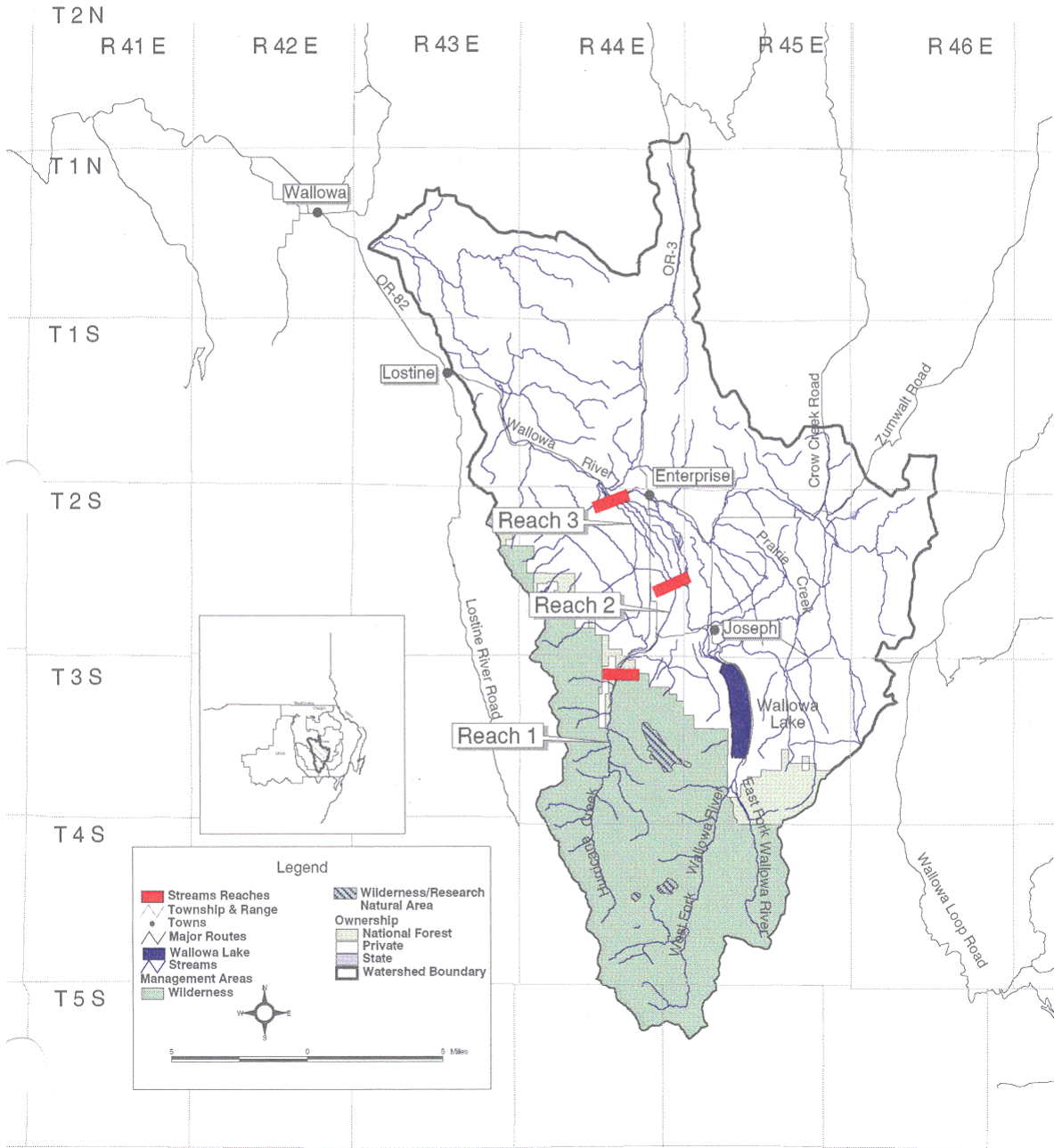


Hurricane Creek Watershed

(3 Reaches)



HURRICANE CREEK¹¹

Hurricane Creek was analyzed in three reaches:

1. Headwaters to upper diversions (Moonshine and Alder Slope Ditches)
2. Upper diversions to third bridge
3. Third bridge to Wallowa River

Hurricane Creek rises in the Eagle Cap Wilderness and flows north to join the Wallowa River near Enterprise. The USGS operated a gauging station above the diversions on Hurricane Creek from 1924 until the late 1970's. The maximum measured flow was 1,110 cfs on June 4, 1948. A much greater flow occurred July 5, 1975 when the gauge height reached 6.02 feet as opposed to 3.55 feet on June 4, 1948, but the amount of flow is not known. A minimum flow of 6 cfs was measured on January 6 and April 13, 1945.

The main resource use on the uppermost reach of Hurricane Creek is recreational camping, fishing, and hiking. Some logging is done in the lower portion of the uppermost reach and the upper portion of the middle reach. Irrigated agriculture and grazing is common on lands adjacent to the middle and lower reaches.

Spring chinook presently spawn in Hurricane Creek from the old gravel pit downstream to the confluence with the Wallowa River, a distance of 3.2 miles. Flows above the gravel pit are presently insufficient to provide passage for adult chinook although historically they would have migrated approximately an additional 4 miles upstream to the cascades, just inside the National Forest boundary. The run size has declined significantly since the mid-1960's when index surveys were standardized as to length, location, and time of year. Index areas were chosen because the majority of spawning occurs in the index reach. The index area is from the gravel pit downstream to the confluence with the Wallowa River, a distance of 3.2 miles. The average redd count in the index area from 1964 to 1973 was 14.6 redds. The average redd count from 1979 to 1988 was 6.8 redds. The average redd count from 1989 to 1998 was 3.2 redds.

Hurricane Creek--Headwaters to Upper Diversions

Water Quantity

Tree Density (Medium Priority).--*Dense thickets of trees, resulting in part from past fire suppression, prevent rain and snow from reaching the ground, and consequently the moisture is lost to the drainage through evaporation or sublimation.*

Tree density is increasing due to Douglas-fir bark beetle and fir engraver beetle along with the eastside screen prohibiting the removal of trees greater than 21 inches in diameter on national forest land.

Maintenance of healthy watershed conditions, by reducing fuel loads as

¹¹See also Watershed Management - Approaches to Implementing Solutions

mentioned below under fuel density, will provide an optimal, sustainable supply of water. Healthy watershed and forest conditions will also supply the water at the optimal times for salmon through snowpack melt and groundwater recharge and release.

Compaction (Low Priority).--*Soil compaction can result in greater surface runoff and less infiltration and groundwater recharge.*

Work on road design and maintenance to avoid quick runoff and let precipitation and snowmelt recharge aquifer. Study relocating road, or portions of road, to a better site out of riparian area. Limit human trail use in riparian area when it results in compaction and devegetation. Educate fishermen and campers about adverse effects of riparian erosion and compaction.

Water Quality

Excess Fine Sediments (Low Priority).--*Excess fine sediment in the lowest portion of this reach creates some water quality problems.*

Work on road design and maintenance to avoid quick surface runoff.

Fuel Density (Medium Priority).--*Excessive fuel density in this watershed is presently a high risk for a catastrophic fire, such as the Tanner Gulch Fire, that would probably result in severe water quality problems. Past fire suppression practices have contributed to the risk of fire.*

Prescribed burning in the wilderness, done judiciously, can help reduce the fuel levels, and provide fire breaks to prevent large uncontrollable fires. In some cases, especially in riparian areas, fuel rearrangement (piling or putting the fuels near the ground to facilitate rotting, judiciously placing fuels to protect streambank, or placing large woody debris in stream to add to stream structure) may be preferable to burning in order to keep the organic material as part of the ecosystem, preserve shade, and prevent sedimentation. Well managed grazing also helps to reduce light "flash" fuels.

Since the original plan was completed in 1993, a Wildland Fire Use Program has been completed for the Eagle Cap Wilderness. Several wildfires have been managed for resource benefits under this program.

Septic (Study).--*Study effects of leakage from septic systems on water quality and salmon habitat.*

If there is a problem with septic systems, limit future development using the county's comprehensive land use plan, and improve current septic system (the ODEQ has information on improving septic systems).

Herbicides/Pesticides (Low Priority).—See Countywide Issues

Stream Structure

No problems were identified.

Substrate

Excess Fine Sediment (Low Priority).--*Excess fine sediment in the substrate from the upstream landslides appears to be a problem in this reach.*

Habitat Requirements

No problems were identified.

Hurricane Creek--Upper Diversions to Third Bridge**Water Quantity**

Irrigation Withdrawals (High Priority).--*Most of this reach is dry during irrigation season (after the runoff from the snowpack melt).*

Irrigation efficiency may allow water to be left in the stream (it should be noted that some amounts of conserved water might sink in the river bed and not necessarily flow on the surface). Lease water from water-right holders during critical periods to supplement minimum (no) flow. Study the possibility of adding impoundments to supply irrigation and keep the natural flow in stream.

Minimum Flow (High Priority).--*As noted above, most of this reach is dry during irrigation season.*

See "Irrigation Withdrawals" above. Preserve vegetative cover to provide snowpack shading, later snowmelt, infiltration, and groundwater recharge. In extremely dense tree cover, thinning can allow more precipitation to reach the ground and provide additional rain/snowpack moisture to the drainage.

Future Demand (Study).--*Future development in this area may place increased demands on water.*

Use zoning and land use planning to limit possible future demands for water which would adversely impact the salmon.

Water Quality

Temperature (Study).--*Study to see if there are temperature problems on this reach.*

Use zoning/land use planning to limit possible future demand for agricultural or domestic uses along the stream, which could result in the loss of riparian vegetation. Provide riparian shading to preserve cool temperatures.

Plant and/or protect conifers, along with deciduous trees and shrubs, in riparian area to provide thermal cover in winter. Increased flow quantities could limit

temperature increases.

Excess Fine Sediments (High Priority).--*Excess fine sediment in this reach creates water quality and other problems for the salmon.*

Work on road design and maintenance to avoid quick surface runoff. Limit dust from roads with lignosulfonate, water, chip seal, or asphalt. Relocate roads to better sites if sediment input to river cannot be mitigated by road maintenance. Avoid using roads or ground skidding when the soil is wet. Use of roads when dry or frozen avoids soil and vegetation disturbance. Water bar and/or revegetate skid trails. Educate fishermen and campers about effects of riparian erosion and compaction. Limit recreational use of roads and trails which results in sediment input to river. Prevent bank erosion and destruction by livestock by fencing riparian area and providing water corridors or alternate water sources. Protect water corridors with rock of appropriate size. Avoid devegetation in the upper watershed to the extent that it would result in extreme peak flows and cause bank erosion. Provide filter strips, settling ponds, and or wetlands for feedlot and pasture runoff.

Septic (Study).--*There is a subdivision sited along this reach; leakage from the septic systems may contribute nitrates (excess nutrients) to the stream.*

If a problem is found, install pump or self-composting toilets. Limit future development and associated septic systems with the County comprehensive land use plan. Improve the current septic systems (the ODEQ has information available on system design).

Herbicides/Pesticides (High Priority).—See Countywide Issues

Other Chemicals (Low Priority).--*The Joseph airport is near this reach of Hurricane Creek, and aviation fuels are stored there. There are fertilizers used on fields near this reach.*

Monitor storage of the aviation fuels to prevent discharge of hazardous material to the stream. Avoid farmland fertilizer runoff to prevent a problem with excess nutrient loading in the creek.

NOTE: Since the original plan was completed in 1993, the Joseph airport has been improved, and fuels are not stored there at this time. In the future, containment of possible fuel storage will meet DEQ/EPA standards.

Stream Structure

Woody Debris (High Priority).--*This reach is lacking large woody debris to provide diversity of stream structure.*

Add and preserve large woody debris. Preserve the riparian plant community to provide a source of future large woody debris.

Channelization (Low Priority).--*Channelization limits diversity of stream structure and habitat.*

Preserve riparian vegetation (and plant where necessary) to provide streambank stability and avoid the need for channelization. Avoid excess peak flows and bank erosion that result from excessive upland devegetation. Fence riparian area to prevent bank erosion and devegetation by livestock. Do not permit more channelization, but if channelization is necessary, develop mitigation strategies. Avoid building structures on floodplain that eventually require channelization for protection.

Substrate

Excess Fine Sediment (High Priority).--*Excess fine sediment in this reach smothers eggs and fills intergravel hiding places.*

See "Water Quality" discussion. Provide filter strips, settling ponds, and/or wetlands for feedlot and pasture runoff.

NOTE: Since the original plan was completed in 1993, some landowners in this stretch have completed streambank stabilization work to prevent bank erosion and reduce sediment.

Physical Barriers (High Priority).--*Lack of water below irrigation diversions creates a physical barrier to fish passage.*

Water could be leased from water-right holders during low flow times to supplement flow. Irrigation efficiency could allow more water to be left in the creek. The diversion barrier could be modified to better provide passage.

Dredging (Low Priority).--*Gravel is removed from this reach for concrete mix.*

Gravel dredging operations should be limited to the times when there are not likely to be anadromous fish spawning (July 1 - August 15) or eggs in the gravel.

Habitat Requirements

Riparian Vegetation (High Priority).--*Riparian vegetation is lacking on portions of this reach.*

Plant and/or protect conifers in riparian area to keep thermal cover in winter and deciduous trees and shrubs to provide habitat diversity. Work on preserving and restoring overall riparian vegetation to provide shade.

Predators and Competitors (Low Priority).--*Predators prey on juvenile salmon, and other fish may compete for food.*

Trout that would compete with salmon for food should not be stocked. Bull trout, which are listed as threatened under ESA, are present in this reach, so no action is warranted at this time. There is a great blue heron rookery nearby, which

results in predation of juvenile fish.

Diversion Screens (Study).--*Irrigation diversions and return flows should be screened to prevent the loss of fish.*

Make sure diversions and irrigation returns are screened, monitored, and maintained.

Hurricane Creek--Third Bridge to Wallowa River

Water Quantity

Irrigation Withdrawals (High Priority).--*Multiple, small irrigation withdrawals limit streamflow which is supplemented by irrigation return flows and springs.*

See "Hurricane Creek--Upper Diversion to Third Bridge."

Minimum Flow (High Priority).--*As noted, multiple, small irrigation withdrawals limit streamflow which is supplemented by irrigation return flows and springs.*

See "Hurricane Creek--Upper Diversion to Third Bridge." Preserve vegetative cover to provide snowpack shading, slower snowmelt, infiltration, and groundwater recharge. In extremely dense tree cover, thinning the trees can allow more precipitation to reach the ground and provide additional rain/snowpack moisture to the drainage.

Water Quality

Temperature (Study).--*Study to see if there are temperature problems on this reach.*

Use zoning/land use planning to limit possible future demand for agricultural or domestic uses along the stream, which could result in the loss of riparian vegetation. Provide riparian shading to preserve cool temperatures.

Plant and/or protect conifers, along with deciduous trees and shrubs, in riparian area to provide thermal cover in winter. Increased flow quantities could limit temperature increases.

Excess Fine Sediments (High Priority).--*Excess fine sediment in this reach creates water quality and other problems for salmon.*

See "Hurricane Creek--Upper Diversion to Third Bridge." Provide filter strips, settling ponds and/or wetlands for feedlot and farmland runoff. If an impoundment is added to supply late season flow, impoundment of water should be managed to allow necessary flushing flows. Some of the fine sediment input on this reach apparently comes from springs located in peat soils of the riparian area and is a natural occurrence.

Irrigation Return Flows (High Priority).--*Irrigation return flows present water quality problems. Among these problems are potentially harmful increases in temperature, sediment, and nutrients.*

Irrigation return flows, especially those with increased water temperatures, should be limited. Wetlands and filter strips could be used to improve water quality of irrigation return flows before they enter the creek. Overland return flows of poor quality water (sediment from plowed cropland, nutrients from fertilized cropland, etc.) to the ditch or stream should be limited.

Septic (Study).--*Input from septic systems to the groundwater system, and through spring flow to the creek, could add to water quality problems. Among these potential problems is the addition of nitrates to the river, which could contribute to excessive algal growth and problems with dissolved oxygen in the creek.*

If there is a problem with leakage it may be possible to improve the current septic systems, possibly with help from the ODEQ. Future development of the area and associated septic systems could also be limited by the county's comprehensive land use plan to reduce nitrate input, etc.

Herbicides/Pesticides (High Priority).—See Countywide Issues

Feedlots (High Priority).--*Runoff from feedlots can contribute to sediment and nutrient problems in the creek. Feedlots in the riparian area also cause the loss of riparian vegetation and shade, as well as streambank erosion.*

There are several possible ways to mitigate the effects of feedlots on the stream. Thorn bushes could be established in the riparian area to discourage use by livestock. Bank erosion and destruction could be curtailed by physical or electric fencing of the riparian area and providing a watering corridor for livestock. Wetlands and/or filter strips could be added to improve the quality of feedlot runoff. Feedlots should be relocated away from the creek by developing alternate water sources.

Excess Nutrients (High Priority).--*Excess nutrients contribute to poor water quality, primarily by feeding excessive algal growth which cause dissolved oxygen problems.*

See "Irrigation Return Flows", "Septic", and "Feedlots" in this section.

Stream Structure

Woody Debris (High Priority).--*This reach is lacking large woody debris to provide diversity of stream structure.*

Add and preserve large woody debris. Preserve the riparian plant community to provide a source of future large woody debris.

Pool/Riffle Ratio (Low Priority).--A good pool/riffle ratio is necessary for good holding, spawning, and rearing habitat. The pool/riffle ratio on this reach has been impacted by human activities.

The pool/riffle could be improved with the addition of large woody debris. Riparian vegetation should be maintained and/or restored to provide a source of future large woody debris.

Channelization (Low Priority).--Channelization limits diversity of stream structure and habitat.

Preserve riparian vegetation (and plant where necessary) to provide streambank stability and avoid the need for channelization. Avoid excess peak flows and bank erosion that result from excessive upland devegetation. Fence riparian area to prevent bank erosion and devegetation by livestock. Avoid channelization and building structures on floodplain.

Substrate

Cobble Embeddedness (High Priority).--Cobble embeddedness that results from excess fine sediments being added to the substrate makes it difficult for salmon to spawn. It also results in loss of intergravel cover for juvenile salmon.

See "Water Quality" in this section.

Excess Fines (High Priority).--Excess fine sediment in the substrate smothers salmon eggs and leads to cobble embeddedness.

See "Water Quality" in this section.

Habitat Requirements

Riparian Vegetation (High Priority).--Riparian vegetation is lacking on portions of this reach.

Work on preserving and restoring overall riparian vegetation to provide shade and large woody debris.

Predators and Competitors (Low Priority).--Predators prey on juvenile salmon, and other fish may compete for food.

See "Hurricane Creek--Upper Diversions to Third Bridge."

Diversion Screens (Study).--Irrigation diversions and return flows should be screened to prevent the loss of fish.

Make sure diversions and irrigation returns are screened, monitored, and maintained.