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### 3.11 TERRESTRIAL BIOLOGICAL RESOURCES

This section addresses the terrestrial plant and animal life within the Northwest Training Range Complex (NWTRC) that may be affected by proposed actions. These biological resources include: vegetation (including wetlands), wildlife, threatened and endangered species, and sediments and soils. For this report, the discussion of terrestrial biological resources does not include avian species found onshore. Avian species found in the operating areas (OPAREAs) are addressed in Section 3.10. Marine mammals, including species such as seals or sea lions that haul out or breed on the island, are addressed in Section 3.9.

Terrestrial areas within the NWTRC that may be affected by activities include the eastern portion of the Naval Air Station Whidbey Island (NASWI) Seaplane Base, Indian Island, Naval Outlying Landing Field (OLF) Coupeville, and Naval Base Kitsap (NBK)-Bangor. Activities within these areas may affect resources that occur on land and in near-shore areas.

Other NWTRC areas include the Olympic Military Operating Areas (MOAs) over the Olympic Peninsula, Okanogan and Roosevelt MOAs over north-central and northeastern Washington, respectively, as well as Admiralty Bay Range/Restricted Airspace (R)-6701. These MOAs and ranges are the sites of air activities and training. Low-altitude aircraft flights (*i.e.* below 3,000 feet [ft] or 914 meters [m]) that occur within Okanogan MOA segments B and C and Roosevelt MOA section B, as described in Chapter 2, may affect wildlife and have been included in the analysis of effects. There are no activities of the proposed actions in other MOAs that would affect land-based biological resources at these locations, and thus, terrestrial biological resources at these sites will not be analyzed in this Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS).

Activities under the Proposed Action that may affect the terrestrial resources discussed in this section are those that are most likely to result in land disturbance, such as explosions, troop training, and materials expended during training. These potential impacts are discussed in more detail in Section 3.11.2, Environmental Consequences.

#### 3.11.1 Affected Environment

##### 3.11.1.1 Vegetation

###### Plant Community Types

The plant community types found in the Study Area are based on the classification defined in the NASWI Integrated Natural Resources Management Plan (INRMP) (DoN 1996) and the NBK-Bangor INRMP (DoN 2001). This section provides a general description of the community types and is followed by a description of the vegetation communities found in specific target locations where activities may occur that would affect terrestrial plant communities. This site-specific information was gained from a variety of source materials which are cited as appropriate.

**Douglas Fir Forest.** This community typically occurs on dry, well-drained soil and is dominated by Douglas fir (*Pseudotsuga menziesii*) and, in some areas, Pacific madrone (*Arbutus menziesii*). These stands have a broadleaf evergreen understory of salal (*Gaultheria shallon*), evergreen huckleberry (*Vaccinium ovatum*), Pacific rhododendron (*Rhododendron macrophyllum*), and Oregon grape (*Berberis nervosa*). Sword fern (*Polystichum munitum*) is one of the most common species occurring in the herbaceous layer. Less common species in this community are lodgepole pine (*Pinus contorta*), western white pine (*Pinus monticola*), western hemlock (*Tsuga heterophylla*), red alder (*Alnus rubra*), ocean spray (*Holodiscus discolor*), clustered wild rose (*Rosa pisocarpa*), red elderberry (*Sambucus racemosa*), and snowberry (*Symphoricarpos albus*). Significant stands of Douglas fir forest are found on the Seaplane Base and OLF Coupeville.

**Mixed Forest.** This vegetation type typically occurs on moister soils than the Douglas fir forest type. Dominant tree species include Douglas fir, western hemlock, western red cedar (*Thuja plicata*), and red alder, with an understory of red huckleberry (*Vaccinium parvifolium*), salal, Oregon grape, red elderberry, and several fern species. Other common associates include Sitka spruce (*Picea sitchensis*), big leaf maple (*Acer macrophyllum*), grand fir (*Abies grandis*), cascara (*Rhamnus purshiana*), bitter cherry (*Prunus emarginata*), and red-osier dogwood (*Cornus stolonifera*). While Douglas fir is dominant in some mixed forest stands, this cover type can be differentiated from the Douglas fir forest type by the co-dominance of hemlock, cedar, and/or deciduous broadleaf tree species.

**Alder Forest.** Red alder stands occur in moist to wet areas on poorly drained organic soils, often over an impervious clay layer. These are usually monotypic stands of alder with salmonberry (*Rubus spectabilis*), thimbleberry (*Rubus parviflorus*) and lady fern (*Athyrium filix femina*) in the understory. Where a disturbance has occurred in forests that were dominated by Douglas fir and western hemlock, red alder replaces the dominant trees as a successional species. These successional areas often contain minor amounts of young Douglas fir, western hemlock, and western red cedar. Sword fern is present in these communities as well. The occurrence of red alder stands at Seaplane Base and OLF Coupeville is due either to relatively high soil moisture or to some kind of past disturbance, such as logging.

**Willow Stand.** Willow communities occur in moist to wet soils around lakes, ponds, marshes, and waterways. The stands are dominated by willows (*Salix* spp.) and black cottonwood (*Populus trichocarpa*) and may include dense thickets of Douglas spiraea, also known as hardhack (*Spiraea douglasii*). Herbaceous associates include common cattail (*Typha latifolia*), skunk cabbage (*Lysichitum americanum*), and curly dock (*Rumex crispus*). Hard-stemmed bulrush (*Scirpus acutus*) and various rushes, sedges, and grasses are also common to this vegetation type. These occur on NASWI at the Seaplane Base.

**Orchard.** Orchards are small stands of old, domestic fruit trees, mostly apple and pear that are overgrown with various shrubs and invasive grass species. Dominant shrubs in the orchards include wild rose and snowberry. Small patches of orchard occur on Seaplane Base, OLF Coupeville, and NBK-Bangor.

**Scrub-shrub.** This is a classification for areas that have received significant disturbance and are revegetating with both native and nonnative shrubs. Tree seedlings may be present but shrubs less than 20 ft (6 m) in height are the dominant plant form. Scrub-shrub areas are dominated by wild rose, snowberry, Himalayan blackberry (*Rubus discolor*), Douglas spiraea, Scotch broom (*Cytisus scoparius*), and other shrub species. Scrub-shrub wetlands may be dominated by Pacific ninebark (*Physocarpus capitatus*), red alder seedlings, willow shrubs and saplings, and Douglas spiraea. This vegetation type occurs in Seaplane Base, Indian Island, OLF Coupeville, and NBK-Bangor.

**Grassland and Cultivated Field.** Open fields and agricultural lease areas comprise a large component of the vegetative cover of station lands on Seaplane Base and OLF Coupeville. This cover type includes a variety of native and exotic grasses, grains, annual crops, and annual weeds. Common species include Canada thistle (*Cirsium arvense*), clover (*Trifolium* spp.), plantain (*Plantago* spp.), ryegrass (*Lolium* spp.), orchard grass (*Dactylis glomerata*), velvet grass (*Holcus lanatus*), western fescue (*Festuca occidentalis*), bentgrass (*Agrostis* spp.), quackgrass (*Agropyron repens*), and bluegrass (*Poa* spp.). Cole crops, field mustard (*Brassica campestris*), and timothy (*Phleum pratense*) are especially common in the cultivated fields.

**Disturbed Area.** This category includes areas that have been recently disturbed or that receive ongoing disturbance, apart from regular landscape maintenance. Disturbed areas typically have extensive patches of bare soil and may or may not be dominated by vegetation. Bare soil is interspersed with seral herbs and weedy exotic species. Common plant species include lambsquarters (*Chenopodium album*), sheep sorrel

(*Rumex acetosella*), curly dock, field mustard, buttercup (*Ranunculus* spp.), clover, tansy ragwort (*Senecio jacobaea*), Canada thistle, a variety of other forbs and the following grass species: red top (*Agrostis alba*), quack grass, velvet grass, Kentucky bluegrass (*Poa pratensis*), and orchard grass.

**Landscaped Area.** The vegetation of landscaped areas consists of a mix of native and non-native species resulting from a variety of landscape practices. Planted trees and shrubs and maintained turfgrass areas are typical.

### 3.11.1.2 Threatened, Endangered, and Sensitive Plant Species

#### **Seaplane Base**

According to the NASWI INRMP (DoN 1996), the golden Indian paintbrush (*Castilleja levisecta*) is a federally-listed threatened species known to occur at Seaplane Base. Further information on this species can be found in a separate report entitled, *Significant Biological and Natural Features of Naval Air Station Whidbey Island, Island County, Washington* (WDNR 1995). Golden paintbrush occurs in open grasslands at elevations below 328 ft (100 m) around the periphery of the Puget Trough with most populations occurring on glacially derived soils (Federal Register Vol.62, No.112, 1997). Based on species distribution information provided in the INRMP (see Figure 8-5 of the INRMP), golden Indian paintbrush is known to occur at Forbes Point on Seaplane Base. Only ten known populations remain in the world, eight of which occur in Washington State (WDNR 1995). Of the eight known sites in Washington, five are located on Whidbey Island. Observations conducted in 1995 indicate that the distribution of the plant on Seaplane Base is decreasing, although no conclusions have been drawn as to trends in population size. Golden Indian paintbrush is very sensitive to disturbance. At Forbes Point, the primary threats to the population at Forbes Point are native and non-native competing vegetation (DoN 1996). Ongoing DoN management efforts include maintaining a fence around the population and hand-pulling competing shrubs from the area.

#### **3.11.1.3 Wetlands**

Wetlands in the NWTRC are important ecosystems which serve valuable purposes. Wetlands have ecosystem values related to erosion, maintaining water quality, cycling nutrients, and providing habitat for aquatic and terrestrial animals. They also have value related to human use of the environment including water supply, flood control, fisheries, aesthetics, and recreation. The primary functions of wetlands in the NWTRC are associated with providing fish and wildlife habitat, providing recreational opportunity, flood attenuation, and water quality enhancement (DoN 1996). Wetlands discussed in this section found within the NWTRC that may be affected include freshwater (palustrine) and saltwater (estuarine) wetlands.

**Freshwater Marsh.** Freshwater marshes are typically saturated, seasonally flooded, or semi-permanently flooded. These areas contain a wide variety of emergent herbaceous and graminoid (i.e., grass-like; e.g., sedges, rushes, grasses) wetland plant species. Plant associations in freshwater marshes vary depending on the hydrologic regime, shade, and soil type. Some of the most frequently occurring species in emergent wetlands in the affected area include lady fern (*Athyrium filix-femina*), curly dock, skunk cabbage, marsh willow herb (*Epilobium watsonii*), water parsley (*Oenanthe sarmentosa*), climbing nightshade (*Solanum dulcamara*), floating-leaved pondweed (*Potamogeton natans*), common cattail, hardstem bulrush, soft rush (*Juncus effusus*), reed canarygrass (*Phalaris arundinacea*), burreed (*Sparganium* spp.), and tufted hairgrass (*Deschampsia caespitosa*). Freshwater marshes occur at Seaplane Base and NBK-Bangor. Freshwater marshes are classified under the United States Fish and Wildlife Service (USFWS) (Cowardin et al. 1979) as palustrine, emergent, and persistent (PEM1) and palustrine scrub-scrub broadleaved deciduous (PSS1) (DoN 1996).

**Freshwater Wet Meadow.** Wet meadows include those wetlands that are temporarily flooded and are dominated by a variety of herbs and graminoid species. Where many freshwater marshes may remain inundated or saturated throughout the year, the surface soils in wet meadows often dry up during summer months. Common plants in wet meadows may include curly dock, creeping buttercup (*Ranunculus repens*), cow parsnip (*Heracleum lanatum*), reed canarygrass, soft rush, and dagger-leaf rush (*Juncus ensifolius*). Wet meadows are found at Seaplane Base, Indian Island, and NBK-Bangor. These are classified under the USFWS (Cowardin et al. 1979) as palustrine, emergent, and persistent (PEM1) (DoN 1996).

**Salt Marsh.** Salt marsh is typically divided into two subtypes, high and low, based on the elevation and relative salinity. The plant communities vary with these factors. Dominant species in high salt marsh areas include redtop (*Agrostis alba*), Pacific silverweed (*Potentilla pacifica*), seaside arrowgrass (*Triglochin maritimum*), Lyngby's sedge (*Carex lyngbyei*), Baltic rush (*Juncus balticus*), springbank clover (*Trifolium wormskjoldii*), meadow barley (*Hordeum branchyantherum*), and Douglas aster (*Aster subspicatus*). Low salt marsh areas are dominated by pickleweed (*Salicornia virginica*), seashore saltgrass (*Distichlis spicata*), seaside arrowgrass, orache or saltweed (*Atriplex patula*), sea plantain (*Plantago maritima*), saltmarsh sandspurry (*Spergularia marina*), and fleshy jaumea (*Jaumea carnosa*). Areas of salt marsh occur at Seaplane Base, Indian Island and NBK-Bangor. These are classified under the USFWS (Cowardin et al. 1979) as estuarine, intertidal, emergent (E2EM1) or unconsolidated shore (E2US). These wetlands are regularly or irregularly flooded by the tides depending upon their elevation (DoN 1996).

**Mudflats.** These areas are classified under the USFWS as estuarine, intertidal and subtidal, unconsolidated shore (E2US and E1UB) (DoN 1996). They are largely lacking in vegetation, although some areas support extensive eelgrass flats, and are often strewn with driftwood along the high tide line. This habitat type is important primarily to marine invertebrates, marine fishes, waterfowl, some raptors, and shorebirds.

**Deciduous Forested Wetlands.** These wetland areas consist of wetland plants with an important component in large deciduous trees, usually red alder. The trees provide shade, keeping water temperatures cool, and supplying a rich organic food source as they shed their leaves. As water levels rise and fall, some trees are killed as their root zones are inundated with water. The trees quickly rot, providing homes for cavity nesters, food for insect foragers, and after they have fallen into the wetland, additional organic matter from which the other existing wetland plants feed. These wetland types are found at Seaplane Base and NBK-Bangor. They are classified under the USFWS classification as palustrine forested broadleaf (PFO1) (DoN 2001).

**Coniferous Forested Wetlands.** These wetlands have Douglas-fir and lodgepole pine in close proximity to their edge. The waters are usually somewhat acidic and brackish in color. Acidic plants, such as hardhack, reed canary grass, and water lilies are indicators of the wetland community. Again, the trees are an important component as they provide a temperature regulation as well as providing necessary large woody debris as they decay and fall to the surrounding area. These wetland types are found at NBK-Bangor. They are classified under the USFWS classification as palustrine forested needle-leaved evergreen (PFO4) (DoN 2001).

**Shrub Dominated Wetlands.** These wetlands are peat bogs in origin, containing hardhack, serviceberry, skunk cabbage, and cattails. They are open and provide easy access for waterfowl species. Because of the lack of canopy cover, they are warmer than other types of wetlands and provide habitat for the more water dependent life cycles of reptile and amphibian species. These wetland types are found at Seaplane Base and NBK-Bangor. They are classified under the USFWS classification as palustrine scrub-scrub broadleaved deciduous (PSS1) (DoN 2001).

### 3.11.1.4 Wildlife

A variety of wildlife is found within the Study Area including fish, marine and terrestrial animals, and bird populations. This section addresses terrestrial animals which inhabit and use the terrestrial environment, with the exception of birds. Fish, marine animals, and birds found in the OPAREA are discussed in sections 3.7 (Fish), 3.9 (Marine Mammals), and 3.10 (Birds), respectively.

This section describes the wildlife potentially found in the terrestrial environment of the NWTRC that may be affected by proposed actions. The reader is referred to the NASWI INRMP (DoN 1996) and the NBK-Bangor INRMP (DoN 2001) for detailed descriptions of habitat use by these various wildlife species. There are no federally-listed threatened or endangered wildlife species found within the terrestrial portion of the Study Area.

**Mammals.** Many small mammals are found within the Study Area that include multiple species of moles (*Scapanus* spp.), voles (*Microtus* spp.), and mice (*Peromyscus maniculatus*, *Mus musculus*, and *Zapus trinotatus*). Rabbits (*Sylvilagus bachmani*), raccoons (*Procyon lotor*), skunks (*Mephitis mephitis*), weasels and ferrets (*Mustela* spp.), bats (*Lasurus* spp. and *Lasionycteris* spp.) and blacktail deer (*Odocoileus hemionus*) are also common. Larger carnivorous species that are present include black bears (*Ursus americanus*), coyotes (*Canis latrans*), bobcats (*Lynx rufus*), and cougars (*Felis concolor*). Aquatic environments within the NWTRC, both freshwater and estuarine, support animals such as beavers (*Aplodontia rufa* and *Castor canadensis*), river otters (*Lutra canadensis*), and muskrat (*Ondatra zibethicus*).

**Amphibians and Reptiles.** Freshwater marshes and meadows are suitable habitat for amphibians found within the NWTRC. Amphibians that could potentially occur within the NWTRC include salamanders, newts, frogs, including the Pacific treefrog (*Hyla regilla*), and the western toad (*Bufo boreas*). Red alder stands particularly near water, found around meadows or along streams, have been identified as important habitat for amphibians. Red alder stands with some component of Douglas fir and western red cedar are considered an even more valuable habitat because of the complexity of the habitat, and the higher potential for large downed woody debris (DoN 1996).

Reptiles use freshwater habitats, grasslands, forested areas, and agricultural fields. Reptiles that may potentially occur include three species of garter snakes (*Thamnophis* spp.), and the northern alligator lizard (*Elgaria coerulea*).

## 3.11.2 Environmental Consequences

### 3.11.2.1 Approach to Analysis

The approach is based on information concerning the environmental resources discussed in Section 3.11.1, and a systematic evaluation of the components of each activity that may affect these resources. The analysis for terrestrial natural resources is organized by specific activity and/or stressors associated with that activity, rather than warfare area. However, where the effect of the stressor differs by area, this will be clearly described.

### Study Area

The analysis presented for the natural resources in the terrestrial environment is focused on those areas where activities and training will occur that would affect resources on land and in the nearshore environment. These environments within the NWTRC include the eastern portion of NASWI Seaplane Base, Indian Island, OLF Coupeville, NBK-Bangor, Okanogan MOA segment B & C, and Roosevelt MOA segment B.

### **Data Sources**

A systematic review of relevant literature and data was conducted to complete the analysis for terrestrial natural resources in the study area. Candidate sources consisted of published and unpublished documents including journals, books, periodicals, bulletins, theses and dissertations, Internet sites, natural resource management plans, previous National Environmental Policy Act (NEPA) documents for facilities and activities in the study area, Department of Defense (DoD) operations reports, and other technical reports published by government agencies, private businesses, and consulting firms. Site-specific DoD INRMPs and compliance documents were primarily referenced during the search for geographic location data on the occurrence of resources within the study area.

### **Methods**

This EIS/OEIS analyzes potential effects to land based natural resources from range activities in the context of the NEPA. Factors considered in the evaluation of significant effects include the extent to which an alternative could change the capacity of a population of a terrestrial species to maintain genetic diversity, reproduce, and function effectively in its native ecosystem. The analysis of effects on terrestrial biological resources was done qualitatively based on resource management plans specific to the NWTRC, previous compliance that has been conducted for actions taken within the NWTRC that are related to activities addressed in this EIS/OEIS, and published literature.

The golden Indian paintbrush is a federally-listed threatened species that occurs on the western portion of Seaplane Base in the area of Forbes Point as discussed in the "Affected Environment" section. The actions and activities being evaluated under all of the alternatives would occur approximately four miles to the west of the known population of golden Indian paintbrush and would not be affected by any alternative. Therefore, this species will not be evaluated further.

### **Warfare Areas and Associated Environmental Stressors**

Of the potential environmental stressors considered in the analysis, the following stressors were carried forward for detailed analysis:

- Vehicle and equipment use
- Vehicle and personnel movements
- Ordnance and pyrotechnic use
- Low-altitude aircraft overflights
- On land demolition
- Materials expended during demolition

Underwater demolition has been dismissed from evaluation of terrestrial biological resources. Underwater detonations that occur in the Study Area are associated with mine neutralization activities and typically use C-4. The majority of underwater detonation training would occur at Crescent Harbor (88 percent) with infrequent training at Indian Island (6 percent) and Floral Point (6 percent) at Bangor. In Crescent Harbor and in Port Townsend Bay on the west side of Indian Island, the distance from the nearest shoreline to where detonations take place is between 1,100 ft and 7,200 ft (355 to 2,195 m) at depths between 50 and 60 ft (15 to 18 m). Detonations occur offshore of Floral Point at NBK-Bangor approximately 600 ft (200 m) offshore in 30 ft (9 m) deep water. Given the depth at which demolition occurs and the distance from shore there, would be no effects to shoreline wetland vegetation or wildlife species using the terrestrial environment (DoN 2000).

### 3.11.2.2 No Action Alternative

#### Impacts on Terrestrial Vegetation and Wetlands

##### Land-based Training

The No Action Alternative includes land-based training activities involving personnel and/or vehicles associated with Explosive Ordnance Disposal (EOD), Intelligence, Surveillance, and reconnaissance (ISR), Naval Special Warfare (NSW), insertion/extraction, and search and rescue (SAR) activities. EOD activities involve six personnel and occasionally involve use of a small truck. These activities occur within the Demolition Training Range (DTR) Seaplane Base and DTR Bangor which are previously disturbed areas cleared of vegetation and within a structure designed to contain a blast. ISR training activities occasionally occur at Seaplane Base Survival Area and involve crews of 11 personnel. Insertion/extraction, including SAR activities, involves delivery and withdrawal of personnel and equipment using helicopters and parachute at designated areas within the bases. At Seaplane Base Survival Area, helicopter rope suspension training (HRST) activities occur monthly and involve approximately eight participants. Participants maneuver briefly within the designated landing area and no vehicles are used. Approximately 31 parachute training activities occur annually at OLF Coupeville at designated drop zones and involve placing personnel into an area undetected. Search and rescue training occurs 40 times per year at the Seaplane Base Survival Area. During SAR exercises, personnel may disembark from a helicopter within the survival area, "rescue" the personnel to be recovered, and return to the helicopter to be removed from the area. The land-based portion of the exercise is limited to foot traffic, typically on established trails, roads, or other open areas, and does not involve vehicles. Naval Special Warfare (NSW) training on Indian Island would also be limited to foot traffic but would occur off roads and trails. These covert activities generally consist of four to six people walking through an area, and activities occur for two to three weeks twice a year.

Vehicle and equipment use and foot traffic associated with the continued use of the existing EOD DTR at Seaplane Base and Bangor by personnel would have a no effect on vegetation. These sites have been and continue to be used for demolition training and vegetation has been cleared from the areas. EOD DTR activities would have no effect on vegetation. ISR training activities that occur at Seaplane Base Survival Area would have negligible impacts on vegetation from trampling and crushing of ground-cover and shrub layer vegetation as personnel move through the training areas. The ISR activities occur occasionally with crews of 11 personnel moving through approximately 420 acres (1.5 square kilometers [km<sup>2</sup>]) of conifer and broadleaf forest habitat; this habitat is more resilient to the low level disturbance of these activities because of the height and structure of the vegetation in the habitat.

Naval Special Warfare training on Indian Island could affect terrestrial vegetation because of off-road foot traffic. Land vehicles will not be used as part of the Special Forces training that will take place on Indian Island. NSW activities involving off-road foot traffic generally would consist of four to six people covertly walking over an area. These activities would occur for two to three weeks twice a year. Because the covert nature of these Special Forces activities requires special training and a light footprint, effects on vegetation would be comparatively minimal.

Insertion/extraction activities at OLF Coupeville and Seaplane Base, with additional SAR activities occurring at Seaplane Base Survival Area, occur predominantly in defined drop zones or insertion points. In these designated areas, vegetation would be impacted because of crushing, trampling, and uprooting. In areas such as grasslands and scrub-shrub habitats vegetation could experience long-term effects as soils become compacted and vegetation is removed. Given the low frequency of these actions and relatively low number of personnel participating, impacts would be minor.

There would be no effect on wetlands as land-based training exercises would be conducted to avoid wetlands.

### Land Demolition

Demolition practice on land takes place in the existing DTR Seaplane Base and DTR Bangor, where little vegetation is present. Typical explosives used include C-4 demolition blocks, detonation (DETA) sheet, detonation cord, and electric blasting caps. Because of the long-term use of the DTRs and repeated disturbances in these areas, little vegetation is present and the areas are considered disturbed. There would be no effect to vegetation in these areas.

### Impacts on Wildlife

#### Land Based Training

For EOD activities at established DTR Seaplane Base and DTR Bangor, the presence of personnel, vehicles, and equipment use to conduct training would have no effect on wildlife as these areas are disturbed from prior use and provide poor quality habitat for wildlife. The other land based training activities would have minor, short-term effects on wildlife due to the presence of personnel and noise generated by training activities. These effects would be predominantly localized to small areas where training was occurring such as the insertion/extraction actions. Due to the dispersed nature of NSW training on Indian Island and ISR activities at Seaplane Base Survival Area, the effects on wildlife would be more widespread. NSW, however, are designed to be convert and undetectable, further reducing wildlife disturbance. In general, wildlife present in areas where exercises are taking place would be disturbed from feeding, nesting, or resting while activities were occurring. Some may leave the area to more suitable adjacent, available habitats. These exercises are not expected to result in chronic stress to wildlife based on the low number of activities that occur per year, the short duration of the exercises, and the low number of vehicles and/or personnel involved in the exercises described in Chapter 2. There would be no change in populations of animals because of vehicle traffic and/or presence of personnel associated with these training activities.

EOD Mobile Unit (MU) and the occasional ISR training exercise would also involve the use of blank small arms ammunitions (a projectile is not fired when blanks are used, but noise is generated), inert grenades, and some pyrotechnics (e.g. signal smoke, flash-bangs, signal flares) may be authorized depending on fire danger level. In addition, there is patrolling with vehicles, including tracked vehicles. The noises generated from these activities are highly localized to the area of disturbance. Flares release heat and light and are designed to burn completely. Wildlife in the area could be exposed to light generated by the flares, but no effects are expected based on the short burn time and infrequent use. Wildlife in the immediate vicinity of the target would respond to the sound of blank ammunition, but any effects would be minor and short-term.

#### Land Demolition

Demolition practice on land takes place in the existing DTR Seaplane Base and DTR Bangor. Typical explosives used include C-4 demolition blocks with a Net Explosive Weight (NEW) training limit of 2.5 lbs at NBK-Bangor and 2.0 lbs at Seaplane Base. As noted above, the activities occur in areas that have been previously cleared of vegetation and occur within a structure designed to contain the blast. Given the disturbed nature and lack of habitat availability of the DTRs, wildlife effects are focused on those areas outside of the DTRs. In general, the effects of explosions correspond to the distance of the animal from the explosion, ranging from lethal injury to short-term behavioral responses to noise. Behavioral responses to noise may range from minor responses such as head-raising and body-shifting, more disturbed mammals may move short distances, and higher level behaviors such as panic and escape would result from more severe disturbances (NPS 1994).

Impacts on wildlife as a result of increased sound levels are difficult to quantify because the evaluation of sound in the environment is generally linked to human reaction (annoyance level), and the literature base for evaluating how sound may affect wildlife is extremely limited. Although the reaction/response of

wildlife to sound in the environment is difficult to measure and characterize, noise can be defined as sound that may be harmful or disturbing to the health and activity of wildlife or sound that can degrade the quality of the habitat. Additionally, what may be considered an adverse effect on one particular species, or individual, may not necessarily translate into the same type of effect on another species or individual.

Wildlife on the outer edges of the zone of influence could exhibit a short-term behavioral response while EOD activities were occurring. Given the more frequent use of the DTR Seaplane Base, approximately 6 training activities per month, and the level of human presence and activity that occurs in this disturbed habitat, animals in this environment may be more habituated to the training activities and would not react or illicit minor responses because of the presence of EOD personnel. At the DTR Bangor the number of detonations is much less, approximately six per year. The wildlife in the vicinity may elicit a stronger physiological response such as fleeing and avoidance of the area as the activity is infrequent.

Animals in areas adjacent to the DTRs may be disturbed by noise resulting from detonations with greater startle response in individuals closest to the area of detonation. The Environmental Protection Agency (EPA) (1971) has indicated that a noise level of 85 dB is required to startle birds. In the prior environmental assessment for the activities at Seaplane Base (DoN 1993), it was shown that noise from 0.5 lb detonations 2,200 ft (670 m) away from the DTR at the northeast boundary fence would be 118 dBP (decibels Peak) and 102 dB 6,000 ft (1,829 m) to the west across grassland habitat. Based on the current use of 2.0 lb shots at this site, it would be expected that the noise level would be higher at this same distance. The noise from detonations would therefore be expected to cause temporary displacement and startling of wildlife in these habitats. However, wildlife would be expected to return to the habitat or to normal behaviors after activity ceases. Studies have also shown that animals can become habituated to noise following frequent exposure and cease to respond behaviorally to the noise (Larkin 1996, NPS 1994, Plumpton 2006).

Given the extended period of time that EOD activities have occurred (15 years) at Seaplane Base, the more frequent nature of the activity at this site, and the high background ambient noise levels as discussed in Section 3.5, noise as a result of land-demolition in the existing DTR would not be expected to act as an independent stressor to wildlife. At NBK-Bangor, the area is predominantly open grasslands. With the use of 2.5 lb explosives in this open environment, the zone of influence would be greater than at Seaplane Base as there is no buffer to noise and the NEW is greater. Thus, land demolitions at NBK-Bangor would travel further, affecting wildlife over a greater area. Overall, the effects of land demolition on wildlife would be short-term and minor. Wildlife may be displaced and there may be temporary increases in stress levels; however, animal behaviors and use of habitat would return shortly after the training had ceased.

#### Aircraft Overflights

Both fixed-wing aircraft and helicopters are used in training activities within the study area. Aircraft that are used below 3,000 ft (914 m) Above Ground Level (AGL) have the potential to affect wildlife. Helicopter use for insertion/extraction exercises, including SAR actions at Seaplane Base Survival Area, occur at less than 500 ft (152 m) AGL. Sometimes helicopters hover about 20 ft (6 m) above ground as described above. Air combat maneuver (ACM) flights that could affect terrestrial wildlife occur within the Okanogan and Roosevelt MOAs, which are located in north-central Washington near the U.S.-Canadian border. ACM include basic flight maneuvers where aircraft engage in offensive and defensive maneuvering against each other. In Okanogan MOA segments B and C and Roosevelt MOA section B, the lower limit flight altitude is 300 ft (91 m); however, the preponderance of air activities occur at high altitudes. The majority of flights involve EA-6B aircraft, but F/A-18 and F-16 aircraft are also used at much lower frequency (see Section 2.3.1.1). The average time for this exercise is about one hour, with typically two aircraft participating in the exercise.

The No Action Alternative would include some relatively low-altitude aircraft overflights (*i.e.*, less than 3,000 ft or 914 m AGL). As a result, wildlife occurring in some parts of the Study Area could be exposed to noise and visual cues associated with aircraft overflights. Wildlife could also be exposed to downdrafts from helicopters.

Numerous studies have documented that wild animals respond to human-made noise, including low-altitude aircraft overflights (Larkin 1996, NPS 1994, Plumpton 2006). The manner in which animals respond to overflights depends on several factors including life-history characteristics of the species, characteristics of the noise source, loudness, onset rate, distance from the noise source, presence/absence of associated visual stimuli, and previous exposure. A primary concern is that low-altitude overflights may cause physiological and/or behavioral responses that reduce the animals' fitness or ability to survive. Researchers have documented a range of behavioral responses to overflights, ranging from indifference to extreme panic. Behavioral responses could interfere with raising young, habitat use, and physiological energy budgets. Most studies have focused on ungulates and birds, while little or no research has been conducted on carnivorous mammals, small mammals, reptiles, and amphibians (NPS 1994). While difficult to measure in the field, some behavioral responses are likely accompanied by physiological responses, such as increased heart rate, or stress. Chronic stress can compromise the general health of animals, but stress is not necessarily indicative of negative consequences to individuals or to populations (Larkin 1996, NPS 1994, Bowles *et al.* 1990 in Larkin 1996). Unless repeatedly exposed to loud noises or simultaneously exposed to synergistic stressors, it is possible that individuals would return to homeostasis almost immediately after exposure and the individual's overall metabolism and energy budgets would not be affected. Studies have also shown that animals can become habituated to noise following frequent exposure and cease to respond behaviorally to the noise (Larkin 1996, NPS 1994, Plumpton 2006).

Fixed-wing aircraft overflights under the No Action Alternative would result in short-term, localized increases in noise levels within the Study Area. Biological receptors on the ground and directly under the flight track could be exposed to the noise levels as described in Section 3.5 (Acoustics). Exposure levels would decrease with increasing distance from the flight track centerline. As discussed in Section 3.5, as aircraft in flight gain altitude, the received noise level drops, often becoming indistinguishable from the background noise. The duration of exposure to fixed-wing aircraft noise would be very brief (seconds) as an aircraft passes overhead. Exposures would be infrequent based on the low number of sorties and the short duration of the exercises (about one hour).

Helicopter overflights under the No Action Alternative takes place within existing higher noise contours as described in section 3.5.3.2. At Seaplane Base, daytime helicopter use would be either indistinguishable from the background jet noise or masked by louder jet noise. A hovering SH-60 helicopter produces sound levels of approximately 90 dBA at 50 ft (15 m) and sound levels would decrease by about 6 dBA for each doubling of the distance from the helicopter. Unlike fixed-wing aircraft, helicopter training activities can occur at less than 500 ft (152 m) AGL and helicopters may hover. Some studies suggest that animals respond more to helicopter overflights than to fixed-wing aircraft overflights (Larkin 1996, Plumpton 2006). Areas exposed to helicopter noise, visual cues, and downdraft would be limited to areas within Seaplane Base Survival Area. The duration of exposure to helicopter noise could be longer than that described for fixed-wing aircraft because helicopters typically fly at slower airspeeds and spend more time over a given area. The typical duration for helicopter use for HRST and SAR activities is five hours. Nonetheless, exposures would be infrequent based on the low number of exercises (67 per year).

Wildlife exposed to low-altitude aircraft overflights under the No Action Alternative could exhibit short-term behavioral and/or physiological responses, but not to the extent where the general health of individuals or populations would be compromised. Aircraft overflights are not expected to result in chronic stress based on the short duration and infrequency of exposure.

The insertion/extraction activities at OLF Coupeville involve parachute insertion with aircraft that are more than 3,000 ft (914 m) above the ground. As discussed in Section 3.5, as aircraft in flight gain altitude, the received noise levels drop, often becoming indistinguishable from the ambient noise. The approximate ground level noise levels from a C-130 aircraft at 2,000 ft is 77.2 dB and at 5,000 ft it is 66.3 dB (USAF 1999). Based on the relatively high flight altitudes and relatively low sound exposure levels, there would be no effect of noise from C-130 aircraft on terrestrial wildlife.

### **3.11.2.3 Alternative 1**

#### **Impacts on Terrestrial Vegetation and Wetlands**

##### **Land Based Training**

The No Action Alternative includes land-based training activities involving personnel and/or vehicles associated with EOD, ISR, NSW, insertion/extraction, and SAR activities. Under Alternative 1, the number of Navy training and testing activities would increase as discussed in Chapter 2. As in the No Action Alternative, continued vehicle and equipment use and foot traffic at the existing DTR Seaplane Base and DTR Bangor would have a negligible effect on vegetation because of the disturbed nature of the areas in which these activities occur. ISR and EODMU training activities that occur at Seaplane Base Survival Area would have minor impacts on vegetation from trampling and crushing of ground-cover and shrub layer vegetation as personnel and light vehicular traffic move through the training area.

Impacts of NSW training at Indian Island on terrestrial vegetation would be the same as the No Action Alternative. Foot traffic in undisturbed areas has the potential to cause damage to individual plants from trampling or crushing in localized areas. However, there would not be any loss of populations and areas of trampling would be expected to recover in a short time period.

Insertion/extraction activities at OLF Coupeville and Seaplane Base and SAR activities at Seaplane Base Survival Area would increase slightly under Alternative 1, as described in Chapter 2. The effects on vegetation would be the same as described under the No Action Alternative and there would be no significant impacts.

There would be no effect on wetlands as land-based training exercises would be conducted to avoid wetlands.

##### **Land Demolition**

Under Alternative 1, activities involving or potentially involving explosives would increase, as discussed in Chapter 2. Because of the long-term and repeated disturbances in the DTR areas of Seaplane Base and NBK-Bangor, little vegetation is present and the areas are considered disturbed. No adverse impacts to vegetation are therefore anticipated.

#### **Impacts on Wildlife**

##### **Land Based Training**

Under Alternative 1, the vehicle and equipment use and foot traffic associated with an increase of EOD training activities at the DTR Seaplane Base and DTR Bangor, as described in Chapter 2, would have a negligible effect on wildlife because of the disturbed and poor quality habitat the areas provide. Animals that are present would either be habituated to the human and vehicle presence or would avoid the area when activities were occurring.

EODMU and ISR training activities at Seaplane Base Survival Area would have short-term minor adverse effects from the presence of personnel and noise and disturbance generated during activities. These exercises are not expected to result in chronic stress to wildlife based on the low number of activities that occur per year, the short duration of the exercises, and the low number of vehicles and/or personnel

involved in the exercises. There would be no change in populations of animals because of vehicle use, presence of personnel, or use of ordnance and pyrotechnics associated with these training activities.

Impacts of NSW training at Indian Island on wildlife and wildlife habitat under Alternative 1 would be the same as the No Action Alternative as training activities would be occurring at the same level. Because the covert nature of these activities have a light footprint, cause little noise disruption, and involve a small number of personnel, the effects of this training would result in temporary displacement of individuals and would disrupt foraging and/or resting behaviors for very brief periods. As these activities are short-term and infrequent, there would not be any population level effects.

Insertion/extraction activities occur on land at OLF Coupeville and Seaplane Base and SAR activities at Seaplane Base Survival Area would increase slightly under Alternative 1, as described in Chapter 2. Personnel movements for insertion/extraction and SAR activities would not prohibit the use of habitats by wildlife once the disturbance ceased. As with NSW training events, wildlife behaviors would be disturbed temporarily, but would be expected to return to normal once the disruption from personnel movements had passed or shortly thereafter. There would be no significant impact to wildlife or wildlife habitat as a result of personnel ground movements associated with insertion/extraction training activities.

#### Land Demolition

Under Alternative 1 there would be additional training activities conducted each year involving land demolitions, as described in Chapter 2. The type of ordnance used would not change from the No Action Alternative. Because of the long-term and repeated disturbances in the DTR Seaplane Base and DTR Bangor, these areas are considered to be of poor quality as wildlife habitat and there would be little effect to wildlife within the DTR themselves. The effects of detonations on habitats and wildlife use in areas adjacent to the DTRs would be the same as under the No Action Alternative. The effects on wildlife from detonations at the DTRs would be temporary displacement and increased stress. Animal behaviors and use of habitat would return to baseline or normal conditions shortly after the training had ceased. No significant adverse impacts to wildlife are anticipated.

#### Aircraft Overflights

There would be a minimal increase in insertion/extraction training and SAR activities at Seaplane Base where helicopters would be used for land based training. The number of inland ACM at Okanogan and Roosevelt MOAs would increase under Alternative 1, as described in Chapter 2. The impacts of aircraft disturbance would be the same as the No Action Alternative. Wildlife exposed to low-altitude aircraft overflights under Alternative 1 could exhibit short-term behavioral and/or physiological responses, but not to the extent where the general health of individuals or populations would be compromised. Aircraft overflights are not expected to result in chronic stress based on the short duration and relative infrequency of exposure.

### **3.11.2.4 Alternative 2**

#### **Impacts on Terrestrial Vegetation and Wetlands**

##### Land Based Training

The No Action Alternative includes land-based training activities involving personnel and/or vehicles associated with EOD, ISR, NSW, insertion/extraction, and SAR activities. Under Alternative 2, the number of Navy training and testing activities would increase, as discussed in Chapter 2. As in the No Action Alternative, continued vehicle and equipment use and foot traffic at the existing DTR Seaplane Base and DTR Bangor would have a negligible effect on vegetation because of the disturbed nature of the areas in which these activities occur. ISR and EODMU training activities that occur at Seaplane Base Survival Area would have minor impacts on vegetation from trampling and crushing of ground-cover and shrub layer vegetation from personnel movements and light vehicular traffic in the training area.

Impacts of NSW training at Indian Island on terrestrial vegetation would be the same as the No Action Alternative. Foot traffic in undisturbed areas has the potential to cause damage to individual plants from trampling or crushing in localized areas however there would not be any loss of populations and areas of trampling would be expected to recover in a short time period.

Insertion/extraction activities at OLF Coupeville and Seaplane Base and SAR activities at Seaplane Base Survival Area would increase slightly under Alternative 2, as described in Chapter 2. The effects on vegetation would be the same as described under the No Action Alternative and there would be no significant impacts.

There would be no effect on wetlands as land-based training exercises would be conducted to avoid wetlands.

#### Land Demolition

Under Alternative 2, activities involving or potentially involving explosives would increase, as discussed in Chapter 2. Because of the long-term and repeated disturbances in the DTR areas of Seaplane Base and NBK-Bangor, little vegetation is present and the areas are considered disturbed. No adverse impacts to vegetation are therefore anticipated.

#### Impacts on Wildlife

##### Land Based Training

Under Alternative 2, the vehicle and equipment use and foot traffic associated with an increase of EOD training activities at the DTR Seaplane Base and DTR Bangor, as described in Chapter 2, would have a negligible effect on wildlife because of the disturbed and poor quality habitat the areas provide. Animals that are present would either be habituated to the human and vehicular presence or would avoid the area when activities were occurring.

EODMU and ISR training activities at Seaplane Base Survival Area would have short-term minor adverse effects from the presence of personnel and noise and disturbance generated during activities. These exercises are not expected to result in chronic stress to wildlife based on the low number of activities that occur per year, the short duration of the exercises, and the low number of vehicles and/or personnel involved in the exercises. There would be no change in populations of animals because of vehicle use, presence of personnel, or use of ordnance and pyrotechnics associated with these training activities.

Impacts of NSW training at Indian Island on wildlife and wildlife habitat under Alternative 2 would be the same as the No Action Alternative as training activities would be occurring at the same level. Because the covert nature of these Special Forces which have a light footprint, cause little disruption because of noise, and the small number of personnel involved, the effects of this training would result in temporary displacement of individuals and would disrupt for very brief periods foraging and/or resting behaviors. As these activities are short-term and infrequent, there would not be any population level effects.

Insertion/extraction activities occur on land at OLF Coupeville and Seaplane Base and SAR activities at Seaplane Base Survival Area would increase slightly under Alternative 2, as described in Chapter 2. Personnel movements for insertion/extraction activities and SAR activities would not prohibit the use of habitats by wildlife once the disturbance ceased. As with NSW training events, wildlife behaviors would be disturbed temporarily, but would be expected to return to normal once the disruption from personnel movements had passed or shortly thereafter. There would be no significant impact to wildlife or wildlife habitat as a result of personnel on the ground movements associated with insertion/extraction training activities.

### Land Demolition

Under Alternative 2 there would be additional training activities conducted each year involving land demolitions, as described in Chapter 2. The type of ordnance used would not change from the No Action Alternative. Because of the long-term and repeated disturbances in the DTR Seaplane Base and DTR Bangor, these areas are considered to be of poor quality as wildlife habitat and there would be little effect to wildlife within the DTR themselves. The effects of detonations on habitats and wildlife use in areas adjacent to the DTRs would be the same as under the No Action Alternative. The effects on wildlife from detonations at the DTRs would be temporary displacement and increased stress. Animal behaviors and use of habitat would return to baseline or normal conditions shortly after the training had ceased. No significant adverse impacts to wildlife are anticipated.

### Aircraft Overflights

There would be a minimal increase in insertion/extraction training and SAR activities at Seaplane Base where helicopters would be used for land based training. The number of inland ACM at Okanogan and Roosevelt MOAs would increase under Alternative 2, as described in Chapter 2. The impacts of aircraft disturbance would be the same as the No Action Alternative. Wildlife exposed to low-altitude aircraft overflights under Alternative 2 could exhibit short-term behavioral and/or physiological responses, but not to the extent where the general health of individuals or populations would be compromised. Aircraft overflights are not expected to result in chronic stress based on the short duration and relative infrequency of exposure.

### **3.11.3 Mitigation Measures**

As summarized in Section 3.11.2, the actions proposed in this EIS/OEIS could affect some terrestrial resources within the study area, but community or population level effects would not be expected under any of the alternatives. Current protective measures would continue to be implemented by the Navy, and no additional mitigation measures would be needed to protect terrestrial vegetation, wetlands, or wildlife.

### **3.11.4 Summary of Effects by Alternative**

As summarized in Table 3.11-1, the No Action Alternative, Alternative 1, and Alternative 2 would have negligible to minor short-term impacts on terrestrial vegetation, wetlands, and wildlife. In addition, there are no federally-listed terrestrial wildlife species that would be affected by land-based NWTRC activities at Seaplane Base, Indian Island, NBK-Bangor, OLF Coupeville, Okanogan MOA, and Roosevelt MOA.

**Table 3.11-1: Summary of Environmental Effects – Terrestrial Biological Resources**

Alternative and Stressor	Summary of Effects and Impact Conclusion
<b>No Action</b>	
Land Based Training	Minor, short-term, and localized disturbance to terrestrial vegetation and wildlife from foot traffic, light vehicular use, and ordnance and pyrotechnics. No long-term population-level effects. Wetlands would not be affected.
Land Demolitions	Temporary displacement and minor disturbance of terrestrial wildlife in the areas adjacent to DTRs. Wildlife would exhibit short-term physiological response but would return to normal behaviors shortly after disturbance. No long-term population level effects. Vegetation and wetlands would not be affected by EOD actions in established DTRs.
Aircraft Overflights	Short-term behavioral responses of wildlife particularly from helicopters. Due to the infrequent occurrence and short-duration of activities, there would be no long-term population-level effects.
<b>Alternative 1</b>	
Land Based Training	Minor, short-term, and localized disturbance to terrestrial vegetation and wildlife from foot traffic, light vehicular use, and ordnance and pyrotechnics. No long-term population-level effects. Wetlands would not be affected.
Land Detonations	Temporary displacement and minor disturbance of terrestrial wildlife in the areas adjacent to DTRs. Wildlife would exhibit short-term physiological response but would return to normal behaviors shortly after disturbance. No long-term population level effects. Vegetation and wetlands would not be affected by EOD actions in established DTRs.
Aircraft Overflights	Short-term behavioral responses of wildlife particularly from helicopters. Although activities would increase over the No Action Alternative, they would occur relatively infrequently and for short-durations which would not result in long-term population-level effects.
<b>Alternative 2 (Preferred Alternative)</b>	
Land Based Training	Minor, short-term, and localized disturbance to terrestrial vegetation and wildlife from foot traffic, light vehicular use, and ordnance and pyrotechnics. No long-term population-level effects. Wetlands would not be affected.
Land Detonations	Temporary displacement and minor disturbance of terrestrial wildlife in the areas adjacent to DTRs. Wildlife would exhibit short-term physiological response but would return to normal behaviors shortly after disturbance. No long-term population level effects. Vegetation and wetlands would not be affected by EOD actions in established DTRs.
Aircraft Overflights	Short-term behavioral responses of wildlife particularly from helicopters. Although activities would increase over the No Action Alternative, they would occur relatively infrequently and for short-durations which would not result in long-term population-level effects.

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