

WYNOOCHEE MANAGEMENT UNIT

WYNOOCHEE RIVER

Description:

The Wynoochee River flows 63.5 miles from its headwaters in the Olympic Mountains to its confluence with the Chehalis River. The river has 68 tributaries totaling 173 miles, as well as an unknown number of smaller tributaries.

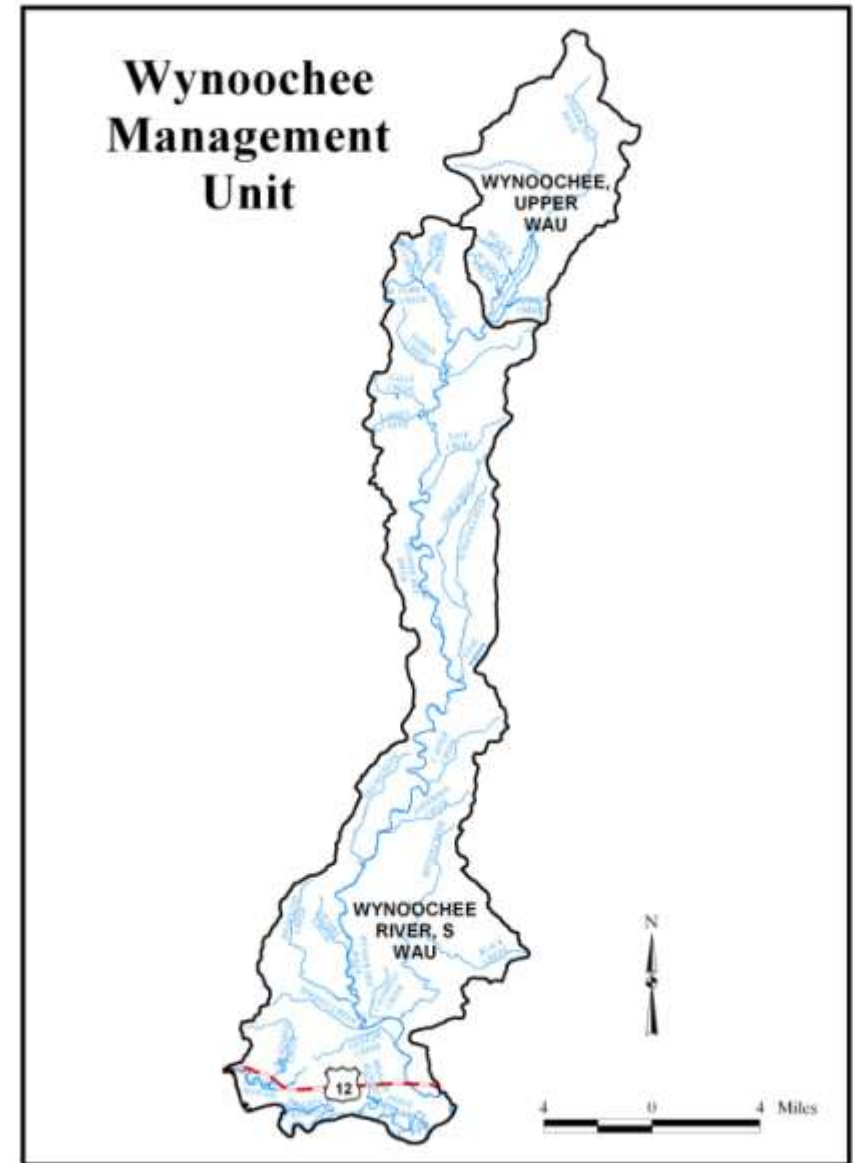
Starting with the lower 20 miles, the Wynoochee flows through a wide, flat farming area with stream widths varying from 25 to 50 yards. This section has good spawning gravel, low gradient, but a less than adequate riparian zone. The next 15 miles alternates between broad floodplains to narrow valleys with small farms. Here the stream gradient is low to moderate, approximately 60 yards wide, and with good spawning gravel. The riparian area has good streambank cover with a mix of timber. The surrounding terrain consists of low, forested hills.

Large timber companies and the USFS own large tracts from the middle to upper reaches of the Wynoochee. This area has extensive side channels with excellent spawning and rearing areas for all salmonids. However, some of these side channels are separated from the mainstem and are not accessible. Farther upstream, the river flows through steep valleys, canyons, and timberlands for six miles. The river in this section has good pool/riffle areas, most of which has spawning gravels. In the areas opposite Neil/Schafer Creek, the river has scoured to its bedrock, most likely due to the lack of gravel transport through the dam. To mitigate the impact of the Wynoochee Dam operated by Tacoma Power, gravel and LWD buildup at the dam is physically transported around this barrier and reintroduced downstream.

Major Tributaries: Schaefer Creek and Black Creek

Land Uses: Forestry, Agriculture, and Rural Residences

Anadromous Fish Stocks: Fall Chinook, coho, chum, cutthroat, winter steelhead, summer steelhead, and bull trout



Wynoochee River Tier 1 Concerns

Wynoochee River Tier 1		
FISH PASSAGE		
Symptom	Cause	General Actions
<ul style="list-style-type: none"> ➔ The Wynoochee has 225 barrier culverts and 55 of unknown passability ➔ Upstream and downstream fish passage impeded at Wynoochee Dam 	<ul style="list-style-type: none"> ➔ High road densities. Since the late 1990s, extensive timber harvest has been going on and the access roads have increased. Old roads have been reopened not using the new Forest and Fish rules, leaving barrier culverts. ➔ The Wynoochee Dam is at RM 47.8, which marks the uppermost extent of natural fish migration. From here, fish are trucked above Wynoochee Lake to spawn in the tributaries flowing into the lake ➔ Residualization in lake and mortality during downstream migration through dam facilities 	<ul style="list-style-type: none"> ➔ Correct barrier culverts. See Section 4. ➔ Habitat enhancement projects downstream from dam to mitigate losses ➔ Improve fish passage at fishways and add a fishway to those structures that do not have them

Wynoochee River Tier 1		
RIPARIAN		
Symptom	Cause	General Actions
<ul style="list-style-type: none"> ➔ Between RM 31 and 22, the forests have been intensely managed and riparian conditions are "fair" with narrow buffers of conifer remaining ➔ Below RM 22 all timberlands located within the floodplain are harvested and converted to agricultural land with the riparian being primarily narrow bands of alder mixed with Douglas fir and the rating is "poor." 	<ul style="list-style-type: none"> ➔ Timber harvest and agricultural practices. Logging and agricultural practices have reduced late seral vegetation cover over large areas of the watershed. ➔ Agricultural practices. Agricultural lands below RM 22 remain with narrow bands of mixed conifer/deciduous tree stands, so the lower reaches will remain with a "poor" for the foreseeable future. ➔ In the lower agricultural areas livestock access has been one of the problems in maintaining or improving adequate riparian buffers. 	<ul style="list-style-type: none"> ➔ Control invasive species. See Section 5. ➔ Identify specific degree at riparian areas for restoration ➔ Install riparian fencing to exclude or reduce livestock access ➔ Interplant conifers in deciduous dominant areas where appropriate ➔ Protect by fee simple or easement key properties of riparian habitat ➔ Revegetate open riparian areas with native plants

Wynoochee River Tier 1

FLOODPLAIN

Symptom	Cause	General Actions
<ul style="list-style-type: none"> ➔ The floodplain connectivity from RM 22 to the mouth is “poor” because of shoreline armoring. ➔ Upstream from RM 22, the riverbed has incised and scoured to bedrock disconnecting the river from the floodplain ➔ Some off-channel spawning and rearing areas have been cut off from the main channel. 	<ul style="list-style-type: none"> ➔ Shoreline armoring and diking used to protect farmlands and residential development in the mid to lower mainstem river. ➔ The mainstem has accelerated gravel transport incising the river and causing severe bank erosion in many locations in the upper portion of the agricultural area. ➔ Dam operations may increase gravel transport and the lack of flooding from the dam operations has likely diminished off-channel habitat from historic levels. ➔ Timber harvest. Recent high peak flows are likely caused by accelerated timber harvesting in the watershed and lack of sufficient late seral vegetative cover to retain water. ➔ Floodplain mining. Past floodplain mining is likely a partial cause of the riverbed scouring. ➔ Severe flooding in 1996-97. ➔ Gravel scouring from high peak flows due to land use (farming and logging) 	<ul style="list-style-type: none"> ➔ Assess floodplain conditions and identify impacts ➔ Conduct a study similar to upper Wishkah study to determine sediment loading and reduction ➔ Gravel enhancement; when removing gravel build up from the fish trap and dam and depositing it downstream, additional gravel should be added to decrease scouring and incision areas downstream ➔ Reconnect, enhance, and/or restore potential off-channel, floodplain, and wetland habitat ➔ Reduce the amount of allowable clearcuts at one time to allow for regeneration to catch up to logging ➔ Reduce the percentage of area harvested to allow regeneration to maintain a higher percentage of late seral timber at any given time to allow the watershed to retain more water ➔ Remove hard armoring (rip rap) or implement bioengineering techniques in place of hard armoring ➔ Upgrade logging roads to comply with Forest and Fish Agreement (1999)

Wynoochee River Tier 2 Concerns

Wynoochee River Tier 2			WATER QUALITY		
Symptom		Cause	General Actions		
<ul style="list-style-type: none"> ➔ Regular temperature exceedances above 16 degrees C. resulted in a 303(d) List, 1996 & 1998. Because of the warm temperatures the Wynoochee is rated "poor" water quality. ➔ The Wynoochee River is the second largest contributor of sediment to the Chehalis system. Water quality during major rain events is likely extremely poor. 		<ul style="list-style-type: none"> ➔ Increased temperatures, dam operations, livestock access, and timber harvest. This is probably caused by warmer weather combined with dam operations, logging vast quantities of the watershed, reducing vegetative cover and shading ➔ Sediment transporting to the river from roads, and sediment deposits blocking stream flow through clean gravels that can have a cooling effect. 	<ul style="list-style-type: none"> ➔ Abandon roads on steep geologically sensitive areas ➔ Conduct a detailed study to determine the causes of temperature increases ➔ Conduct a study similar to the Upper Wishkah study to determine sediment loading and reduction ➔ Erosion control treatments along forest roads to reduce mass wasting, i.e., revegetation, bioengineering, willow cuttings ➔ Install riparian fencing to exclude or reduce livestock access ➔ Reduce sediment loading by reducing road densities (abandon/decommission) ➔ Reduce the percentage of area harvest to allow regeneration to maintain a higher percentage of late seral timber at any given time to allow the watershed to retain more water ➔ Revegetate riverbanks for added protection from erosion ➔ Temperatures, DOs, pH, and turbidity should be monitored regularly ➔ Upgrade logging roads to comply with Forest and Fish Agreement (1999) ➔ Wider riparian areas on agricultural lands with conifers dominating the tree species 		

Wynoochee River Tier 2		SEDIMENT
Symptom	Cause	General Actions
<ul style="list-style-type: none"> ➔ The Wynoochee contributes 30.6% to the sediment loading and the Chehalis River. ➔ In the lower 45 miles, including tributaries, the rating is poor because of high quantities of fine sediment ➔ Juvenile salmonids experience excessive predation ➔ Subbasin is naturally prone to landslides ➔ Mass wasting and debris torrents at road crossings ➔ Sediment has embedded in spawning gravels and dominates the river channel in the slower flowing areas in the lower basin 	<ul style="list-style-type: none"> ➔ 1960's sediment loading study data: <ul style="list-style-type: none"> • 42% -- timber management / roads • 31% -- agriculture • 27% -- natural causes ➔ Agricultural practices and livestock access. The main causes of sediment delivering to the streams are sidecast roads failing and blocked or undersize culverts creating saturated fill slopes. ➔ High road densities. Road densities throughout the watershed are considered poor, (less than 3 miles per square mile), except for the upper Wynoochee which is rated fair. ➔ Mass wasting from land use practices ➔ Sport fishermen. Jet sleds traveling up and down the river at high speeds have caused sediment disturbances along the shorelines where juvenile salmon travel, causing them to move to deeper waters where they are vulnerable to predation by larger fish. ➔ The subbasin is a geologically sensitive area prone to mass wasting because of steep slopes and shallow soils ➔ Timber harvest, high road densities and agricultural practices. Farming and earlier logging practices in the middle reaches of the river have eliminated riparian areas, causing reduced LWD recruitment, accelerated flows, reduced gravel retention, stream incision, and eroded unstable banks. 	<ul style="list-style-type: none"> ➔ Abandon roads on steep geologically sensitive areas ➔ Conduct a study similar to Upper Wishkah study to determine sediment loading and reduction ➔ Correct cross drains that may trigger mass wasting on geologically sensitive slopes ➔ Determine if sedimentation is a problem ➔ Erosion control treatments along forest roads to reduce mass wasting, i.e., revegetation, bioengineering, willow cuttings ➔ Identify sources that are contributing to sediment loading ➔ Install riparian fencing to exclude or reduce livestock access ➔ Institute a rouge and control treatments along forest roads to reduce mass wasting; i.e., re-vegetation, bioengineering, and willow cuttings ➔ Reduce sediment loading by reducing road densities (abandon/decommission) ➔ Reduce the horse power and speed of powerboats to reduce disturbance of bank and displacement of juveniles ➔ Reduce the percentage of area harvested to allow regeneration to maintain a higher percentage of late seral timber at any given time to allow the watershed to retain more water ➔ Revegetate riverbanks for added protection from erosion ➔ Upgrade logging roads to comply with Forest and Fish Agreement (1999)

Wynoochee River Tier 3 Concerns

Wynoochee River Tier 3		
LARGE WOODY DEBRIS (LWD)		
Symptom	Cause	General Actions
<ul style="list-style-type: none"> ➔ LWD within the mainstem river is poor, adding to accelerated substrate transport, channel incision, lack of channel complexity, and gravel retention. ➔ The agricultural areas below RM 22 have a poor ratio of conifer to hardwood, the riparian is narrow or non-existent, LWD recruitment potential in the lower basin is “poor”. 	<ul style="list-style-type: none"> ➔ The areas below the dam have been intensely managed for forestlands and the buffers are narrow reducing LWD recruitment potential. ➔ Timber harvest. The reach below the dam is heavily managed for harvest. ➔ Agricultural practices. Reaches below RM 22 have been converted to agriculture and the riparian and LWD recruitment is limited because of the predominance of hardwoods. 	<ul style="list-style-type: none"> ➔ Dam operations. ➔ Develop LWD supplementation plan that will install logjams in key places to improve instream channel structure and habitat diversity ➔ Install riparian fencing to exclude or reduce livestock access ➔ Interplant conifers in deciduous dominant areas where appropriate ➔ LWD, primarily conifer and only those pieces that float into the dam area is removed from the dam and placed on a gravel bar below the fish trapping facilities. ➔ Revegetate open riparian areas with native plants ➔ The LWD removed from the dam does not constitute the amount of LWD transporting downstream if the dam were not there, so there is a net loss of LWD recruitment from this area. Even though LWD is removed from the dam area and placed below the dam, the natural recruitment has been diminished because much of the LWD above the dam does not float into an area where it can be recovered

Wynoochee River Tier 3**WATER QUANTITY**

Symptom	Cause	General Actions
<ul style="list-style-type: none">➔ Local residents report that river levels are higher and have more fluctuation. The flow graph for the winter months of December, January, February and March from 1994 to 1999 supports this belief.➔ Low flows during the spring months can impact the juvenile salmon out-migration.➔ Overall water quantity conditions are rated "poor" for the Wynoochee subbasin.	<ul style="list-style-type: none">➔ Dam operations. Before dam construction in 1972, the river ranged from 3 CFS in August of 1967 to 24,599 CFS in the winter of 1968. This radical difference is now controlled with the dam to maintain flows of 140 CFS from April to June and 190 CFS for the remainder of the year. It is noteworthy that the dam has aided summer low flows, but other activities might be impacting low flow conditions.➔ Timber management practices have reduced forested land cover, increasing the rate of water run-off into streams, and lowering the water table in summer. Extensive timber harvest below the Forest Service lands after a "poor" rating was determined. The condition of the watershed has continued to decline with extensive harvest practices.➔ The low quantity conditions are due to altered land cover in the upper Wynoochee coupled with flows that dip below established base flows in summer months.➔ The lack of late seral forest stages range from 58% above the dam to 45% in the lower Wynoochee, resulting in poor water retention.	<ul style="list-style-type: none">➔ Adjust dam flows to better accommodate fish➔ Conduct a study to collect additional data on the watershed canopy cover, dam operations and flow regimes (Smith/Wenger report).➔ Reduce the percentage of area harvested to allow regeneration to maintain a higher percentage of late seral timber at any given time to allow the watershed to retain more water