Ice Caves Grazing Allotment EA
Aquatic Conservation Strategy Objectives

Introduction

The Aquatic Conservation Strategy (ACS) is an integral part of the 1994 Northwest Forest Plan. The ACS was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems within public lands. The ACS includes four components (Key Watersheds, Watershed Analysis, Watershed Restoration and Riparian Reserves) and has nine objectives toward meeting the goal of healthy ecosystems and watersheds. Aquatic Conservation Strategy Objectives are applied over time at watershed and broader scales.

The Gifford Pinchot National Forest proposes to continue authorization of grazing on the Ice Caves Horse and Cattle Allotment located in the Cave-Bear Creek and the Little White Salmon subwatersheds. Management of the Ice Caves Allotment would involve some activities within riparian reserves established by the Northwest Forest Plan. Activities within riparian reserves are analyzed at the landscape level for purposes of this ACS analysis. The exact location of the fences and pipeline are to be determined in a future NEPA document. The site-specific analysis for those activities within riparian reserves would be re-evaluated for ACS following completion of the EA. Below is a summary of the activities within riparian reserves under each alternative that would be further analyzed for purposes of addressing ACS at the site-specific scale, Table 1.

Table 1. Summary of activities within Riparian Reserves under each alternative.

Alt A	Alt B	Alt C
Approximately 1 mi of lower Lost Creek protected with drift fence	Approximately 1.8 mi of lower Lost Creek and S. Praire Lake/Tribs protected with drift fence	None of Lost Creek or South Prairie Lake/Tribs would be impacted by grazing
Sensitive C and E channel types with grazing impacts reduced from 3.65 to 2.45 mi	Sensitive C and E channel types with grazing impacts reduced from 3.65 to 1.5 mi	Sensitive C and E channel types would not receive grazing impacts
Approximately 14.5 ac of riparian area protected	Approximately 26.1 ac of riparian area protected	No riparian areas would be impacted from grazing
0.1 mile of Cave Creek added to existing exclosure	0.1 mile of Cave Creek added to existing exclosure	Exclosure would be removed, but no grazing would occur near Cave Creek
No piping of diversion, water diversion site continues in it's existing condition	Pipe existing ditch, necessary diversion upgrades assessed at a later time	Ditch would no longer be diverted for grazing

Objective 3: Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

By eliminating the lower section of the Allotment to cattle grazing, more pressure would be placed on the riparian areas not protected by fencing, which would include 0.4 miles of stream length in harvest units along upper Lost Creek (below Forest Road 6030-080) and 1.2 miles of Cave Creek. Much of the stream margins in these two areas are grazed and trampled resulting in bank failures. It is not expected that the reduced number of livestock alone in both Lost and Cave Creeks would result in a great improvement in streamside conditions currently degraded along Lost Creek and Cave Creek. Favorite grazing "hot spots" with the best available forage would continue to be "hot spots". It is possible that cattle would try to remain in riparian areas for a longer period of time due to higher forage/animal availability. A decrease in number of cattle alone may not lead to an improvement in riparian area condition. Riparian areas would continue to be the first choice for cattle grazing and watering.

Stream restoration is proposed on areas impacted by cattle grazing that will not be protected by fencing. The restoration would consist of re-vegetating areas of bare soil (planting woody species and seeding native forbsand grasses), and placing log barriers along upper stream banks to direct cattle away from impacted areas to chosen less sensitive watering sites. The goal of this restoration would be to reduce the area of disturbed soils in direct proximity to stream channels and to allow for vegetative growth along stream banks. Well vegetated banks would help to provide fish cover, reduce stream bank erosion, control water velocities and temperatures, and supply terrestrial foods for aquatic organisms. This in turn should reduce the introduction of sediment into stream channels. Priority areas for restoration would occur along upper Lost Creek adjacent to the old harvest units about 0.5 mile below Forest Road 6030-080 and along Cave Creek adjacent to the harvest units below Forest Road 8620. The impacted riparian areas along Lost Creek and the tributaries to South Prairie Lake protected by the new fence exclosure would be allowed to recover naturally. Therefore, Alternative B will restore the physical integrity of the aquatic system within the allotment and maintain at the watershed scale.

Objective 4: Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

Under Alternative B, stream temperatures in Lost Creek may continue to not meet the Washington State standard of 16 degrees Celsius. The diversion of water may contribute to lower stream temperatures in lower Lost Creek since sampling occurred during periods of 5 cfs diversion. Lost Creek is the only stream in the Allotment where stream temperature monitoring has been done.

Streams in the Allotment have not been monitored for nutrients and pathogens because there are no known domestic water uses affected by grazing. The only domestic drinking water source in the Allotment is the Peterson Prairie spring which is piped to the Peterson Prairie campground for use by campers. The spring is not accessible to cattle. Cave Creek is diverted into multiple ditches in the town of Trout Lake.

Water quality within the allotment area may be maintained at current conditions and degrade over time at the landscape scale as a result of global climate change. Decreases in coliform and other bacteria and nutrients

from livestock waste would occur in the areas of Lost Creek and South Prairie Lake that would be excluded from livestock use from fencing.

Objective 5: Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.

No sediment or turbidity monitoring has been done in streams which lie within the Allotment. The largest sources of sediment above natural levels are related to roads, harvest units, and stream bank cutting. Stream crossings by roads are often a major contributor to sediment. Lost Creek, South Prairie, and Cave Creek have high road densities. Stream bank erosion is being accelerated by livestock grazing in some reaches, especially along streambanks where timber harvest has removed the riparian forest. By fencing Lost Creek, South Prairie and tributaries, and an additional 0.10 mile of Cave Creek there will no longer be a chronic source of sediment as a result of cattle trampling.

Fence exclosures and a 30% grazing utilization limit will generally improve riparian conditions in the allotment. Stream reaches that are not fenced may have short-term increases in turbidity and suspended sediment levels from streambank trampling, which would be evident at the immediate trampling site. It is believed that grazing has contributed to reduced plant cover and root stability along areas in upper Lost Creek (below Forest Road 6030-080) and 1.2 miles of Cave Creek. These stream margins are likely resulting in an increased level of sediment input and may be experiencing changes in stream morphology. The impacts exhibited along these stream channels would be expected to persist or may degrade further from present conditions if livestock stay in these areas longer than at present. However, stream restoration is proposed on areas impacted by cattle grazing that will not be protected by fencing. This in turn should reduce the introduction of sediment into stream channels.

Lost Creek disperses into several incised channels (which are dry during summer months) adjacent to South Prairie. A few of these incised channels flow into South Prairie, where the stream dumps the sediment load it is carrying into parts of the prairie. This flooding of South Prairie by Lost Creek helps to maintain it as an open meadow. Under Alternative B, the sediment regime under which aquatic ecosystems evolved will be maintained at the watershed and project scale.

Objective 6: Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.

The Cave Creek drainage has a high risk of increased peak flows above natural conditions based on road densities, elevation, and vegetation age classes (USDA 1997a). The two year flood in the Lost Creek and South Prairie drainages are estimated to be greater than ten percent above natural conditions (USDA 1995) based on modeling of stream flows under both current and "natural" forest cover scenarios. Because these drainages have altered flows which affects streambank integrity, they are more vulnerable to streambank degradation from grazing. Streams where bank failure, bare ground along streamsides, and/or riparian vegetation damage due to cattle grazing is evident include Lost Creek, Cave Creek, and the East and South Tributaries to South Prairie Lake. A fence exclosure along these streams will prevent further streambank degradation from grazing and allow for riparian vegetation to re-establish.

Sensitive flat stream reaches within the allotment (5.4 river miles of Cave Creek, 3.75 river miles of Lost Creek, 2.0 river miles of Dry Creek, 0.75 river miles of South Prairie Lake East tributary, 0.3 river miles of South Prairie Lake South tributary, and 0.4 river miles of Lost Meadow Creek) are alluvial streams that are highly sensitive to physical bank disturbance and to increases in stream flows. The fence exclosure and restoration proposal will allow the riparian area to revegetate in order to hold stream banks together during high flows, which would keep channels from eroding and down cutting.

Flows within the allotment are expected to be maintained at the watershed scale. In-stream flows would improve at the project scale for lower Lost Creek as a result of decreasing the amount of water diverted for water troughs.

Objective 7: Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.

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Summer low flows are a concern in Lost Creek because of 5 cfs being diverted from the stream all summer. Under Alternative B, the amount of water being diverted would decrease, thus keeping more water in the system. However, the very lower section of Lost Creek would likely be dry in most years regardless of the diversion. The use of Lost Creek Ditch would no longer exist. Meadow and wetlands would be protected by the fence exclosure. The mitigation measures and restorative actions under Alternative B would maintain the timing, variability, and duration of floodlplain inundation and water table elevation in meadows and wetlands.

Objective 8: Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

By eliminating approximately 1.8 miles of grazing along the lower section of Lost Creek, South Prairie Lake and tributaries, and 0.10 mile of Cave Creek, more pressure would be placed on the riparian areas of upper Lost Creek and portions of Cave Creek because they would not be protected by fencing. The harvest units along upper Lost Creek (about 0.5 mile below Forest Road 6030-080) contain an area of approximately 0.4 miles of stream length currently showing areas of downcutting and degradation, as well as 1.2 miles of Cave Creek. In these two reaches much of the stream margins are being grazed and trampled and bank failures are common. Grazing has contributed to reduced plant cover and root stability along the stream margins likely resulting in an increased level of sediment input and may have contributed to changes in stream morphology. The impacts exhibited along these stream channels would be expected to persist or may degrade further from present conditions if livestock stay in these areas longer than currently due to the elimination of a portion of the lower part of the allotment.

USDA

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Environmental Assessment

Ice Caves Grazing Allotment

Mount Adams Ranger District

Skamania County, Washington

T. 5N, R. 9E; T. 5N, R. 10E; T. 6N, R. 9E; and T. 6N, R. 10E, W.

Conditions as described previously would likely greatly improve in the section of Lost Creek located within the proposed fenced exclosure. Duff (1983) reported that riparian vegetation biomass increased 63 percent in an exclosure along Big Creek, Utah during four years of rest. After a decade of fenced protection, an Oregon stream received 75 percent more shade from alder and willow cover than when it had been grazed (Clair and Storich 1983). Well vegetated banks would help to provide fish cover, reduce stream bank erosion, control water velocities and temperatures, and supply terrestrial foods. Improvements in stream morphology may be seen as root structures become established. Stream width normally decreases when domestic livestock are removed or grazing is eliminated from the surrounding area, and water depth has been found to be greater in sections of stream in ungrazed areas than in sections in grazed areas (Gunderson 1968). Deep pools are vital components of fish habitat for cover from predators and as cool water refuges and rearing habitat during low flows.

Research shows that while riparian areas quickly improve when they are fenced to exclude cattle (Duff 1983), stream morphology improves slowly and fish populations may or may not be improved (Platts 1981). Platts, et al (1983) compared a continuously grazed area on Tabor Creek, Nevada, with an adjacent area that had been rested five years. Stream banks rebuilt rapidly and stream width was significantly less inside than outside the rested exclosure. Bank undercuts, which are important for fish cover and are used as an indicator of stream bank protection, were twice as abundant in the un-grazed reach than those in the grazed reach.

By eliminating 1.2 miles of grazing along Lost Creek more pressure would be placed on the riparian areas not protected by fencing, which would include upper Lost Creek, Lost Creek below Forest Road 6615, South Prairie Lake, and portions of Cave Creek. The harvest units along upper Lost Creek (about 0.5 mile below Forest Road 6030-080) contain an area of approximately 0.4 miles of stream length currently showing areas of downcutting and degradation (Figure 3-8), as well as 1.2 miles of Cave Creek. In these two reaches much of the stream margins are being grazed and trampled and bank failures are common. Grazing has contributed to reduced plant cover and root stability along the stream margins likely resulting in an increased level of sediment input and may have contributed to changes in stream morphology. The impacts exhibited along these stream channels would be expected to persist or may degrade further from present conditions if livestock stay in these areas longer than currently due to the elimination of a portion of the lower part of the Allotment.

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By eliminating the lower section of the Allotment, more pressure would be placed on the riparian areas not protected by fencing, which would include upper Lost Creek and portions of Cave Creek. The diversion ditch has not been observed to draw many livestock away from Lost Creek because there is little forage along the ditch system. The proposed water troughs would likely provide little relief to the riparian areas unless they are placed in areas of substantial forage.

The harvest units along upper Lost Creek (below Forest Road 6030-080) contain an area of approximately 0.4 miles of stream length currently showing degradation from grazing, as well as 1.2 miles of Cave Creek. In these two reaches much of the stream margins are being grazed and trampled and bank failures are common. Grazing has contributed to reduced plant cover and root stability along the stream margins likely resulting in an increased level of sediment input and may have contributed to changes in stream morphology. The impacts exhibited along these stream channels would be expected to persist or may degrade further from present conditions if livestock stay in these areas longer than at present if the lower part of the Allotment is excluded.

It is not expected that the reduced number of livestock alone in both Lost and Cave Creeks would result in a great improvement in streamside conditions currently degraded along Lost Creek and Cave Creek. The favorite grazing “hot spots” with the best available forage would continue to be the “hot spots”. It is possible that the cattle would try to remain in the riparian areas for a longer period of time due to a higher forage/animal availability. Another potential scenario is that the amount of forage in the riparian areas may have always been utilized to its maximum potential with a low number of cattle, so a decrease in numbers alone may not in turn mean an improvement in riparian area condition.

The riparian areas would continue to be the first choice for cattle grazing and watering. It is difficult to conclude what the actual impacts of this alternative on stream banks and riparian areas would be. It does not take excessive utilization of the forage to heavily damage a sensitive stream bank. Because cattle concentrate near streams much damage can occur within a short time period. Most indications show sensitive stream banks cannot be protected just be reducing cattle numbers (Cooper, 1977). Reducing stocking numbers by itself seldom solves riparian problems when the reduction is determined to fit the needs of the non-riparian range. Because livestock are selective grazers, the reduction of stocking numbers must usually be combined with other grazing strategies, such as animal distribution, to achieve successful results in riparian habitats (Platts, 1984).

Extensive riparian use monitoring would be required and cattle would need to be physically moved out of riparian areas as soon as the 30 percent utilization is reached. If these guidelines are met, it is expected there would be an overall improvement in riparian conditions from current conditions but the extent cannot be determined.

If this alternative is implemented, stream restoration within the locations impacted by livestock which will not be protected from future grazing by fencing would be carried out. The restoration would consist of re-vegetating areas of bare soil (planting woody species and seeding native forbs

and grasses), and placing log barriers along upper stream banks to direct cattle away from impacted areas to chosen less sensitive watering sites. The goal of this restoration would be to reduce the area of disturbed soils in direct proximity to stream channels and to allow for vegetative growth along stream banks. Well vegetated banks would help to provide fish cover, reduce stream bank erosion, control water velocities and temperatures, and supply terrestrial foods for aquatic organisms. This in turn should reduce the introduction of sediment into stream channels. Priority areas for restoration would occur along upper Lost Creek adjacent to the old harvest units about 0.5 mile below Forest Road 6030-080 (Sec. 30, T. 6N, R. 9E) and along Cave Creek adjacent to the harvest units below Forest Rpad 8620 (Sec. 1 and 6, T. 5N, R. 10E). The impacted riparian areas along Lost Creek and the tributaries to South Prairie Lake protected by the new fence exclosure would be allowed to recover naturally.

Cumulative Effects (Alternative A or B)

The hydrology and aquatic species effects from grazing within the Ice Caves Allotment are localized to the stream system where the effects are occurring. Of the streams with the most severe cattle grazing impacts, Lost Creek, Cave Creek, and South Prairie Lake tributaries, none of them have above surface flow into another stream or into the Little White Salmon or the White Salmon Rivers. The Lost Creek drainage, which includes its major tributary Dry Creek (West), flows subterranean into the Big Lava Bed. Cave Creek, which includes intermittent tributaries Coyote, Bear, Dry (East), and Lost Meadow Creek, flows into the Trout Lake valley where it is diverted into numerous irrigation ditches and eventually disappears before reaching the White Salmon River. The South Prairie Lake tributaries flow into South Prairie Lake, which drains into surrounding meadows and the Big Lava Bed during high flows. Because of this lack of connection of streams in the grazing allotment with any other downstream water bodies, there should be no detectable hydrologic, water quality, or aquatic species effects from grazing at the 5th field watershed scale from the implementation of this Alternative.

It is apparent that grazing is contributing to maintaining or increasing the erosion problems found along Lost and Cave Creeks. The existing conditions in these drainages, which include predicted peak flows greater than ten percent above natural conditions, the high number of roads/sq.mi. (2.9 miles/sq.mi. in Lost Creek, 4.3 miles/sq.mi. in Cave Creek), the flashy runoff from the Indian Heaven Wilderness snowmelt in Lost Creek, the past riparian area timber harvesting (mid 1990 data showed 34 percent of riparian reserves in early seral stage in Lost Creek and 20 percent in Cave Creek), historical livestock grazing and the fact that much of both stream channels are easily erodable “C” stream channel types, have all led to the unstable channel conditions present today. The constant summer grazing is one more factor which exacerbates the erosion problems in these streams and is cumulatively helping to maintain the unstable conditions. Livestock grazing and trampling is removing streamside vegetation and preventing high densities of forb, shrub, and tree establishment along portions of the stream banks of Lost and Cave Creeks. Without strong root structures to hold stream banks together during high flows, further bank unraveling occurs adding excessive sediment to stream channels, widening the channel, and creating poor habitat conditions for aquatic organisms. Increased sediment loads in turn create wide/shallow stream channels as well as reduce spawning gravel quality and affect trout reproductive success.

No effects from grazing on riparian areas would occur within the proposed fenced sections of Lost Creek. If the riparian vegetation along the fenced portions grows to a height and density where stream shade is provided, stream temperatures may decrease. A trend towards recovery in the riparian areas located within the exclosures by implementation of this alternative would be expected. Riparian vegetation would be allowed to grow to a healthy level where the velocity and erosive energy during peak flows is reduced, stream banks are more stable, and sediment input

into stream courses is lessened. If however the livestock use of Lost Creek above the fence is intensified, impacts from this higher use may be evident in that reach as well as in downstream reaches. This might include increased sediment deposition and the subsequent stream morphology and aquatic species effects from higher sediment loads. Consistent monitoring and enforcement of riparian standards in areas not fenced would be crucial.

Alternative C – No Grazing

Direct and Indirect Effects

Under the No Grazing alternative, cattle disturbances (trampling and foraging) in riparian areas, including the most disturbed reaches of Lost Creek, South Prairie Lake tributaries, and Cave Creek, would cease. Streamside vegetation, stream channel morphology, water quality (sediment, water temperature, nutrients and pathogens), and stream bank soil structure would no longer be influenced by cattle use within the Allotment boundaries. Any accelerated sedimentation from livestock grazing and subsequent degradation of trout spawning and aquatic food producing areas would be curtailed.

A trend toward recovery of streambanks and riparian vegetation and an improvement in aquatic habitat in the grazed sensitive "C" and "E" channel types would be expected if this alternative is implemented. It is anticipated that riparian vegetation would be allowed to grow to a healthy level where the velocity and erosive energy during peak flows is reduced, stream banks are more stable, and sediment input into stream courses is lessened. Over time, if cattle grazing continues to be eliminated from the riparian areas, riparian vegetation would be expected to grow to a height and density where stream shade is provided and wood input into streams is increased. Input of organic detritus and food sources for stream organisms would also be expected to be enhanced. Numerous studies have demonstrated that range riparian-stream habitats degraded by livestock over-grazing can be rehabilitated once grazing has ceased (Platts 1984, Platts 1981). This alternative allows for the natural passive recovery of these riparian areas which would likely take several years.

Cumulative Effects

Of the three sub-watersheds (Lost Creek, Cave Creek and South Prairie Lake) with livestock riparian impacts, none have above surface flow into another stream or into Little White Salmon or White Salmon rivers. Without a connection of streams to any other downstream water bodies in the grazing Allotment, hydrologic, water quality, and aquatic species effects (beneficial in this alternative) would not be expected at the 5th field watershed scale.

Water Quantity and Quality – Lost Creek Diversion

Alternative A – Limited Change to Current Management (Proposed Action)

Direct and Indirect Effects

Under Alternative A, five cfs would continue to be diverted from Lost Creek into the Lost Creek diversion ditch from mid-June through September. This would decrease the volume of water in Lost Creek below the stream diversion (approximately 4 miles) by approximately 14 to 18 percent during the summer months. When the ditch was closed during the summer of 2005, the length of flowing stream increased by 1,677 feet (approx. 0.3 miles). The effect of continuing this