
APPENDIX O—WATERSHED AND STREAM WATER QUALITY CONDITIONS

Much of the following discussion of existing watershed and stream water quality conditions in the watersheds containing BLM land is derived from completed watershed assessments and total maximum daily loads for water quality limited segments in those watersheds. Many of the total maximum daily loads have not yet been completed.

Snake River Basin. The Hells Canyon Dam, near the southwest corner of the CFO, is the uppermost point on the Snake River accessible to anadromous fish (salmon, steelhead). A small portion of the watershed of the Snake River within the CFO is above Hells Canyon Dam (the Brownlee Reservoir reach), but there are no BLM lands in this area.

Downstream of Hells Canyon Dam is characterized by steep-sided canyons, with a narrow rapidly flowing river with stretches of white water. Above the confluence with the Salmon River, the flow in the river is controlled mainly by releases from the Hells Canyon reservoir complex. There are scattered blocks of BLM land on the slopes of the Idaho bank of the river, totaling a little less than 4,000 acres (6.25 square miles). Adjacent to the river on the opposite bank, in Oregon, most of the land belongs to the Hells Canyon National Recreation Area. The average annual precipitation in the Hells Canyon area is about 12.5 inches, based on measurements at Lewiston (IDEQ and Oregon Department of Environmental Quality 2004). The reservoirs trap sediment and nutrients and keep the stream temperature cool because the water is released from deep in the reservoir.

The Imnaha River in Oregon is the main tributary in the segment above the confluence with the Salmon River. It contributes less than three percent to the flow in the Snake River. A Total Maximum Daily Load for temperature in the Imnaha River was completed by Oregon Department of Environmental Quality in 2001 (IDEQ and Oregon Department of Environmental Quality 2004). Because this reach of the Snake River is shared between Oregon and Idaho, each state has separately listed pollutants that affect the designated beneficial uses of the river, which include salmonid habitat, primary contact recreation, and domestic water supply, among others. The State of Oregon lists the Hells Canyon segment due to mercury and temperature, while the State of Idaho lists it only based on temperature. The mercury listing is based on human fish consumption. Although the mercury data are considered inadequate, mercury is believed to originate from upstream sources and has been identified as a contaminant in upstream fish (IDEQ and Oregon Department of Environmental Quality 2004). The mercury is believed to result from legacy mining activity both on tributaries to the Snake River and in the mainstem. A Total Maximum Daily Load for mercury is expected to be issued in 2006 (IDEQ and Oregon Department of Environmental Quality 2004).

Temperature is listed due to violation of the standards of both states intended to support of salmonid habitat. There is some uncertainty as to the adequacy of the temperature data as a basis for a Total Maximum Daily Load because the measurements are instantaneous values rather than averaged over time. Measured summer temperatures have ranged up to 22 degrees Celsius (72 degrees Fahrenheit), which exceeds the 13 degree maximum weekly temperature target identified in the Total Maximum Daily Load (IDEQ and Oregon Department of Environmental Quality 2004).

Elevated concentrations of dissolved gases (air), due to incorporation of air during releases from the Hells Canyon Dam, are believed to occur when spills exceed 2,000 to 3,000 cubic feet per second. Elevated dissolved gases can reduce anadromous fish survival, but this criterion is not a listed value.

The watershed below Hells Canyon Dam is included within the Imnaha-Snake River Recovery Unit of the USFWS' Bull Trout Draft Recovery Plan (USFWS 2005b). Bull trout spawn only in the upper portions of tributary streams. Only fall chinook and mountain whitefish spawn in the mainstem (October 23 to April 15) (IDEQ and Oregon Department of Environmental Quality 2004). Among the threats to bull trout identified in the recovery plan for this unit are irrigation withdrawals affecting water flow and poorly managed livestock grazing affecting stream habitat conditions. The Total Maximum Daily Load for the Snake River discusses these conditions, but concludes that agricultural irrigation is limited within the watershed as most of the land is dry farmed. There are only minor agricultural return flows. Also, livestock densities are relatively low (IDEQ and Oregon Department of Environmental Quality 2004). Within the Hells Canyon reach, three tributaries on the Idaho bank are listed for sediment as a pollutant: Divide Creek, Wolf Creek, and Getta Creek. Total Maximum Daily Loads for these streams were scheduled to be prepared by 2007, according to the settlement agreement between US EPA, IDEQ, and the Idaho Conservation League and the Lands Council.

The Snake River mainstem below the confluence with the Salmon River is not listed in the current IDEQ Section 303(d) list (IDEQ 2002). However, it is listed for temperature in the State of Washington's 1998 303(d) list, based on "3 excursions beyond the criterion...between 7/1/87 and 7/1/91" (Washington Department of Ecology 2000). CFO land holdings in the watershed of this reach (on the Idaho bank) include over 17,000 acres (nearly 27 square miles). Together, about 15 percent of the lands managed by the CFO are in the watershed of the Lower Snake River between Hells Canyon Dam and the Washington State boundary.

Salmon River Basin. More than half of the BLM lands in the CFO are in the Salmon River Basin, primarily in the Middle (Chamberlain Creek reach), Lower, and Little Salmon watersheds. Total Maximum Daily Loads for the Little Salmon and Lower Salmon Rivers are scheduled to be completed in 2007 (Settlement Agreement 2002).

The BLM lands within the Middle Salmon-Chamberlain Creek subbasin occupy a tract five miles long and four miles wide that includes the Marshall Mining District. This tract is within the Nez Perce National Forest, about one mile south of the Salmon River. The tract is drained by several creeks that are tributary to the Salmon River, including Carey Creek, Long Tom Creek, Bear Creek, and Maxwell Creek. These are first or second order streams, in narrow V-shaped channels with steep gradients. A small portion of the southwest corner of the tract, containing Marshall Lake, drains south to Lake Creek, which is in the watershed of the Secesch River. The area is about ten miles northwest of the town of Warren, a historical mining area. Based on data from Warren, which is about ten miles to the southeast of Marshall Mountain, the mean annual precipitation in this area is about 27 inches, and the annual snowfall is about 177 inches. Although there have been concerns about sediment loadings in the Salmon River, primarily from inflows of sediment from the South Fork Salmon River, neither the Middle Salmon-Chamberlain Creek reach, nor any of the streams that traverse the Marshall Mountain Mining District are currently listed as Section 303(d) impaired water bodies (IDEQ 2002).

Clearwater River Basin. More than one-fourth of the BLM-managed land in the CFO is in the Clearwater Basin. Most of that land is in the South Fork and Lower Clearwater subbasins. Total Maximum Daily Loads for water quality limited streams in the South Fork have been completed, but those for the Lower Clearwater River are under development.

Most of the BLM land in the South Fork Clearwater is concentrated in a 36-square-mile tract around Elk City, within the Nez Perce National Forest, but there are scattered parcels along some of the tributary streams to the South Fork Clearwater. Elk City is near the headwaters of the South Fork, where a number of tributaries converge, including the Red River, American River, Big Elk Creek, and Little Elk Creek. The elevation at Elk City is about 6,382 feet and precipitation averages about 30 inches per year, but exceeds 50 inches on the ridge tops to the north. About 40 percent of this precipitation is snow. The highest stream flows on the South Fork near Elk City typically occur from snow melt in late April to June. Rain-on-snow also accounts for some high flows from November through March. Tributary streams draining the Camas Prairie, at the downstream end of the South Fork, typically experience the highest flows during winter, due to rain-on-snow events (IDEQ and US EPA 2003).

In addition to the South Fork Clearwater River itself, several of the tributaries of the South Fork, including Buffalo Gulch, Big Elk Creek, and Little Elk Creek, which are in the watershed of the American River and drain BLM land in the Elk City area, are 303(d) listed waters, for which Total Maximum Daily Loads have been identified. Cottonwood Creek, Threemile Creek, and Butcher Creek, which drain BLM lands on the Camas Prairie, are also 303(d) listed waters. Water quality considerations are discussed below.

The Elk City area, including the watershed of the American River, has been highly affected by human activity, including historic dredge mining, grazing, timber harvesting, and road encroachment. There are about 200 miles of roads in the watershed. According to the Forest Service, about half of the watershed has low human development, including portions of Big and Little Elk Creeks, which are part of the municipal watershed of Elk City. However, much of the watershed is not properly functioning (IDEQ and US EPA 2003).

Buffalo Gulch has been affected by dredge mining, roads, logging, and grazing. The stream is also habitat for salmonids. The stream banks are unstable, and the stream receives high levels of sediments, is affected by high summer water temperatures, and lacks good quality pools.

Both Big Elk Creek and Little Elk Creek also provide habitat for salmonids and other fish species. Bull trout may use the streams, both of which have been affected by grazing, roads, and logging and by unstable banks, lack of pools, high summer water temperatures, and sediment deposition.

The South Fork Clearwater River is water quality limited from the confluence with the Red River to the confluence with the Middle Fork Clearwater at Kooskia. It has been affected by historic mining on tributaries and on the mainstem, by clearcut timber harvesting that occurred from 1960 to 1990, and by road building. Highway 14 parallels the river and has encroached on riparian areas, floodplain, and the river channel along some reaches.

The Camas Prairie tributary streams drain silt-loam glacial outwash soils that overlie basalt lava flows. The streams support salmonid species, but the watersheds have been heavily affected by agricultural activity, which has resulted in erosion, channel destabilization, and sediment deposition. Feedlots and grazing have affected some stream reaches. Cottonwood Creek drains an area of about 125,000 acres, from an elevation of 5,730 feet at Cottonwood Butte to about 1,332 feet at the Clearwater River. The watershed is used primarily for agriculture. About three-quarters of the land is used for dryland farming. Another 20 percent is rangeland or pasture, and the remainder is forest. The primary sources of pollutants are agriculture, livestock grazing, feed lots and dairies, timber harvesting, urban runoff, and sewage. The Cottonwood wastewater treatment plant is permitted to discharge to Cottonwood Creek from November through March. BLM lands account for less than 1 percent of the lands in the watershed. Nearly all of the remaining land is privately owned (IDEQ et al. 2000). The watershed of Threemile Creek drains about 25,000 acres, about half a percent of which the BLM manages, and the rest is privately owned. It is affected by dryland farming and livestock grazing, by nonpoint urban runoff from Grangeville, and by sewage effluent. Similarly, Butcher Creek drains approximately 11,000 acres, of which less than 0.001 percent is managed by BLM, two percent by the State of Idaho, and the rest is privately owned. It is affected primarily by cattle grazing, recent increases in housing construction, and logging (IDEQ and US EPA 2003).