

downstream of Merwin Dam includes a self-sustaining population of wild fall Chinook. Hatchery stocks of spring Chinook, early and late coho, winter and summer steelhead, and sea-run cutthroat trout also inhabit the Lewis River. Sturgeon, lamprey, eulachon smelt, northern pikeminnow (*Ptychocheilus oregonensis*, formerly known as northern squawfish), whitefish, and chum, pink, and sockeye

salmon are occasionally observed downstream of Merwin Dam. More information for the selected species discussed below can be found in the supporting BA.

#### *Existing Fish Species*

Numerous fish species are known to occur in Lake Merwin, Yale Lake, and Swift Reservoir (see supporting BA and BO).

A list of analysis species was developed during planning sessions conducted for the Lewis River Watershed Studies scoping process. Contributors to this list include but are not limited to: WDFW, NMFS, USFWS, and USFS). Analysis species to be included in aquatic studies are listed in Table 7.3–1 (note this list also includes taxonomic groups or guilds).

TABLE 7.3–1—AQUATIC ANALYSIS SPECIES TO BE ASSESSED DURING AQUATIC RESOURCE STUDIES OF THE LEWIS RIVER BASIN.

Analysis species	Selection criteria
Chinook salmon .....	Potential sensitivity to changes in aquatic and riparian habitat quality and connectivity. Strong ecological interactor.
Coho salmon .....	Potential sensitivity to changes in aquatic and riparian habitat quality and connectivity. Strong ecological interactor.
Chum salmon .....	Potential sensitivity to changes in aquatic and riparian habitat quality and connectivity. Strong ecological interactor.
Steelhead trout .....	Potential sensitivity to changes in aquatic and riparian habitat quality and connectivity. Strong ecological interactor.
Sea-run cutthroat trout .....	Potential sensitivity to changes in aquatic and riparian habitat quality and connectivity. Strong ecological interactor.
Pacific lamprey .....	Special habitat requirements during spawning and rearing stages. Important ecological species.
White sturgeon .....	Long-lived species which may have been affected by construction of dams. May be vulnerable to overharvest.
Northern pikeminnow .....	Top level predator. May have increased in numbers due to construction of dams.
Mountain whitefish .....	Native species with some habitat requirements that differ from other salmonids.
Bull trout .....	Federally listed threatened species. Unique habitat requirements. Top level predator.
Kokanee .....	Important introduced sport fish. Planktivore. Interspecific interactions with native fishes may be important.
Sculpins .....	Require cool water temperatures. Many species associated with high stream gradients. Benthic species.
Threespine stickleback .....	Present in Yale and Merwin. Interspecific interactions with kokanee fry may be important.
Largescale sucker .....	Juveniles may constitute important prey item for bull trout.
Aquatic macroinvertebrates and zooplankton guilds.	Changes in these communities may indicate changes in ecological conditions.

The following sections present information on the status of several key aquatic species in the Lewis River basin.

#### *Chinook Salmon*

In the Lewis River, spring Chinook have been supplemented with Cowlitz and Carson hatchery stocks since 1956 (pers. comm., R. Nicolay, WDFW, 1999). The bright fall Chinook run is considered a wild run although the run has experienced intermittent supplementation from 1930 through 1986 (pers. comm., R. Nicolay, WDFW, 1999). This stock is one of only two self-sustaining, wild fall Chinook salmon populations in the Columbia River basin. The Lewis River bright fall Chinook salmon is a designated index stock used for monitoring purposes under the Pacific Salmon Treaty. The Tule fall Chinook run has also been supplemented with Kalama stock since 1930.

#### *Chum Salmon*

Very little is known about the life history of chum in the Lewis River. Smoker *et al.* (1951) confirmed the presence of chum in the Lewis River

downstream of Merwin Dam. Chambers (1957) reported 96 chum spawning just downstream of Merwin Dam in mid-November of 1955. Chum were sighted occasionally during 1998 fall Chinook spawning surveys, and four adult carcasses were observed in Cedar Creek. In addition, about 45 juvenile chum were captured during seining operations related to a smolt residual study in 1998 (pers. comm., S. Hawkins, WDFW, 1999). Annually, about three or four adult chum have also been captured at the Merwin fish trap (pers. comm., R. Nicolay, WDFW, 1999).

#### *Steelhead*

The Lewis River supports populations of winter and summer steelhead. The number of adults returning to the river and run-timing for each of these species are determined by trapping adult migrants in the fish ladder at the Lewis River hatchery and the fish trap at Merwin Dam. In addition, WDFW conducts spawning surveys on the East Fork Lewis River and Cedar Creek. The primary steelhead spawning and rearing areas in the Lewis River are located downstream of Merwin Dam in the

mainstem, Cedar and Johnson creeks, and the East Fork Lewis River. WDFW continues spawning surveys on Cedar Creek and has installed a trap at the Grist Mill fish ladder to monitor upstream migration and to segregate hatchery and wild stocks. There are no existing data on the average annual size of the natural outmigration.

#### *Bull Trout*

Currently, bull trout are listed as threatened under the ESA and are present in all three reservoirs. Self-sustaining bull trout populations exist in Yale and Swift reservoirs. Bull trout found in Lake Merwin are thought to be introduced from upstream, either through spill or turbine operations. There is no known spawning habitat available to bull trout in the reservoir.

The Columbia River population of bull trout is comprised of 141 subpopulations. The Lewis River basin contains two of the 20 subpopulations in watersheds of nine major tributaries of the lower Columbia River (63fr111, June 10, 1998). The number of bull trout inhabiting the Lewis River basin is believed to be low. Spawning and