3.6. TERRESTRIAL BIOLOGICAL RESOURCES

The overall upland environment of NAVBASE Kitsap Bangor includes typical low-elevation western Washington terrestrial vegetation, terrestrial wildlife, and freshwater wetlands and streams. The following sections describe general upland conditions throughout the entire base, as appropriate, and conditions present at the specific LWI and SPE upland project areas where upland elements of the projects would be located, as well as impacts on these resources that would be expected to result from implementation of these projects.

3.6.1. Affected Environment

3.6.1.1. EXISTING CONDITIONS

The overall upland environment of NAVBASE Kitsap Bangor is a mixture of typical second growth forest stands; open, brushy areas; and developed areas. Much of the land has been retained in a more or less natural state, resulting in high-quality natural resources such as wetlands, surface water and groundwater, and forest communities. These high-quality habitat conditions support a diverse population of plant, fish, and wildlife species, as described below.

3.6.1.1.1. VEGETATION AND HABITATS

Information on NAVBASE Kitsap Bangor vegetation communities, including the upland project area, was obtained in the course of forest resource surveys (International Forestry Consultants 2001), wetland surveys (Johnson Controls 1992; Brown and Tannenbaum 2009), terrestrial and wetland surveys (Pentec 2003), wildlife habitat surveys (Tannenbaum and Wallin 2009), and cultural resources surveys (HRA 2011). These reports include maps and lists of plant species found at surveyed sites. Based on a review of the USFWS Endangered Species Program list of 2013, no federally listed threatened or endangered plant species have been identified or are likely to occur on NAVBASE Kitsap Bangor (USFWS 2013a). Four primary land cover types occur in the upland environment on NAVBASE Kitsap Bangor: (1) forest; (2) brush and shrubland; (3) wetlands, streams, and open water; and (4) developed areas including building complexes, paved industrial areas, lawns, landscaping, and mowed rights-of-way and open grass areas (Table 3.6–1). With the exception of wetlands, which are described in Section 3.6.1.1.3, these cover types, as well as invasive and noxious weeds, are described below.

FOREST

Approximately 68 percent of the NAVBASE Kitsap Bangor upland area, including most of the undeveloped area along the waterfront, is composed of forests. Most forest stands are dominated by coniferous trees, including Douglas-fir, western red cedar, western hemlock, grand fir, shore pine, and western white pine (Table 3.6–1). The forest understory consists primarily of conifer seedlings, evergreen shrubs, ferns and other shade-tolerant plants, lichen, and moss species. Canopy closure in coniferous forest stands averages 70 to 100 percent. Most forest stands on NAVBASE Kitsap Bangor are second growth, that is, stands that have regrown following a major disturbance, most commonly timber harvest prior to Navy acquisition of the lands.

Table 3.6–1. Vegetation Cover Types in the Upland Environment on NAVBASE Kitsap Bangor

Cover Type	Approximate Acreage	Description
Forest	4,888 (68.4%)	**Conifer Forest:** Trees, primarily Douglas-fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), western redcedar (*Thuja plicata*), western white pine (*Pinus monticola*), shore pine (*Pinus contorta var. contorta*), Sitka spruce (*Picea sitchensis*), madrone (*Arbutus menziesii*), and grand fir (*Abies grandis*), with an understory of conifer seedlings and salal (*Gaultheria shallon*), sword fern (*Polystichum munitum*), Oregon grape (*Mahonia nervosa*), rhododendron (*Rhododendron macrophyllum*), and huckleberry (*Vaccinium ovatum*). **Deciduous Forest:** Trees, primarily red alder (*Alnus rubra*), bigleaf maple (*Acer macrophyllum*), and black cottonwood (*Populus trichocarpa*), with an understory of salmonberry (*Rubus spectabilis*), oceanspray (*Holodiscus discolor*), and herbaceous species that include sword fern, rough horsetail (*Equisetum hyemale*), and giant horsetail (*Equisetum telmateia*). Other species found in second-growth deciduous forest include the non-native Himalayan blackberry (*Rubus discolor*) and native Pacific blackberry (*Rubus ursinus*), holly (*Ilex aquifolium*), and colonial bentgrass (*Agrostis capillaris*). **Mixed Forest:** This includes both coniferous and deciduous trees and understory vegetation.
Wetlands, Streams, and Open Waters:	Included in Forest and Brush and Shrubland acreage	Described in Section 3.6.1.1.3
Brush and Shrubland	314 (4.4%)	Native plants include salmonberry, Oregon grape, salal, and oceanspray, as well as herbaceous species that include sword fern, rough horsetail, and giant horsetail. Non-native shrub species include Himalayan blackberry, Pacific blackberry, English holly, and colonial bentgrass.
Developed Areas, including lawn, landscaping, mowed rights-of-way	1,947 (27.2%)	Roads, parking lots, buildings, and other structures. Includes athletic fields, mowed areas such as road rights-of-way, and native and landscaped grass and shrub areas adjacent to developed facilities.
Total	7,149 (100%)	

Source: Navy Region NW Geographic Information System (GIS) data layers

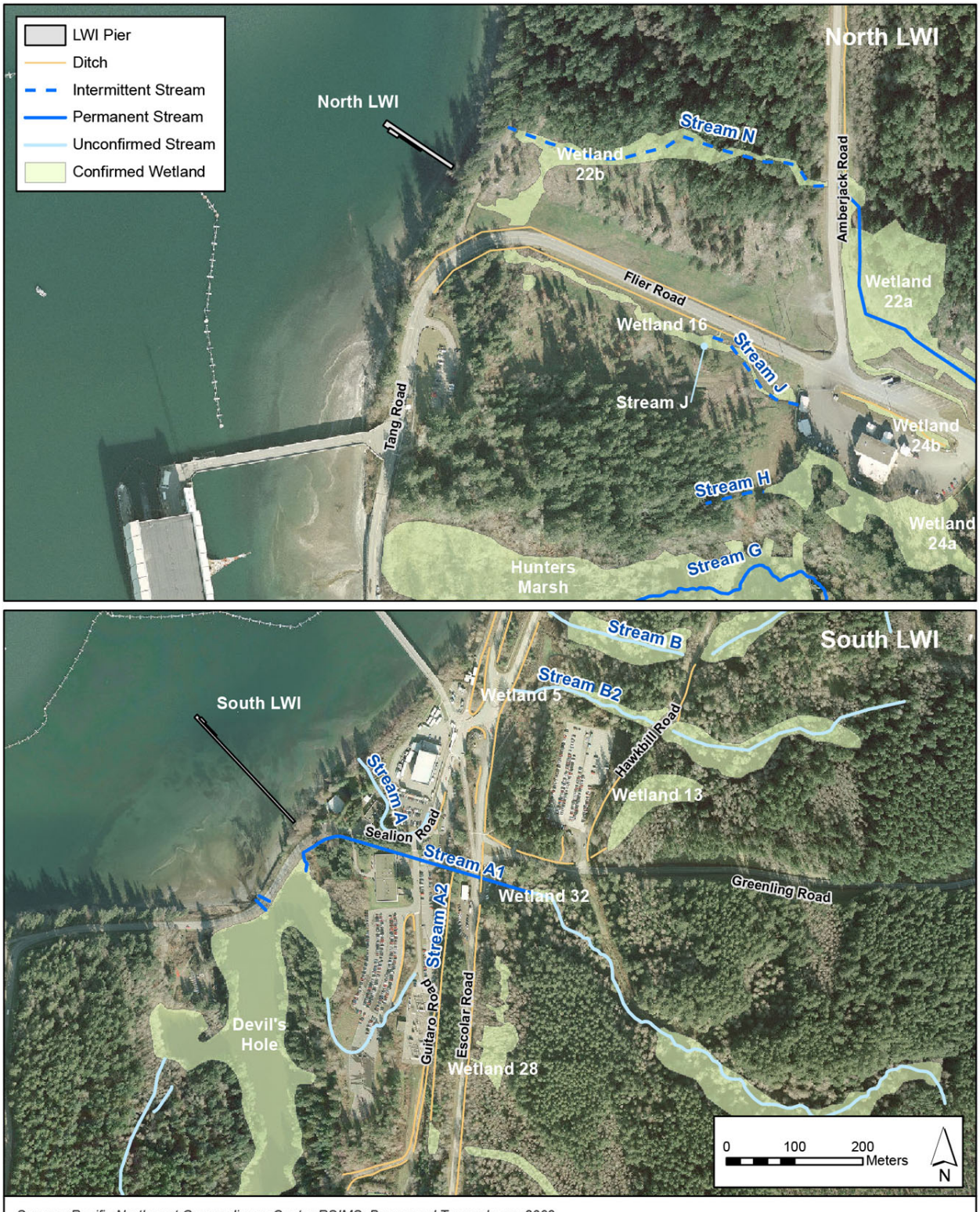
TERRESTRIAL VEGETATION AND HABITATS IN THE VICINITY OF THE LWI PROJECT SITES

The north LWI project site is near a shoreline bluff where a forested strip runs parallel to Tang Road. The forest strip is mixed forest with dominant tree species of Douglas-fir and red alder. Also along the bluff are some unvegetated areas that appear to be natural, likely caused by slides in steep portions of the bluff. This zone is used for perching by raptors and other birds that forage along the shoreline, including bald eagles and kingfishers. It may also provide nesting opportunities for songbirds. Invasive species, including Himalayan blackberry and Scotch broom, are present along the roadside; however, cover of these species was low (up to 3 percent) (International Forestry Consultants 2001). For security purposes, the Navy clears, thins, and maintains a 350-foot (107-meter) zone on both sides of Flier Road. The first 100 feet (30 meters) is maintained free of all trees and undergrowth. In the outer 250 feet (76 meters), trees are thinned and undergrowth is removed by mowing. East of Tang Road, wetlands and their associated streams (Wetlands 16 and 22b and Streams J and N) are present near the north LWI project site, but their value for wildlife is limited because they have been cleared of vegetation (Figure 3.6–1). The wetlands are within the security zone, but some herbaceous/grassy vegetative cover is likely to develop that may provide habitat for amphibians.

Terrestrial vegetation closest to the south LWI project site includes two small patches of trees and a patch of shrubs (primarily non-native Himalayan blackberry) between the shoreline and the north side of Sealion Road. Devil's Hole is approximately 250 feet (76 meters) south of the south LWI project site and is separated from the shoreline by Sealion Road. Devil's Hole is surrounded by coniferous, mixed, and deciduous forests, dominated by Douglas-fir and red alder. The average forest age is 67 to 77 years old, which is slightly older than the average age of forest stands in the waterfront area. Some of the oldest and largest conifers on NAVBASE Kitsap Bangor occur at the south edge of Devil's Hole farthest from the waterfront. Invasive species, including Himalayan blackberry, Scotch broom, and English ivy, cover approximately 5 percent of the area surrounding Devil's Hole and Himalayan blackberry thickets are present along the roadside near the south LWI.

Shoreline vegetation in the vicinity of the south LWI provides perch sites for raptors and other birds and cover for a variety of wildlife species that forage on the shoreline. Devil's Hole and the adjacent shoreline provide high-quality habitat for many wildlife species, such as raptors and carnivores. Otter and mink have been observed crossing Sealion Road from the small Devil's Hole lake to the estuary. Bald eagles, kingfishers, and great blue herons regularly forage in the shallow waters of the area.

Devil's Hole is surrounded on three sides by mature forest stands (Section 3.6.1.1.1) that provide good quality habitat for many wildlife species such as black-tailed deer, small mammals, and songbirds. With the exception of the shoreline adjacent to Sealion Road, forest stands around the lake are relatively undisturbed, which is likely to attract forest-dwelling wildlife species. Emergent or lake fringe wetland is very limited along the lakeshore, offering little habitat for amphibians.



Sources:Pacific Northwest Georeadiness Center RSIMS; Brown and Tannenbaum 2009

Figure 3.6–1. Streams and Wetlands near the LWI Project Sites

TERRESTRIAL VEGETATION AND HABITATS IN THE VICINITY OF THE SPE PROJECT SITE

Vegetation cover at terrestrial sites on the shoreline potentially affected by the SPE project is a combination of forest, shrubs and grassland, and disturbed areas dominated by invasive and non-native shrubs and grasses typical of disturbed shoreline areas of NAVBASE Kitsap Bangor. Dominant tree species include Douglas-fir, red alder, western red cedar, and western hemlock. This habitat is used for perching by raptors and other birds that forage along the shoreline, including bald eagles and kingfishers.

Vegetation at the SPE upland parking lot site east of Sealion Road consists primarily of lowland second growth conifer forest dominated by Douglas-fir, western red cedar, and western hemlock.

The forest understory consists of shade-tolerant conifer seedlings, evergreen shrubs, deciduous shrubs, and ferns. The forest provides good quality habitat for many wildlife species such as black-tailed deer, small mammals, and songbird species. Wetlands in the general vicinity (Section 3.6.1.1.3) are very small but provide habitat for amphibians, reptiles, songbirds, and small mammals. The unnamed stream was classified as potentially perennial and fish-bearing (Anchor QEA 2013) and may provide habitat for aquatic invertebrates. Devil's Hole (with wildlife habitats as described above for the LWI project sites) lies over a low ridge east of the SPE project site.

The site of the proposed parking lot and laydown area for the SPE project includes an abandoned homestead-era orchard approximately 6.4 acres (2.6 hectares) in size located on the corner of Sturgeon Street and Sealion Road (Figure 3.6–2). The orchard consists of old fruit trees associated with a former homestead site and an understory of native and invasive shrub and herbaceous species. A small isolated wetland, described in Section 3.6.1.1.3, was identified at the edge of the orchard (Figure 3.6–2).

3.6.1.1.2. WETLANDS

According to scientists, wetlands are transitional habitats that occur between upland and aquatic environments where the water table is at or near the surface of the land or where the land is covered by shallow water that may be up to 6 feet (2 meters) deep. Wetlands are dominated by plants that can tolerate various degrees of flooding or saturated soils. Freshwater habitats with flowing or deep water, such as rivers, streams, lakes, and ponds, are often closely associated with wetlands. In general, wetlands provide several benefits including flood and stormwater control, baseflow support for streams and groundwater, erosion and shoreline protection, water quality improvement, and support for natural biological systems and wildlife habitat (Hruby 2004).

NAVBASE Kitsap Bangor includes two main watersheds, defined as major surface water drainages separated by topographic divides. The drainages at the base include five sizable perennial streams that enter Hood Canal (part of the northern Hood Canal watershed) and two tributaries of Clear Creek that flow to the southeast and enter into Dyes Inlet (part of the Clear Creek watershed). Some of the perennial streams pass through small lakes or wetlands before discharging into Hood Canal. Most of the wetlands on NAVBASE Kitsap Bangor are palustrine type, emergent, forested, or scrub/shrub wetlands (as defined by Cowardin et al. 1979) that are less than 1 acre (0.4 hectare) in size (Johnson Controls 1992; Navy 2001; Pentec 2003; Brown and Tannenbaum 2009; Anchor QEA 2013).

Sources: Pacific Northwest Georeadiness Center RSIMS; Brown and Tannenbaum 2009; Anchor QEA 2013

Figure 3.6–2. Streams and Wetlands near the SPE Upland Project Area

Wetlands in the project areas were mapped using USACE formal delineation methods (USACE 2010) (Figure 3.6–1, Figure 3.6–2), described using the Cowardin Classification System (Cowardin et al. 1979), and given functional ratings using the WDOE Wetland Rating System (Table 3.6–2) (Hruby 2004).

WETLANDS IN THE VICINITY OF THE LWI PROJECT SITES

Wetlands that occur in the vicinity of the north and south LWI project sites are listed in Table 3.6–3 and described below. Streams in the vicinity of the LWI project sites are also described below. Devil's Hole is the only wetland in the vicinity of the LWI project sites that is included on the National Wetlands Inventory (USFWS 2013b).

Table 3.6–2. WDOE 2004 Wetland Rating System

Category	Description
I	Category I wetlands are those that (1) represent a unique or rare wetland type, or (2) are more sensitive to disturbance than most wetlands, or (3) are relatively undisturbed and contain ecological attributes that are impossible to replace within a human lifetime, or (4) provide a high level of functions. In western Washington the following types of wetlands are Category I: estuarine wetlands larger than 1 acre, Natural Heritage wetlands, mature and old-growth forested wetlands, wetlands in coastal lagoons, and wetlands that perform many functions very well.
II	Category II wetlands are difficult, though not impossible, to replace and provide high levels of some functions. These wetlands occur more commonly than Category I wetlands but still need a relatively high level of protection. Category II wetlands in western Washington include estuarine wetlands, interdunal wetlands, and wetlands that perform functions well.
III	Category III wetlands are (1) wetlands with a moderate level of functions and (2) interdunal wetlands between 0.1 and 1 acre in size. These wetlands have been disturbed in some ways, and are often less diverse or more isolated from other natural resources in the landscape than Category II wetlands.
IV	Category IV wetlands have the lowest levels of functions and are often heavily disturbed. These are wetlands that should be able to be replaced and in some cases be able to be improved.

Source: Hruby 2004

Table 3.6–3. Wetlands in the Vicinity of the LWI and SPE Project Sites

Wetland Name	Acres (Hectares)	Juris-dictional	Wetland Rating Category	Description
Wetland 22b	1.3 (0.5)	Yes	III	Palustrine, forested, emergent marsh, seasonally flooded
Wetland 31 (Devil's Hole)	20 (8.1)	Yes	III	Lacustrine, permanently flooded; palustrine, scrub/shrub, emergent marsh, seasonally flooded
Orchard Wetland	0.06 (0.02)	No	IV	Palustrine, forested, scrub/shrub, emergent marsh, saturated

Sources: Brown and Tannenbaum 2009; MacKenzie and Jones 2013

NORTH LWI PROJECT SITE

There are no wetlands or other waters of the U.S. within the limits of construction of the LWI project sites. Wetlands in the vicinity of the north LWI project site outside of the limits of construction include Wetland 22b, which is within 50 feet (15 meters) of the north LWI project site and is separated from the immediate construction site by Tang Road (Figure 3.6–1).

Wetland 22b is located west of Amberjack Avenue and is associated with intermittent Stream N, which receives drainage from Wetland 22a via a culvert under Amberjack Avenue. *Stream N* flows westerly from Amberjack Avenue to a culvert under Tang Road near the Hood Canal shoreline. Wetland 22b is approximately 1.3 acres (0.5 hectare) and is narrow at the eastern end near Amberjack Avenue and widens toward the west. The upstream half of Wetland 22b supports a natural conifer forest overstory and shrub/herbaceous understory. The downstream half of the wetland and its buffers were cleared of all understory and most trees during 2008. Some scattered small red alders and western red cedars remain in the canopy of the wetland area, but the understory will be maintained in a low grassland/herbaceous condition. Wetland 22b is a Category III wetland because, although portions are disturbed and the wetland provides low value for hydrologic and water quality functions, the wetland is over 1 acre (0.4 hectare) in size and supports a diversity of vegetation types (emergent marsh and forested wetlands) that provide moderate habitat for wildlife.

SOUTH LWI PROJECT SITE

Devil's Hole is a manmade lake located approximately 250 feet (76 meters) southeast of the south LWI project site (Figure 3.6–1) that was created in the 1940s when the Navy modified Sealion Road. Two streams (*Stream A1* and *A2*) flow through culverts and empty into the northwest corner of Devil's Hole, in the vicinity of the south LWI project site. Devil's Hole supports open-water habitat with a narrow band of emergent lake fringe wetland vegetation at the northern edge of the lake, in the vicinity of the south LWI project site. Devil's Hole is a Category III wetland because it is a large water body with moderate water quality, hydrologic, and habitat functions. It is surrounded by intact upland forest buffer except for the vicinity of Sealion Road.

WETLANDS IN THE VICINITY OF THE SPE PROJECT SITE

The *Orchard wetland* was identified by Navy staff in the vicinity of the limits of construction of the proposed SPE upland parking lot site (Figure 3.6–2, Table 3.6–3). The wetland is located at the edge of the orchard adjacent to Sturgeon Street. Including a 30-foot (9-meter) buffer zone, it occupies approximately 0.28 acres (0.11 hectares). The wetland is depressional, apparently captures either surface or shallow subsurface flow from the abutting orchard, and lacks surface discharge. It appears to be highly impacted by historic agricultural land uses. Wetland vegetation consists of a sparse grass-dominated herbaceous layer (slough sedge and reed canary grass) and a tree canopy dominated by red alder.

Thirteen small wetlands (one 0.83-acre [0.34-hectare] wetland and 12 wetlands less than 0.09 acre [0.036 hectare]) and one unnamed perennial stream were identified in the general vicinity of the upland SPE project area and were formally delineated (Anchor QEA 2013) (Figure 3.6–2). All of these features lie uphill from the SPE project site; therefore, they do not

receive drainage from the SPE project upland site. The wetland buffer zone that is closest to the SPE project site is more than 650 feet (198 meters) away and the unnamed stream at its closest reach is more than 1,800 feet (549 meters) from the proposed upland waterfront support facility. Since none of these wetlands, their associated buffers, or hydrologic connections lie within areas potentially disturbed by the SPE project, they were not carried forward in the analysis.

3.6.1.1.3. THREATENED, ENDANGERED, AND SENSITIVE SPECIES

Based on review of USFWS lists of ESA terrestrial plant and wildlife species that occur in Kitsap County, no federally listed terrestrial plant or wildlife species have been identified or are likely to occur on NAVBASE Kitsap Bangor (USFWS 2013a). Other sensitive species and species of concern are described in Section 3.6.1.1.4.

3.6.1.1.4. WILDLIFE

Terrestrial wildlife resources include the mammals, birds, amphibians, and reptiles that live in the area and their associated habitats. None of the freshwater bodies potentially affected by the Proposed Action contain fish. Therefore, freshwater fish are not addressed in this EIS.

The species described in this section include many mammals, birds (including migratory species), amphibians, reptiles, and nuisance/pest species. The main land cover types on NAVBASE Kitsap Bangor provide suitable habitat for a number of different wildlife species and include forest, brush and shrubland, wetlands, streams, and open water; marine shoreline; and developed areas.

WILDLIFE SPECIES

Terrestrial wildlife (game species, non-game mammals, birds, amphibians, and reptiles) in the vicinity of the LWI and SPE project areas are typical of forest-dwelling species that occur on NAVBASE Kitsap Bangor as a whole (Table 3.6–4). The occurrence, habitat use, and other natural history information of these species are discussed below. Appendix A provides a complete listing of all wildlife species known or expected to occur on NAVBASE Kitsap Bangor.

MIGRATORY BIRD SPECIES AND BIRDS OF CONSERVATION CONCERN

Most of the terrestrial bird species occurring on NAVBASE Kitsap Bangor are protected under the MBTA (see Section 3.6.1.2.4), with the exception of introduced species such as rock pigeon and European starling (Section 3.6.1.1.2). Six terrestrial migratory bird species that occur or are likely to occur on NAVBASE Kitsap Bangor are considered birds of conservation concern by the USFWS: bald eagle, peregrine falcon, rufous hummingbird, olive-sided flycatcher, willow flycatcher, and purple finch (USFWS 2008). The state of Washington lists the great blue heron as a priority species for site specific management with a focus on nesting colonies. This species is discussed in Section 3.5.

Table 3.6–4. Wildlife Groupings and Representative Species on NAVBASE Kitsap Bangor

Wildlife Group	Representative Species	Season(s) of Occurrence
Game Species	Black-tailed deer, black bear, cougar, and game birds (i.e., grouse and quail species)	Year round
Non-Game Mammals	Carnivores: river otter, mink, ermine (weasel), coyote, raccoon, red fox, and bobcat Small mammals: shrews, moles, mice, squirrels, rats, mountain beavers, beavers, and rabbits Bats: *Myotis* species, hoary bat, and big brown bat	Year round
Non-Game Birds	Raptors: osprey, bald eagle, red-tailed hawk, owls, and other birds of prey Woodpeckers: pileated woodpecker, downy woodpecker, red-breasted sapsucker Songbirds: sparrows, swallows, warblers, kinglets, chickadees, finches, wrens, and others Wading birds and waterfowl: great blue heron, Canada goose	Year round: great blue heron, bald eagle, woodpeckers, finches, chickadees, red-tailed hawk, crows, jays, sparrows Summer resident: osprey and migratory songbirds (e.g., swallows, warblers, flycatchers, Swainson's thrush) Winter resident: northern harrier, fox sparrow, golden-crowned sparrow, ruby-crowned kinglet Spring and/or fall migrant: sharp-shinned hawk, peregrine falcon, ruby-crowned kinglet, and most summer resident species listed above
Amphibians	Red-legged frog, Pacific tree frog, salamander species Introduced: bullfrog	Year round
Reptiles	Northwestern and common garter snakes and northern alligator lizard	Year round

Sources: Storm and Leonard 1995; Adams et al. 1999; Johnson and O'Neil 2001; Opperman 2003; Jones et al. 2005

BALD EAGLES

The bald eagle was delisted from the ESA on August 8, 2007 (72 FR 37346). However, it remains protected under both the MBTA and the Bald and Golden Eagle Protection Act (16 USC 668-668a); the latter prohibits the taking, possession of, or commerce in bald and golden eagles. Bald eagles in the Pacific Northwest include resident birds and winter migrants that breed farther north. Migration patterns in general are timed to track the availability of spawning salmonids (Buehler 2000). Many resident eagles in the Pacific Northwest migrate in late summer, when juveniles and adults move north up the coast to meet salmon runs in Alaska. At the end of these salmon runs in late fall, Alaskan and Pacific Northwest eagles move south along the coast following salmon runs. Adults reach wintering grounds in Pacific Northwest states in November or December, followed by juveniles in January (Buehler 2000). Eagles that breed in more northern latitudes return to their breeding grounds during spring migration from January to March, depending on food resources and weather conditions.

Near Hood Canal and the Bangor waterfront, bald eagles nest along the shoreline of Dabob Bay on the Bolton Peninsula and along the shoreline of Quilcene Bay, west of Dabob Bay, in Hood Canal. Bald eagles have been observed feeding, perching or roosting, and bathing on NAVBASE Kitsap Bangor year round (Agness and Tannenbaum 2009b; Tannenbaum et al. 2009b, 2011b). A bald eagle nest near the KB Dock was monitored in 2014 (Navy 2014b). A

pair of adult bald eagles was observed at the nest from March through August 2014. However, the condition of the nest deteriorated during the summer and no juveniles were documented. This nest is approximately 1,200 feet (370 meters) south of the LWI project site and 3,200 feet (975 meters) north of the SPE project site. A bald eagle nesting territory is present within 7,200 feet (2,195 meters) of the north LWI project site (WDFW 2010b). This territory contains two nests (WDFW 2010b). Five known bald eagle territories are located on the Toandos Peninsula across Hood Canal from NAVBASE Kitsap Bangor (WDFW 2010b).

GAME SPECIES

The Columbian black-tailed deer is a common, year-round resident on NAVBASE Kitsap Bangor that is seen in most habitat types at the base, but is most common in forested areas (SAIC staff field observations, 2005 to 2009). Black-tailed deer are herbivores and browse on a variety of grasses, forbs, shrubs, and trees (Raedeke and Taber 1983).

Two cougar sightings were reported in 2010 at the upper base, and there have been numerous black bear sightings at the lower base (Jones 2010b, personal communication). Cougars prey on black-tailed deer and smaller mammals in forested and adjacent habitats. Black bears are omnivorous foragers eating plants, berries, and small mammals in the understory of forest, grassland, brush, and shrubland habitats.

Five species of game birds are likely to occur on NAVBASE Kitsap Bangor (Appendix A) including two native species, ruffed and blue grouse. Other game bird species were introduced to the region for the purpose of recreational hunting, including quail species (California and mountain quail) and the ring-necked pheasant (Johnson and O'Neil 2001). Habitats used by game birds include forest, shrubland, and grasslands, depending on the species. These game birds consume primarily plant material, including seeds and berries (Taber and Raedeke 1983).

NON-GAME MAMMALS

Carnivores, or predatory mammals, are found in most habitats on NAVBASE Kitsap Bangor, where they pursue small mammal and avian prey or other food resources. In addition to larger carnivores (black bear and cougar), smaller carnivores include raccoons, weasel, bobcat, coyote, mink, and river otter. River otters are considered to be specialists in aquatic habitats, including the marine shoreline, where they forage in shellfish beds and beaches for molluscs, fish, and crustaceans. Coyote and raccoons also frequent the marine shoreline, where they forage on shellfish, crustaceans, and fish (Tannenbaum et al. 2009b; SAIC staff field observations, 2005 to 2009). Small mammals, including vole, mice, rat, squirrel, and rabbit species, occur in habitats with appropriate food and shelter resources, such as forest understory, grasslands, and brush and shrublands (Johnson and O'Neil 2001). Bat species often forage over open-water habitats with productive insect resources, as well as in forested habitats, forest edges, and open areas (Johnson and O'Neil 2001). Some bat species use forest habitat for maternity colonies and diurnal roosts (e.g., hoary bat and silver-haired bat), whereas other bat species prefer to roost in caves, crevices, or old buildings (*Myotis* spp. and big brown bat) (Johnson and Cassidy 1997).

NON-GAME BIRDS

A variety of terrestrial birds occur on NAVBASE Kitsap Bangor, some of which are year-round residents and some of which are migratory (Table 3.6–4 and Appendix A). Migratory land birds spend only part of the year on NAVBASE Kitsap Bangor for nesting, as winter residents, or as short-term, stopover species during migration (Johnson and O'Neil 2001). Songbirds and other small birds are found in most habitats on NAVBASE Kitsap Bangor, depending on the species. Summer resident migratory songbirds include insect-eating species such as flycatchers, swallows, and warblers that breed in forested habitat and in shrubby growth. This cover type provides the greatest structure for nesting habitat in proximity to food resources (Larsen et al. 2004; Wahl et al. 2005). Year-round resident species include corvids (crows and jays), wrens, most sparrows, finches, and chickadees.

Woodpecker species are year-round residents that inhabit forested habitat, where they use downed wood, snags, and live trees with decay for foraging on insects, such as ants and other invertebrates, and for cavity nesting (Johnson and O'Neil 2001). Raptor species (birds of prey) occurring on NAVBASE Kitsap Bangor include bald eagles, red-tailed hawks, osprey, falcon species (in migration), turkey vulture, and several owl species. Raptor species use all habitats at the base including the marine shoreline. Bald eagles are discussed above. Except for bald eagles, there are no known active raptor nests in the vicinity of the project. Most of the bird species that occur on NAVBASE Kitsap Bangor are considered migratory under the MBTA, although in this region many individuals, including some songbird species, owls, bald eagles, red-tailed hawks, herons, some gull species, and others do not engage in long-distance migrations. Exceptions to the MBTA are introduced species. Migratory birds that are seasonally present on NAVBASE Kitsap Bangor include numerous neotropical songbirds occurring as summer residents; migratory raptors occurring as winter residents, summer residents, or during fall and/or spring migration; and numerous waterfowl and shorebird species that are present in various seasons (Appendix A).

AMPHIBIANS

Amphibians on NAVBASE Kitsap Bangor are likely to include pond/wetland-breeding species (northwestern salamander, rough-skinned newt, Pacific tree frog, red-legged frog, and long-toed salamander) (Johnson and O'Neil 2001; Jones et al. 2005). Bullfrog, an introduced species, is also likely to be present. A terrestrial-breeding species, the western red-backed salamander, may also be present. Other amphibians that may occur at the base include ensatina, western toad, Olympic torrent salamander, coastal giant salamander, and coastal tailed frog. Pond-breeders require quiet waters and suitable aquatic vegetation to support egg attachment (Johnson and O'Neil 2001). Terrestrial breeders require moist sites, such as seeps, crevices, or large logs, within forested stands for breeding. Outside of the breeding season, amphibians on NAVBASE Kitsap Bangor primarily use forest and riparian areas. During winter, most of the amphibian species in the area enter a state of semi-hibernation in underground terrestrial retreats or in the bottom of ponds.

REPTILES

Four species of snakes, two lizards, and two turtles potentially occur on NAVBASE Kitsap Bangor (Storm and Leonard 1995) (Appendix A). One of the turtles, the slider, is an introduced species now distributed throughout freshwater habitats of the Pacific Northwest. Whereas some reptile species potentially occurring on NAVBASE Kitsap Bangor prefer open areas, such as clearcuts or grassland (western fence lizard), others prefer forest habitat (northern alligator lizard), and many are commonly found near freshwater (garter snake species, rubber boa) or in freshwater (western painted turtle). During winter, most of the reptile species in the area hibernate underground.

NUISANCE SPECIES

A number of wildlife species, including European starlings, rock pigeons, ravens, gulls, mice, bats, raccoons, squirrels, and moles, were identified in the *FY 2004 Naval Base Kitsap Bangor Pest Management Plan* (Navy 2004b) as pest species in situations where they occur in structures or interact adversely with humans. This plan describes a variety of methods used to control these species as required primarily for health reasons. Starlings and pigeons are not protected by the MBTA and therefore can be controlled with humane methods, which on NAVBASE Kitsap Bangor include routinely destroying starling nests when found and using netting and other methods to control rock pigeons and their use of waterfront structures. Mammals are prevented from entering buildings by various exclusion measures, or they may be trapped and relocated.

3.6.1.2. CURRENT REQUIREMENTS AND PRACTICES

3.6.1.2.1. REQUIREMENTS AND PRACTICES RELATED TO VEGETATION

NAVBASE Kitsap Bangor manages its forest lands and vegetation in compliance with federal law and regulation, EOs, and DoD and Navy guidance. This includes mandated cooperation with other federal agencies such as USFWS, NMFS, and WDFW. Applicable laws include the Sikes Act Improvement Act (P.L. 86-797 as amended, 16 USC 670(a) et seq.: Conservation Programs on Military Installations); the ESA; the Forest Resources Conservation and Shortage Relief Act (1990); the CWA; the MBTA; and the Noxious Weed Control Act of 1974 (7 USC 2801–2814, January 3, 1975, as amended in 1988 and 1994). EOs pertaining to Navy lands include EO 11990 (wetlands protections) and EO 13112 (combating the introduction of nonindigenous microbial, animal and plant species). DoD and Navy guidance documents directing forest and land management include the *Memorandum on Implementation of Ecosystem Management in the DOD* (1994); DOD Instruction 4715.3 *Environmental Conservation Program* (1996); *Memorandum on Implementation of Sikes Act Improvement Act: Updated Guidance* (2002); Chief of Naval Operations Instruction 5090.1D CH-1 *Environmental Readiness Program Manual* (2014); Naval Facilities Engineering Command *Real Estate Operations and Natural Resources Management Procedure Manual* (P-73); and the *Guidelines for Preparing, Revising and Implementing Integrated Natural Resources Management Plans for Navy Installations* (2003). Pursuant to the Sikes Act, the Navy prepared an Integrated Natural Resources Management Plan (Navy 2001) providing policy goals for land use on NAVBASE Kitsap Bangor.

The Navy is the steward of the lands within NAVBASE Kitsap Bangor and is responsible for managing the forest resource, including timber harvest, conservation, utilization, and enhancement, while maintaining the environmental conditions consistent with the military mission. Timber harvest is an ongoing activity on NAVBASE Kitsap Bangor. Annual harvests over the past five years have generally been less than 100 acres (40 hectares) and conducted exclusively for military construction land clearance.

3.6.1.2.2. REQUIREMENTS AND PRACTICES RELATED TO WILDLIFE

The ESA (16 USC 1531 et seq.), the MBTA (16 USC 703 et seq.), EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, and the Bald and Golden Eagle Protection Act (16 USC 668) protect certain wildlife species, as discussed in Section 3.6.1.2.4. Other applicable requirements are in the Sikes Act Improvement Act (P.L. 86-797 as amended, 16 USC 670(a) et seq.: Conservation Programs on Military Installations). The Navy would avoid knowingly impacting bald eagles and other migratory birds, including nest sites during construction and operation of the LWI and SPE projects.

3.6.1.2.3. REQUIREMENTS AND PRACTICES RELATED TO WETLANDS

Waters of the U.S., including wetlands and navigable waters, are regulated by USACE under Section 404 of the CWA of 1972. EO 11990, *Protection of Wetlands*, directs federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the destruction or modification of waters of the U.S., and to avoid new construction in wetlands wherever there is a practicable alternative. NAVBASE Kitsap Bangor complies with requirements of the CWA and EO 11990 by ensuring there would be no net loss of wetlands at the base, implementing mitigation of wetland impacts, and requiring that any activity within a jurisdictional wetland area be permitted by USACE, subject to nationwide exemptions. WDOE regulates waters of the state, including wetlands, under RCW 90.48, Washington State Water Pollution Control Act, and Section 401 of the CWA.

Wetlands under federal jurisdiction are delineated according to the USACE *Wetlands Delineation Manual* (Environmental Laboratory 1987) and the Western Mountains and Valleys Regional Supplement ("Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region [Version 2.0]") (USACE 2010). USACE's definition of a wetland requires that an area meet criteria for each of three wetland parameters: (1) hydrophytic vegetation, (2) wetland hydrology, and (3) hydric soils (Environmental Laboratory 1987). USACE relies on the WDOE 2004 Wetland Rating System for Western Washington (Hruby 2004) (Table 3.6–2) to assign a functional value to a wetland. This system evaluates wetlands in terms of their hydrologic (flood control), water quality, and habitat functions. Wetlands are classified into four categories, with Category I performing the highest value wetland functions and Category IV providing the lowest value functions (Table 3.6–2) (Hruby 2004).

The CZMA requires that federal actions that have reasonably foreseeable effects on coastal users or resources must be consistent to the maximum extent practicable with the enforceable policies of approved state coastal management programs. Activities and development impacting coastal resources that involve the federal government are evaluated through a process called federal

consistency, in which the proponent agency is required to prepare a CCD for concurrence from the affected state.

Neither project would impact any wetlands. The LWI shoreline abutments described in Section 2.1.1 would require construction below the MHHW line. Placement of fill in the intertidal zone is regulated under the CWA, and a USACE permit under Section 404 of the CWA and Section 10 of the Rivers and Harbors Act would be required. The Navy submitted a JARPA to the USACE for the LWI project, seeking a jurisdictional determination for waters of the U.S. affected by the project and a Section 404 permit application for work within affected waters. Construction in the coastal zone is also regulated by the CZMA. In accordance with the CZMA, the Navy submitted a CCD to WDOE for the LWI project. When the SPE project is programmed and scheduled, the Navy will submit a JARPA to the USACE and a CCD to WDOE for the SPE project.

3.6.1.2.4. Requirements and Practices Related to Threatened, Endangered, and Sensitive Species

The ESA (16 USC 1531 et seq.) protects fish, wildlife, and plant species that are listed as threatened or endangered in the United States or elsewhere. Based on a review of the USFWS Endangered Species Program list of 2013, no federally listed threatened or endangered terrestrial wildlife species or critical habitats have been identified or are likely to occur on NAVBASE Kitsap Bangor (USFWS 2013a). Marbled murrelets, a marine bird species, are addressed in Section 3.5. The Navy would consult with the USFWS Washington Fish and Wildlife Office, as appropriate, in the event that federally listed terrestrial wildlife species are detected in the project area.

The MBTA (16 USC 703 et seq.) and EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, protect migratory birds from harm, except as permitted by USFWS for purposes such as banding, scientific collecting, taxidermy, falconry, depredation control, and other regulated activities such as game bird hunting. Harm includes actions that "result in pursuit, hunting, taking, capture, killing, possession, or transportation of any migratory bird, bird part, nest, or egg thereof." Bald eagles are protected under both the MBTA and the Bald and Golden Eagle Protection Act (16 USC 668), which prohibits the taking of bald eagles through pursuit, shooting, poison, killing, trapping, collecting, disturbance, or transportation.

3.6.1.2.5. Best Management Practices and Current Practices

BMPs and current practices, described in Section 3.7.1.2, would avoid or minimize impacts of the proposed projects on terrestrial vegetation; wetlands; threatened, endangered, and sensitive species; and wildlife, soils, and aquatic resources. Specifically, BMPs and current practices would be implemented to control erosion and runoff following removal of vegetation and earthwork at the SPE upland facility site. Similarly, vegetation removal and excavation in the LWI abutment areas adjacent to the marine shoreline would require BMPs and current practices to minimize and avoid impacts originating in the upland environment. Erosion at the construction staging area would be minimal, but BMPs would be employed as needed to control erosion and sedimentation. BMPs and current practices include the following: diversion berms and interceptor ditches on both sides of the roadways, sediment traps outfitted with rock check

dams and stand pipes, straw bale barriers on the sides of roads, erosion control blankets or turf reinforcement mats, and silt fences along the sides of roads. Water-spraying on soil would be used to control dust generation during earthmoving and hauling activities. Plastic coverings or spraying water on the stockpiled, excavated material would be used to minimize windblown dust. Any fluid spills or leakage from vehicles onto soil would be handled in accordance with a spill response plan.

3.6.2. Environmental Consequences

3.6.2.1. APPROACH TO ANALYSIS

The evaluation of impacts on terrestrial resources considers both direct and indirect effects of construction and operation of the LWI and SPE projects. Potential direct effects include removal or disturbance of vegetation, wetlands, and wildlife habitat; fragmentation of wildlife habitat; barriers to wildlife movements; and noise and other disturbance-related effects on wildlife populations in the project area. Potential indirect impacts include the introduction of non-native plants into areas disturbed by construction.

3.6.2.2. LWI PROJECT ALTERNATIVES

3.6.2.2.1. LWI ALTERNATIVE 1: NO ACTION

With the No Action Alternative, the LWI would not be constructed, overall operations would not change from current levels, and no impacts on terrestrial vegetation, terrestrial wildlife, or wetlands would occur.

3.6.2.2.2. LWI ALTERNATIVE 2: PILE-SUPPORTED PIER

CONSTRUCTION

VEGETATION

Upland construction of the north and south LWI project sites would include clearing of vegetation, grading, excavation, filling, and concrete work for the abutments, stairs, and associated utilities.

Staging Area

The proposed staging area near the intersection of Archerfish and Seawolf Roads (Figure 2–1) is 5.4 acres (2.2 hectares) in size and is highly disturbed due to past use as a staging area for other projects. Approximately half of the site is gravel and would be used for staging for the LWI project. The other half is a sloped, revegetated area that would not be affected by LWI staging. Therefore, there would be no impacts on vegetation at the staging area.

LWI Shoreline Abutments

Approximately 1.1 acre (0.44 hectare) of land supporting forested and shrub vegetation adjacent to the shoreline would be disturbed during construction of the north and south LWI locations (Figure 3.6–1). Vegetation that would be disturbed for the north and south LWI abutments is

located in narrow strips that are largely isolated from intact habitat by roads and vegetation clearing that supports the EHW missile haul route. Construction BMPs for earthwork and hauling activities would support slope stability, and prevent erosion and runoff to adjacent habitats. Therefore, erosion and sedimentation impacts are not anticipated. These measures are described fully in Section 3.7.2.2.2.

Together, the two abutments would create 0.12 acre (0.048 hectare) of new impervious surface. Additional areas (0.1 acre [0.04 hectare]) would be converted to permanent pervious surface such as gravel pathways. A total of 0.86 acre (0.35 hectare) would be revegetated with native species after construction is completed.

WETLANDS

No wetland impacts are anticipated due to construction of the north and south LWIs under LWI Alternative 2.

THREATENED AND ENDANGERED SPECIES

No impacts on ESA-listed terrestrial species would occur under LWI Alternative 2.

WILDLIFE

Visual and audible disturbance leading to avoidance of areas with human activity may alter use of the project area by bird species, which have variable levels of tolerance for disturbance. Species that are intolerant of disturbance while nesting, resting, or foraging may be impacted during construction through increased potential for visual disturbance, increased vehicle and small boat traffic, and construction noise at the project sites (Watson and Pierce 1998; Quinn and Milner 2004; Eissinger 2007).

Construction noise would increase primarily due to airborne pile driving, as described in Section 3.9.3. Additional construction noise would result from the use of heavy equipment for earth moving and excavation; an auger drill rig for pile installation at the shoreline abutments; cranes, concrete saws or jackhammers; and vehicle traffic; but these noise levels would be lower than pile driving noise levels (see Section 3.9.3.2 for noise level details). In particular, extensive dump truck traffic would be required for construction of the LWI abutments, which would increase traffic noise from the LWI project sites along roadways to the upper base. Maximum noise levels from equipment operating concurrently may be as high as 94 dBA intermittently, but on the average noise levels would range from 60 to 68 dBA, similar to other locations where heavy equipment is in operation on a daily basis on the Bangor waterfront. Construction noise would last for about 24 months but pile driving would occur for no more than 80 days during the first year.

Terrestrial wildlife species could be disturbed by elevated noise levels during construction, but there are no current established thresholds for airborne noise-related disturbance. Typical ambient daytime noise levels on the waterfront average 64 dBA although intermittent peak noise can be greater (Section 3.9.2). Under this Alternative, the loudest construction noise (impact pile driving) produces 100 dBA at 50 feet (15 meters) from the source (Table 3.9–3). This noise would attenuate more rapidly in the presence of vegetation than it would over water. Based on

information presented in Section 3.9.3.3, pile driving noise would attenuate to 64 dBA within approximately 2,500 feet (760 meters) from an impact driver. Pile driving would be intermittent and performed largely with a vibratory driver, which produces lower noise levels. The most conservative estimated duration of impact proofing would range from roughly 1.5 to 2 hours; actual impact proofing may take less time or not be required on an active driving day. Thus, under the worst-case scenario, forest-dwelling wildlife in the vicinity of the LWI project sites would experience elevated noise levels due to pile driving for only a portion of the day. Use of heavy construction equipment would contribute to disturbance of terrestrial wildlife species within a shorter distance of the construction sites, but would be in operation more frequently during the construction period.

The impacts of construction on upland wildlife species depend largely upon the habitat uses of these animals within the probable zone of disturbance, especially during their breeding seasons, typically from late February through August, depending on the species. Terrestrial wildlife species are expected to respond to airborne noise in ways similar to marine wildlife, including habituation and sensitization, as described in Sections 3.4 and 3.5. Noise might temporarily displace some terrestrial wildlife during construction, whereas other species may become habituated to noise and visual disturbances and would remain in the general vicinity. Highly mobile species including game species, non-game birds, and small carnivores are expected to avoid the construction sites during periods of high activity, which would be limited to daylight hours during the 24-month construction period. However, the upland area directly affected by the LWI project has limited value as wildlife habitat for these mobile species as well as less mobile species (small mammals, amphibians, and reptiles), and therefore construction period disturbance would not affect many individuals. Although some individual disturbance may occur, population level impacts are not expected.

Bald eagles detected during marine bird surveys on NAVBASE Kitsap Bangor (Tannenbaum et al. 2009b, 2011b) were probably the resident pairs that use nests located in the Vinland neighborhood north of the base and the nest south of Devil's Hole. This species is territorial during the breeding season and forages locally. Territories of bald eagles with nests on relatively straight shorelines on Puget Sound typically contained about 0.93 miles (1.5 kilometers) of shoreline on each side of the nest (Watson and Pierce 1998), and this area is used for foraging.

Responses of bald eagles to noise and visual disturbance vary greatly depending on habituation, location, individual tolerance levels, and the stage of their annual nesting cycle. Watson and Pierce (1998) found that vegetative screening and distance were the two most important factors determining the impact of visual disturbances for bald eagles. Nesting birds are most sensitive to disturbance early in the nesting cycle, which begins in late winter for bald eagles (Watson and Pierce 1998). The nest closest to the north LWI is over 7,200 feet (2,195 meters or 1.36 miles) away, with screening vegetation present. Bald eagles were observed at a nest near the KB docks in 2014 (Navy 2014b) but this nest deteriorated during the summer and no chicks were detected. This nest is approximately 1,200 feet (366 meters or 0.22 mile) from the proposed LWI south location, at which distance airborne impact pile driving noise is expected to attenuate to background sound levels at the Bangor waterfront in the absence of pile driving (Section 3.9.2.1). If eagles were to utilize this nest location in the future, they are not expected to be impacted by construction noise.

Bald eagles foraging on the shoreline would also be susceptible to disturbance due to construction. The USFWS (2003) determined that elevated noise levels from impact pile driving at a dock in Port Angeles could disrupt the normal feeding behavior of adult bald eagles within approximately 2,600 feet (792 meters) of the dock site. Bald eagles have been observed foraging on the shoreline approximately 1,800 feet (549 meters) north of the north LWI site (Tannenbaum et al. 2009b). There is no effective screening from pier construction along this shoreline; thus, bald eagles may avoid foraging during periods of high construction activity within this area. However, undisturbed foraging habitat would be available within the territory. No incidental takes of bald eagles are anticipated.

OPERATION/LONG-TERM IMPACTS

Operation of the LWI would not require additional ground disturbance or vegetation clearing, but may increase the potential for noise and visual disturbance to wildlife present in adjacent forest due to human activity. The abutments, piers, and grate barriers could alter wildlife movement along the marine shoreline, affecting terrestrial species such as raccoon, deer, bear, and river otter that use the shoreline for foraging or as a travel corridor. The LWI abutments would be continuously illuminated at a low level, with relatively limited impacts on the movements of nocturnal animals. Maintenance of the LWI could result in short-term, localized disturbance of wildlife.

The 20 towers on the LWI piers may be used as perches for birds such as gulls and crows, but they would have no wires strung to or from them so the potential to affect birds in flight would be negligible. Since the towers would be only 40 feet (12 meters) tall and completely exposed to view, it is unlikely that they would be used by nesting birds. Nests of most bird species that occur at NAVBASE Kitsap Bangor would be protected under the MBTA while they are in active use (i.e., eggs or chicks are present) but could be removed subsequently.

3.6.2.2.3. LWI ALTERNATIVE 3: PSB MODIFICATIONS (PREFERRED)

CONSTRUCTION

The upland features of LWI Alternative 3 would be very similar to those of Alternative 2. The only difference would be the addition of two 30-foot towers. These two towers would be located within existing developed areas adjacent to the proposed shoreline abutments and so would not result in the loss of any additional habitat. The observation posts would be constructed at the base of the shoreline bluffs and would not affect terrestrial vegetation. The observation post to be installed on Marginal Wharf would require installation of a cable from an upland hub to the wharf, but this cable would be trenched entirely through an existing paved road and no new ground disturbance or vegetation impacts would occur. The number of pile driving days would be fewer for Alternative 3 (up to 30 vs. up to 80). Therefore, the impact of Alternative 3 construction on terrestrial biological resources, e.g., disturbance of wildlife species, would be substantially less than described above for Alternative 2.

OPERATION/LONG-TERM IMPACTS

Operation of LWI Alternative 3 would be the same as Alternative 2 except that Alternative 3 would include installation of two towers adjacent to the abutments and have no over-water

towers. The abutment towers are likely to be used as perches by birds, but unlikely to be used for nesting, as noted for Alternative 2. Any actively used nests that are built on the towers would be protected by the MBTA but may be removed once birds have fledged. The LWI abutments would be continuously illuminated at a low level, with relatively limited effects only on the movements of nocturnal animals. The towers would have no wires strung to or from them so potential to affect birds in flight is negligible. Therefore, the impacts from operation of Alternative 3 would be very similar to those from operation of Alternative 2.

3.6.2.2.4. SUMMARY OF LWI IMPACTS

Impacts on terrestrial vegetation, wetlands, and terrestrial wildlife associated with the construction and operation phases of the LWI project alternatives, along with mitigation and consultation and permit status, are summarized in Table 3.6–5.

Table 3.6–5. Summary of LWI Impacts on Terrestrial Biological Resources

Alternative	Environmental Impacts on Terrestrial Biological Resources
LWI Alternative 1: No Action	No impact.
LWI Alternative 2: Pile-Supported Pier	**Construction***:* Impacts on 1.1 acre (0.44 hectare) of upland vegetation (from abutment construction). Permanent loss of 0.21 acre (0.087 hectare) of vegetation; revegetation of 0.86 acre (0.35 hectare). Pile driving noise impacts on wildlife during one in-water construction season and other equipment noise during a total 24 months of construction (80 days of pile driving). Potential disturbance of bald eagles that may forage in the vicinity. **Operation:** Slightly increased noise and visual disturbance due to human activity at LWI, lighting, and vehicle movements in upland project area and shoreline. Increased isolation of terrestrial habitat encompassed within WSE due to lack of shoreline connectivity to adjacent habitat.
LWI Alternative 3: PSB Modifications (Preferred)	**Construction:** Same as Alternative 2. Impacts on 1.1 acre (0.44 hectare) of upland vegetation (from abutment construction). Permanent loss of 0.21 acre (0.087 hectare) of vegetation; revegetation of 0.86 acre (0.35 hectare). Pile driving noise impacts on wildlife during one in-water construction season and other equipment noise during a total 24 months of construction (30 days of pile driving). Potential disturbance of foraging activity of the bald eagle pair that nests near the south LWI site **Operation:** Similar to Alternative 2. Slightly increased noise and visual disturbance due to human activity at LWI, lighting, and vehicle movements in upland project area and shoreline. Increased isolation of terrestrial habitat encompassed within WSE due to lack of shoreline connectivity to adjacent habitat.
Mitigation: BMPs and current practices to reduce and minimize impacts on terrestrial vegetation and wetland resources are described in Section 3.6.1.2.	
Consultation and Permit Status: No consultation is required for upland vegetation impacts. The Navy submitted a request for water quality certification (through the JARPA process) and a CCD to WDOE, as well as an application for a permit under CWA Section 404 to the USACE through the JARPA process. The Navy will consult with the USFWS Washington Fish and Wildlife Office in the event that any ESA-listed terrestrial wildlife species is detected on NAVBASE Kitsap Bangor and potentially affected by the project. The Navy has determined that the Proposed Action would not result in incidental takes of bald or golden eagles under the Bald and Golden Eagle Protection Act or adversely affect migratory birds under the MBTA. Therefore, no consultation under these acts was requested. Alternative 3 is the Least Environmentally Damaging Practicable Alternative according to the CWA Section 404(b)(1) guidelines.	

BMP = best management practices; CCD = Coastal Consistency Determination; ESA = Endangered Species Act; MBTA = Migratory Bird Treaty Act; USFWS = U.S. Fish and Wildlife Service; WDOE = Washington Department of Ecology; WSE = Waterfront Security Enclave

3.6.2.3. SPE PROJECT ALTERNATIVES

3.6.2.3.1. SPE ALTERNATIVE 1: NO ACTION

Under the No Action Alternative, the SPE would not be constructed, overall operations would not change from current levels, and no impacts on terrestrial vegetation, terrestrial wildlife, or wetlands would occur.

3.6.2.3.2. SPE ALTERNATIVE 2: SHORT PIER (PREFERRED)

CONSTRUCTION

VEGETATION

Construction of the SPE would result in permanent removal of approximately 7 acres (2.8 hectares) of existing second-growth forest vegetation and orchard for the sites of a new parking lot and other project elements (Figure 3.6–2). The forest is contiguous with a larger forested zone on NAVBASE Kitsap Bangor. The orchard pre-dates development of NAVBASE Kitsap Bangor by the Navy and was part of a homestead on the site. The Navy determined that the orchard would not be eligible as a National Register of Historic Places site (Leidos et al. 2014) and requested concurrence from the State Historic Preservation Officer (SHPO) on this finding. Genetic analysis and field identification of the trees determined that the fruit varieties present are heirloom varieties that were widely available around 1900 and are still readily available. Another approximately 4 acres (1.6 hectares) would be temporarily disturbed (vegetation removed) during construction. The timber value of the removed vegetation would be returned to the Navy at present market value. Removal of vegetation and disturbance of soil on the site could result in erosion, runoff, or discharge of fluids from vehicles or equipment onto the site or adjacent undisturbed vegetation communities. Construction BMPs for earthwork and hauling activities would control slope stability, erosion, and runoff to protect the adjacent habitats. These measures are described fully in Section 3.7.1.2.

All clearing and timber sales for construction would be done in accordance with an approved NAVBASE Kitsap Bangor forest management plan. Following construction, revegetation of the temporarily disturbed area would proceed using a mix of native plant material including shrubs, herbaceous plants, and tree seedlings or saplings. Regular maintenance, including planting and seeding desirable native plant species, mowing, weeding, and erosion control would minimize the establishment or spread of invasive plants to exposed soils on the site. The revegetation site would be managed after completion of the project consistent with the forest management plan to avoid establishment of invasive or noxious weeds, and promote restoration of natural habitat values, and prevent establishment of weed species in the adjacent intact forest.

WETLANDS

The SPE project would not impact the orchard wetland because it is excluded from the proposed construction area (Figure 3.6–2). The 30-foot (9-meter) buffer zone would preserve wetland and buffer zone vegetation, and construction-period BMPs (Section 3.7.1.2) would prevent runoff into the buffer zone and wetland.

THREATENED AND ENDANGERED SPECIES

No impacts on ESA-listed terrestrial species would occur under SPE Alternative 2.

WILDLIFE

Construction would result in the permanent loss of approximately 7 acres (2.8 hectares), and temporary loss of 4 acres (1.6 hectares) of wildlife habitat. The area encompassed by the proposed parking lot is good-quality wildlife habitat and resident individuals would be permanently displaced, although the temporarily disturbed area would be revegetated with native plant species that would eventually provide wildlife habitat. The revegetated area would develop a shrub/small tree-dominated community within several years of planting. Construction noise and potential impacts to wildlife are introduced above under LWI Alternative 2, and apply to SPE Alternative 2. As discussed in Section 3.5, tree removal would be conducted outside of the marbled murrelet breeding season (April 1 through September 23). Tree removal between September 24 and March 30 would be protective of all migratory birds.

Bald eagles have been observed foraging on the shoreline at the outlet of Devil's Hole, approximately 3,200 feet (975 meters) from the SPE project site (Tannenbaum et al. 2009b). Given the distance and presence of vegetative screening between the SPE project site and this foraging site, SPE construction would probably not affect bald eagle use of the foraging site. However, bald eagles may avoid the shoreline near the SPE project site, because of construction-related noise and disturbance.

Bald eagles at NAVBASE Kitsap Bangor are discussed under LWI Alternative 2. Due to the distance (3,200 feet [975 meters]) between the nest documented in 2014 (Navy 2014b) and the SPE project site, airborne impact pile driving noise is expected to attenuate to existing ambient levels. Impacts to bald eagles using this nest site are not expected. Similar to the LWI project site, bald eagles are expected to avoid the shoreline near the SPE project during pile driving activity. No incidental takes of bald eagles are anticipated.

Lighting at construction sites can deter use by many nocturnal wildlife species. Construction would occur during normal daytime hours, but some additional lighting may be used on the construction sites at night, which is likely to affect use by wildlife. Given that the construction areas would be cleared of vegetation and occupied by equipment and materials, additional construction lighting at night would not contribute greatly to the overall impacts on wildlife.

OPERATION/LONG-TERM IMPACTS

Operation of the enlarged Service Pier and upland support facility and parking lot would not require additional ground disturbance or vegetation clearing, but could increase the noise and visual disturbance to wildlife present in adjacent forest habitat due to human activity, such as operations staff walking through the area or driving vehicles. The new support facilities would promote human access into areas that are adjacent to relatively undisturbed forested habitat, potentially increasing disturbance to wildlife. Additional night lighting along the extended Service Pier and increased activity may be avoided by most terrestrial wildlife species. Maintenance of the Service Pier could result in short-term, localized disturbance of wildlife.

3.6.2.3.3. SPE ALTERNATIVE 3: LONG PIER

The upland construction and operations of SPE Alternative 3 would be the same as Alternative 2. Therefore, the terrestrial biological impacts of Alternative 3 would be largely the same as those of Alternative 2. The only notable difference is that Alternative 3 would entail a maximum of 205 days of in-water pile driving, compared to 161 days for Alternative 2. Therefore, the potential impacts of pile driving noise on terrestrial wildlife would be slightly longer in duration, but not of greater intensity, for SPE Alternative 3.

3.6.2.3.4. SUMMARY OF SPE IMPACTS

Impacts on terrestrial vegetation, wetlands, and terrestrial wildlife associated with the construction and operation phases of the SPE project alternatives, along with mitigation and consultation and permit status, are summarized in Table 3.6–6.

Table 3.6–6. Summary of SPE Impacts on Terrestrial Biological Resources

Alternative	Environmental Impacts on Terrestrial Biological Resources
SPE Alternative 1: No Action	No impact.
SPE Alternative 2: Short Pier (Preferred)	**Construction:** Permanent loss of 7 acres (2.8 hectares) and temporary loss of 4 acres (1.6 hectares) of forest vegetation and wildlife habitat. Pile-driving noise impacts on wildlife during two in-water construction seasons and other equipment noise during a total 24 months of construction (161 days of pile driving). Some potential for disturbance of foraging by bald eagles. **Operation:** Increased noise and visual disturbance due to human activity at Service Pier, lighting, and vehicle movements in upland project area and shoreline.
SPE Alternative 3: Long Pier	**Construction:** Permanent loss of 7 acres (2.8 hectares) and temporary loss of 4 acres (1.6 hectares) of forest vegetation and wildlife habitat. Pile driving noise impacts on wildlife during two in-water construction seasons and other equipment noise during a total 24 months of construction (205 days of pile driving). Some potential for disturbance of foraging by bald eagles. **Operation:** Increased noise and visual disturbance due to human activity at Service Pier, lighting, and vehicle movements in upland project area and shoreline.
Mitigation: Area temporarily disturbed by construction would be revegetated with native species. BMPs and current practices to reduce and minimize impacts on terrestrial vegetation and wetland resources are described in Section 3.6.1.2.	
Consultation and Permit Status: No consultation is required for upland vegetation impacts. The Navy will submit a request for water quality certification (through the JARPA process) and a CCD to the WDOE. The Navy has submitted a BA and consulted with the USFWS Washington Fish and Wildlife Office on ESA-listed marbled murrelet and will consult on any other ESA-listed terrestrial wildlife species that may be detected on NAVBASE Kitsap Bangor and potentially affected by the project. The Navy has determined that the Proposed Action would not result in incidental takes of bald or golden eagles under the Bald and Golden Eagle Protection Act or adversely affect migratory birds under the MBTA. Therefore, no consultation under these acts was requested. Alternative 2 is the Least Environmentally Damaging Practicable Alternative according to the CWA Section 404(b)(1) guidelines.	

BMP = best management practice; ESA = Endangered Species Act; MBTA = Migratory Bird Treaty Act; USFWS = U.S. Fish and Wildlife Service

3.6.2.4. COMBINED IMPACTS OF LWI AND SPE PROJECTS

3.6.2.4.1. VEGETATION

Together the LWI and SPE (both alternatives) projects would result in permanent clearing of approximately 7.2 acres (2.9 hectares) of forest and shrub vegetation. Approximately 4.9 acres (2 hectares) may also be disturbed temporarily during construction and revegetated with native species.

3.6.2.4.2. WILDLIFE

Together, the LWI and SPE projects would result in the permanent loss of approximately 7.2 acres (2.9 hectares) of forested and shrub wildlife habitat, including the homestead orchard proposed as a parking lot for the Service Pier. An additional 4.9 acres (2 hectares) of similar wildlife habitat would be temporarily disturbed, but revegetated with native species following construction. Pile driving and other construction noise may disturb wildlife during the construction periods (a total of four years). The construction periods for the two projects would not overlap; therefore, concurrent or overlapping noise impacts would not occur. Construction at the south LWI could disturb bald eagles foraging in areas with a direct line of sight to the project location, and the SPE project could extend this disturbance for two additional years.

3.6.2.4.3. WETLANDS

Neither the LWI nor the SPE would result in impacts on wetlands.