Aquatic Species Biological Assessment for Livestock Grazing on the Lake Creek Allotment

SALMON-COBALT RANGER DISTRICT

SALMON-CHALLIS NATIONAL FOREST

LEMHI COUNTY, IDAHO

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1 INTRODUCTION

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

2 BACKGROUND

The Lake Creek Allotment grazing activities are conducted within the Twelvemile Watershed HUC #1706020303 of the Middle Salmon River Subbasin (Figure 1). The Twelvemile watershed encompasses approximately 18.6 miles of perennial streams of which 10.5 miles are on Forest Land (Table 1). These streams range from low to moderate to high gradient. Elevations range from 8,000 feet in headwaters areas to 4,227 feet at the confluence of Lake Creek with the Salmon River. Primary streams within the watersheds are Lake Creek and Rattlesnake Creek.

This subwatershed is located on the west side of the Salmon River, beginning approximately 19 miles upstream of the town of Salmon, Idaho. The subwatershed begins at the Iron Creek/Deer Creek hydrologic divide and ends at the Lake Creek - Henry Creek/Williams Creek hydrologic divide. The subwatershed drains from the Salmon River Mountain Range into the Salmon River.

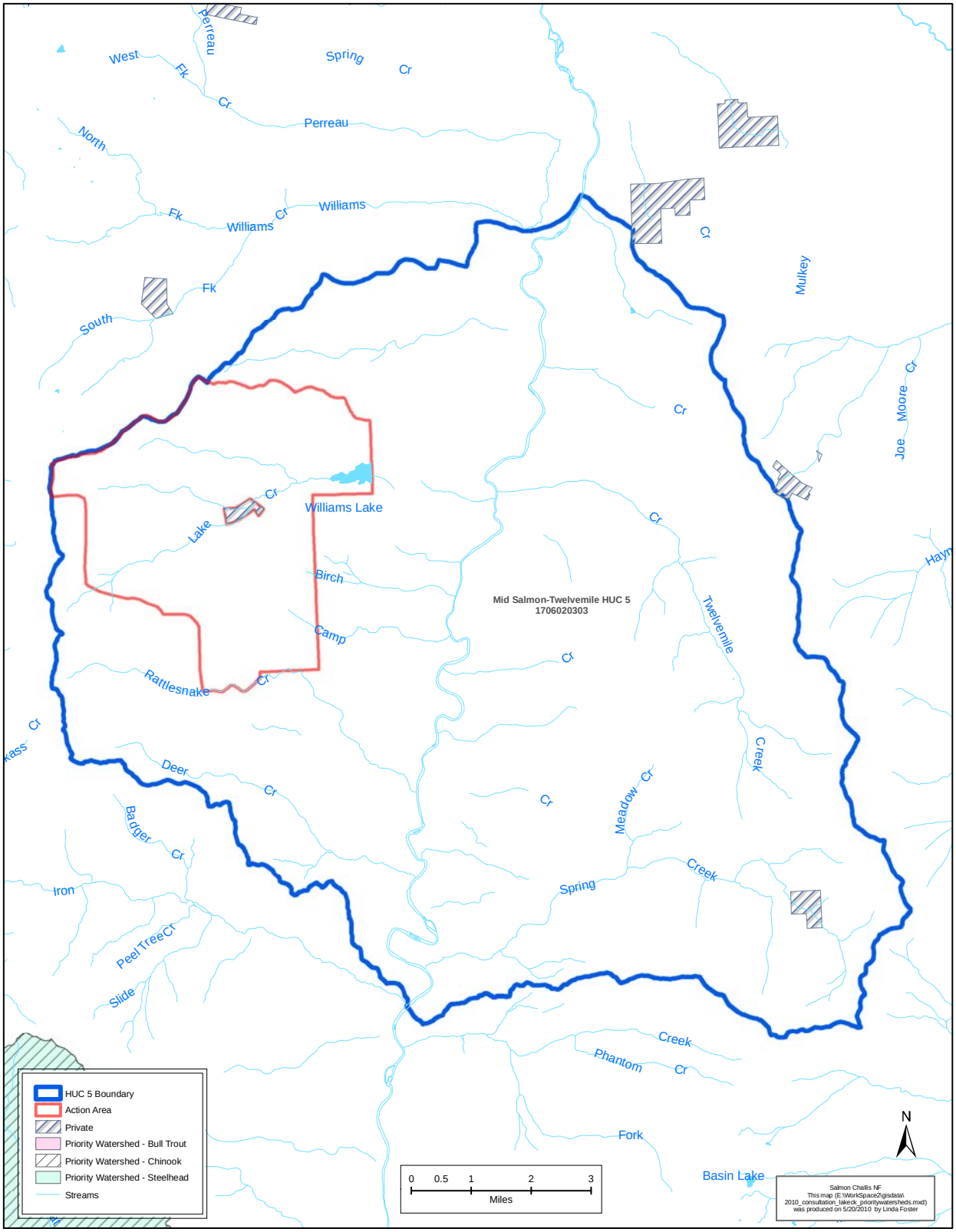
Actions or activities which have occurred or continue to occur within the Twelvemile watershed include historic mining, past timber harvest, grazing, roads, trails, earthen dams, water diversions, outfitting and guiding operations, prescribed and natural fire, and recreation. Dispersed recreation use in this subwatershed consists of hunting, fishing, camping, picnicking, hiking, horseback riding, sightseeing, boating on Williams Lake, outfitter/guide operations and assorted winter activities. These activities occur throughout the subwatershed, however the heaviest use area is adjacent to Williams Lake and associated with water related activities such as boating, swimming, fishing, and waterskiing. There is a developed recreation site on a bench above the lake, a launch area and a small dispersed area to the west of Williams Lake. There are approximately 26.8 miles of trail in the subwatershed.

The area on the east side of the lake has been subdivided and developed with residential homes. Most use occurs only during the summer months, but some residents are year round. Much of the lowermost portions of the subwatershed are developed for residential homes, cultivated fields or livestock grazing. Livestock grazing and timber harvest occur on federal lands, with livestock grazing occurring throughout the subwatershed and most timber harvest occurring in the Lake Creek drainage on the Forest. Extensive timber harvest occurred in the early 1970s, however, recent activity has been limited to 75 acres annually. A watershed survey conducted in 1992 showed little continuing effect of past timber harvest on water quality.

Hydrology

Although there are numerous small streams in this subwatershed, data is limited to the largest two, Rattlesnake Creek and Lake Creek. Rattlesnake Creek has a mean annual streamflow of 3.4 cfs gradients are moderate to high with only 4% of the stream miles having gradients less than 4%. Gradients over the remaining 96% of the stream miles are split nearly in half between moderate and high gradients, with 46% of the stream miles having gradients from 4-10% and 47% having gradients in excess of 10%.

FIGURE 1. LAKE CREEK HUC AND PRIORITY WATERSHEDS



The flow regime of Lake Creek has been impacted by irrigation diversions which, although not preventing it from reaching the Salmon River, alter natural processes. There are 10 water rights claims on Lake Creek below Williams Lake, totaling 8.97 cfs. Of this, there are two claims for 2.32 cfs for the period March 15 to November 15, one claim for 1.0 cfs for the period April 1 to November 1, two claims for 1.55 cfs from April 1 to October 31, one claim for 3.5 cfs from April 1 to October 15, two claims for 0.54 cfs from April 15 to October 15, one claim for 0.04 cfs from October 10 to December 31, and one claim for 0.02 cfs year round.

Land Description

This subwatershed is typical of those along the west side of the Salmon River, with thick forests in the upper portions, gradually changing to steep, rugged, sagebrush/grass slopes, ending sharply at the Salmon River. Very little of this subwatershed could be considered of gentle relief.

TABLE 1 - PERENNIAL STREAMS/MILES BY LAND OWNERSHIP IN THE LAKE CREEK ALLOTMENT

Stream Name	Stream Miles by Land Ownership			
	BLM	USFS	Private	State
Rattlesnake	2.3	3.6	1.4	0
Camp	1.3	1.0	0	0
Birch	2.5	0.8	0	0
Lake	0.2	5.1	2.1	0

Soils and Geology

The Lake Creek subwatershed is hilly to very steep with 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.

A small erosive basin exists in the upper Lake Creek drainage which produces large amounts of sediment during rainfall events. The basin drains down a stream channel, through a culvert under the road and into roadside ditch. However, when the culvert is clogged with debris, water carries sediment across the road and down the slope into Lake Creek. This is a naturally occurring situation and will continue to contribute sediment loads to Lake Creek whenever the culvert under the road becomes blocked (Salmon-Challis National Forest. 2002).

A major northeast-trending fault called the "trans Challis" fault system, includes portions of the subwatershed. This fault system can be traced from the Idaho City area, through the Salmon area and into Montana. The Iron Creek Fault is a major fault within this watershed. Numerous other small faults are also found within the subwatershed.

Vegetative Characteristics

Riparian Vegetation

Riparian vegetation within the subwatershed is typically more woody than herbaceous. Willow, dogwood and cottonwood dominate the overstory in the lower reaches of streams within the watershed, slowly changing into a more conifer dominated overstory as one gets higher in the drainages. Overall, riparian condition is moderate to good with some inclusions of poor condition areas where roads or grazing have impacted the vegetation along short stretches of stream.

Upland vegetation

On the drier sites the dominant vegetation is Wyoming big sagebrush and bluebunch wheatgrass. On the moister sites, Douglas fir and pinegrass are the dominant species. Vegetative trend is static to upward.

3 PROPOSED ACTION

3.1 PROJECT AREA

The Lake Creek Allotment is located southwest of Salmon on National Forest lands within the Lake Creek drainage (Figure 2). Minor headwater portions of the Rattlesnake Creek, Birch Creek, and Camp Creek drainages are also within the project area. The proposed project area is located within the Mid Salmon-Twelvemile Watershed (HUC 1706020303) of the Mid Salmon-Panther Creek Subbasin.

3.2 PROPOSED ACTION

3.2.1 AUTHORIZATION

The Lake Creek C&H Allotment is currently permitted for 93 cow/calf pairs (425 Head Months) from 6/15 to 10/31. Due to use on BLM allotment, permittee has been turning onto allotment in the beginning of July. The allotment is divided into 4 units: Below Ranch, South Fork, North Fork, and Camp Creek Units. The following rotations will be used on this allotment, with rest expected once every fourth year for each unit. The permit number is 10549 and expires on 12/31/2010.

3.2.2 GRAZING SYSTEM

- The Lake Creek C&H Allotment will continue to use a 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 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.

FIGURE 2. LAKE CREEK ALLOTMENT VICINITY MAP

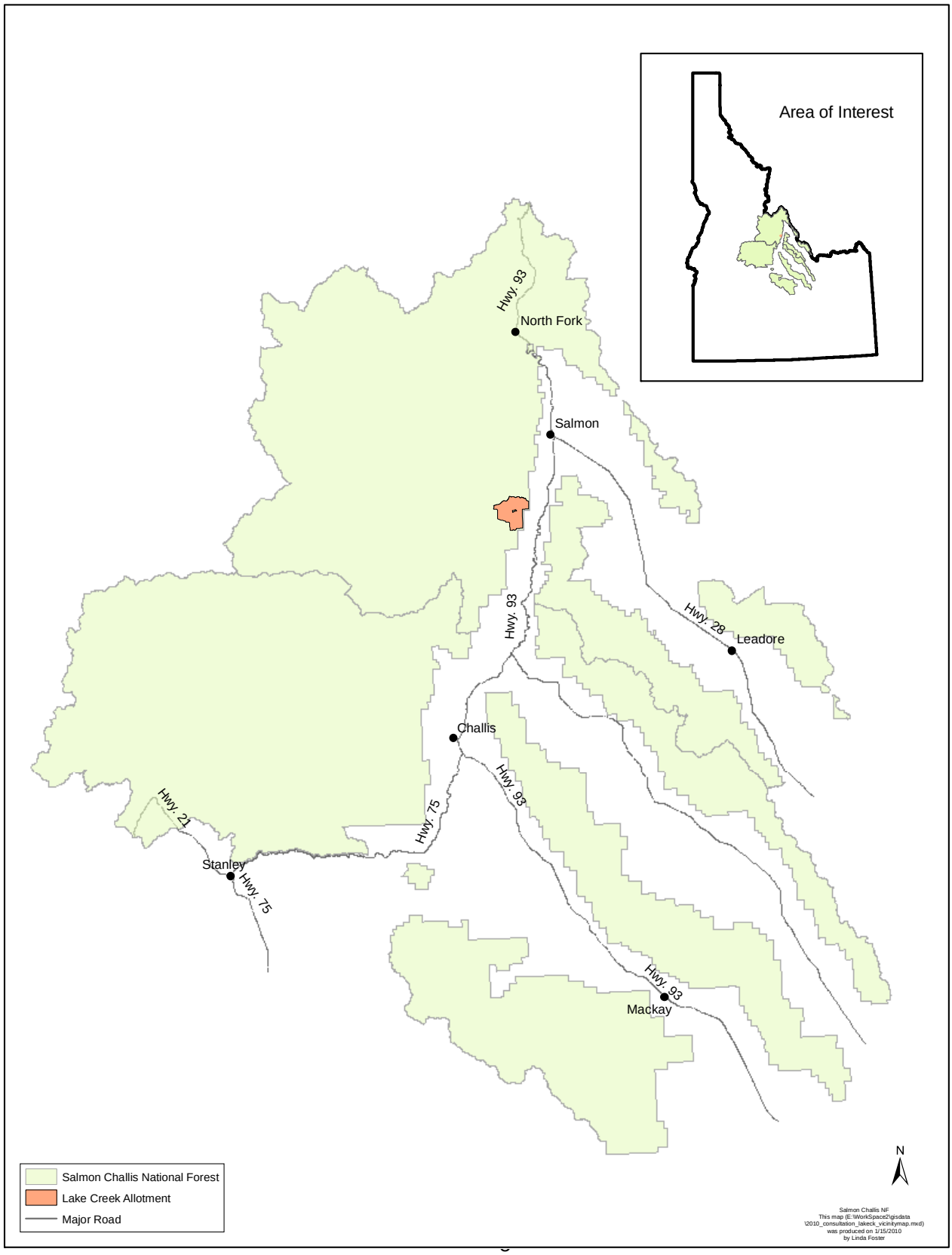


TABLE 2 - LAKE CREEK ALLOTMENT UNIT ROTATION SCHEME

Year 1	Year 2	Year 3	Year 4
South Fork Unit	Camp Creek Unit	Below Ranch Unit	South Fork Unit
North Fork Unit	Below Ranch Unit	South Fork Unit	Below Ranch Unit
Camp Creek Unit	North Fork Unit	Camp Creek Unit	North Fork Unit
Below Ranch Unit (Rest)	South Fork Unit (Rest)	North Fork Unit (Rest)	Camp Creek Unit (Rest)

South Fork Unit:

- Bull Trout: Livestock will be in the unit after August 15th for up to 6 weeks one out of four years.
- Bull Trout: Livestock will be out of the unit before August 15th three out of four years.
- Trailing: Trailing occurs during bull trout spawning in the unit on Lake Creek one out of four years. Duration of move is 1 day.

North Fork Unit:

- Bull Trout: Bull trout are currently not present within this unit. This unit contains proposed critical habitat.
- Trailing: No trailing.

Camp Creek Unit:

- Bull Trout: No ESA fish streams.
- Trailing: No trailing.

Below Ranch Unit:

- Bull Trout: Livestock will be in the unit after August 15th between 6 weeks and 7 weeks two out of four years.
- Bull Trout: Livestock will be out of the unit before August 15th two out of four years.
- Trailing: Trailing could occur during bull trout spawning in the unit on Lake Creek two out of four years. Duration of move is 1 day.

BLM Pasture Unit:

- This pasture is administered by the BLM and contains no ESA fish streams.

Entry: Livestock are trailed onto the allotment from BLM Birch Creek allotment which includes BLM Pasture (Figure 4). Depending on year livestock are trailed to first unit from Birch Creek. Duration of move is less than one day.

Unit Movements: Unit moves depend on the rotation year. The following describes the moves based on the rotation year.

Year 1: Livestock are trailed from the BLM Birch Creek allotment which includes BLM Pasture (Figure 4) directly into the South Fork unit. Then, livestock are trailed to the North Fork unit. Finally, livestock are trailed to the Below Ranch unit. All moves utilize existing roads or pre-established trails.

Year 2: Livestock are trailed from the BLM Birch Creek allotment which includes BLM Pasture (Figure 4) directly into the Camp Creek unit. Then, livestock are trailed through the South Fork unit into the Below Ranch unit. Finally, livestock are trailed to the North Fork unit. All moves utilize existing roads or pre-established trails.

Year 3: Livestock are trailed from the BLM Birch Creek allotment which includes BLM Pasture (Figure 4) through the South Fork unit into the Below Ranch unit. Then, livestock are trailed to the South Fork unit. Finally, livestock are trailed to the Camp Creek unit. All moves utilize existing roads or pre-established trails.

Year 4: Livestock are trailed from the BLM Birch Creek allotment which includes BLM Pasture (Figure 4) directly into the South Fork unit. Then, livestock are trailed to the Below Ranch unit. Finally, livestock are trailed to the North Fork unit. All moves utilize existing roads or pre-established trails.

Exit: Livestock are trailed to permittees home ranch on the allotment. On 11/10, livestock are trailed down Lake Creek Rd (FS RD 028) to home ranch off of allotment.

Total Removal from NFS Lands: All livestock will be removed from allotment by 10/31.

3.2.3 CONSERVATION MEASURES

The following measures will be implemented as part of the Lake Creek Allotment's annual operation instructions (AOI) to avoid and reduce potential impacts to ESA listed fish. Bull trout considerations are:

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

3.2.4 CHANGES FROM EXISTING MANAGEMENT

- The monitoring attribute of browse use will be added to sites that are dominated by woody browse species. Greenline stubble will continue to be monitored at these sites.

3.2.5 RESOURCE OBJECTIVES AND STANDARDS

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

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

Resource Objectives:

- Greenline Successional Status: A greenline successional status value of at least 61 (late seral) or the current value, whichever is greatest (Winward 2000, Burton et al. 2008).
- Woody Species Regeneration: A stable trend at sites with desired condition and an upward trend at sites not at desired condition (Winward 2000, Burton et al. 2008).
- Bank Stability RMO: A bank stability of at least 80% or the current value, whichever is greatest outside of priority watersheds. Within priority watersheds a bank stability of at least 90% or the current value, whichever is greatest (U.S Department of Commerce, National Marine Fisheries Service, 1998).
- Water Temperature RMO: No measureable increase in maximum temperature; <64^{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 (PACFISH BO; - U.S Department of Commerce, National Marine Fisheries Service, 1998). Identification of width:depth ratio objective values will also consider values and ranges identified within the document Descriptions that Represent Natural Conditions in the Salmon River Basin, Idaho (Overton et al, 1995)
- Sediment RMO: <20% surface fine sediment which is substrate <0.25 in (6.4 mm) in diameter in spawning habitat or <30% cobble embeddedness in rearing habitat.

Resource Standards (PACFISH):

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

3.2.6 ANNUAL GRAZING USE INDICATORS

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

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

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

TABLE 3 - LAKE CREEK ALLOTMENT KEY AREA ATTRIBUTES, INDICATORS, TRIGGERS, AND LONG TERM OBJECTIVE.

Key Area Locations	Pasture – Creek	Monitoring Attribute[2]	Endpoint Indicator	Key Species	Trigger
No Key Area[1]	Below Ranch – Lake Cr.	Woody Browse Greenline Stubble	50% 4in.	Willow Hydric ssp	45% 5 in.
No Key Area[1]	South Fork – Lake Cr.	Woody Browse Greenline Stubble	50% 4in.	Willow Hydric ssp	45% 5 in.
Upland Sites	All Units	Utilization	50%	Upland grass species	45%
Riparian Areas	All Units	Utilization by Key Species	50%	Riparian grass species	45%

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

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

Annual use indicators will be measured at key areas by key species (on uplands) and at DMA greenlines annually. Key areas are monitoring sites chosen to reflect the effects of grazing over a larger area (Burton et al 2008). Key species are preferred by livestock and an important component of a plant community, serving as an indicator of change (Coulloudon et al 1999). The Interagency Technical Reference or other best available science would be used to monitor grazing use. The MIM Interagency Technical Bulletin (Burton et al 2008) or other best available science would be used to monitor grazing use at DMAs. Annual use indicators will be monitored by the Forest Service. Triggers will be used by permittees as a tool to help ensure annual use indicators are met. Results from monitoring will be available at (http://www.fs.fed.us/r4/sc/projects/range/index.shtml).

3.2.7 IMPROVEMENTS

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

Existing Improvements: Existing improvements are shown on Figure 3 and will be maintained in accordance with the term grazing permit.

Potential Future Improvement: There are no potential future improvements known at this time.

3.3 MONITORING

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

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

3.4 ADAPTIVE MANAGEMENT

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

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

- Livestock grazing in the uplands and riparian areas will be limited to 50% use on key herbaceous species within key areas of the allotment during the grazing season.
- When the relevant resource objectives are being met (section 3.2.5) annual use indicators, within riparian areas will be 50% browse on multi-stemmed species, 30% browse on single-stemmed species, and 4” residual stubble height.
- When the relevant resource objectives (see section 3.2.5) are not being met annual endpoint indicators, allowable use, will be 30% browse on multi-stemmed species, 20% browse on single-stemmed species, and 6” residual stubble height.
- In non-priority watersheds, when bank stability is 80% or greater the bank alteration **annual use indicator** will be 20%
- In non-priority watersheds, when bank stability is 60-79% the bank alteration **annual use indicator** will be 10-20%
- In non-priority watersheds, when bank stability is less than 60% the bank alteration **annual use indicator** will be 10%

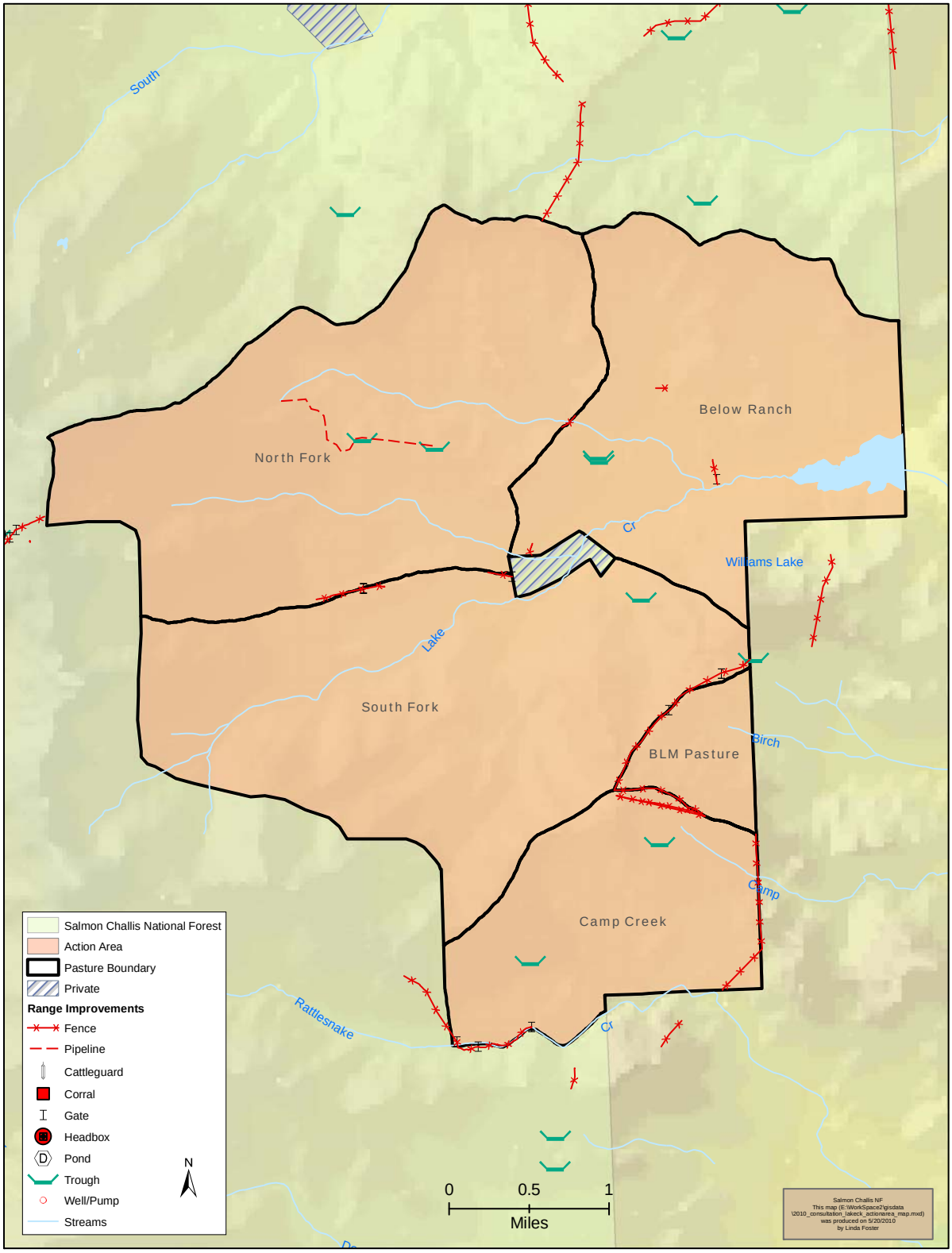
3.5 INTERDEPENDENT ACTIONS

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.

3.6 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.

FIGURE 3. ACTION AREA AND EXISTING IMPROVEMENTS



4 ESA ACTION AREA DESCRIPTION

The ESA action area is defined as “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action” (50 CFR§402.02). In other words, this is the area where the action and any interdependent and interrelated actions will result in direct or indirect effects to listed species or designated critical habitat. Our analysis indicates that the proposed action has the potential to generate direct or indirect affects to aquatic species and aquatic habitats on National Forest System lands within the boundaries of the Lake Creek Allotment.

Priority Watersheds are those watersheds that have been identified per direction in the 1995 PACFISH Biological Opinion, that require a different management strategy because of their importance to listed fish. The action area is not within a priority watershed (Figure 1)

5 LISTED SPECIES REVIEW

5.1 SPECIES OCCURRENCE

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

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

Salmon-Challis National Forest and Idaho Department of Fish and Game surveys indicate that bull trout is the only species occurring within the action area (Figure 4). Sockeye salmon do not occur within either the action area or the larger Middle Fork Salmon River drainage (Federal Register 56FR58619).

5.2 CRITICAL HABITAT

5.2.1 SNAKE RIVER SPRING/SUMMER CHINOOK SALMON

Critical habitat has been designated for Snake River spring/summer Chinook salmon and includes “river reaches presently or historically accessible…to Snake River spring/summer Chinook salmon” (Federal Register 58FR68543). The Salmon-Challis National Forest has developed a process to further refine Chinook salmon critical habitat designations within Forest streams beyond the general direction identified in the Federal Register. Utilizing this process, the Forest has identified no streams within the action area streams supporting critical habitat for Chinook salmon.

5.2.2 SOCKEYE SALMON

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

5.2.3 SNAKE RIVER BASIN STEELHEAD

Critical habitat has been designated for Snake River Basin steelhead (Federal Register 70FR52630). This designation does not include any waters within the action area.

5.2.4 COLUMBIA RIVER BULL TROUT

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

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

6 ENVIRONMENTAL BASELINE DESCRIPTION

The action area is within the Twelvemile HUC5 watershed #1706020303 of the Middle Salmon River Subbasin. Baseline Matrices of Diagnostic Pathways and Indicators for these watersheds are provided in Appendix B.

Below is a general summary of baseline conditions within the action area. While the baseline matrix included in Appendix B reflects aquatic/riparian condition and trend at the watershed scale, the baseline descriptions provided below focus only on baseline conditions within the action area. This is done to focus analysis emphasis on those habitat parameters most likely to be influenced by grazing activities and set the context for analyzing the effects of the proposed action on these conditions. As these characterizations reflect the more localized site-specific conditions of the action area, identified condition and/or functionality assessments may vary from those identified for the larger watershed-scale baseline (Appendix B).

6.1 GENERAL DESCRIPTION OF LISTED FISH POPULATIONS

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

The Lake Creek allotment encompasses one stream, Lake Creek, which supports bull trout populations and proposed critical habitat. All other streams within areas that will be grazed do not contain listed fish or support designated critical habitat. However, livestock grazing in these areas may indirectly affect listed fish and designated critical habitat in other streams within the allotment.

6.1.1 CHINOOK SALMON

Chinook salmon are not present on the Lake Creek Allotment.

6.1.2 STEELHEAD

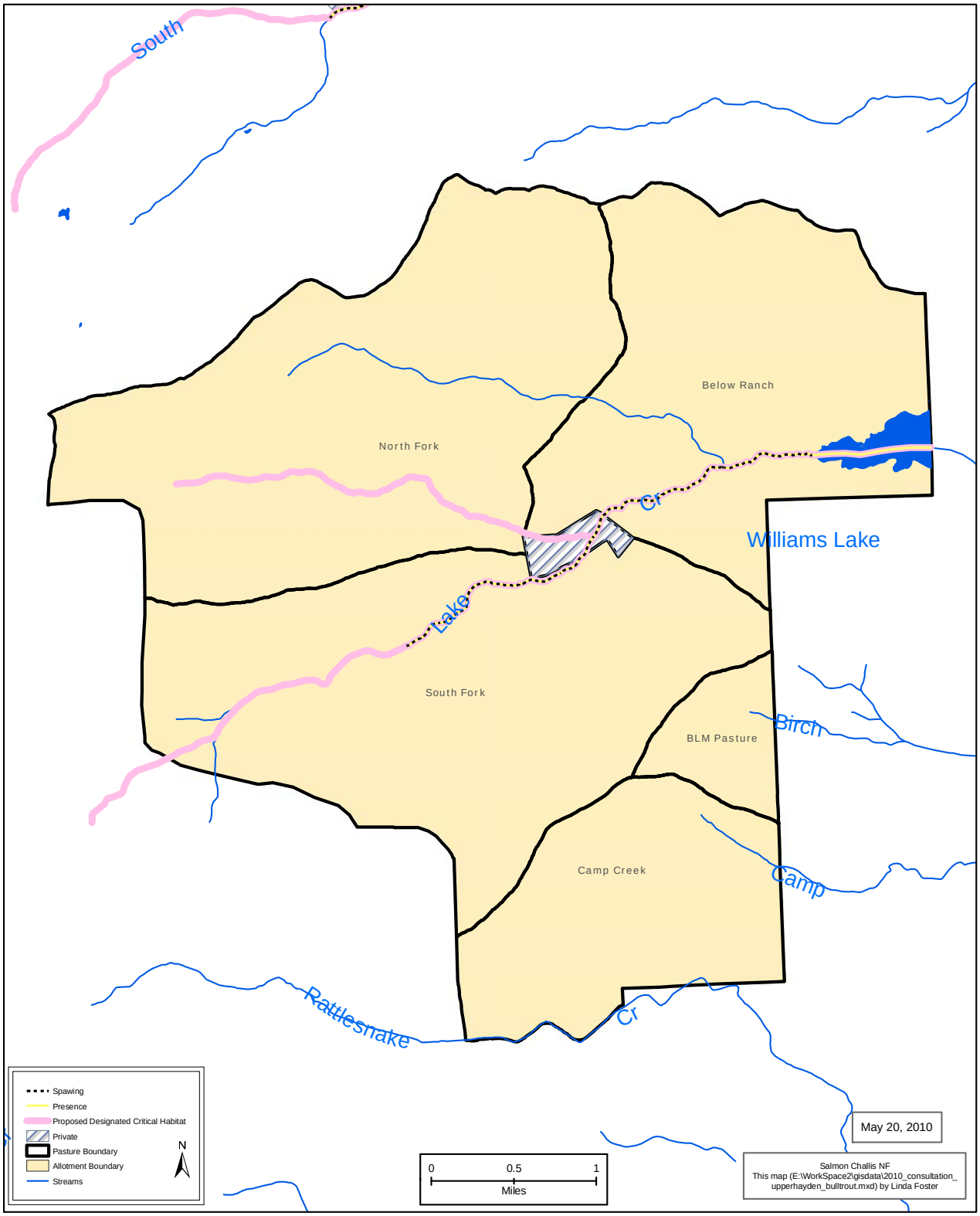
Steelhead are not present on the Lake Creek Allotment.

6.1.3 BULL TROUT

Salmon-Challis National Forest (SCNF) and Idaho Department of Fish and Game surveys identify bull trout within mainstem Lake Creek. SCNF electroshocking operations have identified a healthy bull trout population throughout the main reaches of Lake Creek that flows through the South Fork and Below Ranch units (Figure 4). An observed mean water temperature of 9.2 degrees Centigrade in mid Lake Creek between July 1 and September 30, 2009 suggests that bull trout would be expected to be present in throughout the stream (Gamett, 2002). The resident populations within the action area are considered

strong (Appendix C Table 6). Both fluvial and adfluvial forms are known to inhabit mainstem Lake Creek. Lake Creek is not connected to the Salmon River due to a natural dam below the study area. The adfluvial form is found in Williams Lake. The adfluvial form appears to be increasing in numbers. Migratory corridors and rearing habitat are considered to be in good to excellent condition for the species and this rather isolated subpopulation exists in close proximity to spawning and rearing habitat. There are no reasons that the local population should not be able to sustain itself from short-term disturbance, and risk of extinction of the subpopulation is low. Overall, populations are considered to be Functioning Appropriately.

FIGURE 4. BULL TROUT PRESENCE AND PROPOSED CRITICAL HABITAT IN THE LAKE CREEK ALLOTMENT.



6.2 GENERAL DESCRIPTION OF HABITAT CONDITIONS

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

6.2.1 LAKE CREEK

Fish habitat conditions of mainstem reaches of Lake Creek are in good condition and meeting INFISH (U.S. Department of the Interior, U.S. Fish and Wildlife Service 1998) standards and Pathway Indicators. 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 under any flow levels. However, a relatively high load of "fines' has been discovered in the mainstem due to runoff from a nearby naturally erosive basin (see section 2). The watershed supports significant quantity of suitable spawning habitat for resident bull trout, and steelhead have been reported in the lower reaches below the Forest boundary.

6.2.2 LAKE CREEK TRIBUTARIES

Fish habitat conditions of Lake Creek tributary streams are also generally in good condition relative to quantity and quality of habitat elements, although no listed fish species have been documented using them. Lake Creek tributaries have generally displayed upward trends in overall conditions in recent years.

6.3 MAJOR LIMITING FACTORS

Factors most likely to be limiting fisheries resources of the Lake Creek Allotment from achieving full carrying capacity are elevated stream substrate sediment levels, roading, and potential physical barriers.

A Salmon-Challis National Forest watershed survey of the drainage identified little continuing effect of the extensive timber harvest conducted within the drainage in the 1970s, and major portions of the road system associated with this harvest have been closed and revegetated (Salmon-Challis National Forest, 2002). However, road density within the Lake Creek drainage remains high at 1.8 miles per square mile, and individual small basins within the highly-erosive volcanic drainage continue to be chronic sources of sediment to the Lake Creek stream course. A Subbasin Assessment of the Mid Salmon-Panther Subbasin conducted by the Idaho Department of Environmental Quality (IDEQ, 2001) identified upper-drainage sediment contributions as a major source of nutrient loading to Williams Lake, downstream of the allotment action area. The Assessment additionally identified a Total Maximum Daily Load (TMDL) to reduce the volume of sediment transported to the lake from the phosphorus-rich drainage as a measure to attenuate further eutrophication of the lake.

While significant dewatering of the stream is not occurring, irrigation diversions on both Forest and private lands on Lake Creek and its tributary streams may be presenting barriers to fish migration within the action area.

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

6.4 GRAZING FOCUS INDICATORS

One tool developed to assist in describing the condition of watersheds and streams which listed Chinook salmon, steelhead and bull trout depend on is; *A Framework to assist in Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Subpopulation Watershed Scale* (Appendix 9 in Lee et al., 1997). It is commonly referred to as the Matrix of Pathways and Indicators, and at its most basic level is a table which identifies the important elements or indicators of a listed salmonid habitat. Using this table assists in consistent organization an assessment of current condition and judging how those indicators may be impacted by a proposed action (Lee et al. 1997). The Forest has included a matrix for this allotment as Appendix B of this Biological Assessment. Because the Matrix of Pathways

and Indicators was developed to operate at several spatial scales (Lee et al. 1997) the Forest has selected six indicators from the matrix table as their "Focus Indicators", on which analysis of livestock impacts to fish and designated habitat will be based. These are 1) spawning and incubation, 2) temperature, 3) sediment, 4) width: depth ratio, 5) streambank condition, and 6) riparian conservation areas. These are the indicators that the Forest can easily monitor, have the most specificity with a long running data set, and most closely reflect the aquatic/riparian baseline pathway and indicator elements considered most likely to be impacted by grazing activities within a watershed.

The Forest has utilized these Focus Indicators 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. A description of the relationship between the Focus Indicators, Annual Use Indicators, and Riparian Management Objectives is provided in Table 4.

These Focus 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.

6.4.1 SPAWNING AND INCUBATION:

6.4.1.1 CHINOOK SALMON SPAWNING AND INCUBATION

There are no Chinook salmon within the Lake Creek Allotment.

6.4.1.2 STEELHEAD SPAWNING AND INCUBATION

There are no steelhead within the Lake Creek Allotment.

6.4.1.3 BULL TROUT SPAWNING AND INCUBATION

Mainstem Lake Creek supports both fluvial and adfluvial populations of bull trout, but is not connected to the Main Salmon River. The adfluvial form is found in Williams Lake. Lake Creek supports bull trout spawning. Within the Lake Creek Allotment there are approximately 2.77 miles of bull trout spawning habitat within mainstem Lake Creek including 1.44 miles in the Below Ranch Pasture and 1.34 miles in the South Fork Pasture (Appendix C Table 7).

Data developed by the SCNF identify a general spawning periodicity for bull trout in the Lake Creek drainage ranging from mid August to mid October. Recorded water temperatures of Lake Creek demonstrate that water temperatures are conducive to 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/INFISH identifies a rearing temperature criteria of less than 64 degrees F (17.8 degrees C) and a spawning temperature criteria of less than 60 degrees F (15.6 degrees C) as components of its suite of Riparian Management Objectives. Water temperature conditions in the Lake Creek drainage are considered to be Functioning Appropriately for rearing, spawning, and incubation.

Summer water temperatures have been monitored at one mainstem Lake Creek site from June 24th through October, 2009. The mean temperature was 9.2 degrees centigrade, well below the maximum for successful habitation by bull trout (Gamett 2002). Therefore the overall, observed water temperature regimes within the Lake Creek Allotment are within INFISH water temperature criteria.

6.4.3 SEDIMENT

Stream sediment conditions can influence fish incubation success as well as rearing habitat quantity and quality and fish food base productivity (Bjornn and Reiser, 1991). Stream sediment conditions are considered to be Functioning at Risk both in the Twelvemile watershed and in mainstem Lake Creek in the action area.

Elevated levels of fines have been observed in Lake Creek, which are granitic in nature and are currently coming from high water events within the streambeds and from the overall road system network. Although most of the roads used in the past for timber removal have been closed and revegetated, making them unlikely to be contributing to the sediment load in Lake Creek. However, road density in the drainage is still considered to be high, so some of the currently used roads may contribute to sediment issues.

More importantly, there is a naturally erosive basin in the watershed that delivers large amounts of sediment into Lake Creek under certain conditions. This issue is described in detail in Section 2 of this document. Streamback conditions described below (7.1.5) as related to livestock use are functioning appropriately indicating the sediment/fines are not derived from livestock use in the allotment. Since 1993 the average reading is 41.2 and a reading of 44 in 2008 and none taken in 2009.

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).

Stream width: depth ratios are considered to be Functioning Appropriately within the Twelvemile Watershed and within Lake Creek.

The average width:depth ratio averaged 10.1 at all MIM sites in mainstem Lake Creek and are within the standard for “B” and “C” type channels based on the standards identified for volcanics by the Natural Conditions Database (B channel types: Mean 27 & Standard Deviation 20 and C channel types: Mean 28 & Standard Deviation 25).

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 Lake Creek drainage is not a PACFISH priority watershed, and has a Riparian Management Objective (RMO) of 80 percent or greater bank stability. Since monitoring started in 1994, only one reading was below 90% bank stability (Appendix C). Based upon the Matrix of Pathway and Indicator functionality criteria of 80 percent or greater streambank stability conditions are considered to be Functioning Appropriately within the Twelvemile Watershed and Lake Creek.

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). Related to grazing activities, this is primarily relevant to herbaceous vegetation along streambanks.

Riparian vegetation within the Lake Creek drainage is typically more woody than herbaceous. Willow, dogwood and cottonwood dominate the overstory in the lower reaches of streams within the watershed, slowly changing into a more conifer dominated overstory as one gets higher in the drainages. Overall, the riparian condition is moderate to good.

The Twelvemile Watershed is not impacted by major disturbances that would affect this parameter except for roads in limited areas. Riparian areas are considered to be Functioning Appropriately within the Lake

Creek drainage. The conservation areas in the Lake Creek drainage provide adequate shade, large woody debris, habitat protection, and connectivity.

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 and Schmidt 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).

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).

TABLE 4 – 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,	Greenline Stubble, Browse Use, Bank

		Current Year Alteration	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

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 can be destructive to willow stands when they congregate in them (Kovalchik, Bernard L., and Wayne Elmore. 1991). 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. 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.

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. 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). Removing cattle before 45 - 50% forage use improves the response of willows. The Bureau of Land Management has concluded that exceeding 50% use of current year browse leaders would likely reduce woody vegetation vigor, modify normal growth form, and in the longer-term diminish the age class structure, all of which could affect riparian habitat conditions. Where there is current upward trend of ecological condition it is expected to continue by managing for no more than 50% browse use (USDI BLM 2009).

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

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

It is widely known that bank alteration by trampling, shearing, and exposure of bare soil can be an important source of stream channel and riparian area degradation (Clary and Webster, 1989, Belsky et al., 1997). Impacts of bank alteration may include channel widening (and loss access to floodplains by peak flows), loss of riparian vegetation (which then makes banks more vulnerable to further erosion), localized lowering of water tables in riparian areas (and loss of water storage in floodplains and stream channels), and changes in sediment transport capacity of stream channels (Clary and Webster 1989).

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

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

In southwestern Montana, stream channels narrowed and deepened when streambank disturbance from cattle did not exceed 30 feet per 100 feet of stream reach (Dallas 1997 cited in Mosley et al., 1998). 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 6. 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 in order to loaf, drink, or cross the stream. Livestock walking in 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. Cattle wading into a stream are likely to startle juvenile fish away from streamside cover and other preferred micro-habitats, increasing predation risks (Frid and Dill 2002).

Improperly managed grazing can additionally have adverse indirect effects to streams and riparian areas (Menke 1977; Meehan and Platts 1978;; Clary and Webster 1989;, Belsky et al. 1997). These effects can

include streambank damage, removal of shade-providing vegetation, widening of stream channels, introduction of fine sediment and channel incision.

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

- 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. Permittees will place salt at least ¼ mile away from creeks. This will reduce or eliminate impact on spawning areas.
- Permittees will ride to keep livestock off of creeks. This will reduce or eliminate impact on spawning areas.
- Fences and troughs have been placed to reduce livestock use in creeks. This will reduce or eliminate impact on spawning areas.
- 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.
- Off-Stream Water Development: McInnis and McIver (2001) found that off-stream water and salt can attract cows to the uplands enough to significantly reduce uncovered and unstable streambanks.
- Herding: Utilizing riders to keep livestock away from riparian areas can avoid direct impacts to spawning fish and incubating redds.
- Utilization Indicators: Establishing utilization indicators for forage utilization and moving livestock when these 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 Lake Creek Allotment to reduce the potential for adverse effects to listed fish and aquatic and riparian habitats within the action 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.

7.2 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.

Bull trout spawn within portions of the Lake Creek Allotment and it is possible that livestock could trample redds in these streams if grazing occurs when fish are spawning or eggs are incubating within stream substrates. Effects to listed-species spawning and incubation within the Lake Creek allotment are discussed below.

TABLE 5 - FISH SPECIES PRESENCE BY PERENNIAL STREAM ON THE ALLOTMENT.

Stream Name	Brook Trout	Bull Trout	Chinook	Cutthroat	Rainbow	Steelhead
Rattlesnake	NO	NO	NO	unknown	unknown	NO
Camp	NO	NO	NO	unknown	unknown	NO

Birch	NO	NO	NO	unknown	unknown	NO
Lake	NO	YES	NO	YES	YES	NO

Note: Hatchery steelhead have been documented spawning at the mouth of Lake and Rattlesnake Creeks below migratory barriers. No spawning occurs within the stream itself.

7.2.1 CHINOOK SALMON

There is no Chinook salmon spawning within the Lake Creek allotment.

7.2.2 STEELHEAD

There is no steelhead spawning within the Lake Creek allotment.

7.2.3 BULL TROUT

Mainstem Lake Creek supports populations of bull trout and likely additionally supports spawning habitat for bull trout. The general spawning periodicity for bull trout in the Lake Creek drainage ranges from mid August to mid October. Based upon initiation of bull trout spawning as early as August 15, potential livestock impacts to incubating bull trout redds could occur within both the South Fork and Below Ranch pastures, which could have cattle present In the drainages during the spawning period depending on the annual rotation.

Livestock normally enter the allotment July 1 into the BLM Pasture and trail into the first pasture in the year's rotation (Table 2). Bull trout spawn in Lake Creek that flows through the Below Ranch and South Fork Units. Because of the rest rotation grazing management, livestock will be in one or both of these units every grazing season. The four year rotation (Table 2) provides that the South Fork pasture will be rested one year and livestock will be out of the pasture prior to August 15 two years. Livestock will be in the unit after August 15th for up to 6 weeks one out of four years. The Below Ranch pasture will be rested one year and livestock will be out of the pasture prior to August 15 one year. Livestock will be in the unit after August 15th between 6 weeks and 7 weeks two out of four years.

Vegetation and topography are the major contributing factors contributing to the access of livestock to Lake Creek within the allotment. The willow and alder component of Lake Creek is extremely thick. It is estimated that only about 1 percent of Lake Creek is accessible to livestock within the Below Ranch and South Fork Units.

Water temperatures are within the limits for bull trout to spawn by mid-August as recorded in the lower Below Ranch pasture. The six grazing focus indicators are all functioning appropriately.

In summary, by using stream water temperature data it is concluded that bull trout spawning timeframes are fairly well defined for Lake Creek within the project action area. It is concluded that direct disturbance of spawning bull trout or bull trout redds could occur in Lake Creek at some time after mid August.

Livestock grazing will have minimal impacts to bull trout habitat as demonstrated by monitoring data, pathway indicator assessments, and the six grazing focus indicator assessments presented and discussed within this document. The primary constituent elements (PCEs) for bull trout proposed critical habitat (Appendix D) would be met and the proposed action would be in compliance with the PCEs when critical habitat is designated for bull trout. The proposed action would not be likely to result in an adverse modification of the proposed critical habitat.

7.3 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.

Water temperature conditions in the Lake Creek drainage are considered to be Functioning Appropriately for rearing, spawning, and incubation. Summer water temperatures have been monitored at one mainstem Lake Creek site from June 24th through October, 2009. The mean temperature was 9.2 degrees centigrade, well below the maximum for successful habitation by bull trout (Gamett 2002). Therefore the overall, observed water temperature regimes within the Lake Creek Allotment are within Infish water temperature criteria. Monitoring data do not suggest any significant contribution of temperature impacts as a result of recent livestock grazing. Monitoring data indicate that riparian conditions are generally in static to upward trend, and width:depth ratios are within the natural range of variability. In the absence of observed impacts to these influencing habitat parameters, it is concluded that recent livestock grazing within the Lake Creek Allotment is not resulting in detectable effects to water temperatures or water temperature regimes within the streams of the action area.

The proposed action includes measures, such as livestock movement strategies, salting, and the use of riders to keep livestock away from critical stream reaches, which should result in livestock having even less potential impact on stream temperatures. The four year rotation schedule will result in minimal exposure of Lake Creek to grazing animals after August 15th. Conservation measures designed primarily 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 mainstem Lake Creek. In addition, most of the Lake Creek banks are willow and cottonwood dominated and discourage if not prevent livestock access to spawning areas.

Proposed monitoring will be effective in identifying future trends of water temperature regimes within the action area, as well as in identifying both the occurrence and causal mechanisms of any changed conditions which would initiate responsive modification of grazing management strategies for the allotment under the adaptive management strategy.

7.4 SEDIMENT

Elevated levels of stream sediment can affect the survival of salmonid eggs and alevins (Bjornn, et al, 1998). Livestock grazing can increase sediment levels by altering bank stability, riparian vegetation, and upland vegetation. Livestock grazing and unmanaged trailing activities can impact sediment levels in areas that are grazed by livestock and in areas downstream from where grazing occurs.

Livestock activity within the Lake Creek drainage is not currently considered to be a significant factor influencing sediment levels. Stream sediment conditions are considered to be Functioning at Risk in both the Twelvemile watershed and in Lake Creek. Elevated levels of fines have been observed in Lake Creek are tied to erosion in an upstream basin during high water events and from the road system network. Streambank conditions described in Section 7.1.5 as related to livestock use are functioning appropriately indicating the sediment/fines are not derived from livestock use. In 1993 the average reading was 41.2 and in 2008 it was 44. No sediment readings were taken in 2009. As discussed previously, this is due to inputs from a naturally erosive basin that can drain into Lake Creek under some rainfall conditions. Road beds are also thought to be a source of sediments in the drainage and the watershed.

In summary, the Conservation Measures associated with the proposed grazing action are considered to be effective in minimizing potential livestock generated sediments to stream channels in the Lake Creek Allotment action area. The proposed action is expected to maintain the condition of the Sediment Focus Indicator. Ongoing sediment monitoring continue to identify trends of stream substrate conditions within the Lake Creek Allotment. These monitoring operations, supplemented by ongoing MIM monitoring, will be effective in identifying both the occurrence and causal mechanisms of any significant change in substrate conditions which would initiate responsive modification of grazing management strategies for the allotment under the adaptive management strategy.

7.5 WIDTH: DEPTH RATIO

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

Stream width: depth ratios are considered to be Functioning Appropriately within the Twelvemile Watershed and within Lake Creek. The average width:depth ratio averaged 10.1 at all MIM sites in mainstem Lake Creek and are within standards for "B" and "C" channel types.

While currently within the range of values identified in the Natural Condition Database, the general trend of width:depth ratios within the Lake Creek Allotment has been relatively static over time. Considering both observed width: depth ratios and streambank stability data and trend, it is concluded that livestock grazing activities have not directly produced or contributed to any significant impacts on width:depth ratios of streams within the Lake Creek allotment which can be meaningfully measured, detected or evaluated. Additionally the proposed action includes measures, including employment of riders to keep livestock away from critical stream reaches, which should result in livestock having even less potential impact on streambanks and width:depth ratios than has occurred in the past

In summary, it is concluded that direct and indirect effects of the proposed livestock grazing action on channel morphology of allotment area streams are insignificant, and are not expected to have any meaningfully measureable or discernable influence on stream channel width: depth ratios within the action area. The proposed action is expected to maintain the condition of the width:depth Focus Indicator.

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

7.6 STREAMBANK CONDITION

Streambank conditions can have important effects on fish populations and livestock grazing can impact streambank conditions by direct alteration of the bank or by modifying riparian vegetation (Platts and Nelson, 1989). The Lake Creek drainage is not a PACFISH priority watershed and has an identified Riparian Management Objective (RMO) of 80 percent or greater bank stability. Since monitoring started in 1994, all readings have been at or above 90% bank stability. Based upon the Matrix of Pathway and Indicator functionality criteria of 80 percent or greater streambank stability, baseline streambank conditions are considered to be Functioning Appropriately within the Twelvemile Watershed Subwatershed and Functioning Appropriately in Lake Creek.

Strategies and Conservation Measures of the proposed action, while designed primarily to avoid livestock presence within stream channels during critical spawning periods, additionally serve to minimize potential livestock impacts to streambanks of action area streams. Measures including alternating rotations of the South Fork and Below Ranch pastures, rapid movement of livestock through trailing areas, salting and fencing, and use of range riders to keep livestock in upland areas will all contribute to minimizing near stream livestock activity and the potential for direct streambank impacts on action area streams. In addition, most of the spawning reaches in Lake Creek are protected by the willow and cottonwood dominated vegetation which discourage, if not prevent, livestock access to the stream.

In summary, it is concluded that direct and indirect effects of the proposed livestock grazing actions on streambank conditions within Lake Creek Allotment streams are insignificant, and not expected to have any meaningfully measureable or discernable influence on streambank stability levels within the action area. The proposed action is therefore expected to maintain the condition of the Streambank Focus Indicator.

Future field data collections in association with ongoing sediment monitoring operations will continue to identify trends of streambank conditions within both grazed and livestock-excluded portions of the Lake Creek Allotment. These monitoring operations, supplemented by ongoing MIM monitoring, will be effective in identifying both the occurrence and causal mechanisms of any significant change in streambank conditions which would initiate responsive modification of grazing management strategies for the allotment under the adaptive management strategy.

7.7 RIPARIAN CONSERVATION AREAS

The condition of riparian areas can have important affects on fish populations. Livestock grazing can impact riparian areas by direct reduction or altering riparian vegetation and/or by impacting protective streambank cover (Platts and Nelson, 1989). Riparian vegetation within the Lake Creek drainage is typically more woody than herbaceous. Willow, dogwood and cottonwood dominate the overstory in the lower reaches of streams within the watershed, slowly changing into a more conifer dominated overstory as one gets higher in the drainages. Overall, riparian condition is moderate to good.

The Twelvemile Watershed is not impacted by major disturbances that would affect this parameter except for roads in limited areas. Riparian areas are considered to be Functioning Appropriately within the Lake Creek drainage. The conservation areas in the Lake Creek drainage provide adequate shade, large woody debris, habitat protection, and connectivity. Current livestock grazing activities within the action area are not considered to be negatively impacting riparian conditions. Impacts of past livestock grazing strategies within the action area are not continuing to occur and overall riparian conditions are considered to have improved over the past several years.

In summary, it is expected that the direct and indirect effects of the proposed actions on riparian conservation areas are not able to be meaningfully measured, detected or evaluated, and are therefore insignificant. The proposed action is expected to maintain the condition of the Riparian Focus Indicator. Future field data collections will continue to identify trends of riparian vegetation conditions within the Lake Creek Allotment. These monitoring operations will be effective in identifying any significant change in riparian conditions which would initiate responsive modification of grazing management strategies for the allotment under the adaptive management strategy.

7.8 CUMULATIVE EFFECTS

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

State lands are very limited in the subwatershed and are managed in conjunction with private land activities. The dominant use is livestock grazing.

Resource conditions on private lands are affected by livestock grazing, mining, water withdrawals for mining, water withdrawals for irrigation, residential home site development and roads. Many sites impact the Salmon River as well as tributary streams within the subwatershed.

7.9 SUMMARY OF EFFECTS

The effects analysis identifies a non-discountable potential for direct impact of livestock on spawning bull trout and their incubating eggs. These potential impacts could directly affect the Growth and Survival Indicator of the Subpopulation Characteristics Pathway, which could produce related indirect effects to the Subpopulation Size and Persistence and Genetic Integrity Indicators. 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 functioning levels.

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

TABLE 6 - EFFECTS SUMMARY FOR LAKE CREEK ALLOTMENT GRAZING ACTIVITIES

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

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

1/ Within the Lake Creek Subwatershed

8 SUMMARY OF EFFECTS

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

8.1 SNAKE RIVER SPRING/SUMMER CHINOOK SALMON

The effects analysis concluded that the proposed action will have a NO EFFECT to Chinook salmon because they are not present in the Lake Creek allotment.

The effects analysis concluded that the proposed action will have NO EFFECT on Chinook salmon critical habitat because it is not present in this allotment.

8.2 SNAKE RIVER STEELHEAD

The effects analysis concluded that the proposed action will have a NO EFFECT to steelhead because they are not present in the Lake Creek allotment.

The effects analysis concluded that the proposed action will have NO EFFECT on steelhead critical habitat because it is not present in this allotment.

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 (3.2.3) limit the adverse effects of grazing activities, there exists a remaining potential for direct trampling of bull trout redds within action area streams. Therefore, the proposed action results in a “MAY AFFECT,

LIKELY TO ADVERSELY AFFECT" determination for bull trout because the number of days livestock could trample redds during the four year rotation is minimized through rotation timing. In addition, the upper reaches of Lake Creek are dominated by willow, dog wood, and cottonwood which serve as physical barriers to keep livestock away from the creek. Conservation measures (3.2.3) will minimize potential effects to fish and fish habitat. Resource management objectives (3.2.4) and grazing use standards (3.2.5) will minimize potential impacts to habitat and fish. In addition, habitat quality (7.2.1) is considered to be in good condition and the grazing focus indicators (8.0) support this conclusion.

The action area does not currently contain designated bull trout critical habitat, however it does contain proposed designated critical habitat. As discussed in the Analysis of Effects section (8.9) and Table 5 of this BA, though there will be some impacts to the proposed critical habitat in the action area of this BA, they will likely be insignificant as discussed in the Grazing Focus Indicator section. In addition, all vegetation pathway indicators, PCEs, and the grazing focus indicators are being met with current livestock management practices. Therefore, the proposed action is found to result in a "MAY AFFECT, NOT LIKELY TO ADVERSELY AFFECT" determination for proposed critical habitat identified for bull trout.

8.4 SNAKE RIVER SOCKEYE SALMON

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

8.5 ESSENTIAL FISH HABITAT

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

TABLE 7 - EFFECTS DETERMINATION SUMMARY FOR LAKE CREEK ALLOTMENT GRAZING ACTIVITIES

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

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

APPENDIX A
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APPENDIX B

WATERSHED BASELINES WITH MATRICES OF DIAGNOSTIC PATHWAYS AND INDICATORS

Twelvemile Creek – Salmon River Watershed Baseline

Agency: USDA Forest Service, Salmon-Challis National Forest

HU Code and Name: 1706020303 Twelvemile Creek – Salmon River

Unit: Salmon-Cobalt Ranger District

Spacial Scale of Matrix: One 5th HUC

Fish Species Present: Bull Trout

Proposed Designated Critical Habitat Present: Bull Trout

Anadromous Species Population: Salmon River

Anadromous Species Subpopulation: N/A

Bull Trout Core Area: Salmon River

Local Population: N/A

Management Actions: Ongoing

Updated: 11-20-09

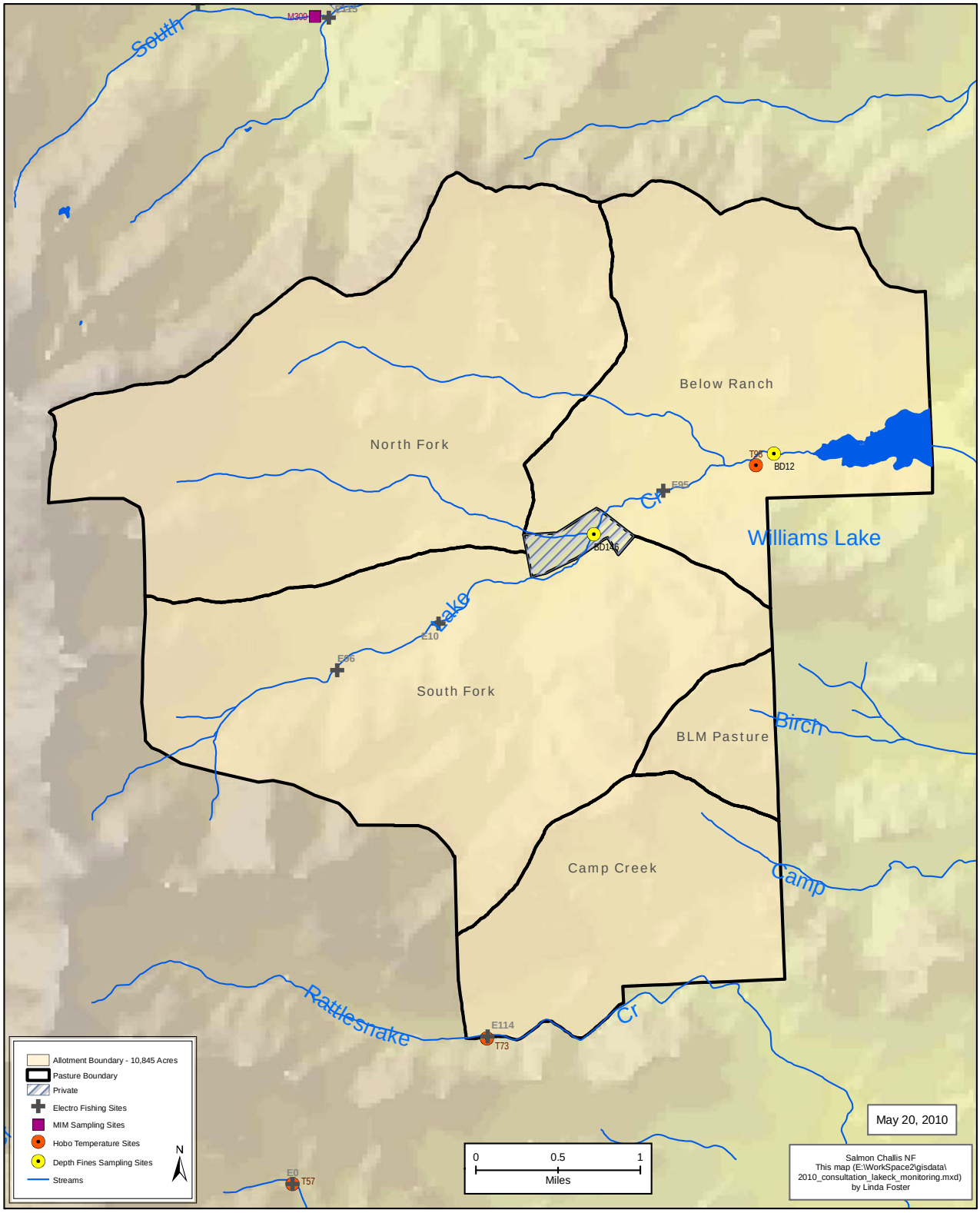
Subpopulation Characteristics		
Pathways Indicators	**Baseline**	**Discussion of Baseline – Current Condition**
Subpopulation Size	FA BT	Twelvemile and Lake Creeks are the only streams with bull trout. PJ that there is a strong resident population due to habitat; status of fluvial population unknown but potential exists.
Growth and Survival	FA BT	PJ; migratory population is likely.
Life History Diversity and Isolation	FR BT	There are irrigation diversion structures that may be barriers to migration, but Twelvemile Creek does reach Salmon River. Lake Creek population is isolated in and above Williams Lake
Persistence and Genetic Integrity	FA BT	Potential exists for fluvial population; no brook trout.
Water Quality		
Pathways Indicators	**Baseline**	**Discussion of Baseline – Current Condition**
Temperature (7day average. Maximum, oC)	FA	Meets standards on federal lands; data available
Sediment	FR	Meets standards on federal lands; data available

Chemical Contaminants/Nutrients	FA	No streams on 303(d) list; No known sources for potential pollutants except via home sites on private land
Habitat Access		
Pathways Indicators	**Baseline**	**Discussion of Baseline – Current Condition**
Physical Barriers	FR	There are irrigation diversion structures on private which may be barriers to migration.
Habitat Elements		
Pathways Indicators	**Baseline**	**Discussion of Baseline – Current Condition**
Substrate Embeddedness	FA	PJ; no data available.
Large Woody Debris	FA	Meets federal standards; data available.
Large Pools or Pool Frequency and Quality	FA	High gradient system; A-B channel types; meets federal standards; data available.
Off-Channel Habitat	FR	Bull Trout and Steelhead: PJ; high quality habitat impacted only in portions by road in the valley bottom (<½ mile).
Refugia	FR	Bull Trout and Steelhead: PJ; high quality habitat impacted only in portions by road in the valley bottom (<½ mile).
Channel Condition & Dynamics		
Pathways Indicators	**Baseline**	**Discussion of Baseline – Current Condition**
Average Wetted Width/Maximum Depth Ratio	FA	Meets federal standards; data available
Streambank Condition	FA	Meets federal standards;, data available; very stable, naturally armored
Floodplain Connectivity	FA	Good except where impacted by road in historic floodplain (<1/2 mile). The watershed has approximately 38.5 miles of roads within an RHCA, which is 16.6% of the roads within the watershed.
Flow/Hydrology		

Pathways Indicators	Baseline	Discussion of Baseline – Current Condition
Change in Peak/Base Flows	FR	Most of stream has natural flow regime; only impacted on lowermost reaches by private irrigation practices.
Increase in Drainage Network	FA	PJ due to limited roading and disturbance.
Watershed Condition		
Pathways Indicators	**Baseline**	**Discussion of Baseline – Current Condition**
Road Density and Location	FR	Road density is 1.8 mi/mi2. The watershed has approximately 38.5 miles of roads within an RHCA, which is 16.6% of the roads within the watershed.
Disturbance History	FA	Overall ECA is 4.5%.
Riparian Conservation Areas	FA	PJ; unimpacted by major disturbances that would affect this parameter except for road in limited areas.
Disturbance Regime	FA	High quality habitat in a very stable system.
Integration of Species and Habitat Conditions		
Pathways Indicators	**Baseline**	**Discussion of Baseline – Current Condition**
Habitat Quality and Connectivity	FA	As noted above, this system has a strong resident population with potential for migratory form. Stream is not dewatered, but diversion structures may be barriers to migration. Livestock grazing has potential to impact very small portions of the stream due to topography and thickly vegetated riparian corridor. Where access is available, vegetation is very healthy, with regeneration, and streambanks are very stable. Twelvemile Creek is very stable with good riparian and aquatic habitats, supporting natural processes and a healthy resident bull trout population. Current management, will maintain this excellent habitat and provide the necessary habitat parameters to sustain healthy bull trout populations.

APPENDIX C
MONITORING DATA AND SUMMARIES

APPENDIX C FIGURE 1 – LOCATIONS OF SAMPLE SITES FOR LAKE CREEK ALLOTMENT



APPENDIX C TABLE 1 - FISH INFORMATION

Stream	Site ID	Sample Date	Sampling Method	Species Present		
				Chinook	Steelhead/ Rainbow	Bull Trout
Lake Cr	Lake 1	2009	E Shock	NO	YES	YES
Lake Cr	Lake 2	2009	E Shock	NO	YES	YES
Lake Cr	Lake 3	2009	E Shock	NO	NO	NO
Lake Unnamed Trib	Lake Trib	2009	E Shock	NO	YES	YES

APPENDIX C TABLE 2 - WATER TEMPERATURE 2009

Pasture	Site ID	Monitoring Period	Maximum Daily Temperature	Maximum of 7 day Moving Maximum	Mean Temperature 7/1 to 9/30
Below Ranch	Lake Cr	6/25–10/20	12.9	12.0	9.2

APPENDIX C TABLE 3 - SEDIMENT - MEAN PERCENT FINES <.25 AT DEPTH

Pasture	Site ID	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Below Ranch	XXXX Lake 1	42.7	52.0	53.8	39.7	50.0	44.6	35.9		29.8	38.6	38.7	32.4	32.8			44.0	
	XXXX Lake 2							28.9		45.0								

APPENDIX C TABLE 4 - CHANNEL GEOMETRY – WIDTH: DEPTH RATIO

Pasture	Site ID	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Below Ranch	XXXX Lake 1			12.5	7.2	10.2	10.1	10.8		11.2	15.0	12.4						
	XXXX Lake 2							6.1		6.0								

APPENDIX C TABLE 5 – STREAMBANK CONDITION – PERCENT STABLE BANKS

Pasture	Site ID	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Below Ranch	XXXX Lake 1		97.0	99.0	95.5	91.0		100		91.0	97.0	98.0	98.0	98.5			91.5	
	XXXX Lake 2							99.0		96.0								

APPENDIX C TABLE 6 – FISH DENSITY LAKE CREEK ALLOTMENT

	Year								
Stream Name	**2009**			**2009**			**2009**		
Lake Creek #1	**Chinook Salmon**			**Steelhead**			**Bull Trout**		
	1st pass	2nd/3rd pass	fish/100m^2	1st pass	2nd/3rd pass	fish/100m^2	1st pass	2nd/3rd pass	fish/100m^2
	0	NA	NA	0	NA	NA	15	NA	NA

APPENDIX C TABLE 7 – LAKE CREEK ALLOTMENT FISH PRESENCE

Bull Trout Present

	Sum of LENGTH
Below Ranch Unit	2.17
Lake Creek	2.17
South Fork Unit	1.34
Lake Creek	1.34
Grand Total	3.50

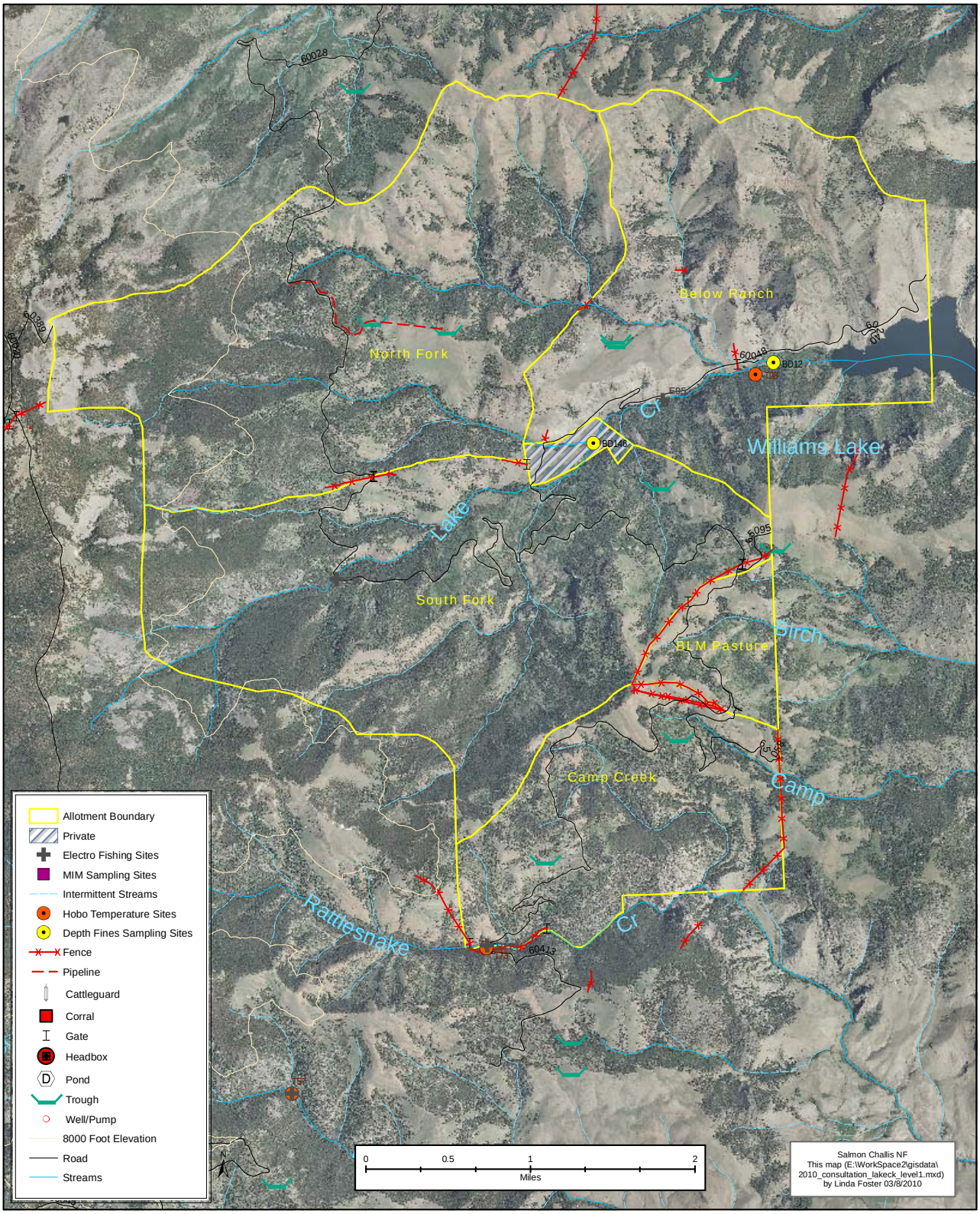
Bull Trout Spawning

	Sum of LENGTH
Below Ranch Unit	1.44
South Fork Unit	1.34
Grand Total	2.77

Bull Trout Proposed DCH

	Sum of LENGTH
Below Ranch Unit	2.22
Lake Creek	2.15
Unnamed Creek	0.07
North Fork	2.43
Unnamed Creek	2.43
South Fork	3.06
Lake Creek	3.06
Grand Total	7.71

APPENDIX C FIGURE 2 – LAKE CREEK ALLOTMENT



APPENDIX D
BULL TROUT CONSTITUENT ELEMENTS OF CRITICAL HABITAT

Primary Constituent Elements of Critical Habitat

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

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

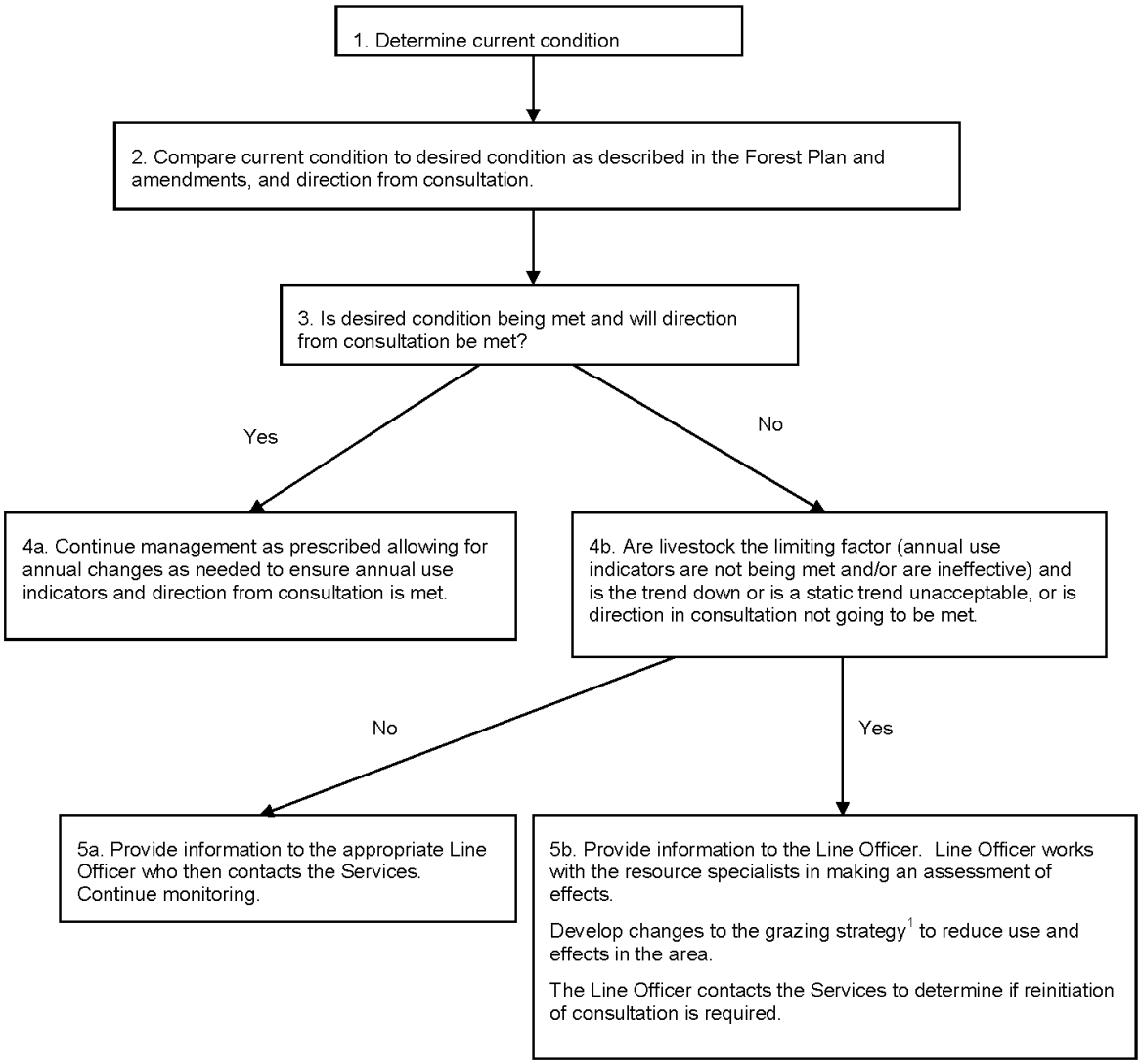
Primary Constituent Elements for Proposed Bull Trout Critical Habitat and Associated Habitat Indicators

PCE #	PCE Description	Associated Habitat Indicators
1.	Springs, seeps, groundwater sources, and subsurface water connectivity (hyporehic flows) to contribute to water quality and quantity and provide thermal refugia.	floodplain connectivity, change in peak/base flows, increase in drainage network, **riparian conservation areas**, chemical contamination/nutrients
2.	Migratory habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.	life history diversity and isolation, persistence and genetic integrity, **temperature**, chemical contamination/nutrients, physical barriers, **average wetted width/maximum depth ratio in scour pools in a reach**, change in peak/base flows, refugia
3.	An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.	growth and survival, life history diversity and isolation, **riparian conservation areas**, floodplain connectivity (importance of aquatic habitat condition indirectly covered by previous seven PCEs)
4.	Complex river, stream, lake, reservoir, and marine shoreline aquatic environments and processes with features such as large wood, side channels, pools, undercut banks and substrates, to provide a variety of depths, gradients, velocities, and structure.	large woody debris, pool frequency and quality, large pools, off channel habitat, refugia, **average wetted width/maximum depth ratio in scour pools in a reach**, **streambank condition**, floodplain connectivity, **riparian conservation areas**
5.	Water temperatures ranging from 2 to 15 °C (36 to 59 °F), with adequate thermal refugia available for temperatures at the upper end of this range. Specific temperatures within this range will vary depending on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shade, such as that provided by riparian habitat; and local groundwater influence.	**temperature**, refugia, **average wetted width/maximum depth ratio in scour pools in a reach**, streambank **condition**, change in peak/base flows, **riparian conservation areas**, floodplain connectivity
6.	Substrates of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount (e.g., less than 12 percent) of fine substrate less than 0.85 mm (0.03 in.) in diameter and minimal embeddedness of these fines in larger substrates are characteristic of these conditions.	**sediment**, **substrate embeddedness**, large woody debris, pool frequency and quality

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

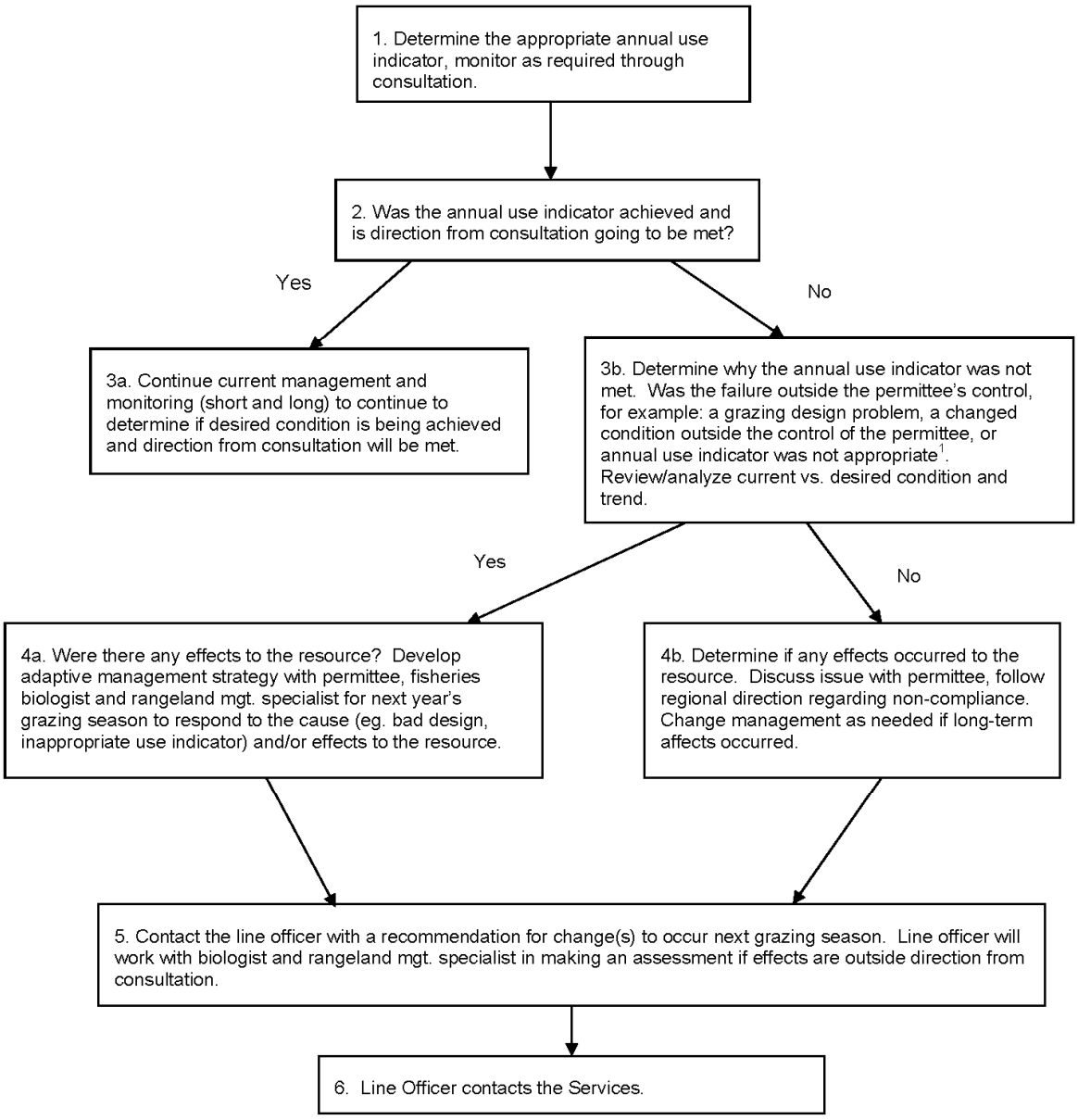
APPENDIX E
ADAPTIVE MANAGEMENT DIAGRAMS

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



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

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



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