

CLOQUALLUM MANAGEMENT UNIT

CLOQUALLUM CREEK

Description:

Cloquallum Creek and its tributaries have a drainage area of 70 square miles. The headwaters begin in the low hills of the southern Olympic Mountains and flow through broad valleys. The Cloquallum flows through Stump Lake at RM 12; Star and Arrowhead Lakes connect to the river by small tributaries.

Cloquallum, Mox-Chehalis, and Newman Creeks have low-to-moderate gradient except in the headwaters. The tributaries have excellent pool-to-riffle ratios. Gravel is the predominant bottom material in the Cloquallum drainages, although Newman and Workman Creeks have sandy bottoms with some gavel in those areas with long pools and riffles. Delezene and Workman Creeks are short, northerly flowing streams that are generally confined to narrow ravines except in the lower reaches.

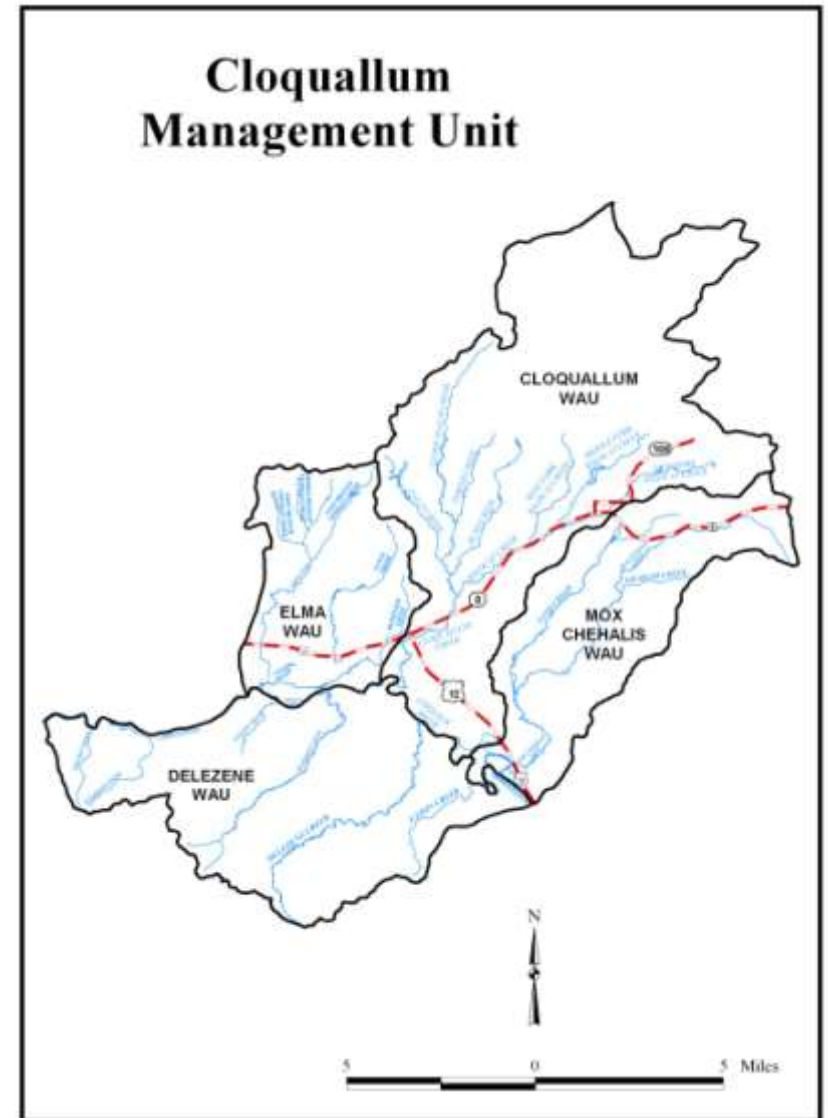
Most of the hills are in timber production. Livestock production and rural residential uses are scattered through the low, flat valleys. Recreational properties are developing around Star and Arrowhead Lakes. Newman and Vance Creeks are heavily impacted by agricultural and residential development, with extensive riparian removal and channelization.

Chum distribution is greatly reduced from historic use, although the run is still listed as healthy. Coho escapements declined in the 1990's. WDF blasted the falls on upper Delezene Creek to provide upstream habitat in the headwaters.

Major Tributaries: Mox-Chehalis, Newman, Vance, McDonald, Falls, Bush, Delezene, Workman, and Wildcat Creeks

Land Uses: Forestry, Agriculture, and Rural Residences

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



Cloquallum Creek Tier 1 Concerns

Cloquallum Creek Tier 1 FISH PASSAGE		
Symptom	Cause	General Actions
<ul style="list-style-type: none"> ➔ Log jams and log booms block minor portions of the Mox-Chehalis watershed. ➔ There is no inventory except for portions of the Cloquallum WAU in Mason County which identifies 107 barriers (0, 33%, 67% passable) and 15 sites with unknown passability. 	<ul style="list-style-type: none"> ➔ High road densities. Road densities are very high in this area. Miles of road per square mile indicated: <ul style="list-style-type: none"> • Cloquallum – 4.5 • Workman – 4.6 • Vance – 4.7 • Delezene – 4.6 • Newman – 4.7 • Mox-Chehalis – 4.7 	<ul style="list-style-type: none"> ➔ Correct barrier culverts. See Section 4 for guidelines.

Cloquallum Creek Tier 1 RIPARIAN		
Symptom	Cause	General Actions
<ul style="list-style-type: none"> ➔ The riparian habitat in the Cloquallum subbasin is considered to be in poor condition and will not significantly contribute LWD. ➔ Cloquallum Creek riparian areas contain predominantly alder re-growth with a sparse distribution of conifers. 	<ul style="list-style-type: none"> ➔ The Newman, Vance, Cloquallum, and Mox Chehalis Creek areas have 44.4 miles of vegetation loss and 7.2 miles of tree canopy loss. ➔ Riparian degradation and loss. There is extensive habitat degradation from loss of vegetation and tree canopy. The cause of riparian loss is greatly unknown; however, some loss is attributed to agriculture (9%) and logging (7.4%). ➔ Cloquallum data: <ul style="list-style-type: none"> • RM 0-1.5 – Agricultural • RM 1.5-7 – Rural Residential • RM 7-upstream – Managed Timberlands 	<ul style="list-style-type: none"> ➔ Control invasive species. See Section 5. ➔ Install riparian fencing to exclude or reduce livestock access ➔ Interplant conifers in deciduous dominant areas when appropriate ➔ Protect (fee simple or easements) key properties of riparian habitat ➔ Restore riparian corridor in the Cloquallum subbasin (identify specific degraded areas for restoration needs) ➔ Revegetate open riparian areas with native plants

Cloquallum Creek Tier 1 WATER QUANTITY		
Symptom	Cause	General Actions
<ul style="list-style-type: none"> ➔ Data gap for stream flow. Specific stream flow data are lacking for streams in this area. All regions rated poor for ecological maturity. ➔ Stream flow during summer months is low in Delezene and Workman Creeks. ➔ Mox Chehalis and Wildcat Creeks are closed to further consumptive water appropriations. 	<ul style="list-style-type: none"> ➔ Riparian degradation and loss as well as timber harvesting ➔ Landscape manipulations that cause quick surface water runoff do not allow for aquifer recharge. Poor ratings (hydrologically immature) are indicated: <ul style="list-style-type: none"> • Newman – 89% • Delezene – 74% • Cloquallum – 73% • Vance – 89% • Mox-Chehalis – 77% 	<ul style="list-style-type: none"> ➔ Determine if water withdrawals are being followed in accordance with current water rights ➔ Implement activities that lead to natural aquifer recharge ➔ Increase hydrologic continuity – reduce impervious surfaces ➔ Reduce stormwater discharge directly to streams ➔ Restore wetlands for water storage.

Cloquallum Creek Tier 2 Concerns

Cloquallum Creek Tier 2		
FLOODPLAIN		
Symptom	Cause	General Actions
<p>➔ The floodplains in the lower reaches of Newman, Vance, Cloquallum, and Mox Chehalis, do not accommodate natural channel migration or flood storage.</p>	<p>➔ The historic lowest mile of Mox Chehalis Creek is an abandoned oxbow channel that has been filled for croplands and re-routed.</p> <p>➔ Agricultural and rural residential use. The City of McCleary is located at RM 5.1 of Wildcat Creek.</p> <p>➔ Riprap and other bank protection. Flood control through the use of bank protection has been documented in Newman, Vance, Cloquallum, and Mox-Chehalis (2.2 miles), and in Workman and Delezene (40 linear feet).</p> <p>➔ Channel incision is likely to occur due to past splash dam activities. Splash dams are present on streams, including:</p> <ul style="list-style-type: none"> • Cloquallum – 3 • Workman – 1 • Mox Chehalis – 1 • Delezene – 7 • Vance – 2 • Wildcat Creek – 3 	<p>➔ Assess floodplain conditions and identify impacts</p> <p>➔ Protect key properties (fee simple or easements) to facilitate natural channel migration and reconnection to the floodplain</p> <p>➔ Reconnect, enhance, and/or restore potential off-channel, floodplain, and wetland habitat</p> <p>➔ Remove hard armoring (riprap) or implement bioengineering techniques in place of riprap.</p>

Cloquallum Creek Tier 2		
SEDIMENT		
Symptom	Cause	General Actions
<p>➔ There is a limited amount of poor quality spawning areas in Newman Creek and its tributaries. A fair amount of spawning gravel is evident in Delezene and Workman Creeks.</p> <p>➔ Excessive sediment and bank erosion</p> <ul style="list-style-type: none"> • Excessive sediment is apparent for 16 miles of Newman, Vance, Cloquallum, and Mox Chehalis subbasins. There are 10.5 miles of bank erosion in this area. • Excessive sediment is apparent for 16.2 miles of Workman Creek. • Delezene Creek has 0.3 miles of bank erosion. 	<p>➔ High road densities. Road densities are very high in this area. Miles of road per square mile indicated:</p> <ul style="list-style-type: none"> • Cloquallum - 4.5 • Workman - 4.6 • Vance - 4.7 • Delezene - 4.6 • Newman - 4.7 • Mox Chehalis - 4.7 <p>➔ Landslides. Although the Newman, Vance, Cloquallum, and Mox Chehalis Creeks rate low risk for landslides, there exists a higher risk for Workman and Delezene Creeks.</p> <p>➔ Livestock access. Livestock is prevalent near the mouths of Delezene, Workman, Cloquallum, Wildcat, and Mox Chehalis Creeks.</p> <p>➔ Off-road vehicle activity. Off-road vehicle activity is present in Cloquallum and Wildcat Creek areas.</p> <p>➔ The frequent release of high water from splash dams accelerated channel scouring and streambank erosion</p>	<p>➔ Abandon roads on steep geologically sensitive areas</p> <p>➔ Identify sources that are contributing to sediment loading</p> <p>➔ Implement alternative methods of bank stabilization through bioengineering.</p> <p>➔ Minimize motor vehicle access to streams</p> <p>➔ Revegetate stream and riverbanks for added protection from erosion</p> <p>➔ Upgrade all logging roads to comply with Forest and Fish Agreement (1999)</p>

Symptom	Cause	General Actions
	<p>where riparian logging destabilized banks.</p> <ul style="list-style-type: none">➔ Log delivery using splash dams reduced the amount of LWD in the system that in turn reduced the ability to store and retain spawning gravel and fine sediment.➔ Channel incision is likely to occur due to past splash dam activities. Splash dams are present on streams, including:<ul style="list-style-type: none">• Cloquallum – 3• Workman – 1• Mox Chehalis – 1• Delezene – 7• Vance – 2• Wildcat Creek – 3	

Cloquallum Creek Tier 3 Concerns

Cloquallum Creek Tier 3		
LARGE WOODY DEBRIS		
Symptom	Cause	General Actions
<ul style="list-style-type: none"> ➔ There are estimated low levels of LWD in the Cloquallum subbasin. 	<ul style="list-style-type: none"> ➔ Low estimated levels of LWD due to past splash damming activities, LWD removal, and poor riparian recruitment. 	<ul style="list-style-type: none"> ➔ Determine LWD levels in Cloquallum subbasin ➔ Develop LWD supplementation plan that will increase LWD by installing logjams and single key piece placement using large conifer when possible ➔ Educate landowners on the importance of leaving LWD (not taking for firewood)

Cloquallum Creek Tier 3		
WATER QUALITY		
Symptom	Cause	General Actions
<ul style="list-style-type: none"> ➔ Elevated stream temperatures are apparent in Wildcat Creek (303d listed stream). 	<ul style="list-style-type: none"> ➔ Conversion of mature conifer vegetation to non-forest uses, i.e., agriculture and urbanization, are most pronounced in Newman, Vance, and Wildcat drainages. Conversion to open spaces and deciduous trees is problematic in the area. ➔ Road run-off. Wildcat Creek noted 4 sites of road run-off; Mox Chehalis and Sand Creeks noted 5 sites. ➔ Livestock access. Livestock activity has been documented at 6 sites in Cloquallum and 3 sites in Wildcat Creek. Numerous livestock waste inputs are apparent in lower Mox-Chehalis Creek. 	<ul style="list-style-type: none"> ➔ Determine water quality conditions ➔ TMDL Implementation – Temperature, pH, fecal coliform