










## Science on the Creek, 2017

Science continues to pile up demonstrating the pollution problems and damage in Hangman Creek. 2017 saw the highest flows in 20 years, causing massive erosion throughout the basin and destroying redband trout habitat in the Spokane River. Not surprisingly, Hangman Creek contained numerous and constant water quality exceedances. High levels of nutrients, high water temperatures, tons of sediment in surface water, along with low dissolved oxygen levels are the result of a highly impacted watershed. Ditching, drain tiling, and the removal of shoreline vegetation has had a cascade effect in creating problems downstream in the flood plains. This has resulted in the total loss of native trout habitat in the main stem of the creek. Macroinvertebrate (aquatic insect) monitoring in Hangman Creek showed "poor" to "very poor" scores that are indicative of a damaged watershed.



**Grading:**  = conditions that do not support native redband trout  
 = conditions that do support native redband trout

Indicator	Grade	Notes
Temperature		Water temperatures in Hangman Creek exceeded Washington State standards for cold water fish, including trout, for most of the summer, with some tributaries containing cooler water.
Turbidity (Water Clarity)		Massive sediment loads caused very low water clarity (turbidity) during the spring. This makes it hard for fish to breath and buries fish and aquatic insect habitat in the Spokane River.
Dissolved Oxygen (DO)		Continuous monitoring in Hangman Creek near Tekoa showed low dissolved oxygen 62-68% of the days during the May-October monitoring period.
Nutrients (Nitrate, phosphorous)		Hangman Creek carried massive loads of phosphorous into the Spokane River, which contributes to low dissolved oxygen and harmful algae blooms in Lake Spokane. Aquatic life needs adequate oxygen to survive.
Aquatic Macroinvertebrates		Surveys found very few insects that are critical to support the existence of trout and support the food chain in Hangman Creek.



Hangman Creek deposited a deep layer of sediment in the Spokane River in Winter/Spring of 2017, burying fish spawning habitat, making it hard to breath and feed for trout, and destroying habitat of aquatic invertebrates.

# Water Quality Results

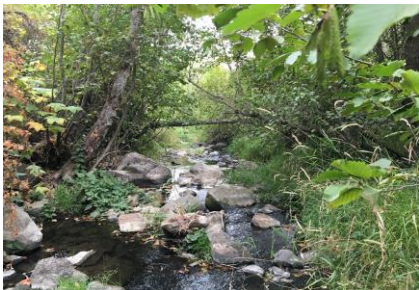
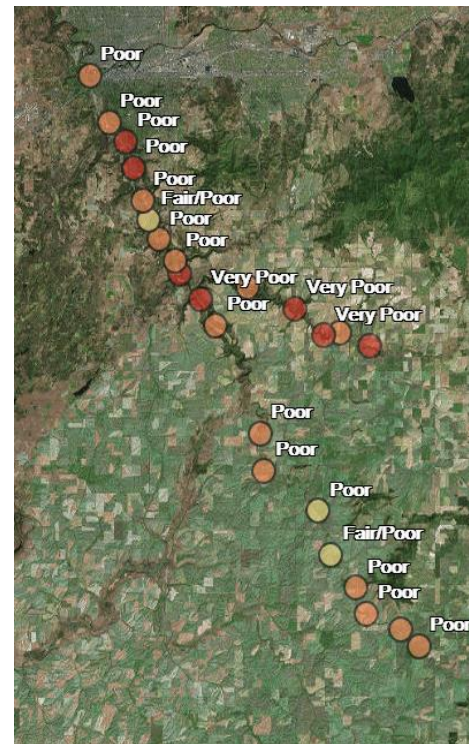


**Turbidity:** Suspended sediment (dirt) causes water clarity problems in Hangman Creek. In 2017, massive loads of sediment polluted the Spokane River for months (see photos on front), carrying tons of nutrients, smothering redband trout nests and covering macroinvertebrate (aquatic insect) habitat. In the upper waters of Hangman Creek turbidity was detected 92% of the time. Most of the sediment comes from overland runoff (photo at left). Lack of streamside vegetation in the watershed allows sediment to run directly into surface water.

**Macroinvertebrates:** A survey of aquatic macroinvertebrates (insects) on Hangman and Rock Creeks found very low species richness indices, very poor biodiversity, and few insects indicating good water quality. Aquatic insects are extremely sensitive to poor water quality, making them an accurate indicator of stream health. “Poor” and “Very Poor” scores dominated the survey (right).



**Nutrients:** High nutrient levels cause algal growth (left) in the water and low dissolved oxygen levels, especially in Lake Spokane. In 2017 we found that Hangman Creek contributed an average of over 6,000 lbs/day of phosphorous during February-May. The cleanup plan calls for no more than 140 lbs/day.



## Healthy Shorelines = Clean Streams:

Stream side vegetation and fields that are using low disturbance tillage practices are essential in protecting our creeks from polluted runoff



## Poor Shoreline Cover = Very Polluted Water:

Denuded and destroyed shorelines along with bare fields and disturbed soils contribute to polluted runoff getting into our streams.