2.3 Overview of Segments within the SR-HC TMDL Reach

Because of the extensive scope of this TMDL (RM 409 to RM 188), the SR-HC TMDL reach has been divided into five smaller segments (Figure 2.3.1) on the basis of hydrology, management, listed pollutants and designated beneficial uses.

- The Upstream Snake River segment (RM 409 to 335, 74 miles)
- The Brownlee Reservoir segment (RM 335 to 285, 50 miles)
- The Oxbow Reservoir segment (RM 285 below Brownlee Dam to RM 272.5, 12.5 miles)
- The Hells Canyon Reservoir segment (RM 272.5 below Oxbow Dam to RM 247, 25.5 miles)
- The Downstream Snake River segment (RM 247 below Hells Canyon Dam to RM 188, 59 miles)

The Upstream Snake River segment (RM 409 to 335) includes the riverine section of the Snake River upstream of the reservoir impoundments. It extends from where the river intersects the Oregon/Idaho border (near the town of Adrian, Oregon), downstream to Farewell Bend. All of the major tributary inflows to the SR-HC TMDL reach (with the exception of the Burnt and Powder rivers) enter the mainstem Snake River within this segment. The vast majority of agricultural and urban/suburban landuse occurs within this segment of the SR-HC TMDL reach. Flow within this segment is primarily driven by snowmelt and seasonal precipitation events, upstream and tributary impoundments, and irrigation diversions and returns.

The Brownlee Reservoir segment (RM 335 to 285) includes Brownlee Reservoir from Farewell Bend through Brownlee Dam. Total reservoir volume is 1,420,000 acre-feet. While Brownlee Reservoir contains three fairly distinct hydrological regions: the riverine zone near the tailwaters (roughly RM 335 to RM 315), the transition zone (roughly RM 315 to 305), and the lacustrine zone (RM 305 to 285); water management and water quality concerns are well correlated with the reservoir boundaries. Flow into Brownlee Reservoir is almost exclusively the product of the outflow of the Upstream Snake River segment which becomes the tailwaters of the reservoir at RM 335, and the Burnt and Powder rivers that flow directly into Brownlee Reservoir at RM 327.5 and RM 296 respectively. However the inflow of these two tributaries is relatively minor when compared with the inflow from the Upstream Snake River segment (3.6% combined total). Flow and residence time within the reservoir is controlled by outflows through Brownlee Dam. Average residence time is 34 days, however, with consideration of the additional internal processes of stratification, depth of withdrawal, flood control requirements and management for power generation, the residence time in different parts of the reservoir can vary considerably.

The Oxbow Reservoir segment (RM 285 to 272.5) includes Oxbow Reservoir from the outflow of Brownlee Dam to Oxbow Dam. This segment is much smaller than the Brownlee Reservoir segment (total reservoir volume is 57,500 acre-feet), and has an average retention time of only 1.4 days. Flow into Oxbow Reservoir is made up almost exclusively of the outflow of Brownlee Reservoir. Wildhorse River, which flows directly into Oxbow Reservoir near Brownlee Dam, constitutes less than 1% of the total inflow. Flow and residence times within the Oxbow Reservoir are controlled by water releases from Brownlee Reservoir and Oxbow Dam. Oxbow Reservoir is not operated for flood control. Due to its relatively small size, highly controlled inflow and outflow, and short residence time, water management and water quality concerns in this segment are well correlated with the reservoir boundaries.

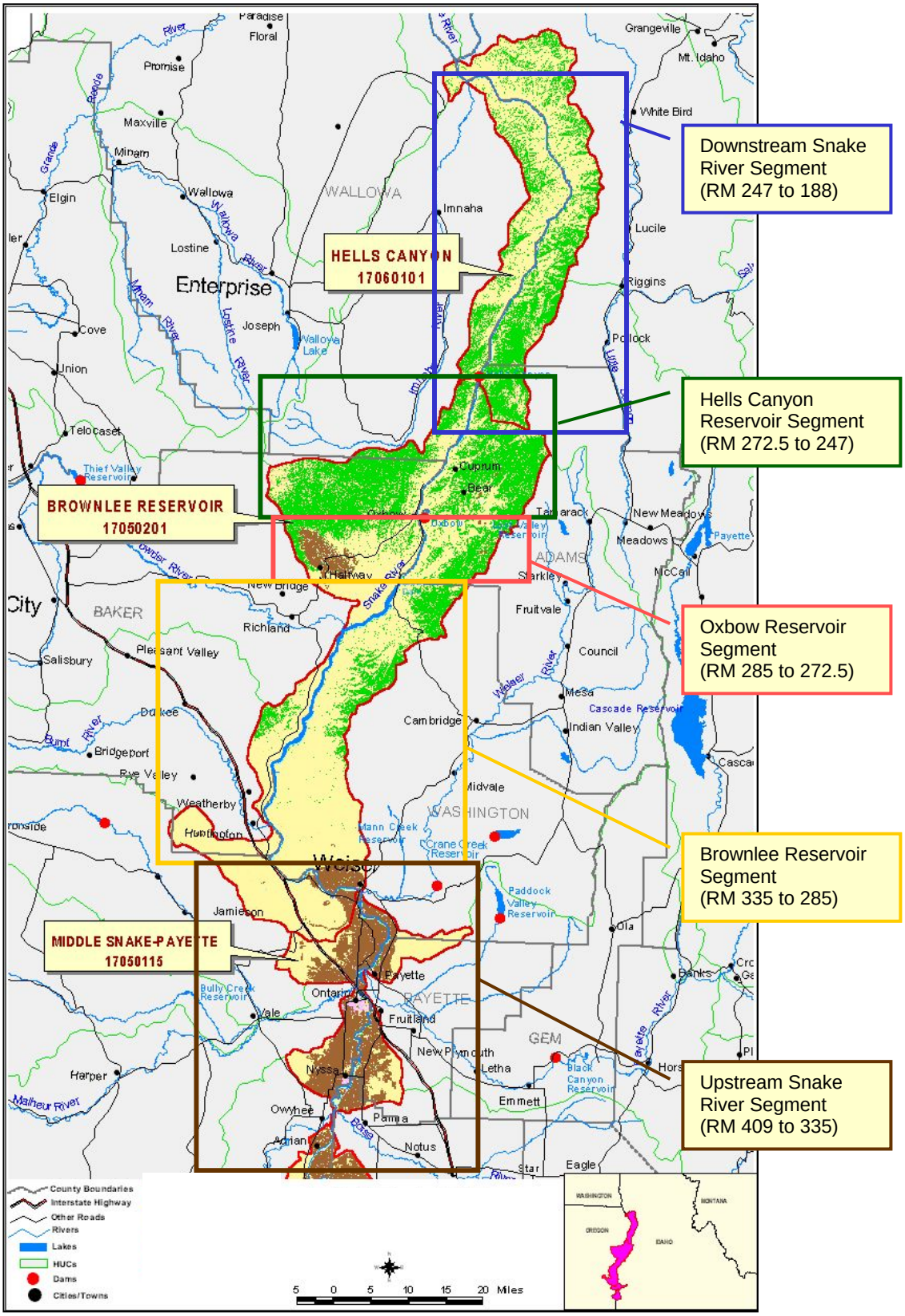

Figure 2.3.1 Snake River – Hells Canyon TMDL Segments.

The Hells Canyon Reservoir segment (RM 272.5 to 247) includes Hells Canyon Reservoir from the outflow of Oxbow Reservoir to Hells Canyon Dam. This segment is also fairly small and fast flowing with a total volume of 170,000 acre-feet and has an average retention time of 4 days. Flow into Hells Canyon Reservoir is made up almost exclusively of the outflow of Oxbow Reservoir. Pine Creek, which flows directly into Hells Canyon Reservoir near Oxbow Dam, constitutes less than 1% of the total inflow. Water releases from Oxbow Reservoir and Hells Canyon Dam control flow and residence times within the reservoir. Hells Canyon Reservoir is not operated for flood control. Due to its relatively small size, highly controlled inflow and outflow, and short residence time, water management and water quality concerns in this segment are well correlated with the reservoir boundaries.

The Downstream Snake River segment (RM 247 to 188) includes the Snake River from below Hells Canyon Dam to immediately upstream of the Salmon River inflow. This segment is a rapid-flowing, narrow river, characterized by high, steep canyon walls and stretches of white water. The flow and volume of this segment are almost completely driven by the outflow of the Hells Canyon Complex reservoirs, and support significant recreational uses year round.

A more detailed discussion of these segments, designated beneficial uses and pollutant listings, as well as the relationship between water quality data and pertinent SR-HC TMDL water quality targets is presented in Sections 2.3.1 through 2.3.5.

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