



*Figure 3-5. Photo example of a straight, homogenous, armored, and over-widened channel segment found in the project area. Note the large material and lack of low-flow channel definition.*



*Figure 3-6. Photo example of a straight, homogenous, armored, and over-widened channel segment in the project area. Note the large material and lack of habitat diversity.*

### 3.3 Fish Use and Habitat Availability

Bear Creek is utilized by ESA-listed spring Chinook salmon and summer steelhead, with spawning and rearing for both species documented within the project area. Other important native species, including ESA-listed bull trout, Oregon Sensitive Species redband trout, and lamprey, also utilize Bear Creek and the project area (GRMW, 2024). ODFW conducted a mussel survey on Bear Creek in August 2025 and found no evidence of mussels within Bear Creek. The identified limiting factors for spring Chinook salmon and summer steelhead include lack of habitat quantity and diversity, elevated summer water temperatures, diminished streamflow, reduced floodplain connectivity and function, and degraded riparian conditions. The highest priority limiting life stages are adult immigration and fluvial migration. Summer and winter rearing for all species is a medium priority (GRMW, 2024).

The lack of habitat quantity and diversity on Bear Creek can be summarized as a lack of pools, a lack of spawning-sized sediment, and a lack of hydraulic diversity. All of these habitat concerns are inter-related and can be improved upon by leveraging the same processes. The existing channel bed material is characterized by an armor layer of large cobble and boulder material that is not readily mobilized. This is generally the case for the entire project area, but the size of the material is largest on the reaches that are straight and over-widened while various amounts of sand and gravel have been deposited in dynamic reaches influenced by large woody structures (see geomorphic discussion in Section 3.2 above). A straight, over-widened, and heavily armored channel is problematic from a habitat perspective for a number of reasons, including:

- Infrequent pool formation
- Shallow, disconnected flows during low-flow conditions
- Little-to-no sediment sorting of spawning gravel-sized material

#### 3.3.1 Brook Trout

As a project sponsor, ODFW is interested in the potential impact of restoration efforts to non-native fish species, especially eastern brook trout (*Salvelinus fontinalis*), and ensuring that efforts to improve fish habitat for threatened native fluvial bull trout will not benefit brook trout. The project sponsors have worked closely with ODFW district fish biologists during the design iterations to identify any concerns related to the potential of increasing brook trout habitat. District biologists have stated that there is not currently an established brook trout population within the project reach, but there is a population located upstream in Bear Lake and within the uppermost reaches of Bear Creek below the lake. ODFW is currently working on an eradication effort and is seeing systematic decreases in brook trout numbers; it is anticipated the population will be eradicated within the next five years. The district biologists have stated that they are comfortable with the design and feel this effort will do more to benefit bull trout and native salmonids and is low risk for brook trout establishment (W. Morton, personal communication, September 11, 2025).

### 3.4 Riparian Conditions and Wetlands

Based on National Resource Conservation Service (NRCS) soil maps, the primary soil type overlaying the Bear Creek floodplain is identified as a Mippon loam, 0 to 3 percent slopes, which consists primarily of mixed alluvium. The dominant texture of the soil surface is fine, sandy loam and loam mixed with slightly decomposed plant material (Ecosystem Sciences, 2025; Appendix D).

The vegetation regime within the project area consists of an overstory of black cottonwood (*Populus trichocarpa*), mountain alder (*Alnus incana*), and various coniferous species (e.g., *Pinus ponderosa*, *Pseudotsuga menziesii*), and a tree/shrub stratum that is dominated by various willow species. Black cottonwood, willow, and alder saplings were observed near the wetted edge of the river along cobble bars throughout the project area. The floodplains are densely forested, providing substantial shade and sources for wood recruitment, as shown in Figure 3-7. There is a noticeable lack of willow and cottonwood recruitment along the margins of Bear Creek, as