Appendix B, Chapter 1
Bald Eagle

1.0 Bald Eagle (*Haliaeetus leucocephalus*)

Bald eagles (*Haliaeetus leucocephalus*) are distributed throughout North America, breeding in most of its range; abundance is highest along coastal areas of the northern conterminous states, Canada, Alaska, as well as Florida and South Carolina. Eagles have been observed to reach a maximum age of about 28 years in the wild (Schempf 1997 as cited in Stinson et al. 2001); captive birds have lived to age 47 (Stalmaster 1987 as cited in Stinson et al. 2001). In general, southern areas within this range are more important as wintering areas than breeding areas. In Washington, bald eagles are substantially more abundant in the cool, maritime region west of the Cascade Mountain range (Stinson et al. 2001).

Depending on the level of competition for food and nest sites, bald eagles may attempt to breed at age 3 or as late as age 8 (Gerrard et al. 1992, Bowman et al. 1995, Buehler 2000 as cited in Stinson et al. 2001). Bald eagles develop pair bonds that generally last until one eagle dies (Jenkins and Jackman 1993 as cited in Stinson et al. 2001). Eagles usually return annually to a nesting territory near a reliable food source; breeding adults will defend their territories from intruding eagles. As with breeding site fidelity, bald eagles seem to exhibit a relatively high annual fidelity to wintering areas (Harmata and Stahlecker 1993, Buehler 2000 as cited in Stinson et al. 2001). Communal night roosts are an important component of bald eagle wintering habitat. Eagles may also roost singly, in pairs or gather in large congregations of as many as 500 individuals at locations that are used year-after-year. Roosts may vary widely but studies have shown that communal night roosts provide a microclimate more favorable than available elsewhere in the vicinity (Keister et al. 1985, Stalmaster 1981, Knight et al. 1983, Stellini 1987 as cited in Stinson et al. 2001).

Bald eagle populations throughout its range exhibited a slow decline because of habitat loss, decreased abundance of winter foods, and harassment/hunting since the time of European settlement. Despite protection with the Bald Eagle Protection Act of 1940, harassment by humans continued because of misidentification with golden eagles, poisoning of bald eagles in conjunction with livestock predator control programs, and collection of bald eagle parts for black market collectors or native American ceremonial uses. The population decline accelerated dramatically after the early 1940s with the widespread use of organochlorine pesticides,

particularly DDT (Elliot and Harris 2001-2002). By the 1960s, less than 700 breeding pairs were estimated to exist in the lower 48 states and bald eagles had been extripated from at least seven states within its historical range (Stinson et al. 2001).

The ban of DDT, habitat protection, reduced persecution, and reintroduction projects have aided in recovery of the North American population (Stinson et al. 2001). During the preceeding 25 years, the bald eagle population has doubled every 7-8 years. Most known populations have reached regional recovery goals where applicable, but populations remain below pre-European settlement abundance (Buehler 2000 as cited in Stinson et al. 2001). In Washington the most recent (1998) statewide survey recorded 664 occupied nest sites; this accounts for 12% of the known bald eagle territories across the lower 48 states (Stinson et al. 2001). A recent decline in nest occupancy rate and the occurrence of nest sites in developed areas suggests that nesting habitat in areas of western Washington is approaching saturation (Stinson et al. 2001).

Historically, bald eagles were common and locally abundant throughout Washington; accounts from 1890 indicate that bald eagles were especially abundant near the mouth of the Columbia River (Stinson et al. 2001). No historical population abundance or density estimates are available for bald eagles in Washington. The Washington and Oregon bald eagle populations were included for federal listing as endangered under the Endangered Species Act in 1978. Threats to the population identified at the time of listing included reproductive failure caused by organochlorine pesticides, widespread loss of suitable nesting habitat resulting from logging, housing development, and recreation, and persecution (primarily illegal shooting (USFWS 1978 as cited in Stinson et al. 2001). In 1994, the USFWS proposed to reclassify the bald eagle from endangered to threatened throughout its range; this reclassification was finalized in 1995. In 1999, the USFWS proposed to delist the bald eagle throughout its range, however, this delisting has not been finalized.

Breeding bald eagles require large trees near open water that is not subject to intense human activity and will generally select one of the largest trees in a stand for nesting (Anthony et al. 1982 as cited in Stinson et al. 2001). In Washington, 99% of all bald eagle nests are within 1 mile of a lake, river, or marine shoreline. The distance to open water varies somewhat with shore type; nests tend to be closer to marine shores and rivers than to lake shores. Eagles also require perches distributed throughout their nest territories; perches are prominent points which provide a view of the common foraging area. Because eagles exhibit consistent daily foraging patterns, they often use the same perches (Stalmaster 1987, Gerrard and Bortolotti 1988 as cited in Stinson et al. 2001).

Bald eagles breeding in the lower Columbia River region are year-yound residents and do not migrate during the winter (Garrett et al. 1988). All bald eagle nest sites in this area have been monitored for productivity since the late 1970s, and in recent years there were 96 occupied breeding territories (Isaacs and Anthony 2003). In addition, the area supports an additional wintering population of over 100 eagles. Studies in the early 1980's in the Columbia River estuary indicated eagle diet consisted of 90% fish, 7% birds, and 3% mammals (Watson et al. 1991 as cited in Stinson et al. 2001). Waterfowl were the most common avian prey in nests, while suckers (*Catostomus spp*.), American shad (*Alosa sapidissima*), and carp (*Cyprinus carpio*) were the most common fish prey items. Bald eagles will often steal prey from osprey and gulls, and have even been observed stealing marine invertebrates from sea otters (Watt et al. 1995 as cited in Stinson et al. 2001), and fish from river otters (Taylor 1992 as cited in Stinson et

al. 2001). Diet of bald eagles can vary considerably, depending on the geographic location or the methods used to determine diet composition (Knight et al. 1990 as cited in Stinson et al. 2001).

The lower Columbia River bald eagle population is one of only two regional populations in Washington that has exhibited low reproductive success representative of a decreasing population (the other regional population was in Hood Canal). Significant concentrations of DDE, PCB, and dioxins were found in bald eagle eggs on the lower Columbia River (Anthony et al. 1993, USFWS 1999b, Mahaffy et al. 2001 as cited in Stinson et al. 2001); concentrations of these contaminants were above no-effect levels estimated for the species. Despite low reproduction success, the lower Columbia River bald eagle population has increased, likely as a result of recruitment of new adults from other areas. Although, the reproductive health of the lower Columbia population appears to be improving based on recent linear trend analysis (Stinson et al. 2001), bald eagle productivity and breeding success of pairs nesting below river mile 60 remains low, especially for those pairs nesting between river mile 13 to 31 (USFWS 1999b, Isaacs and Anthony 2003).

The density of nesting eagles depends on many factors that determine habitat quality, such as prey populations, human disturbance, and perhaps the availability of nest and perch trees. Occupied nests of adjacent nesting pairs are generally spaced closer in areas of high quality habitat. The seasonal home range that contains the foraging and nesting habitat of a pair averages about 2.6 mi^2 in the Puget Sound region (Watson and Pierce 1998 as cited in Stinson et al. 2001) and about 8.5 mi^2 in the Columbia River Estuary (Garrett et al. 1993 as cited in Stinson et al. 2001). However, most eagle activity in the lower Columbia River occurs within 0.2 mi^2 of the nest site (Garrett et al. 1993).