HUMPTULIPS MANAGEMENT UNIT

HUMPTULIPS RIVER

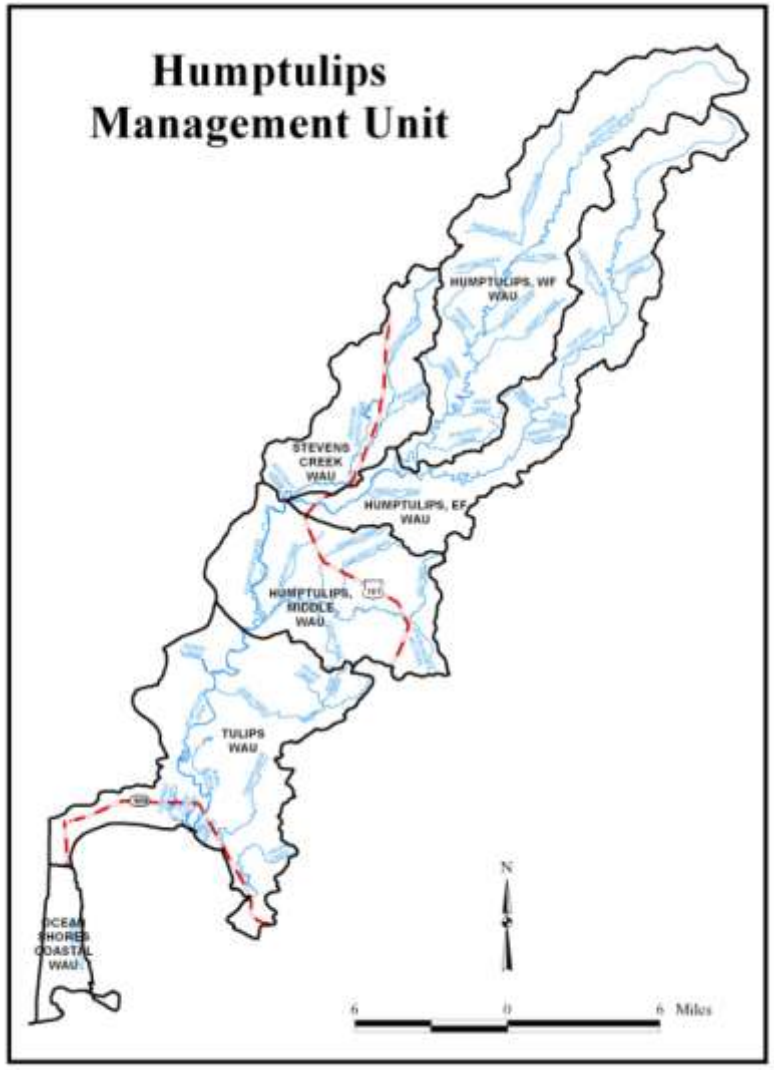
Description:

The Humptulips Watershed has 320 stream miles with over 160 miles of anadromous fish habitat.

The Humptulips River mainstem branches into the West Fork at RM 28.11 and the East Fork at RM 28.2. The lower portion of the Humptulips has a low gradient that flows through farmlands and timbered areas. Although most sloughs in this section are tidally influenced, including Gillis, Campbell, and Jesse Slough, Burg Slough is not. The Humptulips Hatchery is at the confluence of Stevens Creek and the mainstem (RM 22.5).

The lower Humptulips has three primary tributaries: Big Creek, Stevens Creek, and Deep Creek. Of the three, Deep Creek is the most important tributary in the lower basin. Deep Creek, is 7.8 miles long and flows through partially cleared areas, averages 9 meters in width, and has two falls. Failor Lake dam lies above both falls. Deep Creek enters the mainstem at RM 9.6. Big Creek is an 11.5-mile long tributary entering the mainstem at RM 15.4. It has a moderate-to-low gradient, ample spawning gravels, and good canopy cover. Cedar Creek, one of its tributaries, has a dam. Another tributary, Fairchild Creek, has a fishway under highway 101 at RM 1.6.

The East Fork Humptulips starts at RM 28.2 and has 29.9 stream miles. Another 19 tributaries add 31.4 stream miles. Altogether, the East Fork watershed drains 46.4 square miles. The East Fork originates in the foothills of the Olympic Mountains between steep hills, eventually flowing into a river valley that gradually broadens. The East Fork has a good balance of pools and riffles with numerous falls and cascades at the upper end. Fish use occurs in the lower 17 miles; however, the addition of a fish ladder at the falls below the confluence with Flat Bottom Creek will open another mile of habitat. All the tributaries of the East Fork are short and steep with fish habitat being concentrated at the lower ends. Most of the East Fork lies within forestland subject to past and current logging.



The West Fork Humptulips starts at RM 28.11 and is 17.3 miles long. Thirteen tributaries add another 35.8 stream miles. This watershed drains an area of approximately 46 square miles. The West Fork originates in the Olympic Mountains in forested areas with steep gradients. It flows through a narrow gorge at RM 45.4 through 45.9, creating cascades that form a natural barrier. Further downstream, the main channel has a low to moderate gradient with a series of high cut banks before entering a broad river valley. Most of the watershed is in forestland with no agricultural or residential development. The principal tributaries include Chester, Grouse, Newbury, Donkey, Furlough, Elk, and O'Brien Creeks. These tributaries are generally steep in their upper reaches and do not moderate in gradient until their confluence with the West Fork. Most of the tributaries have falls within a mile of their mouth.

Major Tributaries: Big Creek, Stevens Creek, and Deep Creek

Land Uses: Forestry and rural residences

Anadromous Fish Stocks: Fall Chinook*, spring Chinook, coho*, chum, cutthroat, winter steelhead*, summer steelhead, and bull trout (* denotes priority stock)

Humptulips River Tier 1 Concerns

Humptulips River Tier 1	WATER QUALITY	
Symptom	**Cause**	**General Actions**
➡ The mainstem Humptulips is on the 1998 303(d) list for warm water temperatures. Warm water temperatures have also been recorded in the East and West Forks. Temperatures at the WDOE monitoring site at RM 23.6 have a mean monthly temperature frequency exceeding 15.6 degrees C. in the summer months.	➡ Riparian degradation and loss. The frequency of high temperatures in the lower reaches of the East and West Forks and mainstem river are due to increased riparian harvests and degraded riparian vegetation.	➡ Determine water quality conditions ➡ Identify specific degraded riparian areas for restoration ➡ Implement TMDL recommendations ➡ Install riparian fencing to exclude or reduce livestock access ➡ Interplant conifers in deciduous dominant areas ➡ Revegetate open riparian areas with native plants
➡ The mainstem has a rating of "poor" for water quality.	➡ High rain events and sediment loading from logging roads most likely diminishes the water quality during the high peak flow events.	➡ Abandon roads on steep geologically sensitive areas ➡ Correct cross drains that may trigger mass wasting ➡ Minimize motor vehicle access to streams ➡ Reduce sediment loading by reducing road densities ➡ Upgrade logging roads to comply with Forest and Fish Agreement (1999)
➡ Recent TMDLs of fecal coliform indicates the Humptulips produces 13% of the fecal coliform delivered to the Chehalis Basin.	➡ No non-point sources are identified, but speculated that failing septic systems, livestock waste and wild game waste may be the cause.	➡ Implement TMDL recommendations ➡ Install riparian fencing to exclude or reduce livestock access

Humptulips River Tier 1	FISH PASSAGE	
Symptom	**Cause**	**General Actions**
➡ Fish access to spawning / rearing habitat is restricted	➡ Humptulips has over 851 culverts based on recent assessment in the basin by Mason Conservation District: • 369 - 33-67% passable • 96 - Unknown passability ➡ High road density. There are 837 miles of roads in the Humptulips watershed: 212 on National Forest lands, 177 on non-forest lands in the East and West Forks, 104 on	➡ Correct barrier culverts. See Section 4. ➡ Improve fish passage at fishways and add a fishway to those structures without ones

Humptulips River Tier 1	FISH PASSAGE	
Symptom	**Cause**	**General Actions**
	non-forest lands in Stevens Creek, and 344 on non-forest lands downstream of the Forks, including the Big Creek drainage.	

Humptulips River Tier 1	SEDIMENT	
Symptom	**Cause**	**General Actions**
➡ Excessive bedload transports high quantities of fine sediment and reduces spawning gravel in the system. ➡ Substrate embeddedness is high in O'Brien Creek and the W. Fork. These reaches are rated "poor" for sediment delivery.	➡ Watershed analysis identified 55 channel segments with increased fine sediment delivery in the following reaches; East Fork, West Fork, Chester and Donkey Creek. ➡ High road densities. There are 837 mi. of roads in the Humptulips watershed; 212 on National Forest lands, 177 on non-forest lands in the E. and W. Forks, 104 on non-forest lands in Stevens Creek, and 344 on non-forest lands downstream of the Forks, including the Big Creek drainage. ➡ Timber management, gravel bar mining and splash dams have modified sediment delivery and substrate composition in the Humptulips. ➡ Timber harvest. All sediment delivery is related to logging roads. ➡ Surface erosion. Of 14 bridges in the East and West Fork Humptulips, 8 pose a high vulnerability to mass wasting. ➡ Landslides. Of 286 landslides surveyed, 17.3% were caused by timber harvest, 46.9% by roads, and 35.7% by natural events.	➡ Abandon roads on steep geologically sensitive areas ➡ Develop improved methods of flushing sediment from the municipal dams ➡ Implement alternative methods of bank stabilization (bioengineering) in locations of excessive erosion ➡ Reduce sediment loading by reducing road densities (abandon/decommission) ➡ Correct cross drains that may trigger mass wasting on geologically sensitive slopes ➡ Minimize motor vehicle access to streams ➡ Upgrade logging roads to comply with Forest and Fish Agreement (1999)
➡ Accelerated channel scouring and streambank erosion.	➡ Splash dams. • The frequent release of high water from splash dams accelerated channel scouring and streambank erosion where riparian logging destabilized the banks. • Log delivery using splash dams reduced the amount of LWD in the system that in turn reduced the ability to store and retain spawning gravels and fine sediments. ➡ Landslides. Of 286 landslides surveyed, 17.3% were caused by timber harvest, 46.9% by roads, and 35.7% by natural events. ➡ In five areas with road densities between 3 and 5.4 miles	➡ Abandon roads on steep geologically sensitive areas ➡ Correct cross drains that may trigger mass wasting on geologically sensitive slopes ➡ Develop improved methods of flushing sediment from the municipal dams ➡ Develop LWD supplementation plan that will install logjams in key places to improve instream channel structure and habitat diversity ➡ Implement alternative methods of bank stabilization (bioengineering) in locations of excessive erosion

Humptulips River Tier 1	SEDIMENT	
Symptom	**Cause**	**General Actions**
	per square mile road, erosion delivered 95% to 237% of natural background erosion. These stream sections are rated poor: • W. Fork upstream of Chester Creek. • The area upstream of Donkey Creek. • The Lower West Fork Humptulips. • Donkey Creek. • The lower East Fork.	➡ Install LWD pieces in conjunction with other restoration projects ➡ Minimize motor vehicle access to streams ➡ Reduce sediment loading by reducing road densities (abandon/decommission) ➡ Upgrade logging roads to comply with Forest and Fish Agreement (1999)

Humptulips River Tier 2 Concerns

Humptulips River Tier 2	RIPARIAN	
Symptom	**Cause**	**General Actions**
➡ The majority of the riparian zone downstream of the East and West Forks are poor. The agricultural lands on the lower mainstem have riparian zones that are generally sparsely stocked and narrow.	➡ The channel widths in this area are generally wide and difficult to shade, so this area is low for shade cover. ➡ Regenerated areas on the private lands are predominately hardwoods, and those areas in the natural migration zones frequently disturbed by high peak flows have added to the increased dominance of hardwoods. ➡ The Lower Mainstem has a high proportion of agricultural and rural residential land use. ➡ Timber harvest. Logging since the late 1800s has affected the Humptulips watershed. • Before 1930, concentrated harvesting occurred near the lower mainstem river, East and West Forks, and the large tributaries because the only method of log transport was by splash dam. • Early logging practices did not protect riparian habitat and by 1960 the majority of the private forestlands had been harvested including the majority of the riparian areas.	➡ Control invasive species. See Section 5. ➡ Identify specific degraded riparian areas for restoration needs ➡ Install riparian fencing to exclude or reduce livestock access ➡ Interplant conifers in deciduous dominant areas where appropriate ➡ Revegetate open riparian areas with native plants
➡ The lower tributaries of the East and West Fork have poor riparian shade and LWD recruitment, but the upper areas within the Forest Service lands are mostly unmanaged and have good riparian shade.	➡ Big Creek has some rural residential, but primarily forestlands. ➡ Timber harvest. Logging since the late 1800s has affected the Humptulips watershed. • Before 1930, concentrated harvesting occurred near the lower mainstem river, East and West Forks, and the large tributaries because the only method of log transport was by splash dam. • Early logging practices did not protect riparian habitat and by 1960 the majority of the private forestlands had been harvested including the majority of the riparian areas.	➡ Develop LWD supplementation plan that will install logjams in key places to improve instream channel structure and habitat diversity ➡ Identify specific degraded riparian areas for restoration ➡ Install LWD pieces in conjunction with other restoration projects ➡ Install riparian fencing to exclude or reduce livestock access ➡ Interplant conifers in deciduous dominant areas where appropriate ➡ Revegetate open riparian areas with native plants

Humptulips River Tier 2	FLOODPLAIN	
Symptom	**Cause**	**General Actions**
➡ Some restriction of natural stream migration, especially in the mainstem.	➡ Riprap and other bank protection. • The Humptulips Valley Dike Road at RM 6.9 in the mainstem. The dike does not appear to have cut off any historic side-channels or sloughs, but has prevented the natural migration from creating side-channel and margin habitat in this reach. • There are three other sections of riprap along the mainstem which were placed to reduce bank erosion and there is riprap placed near the three boat ramps. ➡ The only adjacent road confinement is Ocean Beach Road, where .4 of a mile of the stream is impacted at RM 6.	➡ Assess floodplain conditions and identify impacts ➡ Reconnect, enhance, and/or restore potential off-channel, floodplain, and wetland habitat ➡ Remove hard armoring (riprap) or implement bioengineering techniques in place of hard armoring
➡ There is an absence of side-channels in the floodplains of confined, low gradient reaches within the East and West Forks.	➡ Splash dams. Suggests a long-term effect of splash dams. The extensive use of splash dams between the 1890s and the 1930s may have had a greater impact on the natural functions of the floodplain than more recent impacts, but it would be difficult to quantify those effects. The frequent release of high flows during log drives removed natural woody debris, and accelerated channel incision. In those areas where splash damming did not occur, the rating is considered "good." Because side-channels were blocked off to prevent logs from being stranded, the down cutting on the side-channels would not have occurred at the same rate, resulting in isolation from the main channel. The consequential reduction of side-channels and LWD resulted in reduced juvenile habitat for rearing. ➡ Low levels of LWD. Until the 1980s, riparian harvest and stream cleaning reduced the recruitment of LWD to stream channels preventing the natural formation of debris jams that create new side channels.	➡ Determine LWD quantities ➡ Develop LWD supplementation plan that will install logjams in key places to improve instream channel structure and habitat diversity ➡ Interplant conifers in deciduous dominant areas where appropriate ➡ Revegetate open riparian areas with native plants

Humptulips River Tier 3 Concerns

Humptulips River Tier 3	WATER QUANTITY	
Symptom	**Cause**	**General Actions**
➡ Direct measurements of stream flows ceased in 1979 with no flow trends to establish a base for current flows. Indicators show decrease in hydrological maturity. The Humptulips suffers from rapid flow increases during heavy rains and quickly returns to seasonal flows after the rain event, suggesting hydrology impacts to the stream and the floodplain. High peak flows increase bank erosion and input of fine sediments, causes stream incision with channel scour, separates the floodplain and impacts fish in all life stages of development	➡ Riparian degradation and loss and timber harvest. • The middle Humptulips is rated "poor" for hydrologic maturity; 63% of the land in hardwoods or lacking trees. • The lower Humptulips has a significant loss of mature conifer, but the rating was just under the "poor" rating. • The Lower Humptulips is more impacted overall than the East and West Forks for land cover and vegetative type. • The middle Humptulips is rated "poor" for water quantity because of the low quantity of mature conifer for land cover. Other areas are rated "good" with the lower river barely missing the "poor" rating. Changes of land use from timber to other uses will lower the "good" rating. • Both the East and West Forks are rated "good" for water quantity, but continued logging in these basins may have decreased these ratings.	➡ Identify specific degraded riparian areas for restoration needs ➡ 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

Humptulips River Tier 3	LARGE WOODY DEBRIS (LWD)	
Symptom	**Cause**	**General Actions**
➡ Existing LWD densities were surveyed in 31% of the 320 miles of streams in the East and West Forks; 29.6 miles had poor densities, 6.9 miles had fair densities and 24.9 miles had good densities. ➡ All good LWD densities were in the mainstem East and West Forks and all tributaries of these mainstems had poor densities except for Rainbow Creek and an unnamed tributary of the West Fork. ➡ Areas in the upper reaches of both branches on Forest Service lands have good LWD densities and recruitment potential because of the amount of late seral conifers. ➡ No densities were measured in the Lower Mainstem.	➡ Riparian degradation and loss. The overall potential for LWD recruitment below the East and West Forks in the mainstem river are poor due to no vegetation, hardwood dominated or previously logged riparian zones ➡ Long-term LWD recruitment potential has improved for the majority of the watershed because of the buffer protections which started in the mid-1980s and followed up with Timber Fish and Wildlife rules adopted into law in 2001. ➡ Timber harvest, agricultural and rural residential use. In the lower mainstem and lower portions of the East and West Forks where agriculture and rural residential areas predominate, and where the riparian has been logged, the near term potential is poor for LWD recruitment.	➡ Develop LWD supplementation plan that will install logjams in key places to improve instream channel structure and habitat diversity ➡ Identify specific degraded riparian areas for restoration needs ➡ Install LWD pieces in conjunction with other restoration projects ➡ Interplant conifers in deciduous dominant areas where appropriate ➡ Revegetate open riparian areas with native plants