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

File Code: 2670
Date: April 27, 2010

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

Dear Acting Supervisor:

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

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 We have analyzed the potential effects based on the best available information either published or unpublished.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

This Assessment's determinations of effects include a "May Affect" determination for individual fish species within the action area, as well as a determination for proposed Critical Habitat. Determinations have concluded there would likely be 'Adverse Effects' to bull trout and there would be 'Not Likely to Adversely Affect' on bull trout proposed critical habitat.

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

Sincerely,

Stefani Melvin

for FRANK V. GUZMAN
Forest Supervisor

Encl. *Aquatic Species Biological Assessment for the South Fork of Williams Creek Cattle and Horse Allotment*
cc: Stefani Melvin, Karen E Dunlap, Karryl Krieger

Aquatic Species Biological Assessment for the South Fork Williams Creek Cattle and Horse Allotment

SALMON-COBALT RANGER DISTRICT

SALMON-CHALLIS NATIONAL FOREST

LEMHI COUNTY, IDAHO

Prepared by: Karryl L. Krieger

Fish Biologist

Signature: Karryl L Krieger

Date: 27 April 2010

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

2 BACKGROUND

The Williams Creek subwatershed is located near the town of Salmon, draining the area immediately to the west. The watershed is bounded on the north by the Wallace Creek subwatershed, and on the south by the Lake Creek subwatershed. The vast majority of this subwatershed is U.S. Forest Service (USFS) administered land, with private lands along the Salmon River corridor and up the primary drainages. Sandwiched between these two is a strip Bureau of Land Management (BLM) administered lands.

The Middle Salmon-Williams Creek Watershed supports 60.7 miles of streams of which 45.1 are on the National Forest. The majority of streams within the watersheds are considered are of moderate gradient, with 52% of the miles in the 4-10% gradient range. Of the remainder, 24% are low gradient and 22% are high gradient. Elevations range from 10,000 feet in headwaters areas to 4,000 feet at the confluence of Williams Creek with the Salmon River.

Williams Creek is the primary perennial tributary within the subwatershed and the only one with the potential for use by anadromous fish. Williams Creek at the Forest boundary has an estimated mean annual flow of 10 cfs. The major tributary of Williams Creek is the South Fork of Williams Creek. Other perennial tributaries in the subwatershed include Perreau Creek, with a mean annual flow of 4.5 cfs, and Jesse Creek with a mean annual flow of 5.0 cfs. There is no information available for Billy Creek, Gorley Creek, Pollard Canyon and Spring Creek, all of which are fairly small streams which generally do not reach the Salmon River except during snowmelt or thunderstorm events. Jesse Creek is the water source for the City of Salmon.

The headwaters of Williams Creek flow through a high gradient, narrow valley bottom. It then enters a moderate gradient (3-6%), V-shaped valley bottom. The South Fork of Williams Creek enters Williams Creek above the BLM. Upon leaving the canyon, the channel turns toward the north and is bisected by several irrigation ditches. It is unknown at this time how much interchange exists between these water bodies. Downstream, the channel is impounded by a man-made dam which likely prohibits fish migration. The exact manner in which water is passed through/under/around this structure is currently unknown. Discussions with IDFG personnel indicate that the landowner wanted to trap hatchery steelhead, which swam up Williams Creek to this point, to use for stocking this pond. A stocking permit was not granted.

The soils developed on these lands are usually moderately deep (20-40 inches) to deep (greater than 40 inches). Soil textures range from sandy loam to loamy coarse sands. Coarse fragments are mainly gravels with some cobbles that occur in moderate amounts, generally greater than 35 percent. These soils usually have a low water-holding capacity because of the soils coarse textures.

The inherent erosion hazard of these soils is moderate to high, the debris slide hazard is low to moderate, the surface creep hazard is low to high, the slump hazard is very low to low, and the revegetation potential is fair on cool-moist aspects and fair to poor on the hot-dry aspects.

The major areas of sedimentary origin includes the steep sideslopes of the deep canyons and the canyon bottoms which have been formed by stream-cutting action in sedimentary bedrock. The 60 to 90+ percent gradient of the sideslopes is the major criteria used to delineate this association. The slopes are dissected by shallow, parallel drainage systems and the steep headlands of these drainages are included in this association. Elevations are between 6,600 to 9,600 feet. Rock outcrops and talus slopes are frequently found. The valley bottoms may range from narrow valley bottoms in which the stream is actively cutting its channel in bedrock to wide valley bottoms in which the stream is meandering across depositional material. These lands are usually found at the lower elevations.

The soils developed on these lands are usually shallow (less than 20 inches) to moderately deep (20-40 inches). Soil textures range from loams to silt loams. Coarse fragments are mainly gravels, cobbles and occur in moderate amounts, generally greater than 35 percent. Some areas may contain inclusions of calcareous soils with pH above 8.0.

The inherent erosion hazard of these soils is moderate to high, the debris slide hazard is moderate, the surface creep hazard is moderate to high, the slump hazard is very low to moderate, and the revegetation potential is fair to poor on the northern aspects and fair to poor on the southern aspects.

Human use within the watershed includes the Williams Creek road that has been identified as a major sediment producer for the four miles which parallels the stream. Several roads in the watershed are closed on a permanent basis for various resource concerns. The Williams Creek Road is plowed during winter months to allow access to the Cobalt townsite and active mines.

Recreational activities in the watershed are primarily tied to hunting, fishing, camping, picnicking, horseback riding, hiking, sightseeing, outfitter/guide operations, snow-machining and cross-country skiing. A portion of the groomed snow machine trail system lies along the western boundary of the subwatershed and receives fairly heavy use. In addition here are approximately 13 miles of cross-country ski/mountain bike trails. Most dispersed camping in the watershed occurs on the Forest lands and is associated with open timber areas along roads. The USFS has two developed recreation sites, the Cougar Point Campground, which has twelve designated campsites (tent & RV), two vault toilets, picnic tables, fire rings, a potable water system and access road, and the Williams Creek Picnic Area, a group picnic area with picnic tables, fire rings and a two unit toilet with fiberglass vault. Both sites are located immediately adjacent to the Williams Creek road.

There are six developed borrow sources on USFS lands. Two sites are near Williams Creek summit, two near the South Fork Williams Creek, one in the Perreau Creek drainage and one in the Jesse Creek drainage. None of these sites impact the streams in the watershed.

No timber harvest occurs on BLM lands within this watershed. There have been historical harvest activities on the Forest.

The USFS conducts vegetative monitoring at multiple sites on their allotments. Monitoring has been conducted since 1993 and includes water temperature, greenline, bank stability, cross-section, woody species regeneration, utilization levels and photographs. Management for the next grazing season is based on the trend studies and utilization levels.

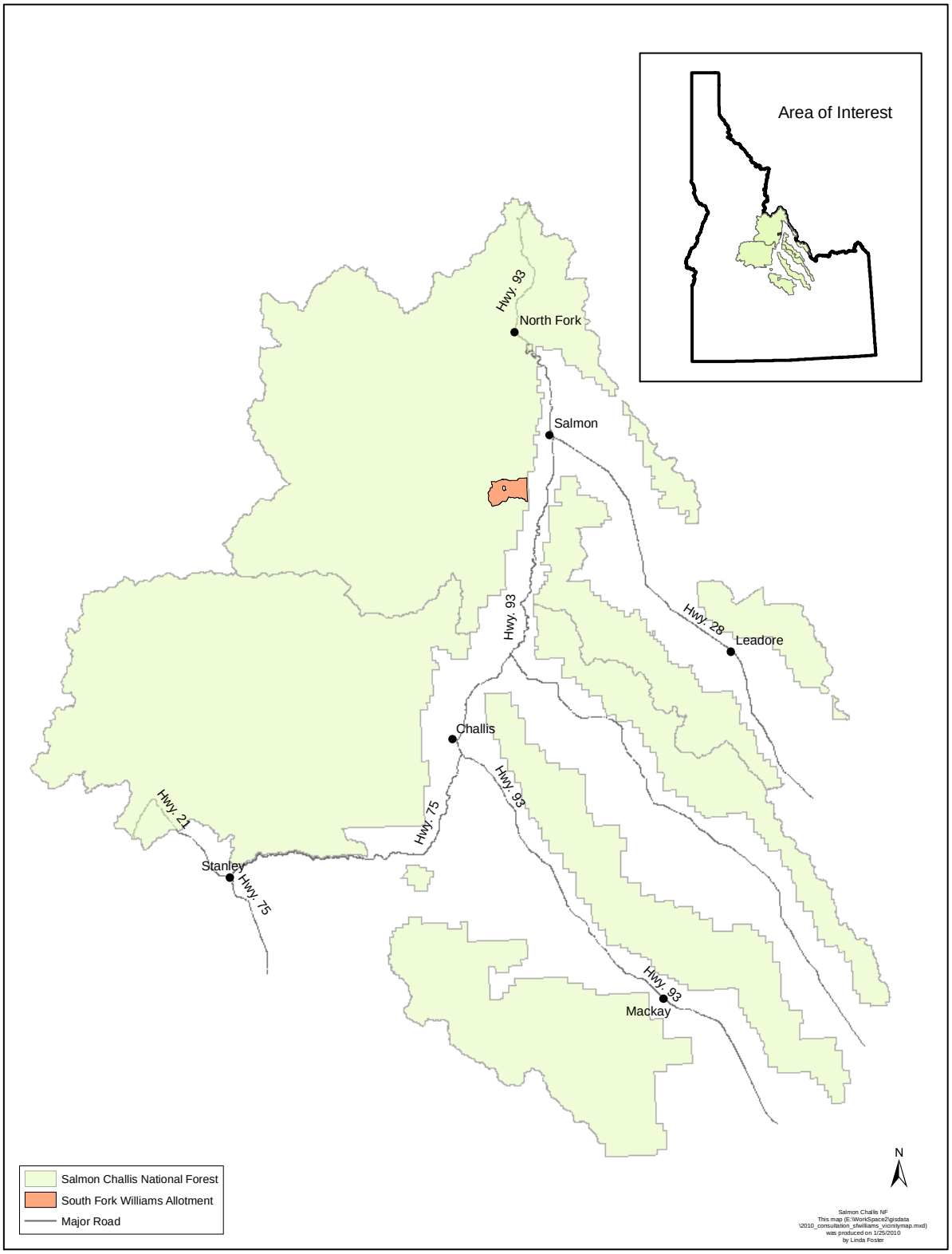
3 PROPOSED ACTION

3.1 PROJECT AREA

The South Fork Williams Creek Allotment is located southwest of Salmon on National Forest lands within the Williams Creek, South Fork Williams Creek, North Fork Williams Creek and Henry Creek drainages (Figure 1 and 3). The South Fork of Williams Creek Allotment is located on the Salmon-Cobalt Ranger District of the Salmon Challis National Forest. The South Fork of Williams Creek Cattle & Horse (C&H) Allotment is 11,388 acres. The allotment is divided into 4 units: Heifer Unit, South Fork, Powder House, and Henry Creek Units

The proposed project area is located within the Williams Creek-Salmon River (HUC 1706020304) and Twelvemile-Salmon River (HUC 1706020303) of the (see figure 3).

FIGURE 1 – SOUTH FORK WILLIAMS CREEK ALLOTMENT VICINITY MAP



3.2 PROPOSED ACTION

3.2.1 CURRENT PERMIT

The South Fork Williams Creek Allotment is permitted for 180 cow/calf pairs (722 Head Months) from June 16 - October 15. The permit number is 10568 and expires on 12/31/2015.

3.2.2 GRAZING SYSTEM

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

The following rotations will be used on this allotment:

TABLE 1 – GRAZING SCHEDULE ROTATION

Year 1	Year 2	Year 3
Heifer Pasture Unit	Heifer Pasture Unit	Heifer Pasture Unit
Henry Creek Unit	Henry Creek Unit	South Fork Unit
South Fork Unit	Powder House Unit	Powder House Unit
Powder House Unit (Rest)	South Fork Unit (Rest)	Henry Creek Unit (Rest)

Heifer Pasture Unit:

- Bull Trout: Livestock will always be out of the unit before August 15th.
- Trailing: No trailing.

Henry Creek Unit:

- No ESA fish streams in unit.
- Trailing: No trailing.

South Fork Unit:

- Bull Trout: Livestock will be in the unit after August 15th between 2 weeks and 8 weeks two out of three years.
- Bull Trout: Livestock will be out of unit before August 15th one out of three years.
- Trailing: Trailing occurs in the unit on South Fork Williams Creek one out of three years. Duration of move is 1 day.

Powder House Unit:

- Bull Trout: Livestock will be in the unit after August 15th for up to 8 weeks two out of three years.
- Bull Trout: Livestock will be out of unit before August 15th one out of three years.
- Livestock have no access to ESA fish occupied portion of South Fork of Williams due to topography, fence, and cattle guard.
- Trailing: Trailing occurs in the unit on South Fork Williams Creek two out of three years. Duration of move is 1 day.

Entry: Livestock are trailed onto the Heifer Pasture Unit from the BLM Henry Allotment. Duration of move is approximately one day.

Unit Movements: The allotment rotation utilizes a three year rest-rotation system. The Heifer Pasture Unit is used first every year due to the presence of poison (Larkspur) in every other unit. Only 150 cow/calf pairs are trailed to the Heifer Pasture Unit. The other 30 cow/calf pairs are trucked onto the

allotment into the second unit in the rotation. Each pasture move utilizes pre-established trails. Duration of each move is approximately one day. See Table 1.

Year 1: Livestock are trailed onto the Heifer Pasture Unit from the BLM Henry Allotment. Livestock are out of the Heifer Pasture Unit prior to bull trout spawning every year. Livestock are then trailed to the Henry Creek Unit where there is no bull trout spawning. The next move is to the South Fork Unit. A combination of permittee riding to keep livestock out of the stream, fences, steep topography, and brush dominated vegetation in the upper reaches all serve to minimize the occurrence of livestock trampling redds. The Powder House Unit is rested.

Year 2: Livestock are trailed onto the Heifer Pasture Unit from the BLM Henry Allotment. Livestock are out of the Heifer Pasture Unit prior to bull trout spawning every year. Then, livestock are trailed to the Henry Creek Unit where there is no bull trout spawning. Finally, livestock are trailed to the Powder House Unit. Fences and steep topography serve to keep livestock out of the North Fork Williams Creek. The location of a water trough combined with permittee riding to keep livestock out of the stream, fencing, and brush dominated stream banks greatly reduce the occurrence of livestock access to the South Fork Williams Creek. The South Fork Unit is rested.

Year 3: Livestock are trailed onto the Heifer Pasture Unit from the BLM Henry Allotment. Livestock are out of the Heifer Pasture Unit prior to bull trout spawning every year. Then, livestock are trailed to the South Fork Unit where they remain for approximately 10 days past the August 15th date. A combination of permittee riding to keep livestock out of the stream, fences, steep topography, and brush dominated vegetation in the upper reaches all serve to minimize the occurrence of livestock trampling redds. Finally, livestock are trailed to the Powder House Unit. The location of a water trough combined with permittee riding to keep livestock out of the stream, fencing and brush dominated stream banks greatly reduce the occurrence of livestock access to the South Fork Williams Creek. The Henry Creek Unit is rested.

Total Removal from NFS Lands: All livestock will be removed from the allotment by 10/15.

Exit: Livestock are trailed off the allotment to the permittee's private land inholdings (Corral Ranch). Livestock are trailed from permittee's private land down South Fork Williams road (FS RD 028) to Williams Creek road (FS RD 021) to home ranch on November 1st. A special use permit will be issued for this purpose.

3.2.3 CONSERVATION MEASURES

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

1. The on date will be varied so that livestock will be placed on the allotment at range readiness. This will reduce potential for bank alteration. This will help meet our long term riparian resource objective for bank stability.
2. Annual use indicators will dictate when livestock are moved between units or off the allotment within the terms of the term grazing permit including moves in response to fish spawning. This will help us meet our long term riparian resource objectives. Annual use indicators will be monitored by Forest Service personnel.
3. Permittees will continue to salt at least ¼ mile away from creeks. This will continue to reduce potential impacts on spawning areas and designated critical habitat.
4. Permittees will continue to distribute livestock away from streams and associated riparian areas (ride), reducing potential impacts on spawning areas and designated critical habitat.
5. Fences and water developments have been placed to reduce livestock use on streams and their associated riparian areas. This will continue to reduce impacts on 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 (U.S Department of Commerce, National Marine Fisheries Service, 1998). PACFISH is an interim strategy for managing anadromous fish-producing watersheds that was amended into the Salmon and Challis Forest Plans in 1995.

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

Resource Objectives:

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

Resource Standards (PACFISH):

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

Conservation Areas, assure that facilities do not prevent attainment of Riparian Management Objectives or adversely affect listed anadromous fish. Relocate or close facilities where these objectives cannot be met.

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

3.2.6 ANNUAL GRAZING USE INDICATORS

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

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

TABLE 2 – ANNUAL USE INDICATORS

Key Area Locations	Unit - Creek	Monitoring Attribute**	Use Indicator	Key Species	Trigger
MIM M309	South Fork Unit and Powder House Unit – South Fork Williams Creek	Browse use	50% 30%	Willow Alder	45% 25%
		Greenline stubble	4 in.	Hydric spp	5 in.
New Site1	Heifer Pasture Unit – South Fork Williams Creek	Browse use	50% 30%	Willow Alder	45% 25%
		Greenline stubble	4 in.	Hydric spp	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 unit. Key areas will be established to monitor trend.

**Browse use 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 (Utilization Studies and Residual Measurements, Interagency Technical Reference 1734-3). The Interagency Technical Reference or other best available science would be used to monitor grazing use. The MIM Interagency Technical Bulletin (Burton et al 2008) or other best available

science would be used to monitor grazing use at DMAs. Annual use indicators will be monitored by the Forest Service. Triggers will be used by permittees as a tool to help ensure annual use indicators are met. Results from monitoring will be available at (http://www.fs.fed.us/r4/sc/projects/range/index.shtml).

3.2.7 IMPROVEMENTS

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

Existing Improvements: Existing improvements are shown on Figure 7 and will be maintained in accordance with the term grazing permit.

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

3.3 MONITORING

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

Effectiveness Monitoring: The condition of resource objectives will be evaluated in the following manner. Within the South Fork, Power House and Heifer Pasture 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.

3.4 INTERDEPENDENT ACTIONS

Interdependent actions are actions that have “no independent utility apart from the action under consideration” (50 CFR§402.02). The Forest has not identified any interdependent actions associated with the proposed action. There are activities that occur within the action area and may be associated with the proposed action. However, we believe that these activities would continue to occur in a manner similar to the way they are currently occurring whether or not livestock graze on the South Fork Williams Allotment. Therefore, these activities will not be considered as interdependent actions.

3.5 INTERRELATED ACTIONS

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

3.6 ADAPTIVE MANAGEMENT

The adaptive management strategy described below and depicted in Appendix 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%

4 ESA ACTION AREA DESCRIPTION

The ESA action area is defined as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 CFR§402.02). This is the area where the action and any interdependent and interrelated actions will result in direct or indirect affects to listed species or designated critical habitat. Our analysis indicates that the proposed action has the potential to generate direct or indirect affects to listed aquatic species and aquatic habitats in the Williams Creek drainage from the headwaters downstream to the Forest Boundary (Figure 2).

Priority Watersheds are those watersheds that have been identified per direction in the 1995 PACFISH Biological Opinion, that require a different management strategy because of their importance to listed fish. There are no priority watersheds within the Action Area.

FIGURE 2 – SOUTH FORK WILLIAMS CREEK ALLOTMENT ACTION AREA

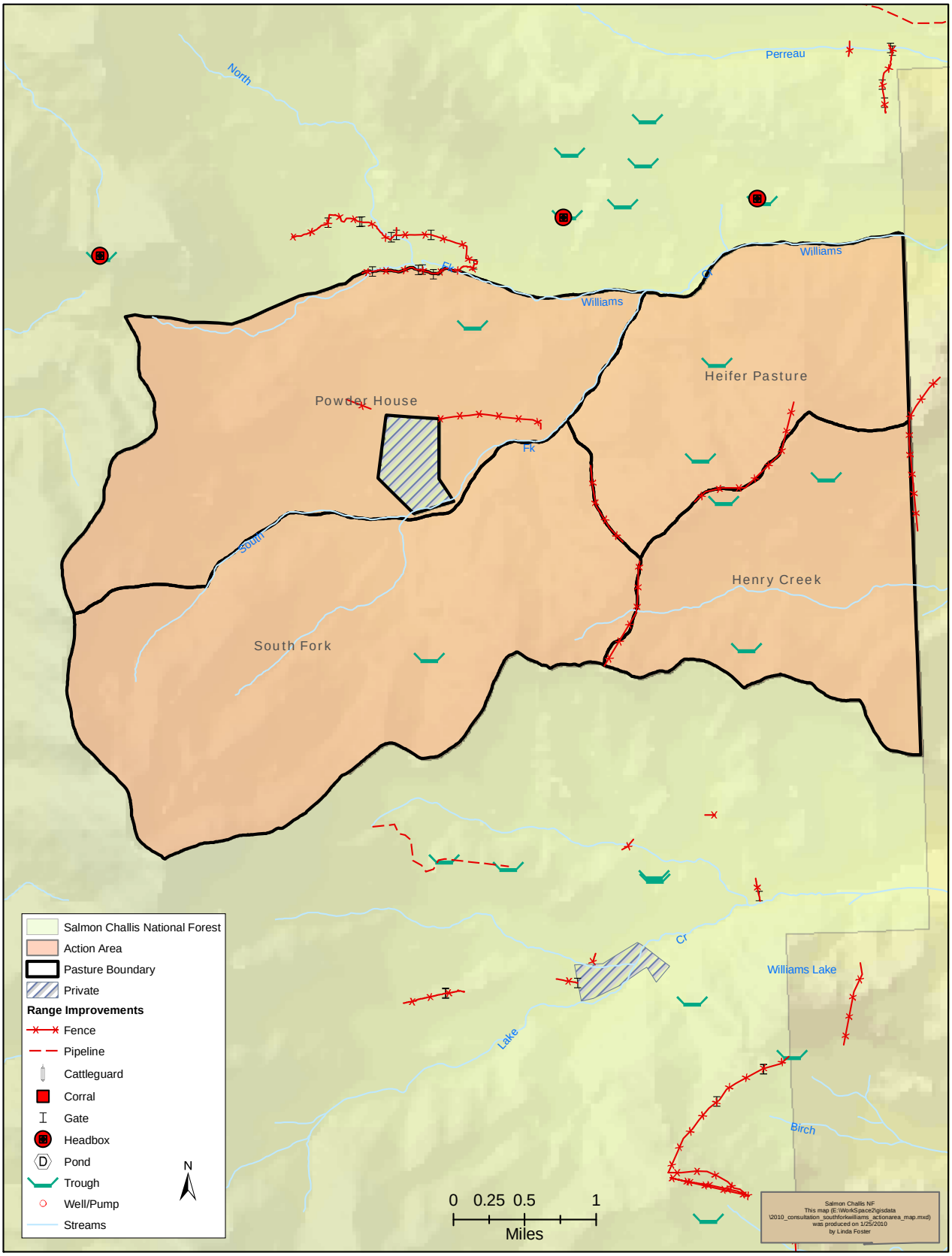
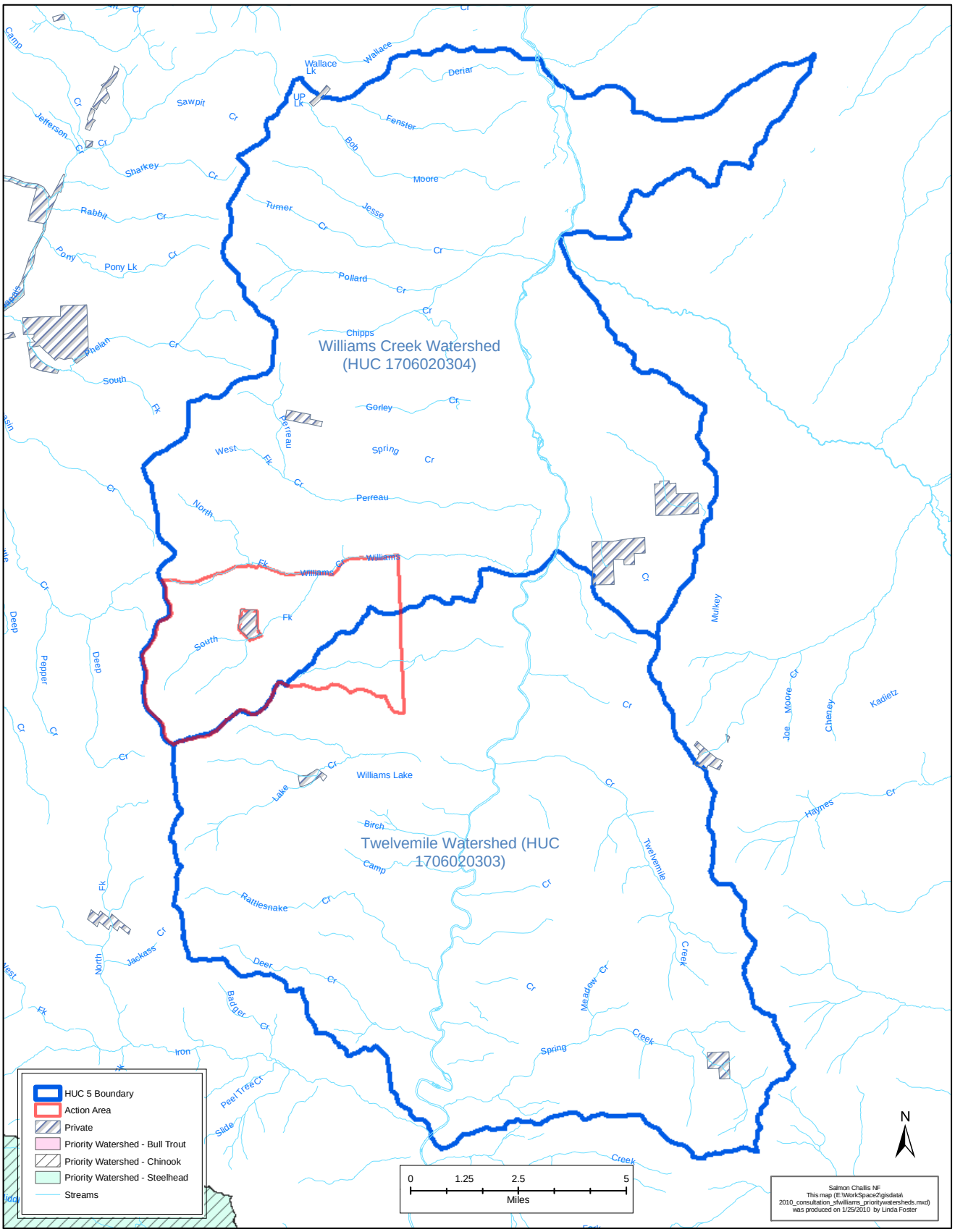


FIGURE 3 – SOUTH FORK WILLIAMS CREEK HUCS



5 LISTED SPECIES REVIEW

5.1 SPECIES OCCURRENCE

The current semi-annual Species List issued by the U.S. Fish and Wildlife Service (List #14420-2010-SL-0089, issued Dec. 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 occur 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 determined there is no critical habitat for Chinook salmon within this action area.

5.2.2 SOCKEYE SALMON

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

5.2.3 SNAKE RIVER BASIN STEELHEAD

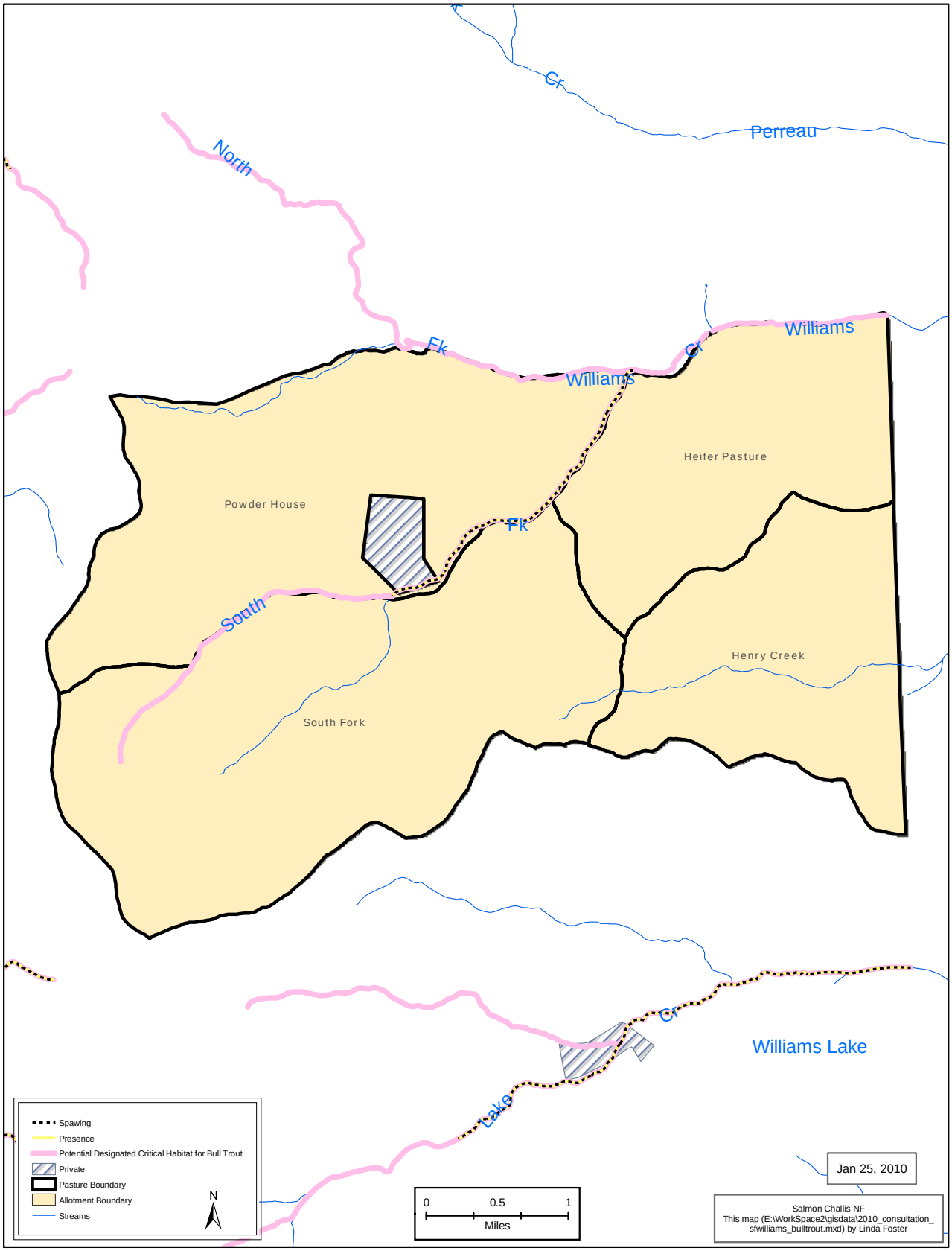
Critical habitat has been designated for Snake River Basin steelhead (Federal Register 70FR52630). Steelhead designated critical habitat is not present within the action area.

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 South Fork of Williams 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 South Fork Williams Allotment action area includes mainstem reaches of South Fork Williams Creek and Williams Creek (Figure 4).

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

FIGURE 4 – BULL TROUT



6 ENVIRONMENTAL BASELINE DESCRIPTION

The action area is within the Middle Salmon-Williams Creek Watershed (HUC 1706020304) of the Mid Salmon-Panther Creek 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.

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 South Fork Williams Creek Allotment includes one stream, South Fork Williams Creek, which supports populations of, and/ or habitat for, listed fish species. All other streams that are in the action area do not contain listed fish or support designated critical habitat. Designated habitat has been proposed in Williams Creek for Bull Trout and South Fork of Williams Creek. Steelhead have been found using lower Williams Creek below the Forest boundary, outside of the action area.

TABLE 3 – FISH SPECIES PRESENCE BY PERENNIAL STREAM WITHIN THE ALLOTMENT

Stream Name	Brook Trout	Bull Trout	Chinook	Cutthroat	Rainbow	Steelhead
Williams Creek	NO	NO	NO	YES	YES	NO
South Fork	NO	YES 2.23 miles	NO	YES	unknown	NO
West Fork	NO	NO	NO	unknown	unknown	NO

6.1.1 CHINOOK SALMON

Chinook salmon are not present in any streams in this allotment.

6.1.2 STEELHEAD

Steelhead are not present in any streams in this allotment. However, steelhead spawning has been documented in lower Williams Creek well below the Forest boundary above the Salmon River.

6.1.3 BULL TROUT

Salmon-Challis National Forest and Idaho Department of Fish and Game surveys identify bull trout within the South Fork of Williams Creek. An observed mean water temperature of 9.3 degrees Centigrade in the South Fork Williams Creek between July 1 and September 30, 2009 suggests that bull trout would be expected to be present in these lower reaches of the stream (Gamett, 2002).

The resident populations within the action area are considered strong. Resident forms are known to utilize South Fork Williams Creek, and could easily utilize the mainstem of Williams Creek. Migratory corridors and rearing habitat within the action area are considered to be in good to excellent condition for the species and the subpopulation exists in close proximity to spawning and rearing habitat. Williams Creek is cut off on private lands between the Forest and the Salmon River downstream of the action area, so there are no fluvial bull trout within the action area. There are valid reasons that the local population should be

able to recover from short-term disturbance, and risk of extinction of the subpopulation. Overall, populations are considered to be Functioning Appropriately.

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 WILLIAMS CREEK DRAINAGE

Fish habitat conditions of stream reaches of the Williams Creek drainage are in generally good condition. Overall physical habitat quality, including the elements of water quality, flow/hydrology, channel conditions and structural habitat elements is considered good. Connectivity is poor in the lower reaches of the drainage outside of the action area and is disconnected from the Main Salmon River. The watershed supports significant quantity of suitable spawning habitat for bull trout. High runoff flows have periodically resulted in decreased streambank stabilities and elevated sediment levels.

Williams Creek Drainage Tributaries:

Fish habitat conditions of the Williams Creek tributary streams are also generally in good condition relative to quantity and quality of habitat elements. Water temperature regimes are within the parameters for bull trout (Gamett 2002). Corral Ranch inholdings and outfitter and guided activities are located within the Riparian Habitat Conservation Areas (RHCAs) of some tributary streams. Williams Creek drainage tributaries have generally displayed upward trends in streambank and sediment conditions in recent years. Connectivity between upper and lower reaches of Williams Creek has been improved in recent years.

6.3 MAJOR LIMITING FACTORS

Factors most likely to be limiting Williams Creek drainage fisheries resources from achieving full carrying capacity are isolation, road location, and dewatering on private land for irrigation purposes, which are by far the biggest threats to listed fish species within this watershed. Williams Creek is cut off on private lands between the Forest and the Salmon River. Sediment, fines, and streambank condition data have been at levels well within RMO and Forest Plan standards on Forest Lands. Annual survey data shows streambank stability readings averaging greater than 90% (Appendix C Table 6). Historic grazing activities may have contributed to habitat capability limitations within the South Fork Williams Creek Allotment area. It is believed that improvements in grazing strategies implemented on the allotment within recent years have minimized any continuing contribution to impacts limiting habitat parameters within the watersheds.

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

6.4 GRAZING FOCUS INDICATORS

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

areas. These are the indicators that the Forest can easily monitor, have the most specificity with a long running data set, and most closely reflect the aquatic/riparian baseline pathway and indicator elements considered most likely to be impacted by grazing activities within a watershed.

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

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

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

6.4.1 SPAWNING AND INCUBATION:

6.4.1.1 CHINOOK SALMON SPAWNING AND INCUBATION

There are no Chinook salmon within the South Fork Williams Creek Allotment.

6.4.1.2 STEELHEAD SPAWNING AND INCUBATION

There are no steelhead within the South Fork Williams Creek Allotment.

6.4.1.3 BULL TROUT SPAWNING AND INCUBATION

The South Fork of Williams Creek supports populations of bull trout. It is considered that this stream also supports bull trout spawning, rearing, and migratory habitat. within the South Fork Williams Creek Allotment, Figure 4 and Appendix C Table 1 identify approximately 2.23 miles of bull trout spawning habitat within the action area spread out in three units; Heifer, Powder House, and South Fork.

Salmon-Challis fisheries biologists have identified a general spawning periodicity for bull trout in the Williams drainage ranging from mid August to mid October. Recorded water temperature regimes of the Williams Creek drainage suggest that water temperatures are conducive to bull trout spawning by mid August.

6.4.2 WATER TEMPERATURE

Water temperature conditions in the Williams Creek Watersheds are considered to be Functioning Appropriately for rearing, spawning, and incubation relative to these criteria.

Seasonal water temperature regimes have been monitored at two mainstem Williams Creek sites. Water temperatures were monitored on mainstem Williams Creek and the South Fork Williams during 2009.

Overall, observed water temperature regimes within the Williams Creek Allotment have been within INFISH water temperature criteria (Appendix C Table 3).

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 Appropriately in the Williams Creek subwatershed. Sediment levels have been monitored at numerous sites within the South Fork Williams Creek Allotment since 1994.

Monitoring data from sites within the Heifer Pasture Unit reveal sediment levels well within standards (<.25). Two surveys indicating fines below the Forest goal level of less than 25 percent fines.

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 Williams Creek Subwatershed.

Width:depth ratios at all depth fine sampling sites have remained fairly stable from 1995 to 2003, the last year of the survey. Width: depth ratios are well within the standard for a B channel type. The average width:depth ratios (Appendix C Table 5) are within the standard for “B” and “C” type channels based on the standards identified for volcanics by the Natural Conditions Database.

Most fish bearing stream reaches located on federally administered lands are forested “B” and “C” channel types. Even with some valley bottom roads, it is thought that the width/maximum depth ratio has not been adversely altered.

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 Williams Creek drainage is not a priority watershed, therefore, it has a Riparian Management Objective (RMO) of 80 percent or greater 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 Williams Creek Subwatershed and Functioning Appropriately in tributary subwatersheds. Streambank conditions within the South Fork Williams Creek Allotment have been monitored in association with sediment monitoring operations since 1994. Monitoring sites are located on mainstem South Fork Williams Creek in the Heifer Pasture Unit. The minimum reading of 78% is the only reading below 80% with an average reading of 92%. Bank stability has improved over the years with the higher readings in recent years. Livestock grazing has not contributed to degradation of stream bank conditions in this allotment.

6.4.6 RIPARIAN CONSERVATION AREAS

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

Riparian areas are considered to be Functioning Appropriately. These conservation areas provide adequate shade, large woody debris, habitat protection, and connectivity. Most of the Williams Creek Watershed is Functioning Appropriately for riparian reserves. Some RHCA’s throughout the allotment have been affected by grazing and roads.

South Fork Williams Creek: Greenline Ecological status (GES) trend is static at late seral. The site is dominated by Willow and Alder. Livestock have limited access to the stream due to woody dominance. Due to the Willow and Alder dominance, the best monitoring attribute to manage site is browse use with an endpoint indicator not to exceed 50% on Willow and 30% on Alder. The monitoring attribute of greenline stubble with an endpoint indicator no less than 4 inches.

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 3.2.6. There is considerable overlap; the riparian system effectively integrates vegetation cover, flow regimes, sediment and nutrients (DeBano 1989). The goal is to manage livestock grazing so as not to prevent the attainment and maintenance of healthy aquatic and riparian communities (Gamett et al 2008).

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

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

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

Annual Use Indicators and Vegetation in Riparian Areas. How much and what type of vegetation exists in a riparian plant community, particularly on the greenline, determines how well the riparian system performs its function of reducing flow velocity, trapping sediment, building banks and protecting against erosion. The susceptibility of streambanks to damage is influenced by vegetation. Woody vegetation has

an essential role in maintaining riparian function; reducing browsing pressure on riparian trees and shrubs is a significant benefit. Roots and rhizomes of herbaceous vegetation provide much of the compressive strength and soil stability for streambanks in meadow situations such as on the Challis National Forest (Clary and Kinney 2000).

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

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

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

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

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

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

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

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

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

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

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

7 ANALYSIS OF EFFECTS

This section contains the effects analysis. The effects of the proposed action are described below and summarized in Table 5. Analysis emphasizes effects to the six focus indicators previously identified as being susceptible to impacts of grazing activities.

7.1 DIRECT AND INDIRECT EFFECTS

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

Direct effects of livestock grazing may occur when livestock enter streams occupied by listed salmonids to loaf, drink, or cross the stream. Livestock entering fish-spawning areas can trample redds, and destroy or dislodge embryos and alevins (Belsky et al,1997).

During the early phases of their life cycle, juvenile salmonids have little or no capacity for mobility, and large numbers of embryos or young are concentrated in small areas.

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

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

- Strategic Rotation: Unit rotation strategies designed to move livestock off streams during critical spawning periods can avoid direct impact to spawning fish or their incubating redds.

- Fencing: Fencing sensitive riparian areas can be an effective way of protecting riparian resources, fish habitat and fish populations. Platts (1991) found that, in 20 of 21 studies, stream and riparian habitats improved when grazing was prohibited in fenced riparian zones.

- Salting: Placing salt or mineral supplements in upland areas can decrease the amount of time livestock spend in riparian areas. Ehrhart and Hansen (1997) provide evidence that salt, when used in conjunction with alternate water sources, can help distribute livestock over open range

- Off-Stream Water Development: McInnis and McIver (2001) found that off-stream water and salt can attract cows to the uplands enough to significantly reduce uncovered and unstable streambanks.

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

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

The Forest has integrated each of these measures into its grazing strategy for the South Fork Williams Creek Allotment to reduce the potential for adverse effects to listed fish and aquatic and riparian habitats within the action area. Rotation schedules have been refined to best avoid direct impact to spawning fish and incubating eggs every year in the same location. Salting and herding are employed in streams/pastures to keep livestock off stream areas. Utilization standards have been identified and revised for the various pastures of the allotment to promote attainment of riparian objectives.

Livestock do not go into the North Fork Williams Creek because of steep brush covered topography and fences in the Powder House Unit. Only 2% of the stream in the Powder House Unit is accessible by livestock because of steep brush covered topography and fences. Access to bull trout spawning areas to lower South Fork Williams Creek from the Heifer and Powder House Units is restricted by steep topography and a fence in the Heifer Unit. None of the Heifer Unit stream is accessible by livestock. In addition, there is a watering trough in the Powder House Unit that provides water above the creek that reduces the need for livestock to access the creek for water. Access to the South Fork Williams Creek from the Powder House Unit below the private inholdings is fenced. Only 5% of the South Fork Unit is accessible by livestock.

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

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

7.1.1 SPAWNING AND INCUBATION

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

Bull trout only spawn within the South Fork Williams Creek of the South Fork Williams 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 South Fork Williams Creek allotment are discussed individually below.

7.1.1.1 CHINOOK SALMON

Chinook salmon or Chinook designated critical habitat are not present in any streams in this allotment.

7.1.1.2 STEELHEAD

Steelhead or steelhead designated critical habitat are not present in any streams in this allotment.

7.1.1.3 BULL TROUT

The South Fork Williams Creek supports populations of bull trout. It is considered this stream additionally support spawning and rearing habitat for the species.

The Salmon-Challis NF fisheries biologist has identified a general spawning periodicity for bull trout in the Williams Creek drainage ranging 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 the South Fork Williams Creek, which could have cattle present in the drainages during spawning periods depending on the annual rotation of livestock among pastures. Trampling impacts could occur within Heifer Pasture, Powder House, and South Fork Units. Livestock do not go into the North Fork Williams Creek because of steep brush covered topography and fences in the Powder House Unit. There are 1.5 miles of fences in the Powder House Unit that prevent livestock from accessing bull trout spawning areas.

Livestock do not go into the North Fork Williams Creek because of steep brush covered topography and fences in the Powder House Unit. Only 2% of the stream in the Powder House Unit is accessible by livestock because of steep brush covered topography and fences. Access to bull trout spawning areas to lower South Fork Williams Creek from the Heifer and Powder House Units is restricted by steep topography and a fence in the Heifer Unit. None of the Heifer Unit stream is accessible by livestock. In addition, there is a watering trough in the Powder House Unit that provides water above the creek that reduces the need for livestock to access the creek for water. Access to the South Fork Williams Creek from the Powder House Unit below the private inholdings is fenced. Only 5% of the South Fork Unit is accessible by livestock.

Livestock grazing, as described in the proposed action, has had minimal impacts to bull trout habitat based on habitat conditions measured by the monitoring and survey data presented and discussed within this document. The primary constituent elements (PCEs) for bull trout proposed critical habitat (Appendix D) have been met and would be met with the proposed action 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.

7.1.2 WATER TEMPERATURE

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

Water temperature data for the Williams Creek and South Fork Williams Creek indicate that temperature regimes are conducive to bull trout spawning by August 15. Water temperature monitoring data for the 2009 season identify an early August seasonal drop in water temperatures. The observed temperature regimes suggest a mid August initiation of bull trout spawning activity within the allotment.

In summary, water temperatures throughout the allotment's bull trout supporting streams are conducive to successful spawning opportunities (Appendix C Table 3).

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.

7.1.3 SEDIMENT

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

Livestock activity within the South Fork Williams Creek drainage is not currently considered to be a significant factor influencing sediment levels. Bank stability and sediment/fines measurements over the past several years show a stable bank condition that is not contributing to sediment delivery to streams (Appendix C Table 4). Strategies and Conservation Measures of the proposed action, while designed primarily avoid livestock presence within stream channels during critical spawning periods additionally serve to minimize potential sediment generation to allotment streams from near-stream livestock activity.

In summary, the Conservation Measures associated with the proposed grazing action are considered to be effective in minimizing potential generation of sediment to stream channels of the South Fork Williams Creek Allotment action area.

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

7.1.4 WIDTH: DEPTH RATIO

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

Width:depth ratios are currently well within the range of values identified for “B” channel types (Appendix C Table 5). Therefore, 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 South Fork Williams Creek allotment which can be meaningfully measured, detected or evaluated.

Management strategies and Conservation Measures of the proposed action, while designed primarily avoid livestock presence within stream channels during critical spawning periods additionally serve to minimize potential livestock impacts to channel morphology of action area streams.

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.

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.

7.1.5 STREAMBANK CONDITION

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

The Williams Creek drainage is not considered to be a PACFISH priority watershed, with a Riparian Management Objective (RMO) of 80 percent or greater 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 Williams Creek Subwatershed and Functioning Appropriately in tributary subwatersheds. Streambank conditions within the Williams Creek Allotment have been monitored in association with sediment monitoring operations since 1994. Monitoring sites are located on mainstem South Fork Williams Creek in the Heifer pasture. The minimum reading of 78% is the only reading below 80% with an average reading of 92%. Bank stability has improved over the years with the higher readings in recent years and this upward trend does not appear to have been retarded or otherwise limited by livestock grazing within any pastures of the allotment. Livestock grazing does not appear to have contributed to degradation of stream bank conditions in this allotment.

Strategies and Conservation Measures of the proposed action, while designed primarily avoid livestock presence within stream channels during critical spawning periods; additionally serve to minimize potential livestock impacts to streambanks of action area streams.

In summary, it is concluded that direct and indirect effects of the proposed livestock grazing actions on streambank conditions within the South Fork Williams 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 South Fork Williams 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.

7.1.6 RIPARIAN CONSERVATION AREAS

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

Current livestock grazing activities within the 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 be improved.

Riparian areas are considered to be Functioning Appropriately. These conservation areas provide adequate shade, large woody debris, habitat protection, and connectivity. Most of the Williams Creek Watershed is Functioning Appropriately for riparian reserves.

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.

7.2 CUMULATIVE EFFECTS

The definition of cumulative effects as used for Section 7 consultation under the Endangered Species Act are “those effects of *future State or private activities*, not involving Federal activities, that are *reasonably*

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

There is a private land inholding (Corral Ranch) along a short segment of the South Fork of Williams Creek in the Powder House Pasture. Activities on private lands include intensive grazing and agriculture practices on the ranch and on other private lands throughout the riparian area especially in the lower portions of the drainages where there are numerous unscreened diversions which can and do dewater streams along with stream channelization, and removal of riparian vegetation.

Activities on State lands are similar to those on private lands, with grazing being the dominant activity.

7.3 SUMMARY OF EFFECTS

The effects analysis identifies a non-discountable potential for direct impact of livestock on spawning bull trout and their incubating eggs. These potential impacts could directly affect the Growth and Survival Indicator of the Subpopulation Characteristics Pathway, which could produce related indirect effects to the Subpopulation Size and Persistence and Genetic Integrity Indicators. Impacts of proposed grazing activities to aquatic and riparian habitat focus indicators, including water temperature, sediment, width: depth ratio, streambank condition and riparian habitat conservation areas are all identified as insignificant or discountable. The proposed action would maintain these indicators at their current levels of functionality.

Table 5 summarizes effects of proposed South Fork Williams 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 5 – EFFECTS SUMMARY FOR PATHWAY INDICATORS, SOUTH FORK WILLIAMS CREEK ALLOTMENT

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/FR	NO	NO	YES	NO	NO	YES
	Growth and Survival (including incubation survival)	FR/FR	NO	NO	YES	NO	NO	YES
	Life History Diversity and Isolation	FR/FR	NO	NO	NO	NO	NO	NO
	Persistence and Genetic Integrity	FR/FR	NO	NO	YES	NO	NO	YES
Water Quality	Temperature	FA/FA	NO	NO	NO	NO	NO	NO
	Sediment	FA/FA	NO	NO	NO	NO	NO	NO
	Chemical Characteristics	FA/FA	NO	NO	NO	NO	NO	NO

Habitat Access	Physical Barriers	FA/FA	NO	NO	NO	NO	NO	NO
Habitat Elements	Substrate Embed.	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	LWD	FA/FA	NO	NO	NO	NO	NO	NO
	Pool Frequency and Quality	FA/FA	NO	NO	NO	NO	NO	NO
	Off-channel Habitat	FA/FA	NO	NO	NO	NO	NO	NO
	Refugia	FA/FA	NO	NO	NO	NO	NO	NO
Channel Condition and Dynamics	Width:Depth Ratio	FA/FA	NO	NO	NO	NO	NO	NO
	Streambank Condition	FA/FA	NO	NO	NO	NO	NO	NO
	Floodplain Connectivity	FA/FA	NO	NO	NO	NO	NO	NO
Flow/Hydrology	Change in Peak/Base Flows	FA/FA	NO	NO	NO	NO	NO	NO
	Increase in Drainage Networks	FA/FA	NO	NO	NO	NO	NO	NO
Watershed Conditions	Road Density and Location	FR/FR	NO	NO	NO	NO	NO	NO
	Disturbance History	FR/FR	NO	NO	NO	NO	NO	NO
	Riparian Conservation Areas	FA/FA	NO	NO	NO	NO	NO	NO
	Disturbance Regime	FA/FA	NO	NO	NO	NO	NO	NO
Integration of Species and Habitat Conditions	Habitat Quality and Connectivity	FA/FA	NO	NO	NO	NO	NO	NO

1/ Williams Creek Subwatershed

8 EFFECTS DETERMINATION

The effects determination for each species was made using the above analysis and the effects determination key (Table 5). The specific determinations are identified below and summarized in Table 6.

8.1 SNAKE RIVER SPRING/SUMMER CHINOOK SALMON

The effects analysis concluded that the proposed action will have NO EFFECT on Chinook salmon because they are not present in this 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 NO EFFECT on steelhead because they are not present in this 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 limit the adverse effects of grazing activities, there exists a remaining potential for direct trampling of bull trout redds within action area streams. There are natural topographical and fence barriers that minimize the potential for livestock to access bull trout spawning reaches. Livestock do not go into the North Fork Williams Creek because of steep brush covered topography and fences in the Powder House Unit. Only 2% of the stream in the Powder House Unit is accessible by livestock because of steep brush covered topography and fences. Access to bull trout spawning areas to lower South Fork Williams Creek from the Heifer and Powder House Units is restricted by steep topography and a fence in the Heifer Unit. None of the Heifer Unit stream is accessible by livestock. In addition, there is a watering trough in the Powder House Unit that provides water above the creek that reduces the need for livestock to access the creek for water. Access to the South Fork Williams Creek from the Powder House Unit below the private inholdings is fenced. Only 5% of the South Fork Unit is accessible by livestock.

Resource management objectives (3.2.4) and grazing use standards (Table 2) will minimize potential impacts to habitat and fish. In addition, habitat quality (3.5.1.4) is considered to be in good condition and the grazing focus indicators (3.5.2) support this conclusion. Therefore, the proposed action results in a "MAY AFFECT, LIKELY TO ADVERSELY AFFECT" determination for bull trout.

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 (3.6) 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. 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 6 – EFFECTS DETERMINATION SUMMARY FOR SOUTH FORK WILLIAMS CREEK ALLOTMENT GRAZING ACTIVITIES

	Chinook Salmon		**Steelhead**		**Bull Trout**	
	Species	Designated Critical Habitat	Species	Designated Critical Habitat	Species	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
REFERENCES

REFERENCES

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APPENDIX B

WATERSHED BASELINES WITH

MATRICES OF DIAGNOSTIC PATHWAYS AND INDICATORS

APPENDIX B TABLE 1 – WILLIAMS CREEK

Agency: USDA Forest Service, Salmon-Challis National Forest	**HU Code and Name:** 1706020304 Williams Creek – Salmon River
Unit: Salmon-Cobalt Ranger District	**Spacial Scale of Matrix:** One 5th HUC
Fish Species Present: Bull Trout	**Proposed Critical Habitat:** Bull Trout
Anadromous Species Population: N/A	**Anadromous Species Subpopulation:** N/A
Bull Trout Core Area: Middle Salmon River-Panther	**Local Population:** Williams Creek
Management Actions: Ongoing	**Updated:** 3/23/2010

APPENDIX B TABLE 2 – MATRIX OF DIAGNOSTIC PATHWAYS AND INDICATORS

Subpopulation Characteristics		
Pathways Indicators	**Baseline**	**Discussion of Baseline – Current Condition**
Subpopulation Size	**FR $_{BT}$**	PJ; current population size is unknown; fluvial population has been impacted by reduced access to tributary streams.
Growth and Survival	**FR $_{BT}$**	Because of low numbers in the South Fork of Williams Creek, length of occupied habitat in Jesse Creek and lack of connectivity with other nearby subpopulations, survival is thought to be compromised within this watershed.
Life History Diversity and Isolation	**FU $_{BT}$**	Fluvial bull trout are not expected within either drainage because of seasonal dewatering. Both subpopulations are for the most part completely isolated from other nearby subpopulations.
Persistence and Genetic Integrity	**FR $_{BT}$**	No eastern brook trout exist within either drainage. Genetic integrity is compromised because of the small subpopulation size and lack of connectivity.
Water Quality		
Pathways Indicators	**Baseline**	**Discussion of Baseline – Current Condition**
Temperature (7day average. Maximum, ^{o}C)	**FR**	Streams of the watershed are considered to be functioning appropriately relative to PACFISH criteria. Williams Creek is functioning at risk relative to INFISH criteria
Sediment	**FA**	All streams that have been surveyed on a regular basis appear to be functioning appropriately Williams Creek, because of its close proximity to the Williams Creek Road, has an extremely high sediment delivery rate. Because of the high gradient nature of Williams Creek, the retention time of sediment is short.

Chemical Contaminants/Nutrients	**FR**	Gorley Creek – Combined Biota/Habitat Bioassessments Hot Spring Creek – Combined Biota/Habitat Bioassessments Hyde Creek – Combined Biota/Habitat Bioassessments Perreau Creek – Combined Biota/Habitat Bioassessments Spring Creek – Combined Biota/Habitat Bioassessments Tormay Creek – Combined Biota/Habitat Bioassessments West Fork Perreau Creek - Combined Biota/Habitat Bioassessments
Habitat Access		
Pathways Indicators	**Baseline**	**Discussion of Baseline – Current Condition**
Physical Barriers	**FU**	All fish-bearing and non fish-bearing tributaries to the main Salmon River within this watershed are seasonally dewatered during the irrigation and high use domestic water use season. Associated with an impassible high gradient reach approximately 1.0 mile above the South Fork of Williams Creek are two barrier road culverts. Associated with the Williams Creek Picnic Area further upstream is a third barrier culvert. Local people have reported that hatchery steelhead trout spawn in lower Williams Creek up to the top of the private land. The success of these spawning fish is presently unknown because of mid-summer dewatering along lower Williams Creek. Hatchery steelhead trout have been observed spawning in lower Pollard Creek below the extended concrete culvert near the NOAA-Fisheries office.
Habitat Elements		
Pathways Indicators	**Baseline**	**Discussion of Baseline – Current Condition**
Substrate Embeddedness	**N/A**	No substrate embeddedness data have been collected; refer to sediment.
Large Woody Debris	**FA**	(Professional Judgment) – No R1/R4 inventory data have been collected within this watershed. The amount and supply of LWD is thought to be adequate. Minimal activities have occurred upstream of the water treatment plant in the municipal watershed.
Large Pools or Pool Frequency and Quality	**FA**	No R1/R4 inventory data have been collected within this watershed. Most fish bearing streams located on federally administered lands are forested “A” and “B” channel types with a couple very short isolated reaches of “C” and “E” channel type. It is expected in areas where valley bottom roads impinge on the stream channels and LWD has been removed, pools quantity and quality is thought to be less than adequate as is the case along much of Williams Creek.
Off-Channel Habitat	**FA**	No R1/R4 inventory data have been collected within this watershed. Off-channel habitat on federally administered lands is naturally limiting because of the “A” and “B” channel types. Valley bottom roads such as the Williams Creek Road have in areas affected the amount of off-channel habitat.
Refugia	**FA**	On federally administered lands, refugia has not been altered substantially. Because of reduced flows and various instream structures associated with diversions which reduce access into tributary streams from the river, thermal refuge in the lower reaches of Williams, Perreau and Pollard creeks has been substantially reduced when Salmon River heats up during the summer months.

Channel Condition & Dynamics		
Pathways Indicators	**Baseline**	**Discussion of Baseline – Current Condition**
Average Wetted Width/Maximum Depth Ratio	**FA**	Width: depth ratios are well within the standard for a B channel type. The average width:depth ratios (Appendix C) 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.
Streambank Condition	**FA**	Monitoring sites are located on mainstem South Fork Williams Creek in the Heifer Pasture Unit. The minimum reading of 78% is the only reading below 80% with an average reading of 92%. Bank stability has improved over the years with the higher readings in recent years. Livestock grazing has not contributed to degradation of stream bank conditions in this allotment.
Floodplain Connectivity	**FA**	With the exception reaches of Williams Creek, flood flows on federally administered lands have full access to their respective floodplains. This watershed has approximately 74.4 miles of roads within an RHCA, which is 17.6% of the roads within the watershed. Steelhead – This parameter has been affected by roads, agriculture, and residential development.
Flow/Hydrology		
Pathways Indicators	**Baseline**	**Discussion of Baseline – Current Condition**
Change in Peak/Base Flows	**FA**	Even though water is diverted during peak flow periods spring flood flows are thought to be adequate from a channel maintenance stand point along Williams and Pollard creeks. Most all other streams are completely captured year around even during high flow periods. Water rights are too numerous to be listed by subwatershed; most points of diversion occur on private land. It is thought that peak flows have not increased as a result of timber harvest and/or fire on federally administered lands in any of the four 6th field subwatersheds. The maximum Equivalent Clearcut Acres (ECA) for any of the four subwatersheds is 16.9% in the Williams Creek subwatershed primarily related to the Lake Mountain Fire of 1985. Most timber stands throughout the Lake Mountain Fire are recovering rapidly with dense stands of young lodgepole pines.
Increase in Drainage Network	**FA**	The drainage network has increased slightly on federally administered lands primarily related to road drainage ditches. The drainage network has increased substantially on private lands as a result of private ditches.
Watershed Condition		
Pathways Indicators	**Baseline**	**Discussion of Baseline – Current Condition**
Road Density and	**FU**	Road density is 3.1 mi/mi^2. This watershed has approximately 74.4 miles of roads within an RHCA, which is 17.6% of the roads within the watershed.

Location		
Disturbance History	**FR**	Overall ECA is 11.7%.
Riparian Conservation Areas	**FA**	Most fish bearing stream located on federally administered lands are forested “A” and “B” channel types with very narrow riparian corridors. Several valley bottom roads immediately paralleling fish bearing streams have adversely affected riparian vegetation. With the exception of Pollard and Williams creeks, all other stream channels have been completely captured in private hay fields and never reach the main Salmon River. Many valley bottom stream channels and associated riparian areas have been completely obliterated.
Disturbance Regime	**FA**	All four subwatersheds are stable with limited natural disturbance. Rain on snow events are rare. The only known large scale unstable landtypes are located in the headwaters of South Fork of Williams Creek and in the Seven-mile Creek drainage on BLM administered lands. Although unstable, the Seven-mile Creek drainage is fishless. Although frequent, fires have been effectively suppressed with the exception of the 1985 Lake Mountain Fire in the headwaters of the South Fork of the Williams Creek drainage and the 2003 Withington Creek Fire.
Integration of Species and Habitat Conditions		
Pathways Indicators	**Baseline**	**Discussion of Baseline – Current Condition**
Habitat Quality and Connectivity	**FA**	Anadromous fish are limited to the very lower ends of Williams and Pollard Canyon creeks as well as the main Salmon River. Bull trout are isolated in the headwaters of the South Fork of the Williams and Jesse Creek drainages. Isolation, road location and dewatering are by far the biggest threats to listed fish species within this watershed.

APPENDIX B TABLE 3 – TWELVEMILE CREEK

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:** 3/23/2010

APPENDIX B TABLE 4 – MATRIX OF DIAGNOSTIC PATHWAYS AND INDICATORS

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 – SOUTH FORK WILLIAMS CREEK ALLOTMENT MONITORING SITES

APPENDIX C TABLE 1 – SOUTH FORK WILLIAMS CREEK ALLOTMENT FISH PRESENCE

Bull Trout Present	Sum of LENGTH
Heifer Pasture Unit	0.00
South Fork Williams Creek	0.00
Powder House Unit	2.21
South Fork Williams Creek	2.21
South Fork Unit	0.01
South Fork Williams Creek	0.01
Grand Total	2.23

Bull Trout Spawning	Sum of LENGTH
Heifer Pasture Unit	0.00
South Fork Williams Creek	0.00
Powder House Unit	2.21
South Fork Williams Creek	2.21
South Fork Unit	0.01
South Fork Williams Creek	0.01
Grand Total	2.23

Bull Trout Proposed DCH	Sum of LENGTH
Heifer Pasture Unit	0.00
South Fork Williams Creek	0.00
Powder House Unit	2.80
South Fork Williams Creek	2.80
South Fork Unit	1.60
South Fork Williams Creek	1.60
Grand Total	4.41

APPENDIX C TABLE 2 – FISH INFORMATION

Stream	Site ID	Sample Date	Sampling Method	Species Present		
				Chinook	Steelhead/Rainbow	Bull Trout
Williams Cr	XXX	2009	E-Shock	NO	NO	NO
SF Williams Cr	#1	2009	E-Shock	NO	NO	6
SF Williams Cr	#2	2009	E-Shock	NO	NO	NO
SF Williams Cr	#3	2009	E-Shock	NO	NO	NO
NF Williams Cr	#1	2009	E-Shock	NO	NO	NO
NF Williams Cr	#2	2009	E-Shock	NO	NO	NO

APPENDIX C TABLE 3 – WATER TEMPERATURE 2009

Pasture	Site ID	Monitoring Period	Maximum Daily Temperature	Maximum of 7 day Moving Maximum	Mean Temperature 7/1 to 9/30
Heifer Pasture Unit	Williams	6/25– 10/31	12.8	12.8	9.4

	SF Williams	6/25–10/31	12.5	12.5	9.3

APPENDIX C TABLE 4 – 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
Heifer Pasture	Williams	34.1	24.8	16.1	20.6	14.6	6.6	14.4	17.0	10.7	18.8	20.0	8.1	7.4	19.3	11.7	17.1	
	SF Williams																28.1	21.0

APPENDIX C TABLE 5 – 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
Heifer Pasture	Williams			10.6	13.1	14.0	22.5	15.9	17.7	12.8	17.6	17.7						
	SF Williams																12.0	

APPENDIX C TABLE 6 – 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
Heifer Pasture	Williams		94.0	100	80.5	81.0	86.0	96.0	91.0	83.5	96.0	78.0	99.0	98.5	100	100	100	
	SF Williams																90.0	90.0

APPENDIX C TABLE 7 – FISH DENSITY FOR THE SOUTH FORK WILLIAMS CREEK ALLOTMENT

Stream Name	2009			2009			2009		
South Fork Williams 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	0	NA	0	0	NA	4	2	1.9
South Fork Williams Creek	**2007**			**2007**			**2007**		
	Chinook salmon			steelhead			bull trout		
	1st pass	2nd/3rd pass	fish/100m^2	1st pass	2nd/3rd pass	fish/100m^2	1st pass	2nd/3rd pass	fish/100m^2
	0	0	NA	0	0	NA	6	0	NA

APPENDIX C TABLE 8 – MULTIPLE INDICATORS MONITORING (MIM) DATA

Unit	**Creek Name**	**Site#**	**Year**	**Width:Depth Ratio**	**Bank Stability**	**Woody Species Regeneration**		**Greenline Ecological Status (GES)**	**GES Trend**
						Seedling/Young (#/%)	**Mature/Dead (#/%)**		
South Fork	South Fork Williams	M309	1995	n/a	97	71/49	73/51	76/LS	Base
			2009	n/a	n/a	n/a	n/a	LS	Static

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)

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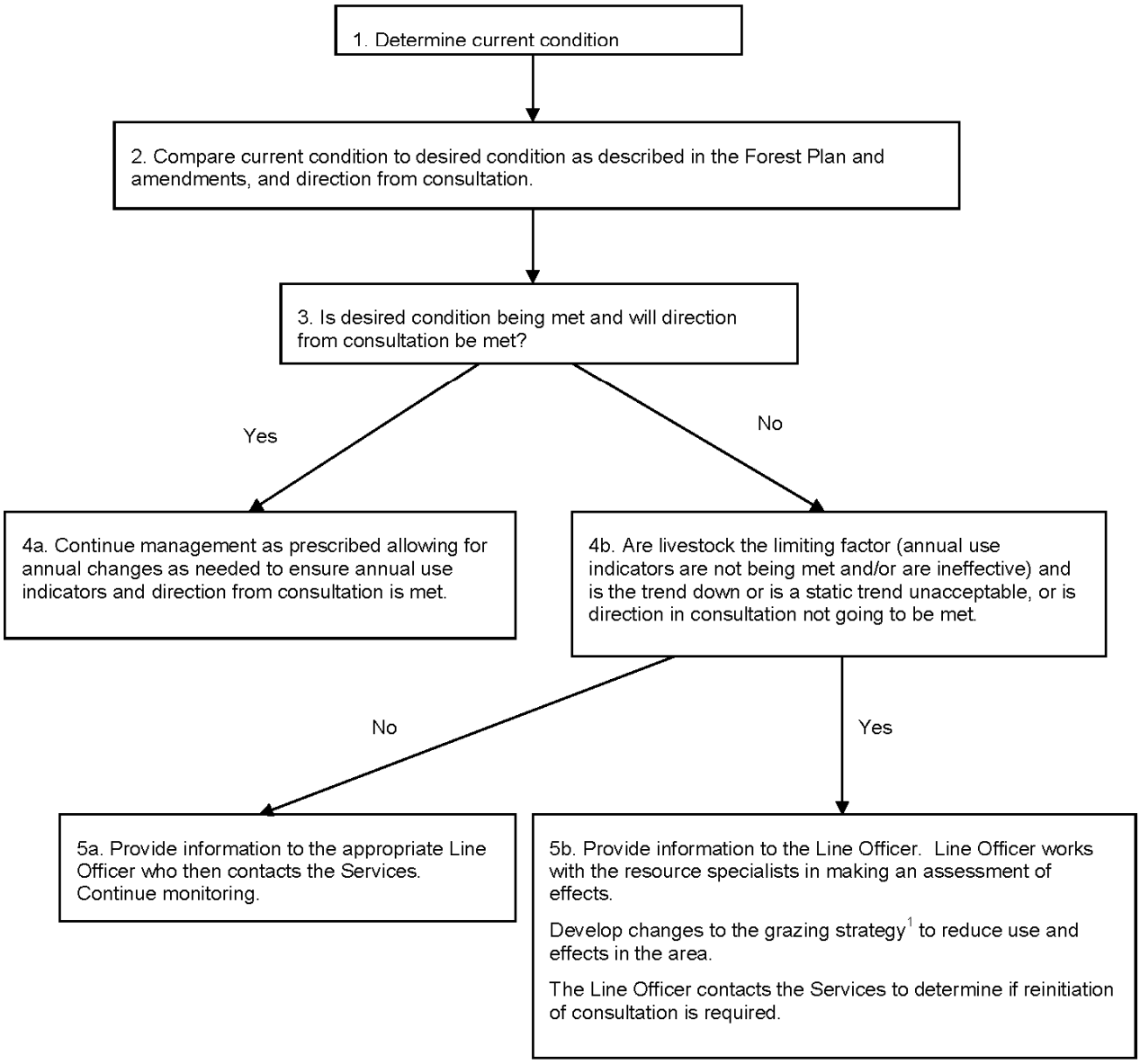
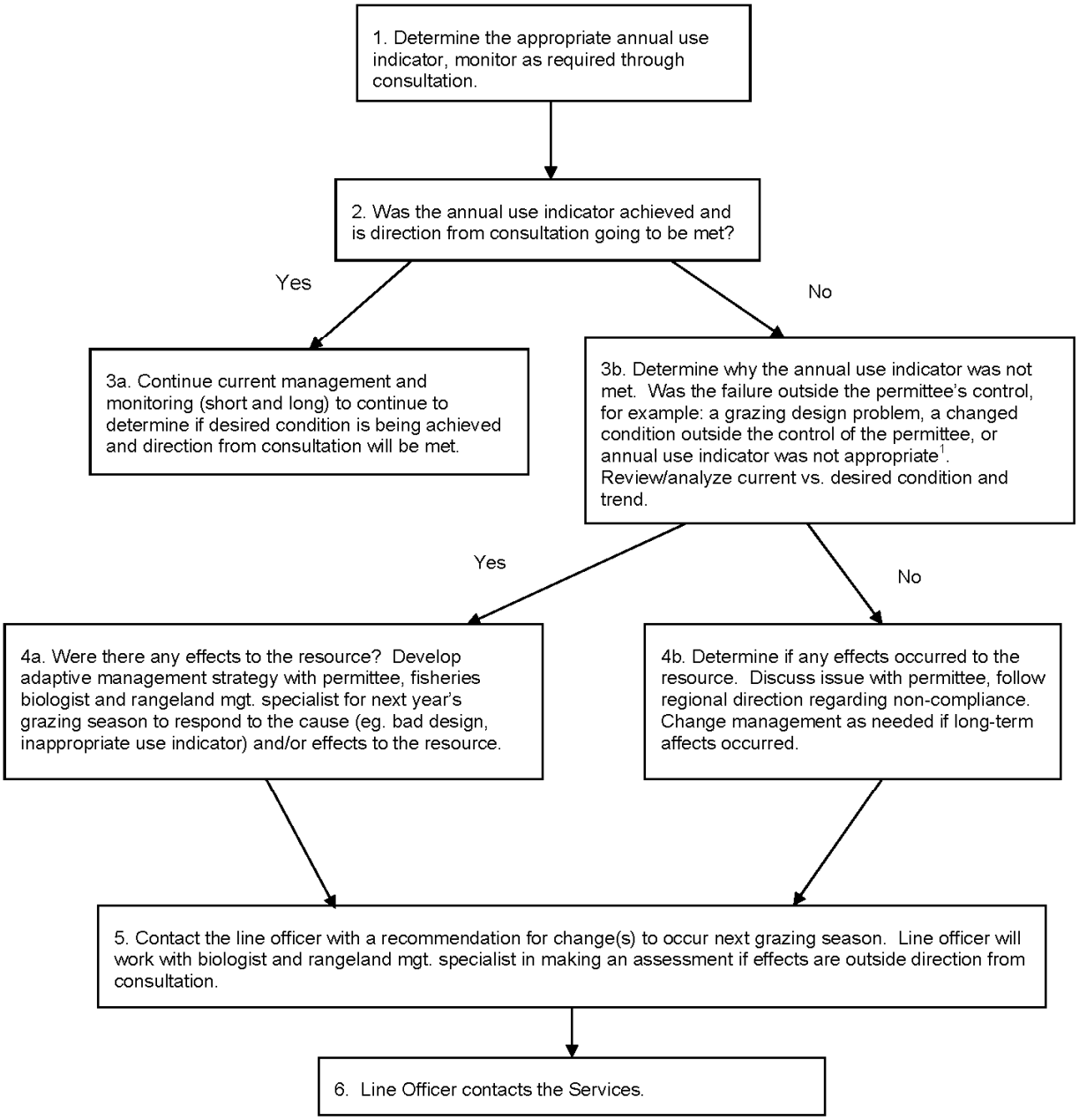
APPENDIX E
ADAPTIVE MANAGEMENT DIAGRAM

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.