SECTION 45 – Table of Contents

45 Lake Rufus Woods Subbasin Overview

Section 45 Lake Rufus Woods Subbasin Overview is adapted from the Lake Rufus Woods Subbasin Summary Report (2000).

45.1 Regional Context for Lake Rufus Woods Subbasin

The Lake Rufus Woods Subbasin is one of six subbasins within the IMP and is bounded in the west by the Okanogan Subbasin within the Columbia Cascade Province and to the east by the San Poil and Upper Columbia subbasins. The Subbasin is differentiated by the portion of the Columbia River and tributaries from Chief Joseph Dam to Grand Coulee Dam in north central Washington state.

45.2 Lake Rufus Woods Subbasin Description

45.2.1 General Location

Lake Rufus Woods is a 51-mile long Columbia River mainstem impoundment located in north central Washington. Lake Rufus Woods is bounded by Chief Joseph Dam at river mile (RM) 545.1 at its lower end, and Grand Coulee Dam at RM 596.6 at its upper end. The Colville Indian Reservation borders the entire north shoreline of the lake in Okanogan County and the southern portion of the Subbasin is located in Douglas County. The Nespelem River is the major tributary and enters Lake Rufus Woods at RM 582 (Figure 1). Several lakes and small tributary streams also provide fish habitat, most of which are located on the Colville Indian Reservation.

45.2.2 Drainage Area

The Lake Rufus Woods Subbasin encompasses approximately 915 square miles of Douglas and Okanogan counties. The watershed for the Nespelem River consists of 224 square miles and exists entirely on the Colville Confederated Tribes (CCT) (EPA 2000). A natural waterfall located at RM 1.5 historically blocked anadromous fish and continues to block adfluvial resident species from the majority of the Nespelem watershed. Coyote Creek is the only other watershed that could have sustained anadromous fish, but access was blocked to fish with the completion of Chief Joseph Dam.

45.2.3 Climate

The Subbasin has a continental climate that is influenced by maritime air masses from the Pacific coast. The average annual temperature is 9° C (49° F), with July being the warmest month and January being the coldest. The annual precipitation for the area is 27 cm (10.5 inches) with approximately 5 cm (21 inches) of snowfall (Weather Underground 2000).

45.2.3 Geology

The Lake Rufus Woods Subbasin lies on three geologic provinces: (1) the Kootenay Arc that the Nespelem River flows through, (2) the Okanogan subcontinent to the north, and (3) the Columbia Plateau to the south. The Kootenay Arc was the old coastal plain of North America in the Paleozoic period. The Okanogan subcontinent was a small island about the size of California off the west coast in the Mesozoic period. Both of these

collided into the Old North American continent to form the Okanogan highland area, which is mostly old granite folded in layers. The Plateau is a product of numerous volcanic eruptions that created the Miocene basalt flows and is comprised of fine-grained black basalt. A series of flood cannels, known as the Channeled Scablands, were created by floodwaters from glacial Lake Missoula (Alt and Hyndman 1984).

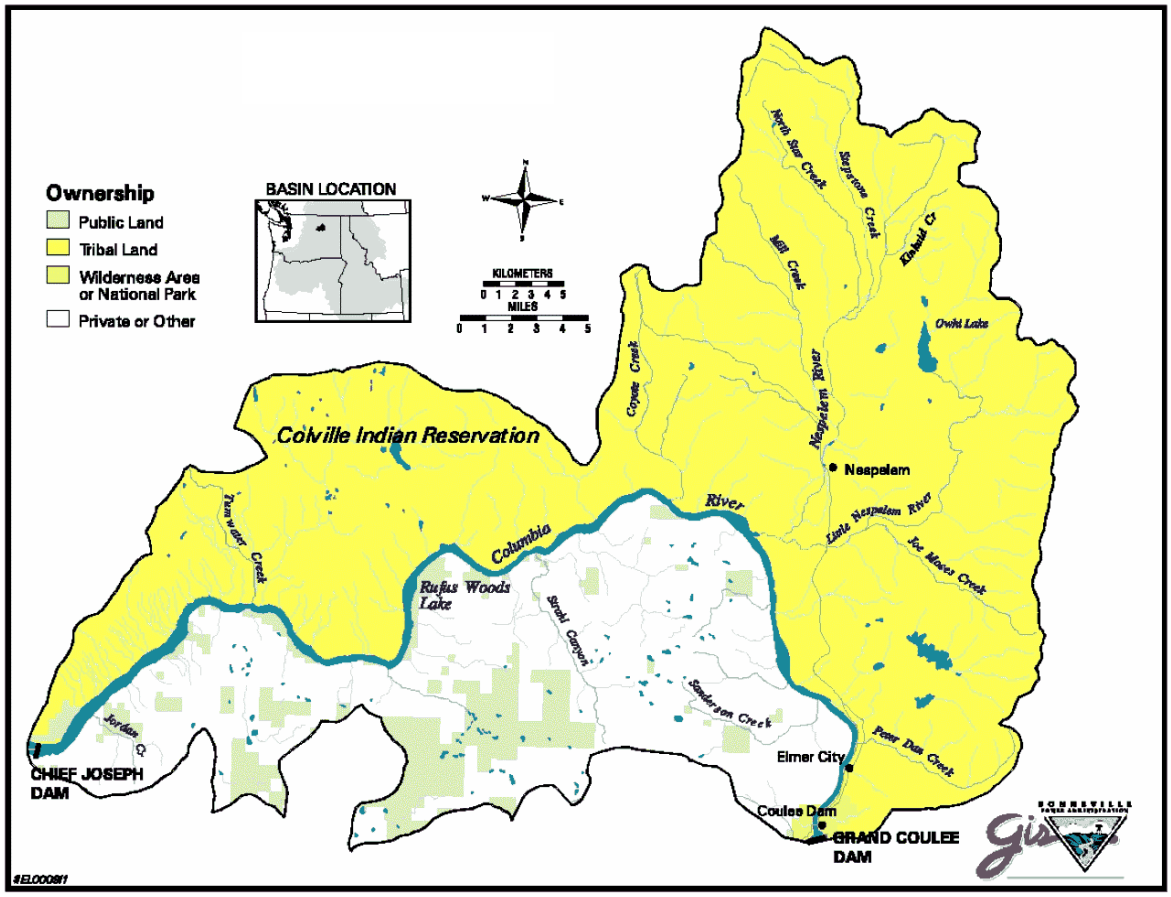

Figure 45.1. Lake Rufus Woods Subbasin

45.2.4 Soils

Soils in these areas are tied to elevation. In mountainous areas, the soil is mostly stony or gravelly sandy loams of one meter or less in depth. At lower elevations the soils are mostly glacial till consisting of glacial out-wash, sands, and gravels that are well drained. The Columbia Plateau has little to no soil on top of the basalt, thus the soil that is found here is mostly loess, a light brown silt loam (Alt and Hyndman 1984).

45.2.5 Vegetation

Shrub-steppe habitats dominate the western and southern portions of the Subbasin. Forested habitats of ponderosa pine and interior mixed conifer forest occur in the higher elevations of the northeastern portion of the Subbasin. Agriculture and related land uses

comprise over 16 percent of the area, primarily south of Lake Rufus Woods. The largest urban centers include Nespelem, Elmer City, and Coulee Dam.

Figure 45.2 shows the current distribution of wildlife-habitat types in the Lake Rufus Woods Subbasin based on IBIS (2003). A map of the historic vegetation of the IMP, including the Lake Rufus Woods Subbasin, is provided in Section 4, Terrestrial Resources in the Intermountain Province (Figure 4.1).

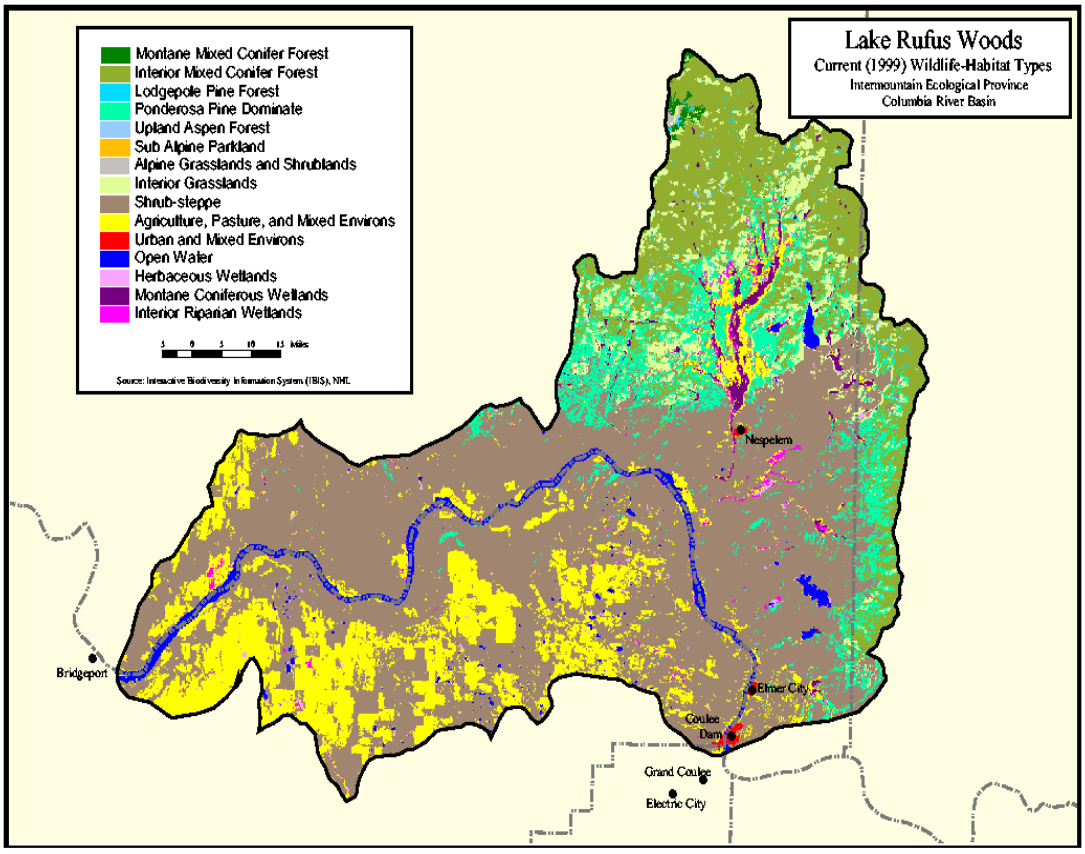

Figure 45.2. Habitat types in the Lake Rufus Woods Subbasin (*Source*: IBIS 1999)

45.2.6 Major Land Uses

The region north of the Columbia River is situated within the Colville Indian Reservation, while south of the Columbia River is mostly comprised of private or public lands (Figure 45.1).

Land uses include ranching, farming, and timber harvest. Private and Tribal lands at lower elevation are used to graze cattle mainly in the winter months. Agriculture (mostly hay fields) is common within the broad floodplains of the Nespelem River Valley.

Timber harvest is limited to the forested headwaters and tributary reaches. Human development in this area and along the Little Nespelem River has resulted in a highly altered river with considerable artificial confinement and water withdrawals. The United States Army Corps of Engineers (USACOE) has several land holdings along Lake Rufus Woods and has developed recreation sites mostly on the western end of the lake near Chief Joseph Dam. An improved boat ramp is available at Seton's Grove located 4 miles downstream of Grand Coulee Dam and two other unimproved boat ramps are located downstream of the Nespelem River mouth on the Colville Indian Reservation. Camping and boat lunch facilities maintained by the USACOE are located 3 miles upstream of the dam. Several shore fishing access sites are provided by the CCT along the northern shoreline but no public access is available along the southern shore of Lake Rufus Woods. With the development of a destination fishery at Lake Rufus Woods, managing people and access has become a larger issue recently and efforts to increase access and reduce impacts will be important to consider when evaluating for future fisheries management efforts.

Chief Joseph and Grand Coulee dams have severely altered the landscape of the Lake Rufus Woods Subbasin. Before construction of Grand Coulee Dam, the Columbia River flowed through the present day Lake Rufus Woods in a near natural state. The construction of Grand Coulee Dam has altered the quantity and timing of the Columbia River throughout much of the mainstem Columbia River, including the present day area of Lake Rufus Woods. In addition, the construction of Chief Joseph Dam changed much of the former large riverine system into the present day reservoir (Lake Rufus Woods). Both Grand Coulee and Chief Joseph dams and their lack of fish passage facilities have completely eliminated all anadromous forms of fishes that once migrated from the Pacific Ocean into the mainstem and tributaries of the Columbia River above the present day site of Chief Joseph Dam. The complete lack of passage has also impacted resident fish, especially adfluvial life history forms and wildlife that historically traveled along the Columbia River corridor.

The large amount of energy produced by Grand Coulee and Chief Joseph dams, along with the increased irrigation capabilities, has helped promote the development of the landscape into a heavily managed area. Agriculture, orchards, logging, and aquaculture operations all currently preside in the Lake Rufus Woods Subbasin (Jeff Korth, District Fish Biologist, WDFW, personal communication, 2003).

Road density in the Subbasin ranges from low to high, with much of the area in the moderate category. Figure 45.3 shows road density, by density class, for each sixth order watershed in the Lake Rufus Woods Subbasin. Road densities are highest on the Colville Reservation within the Smith Creek, Kincaid Creek, Coyote Creek, and upper Nespelem River watersheds, all having road densities greater than 3 mile/square mile (CCT 2000).

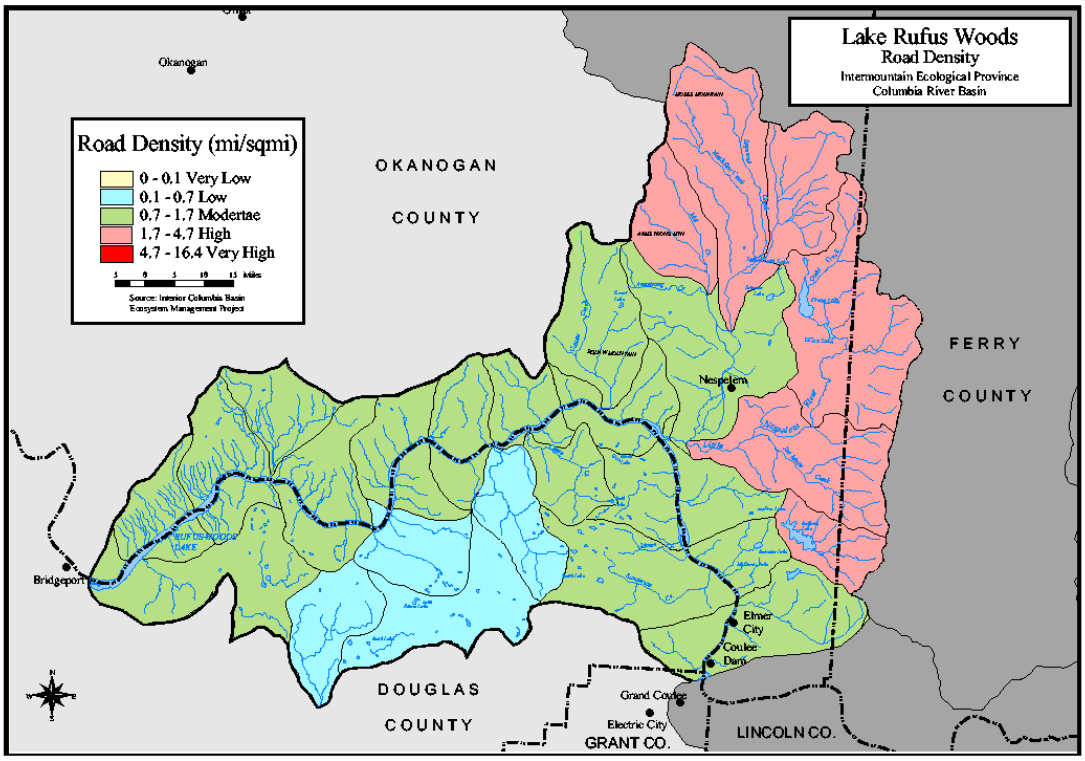

Figure 45.3. Road density in the Lake Rufus Woods Subbasin

45.3 Logic Path

The logic path starts with an overall physical description of the Subbasin, followed by an assessment of aquatic and terrestrial resources from which a management plan was created with specific strategies and objectives to address limiting factors and management goals. In the next section, Section 46: Aquatic Assessment Lake Rufus Woods Subbasin, aquatic resources regarding the historic and current status of selected focal species are described in detail. An analysis based on the QHA technique (described in Section 3) identifies specific habitat attributes that have been altered the most over time relative to the entire Subbasin and which areas in the Subbasin are categorized as having poor or good habitat for the respective focal species. Based on the current status of the focal species, limiting habitat attributes, and management goals recognized in the Subbasin, strategies and objectives were identified and are presented in Section 50 Lake Rufus Woods Subbasin Management Plan. The terrestrial assessment, provided in Section 49, provides a description of the historic and current status of wildlife species and condition of terrestrial habitat types within the Subbasin. Based on the terrestrial assessment and key findings, strategies and objectives were developed and are defined in Section 50: Lake Rufus Woods Subbasin Management Plan.