on ESA stream reaches within the ESA Action Area. The effects of the proposed project's activities will not play a role in changing peak flows and base flows in the Hayden Creek 5th field HUC or within the ESA Action Area. Therefore the effects of this action will ***Maintain*** this environmental baseline condition because of the action's design criteria and following required standard and guidelines.

Increase in Drainage Network	**FA** BT, CK, SH	**There has been a zero or minimum increase in active channel length correlated with human caused disturbance within the Indian Creek-Salmon River 5th field HUC.** **It is my professional judgment that increase in drainage network is *Functioning Appropriately* for the Hayden 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 Hayden Creek 5th field HUC or within the ESA Action Area. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**
Watershed Condition		
Pathway Indicators	**Status of Baseline**	**Discussion of Baseline – Current Condition**
Road Density and Location	**FR** BT, CK, SH	**The Hayden Creek 5th field HUC has 175.9 miles of roads, a road density of 1.2 (mi/mi²) with some valley bottom roads (51.3 miles of road within a PACFISH RHCA and 29.2% of the roads are within a PACFISH RHCA).** **It is my professional judgment that road density and location is *Functioning at Risk* for the Hayden Creek 5th field HUC. The effects of the proposed project's activities will not play a role in road density or location in the Hayden Creek 5th field HUC or within the ESA Action Area. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**
Disturbance History	**FUR** BT, CK, SH	**The ECA for the Hayden Creek 5th field HUC is 17.7 percent with an overall cumulative effects rating of Moderate. This rating is caused by timber harvest and historic fires within the Hayden 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.** **It is my professional judgment that disturbance history is *Functioning at Unacceptable Risk* for the Hayden Creek 5th field HUC. The effects of the proposed project's activities will not play a role in disturbance history within the Hayden Creek 5th field HUC or within the ESA Action Area. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**

Riparian Conservation Areas	**FA $_{BT, CK, SH}$**	**The riparian conservation areas provide adequate shade, large woody debris recruitment and habitat protection and connectivity within the Hayden 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%.** **It is my professional judgment that riparian conservation areas are *Functioning Appropriately for* the Hayden 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 cattle grazing activities within some riparian areas. Current and future cattle grazing activities are being managed so as not to degrade riparian conservation areas. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**
Disturbance Regime **(bull trout only)**	**FA $_{BT}$**	**The disturbance regime, within the Hayden 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.** **It is my professional judgment that disturbance regimes are *Functioning Appropriately for* the Hayden 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 cattle grazing activities within some riparian areas. Current and future cattle grazing activities are being managed so as not to degrade riparian areas and stream habitat within the ESA Action Area. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**

Integration of Species and Habitat Conditions		
Pathway Indicators	**Status of Baseline**	**Discussion of Baseline – Current Condition**
(bull trout only)	**FA $_{BT}$**	**Within the Hayden Creek 5th field HUC habitat quality and connectivity among subpopulations is high. The migratory form is present. Disturbance has not altered channel equilibrium. Fine sediments and other habitat characteristics influencing survival or growth are consistent with pristine habitat. The subpopulation has the resilience to recover from short-term disturbances within one to two generations (5-10 years). The subpopulation is fluctuating around equilibrium or is growing.** **It is my professional judgment that integration of species and habitat conditions are *Functioning Appropriately for* the Hayden 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 cattle grazing activities within some riparian areas and stream reaches. Current and future cattle grazing activities are being managed so as not to degrade riparian areas and stream habitat within the Hayden Creek 5th field HUC and the ESA Action Area. Therefore the effects of this action will *Maintain* this environmental baseline condition because of the action's design criteria and following required standard and guidelines.**

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

$_{BT}$ Bull Trout, $_{CK}$ Chinook, $_{SH}$ Steelhead, $_{1}$ Rearing, $_{2}$ Spawning/Incubation, $_{TRIB}$ Tributaries,

Effects of the Action:

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

APPENDIX C – MONITORING DATA AND SUMMARIES

Figure 7 - Upper Hayden Allotment Monitoring Sites

Upper Hayden Monitoring

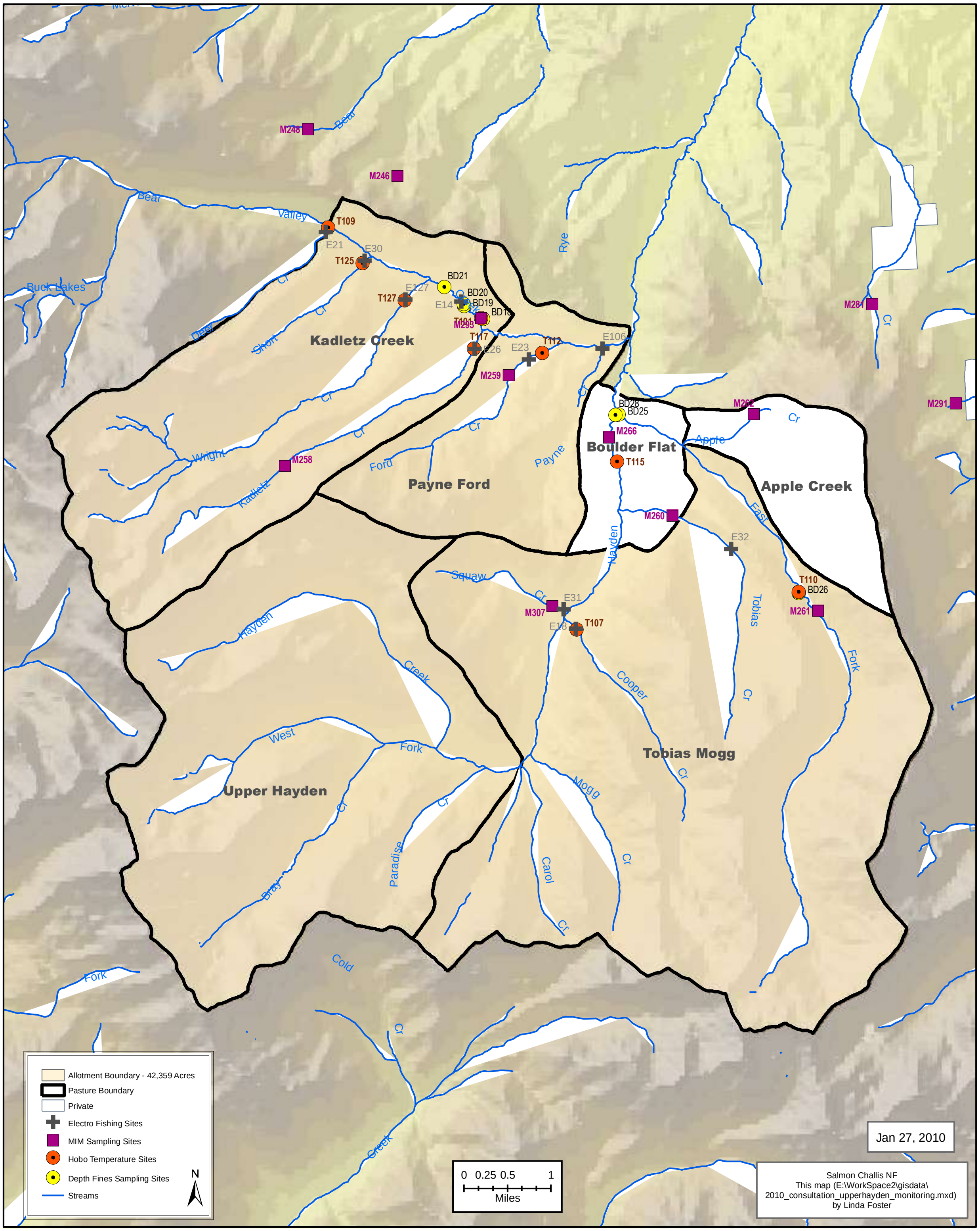


Table 13 - Upper Hayden Allotment Summary of Monitoring Data Collected

Upper Hayden Allotment - (19)	Chinook salmon	Chinook Salmon Presence Miles	Chinook salmon Spawning Miles	Chinook salmon DCH Miles	steelhead	steelhead Presence Miles	steelhead Spawning Miles	steelhead DCH miles	bull trout	bull trout Presence Miles	bull trout Spawning Miles	bull trout DCH miles	Temperature	Sediment	Electrofishing	MIM Width/Depth Ratio	Streambank Condition	Greenline Ecological Status
Apple Creek	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	99	92, 99, 04
Bear Valley Creek (MIS)	Yes	4.39	4.39	4.39	Yes	4.36	4.36	4.43	Yes	4.43	4.43	4.43	05-09	93-05, 09	05-07, 09	No	No	No
Bray Creek	No	No	No	No	Yes	2.75	2.75	No	Yes	2.75	1.94	3.39	No	No	No	No	No	No
Carol Creek	No	No	No	No	No	No	No	No	Yes	1.41	1.41	No	No	No	No	No	No	No
Cooper Creek	No	No	No	No	No	No	No	No	Yes	2.89	2.54	2.89	06, 07, 09	No	09	No	No	No
Deer Creek	No	No	No	No	No	No	No	No	No	No	No	0.74	04, 06, 09	No	09	No	No	No
East Fork Hayden Creek (MIS)	No	No	No	No	Yes	7.6	7.6	4.94	Yes	7.6	5.96	8.71	05-09	93-94, 97-05	07-08	No	98	92, 98, 04, 09
Ford Creek	No	No	No	No	No	No	No	No	No	No	No	No	04, 09	No	09	11.76	09	92, 96, 04, 09
Hayden Creek	Yes	3.04	3.04	3.04	Yes	9.86	9.86	7.74	Yes	9.89	9.02	10.55	04-06, 09	93-04, 07-09	No	20.4	01, 07, 09	92, 01, 07, 09
Kadletz Creek	No	No	No	No	Yes	3.64	3.64	1.63	Yes	3.64	3.19	4.96	04, 09	No	06, 09	No	93, 96	93, 96, 04, 09
Mogg Creek	No	No	No	No	No	No	No	No	Yes	0.11	0.11	No	No	No	No	No	No	No
Paradise Creek	No	No	No	No	No	No	No	No	Yes	1.44	1.37	No	No	No	No	No	No	No
Payne Creek	No	No	No	No	No	No	No	No	No	No	No	No	No	No	09	No	No	No
Short Creek	No	No	No	No	No	No	No	No	No	No	No	1.84	04, 09	No	06, 09	No	No	No
Squaw Creek	No	No	No	No	No	No	No	No	No	No	No	No	No	No	09	No	04	92, 04
Tobias Creek	No	No	No	No	No	No	No	No	No	No	No	No	06	No	05, 09	No	96, 04	92, 96, 04, 09
Wade Creek	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
West Fork Hayden Creek	No	No	No	No	Yes	3.09	3.09	0.61	Yes	3.09	2.32	3.8	No	No	No	No	No	No
Wright Creek	No	No	No	No	Yes	4.91	4.91	2.81	Yes	4.91	3.56	5.37	09	No	06, 09	No	No	No

Table 14 - Upper Hayden Allotment Width:Depth ratios using Snake River Adjudication Sites Monitored 1988-1990

Adjudication Monitoring Station	Bankfull Width	X-Sectional Area	Bankfull Depth	Width/Depth Ratio	Natural Condition Data Base Width/Depth Ratio
Bear Valley Creek 1	19.7	35.63	1.81	10.9	28.0
Bear Valley Creek 2	29.4	29.54	1.00	29.3	28.0
EF Hayden Creek 1A	11.62	13.61	1.17	9.9	28.0
Hayden Creek 1A	33.9	104.94	3.10	11.0	28.0

Table 15 - Upper Hayden Allotment (steelhead)

Steelhead Present	
Row Labels	Sum of LENGTH
Bear Valley Creek	4.36
Bray Creek	2.75
East Fork Hayden Creek	7.60
Hayden Creek	9.86
Kadletz Creek	3.64
West Fork Hayden Creek	3.09
Wright Creek	4.91
Grand Total	36.20

Steelhead Spawning	
Row Labels	Sum of LENGTH
Bear Valley Creek	4.36
Bray Creek	2.75
East Fork Hayden Creek	7.60
Hayden Creek	9.86
Kadletz Creek	3.64
West Fork Hayden Creek	3.09
Wright Creek	4.91
Grand Total	36.20

Steelhead DCH	
Row Labels	Sum of LENGTH
Bear Valley Creek	4.43
East Fork Hayden Creek	4.94
Hayden Creek	7.74
Kadletz Creek	1.63
West Fork Hayden Creek	0.61
Wright Creek	2.81
Grand Total	22.16

Table 16 - Upper Hayden Allotment's Units (steelhead)

Steelhead Present	
Row Labels	Sum of LENGTH
Boulder Flat	2.87
East Fork Hayden Creek	0.92
Hayden Creek	1.95
Kadletz Creek	11.22
Bear Valley Creek	2.67
Kadletz Creek	3.64
Wright Creek	4.91
Payne Ford	1.68
Bear Valley Creek	1.68
Tobias Mogg	9.60
East Fork Hayden Creek	6.68
Hayden Creek	2.92
Upper Hayden	10.83
Bray Creek	2.75
Hayden Creek	4.99
West Fork Hayden Creek	3.09
Grand Total	36.20

Steelhead Spawning	
Row Labels	Sum of LENGTH
Boulder Flat	2.87
East Fork Hayden Creek	0.92
Hayden Creek	1.95
Kadletz Creek	11.22
Bear Valley Creek	2.67
Kadletz Creek	3.64
Wright Creek	4.91
Payne Ford	1.68
Bear Valley Creek	1.68
Tobias Mogg	9.60
East Fork Hayden Creek	6.68
Hayden Creek	2.92
Upper Hayden	10.83
Bray Creek	2.75
Hayden Creek	4.99
West Fork Hayden Creek	3.09
Grand Total	36.20

Steelhead DCH	
Row Labels	Sum of LENGTH
Boulder Flat	2.87
East Fork Hayden Creek	0.92
Hayden Creek	1.95
Kadletz Creek	7.19
Bear Valley Creek	2.75
Kadletz Creek	1.63
Wright Creek	2.81
Payne Ford	1.68
Bear Valley Creek	1.68
Tobias Mogg	6.94
East Fork Hayden Creek	4.02
Hayden Creek	2.92
Upper Hayden	3.48
Hayden Creek	2.87
West Fork Hayden Creek	0.61
Grand Total	22.16

Table 17 - Upper Hayden Allotment (bull trout)

Upper Hayden Bull Trout Present

Row Labels	Sum of LENGTH
Bear Valley Creek	4.43
Bray Creek	2.75
Carol Creek	1.41
Cooper Creek	2.89
East Fork Hayden Creek	7.60
Hayden Creek	9.89
Kadletz Creek	3.64
Mogg Creek	0.11
Paradise Creek	1.44
West Fork Hayden Creek	3.09
Wright Creek	4.91
Grand Total	42.16

Upper Hayden Bull Trout Spawning

Row Labels	Sum of LENGTH
Bear Valley Creek	4.43
Bray Creek	1.94
Carol Creek	1.41
Cooper Creek	2.54
East Fork Hayden Creek	5.96
Hayden Creek	9.02
Kadletz Creek	3.19
Mogg Creek	0.11
Paradise Creek	1.37
West Fork Hayden Creek	2.32
Wright Creek	3.56
Grand Total	35.86

Upper Hayden Bull Trout Proposed DCH

Row Labels	Sum of LENGTH
Bear Valley Creek	4.43
Bray Creek	3.39
Cooper Creek	2.89
Deer Creek	0.74
East Fork Hayden Creek	8.71
Hayden Creek	10.55
Kadletz Creek	4.96
Short Creek	1.84
West Fork Hayden Creek	3.80
Wright Creek	5.37
Grand Total	46.69

Table 18 - Upper Hayden Allotment's Units (bull trout)

Bull Trout Present	
Row Labels	Sum of LENGTH
Boulder Flat	2.87
East Fork Hayden Creek	0.92
Hayden Creek	1.95
Kadletz Creek	11.29
Bear Valley Creek	2.75
Kadletz Creek	3.64
Wright Creek	4.91
Payne Ford	1.68
Bear Valley Creek	1.68
Tobias Mogg	14.01
Carol Creek	1.40
Cooper Creek	2.89
East Fork Hayden Creek	6.68
Hayden Creek	2.92
Mogg Creek	0.11
Upper Hayden	12.31
Bray Creek	2.75
Carol Creek	0.01
Hayden Creek	5.02
Paradise Creek	1.44
West Fork Hayden Creek	3.09
Grand Total	42.16

Bull Trout Spawning	
Row Labels	Sum of LENGTH
Boulder Flat	2.87
East Fork Hayden Creek	0.92
Hayden Creek	1.95
Kadletz Creek	9.50
Bear Valley Creek	2.75
Kadletz Creek	3.19
Wright Creek	3.56
Payne Ford	1.68
Bear Valley Creek	1.68
Tobias Mogg	12.02
Carol Creek	1.40
Cooper Creek	2.54
East Fork Hayden Creek	5.05
Hayden Creek	2.92
Mogg Creek	0.11
Upper Hayden	9.79
Bray Creek	1.94
Carol Creek	0.01
Hayden Creek	4.15
Paradise Creek	1.37
West Fork Hayden Creek	2.32
Grand Total	35.86

Upper Hayden Bull Trout Proposed CH	
Row Labels	Sum of LENGTH
Bear Valley Creek	4.43
Bray Creek	3.39
Cooper Creek	2.89
Deer Creek	0.74
East Fork Hayden Creek	8.71
Hayden Creek	10.55
Kadletz Creek	4.96
Short Creek	1.84
West Fork Hayden Creek	3.80
Wright Creek	5.37
Grand Total	46.69

Table 19 - Upper Hayden Allotment (Chinook salmon)

Upper Hayden Chinook Present	
Row Labels	Sum of LENGTH
⊞ Bear Valley Creek	4.39
⊞ Hayden Creek	3.04
Grand Total	7.44

Upper Hayden Chinook Spawning	
Row Labels	Sum of LENGTH
⊞ Bear Valley Creek	4.39
⊞ Hayden Creek	3.04
Grand Total	7.44

Upper Hayden Chinook DCH	
Row Labels	Sum of LENGTH
⊞ Bear Valley Creek	4.39
⊞ East Fork Hayden Creek	0.25
⊞ Hayden Creek	3.04
Grand Total	7.69

Table 20 - Upper Hayden Allotment's Units (Chinook salmon)

Chinook Present	
Row Labels	Sum of LENGTH
⊟ Boulder Flat	1.95
⊞ Hayden Creek	1.95
⊟ Kadletz Creek	2.71
⊞ Bear Valley Creek	2.71
⊟ Payne Ford	1.68
⊞ Bear Valley Creek	1.68
⊟ Tobias Mogg	1.09
⊞ Hayden Creek	1.09
Grand Total	7.44

Chinook Spawning	
Row Labels	Sum of LENGTH
⊟ Boulder Flat	1.95
⊞ Hayden Creek	1.95
⊟ Kadletz Creek	2.71
⊞ Bear Valley Creek	2.71
⊟ Payne Ford	1.68
⊞ Bear Valley Creek	1.68
⊟ Tobias Mogg	1.09
⊞ Hayden Creek	1.09
Grand Total	7.44

Chinook DHC	
Row Labels	Sum of LENGTH
⊟ Boulder Flat	2.20
⊞ East Fork Hayden Creek	0.25
⊞ Hayden Creek	1.95
⊟ Kadletz Creek	2.71
⊞ Bear Valley Creek	2.71
⊟ Payne Ford	1.68
⊞ Bear Valley Creek	1.68
⊟ Tobias Mogg	1.09
⊞ Hayden Creek	1.09
Grand Total	7.69

Table 21 - 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
Kadletz Creek	T101 Bear Valley Creek	2005	6/24 – 10/04	13.3°C	13.1°C	8.2°C
		2006	7/12 – 9/27	14.5°C	14.0°C	Insufficient Data
		2007	6/28 – 9/25	15.2°C	14.4°C	Insufficient Data
		2008	7/9 – 11/01	12.9°C	12.4°C	Insufficient Data
		2009	6/30 – 10/05	12.9°C	12.3°C	8.1°C
	T109 Deer Creek	2004	6/18 – 10/05	10.6°C	10.4°C	7.2°C
		2006	7/12 – 9/27	11.0°C	10.8°C	Insufficient Data
		2009	6/18 – 10/05	9.8°C	9.5°C	7.1°C
	T117 Kadletz Creek	2004	6/18 – 10/05	12.0°C	11.6°C	7.9°C
		2009	6/18 – 10/05	11.8°C	11.1°C	7.9°C
	T125 Short Creek	2004	6/18 – 10/05	9.1°C	8.9°C	6.9°C
		2009	6/18 – 10/05	9.0°C	8.5°C	6.5°C

Unit	Site ID	Year	Monitoring Period	Maximum Daily Temperature	Maximum of 7 day Moving Maximum	Mean Temperature 7/1 to 9/30
Kadletz Creek	T127 Wright Creek	2009	6/18 – 10/05	11.0°C	10.5°C	7.6°C
Payne Ford	T112 Ford Creek	2004	6/16 – 10/05	15.6°C	15.1°C	10.5°C
		2009	6/30 – 10/05	14.9°C	14.1°C	10.1°C
Boulder Flat	T115 Hayden Creek	2004	7/01 – 10/03	12.3°C	11.7°C	6.7°C
		2005	6/24 – 10/04	12.8°C	11.9°C	6.7°C
		2006	7/12 – 9/27	16.4°C	15.5°C	Insufficient Data
		2009	7/08 – 10/05	14.1°C	12.8°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
Tobias Mogg	T107 Cooper Creek	2006	7/14 – 11/01	13.7°C	13.0°C	Insufficient Data
		2007	5/01 – 8/05	13.3°C	13.0°C	Insufficient Data
		2009	7/09 – 10/13	12.6°C	11.5°C	Insufficient Data
	East Fork Hayden Creek #1	2004	6/16 – 10/03	13.6°C	12.9°C	8.8°C
		2005	6/24 – 10/04	13.1°C	12.4°C	8.2°C
		2006	7/12 – 9/27	14.1°C	13.4°C	Insufficient Data
		2007	6/28 – 9/25	13.7°C	13.2°C	Insufficient Data
	T110 East Fork Hayden Creek #2	2004	6/16 – 10/03	12.8°C	12.4°C	6.9°C
		2005	6/24 – 10/04	11.7°C	11.0°C	6.5°C
		2006	7/01 – 11/01	13.3°C	12.4°C	6.7°C
		2007	6/28 – 9/25	12.6°C	11.8°C	Insufficient Data
		2008	7/09 – 11/01	11.0°C	10.4°C	Insufficient Data
		2009	5/01 – 10/05	12.6°C	11.7°C	8.0°C
	Tobias Creek	2006	7/12 – 9/27	15.2°C	15.1°C	Insufficient Data

Figure 8 - Idaho Fish and Game Hayden Creek Chinook Redd Counts 2005

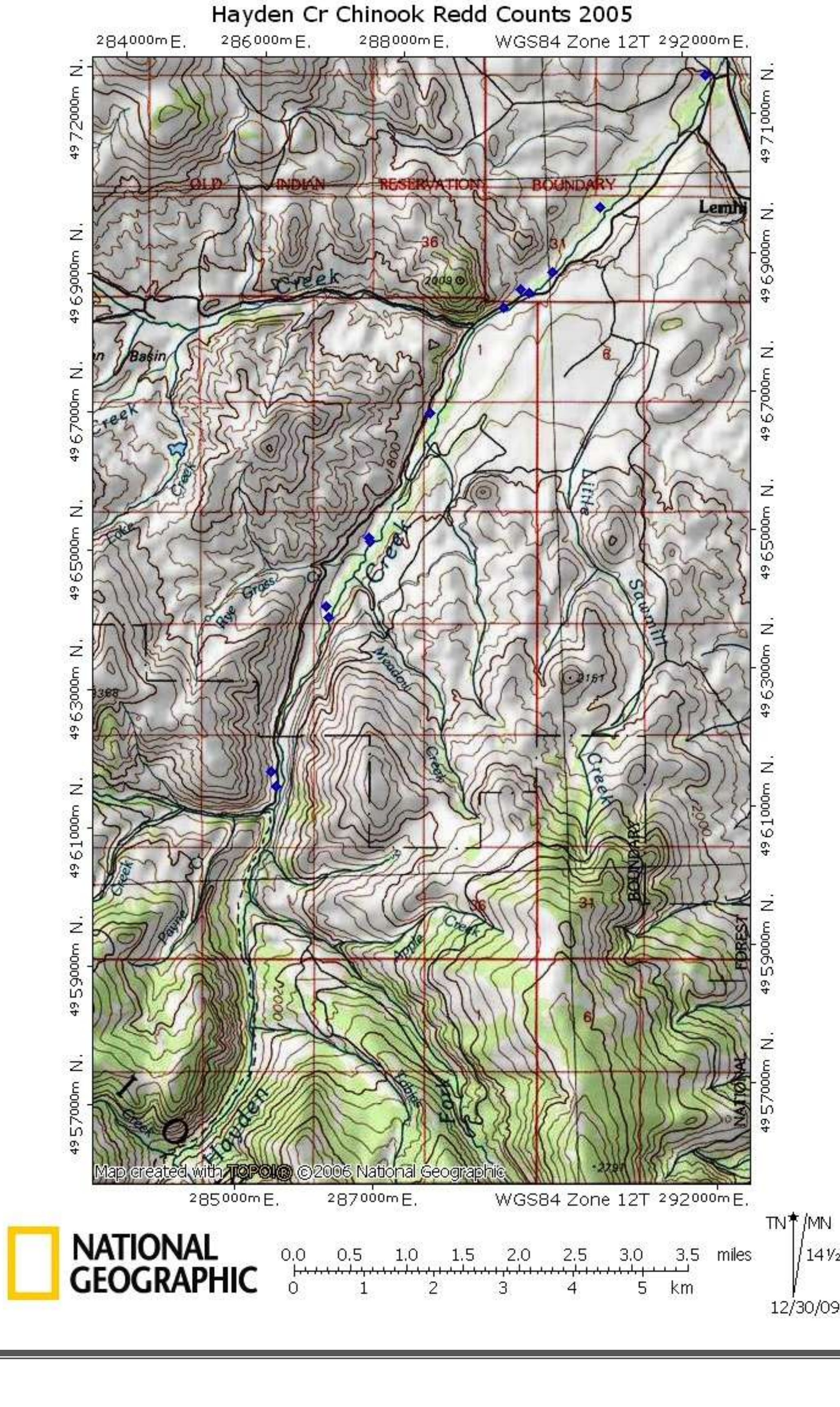


Figure 9 - Idaho Fish and Game Hayden Creek Chinook Redd Counts 2006

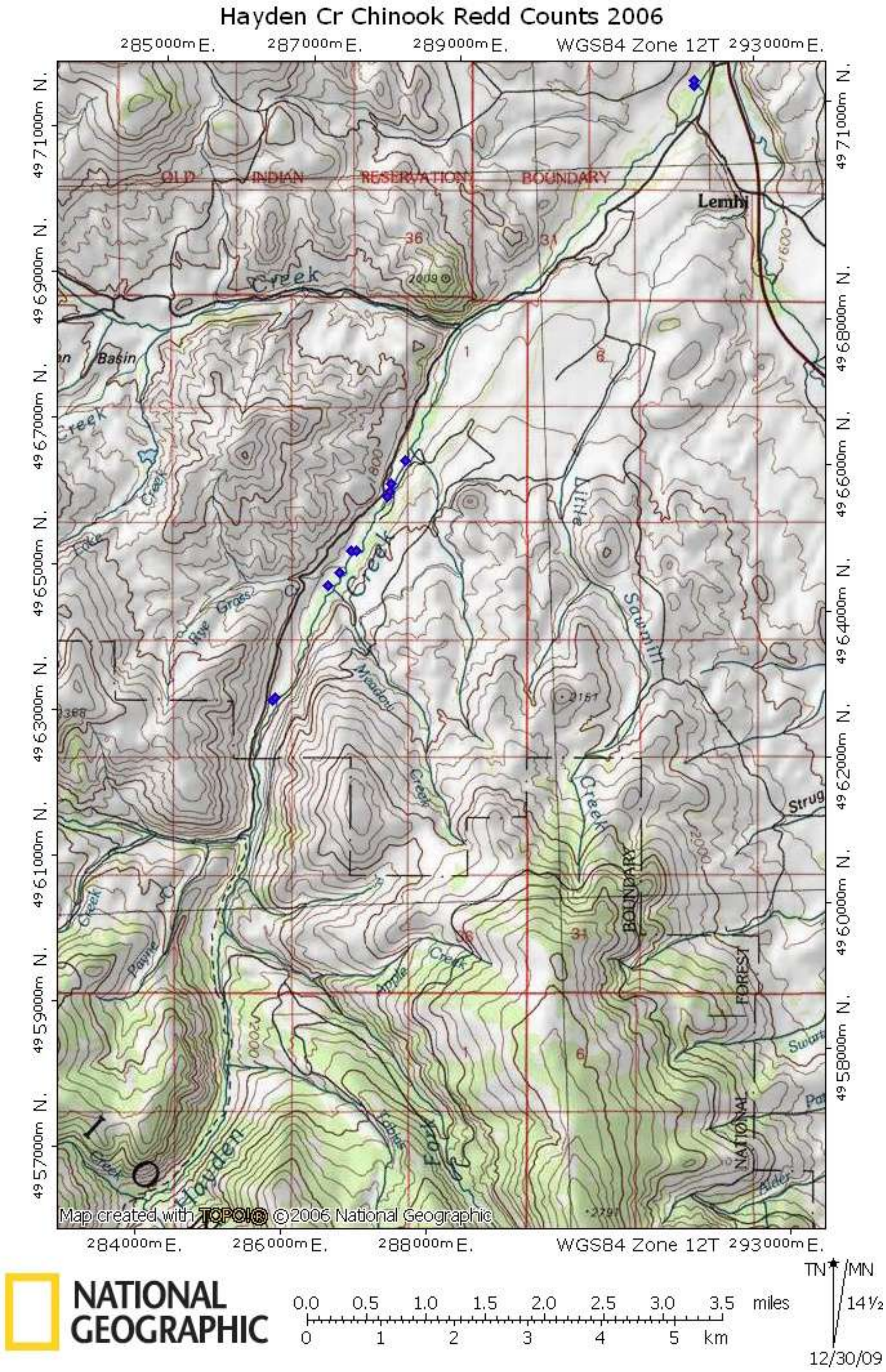


Figure 10 - Idaho Fish and Game Hayden Creek Chinook Redd Counts 2007

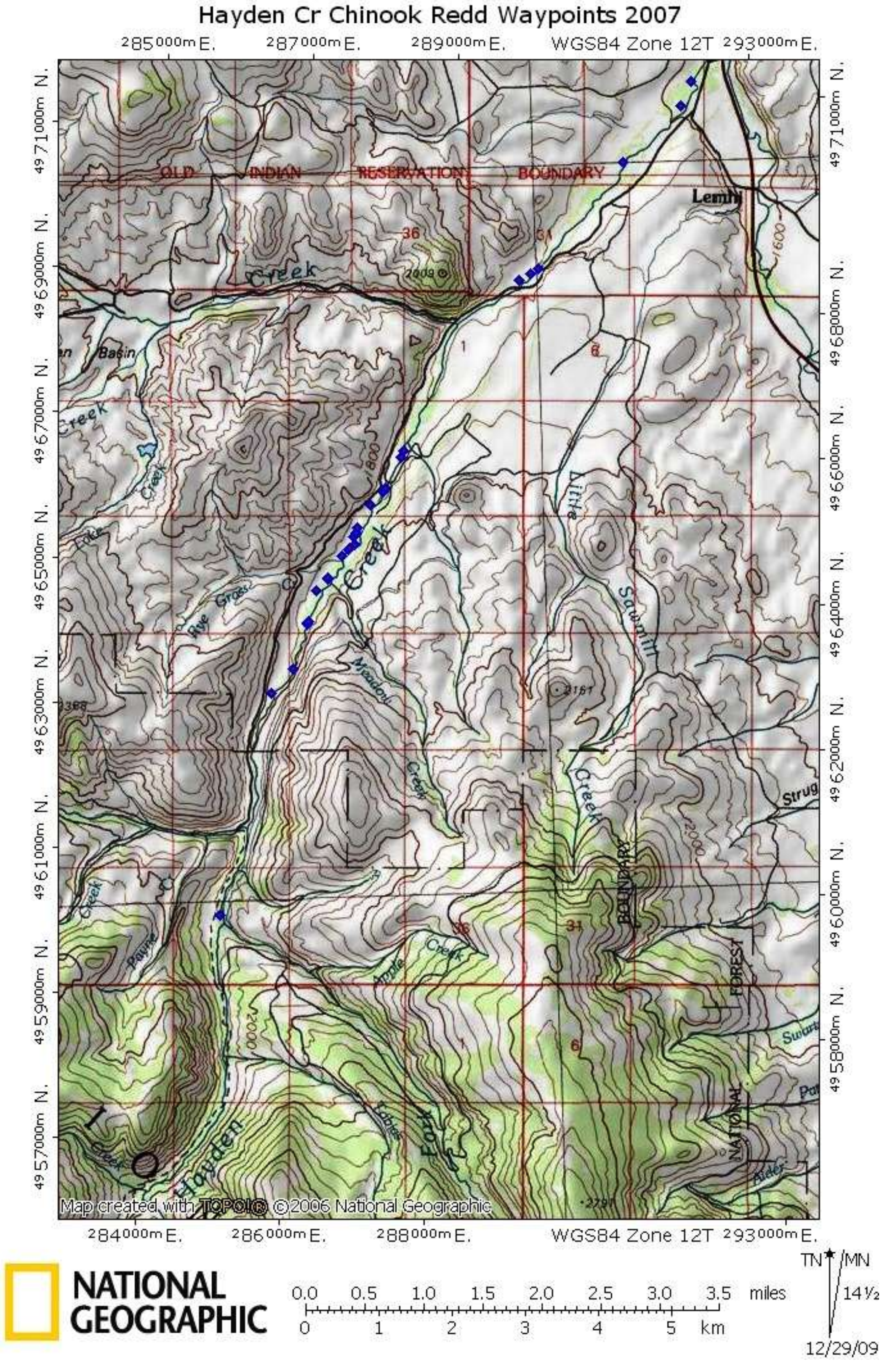


Figure 11 - Idaho Fish and Game Hayden Creek Chinook Redd Counts 2009

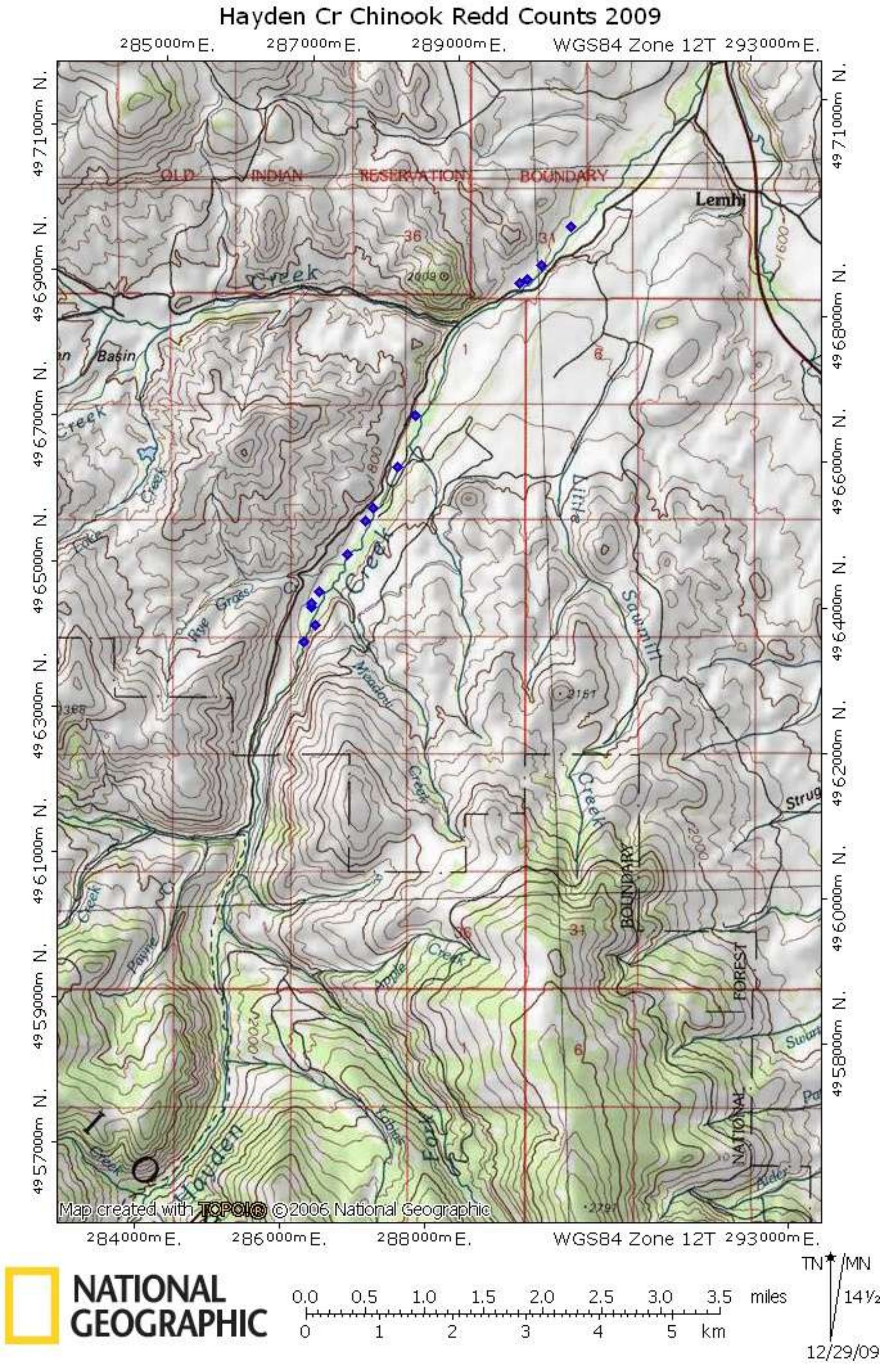


Table 22 - Multiple Indicators Monitoring (MIM) Summary

Upper Hayden Greenline Summary

Pasture	Creek Name	Site #	Year	Width:Depth	Bank Stability	Woody Species Regeneration		Greenline Ecological Status	GES Trend	Summary of Trend
						Seedling/Young (#/%)	Mature/Dead (#/%)			
Boulder Flat	Hayden Creek	M226	1992	n/a	n/a	69/58%	50/42%	47/MS	Base	Downward trend on Boulder Flat in 2007 and static in 2009 attributed to Tobias fire in 2003. Bank Alteration in 2009 was 4%. Low bank alteration indicates livestock use is minimal.
			2001	n/a	92	134/60%	90/40%	82/LS	Up	
			2007	n/a	90	21/29%	52/71%	52/MS	Down	
			2009	20.4	85	25/18%	115/82%	50/MS	Static	
" "	Tobias	M260	1992	n/a	n/a	81/35%	149/65%	76/LS	Base	GES is at PNC. Creek is woody and bouldered with under growth of Carex. Livestock do not utilize riparian except in small water gaps
			1996	n/a	100	87/31%	191/69%	100/PNC	Up	
			2004	n/a	90	n/a	n/a	PNC	Static	
			2009	n/a	n/a	n/a	n/a	PNC	Static	
Apple Creek	Apple Creek	M262	1992	n/a	n/a	28/36%	49/64%	88/PNC	Base	GES is in a upward trend at Late Seral. Creek is heavily timbered and bouldered. Livestock do not utilize riparian except in small water gaps
			1999	n/a	70	93/53%	84/47%	59/MS	Down	
			2004	n/a	n/a	n/a	n/a	62/LS	Up	
Tobias-Mogg	Squaw Creek		1992	n/a	n/a	n/a	n/a	75/LS	Base	GES is at Late Seral. Creek is heavily timbered and bouldered. Livestock do not utilize riparian except in small water gaps
			2004	n/a	89	188/61	122/39	66/LS	Static	
" "	East Fork Hayden	M261	1992	n/a	82	146/65%	78/35%	84/PNC	Base	GES is at PNC. Creek is dominated by Willows. Livestock have limited access to creek.
			1998	n/a	82	98/58%	72/42%	98/PNC	Up	
			2004	n/a	90	n/a	n/a	PNC	Static	
			2009	n/a	n/a	n/a	n/a	PNC	Static	
Kadletz	Kadletz Creek	M258	1993	n/a	77	164/55%	133/45%	77/LS	Base	GES is at Late Seral. Creek is heavily timbered and bouldered. Livestock do not utilize riparian except in small water gaps
			1996	n/a	99	147/66%	77/34%	65/LS	Static	
			2004	n/a	n/a	n/a	n/a	79/LS	Static	
			2009	n/a	n/a	n/a	n/a	LS	Static	
Payne-Ford	Ford	M259	1992	n/a	n/a	101/61%	65/39%	45/MS	Base	GES is at PNC. Creek is very woody and bouldered. Livestock do not utilize riparian except in small water gaps
			1996	n/a	n/a	126/63%	74/37%	98/PNC	Up	
			2004	n/a	n/a	66/58%	49/42%	83/LS	Down	
			2009	11.76	83	49/53%	44/47%	PNC	Up	

*0-15 Very Early Seral; 16-40 Early Seral; 41-60 Mid Seral; 61-85 Late Seral; 86+ PNC

Upper Hayden Allotment Riparian Discussion:

Monitoring sites were established and subsequent monitoring has occurred on the Upper Hayden Allotment since the early 90's. Since that time, grazing management has evolved based upon management in reference to listed fish species which occur within the allotment. Greenline Ecological Status (GES) typically is the element in which interpretations of ecological status and trend will be discussed in the following:

Generally, of the seven sites monitored since the early 90's, six are in upward trend or at Late Seral/ PNC. The monitoring site on Hayden Creek is static at Mid Seral.

All sites will also have a monitoring attribute for bank alteration with an endpoint indicator not to exceed 20%.

Hayden Creek: Downward trend on Hayden Creek in 2007 and static in 2009 attributed to Tobias fire in 2003. Bank Alteration in 2009 was 4%. Low bank alteration indicates livestock use is minimal. In order to aid site recovery after the fire, the monitoring attribute is stubble height with an endpoint indicator of 6 inches.

Apple Creek: GES is in a upward trend at Late Seral. The riparian area is heavily timbered and the stream is dominated by boulders. Livestock do not utilize riparian except in small water gaps. Greenline is dominated by Spruce trees. Due to the conifer dominance, the best monitoring attribute to manage site is bank alteration with an endpoint indicator not to exceed 20%.

Squaw Creek: GES is static at Late Seral. The riparian area is heavily timbered and the stream is dominated by boulders. Livestock do not utilize riparian except in small water gaps. Greenline is dominated by Spruce trees. Due to the conifer dominance, the best monitoring attribute to manage site is bank alteration with an endpoint indicator not to exceed 20%.

East Fork Hayden Creek: GES is static at PNC. The riparian area is dominated by Willows. Livestock have limited access to the stream. Due to the willow dominance, the best monitoring attribute to manage site is browse use with an endpoint indicator not to exceed 30%.

Tobias Creek: GES is static at PNC. The riparian area is heavily timbered with under growth of Carex and the stream is dominated by boulders. Livestock do not utilize riparian except in small water gaps. Due to the well established Carex under growth, the best monitoring attribute to manage the site is stubble height with an endpoint indicator of 5 inches.

Kadletz Creek: GES is static at Late Seral. The riparian area is heavily timbered and the stream is dominated by boulders. Livestock do not utilize riparian except in small water gaps. Site does not meet current greenline protocol. Site will continue to be a photo trend site. New greenline site will be established in upper meadow on Kadletz Creek. The new site will have a monitoring attribute of stubble height with an endpoint indicator of 5 inches.

Ford Creek: GES is in an upward trend at PNC. The riparian area is heavily timbered and the stream is dominated by boulders. Livestock do not utilize riparian except in small water gaps. Due to woody dominance, the best monitoring attribute to manage site is browse use with an endpoint indicator not to exceed 30%.

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 create a detailed map of those areas that have already been designated by the rule. For the purposes of the project, we assume CSCH to be all areas currently or historically occupied by Chinook salmon. This process includes only those areas within the administrative boundary of the SCNF.

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

Step 1: Add reaches identified by the Intrinsic Potential Model

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

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

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

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

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

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

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

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

Various organizations other than the SCNF have conducted fisheries assessments and resulting data are valuable for identifying areas where Chinook salmon have occurred within the SCNF. Such organizations may include, but not be limited to a) the Idaho Department of Fish and Game, b) the Department of Environmental Quality, and c) Native

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Literature Cited

Cooney, T. and D. Holzer. 2006. Appendix C: Interior Columbia basin stream type chinook salmon and steelhead populations: habitat intrinsic potential analysis. Preliminary Review Draft. NWFSC

Kahler, T. H. and T.P. Quinn. 1998. Juvenile and resident salmonid movement and passage through culverts. Washington State Department of Transportation Research Project T9903, Task 96. Transportation Building, Olympia, WA.

Maslin, P. E., W. R. McKinney and T. L. Moore. 1996a. Intermittent streams as rearing habitat for Sacramento River chinook salmon. http://www.csuchico.edu/~pmaslin/rsrch/Salmon/Abstrt.html

Maslin, P. E., W. R. McKinney and T. L. Moore. 1996b. Intermittent streams as rearing habitat for Sacramento River chinook salmon. 1996 Update. http://www.csuchico.edu/~pmaslin/rsrch/Salmon96/Abstrct.html

Maslin, P.E., J. Kindopp and M. Lennox. 1997. Intermittent streams as rearing habitat for Sacramento River chinook salmon. 1997 Update. http://www.csuchico.edu/~pmaslin/rsrch/Salmon97/Abstrct.html

Maslin, P.E., J. Kindopp and M. Lennox. 1998. Intermittent streams as rearing habitat for Sacramento River chinook salmon. 1998 Update. http://www.csuchico.edu/~pmaslin/rsrch/Salmon98/Abstrct.html

Maslin, P.E., J. Kindopp, M. Lennox, and C. Storm. 1997. Intermittent streams as rearing habitat for Sacramento River chinook salmon. 1997 Update. http://www.csuchico.edu/~pmaslin/rsrch/Salmon99/Abstrct.html

Murray, C.B. and M.L. Rosenau. 1989. Rearing of juvenile chinook in nonnatal tributaries of the lower Fraser River, British Columbia. Trans. Amer. Fish. Soc. 118(3): 284-289.

Scrivener, J.C., T.G. Brown, and B.C. Andersen. 1994. Juvenile chinook salmon (*Oncorhynchus tshawytscha*) utilization of Hawks Creek, a small nonnatal tributary of the upper Fraser River. Can. J. Fish. Aquat. Sci. 51: 1139-1146.

Torgersen, C.E., Price, D.M., Li, H.W. and McIntoch, B.A. 1999. Multiscale thermal refugia and stream habitat associations of Chinook salmon in northeastern Oregon. Ecological Applications 9: 301-319.

Yukon River Council. Chinook salmon (ONCORHYNCHUS TSHAWYTSCHA). http://yukonriverpanel.com/salmon/about/yukon-river-salmon/chinook/

APPENDIX E – BULL TROUT PRIMARY CONSTITUENT ELEMENTS OF CRITICAL HABITAT

Primary Constituent Elements for Proposed Bull Trout Critical Habitat and Associated Habitat Indicators PCE # PCE Description Associated Habitat Indicator

PCE #	PCE Description	Associated Habitat Indicators
1	Permanent water having low levels of contaminants such that normal reproduction, growth and survival are not inhibited	sediment, chemical contamination/nutrients, change in peak/base flows
2	Water temperatures ranging from 2° to 15°C (36° to 59°F), with adequate thermal refugia available for temperatures at the upper end of this range. Specific temperatures within this range will vary depending on bull trou t life history stage and for m, 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
3	Complex stream channels with features such as woody debris, side channels, pools, and undercut banks to provide a variety of depths, velocities, and instream structures	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
4	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 of fine substrate less than 0.63 cm (0.25 in) in diameter and minimal substrate embeddedness are characteristic of these conditions	sediment, substrate embeddedness, large woody debris, pool frequency and quality
5	A natural hydrograph, including peak, high, low, and base flows within historic ranges or, if regulated , a hydrograph that demonstrates the ability to support bull trout populations	change in pea k/base flows, increase in drainage network, disturbance history, disturbance regime
6	Springs, seeps, groundwater sources, and subsurface water connectivity to contribute to water quality and quantity	floodplain connectivity, change in peak/base flows, increase in drainage network, riparian conservation areas, chemical contamination/nutrients
7	Migratory corridors with minimal physical, biological, or chemical barriers between spawning, rearing, overwintering, and foraging habitats, including intermittent or seasonal barriers induced by high water temperatures or low flows	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
8	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 hab itat condition indirectly covered by previous seven PCEs)
9	Few or no predatory, interbreeding, or competitive nonnative species present	persistence and genetic integrity, physical barriers

The following rationale supports that the PCEs for proposed bull trout critical habitat are

thoroughly addressed in the current matrix analysis and that the environmental baseline conditions and determination for effects to the species consists of a biological and habitat component addressing in total the PCEs listed in the proposed rule for proposed critical habitat (USDI 2002a).

1. Permanent water having low levels of contaminants such that normal reproduction, growth and survival are not inhibited.

Flow conditions, such as perennial or ephemeral would be analyzed through *changes in peak/base flows*, and addressed in consideration of current base flows. Changes in hydrograph amplitude or timing with respect to watershed size, geology, and geography would be considered. The level of contaminants is addressed directly by the analysis of *chemical contamination/nutrients* and *sediment*. Current listing under 303(d) status should be considered, as well as the causes for that listing. *Sediment* is considered a contaminant especially in spawning and rearing habitat and analysis would apply to this PCE.

2. Water temperatures ranging from 2°to 15°C (36° to 59°F), with adequate thermal refugia available for temperatures at the upper end of this range. Specific temperatures within this range will vary depending on bull trout life history stage and form, geography, elevation, diurnal and seasonal variation, shade, such as that provided by riparian habitat, and local groundwater influence. This PCE is addressed directly by the analysis of *temperature*. It is addressed indirectly through consideration of *refugia*, which by definition is high quality habitat of appropriate temperature. Availability of refugia is also considered in analysis of *pool frequency and quality* and *large pools*. *Average wetted width/maximum depth ratio in scour pools* is an indication of water volume, which indirectly indicates water temperature, i.e., low ratios indicate deeper water, which in turn indicates possible refugia. This indicator in conjunction with *change in peak/base flows* is an indicator of potential temperature and refugia concerns particularly during low flow periods. *Streambank condition*, *floodplain connectivity* and *riparian conservation areas* address the components of shade and groundwater influence, both of which are important factors of water temperature. Stable streambanks and intact riparian areas, which include part of the floodplain, typically support adequate vegetation to maintain thermal cover to streams during low flow periods.

3. Complex stream channels with features such as woody debris, side channels, pools, and undercut banks to provide a variety of depths, velocities, and instream structures. The analysis of *large woody debris*, such as current values and sources available for recruitment, directly addresses this PCE. Large woody debris increases channel complexity and creates pools and undercut banks. *Pool frequency and quality* would also directly address this PCE, showing the number of pools per mile as well as the amount of cover and temperature of water in the pools. *Average wetted width/maximum depth ratio in scour pools in a reach* is an indicator of channel shape and pool quality. Low ratios suggest deeper, 3 higher quality pools. *Large pools,* consisting of a wide range of water depths, velocities, substrates and cover, are typical of high quality habitat and are a key component of channel complexity (USDI 1998e). An analysis of *off-channel habitat* would describe side-channels and other off-channel areas. *Streambank condition* would analyze the stability of the banks, including such features as undercut banks. The analysis of both *riparian conservation areas* and *floodplain connectivity* would directly address this PCE. Floodplain and riparian functions include the maintenance of habitat and channel complexity, the recruitment of large woody debris and the connectivity to off-channel habitats or side channels (USDI 1998e). Complex habitats provide refugia for bull trout and in turn, *refugia* analysis would assess complex stream channels. All of these habitat indicators consider the numerous characteristics of instream bull trout habitat and quantify critical components that are fundamental to creating and maintaining complex instream habitat over time.

4. 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 of fine substrate less than 0.63 cm (0.25 in) in diameter and minimal substrate embeddedness are characteristic of these conditions. This PCE is addressed directly by analysis of *sediment* in areas of spawning and incubation and considers directly the size class composition of instream sediments, particularly fine sediments <63 mm. This PCE also is addressed directly by analysis of *substrate embeddedness* in rearing areas, which is a function of sediment size class and bedload transport. Both of these indicators would assess substrate composition and stability in relation to the various life stages of the bull trout as well as the sediment transportation and deposition. *Large woody debris* and *pool frequency and quality* affect sediment transport and redistribution within a stream and would indirectly assess substrate composition and amounts.

5. A natural hydrograph, including peak, high, low, and base flows within historic ranges or, if regulated, a hydrograph that demonstrates the ability to support bull trout populations. This PCE is addressed by analysis of *change in peak/base flows*, which considers changes in hydrograph amplitude or timing with respect to watershed size, geology, and geography. Considering *increase in drainage network* and *disturbance history* provides further information. Roads and vegetation management both have effects strongly linked to a stream's hydrograph. *Disturbance regime* ties this information together to consider how a watershed reacts to disturbance and the time required to recover back to pre-disturbance conditions.

6. Springs, seeps, groundwater sources, and subsurface water connectivity to contribute to water quality and quantity. This PCE is addressed by analysis of *floodplain connectivity* and *riparian conservation areas*. *Floodplain connectivity* considers hydrologic linkage of off-channel areas with the main channel and overbank flow maintenance of wetland function and riparian vegetation and succession. Floodplain and riparian areas provide hydrologic connectivity for springs, seeps, groundwater upwelling and wetlands and contribute to the maintenance of the water table (USDI 1998e). The analysis of *changes in peak/base flows* would address subsurface water connectivity. *Increase in drainage network* would address potential changes to groundwater sources and subsurface water connectivity. C*hemical contamination/nutrients* would address concerns regarding groundwater water quality.

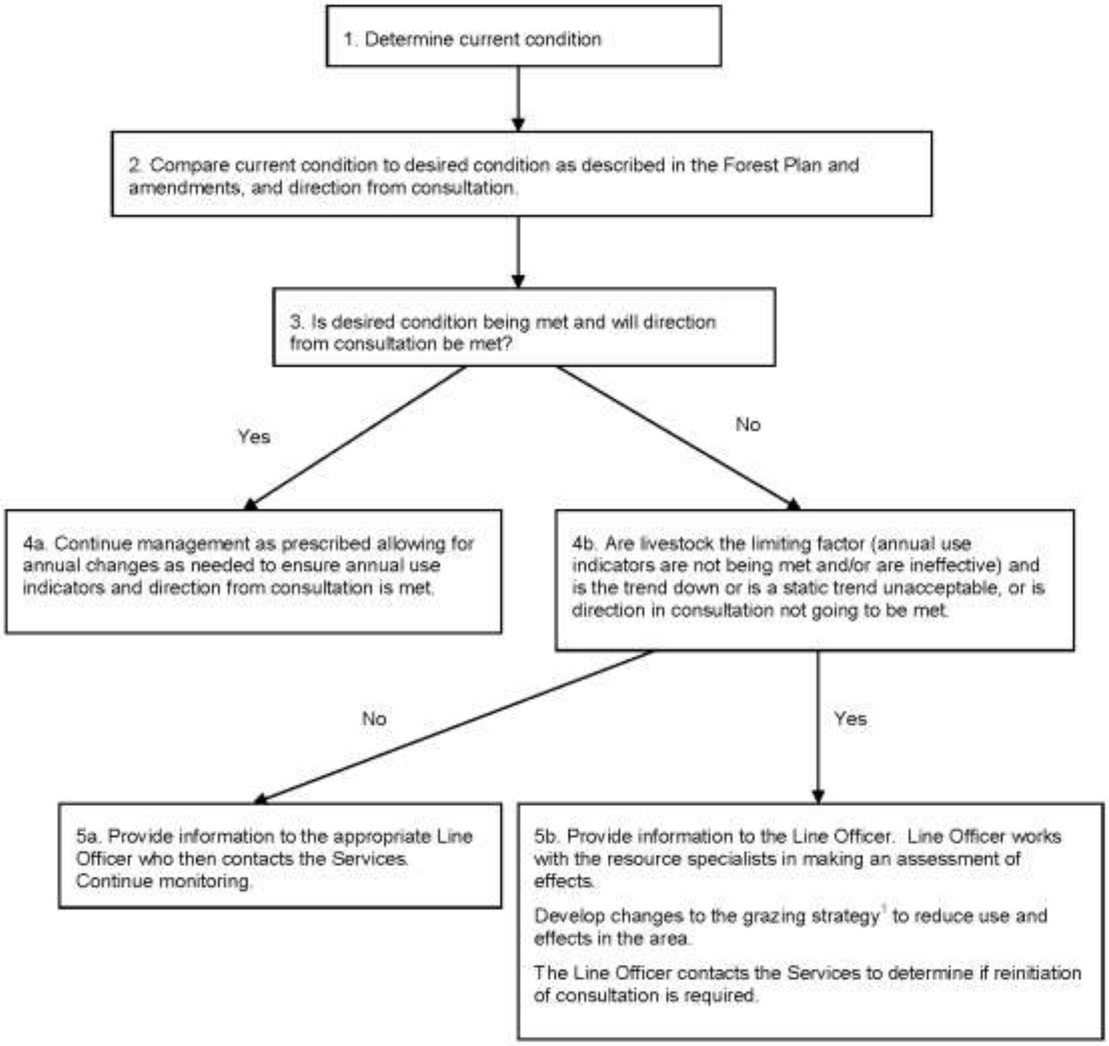
7. Migratory corridors with minimal physical, biological, or chemical barriers between spawning, rearing, overwintering, and foraging habitats, including intermittent or seasonal barriers induced by high water temperatures or low flows. The biological indicator *life history diversity and isolation* addresses the function of migration and/or subsequent isolation with respect to the population. The biological indicator *persistence and genetic integrity* indirectly reflects the status of migratory corridors. Physical, biological or chemical barriers to migration are addressed directly through water quality habitat indicators, including *temperature*, *chemical contamination/nutrients* and *physical barriers*. The analysis of these indicators would assess if barriers have been created due to impacts such as high temperatures, high concentrations of contaminants or physical barriers. Analysis of *change in peak/base flows* and *average wetted width/maximum depth ratio in scour pools in a reach* would assess whether changes in flow might create a seasonal barrier to migration. An analysis of *refugia,* which considers the habitat's ability to support strong, well distributed, and connected populations for all life stages and forms of bull trout, would also be pertinent to this PCE.

8. An abundant food base including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish. An analysis of *floodplain connectivity* and *riparian conservation areas* would assess these contributions to the food base. Floodplain and riparian areas provide habitat to aquatic invertebrates, which in turn provides a forage base to bull trout (USDI 1998e). This PCE is indirectly addressed through the biological indicator of *growth and survival* and *life history diversity and isolation*. Both of these indicators look at habitat quality and subpopulation condition, which provides information on food base. This PCE is a synthesis of the previous PCEs. It is addressed through the analysis of biological and habitat indicators in that, if a bull trout population either exists or could exist in a watershed, then there is an adequate forage base. A healthy habitat provides a forage base for the target species. Any potential impairment to the forage base has been addressed by way of summarizing the biological and habitat indicators.

9. Few or no predatory, interbreeding, or competitive nonnative species present. This PCE is addressed specifically by analysis of the biological *indicator persistence and genetic integrity*. This indicator analyzes the probability of hybridization or displacement by competitive species. An analysis of *physical barriers* may indirectly address non-native species in those areas where a barrier may prevent the invasion of non-native species.

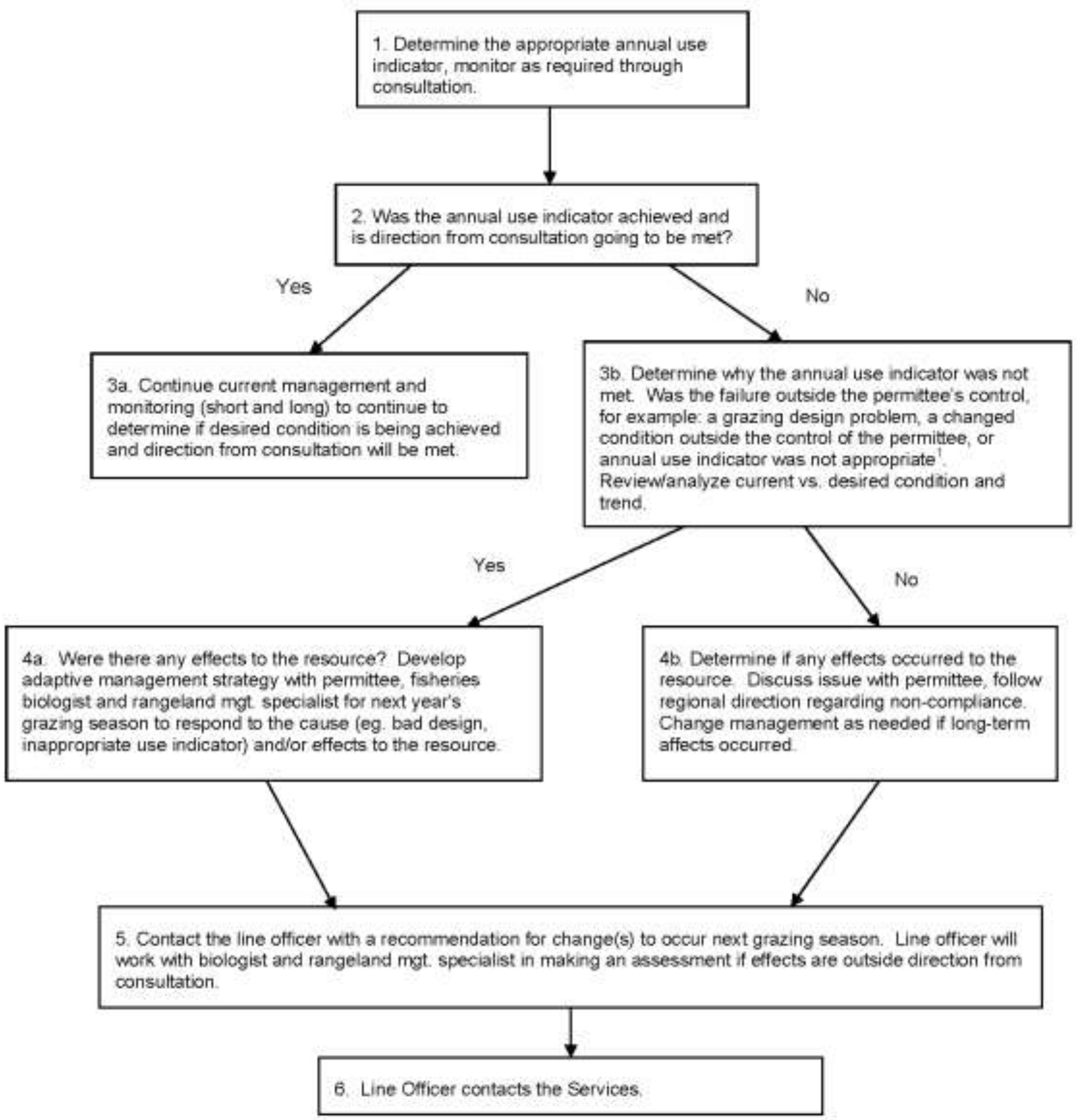
APPENDIX F – ADAPTIVE MANAGEMENT DIAGRAMS

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



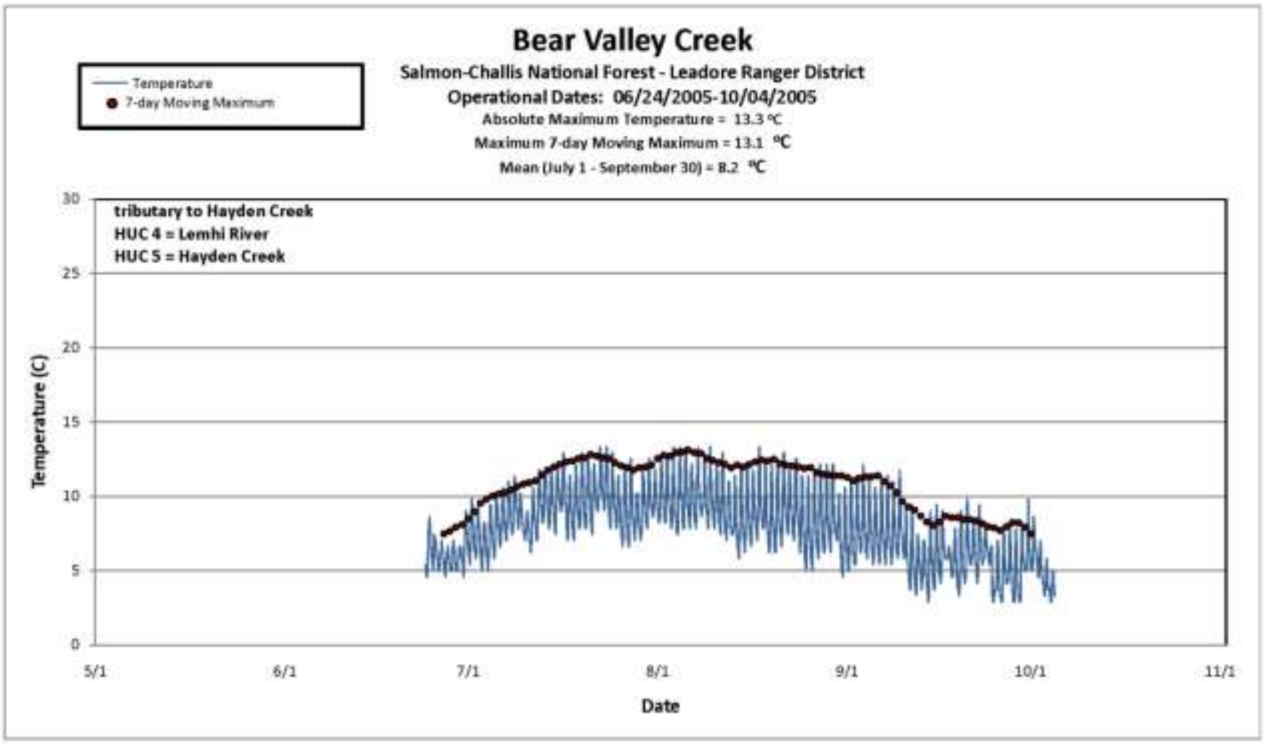
[1]Management actions will initially reduce use in the area. It is expected this may occur in any number of ways including but not limited to changing the season of use, reducing numbers, changing amount of use on annual indicator, changing herding practices, changing salting practices and/or reconstructing/constructing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

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

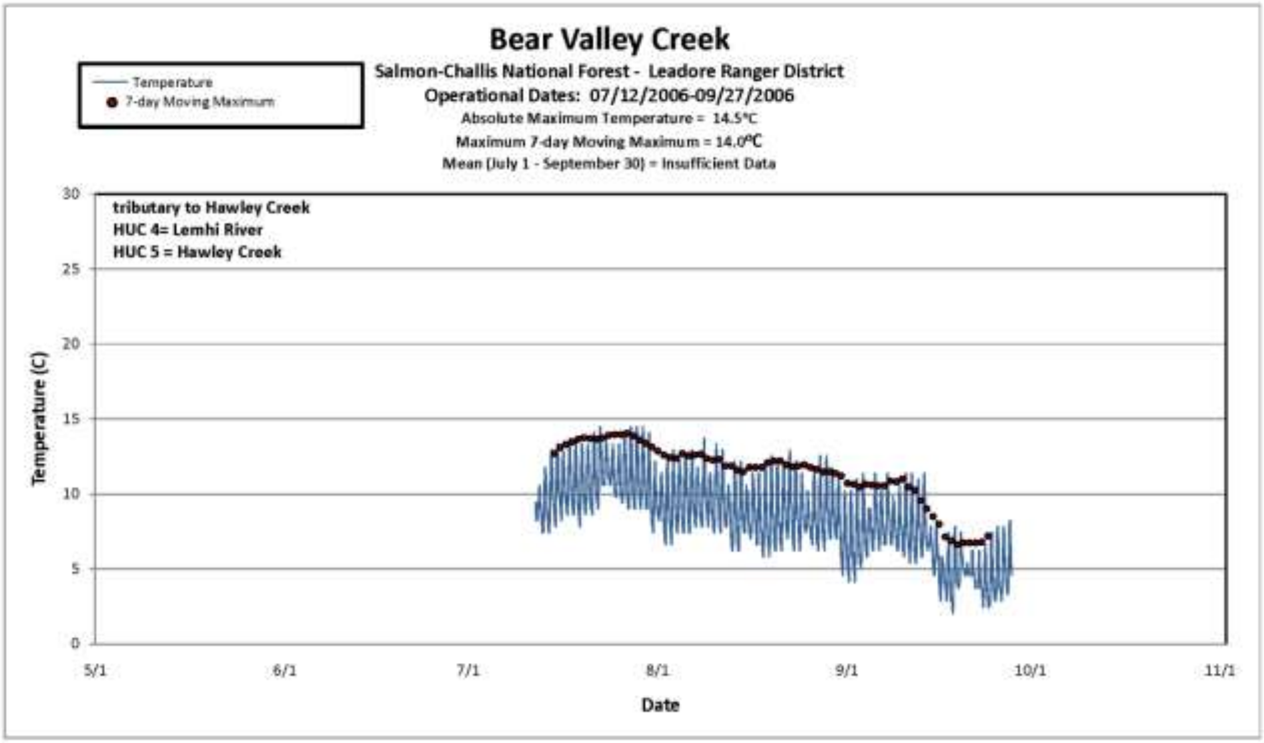


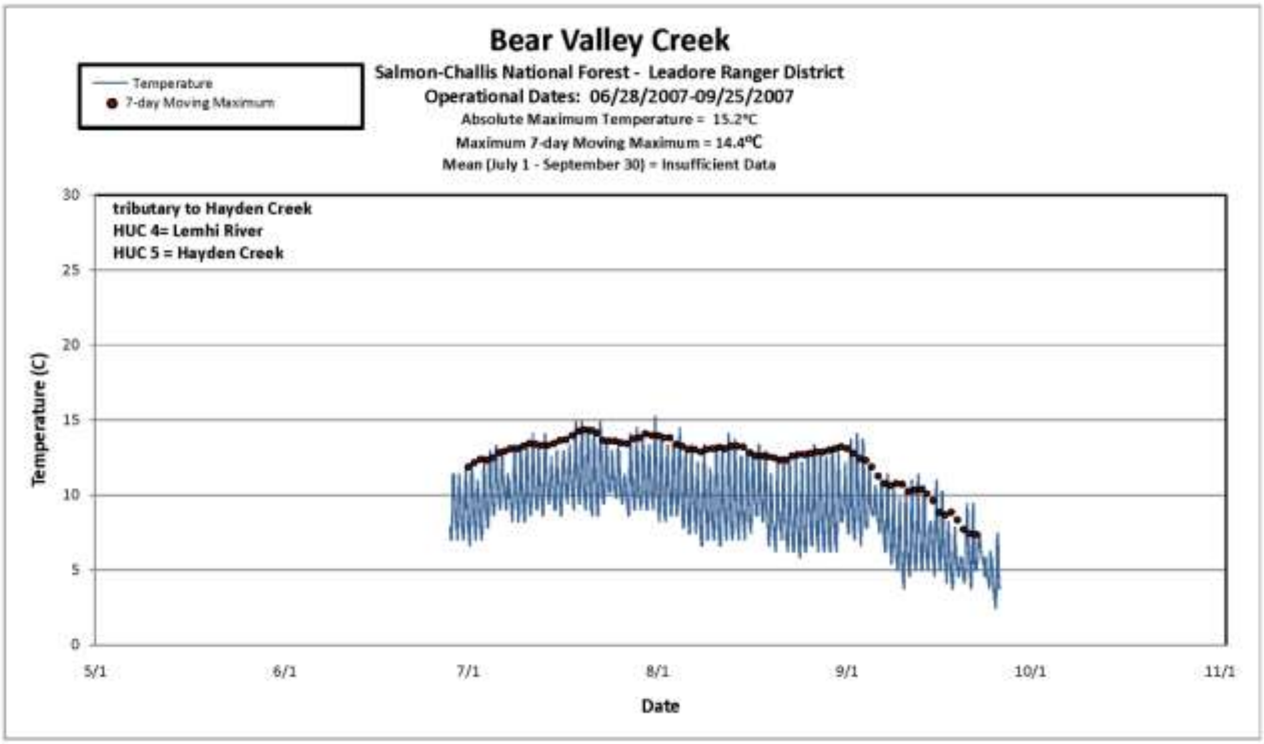
[1]An inappropriate annual use indicator is an indicator that does not most accurately identify the weak link or first attribute that would indicate excessive livestock impacts. In this situation, changing to a more appropriate indicator will help achieve or maintain desired conditions.

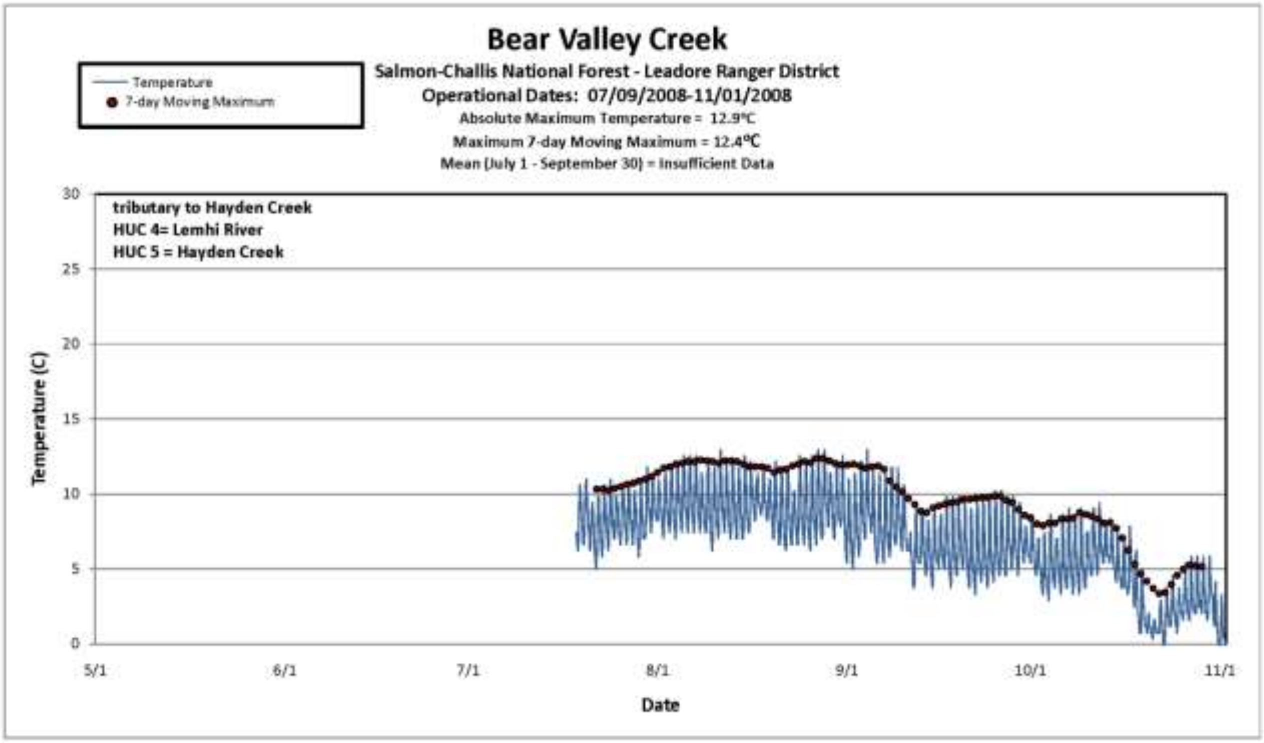
APPENDIX G – STREAM TEMPERATURE GRAPHS

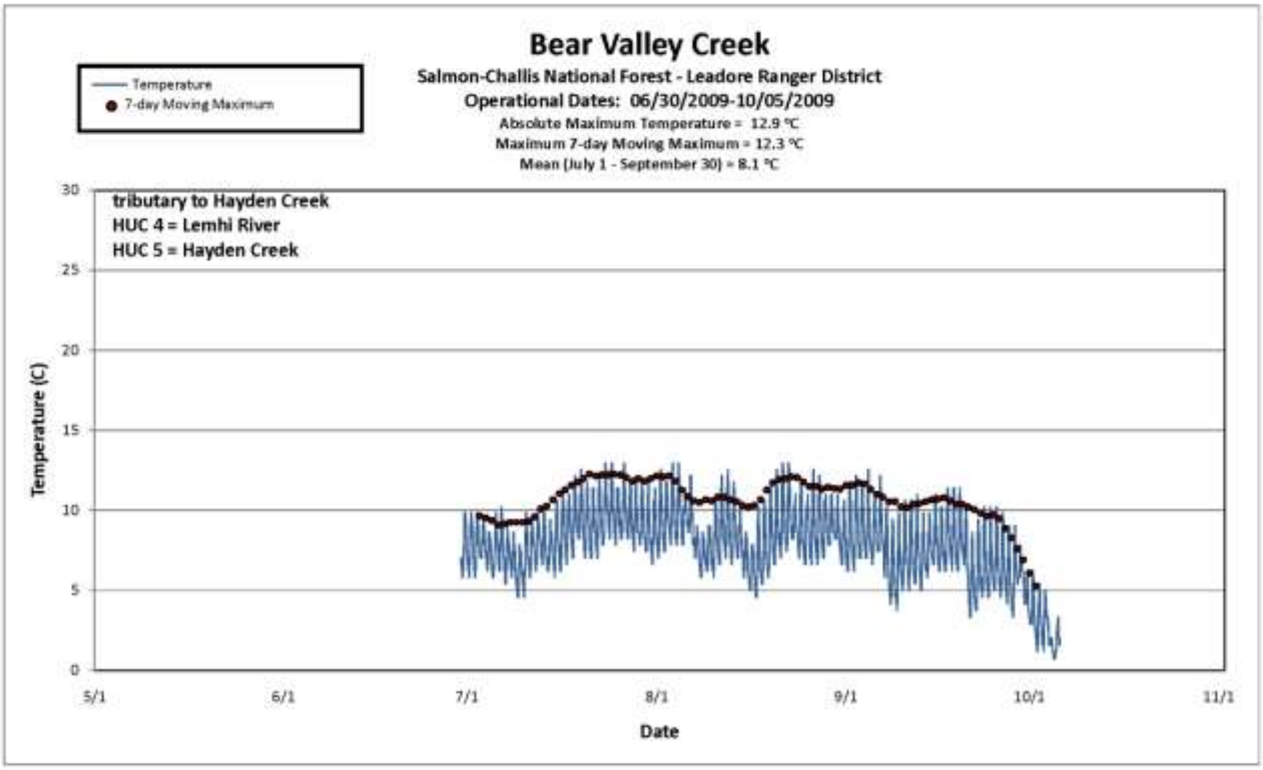


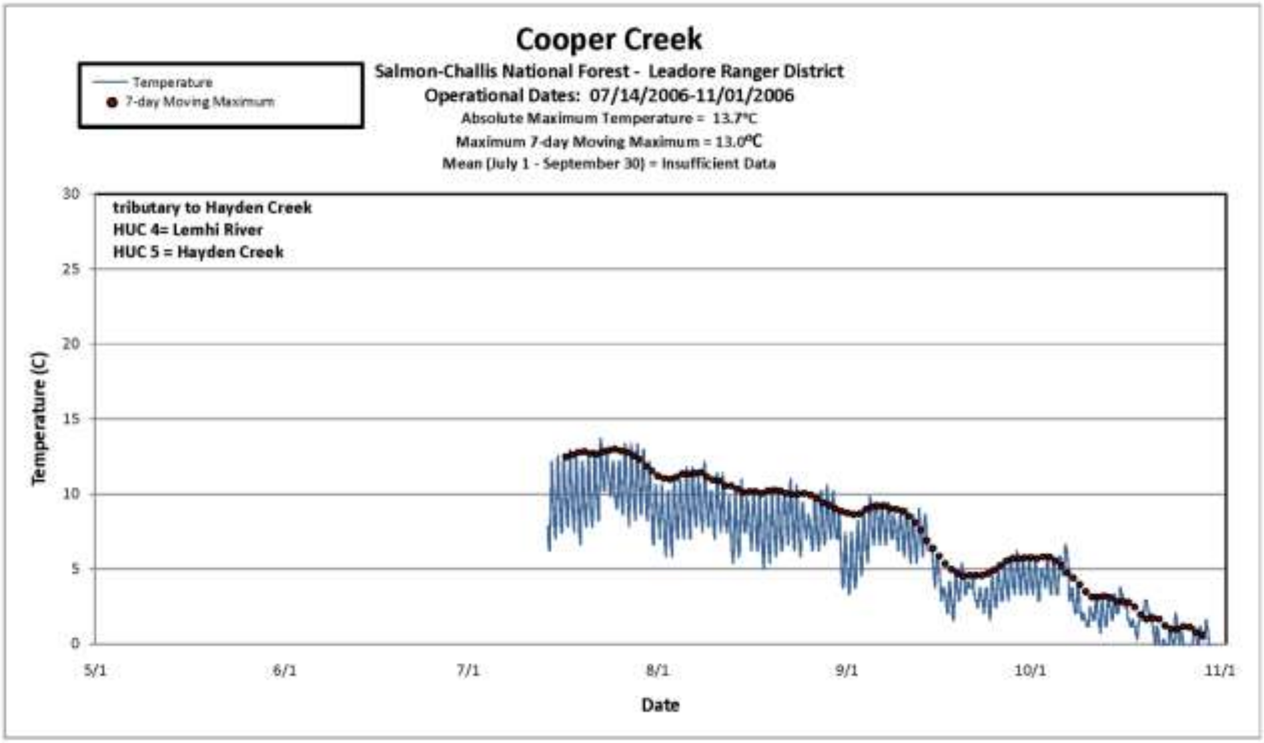
Bear Valley Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 06/24/2005-10/04/2005
Absolute Maximum Temperature = 13.3 °C
Maximum 7-day Moving Maximum = 13.1 °C
Mean (July 1 - September 30) = 8.2 °C
Temperature
7-day Moving Maximum
tributary to Hayden Creek
HUC 4 = Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date

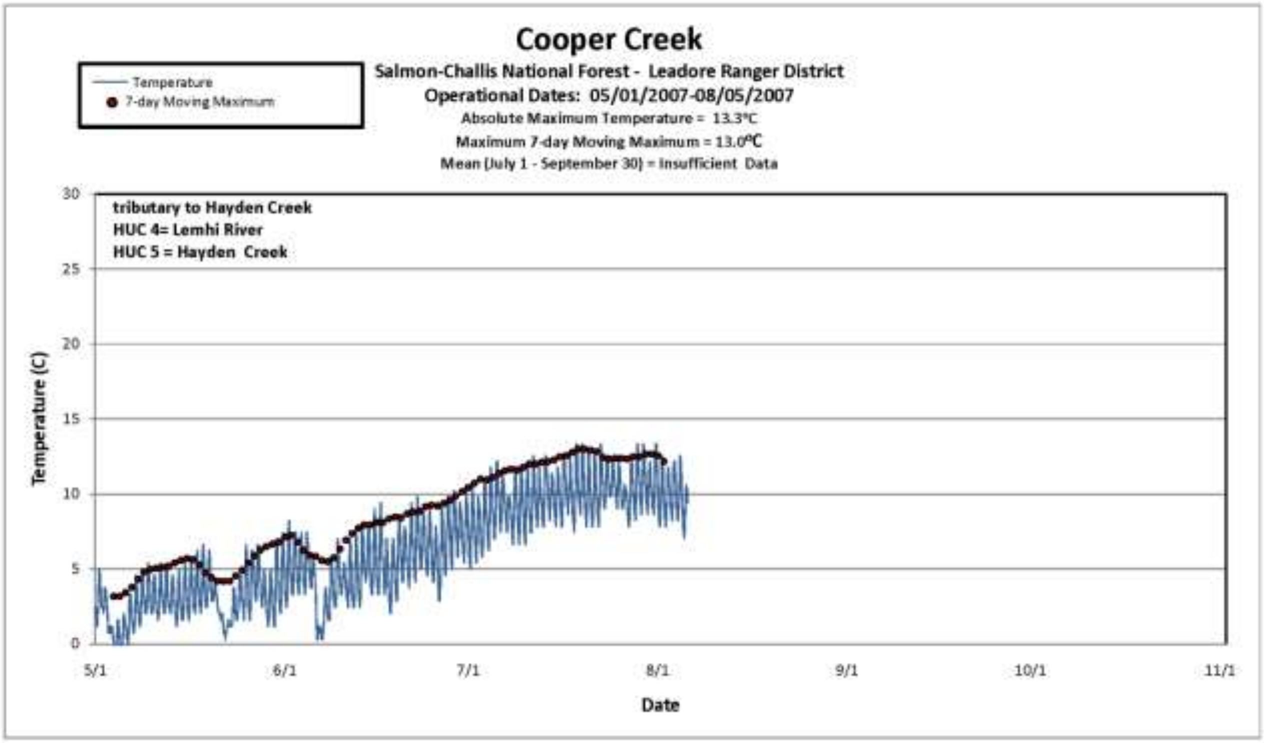

Bear Valley Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 07/12/2006-09/27/2006
Absolute Maximum Temperature = 14.5°C
Maximum 7-day Moving Maximum = 14.0°C
Mean (July 1 - September 30) = Insufficient Data
Temperature
7-day Moving Maximum
tributary to Hawley Creek
HUC 4= Lemhi River
HUC 5 = Hawley Creek
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date

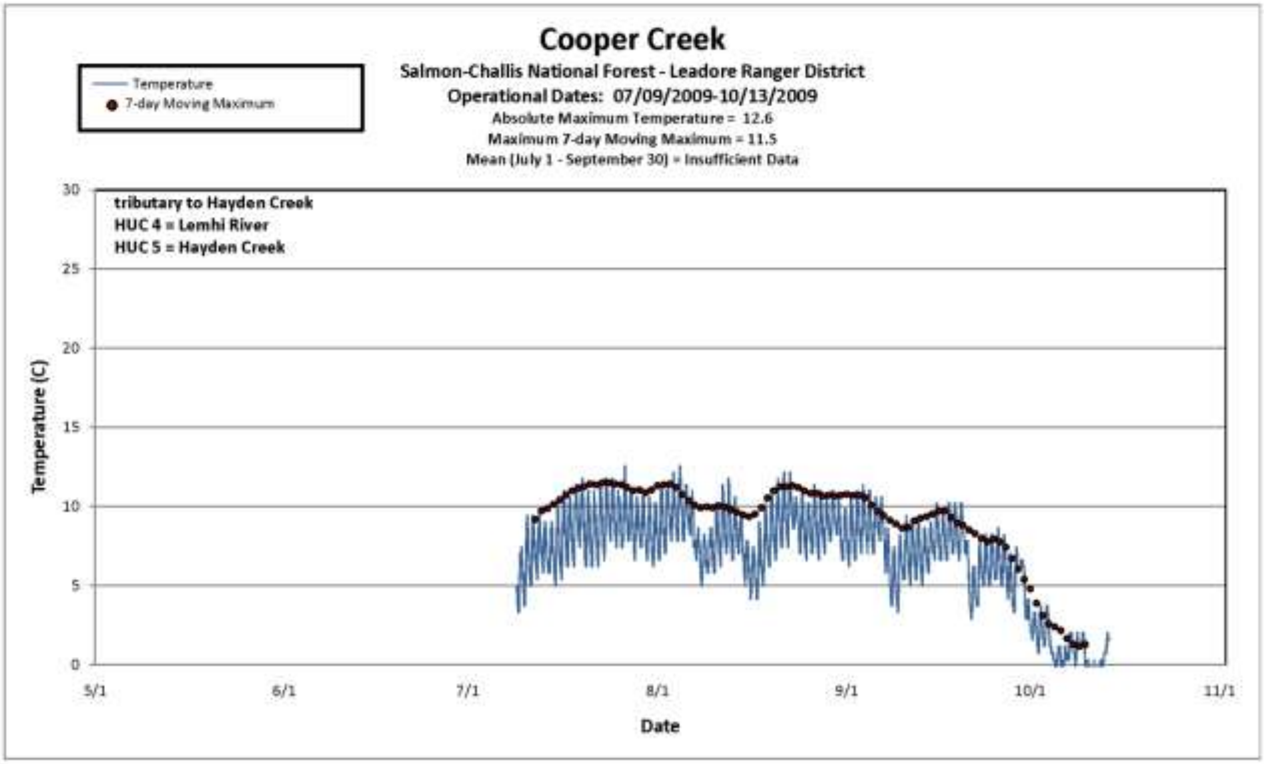

Bear Valley Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 06/28/2007-09/25/2007
Absolute Maximum Temperature = 15.2°C
Maximum 7-day Moving Maximum = 14.4°C
Mean (July 1 - September 30) = Insufficient Data
Temperature
7-day Moving Maximum
tributary to Hayden Creek
HUC 4= Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date

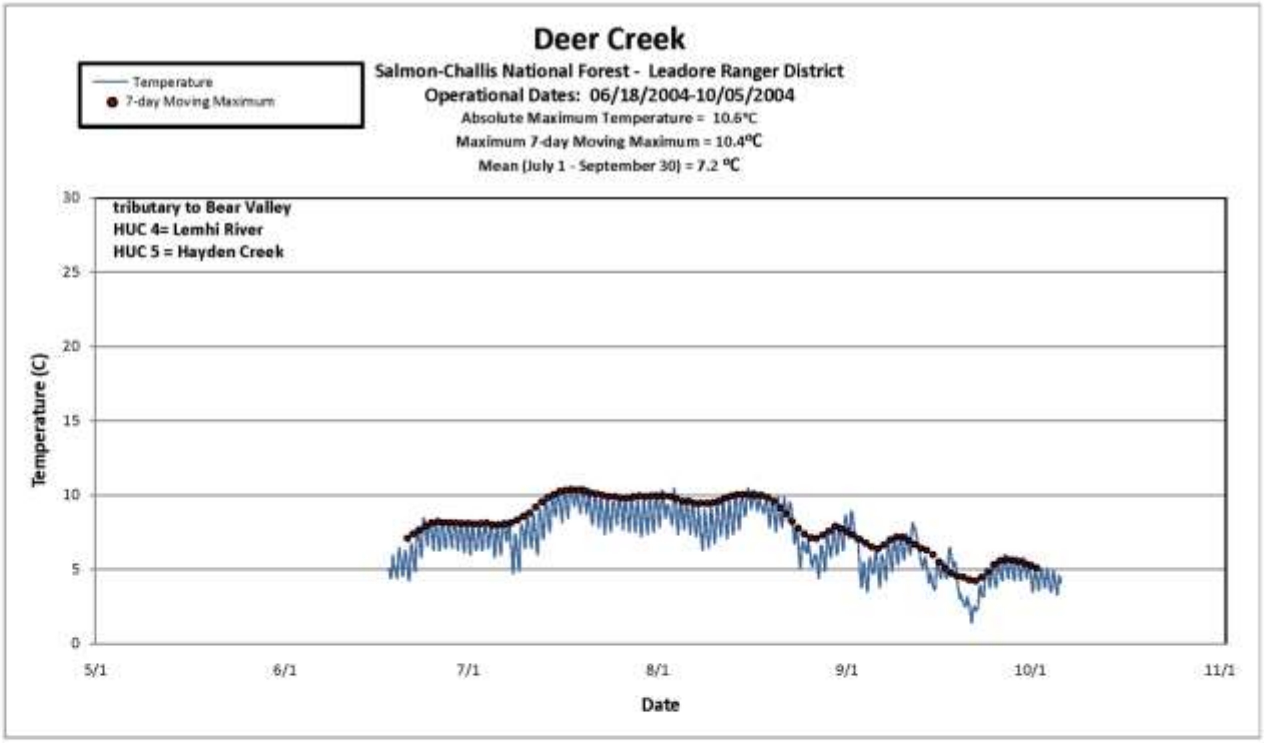

Bear Valley Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 07/09/2008-11/01/2008
Absolute Maximum Temperature = 12.9°C
Maximum 7-day Moving Maximum = 12.4°C
Mean (July 1 - September 30) = Insufficient Data
Temperature
7-day Moving Maximum
tributary to Hayden Creek
HUC 4= Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date

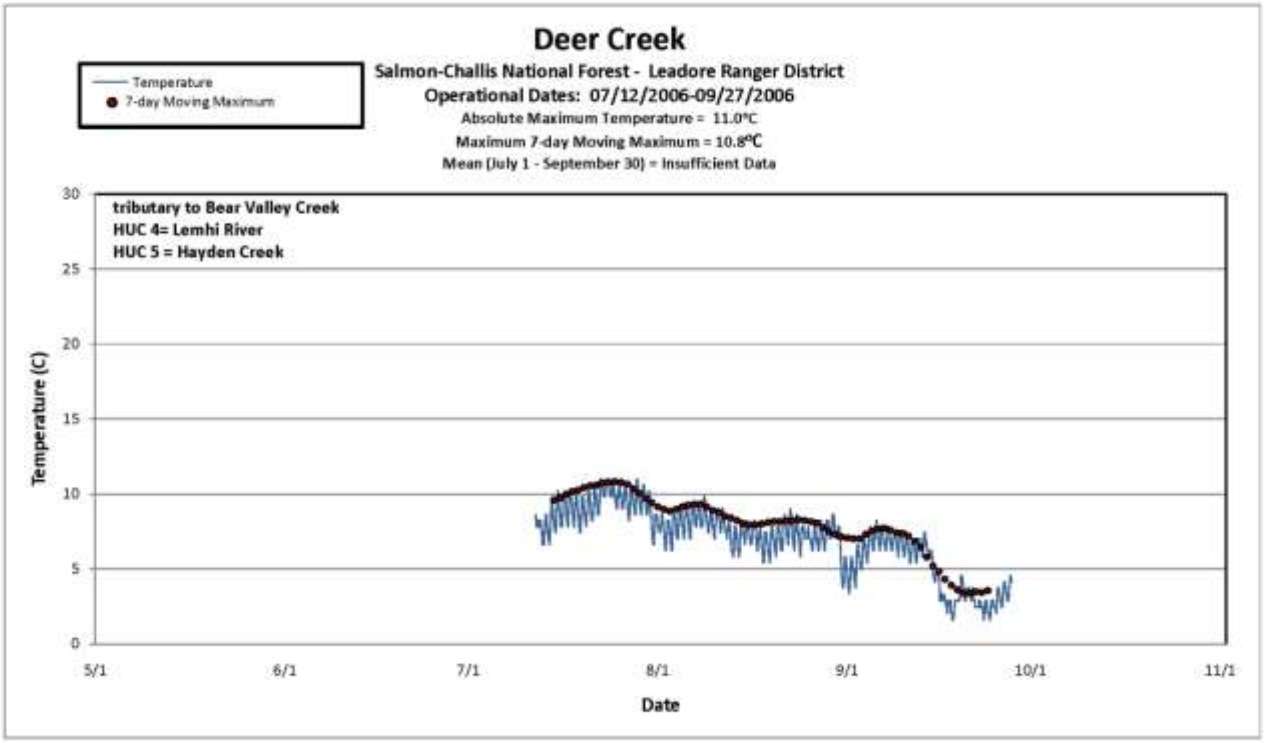

Bear Valley Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 06/30/2009-10/05/2009
Absolute Maximum Temperature = 12.9 °C
Maximum 7-day Moving Maximum = 12.3 °C
Mean (July 1 - September 30) = 8.1 °C
Temperature
7-day Moving Maximum
tributary to Hayden Creek
HUC 4 = Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date

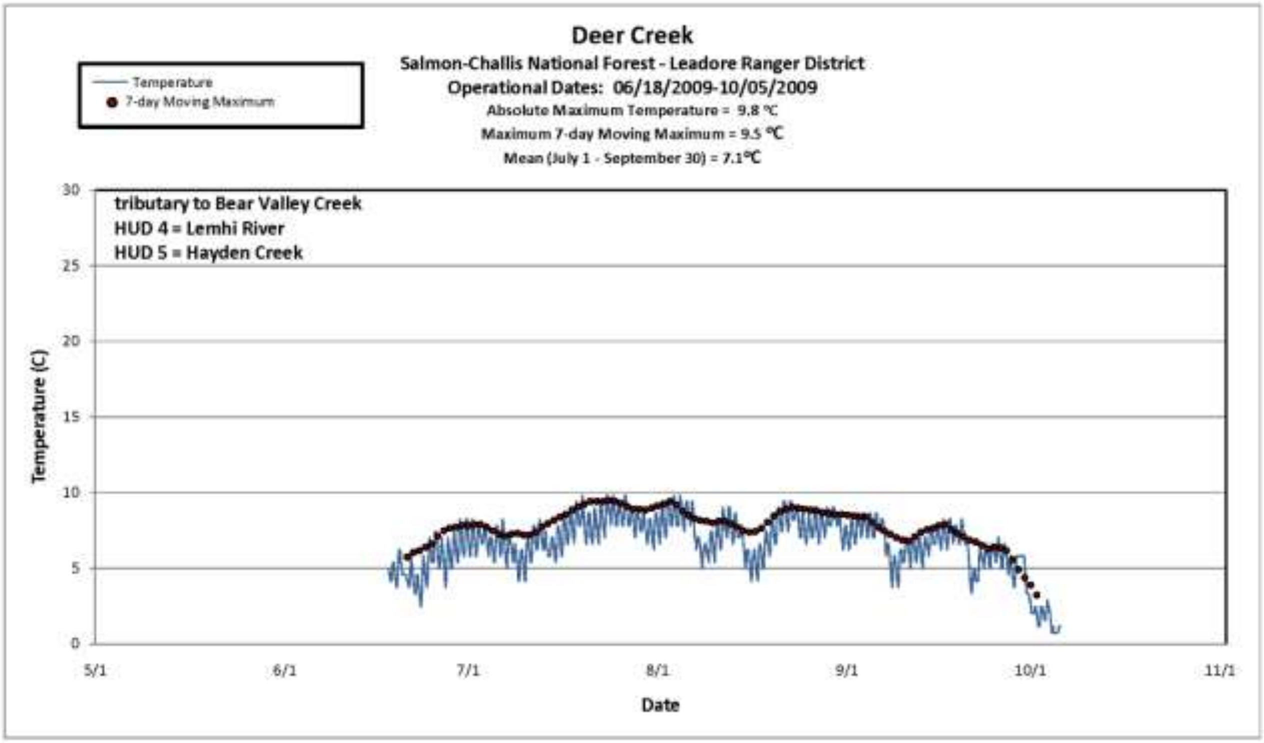

Cooper Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 07/14/2006-11/01/2006
Absolute Maximum Temperature = 13.7°C
Maximum 7-day Moving Maximum = 13.0°C
Mean (July 1 - September 30) = Insufficient Data
Temperature
7-day Moving Maximum
tributary to Hayden Creek
HUC 4= Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date

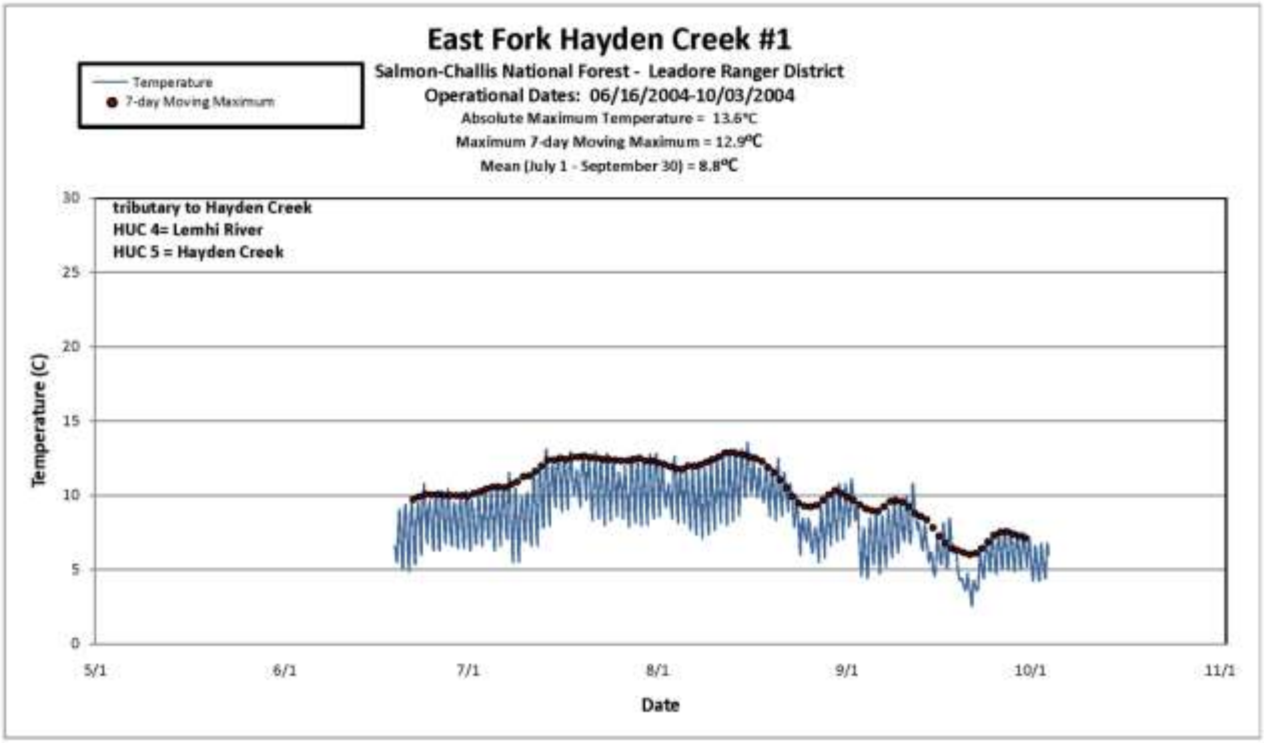

Cooper Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 05/01/2007-08/05/2007
Absolute Maximum Temperature = 13.3°C
Maximum 7-day Moving Maximum = 13.0°C
Mean (July 1 - September 30) = Insufficient Data
Temperature
7-day Moving Maximum
tributary to Hayden Creek
HUC 4= Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date

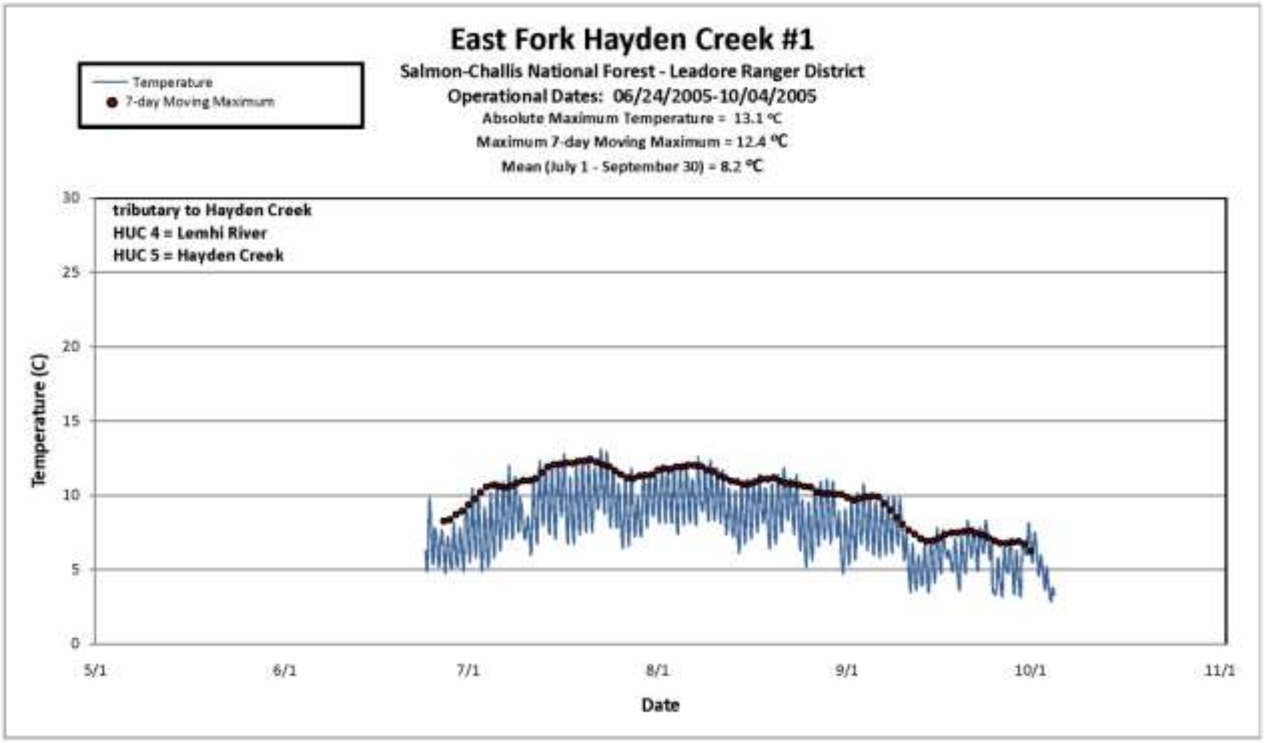

Cooper Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 07/09/2009-10/13/2009
Absolute Maximum Temperature = 12.6
Maximum 7-day Moving Maximum = 11.5
Mean (July 1 - September 30) = Insufficient Data
Temperature
7-day Moving Maximum
tributary to Hayden Creek
HUC 4 = Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
Date
0
5
10
15
20
25
30
5/1
6/1
7/1
8/1
9/1
10/1
11/1

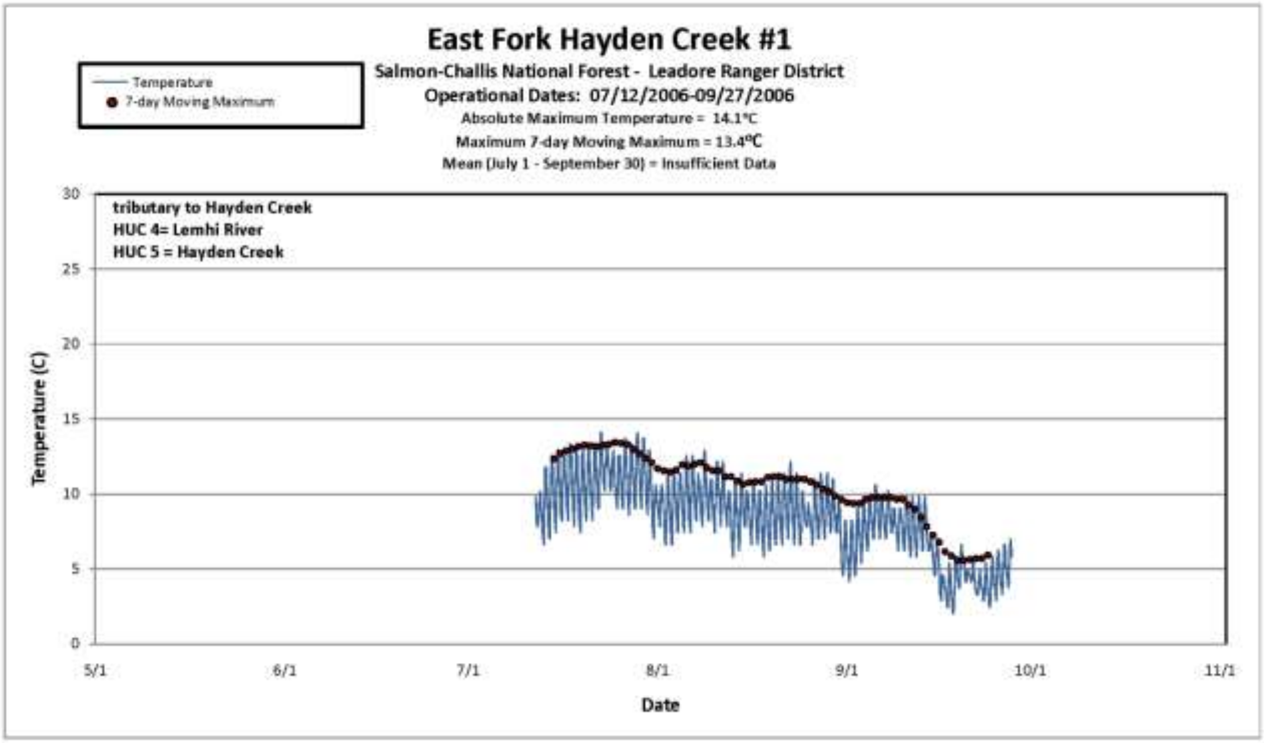

Deer Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 06/18/2004-10/05/2004
Absolute Maximum Temperature = 10.6°C
Maximum 7-day Moving Maximum = 10.4°C
Mean (July 1 - September 30) = 7.2 °C
Temperature
7-day Moving Maximum
tributary to Bear Valley
HUC 4= Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date

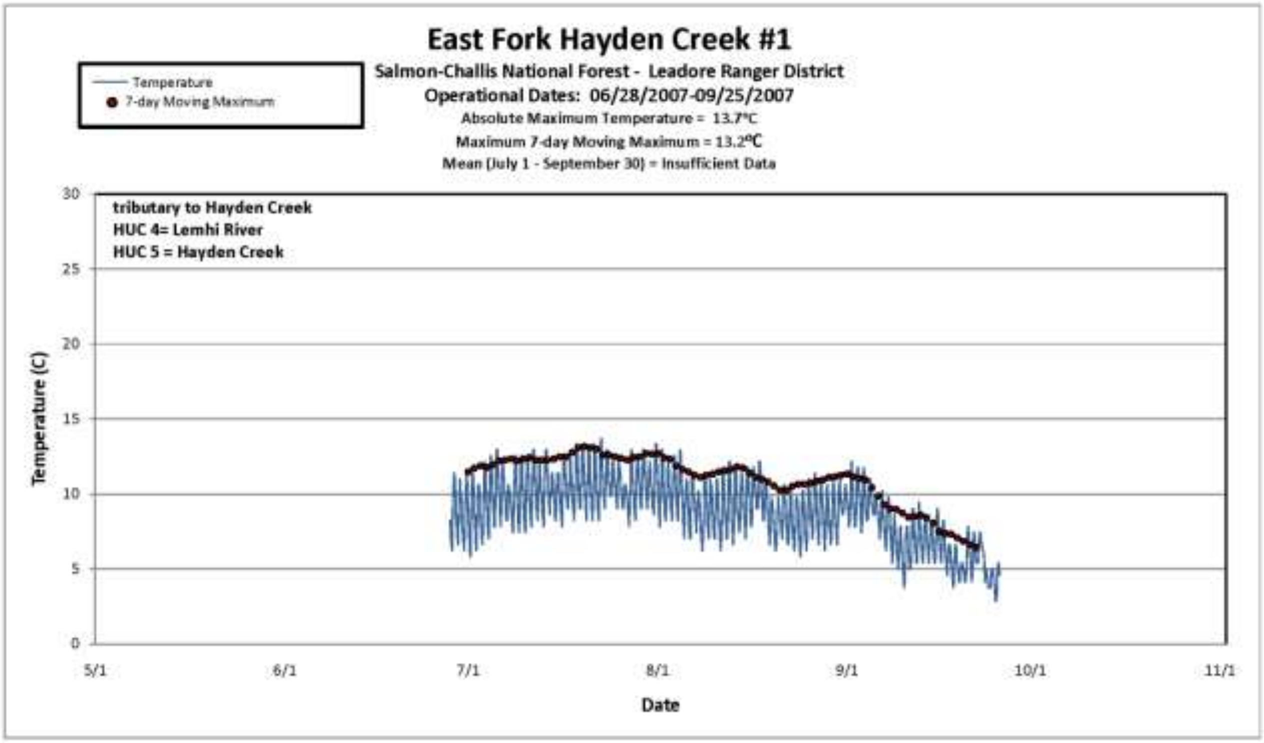

Deer Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 07/12/2006-09/27/2006
Absolute Maximum Temperature = 11.0°C
Maximum 7-day Moving Maximum = 10.8°C
Mean (July 1 - September 30) = Insufficient Data
Temperature
7-day Moving Maximum
tributary to Bear Valley Creek
HUC 4= Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date

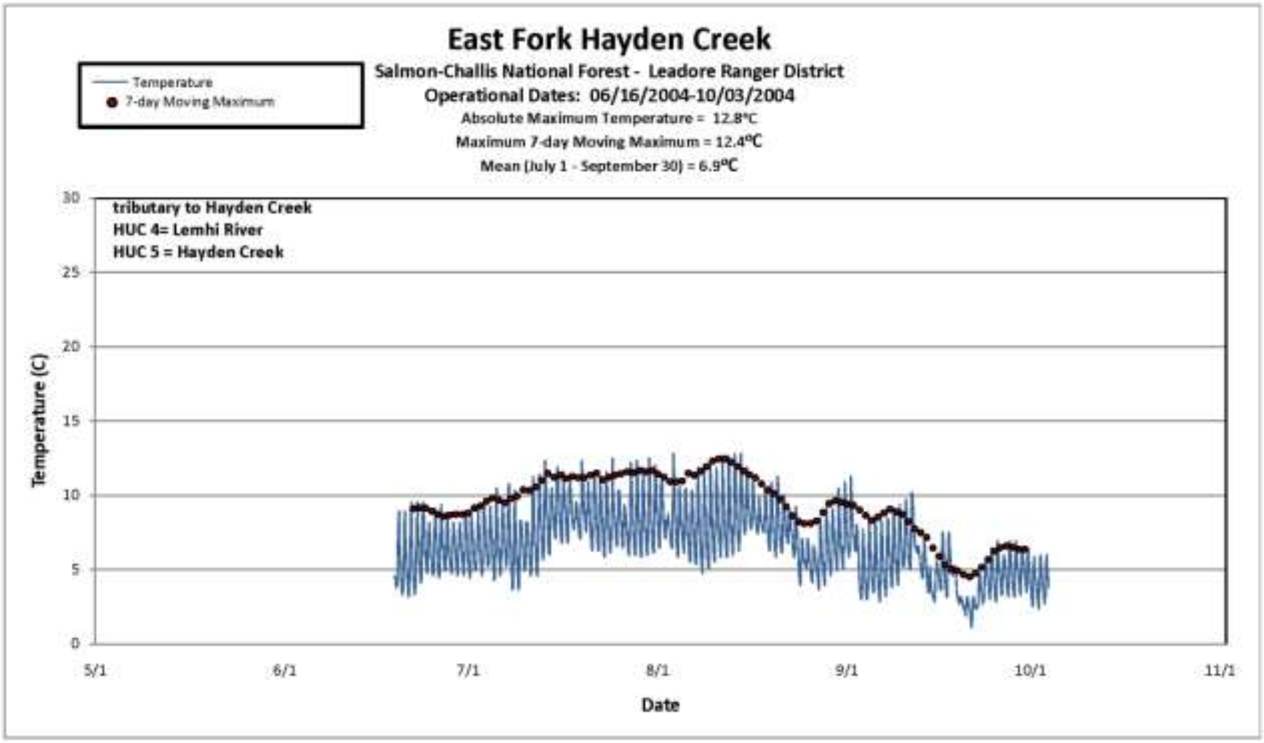

Deer Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 06/18/2009-10/05/2009
Absolute Maximum Temperature = 9.8 °C
Maximum 7-day Moving Maximum = 9.5 °C
Mean (July 1 - September 30) = 7.1°C
Temperature
7-day Moving Maximum
tributary to Bear Valley Creek
HUD 4 = Lemhi River
HUD 5 = Hayden Creek
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date

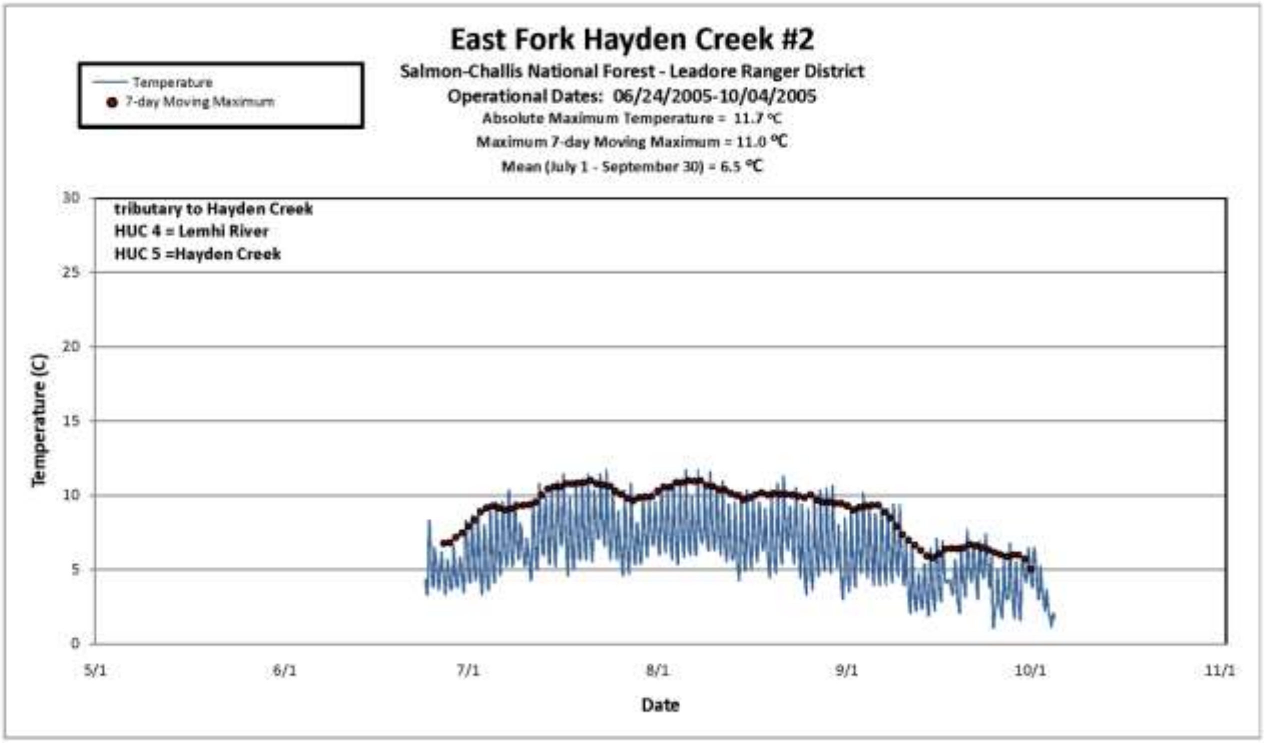

East Fork Hayden Creek #1
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 06/16/2004-10/03/2004
Absolute Maximum Temperature = 13.6°C
Maximum 7-day Moving Maximum = 12.9°C
Mean (July 1 - September 30) = 8.8°C
Temperature
7-day Moving Maximum
tributary to Hayden Creek
HUC 4= Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
Date
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1

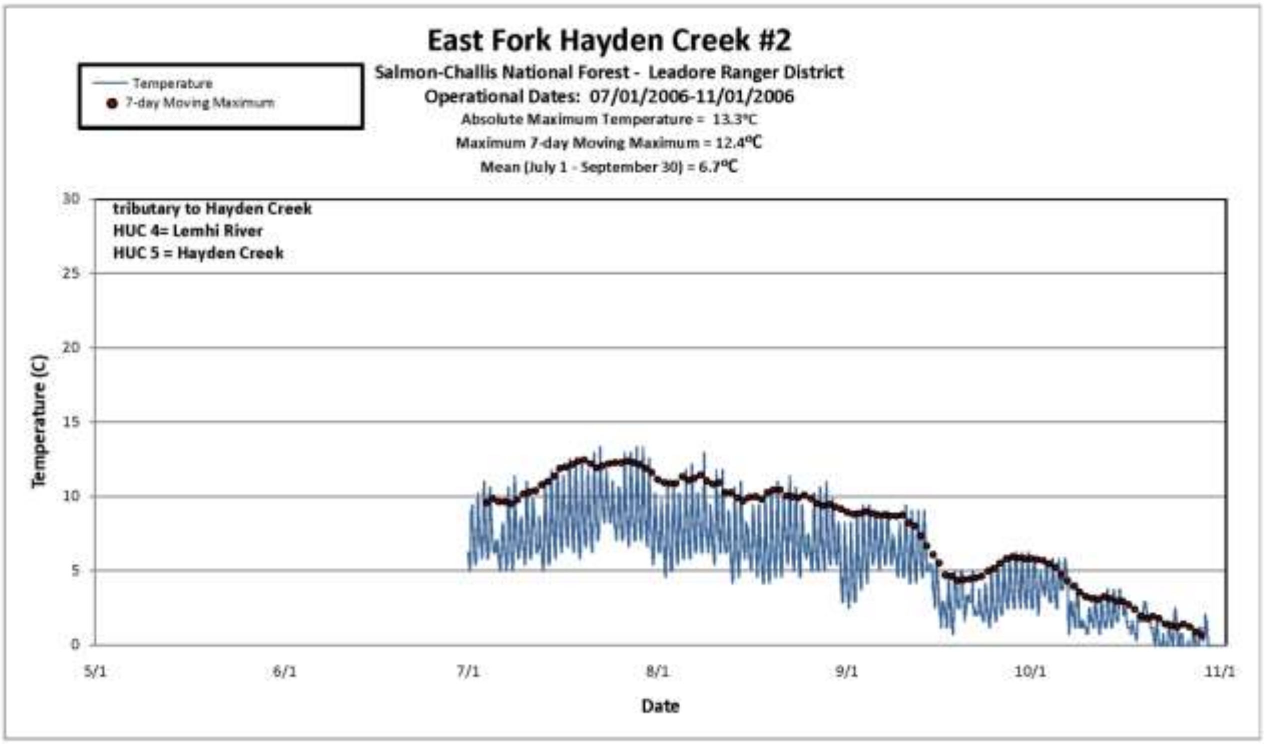

East Fork Hayden Creek #1
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 06/24/2005-10/04/2005
Absolute Maximum Temperature = 13.1 °C
Maximum 7-day Moving Maximum = 12.4 °C
Mean (July 1 - September 30) = 8.2 °C
Temperature
7-day Moving Maximum
tributary to Hayden Creek
HUC 4 = Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date

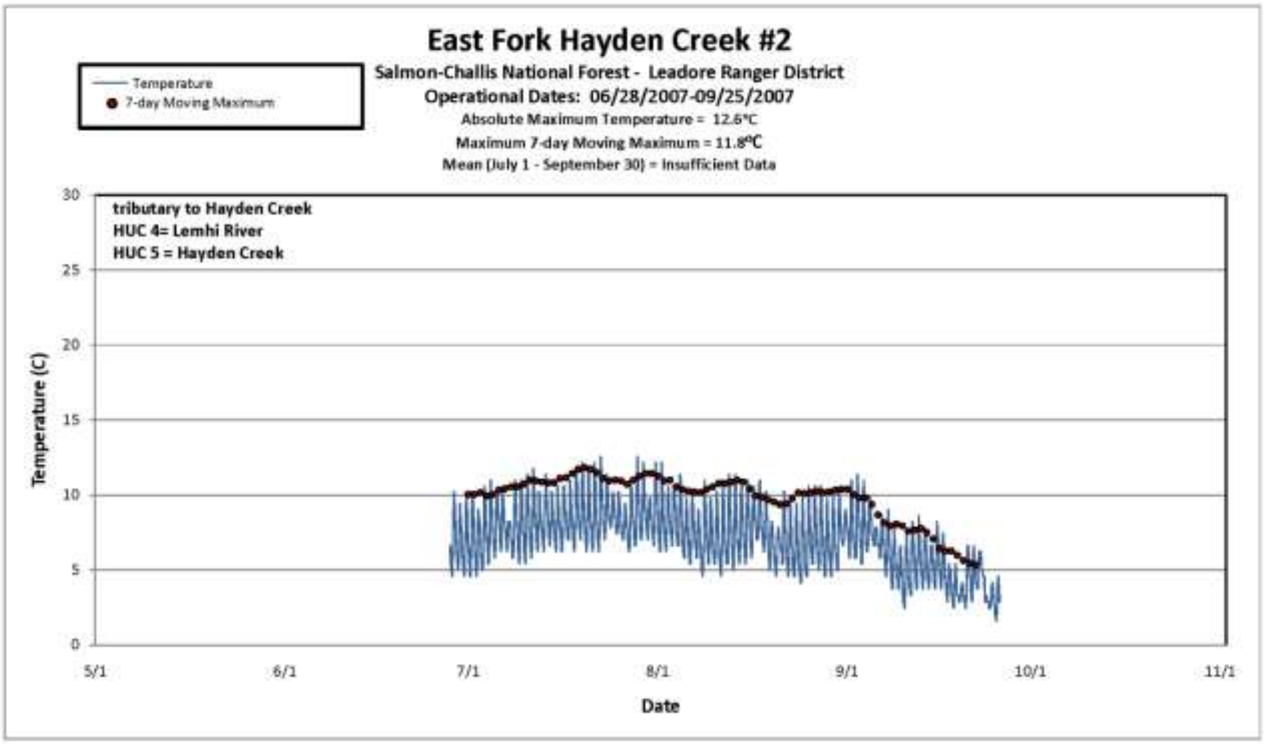

East Fork Hayden Creek #1
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 07/12/2006-09/27/2006
Absolute Maximum Temperature = 14.1°C
Maximum 7-day Moving Maximum = 13.4°C
Mean (July 1 - September 30) = Insufficient Data
Temperature
7-day Moving Maximum
tributary to Hayden Creek
HUC 4= Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date

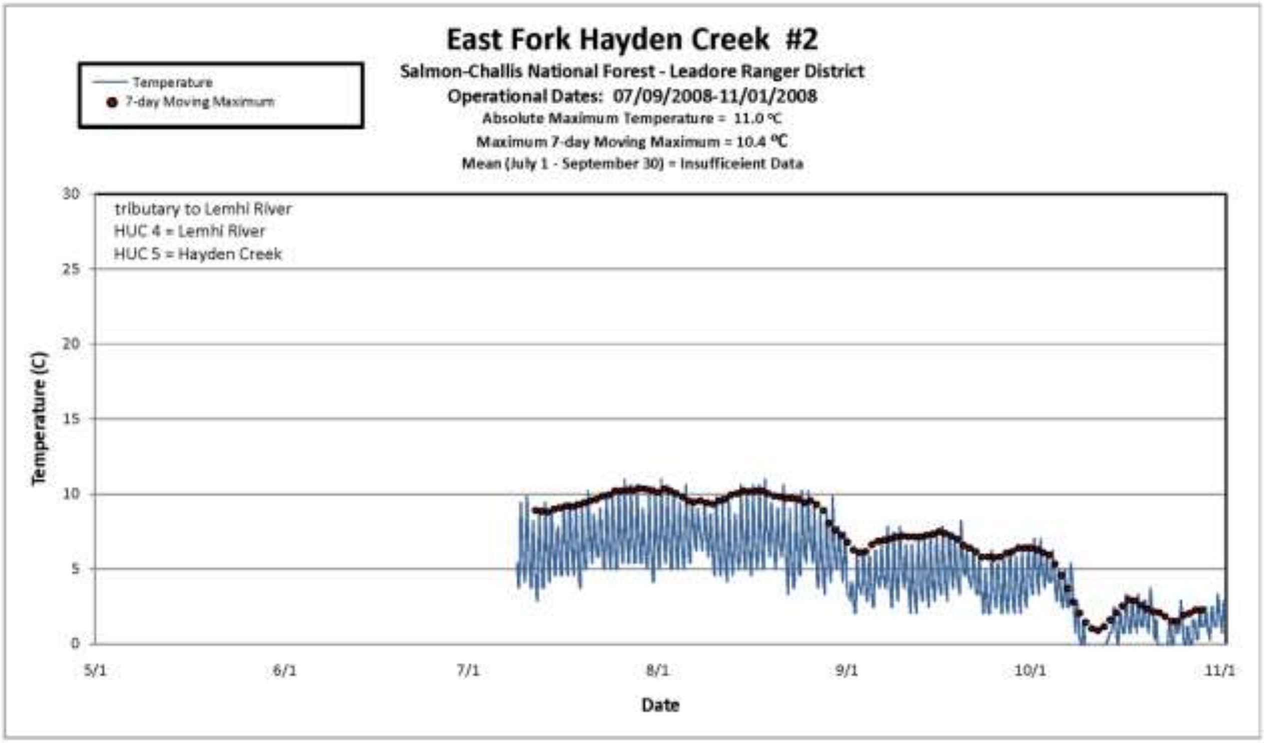

East Fork Hayden Creek #1
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 06/28/2007-09/25/2007
Absolute Maximum Temperature = 13.7°C
Maximum 7-day Moving Maximum = 13.2°C
Mean (July 1 - September 30) = Insufficient Data
Temperature
7-day Moving Maximum
tributary to Hayden Creek
HUC 4= Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
0
5
10
15
20
25
30
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date

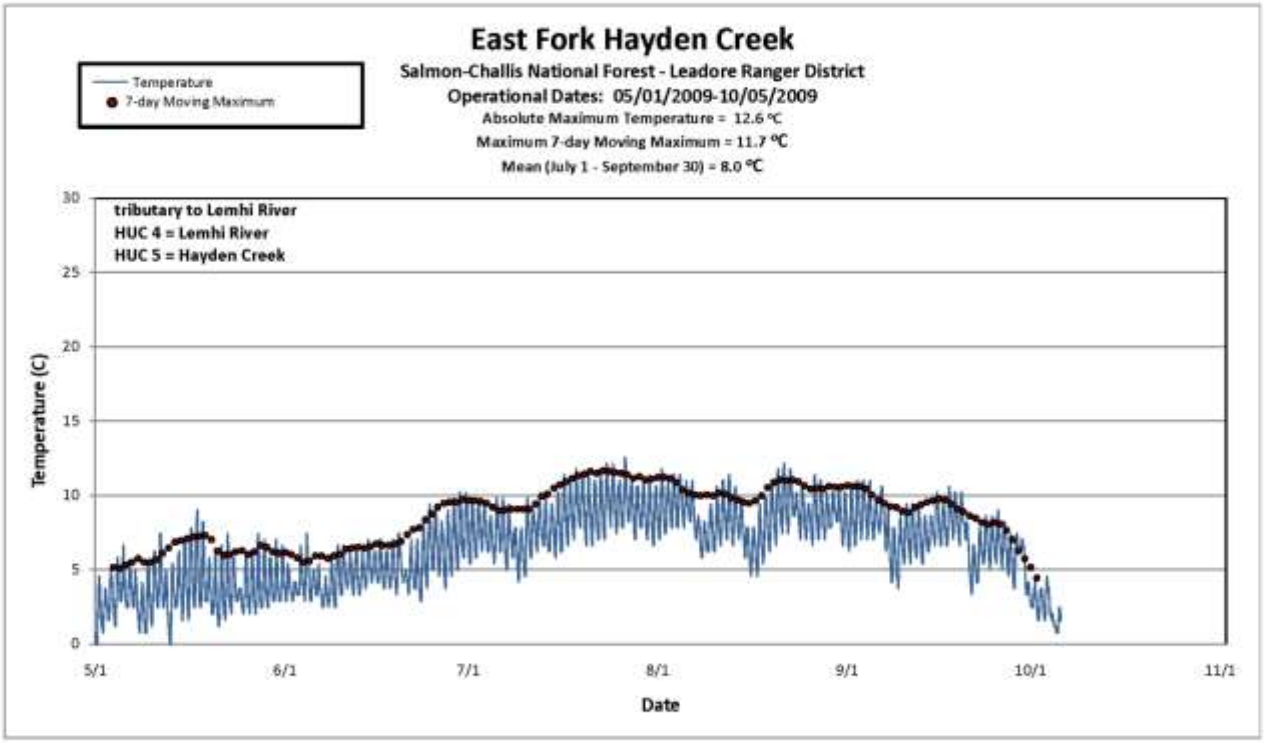

East Fork Hayden Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 06/16/2004-10/03/2004
Absolute Maximum Temperature = 12.8°C
Maximum 7-day Moving Maximum = 12.4°C
Mean (July 1 - September 30) = 6.9°C
Temperature
7-day Moving Maximum
tributary to Hayden Creek
HUC 4= Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date

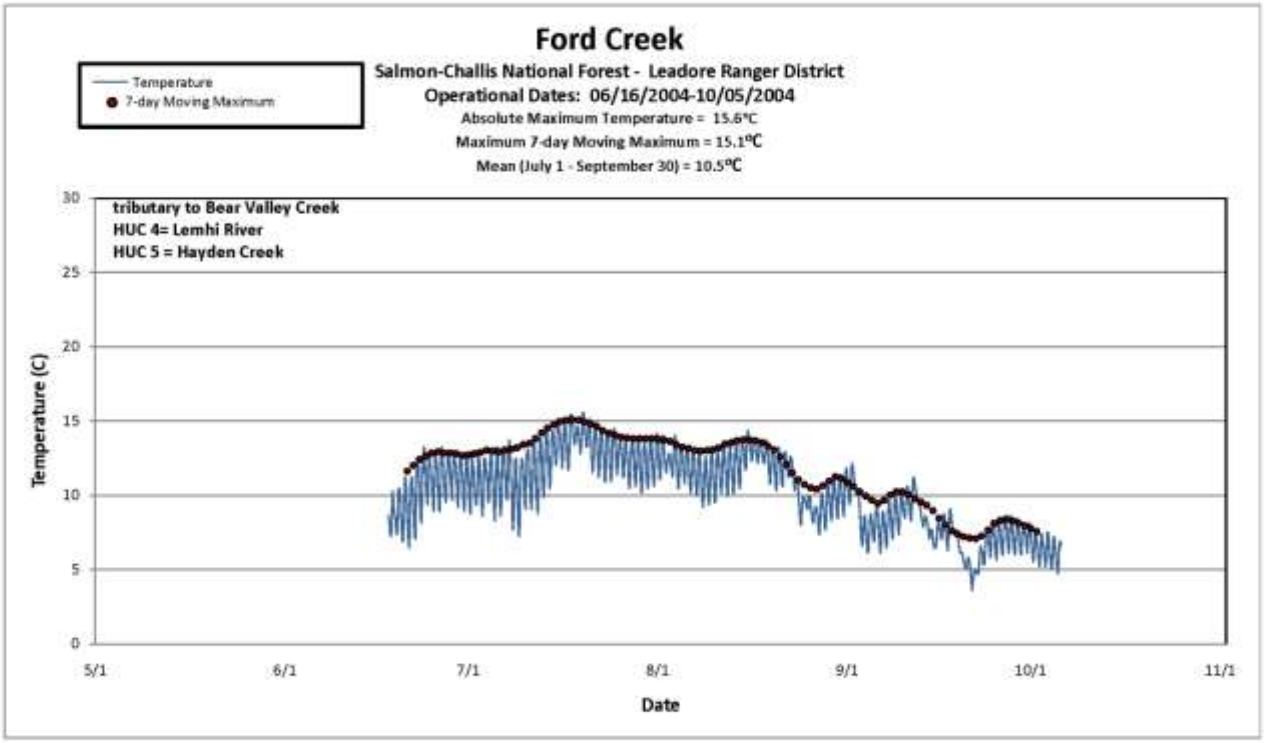

East Fork Hayden Creek #2
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 06/24/2005-10/04/2005
Absolute Maximum Temperature = 11.7 °C
Maximum 7-day Moving Maximum = 11.0 °C
Mean (July 1 - September 30) = 6.5 °C
Temperature
7-day Moving Maximum
tributary to Hayden Creek
HUC 4 = Lemhi River
HUC 5 =Hayden Creek
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date

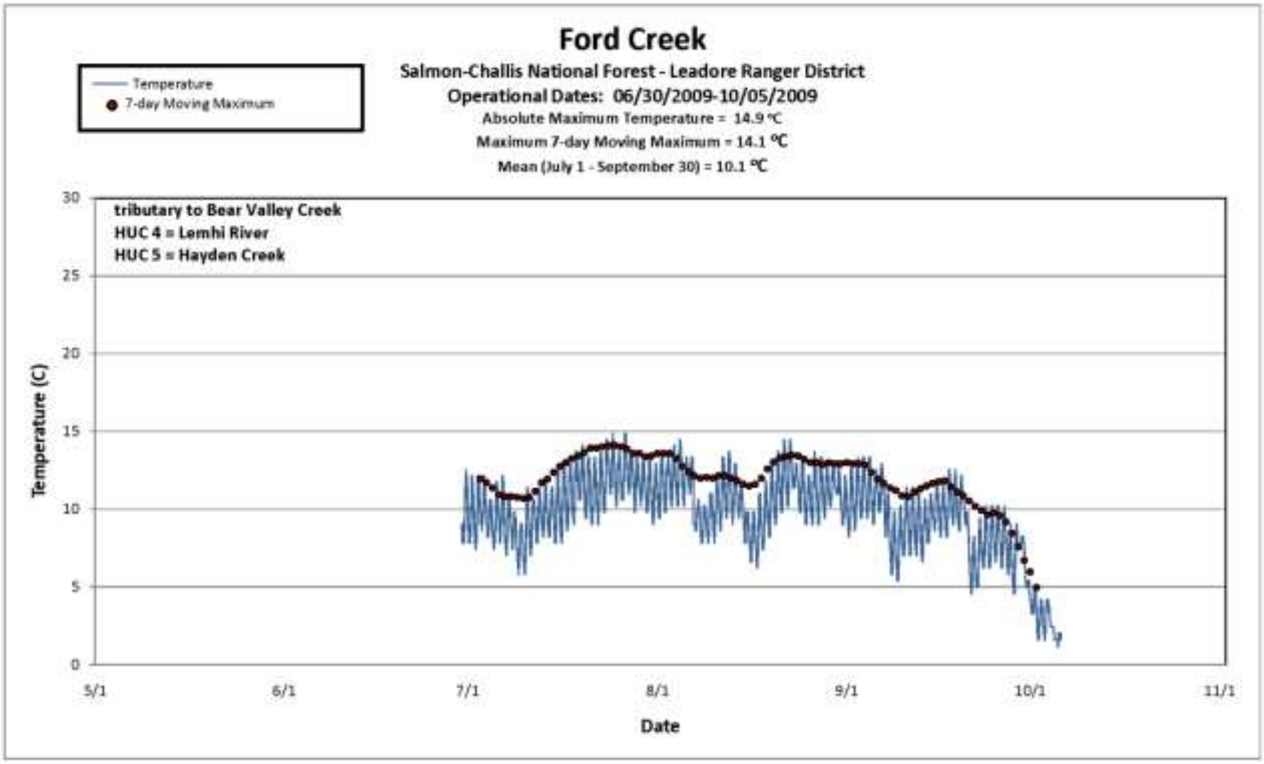

East Fork Hayden Creek #2
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 07/01/2006-11/01/2006
Absolute Maximum Temperature = 13.3°C
Maximum 7-day Moving Maximum = 12.4°C
Mean (July 1 - September 30) = 6.7°C
Temperature
7-day Moving Maximum
tributary to Hayden Creek
HUC 4= Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date

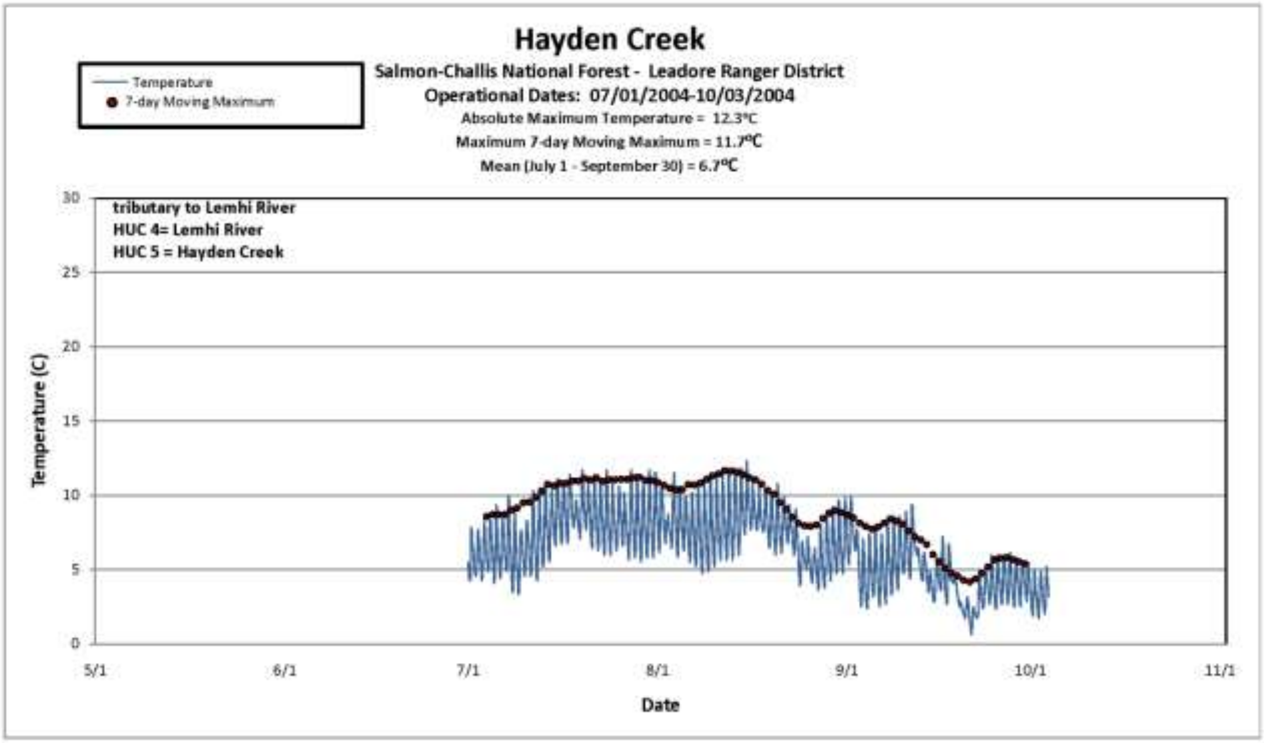

East Fork Hayden Creek #2
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 06/28/2007-09/25/2007
Absolute Maximum Temperature = 12.6°C
Maximum 7-day Moving Maximum = 11.8°C
Mean (July 1 - September 30) = Insufficient Data
Temperature
7-day Moving Maximum
tributary to Hayden Creek
HUC 4= Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date

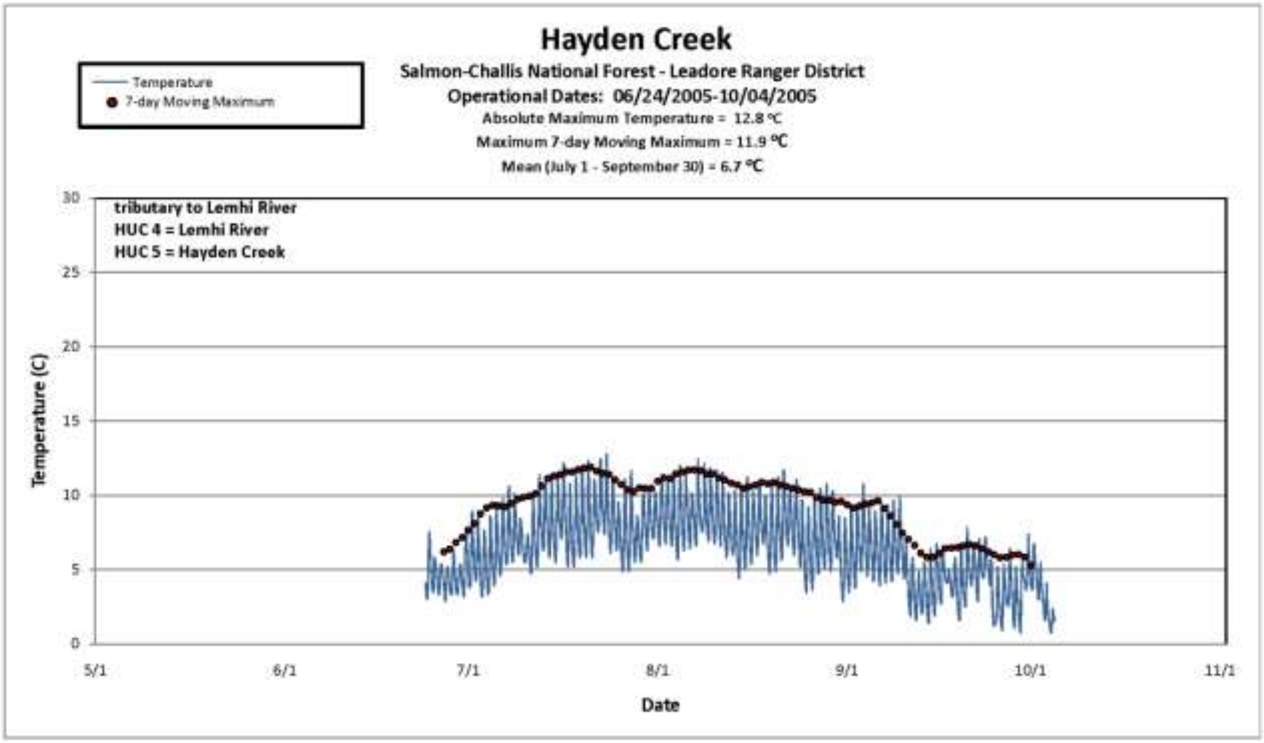

East Fork Hayden Creek #2
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 07/09/2008-11/01/2008
Absolute Maximum Temperature = 11.0 °C
Maximum 7-day Moving Maximum = 10.4 °C
Mean (July 1 - September 30) = Insufficeient Data
Temperature
7-day Moving Maximum
tributary to Lemhi River
HUC 4 = Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date

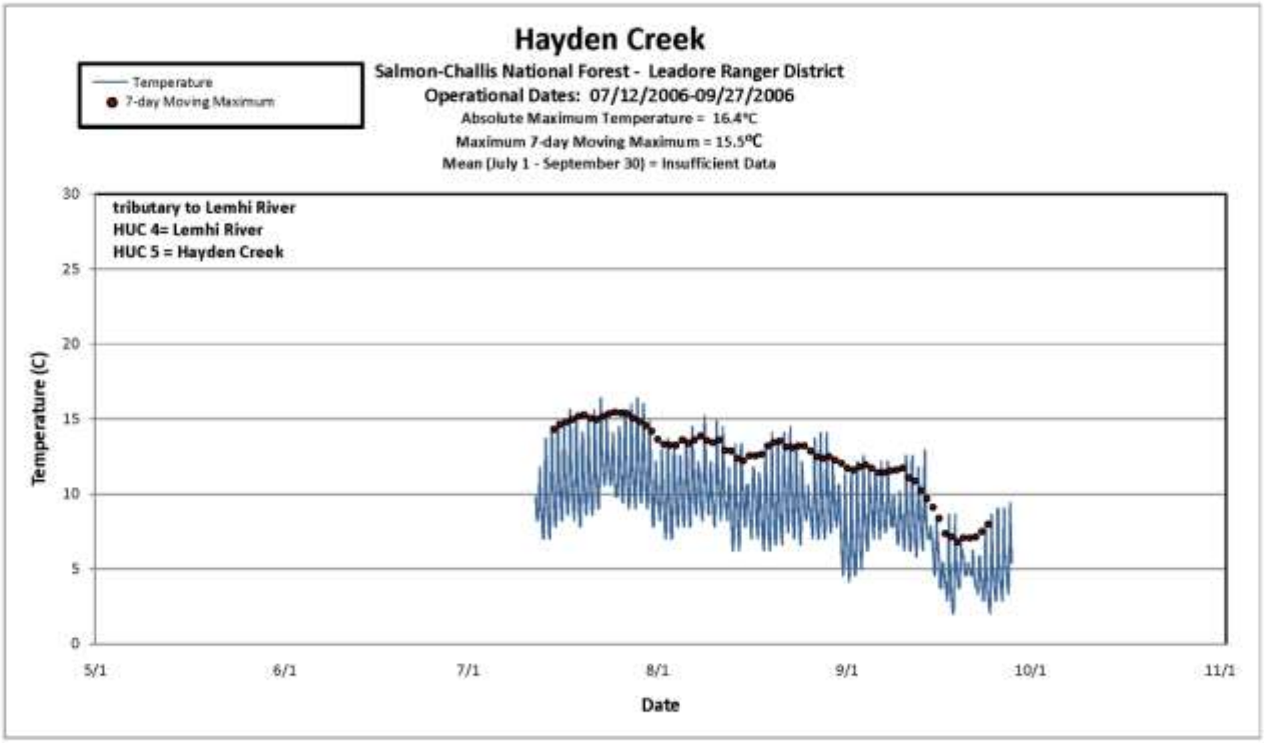

East Fork Hayden Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 05/01/2009-10/05/2009
Absolute Maximum Temperature = 12.6 °C
Maximum 7-day Moving Maximum = 11.7 °C
Mean (July 1 - September 30) = 8.0 °C
Temperature
7-day Moving Maximum
tributary to Lemhi River
HUC 4 = Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date

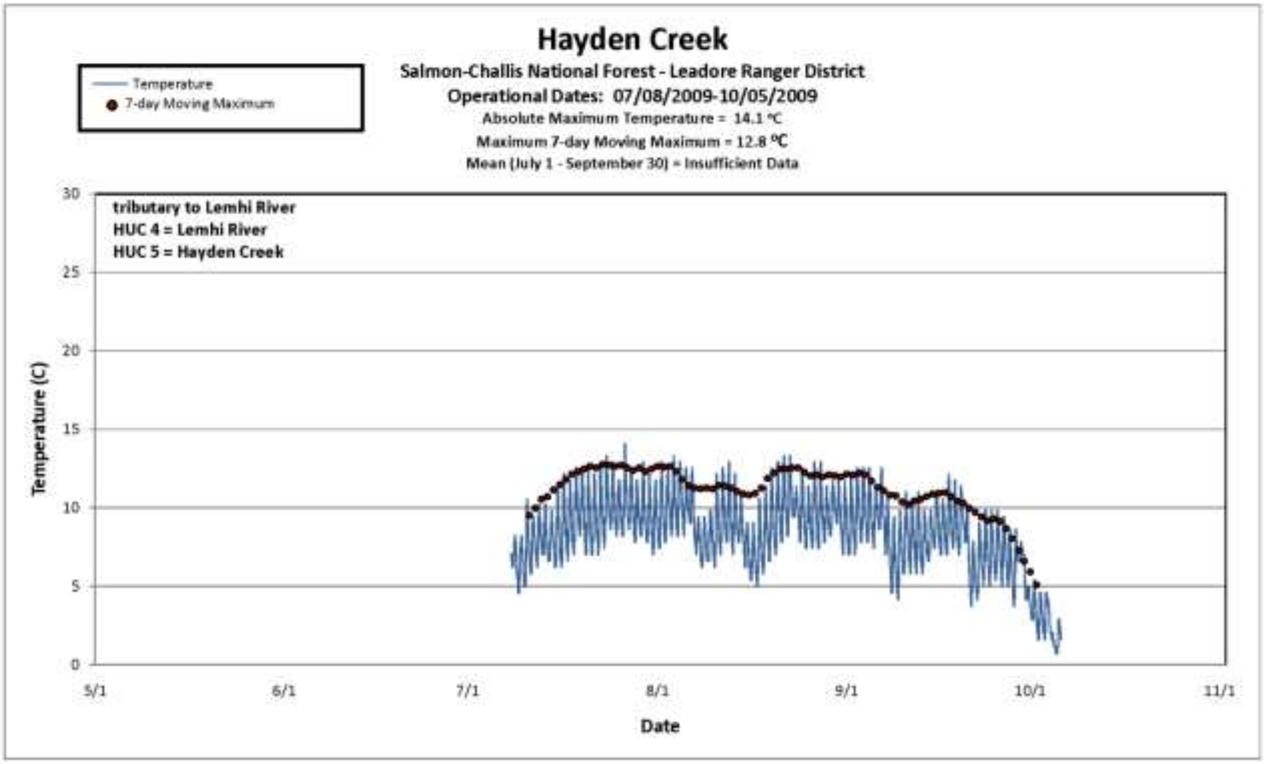

Ford Creek
Temperature
7-day Moving Maximum
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 06/16/2004-10/05/2004
Absolute Maximum Temperature = 15.6°C
Maximum 7-day Moving Maximum = 15.1°C
Mean (July 1 - September 30) = 10.5°C
tributary to Bear Valley Creek
HUC 4= Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date

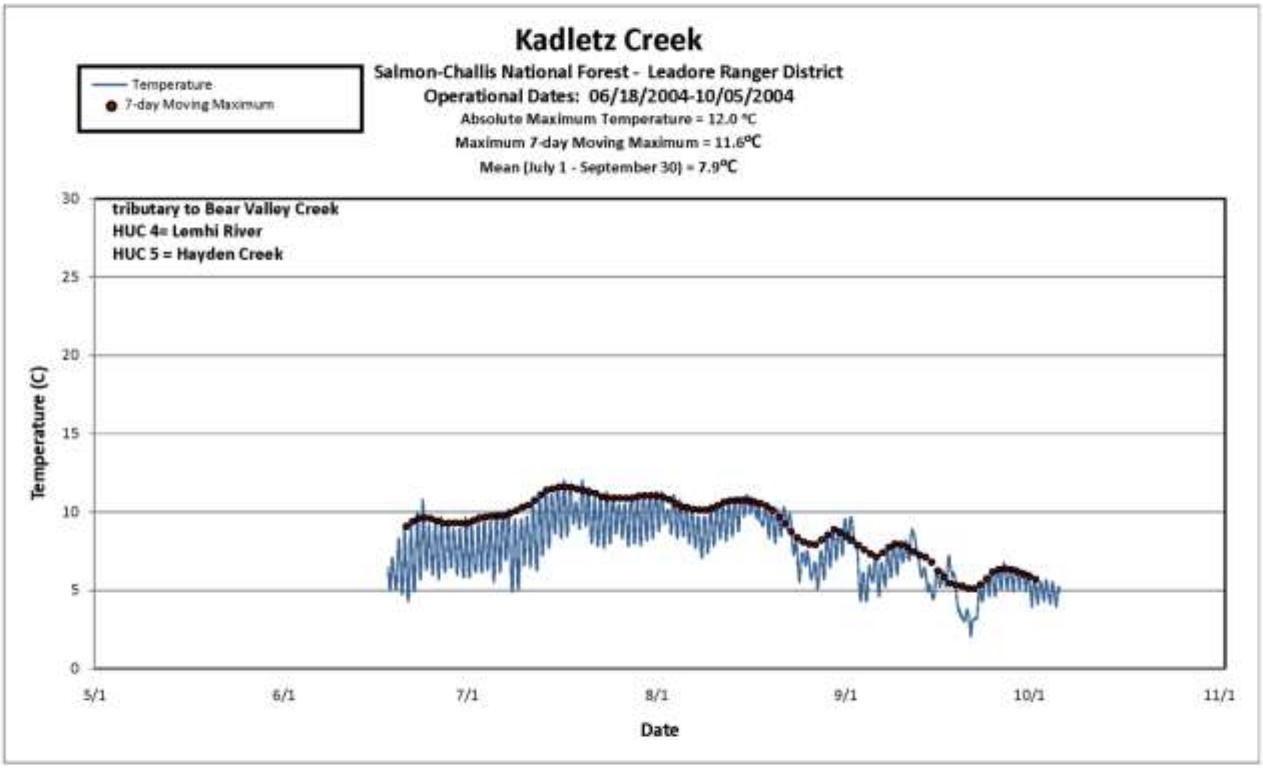

Ford Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 06/30/2009-10/05/2009
Absolute Maximum Temperature = 14.9 °C
Maximum 7-day Moving Maximum = 14.1 °C
Mean (July 1 - September 30) = 10.1 °C
Temperature
7-day Moving Maximum
tributary to Bear Valley Creek
HUC 4 = Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date

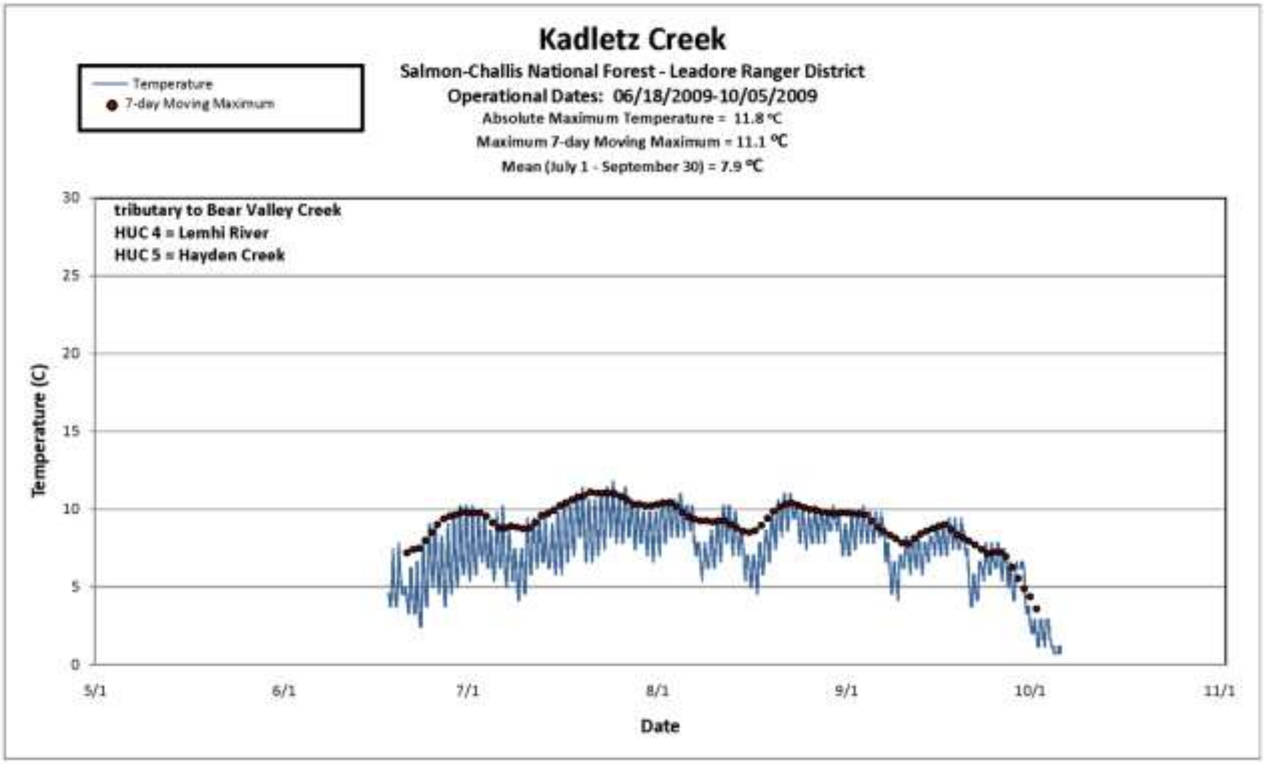

Hayden Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 07/01/2004-10/03/2004
Absolute Maximum Temperature = 12.3°C
Maximum 7-day Moving Maximum = 11.7°C
Mean (July 1 - September 30) = 6.7°C
Temperature
7-day Moving Maximum
tributary to Lemhi River
HUC 4= Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date

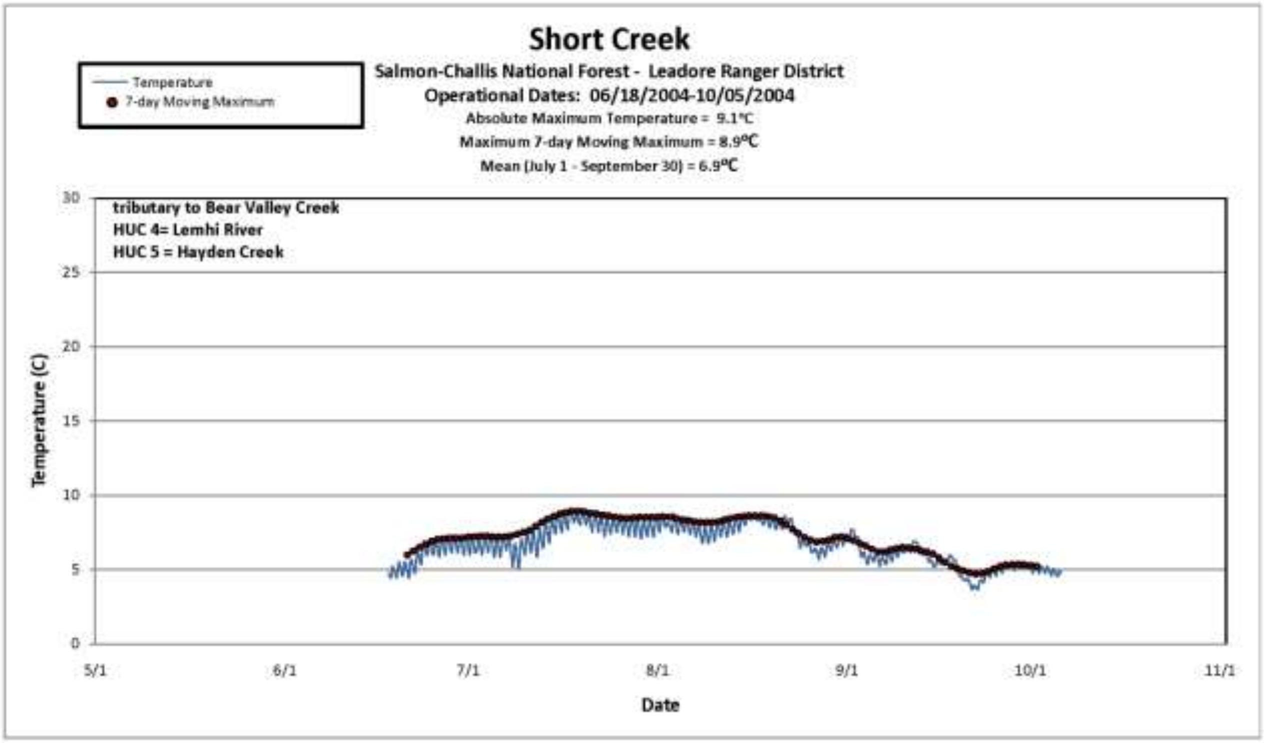

Hayden Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 06/24/2005-10/04/2005
Absolute Maximum Temperature = 12.8 °C
Maximum 7-day Moving Maximum = 11.9 °C
Mean (July 1 - September 30) = 6.7 °C
Temperature
7-day Moving Maximum
tributary to Lemhi River
HUC 4 = Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date

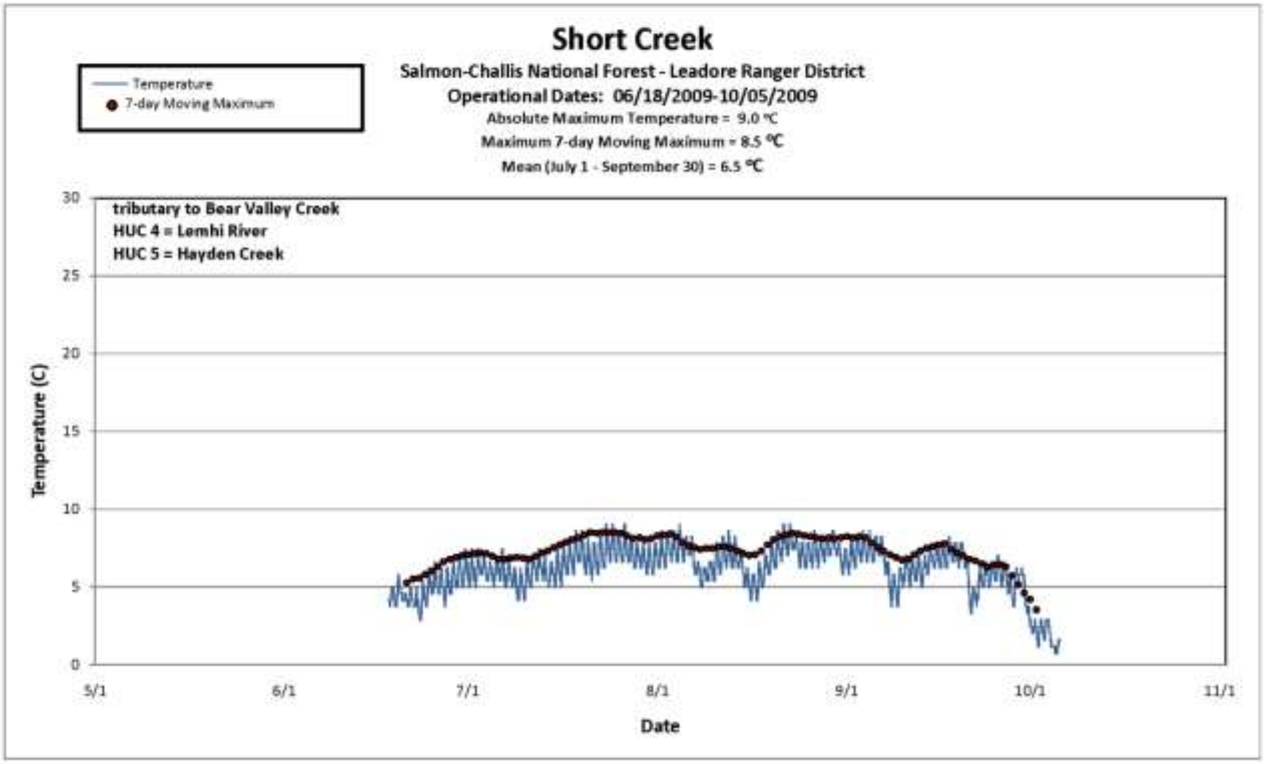

Hayden Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 07/12/2006-09/27/2006
Absolute Maximum Temperature = 16.4°C
Maximum 7-day Moving Maximum = 15.5°C
Mean (July 1 - September 30) = Insufficient Data
Temperature
7-day Moving Maximum
tributary to Lemhi River
HUC 4= Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date

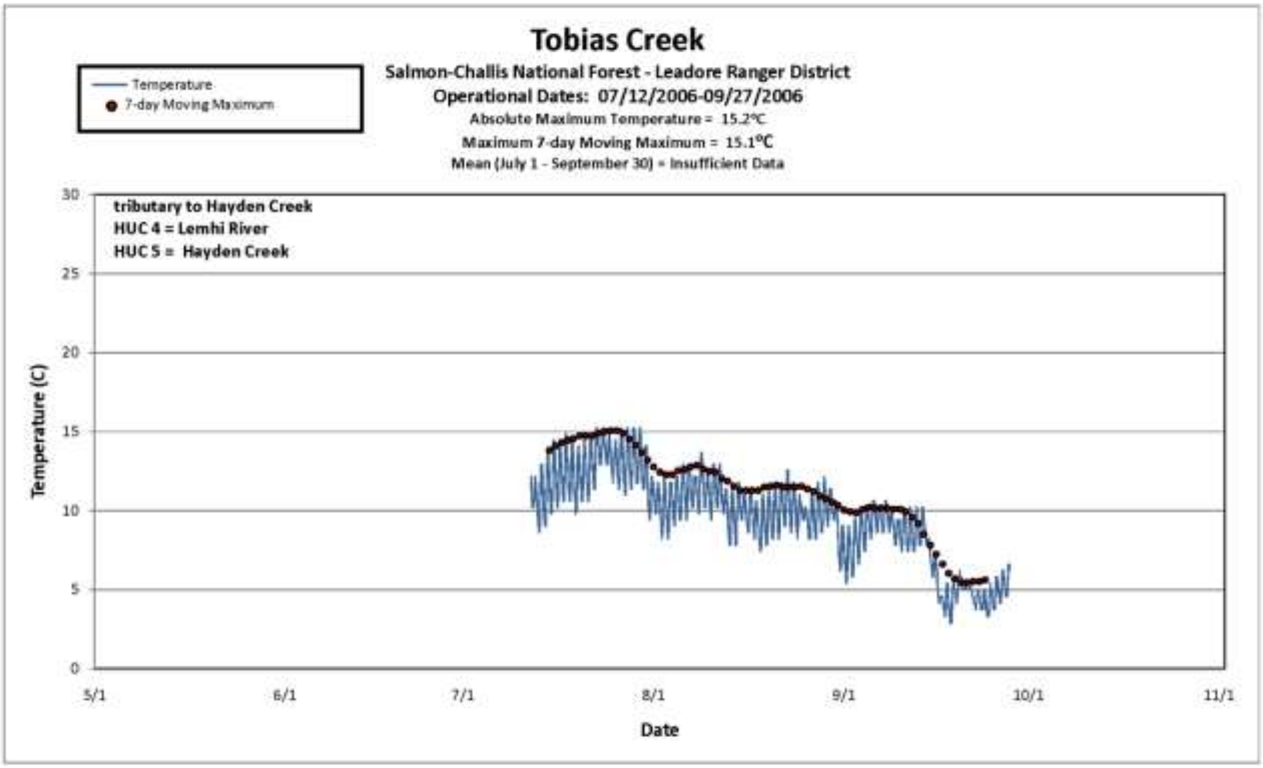

Hayden Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 07/08/2009-10/05/2009
Absolute Maximum Temperature = 14.1 °C
Maximum 7-day Moving Maximum = 12.8 °C
Mean (July 1 - September 30) = Insufficient Data
Temperature
7-day Moving Maximum
tributary to Lemhi River
HUC 4 = Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date

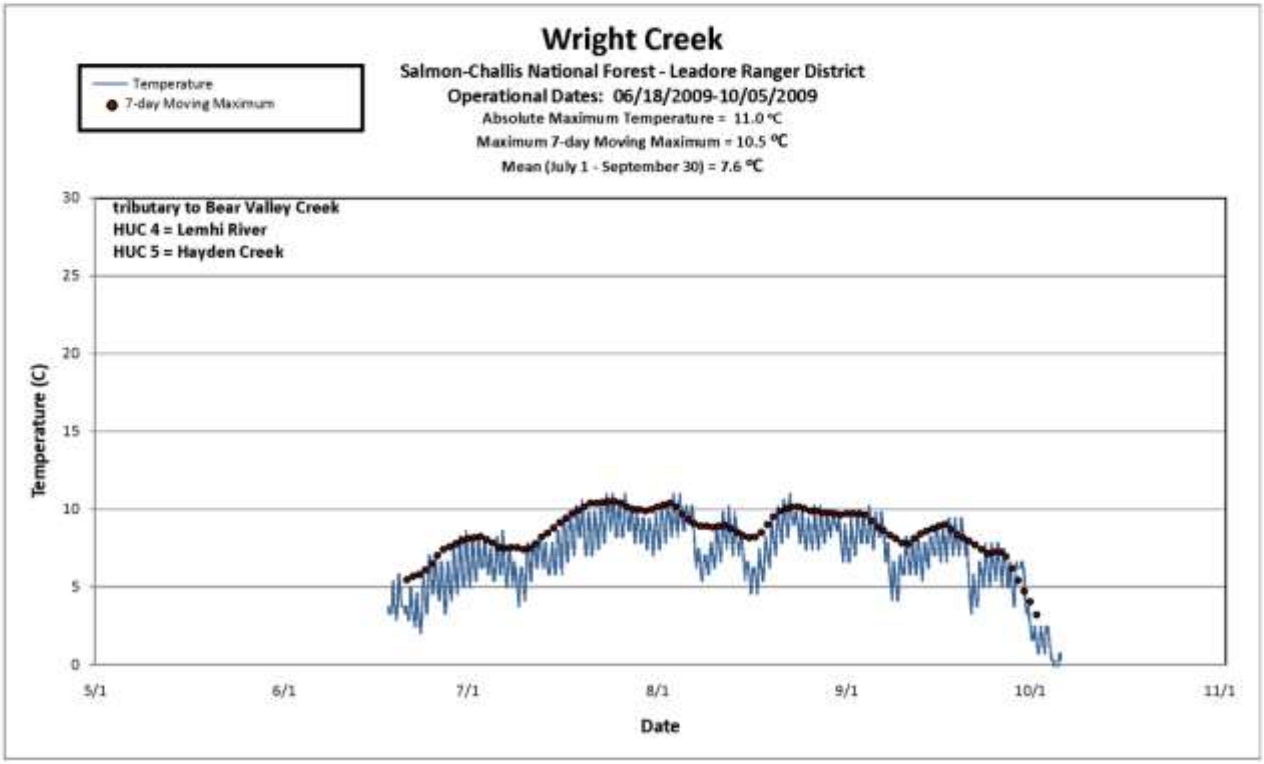

Kadletz Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 06/18/2004-10/05/2004
Absolute Maximum Temperature = 12.0 °C
Maximum 7-day Moving Maximum = 11.6°C
Mean (July 1 - September 30) = 7.9°C
Temperature
7-day Moving Maximum
tributary to Bear Valley Creek
HUC 4= Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date


Kadletz Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 06/18/2009-10/05/2009
Absolute Maximum Temperature = 11.8 °C
Maximum 7-day Moving Maximum = 11.1 °C
Mean (July 1 - September 30) = 7.9 °C
Temperature
7-day Moving Maximum
tributary to Bear Valley Creek
HUC 4 = Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date


Short Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 06/18/2004-10/05/2004
Absolute Maximum Temperature = 9.1°C
Maximum 7-day Moving Maximum = 8.9°C
Mean (July 1 - September 30) = 6.9°C
Temperature
7-day Moving Maximum
tributary to Bear Valley Creek
HUC 4= Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
0
5
10
15
20
25
30
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date


Short Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 06/18/2009-10/05/2009
Absolute Maximum Temperature = 9.0 °C
Maximum 7-day Moving Maximum = 8.5 °C
Mean (July 1 - September 30) = 6.5 °C
Temperature
7-day Moving Maximum
tributary to Bear Valley Creek
HUC 4 = Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
0
5
10
15
20
25
30
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date


Tobias Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 07/12/2006-09/27/2006
Absolute Maximum Temperature = 15.2°C
Maximum 7-day Moving Maximum = 15.1°C
Mean (July 1 - September 30) = Insufficient Data
Temperature
7-day Moving Maximum
tributary to Hayden Creek
HUC 4 = Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1
Date


Wright Creek
Salmon-Challis National Forest - Leadore Ranger District
Operational Dates: 06/18/2009-10/05/2009
Absolute Maximum Temperature = 11.0 °C
Maximum 7-day Moving Maximum = 10.5 °C
Mean (July 1 - September 30) = 7.6 °C
Temperature
7-day Moving Maximum
tributary to Bear Valley Creek
HUC 4 = Lemhi River
HUC 5 = Hayden Creek
Temperature (C)
Date
30
25
20
15
10
5
0
5/1
6/1
7/1
8/1
9/1
10/1
11/1

APPENDIX H – ELECTROFISHING STREAM SUMMARY WITHIN ESA ACTION AREA

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

	Year								
Stream Name	**2009**			**2009**			**2009**		
Bear Valley Creek	Chinook salmon			steelhead			bull trout		
	1st pass	2nd pass	fish/100m^2	1st pass	2nd pass	fish/100m^2	1st pass	2nd pass	fish/100m^2
	0	0	NA	1	0	NA	19	7	7.22
	2007			**2007**			**2007**		
	Chinook salmon			steelhead			bull trout		
	1st pass	2nd pass	fish/100m^2	1st pass	2nd pass	fish/100m^2	1st pass	2nd pass	fish/100m^2
	0	0	NA	3	0	NA	34	13	13.18
	2005			**2005**			**2005**		
	Chinook salmon			steelhead			bull trout		
	1st pass	2nd pass	fish/100m^2	1st pass	2nd pass	fish/100m^2	1st pass	2nd pass	fish/100m^2
	0	0	NA	0	0	NA	17	8	6.1

	Year								
Stream Name	**2009**			**2009**			**2009**		
Cooper Creek	Chinook salmon			steelhead			bull trout		
	1st pass	2nd pass	fish/100m^2	1st pass	2nd pass	fish/100m^2	1st pass	2nd pass	fish/100m^2
	0	NA	NA	0	NA	NA	22	NA	NA

	Year								
Stream Name	**2009**			**2009**			**2009**		
Deer Creek	Chinook salmon			steelhead			bull trout		
	1st pass	2nd pass	fish/100m^2	1st pass	2nd pass	fish/100m^2	1st pass	2nd pass	fish/100m^2
	0	0	NA	0	0	NA	0	0	NA
	2006			**2006**			**2006**		
	Chinook salmon			steelhead			bull trout		
	1st pass	2nd pass	fish/100m^2	1st pass	2nd pass	fish/100m^2	1st pass	2nd pass	fish/100m^2
	0	0	NA	0	0	NA	0	0	NA

	Year								
Stream Name	**2008**			**2008**			**2008**		
East Fork Hayden Creek	Chinook salmon			steelhead			bull trout		
	1st pass	2nd pass	fish/100m^2	1st pass	2nd pass	fish/100m^2	1st pass	2nd pass	fish/100m^2
	0	0	NA	0	0	NA	17	7	7
	2007			**2007**			**2007**		
	Chinook salmon			steelhead			bull trout		
	1st pass	2nd pass	fish/100m^2	1st pass	2nd pass	fish/100m^2	1st pass	2nd pass	fish/100m^2
	0	0	NA	0	0	NA	33	11	12.94
	2005			**2005**			**2005**		
	Chinook salmon			steelhead			bull trout		
	1st pass	2nd pass	fish/100m^2	1st pass	2nd pass	fish/100m^2	1st pass	2nd pass	fish/100m^2
	0	0	NA	0	0	NA	30	7	10

	Year								
Stream Name	**2009**			**2009**			**2009**		
Kadletz Creek	Chinook salmon			steelhead			bull trout		
	1st pass	2nd pass	fish/100m^2	1st pass	2nd pass	fish/100m^2	1st pass	2nd pass	fish/100m^2
	0	NA	NA	0	NA	NA	20	NA	NA

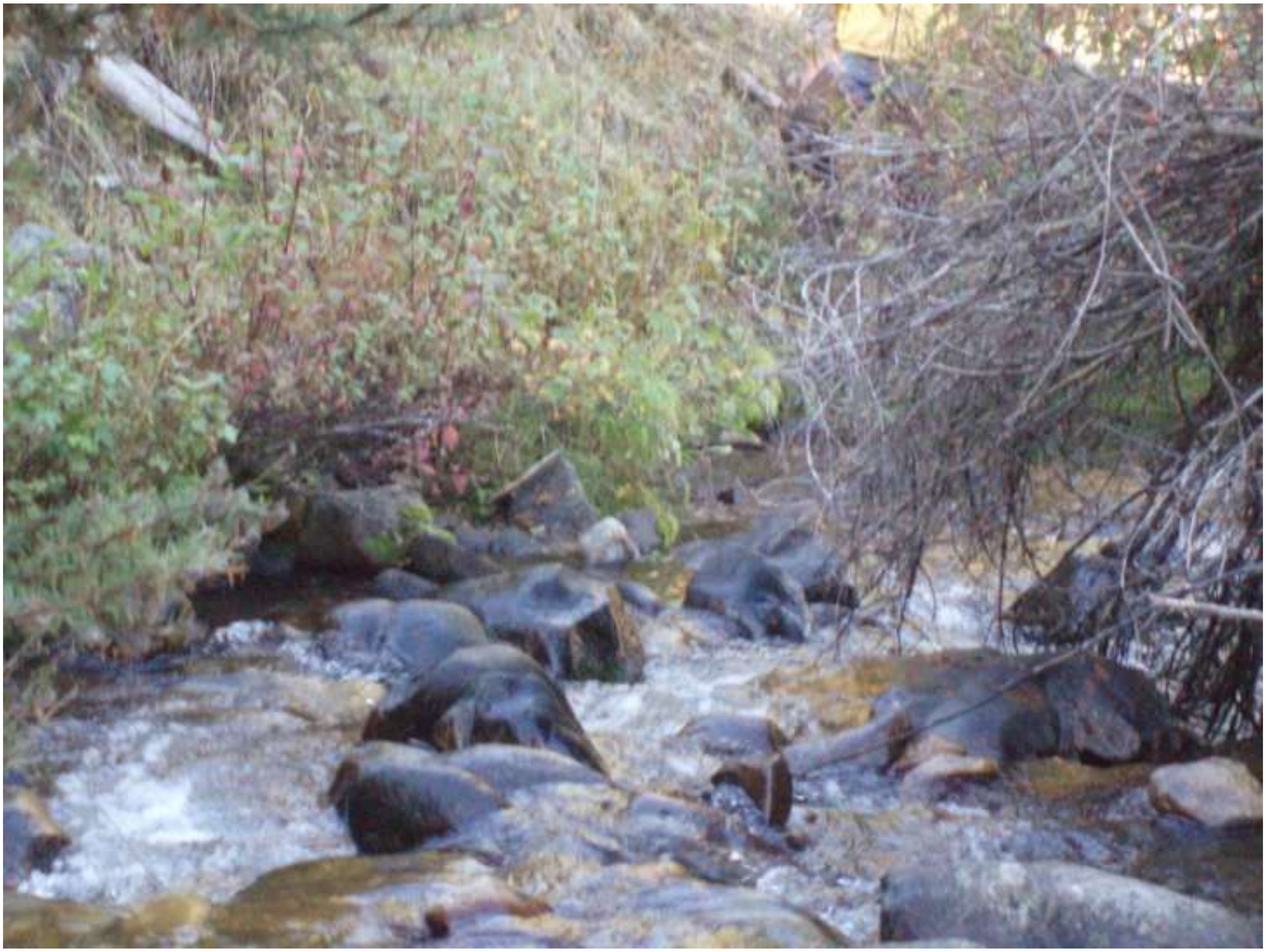
	Year								
Stream Name	**2009**			**2009**			**2009**		
Short Creek	Chinook salmon			steelhead			bull trout		
	1st pass	2nd pass	fish/100m^2	1st pass	2nd pass	fish/100m^2	1st pass	2nd pass	fish/100m^2
	0	0	NA	0	0	NA	0	0	NA
	2006			**2006**			**2006**		
	Chinook salmon			steelhead			bull trout		
	1st pass	2nd pass	fish/100m^2	1st pass	2nd pass	fish/100m^2	1st pass	2nd pass	fish/100m^2
	0	0	NA	0	0	NA	0	0	NA

	Year								
Stream Name	**2009**			**2009**			**2009**		
Wright Creek	Chinook salmon			steelhead			bull trout		
	1st pass	2nd pass	fish/100m^2	1st pass	2nd pass	fish/100m^2	1st pass	2nd pass	fish/100m^2
	0	NA	NA	0	NA	NA	23	NA	NA

APPENDIX I – STREAM PICTURES WITHIN THE ESA ACTION AREA

Bear Valley Creek

Cooper Creek



Deer Creek

East Fork Hayden Creek

Ford Creek

Hayden Creek

Kadletz Creek

Payne Creek

Short Creek

Squaw Creek

Tobias Creek

Wright Creek