TER 8 Appendix 2

Fire Ecology and History

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Fire disturbance is an important factor in the ecology of Northwest forest environments. Fire is considered the first major force employed by humans to alter the environment. The presence of fire in forested environments has provided both positive and negative effects to the social and ecological environment. Native Americans and early European settlers used fire to clear land for agriculture, improve vegetation for browsing or grazing, and to drive game for hunting. Society has also viewed fire as detrimental to the production of valuable timber resources and the protection of natural ecosystems.

Some plant species have physiological characteristics that resist the effects of fire or have adapted traits to take advantage of recurrent fires. These physiological factors and the patterns of fire have determined the distribution and development of plant communities in some areas of the west. Trees such as Douglas-fir, western larch (*Larix occidentalis*), and Ponderosa pine (*Pinus ponderosa*) develop a thick bark layer on the lower stem to insulate and protect the trees during ground fires. Other plant species, such as lodgepole pine, and evergreen ceanothus (*Ceanothus velutinus*), have cones or seeds that require the high temperatures usually present in fire-dominated ecosystems to expose or initiate germination of the seeds. The presence of Douglas-fir dominated stands in the lower Lewis River watershed is partly a result of the fire adaptation characteristics of this species compared to western hemlock and western red cedar, which are more susceptible to the effects of fire.

Fire has also been used as a tool for managing wildlife habitat. Understory and site preparation burns stimulate the production of forb and browse species and maintain early successional stage plant communities. These types of burns provide the greatest benefit for the management of ungulate species when conducted in appropriate vegetation types and within proximity to forest stands that can provide cover. The clearcut harvesting practices commonly used throughout the Northwest provide site conditions similar to natural large-scale disturbance events (e.g., wind throw, stand replacement fire, disease, and insect epidemics) that promote the development of early successional stage species.

Although western Washington is well known for the abundant rainfall that allows the growth of diverse forest vegetation and large trees, the weather conditions during June through September can be fairly dry, increasing the risk of forest fires. The natural fire return interval for the western hemlock zone is estimated at approximately 250 years, although it varies greatly within the region (Chappell et al. 2001). Research indicates that drier settings of the Douglas-fir and western hemlock forest types in the western Washington and Oregon region may have an historical fire return interval of approximately 50 years (Heyerdahl et al. 1994). Higher elevation forest types in western Washington, comprised of mountain hemlock and silver fir, have longer fire return intervals than lower elevation forests, extending up to 800 years.

Fires have occurred in the Lewis River area several times in the last 200 years including:

- 1826: Botanist David Douglas noted the presence of recent burned-over land and ongoing forest fires around Fort Vancouver and in the lower Willamette Valley (Morris 1934).

- 1868: Large-scale fires spread throughout western Washington and the Willamette Valley. One of the fires burned as close as Fern prairie, just south of the Lewis River (Morris 1934).

- 1902: In September 1902, 2 large fires swept through the Lewis River valley. These fires converged in the valley between Ariel and Yale. The size of the burned area is estimated at 240,000 acres (DNR 1977). Another fire occurred in the Siouxon Creek drainage near this same time period, and is estimated to have covered 70,000 acres (DNR 1977).

- 1927: Fires reburned parts of the same area that was burned in 1902. The 1927 reburn occurred in the Dole Valley area of the East Fork of the Lewis River and is estimated to have covered about 47,000 acres (DNR 1977).

- 1929: 155,000 to 210,000 acres were burned between Stevenson and Yacolt along the East Fork of the Lewis River (DNR 1977).

- 1952: In November, a fire occurred in the area near Bear Prairie and was estimated at 15,000 acres (DNR 1977).