CHEHALIS LEAD ENTITY PRESENTS

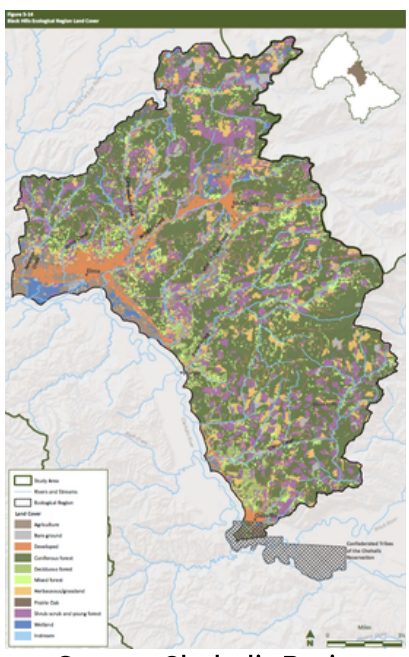
BLACK HILLS ECOLOGICAL REGION

AN AQUATIC SPECIES RESTORATION PLAN TRANSLATION

CLICK ON THE PICTURES AND LINKS FOR MORE INFORMATION

STATISTICS FOR THIS REGION

- This ecological region encompasses 215 square miles and represents approximately 8% of the overall Chehalis Basin
- The highest point in this region is Capitol Peak at 2,659 feet in the Black Hills
- Average annual precipitation is 50 to 75 inches, although it can reach up to 200 inches in the Porter, Mox Chehalis, and Cloquallum creek drainages
- 71% of this ecological region lies within Grays Harbor County, 15 % in Mason County and, 14% within Thurston County



Source: Chehalis Basin Strategy ASRP Phase 1, pg 151

CURRENT CONDITIONS

- Land cover is 47% coniferous forest, 18% scrub-shrub, 8% mixed forest, 7% developed, 6% grassland, 5% deciduous forest, 4% wetland, 4% agriculture, and small percentages of other cover
- Water quality is impaired primarily for temperature, low dissolved oxygen, and bacteria (Ecology 2018)
- Many streams have been scoured to bedrock most likely due to large wood and beaver dam removal
- Summer water temperatures are modeled to increase 2.7 - 4.5 degrees Fahrenheit by 2080 (Beechie 2018)

Black Hills Current Snapshot

Condition of Watershed Processes:
Hydrology –impaired
Floodplain connectivity – moderately impaired
Riparian condition – moderately impaired
Water quality – impaired

Restoration Potential: High

Protection Potential: Moderate

Geographic Spatial Units: Cedar Creek, Porter Creek, Mox Chehalis Creek, Cloquallum-Wildcat Creek, and Newman-Vance Creek

Source: Chehalis Basin Strategy ASRP Phase 1, pg 150

IMPORTANCE TO WILDLIFE

- The salmonid species present in this ecological region include fall-run Chinook salmon, coho salmon, chum salmon, and steelhead
- Non-salmon indicator species include Western toad, coastal tailed frog, Northern red-legged frog, North American beaver, Olympic mudminnow, largescale sucker, mountain whitefish, Pacific lamprey, riffle and reticulate sculpin, and speckled dace
- The bird indicator species present include great blue heron, Barrow's goldeneye, common goldeneye, and wood duck

Western Toad, Source: USGS/Chris Brown

LIMITING FACTORS

Salmon and other indicator species struggle with:

- High water temperatures
- Low flows
- Fish passage barriers
- Predation (non-native fish species and bullfrogs)
- Invasive plant species, including reed canarygrass are present
- Sediment conditions (fine sediments smother salmonid eggs)
- Low habitat diversity (lack of side channels and large wood, floodplain connectivity, and significant loss of beaver ponds)
- Reduced quantity and quality of instream habitats

Invasive fish, Smallmouth Bass (Micropterus dolomie)
Source: Marcus Rosten/USFWS

CREATED BY GRAYS HARBOR STREAM TEAM
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ECOSYSTEM PROTECTIONS

- Ensure continued protection and management of riparian areas
- Identify and protect areas with wetlands and cool-water inputs such as Cedar, Raccoon, and Sand Creeks
- Protect areas with existing beaver ponds

Lower Satsop River riparian planting, Source: Alexa Brown

RESTORATION REQUIRED

- Restore and manage riparian areas
- Address fish passage barriers
- Place stable instream wood
- Construct beaver dam analogs and promote beaver use
- Put immediate effort into restoring Porter, Cedar, and Sherman Creeks with large wood augmentation
- Protect and enhance areas around confluences with the mainstem Chehalis River
- Restore riparian and floodplain habitats along lower ends of streams where they enter the Chehalis River valley
- Enhance Mox Chehalis Creek and other Black Hills streams for off-channel and beaver pond habitat for coho salmon

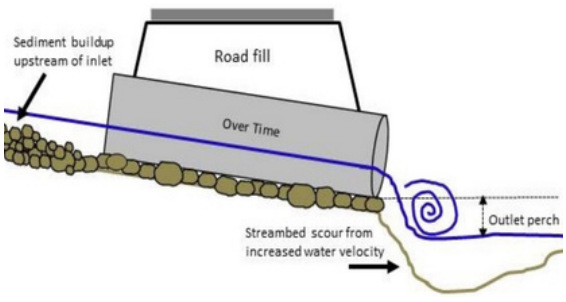
A fish passage barrier culvert, Source: Alexa Brown

WHY ARE FISH PASSAGE BARRIERS A PROBLEM?

Fish passage barriers limit fish habitat, reduce the transport of sediment and gravel, large woody debris, and limit habitat for other species.

- **Salmonid Passability**

The main reason so many are concerned about fish passage barriers is that they pose a barrier to adult salmon looking to spawn upstream of them. When they are blocked from making it upstream salmon end up getting crowded below the fish passage barrier and spawn on top of where other salmon have already spawned. This decreases the likely hood of those eggs surviving. Another reason fish passage barriers pose such a problem is that they limit habitat available to juvenile fish. While an adult might have been able to make it past a barrier, juveniles below the barrier cannot get back up to access the habitat above the culvert. They end up getting crowded in bigger waters where there are more predators and competition, limiting their survivability.



Example of a fish passage barrier, Source: NHDES Aquatic Resource Mitigation Program

- **Sediment and Gravel Transport**

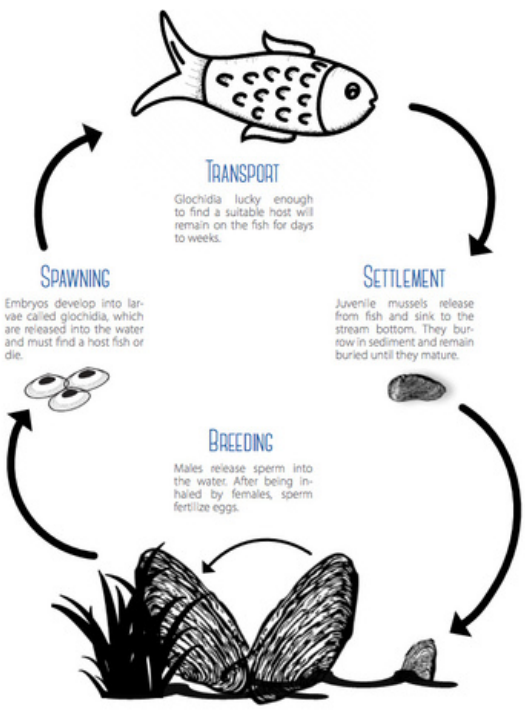
Sediment and gravel often get backed up behind fish passage barriers. This sediment and gravel is important in order to carry nutrients and spawning gravels downstream to replenish those gravels that have been washed out during flooding events.

- **Large Woody Debris**

Culverts and other fish passage barriers limit large woody debris from being transported downstream. This wood is essential for creating and maintaining habitat complexity. This wood can also back up against culverts and create flooding upstream, so it is important to remove undersized culverts and replace them with structures that allow this wood to pass though.

- **Other Wildlife**

Fish passage barriers also pose passage problems for other fish like Olympic mudminnow, largescale sucker, mountain whitefish, Pacific lamprey, riffle and reticulate sculpin, and speckled dace. Freshwater mussels also are effected by these fish passage barriers because the larval stage of this bivalve is parasitic on certain fish species and if the fish cannot travel upstream of the fish passage barrier neither do the freshwater mussels.



Freshwater Mussel Life Cycle, Source: Xerces Society

Source: Pacific Lamprey Assesment, U.S. Fish and Wildlife Service, The characteristics of woody debris and sediment distribution in headwater streams, southeastern Alaska, Takashi Gomi, Roy C. Sidle, Mason D. Bryant, and Richard D. Woodsmith, and U.S. Fish and Wildlife Service, Fish Passage

CHECK OUT ADDITIONAL RESOURCES

- Chehalis Lead Entity: http://www.chehalisleadentity.org/
- Chehalis Basin Partnership: https://chehalisbasinpartnership.org/
- Chehalis Basin Strategy: https://chehalisbasinstrategy.com/asrp/

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