



NONPOINT SOURCE SUCCESS STORY

Idaho

Controlling Erosion from Forest Roads Restores Caribou Creek

Waterbody Improved

Data indicated that excessive sedimentation from eroding historic forest roads and unstable streambanks negatively affected cold-water aquatic life in Idaho's Caribou Creek. In 1996, the Idaho Department of Environmental Quality (IDEQ) added Caribou Creek to the state's Clean Water Act (CWA) section 303(d) list of impaired waters for sediment. Manulife Investment Management and the private local forest land manager Manulife Forest Management (Manulife) (previously Hancock Forest Management) acquired the land on behalf of their clients in 2013 and resurfaced existing roads, improved road crossings, installed and replaced culverts, and removed unused forest roads. Data showed improved water quality and aquatic habitat conditions, which prompted IDEQ to remove Caribou Creek from the state's list of impaired waters for sediment in the 2018/2020 Integrated Report.

Problem

Caribou Creek (ID17010214PN045_02) is a 3rd-order tributary in the upper reaches of the Pack River watershed within the Lake Pend Oreille subbasin (Figure 1). Almost the entire Caribou Creek watershed (99.8%) is working forestland, but a small number of rural residences exist in the lower drainage. About 64% of the land is privately owned, and the remaining 36% is publicly owned by the U.S. Forest Service (USFS), the Idaho Department of Lands (IDL), or the Bureau of Land Management (BLM).

IDEQ added the 16.97-mile Caribou Creek–Headwaters to Pack River assessment unit (AU) (ID17010214PN045_02) to the 1996 CWA Section 303(d) water quality impaired list for sediment based on information provided in the 1995 CWA Section 305(b) report. In 1998 IDL conducted a Cumulative Watershed Effects (CWE) analysis in the Caribou Creek watershed and confirmed sediment impairment. The survey found adverse canopy cover/stream temperature and sediment conditions. The total sediment delivery score was at the high end of the moderate range—resulting from numerous legacy roads in poor condition. IDL conducted additional CWE analyses in 2002 and 2009, both of which showed that Caribou Creek rated high for surface erosion hazard and had a moderate mass failure hazard rating due to the granitic geology of the watershed.

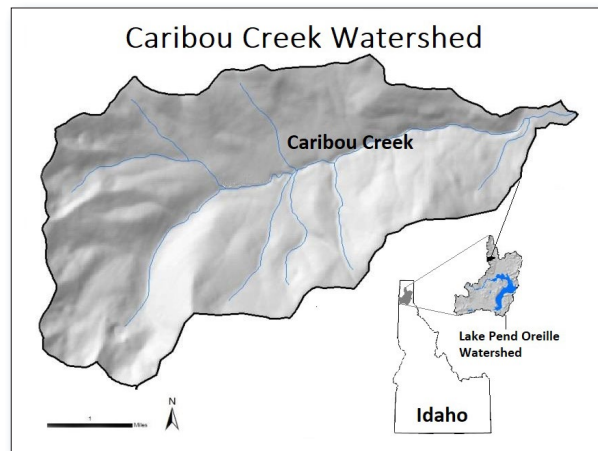


Figure 1. Caribou Creek is in northern Idaho.

IDEQ developed the Pend Oreille tributaries sediment total maximum daily loads (TMDLs) in 2007. First, IDEQ used a sediment modeling exercise to determine the existing sediment loads and the target sediment loads. Then, IDEQ calculated the necessary sediment load reductions by subtracting the target sediment load (natural background) from the existing load. According to the TMDL calculations, sediment loads in Caribou Creek needed to be reduced by 2,186.8 tons per year to meet the target load of 663.4 tons per year, which would allow Caribou Creek to meet Idaho's narrative water quality standard for sediment.



Figure 2. The landowner built a new bridge across Caribou Creek (2015).

Story Highlights

Manulife, whose clients are the primary landowners in the Caribou Creek watershed, went beyond legal requirements to reduce sediment sources. Manulife completed numerous improvements along 28 miles of road, including: (1) replacing a culvert on USFS road at the mouth of Caribou Creek, (2) replacing a bridge at mile 4 on Caribou Creek in conjunction with IDL timber sale/cost-share, (3) upgrading and replacing culverts on a road system via cost-share with IDL, (4) discontinuing use of 0.5 miles of road between Hellroaring and Caribou creeks, (5) installing culverts and reshaping/recontouring a road in preparation for use for hauling, and (6) improving the road surface at stream crossings on the first 2.5 miles of Caribou Creek Road. These projects reduced the amount of sediment entering Caribou Creek.

Results

IDEQ collected Beneficial Use Reconnaissance Program (BURP) data along Caribou Creek in 2014 and 2017 for three categories: macroinvertebrates, fish, and habitat. Caribou Creek earned BURP scores of 2.67 (in 2014) and 2.0 (in 2017), both of which met or exceeded the minimum score of 2.0 that indicates full support of the cold water aquatic life beneficial use. Data from these assessment years showed limited pool

embeddedness with stable sediment. The channel banks were stable, and undercut banks were mostly stable and had abundant overhanging vegetation. The riparian area was healthy, with little corridor development. The Idaho Department of Fish and Game (IDFG) also observed numerous cutthroat trout in multiple age classes in 2014 and 2017. Bull trout were also present. IDEQ conducted a road survey in 2015, which showed the forest roads to be in excellent condition, with many new culverts and a major bridge replacement (Figure 2).

Because the 2001 Clark Fork/Pend Oreille Subbasin Assessment and TMDL document did not clearly explain how the sediment loads were calculated in the TMDL, a quantitative evaluation of sediment load reductions could not be made. Instead, IDEQ reviewed BURP scores, other ecosystem data, and evidence of nonpoint source control project implementation to determine the AU support status. As a result of the weight of evidence, IDEQ determined that the sediment load reductions have been met, and Caribou Creek (AU ID17010214PN045_02) is now supporting cold water aquatic life use and salmonid spawning use. Caribou Creek will remain listed as impaired for temperature pending future review.

In 2018, IDFG and Avista supported habitat assessments in Caribou and Hellroaring Creeks. Although Caribou Creek currently supports healthy populations of bull trout and westslope cutthroat trout, a restoration strategy was developed that will further improve habitat throughout the basin.

Partners and Funding

Manulife funded and led the planning and implementation of erosion control projects on land they manage, with assistance and cooperation from USFS and IDL. IDEQ and IDFG conducted monitoring and assessments of Caribou Creek. The 2018 assessment by IDFG and Avista was supported by \$62,000 through Avista's Idaho Tributary Habitat Acquisition and Fishery Enhancement Program, which is funded by the Clark Fork Settlement Agreement—a decades-old hydropower dam agreement that addresses ongoing resource issues in the Clark Fork River and Lake Pend Oreille tributary watersheds.

For additional information contact:

Bob Steed

Idaho Department of Environmental Quality
Surface Water Manager, Coeur d'Alene Regional Office
208-769-1422 • robert.steed@deq.idaho.gov

David Bergvall

Manulife Investment Management
Associate Director, Environment and Policy
dbergvall@manulife.com



U.S. Environmental Protection Agency
Office of Water
Washington, DC

EPA 841-F-23-001R
December 2023