3.9 Birds

3.9 BIRDS

3.9.1 Affected Environment

For purposes of this Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS), the Region of Influence (ROI) for birds is the Temporary Maritime Activities Area (TMAA) within the Gulf of Alaska (GOA). The nearest shoreline (Kenai Peninsula) is located approximately 24 nautical miles (nm) (44 kilometers [km]) north of the TMAA's northern boundary. The approximate middle of the TMAA is located 140 nm (259 km) offshore. Given that the TMAA is more than 12 nm (22 km) from the closest point of land, it is therefore outside of United States (U.S.) Territorial Seas. Areas inland from the coastline, including United States (U.S.) Air Force (Air Force) air ranges and U.S. Army (Army) training lands, are addressed in the *Alaska Military Operations Areas EIS* (USAF 1995), *Improvements to Military Training Routes in Alaska Environmental Assessment* (USAF 2007), *Alaska Army Lands Withdrawal Renewal Final Legislative EIS* (Army 1999) and the *Transformation of U.S. Army Alaska FEIS* (Army 2004). Thus, this section provides an overview of the species, distribution, and occurrence of birds that are either resident or migratory through the TMAA.

3.9.1.1 Existing Conditions

The habitat found within the TMAA supports a wide diversity of resident and migratory seabirds and sea ducks. Since the TMAA occurs mostly over the outer shelf slope and deeper ocean waters, this area is dominated by species that use the region seasonally and are not land-based outside the nesting season. Birds that are year-round residents or that migrate from northern waters frozen over in the winter use the protected embayments of Kodiak Island and the mainland shoreline to avoid harsh winter storms (DoN 2006).

Migratory birds are any species or family of birds that live, reproduce, or migrate within or across international borders at some point during their annual life cycle. Seabirds, which are included in migratory birds protected by the Migratory Bird Treaty Act (MBTA, Section 3.9.2.2) (U.S. Fish and Wildlife Service [USFWS] 1985), are birds whose normal habitat and food source is the sea, whether they utilize coastal waters (the nearshore), offshore waters (the continental shelf), or pelagic waters (the open sea) (Harrison 1983).

The TMAA consists of open water surface and subsurface operating areas and overlying airspace to the south of Prince William Sound and east of Kodiak Island. The GOA is one of the world's most productive ocean regions and the habitats associated with these cold and turbulent waters contain identifiable collections of microhabitats that sustain resident and migratory species of seabirds. The waters of the GOA provide both protected shallow water habitat for seabirds and sea ducks, which forage on the sea bottom, and nutrient rich offshore areas for seabirds that rely on upwelling zones and shelf currents to transport prey to the surface. In general, seabird and sea duck distribution in the GOA is seasonally influenced by prey availability and probably weather patterns (Hunt and Schneider 1987). Since carbon flux for the benthic community is highest in the nearshore areas (Iverson et al. 1979), these waters provide good winter food sources for bottom-feeding ducks.

The GOA is a large ecosystem that lies off the southern coast of Alaska and the western coast of Canada. It is separated from the East Bering Sea by the Alaska Peninsula. Its climate is sub-Arctic. The cold Subarctic Current, as it bifurcates towards the south, serves as the boundary between the GOA and the California Current. Decadal climate change has shown an effect on plankton production and plankton species composition. The GOA ecosystem is a highly productive (>300 grams [g] of carbon per square meter [m^2] per year) ecosystem based on global primary productivity estimates (Sea-viewing Wide Field-of-view Sensor [SeaWiFS] 2008). It presents a significant upwelling phenomenon linked to the presence of the counterclockwise gyre of the Alaska Current (National Oceanic and Atmospheric Administration [NOAA] 2002). A well-documented climatic regime shift occurring in the late 1970s caused the Alaska

gyre to be centered more to the east (Lagerloef 1995). The LME's cold, nutrient-rich waters support a diverse ecosystem. Large-scale atmospheric and oceanographic conditions affect the productivity of this area. Changes in zooplankton biomass have been observed in both the GOA and the California Current directly to the south. These biomass changes appear to be inversely related to each other (Brodeur et al. 1999).

Many of the larger seabirds, especially the albatrosses and the shearwaters, move into the Gulf from more southern climates during the summer and fall months and feed along the Alaskan current as it traces the continental shelf break. Carbon flux in the pelagic food chain is greatest in the outer shelf (where bottom depth is 328 to 558 feet (ft) (100 to 170 meters [m]); Iverson et al. 1979), as upwelling brings deepwater nutrients to the surface, which stimulates planktonic growth. Hunt and Schneider (1987) found that the pelagic distribution of seabirds mirrored the distribution of plankton, regardless of the trophic level on which a particular species fed. Since the TMAA occurs mostly over outer shelf, slope, and deeper ocean waters, this area is dominated by those species that use the region seasonally and are not land-based outside the nesting season.

The USFWS, which oversees the National Wildlife Refuges (NWR) system, protects a significant amount of marine habitat within U.S. waters. Three NWRs (Alaska Maritime, Becharof, and Kenai) that contain a marine component are located throughout the GOA, though outside the TMAA. These NWRs provide over 3 million hectares of refuge for seabirds, shorebirds, migratory waterfowl, and a diverse array of marine mammals and flora. Together with federal agencies and legislation, the operation and management of Alaska NWRs is also influenced by policy documents such as the Alaska National Interest Lands Conservation Act of 1980 (USFWS 2004b).

Table 3.9-1 identifies bird species known to occur in or breed in the coastal zones within the GOA. Two of these are protected under the authority of the Endangered Species Act (ESA): one is federally listed as endangered (short-tailed albatross [*Phoebastria albatrus*]) and one is federally listed as threatened (Steller's eider [*Polysticta stelleri*]). Five species are not listed as threatened or endangered under the ESA but have been named Birds of Conservation Concern (BCC) by the USFWS. These are the black-footed albatross (*Phoebastria nigripes*), Laysan albatross (*Phoebastria immutabilis*), Aleutian tern (*Onychoprion aleuticus*), Arctic tern (*Sterna paradisaea*), and the Caspian tern (*Hydroprogne caspia*).

Other species are not listed but have been identified by agencies for different reasons. The black oystercatcher (*Haematopus bachmani*) is considered by the U.S. Shorebird Conservation Plan and its regional counterpart, the Alaska Shorebird Conservation Plan, as a species of high concern. Classification is due to the species' limited breeding distribution and small global populations (Brown et al. 2001). The Kittlitz's murrelet (*Brachyramphus brevirostris*) has been listed as a candidate species throughout its range as several core populations have been reduced by 80 to 90 percent in the past two decades.

Table 3.9-1: Representative Birds Known to Occur or Breed in the Coastal Zones within the GOA

Common Name	Genus and Species	Common Name	Genus and Species
Aleutian Tern[BCC, B]	*Onychoprion aleuticus*	Clark's Grebe	*Aechmophorus clarkii*
American Avocet	*Recurvirostra americana*	Common Eider	*Somateria mollissima*
American Golden-Plover	*Pluvialis dominica*	Common Goldeneye	*Bucephala clangula*
American Wigeon	*Anas americana*	Common Greenshank	*Tringa nebularia*
Ancient Murrelet[B]	*Synthliboramphus antiquus*	Common Loon	*Gavia immer*
Arctic Loon	*Gavia arctica*	Common Merganser	*Mergus merganser*
Arctic Tern[BCC,B]	*Sterna paradisaea*	Common Murre[B]	*Uria aalge*
Baird's Sandpiper	*Calidris bairdii*	Common Ringed Plover	*Charadrius hiaticula*
Barrow's Goldeneye	*Bucephala islandica*	Common Sandpiper	*Actitis hypoleucos*
Bar-tailed Godwit	*Limosa lapponica*	Cook's Petrel	*Pterodroma cookii*
Black Guillemot[B]	*Cepphus grylle*	Crested Auklet[B]	*Aethia cristatella*
Black Oystercatcher	*Haematopus bachmani*	Curlew Sandpiper	*Calidris ferruginea*
Black Scoter	*Melanitta americana*	Double-crested Cormorant[B]	*Phalacrocorax auritus*
Black Turnstone	*Arenaria melanocephala*	Dovekie[B]	*Alle alle*
Black-bellied Plover	*Pluvialis squatarola*	Dunlin	*Calidris alpina*
Black-footed Albatross[BCC, B]	*Phoebastria nigripes*	Emperor Goose	*Chen canagica*
Black-legged Kittiwake[B]	*Rissa tridactyla*	Eskimo Curlew	*Numenius borealis*
Black-tailed Godwit	*Limosa limosa*	Eurasian Dotterel	*Charadrius morinellus*
Black-winged Stilt	*Himantopus himantopus*	Eurasian Wigeon	*Anas penelope*
Blue-winged Teal	*Anas discors*	Far Eastern Curlew	*Numenius madagascariensis*
Bonaparte's Gull	*Chroicocephalus philadelphia*	Flesh-footed Shearwater	*Puffinus carneipes*
Brandt's Cormorant[B]	*Phalacrocorax penicillatus*	Fork-tailed Storm-Petrel[B]	*Oceanodroma furcata*
Brant[B]	*Branta bernicla*	Gadwall	*Anas strepera*
Bristle-thighed Curlew	*Numenius tahitiensis*	Glaucous Gull[B]	*Larus hyperboreus*
Broad-billed Sandpiper	*Limicola falcinellus*	Glaucous-winged Gull[B]	*Larus glaucescens*
Buff-breasted Sandpiper	*Tryngites subruficollis*	Gray-tailed Tattler	*Tringa brevipes*
Bufflehead	*Bucephala albeola*	Great Knot	*Calidris tenuirostris*
Buller's Shearwater	*Puffinus bulleri*	Greater Scaup	*Aythya marila*
Cackling Goose	*Branta hutchinsii*	Greater White-fronted Goose	*Anser albifrons*
Canada Goose	*Branta canadensis*	Greater Yellowlegs	*Tringa melanoleuca*
Canvasback	*Aythya valisineria*	Green Sandpiper	*Tringa ochropus*
Caspian Tern[BCC,B]	*Hydroprogne caspia*	Green-winged Teal	*Anas crecca*
Cassin's Auklet[B]	*Ptychoramphus aleuticus*	Harlequin Duck	*Histrionicus histrionicus*

Table 3.9-1: Representative Birds Known to Occur or Breed in the Coastal Zones within the GOA (continued)

Common Name	Genus and Species	Common Name	Genus and Species
Herring Gull[B]	*Larus argentatus*	Northern Shoveler	*Anas clypeata*
Hooded Merganser	*Lophodytes cucullatus*	Oriental Pratincole	*Glareola maldivarum*
Horned Grebe	*Podiceps auritus*	Pacific Golden-Plover	*Pluvialis fulva*
Horned Puffin[B]	*Fratercula corniculata*	Pacific Loon	*Gavia pacifica*
Hudsonian Godwit	*Limosa haemastica*	Parakeet Auklet[B]	*Aethia psittacula*
Jack Snipe	*Lymnocryptes minimus*	Parasitic Jaeger[B]	*Stercorarius parasiticus*
Killdeer	*Charadrius vociferus*	Pectoral Sandpiper	*Calidris melanotos*
King Eider	*Somateria spectabilis*	Pelagic Cormorant[B]	*Phalacrocorax pelagicus*
Kittlitz's Murrelet [C,BCC, B]	*Brachyramphus brevirostris*	Peregrine Falcon	*Falco peregrinus*
Laysan Albatross[BCC, B]	*Phoebastria immutabilis*	Pied-billed Grebe	*Podilymbus podiceps*
Leach's Storm-Petrel[B]	*Oceanodroma leucorhoa*	Pigeon Guillemot[B]	*Cepphus columba*
Least Auklet[B]	*Aethia pusilla*	Pink-footed Shearwater	*Puffinus creatopus*
Least Sandpiper	*Calidris minutilla*	Pin-tailed Snipe	*Gallinago stenura*
Lesser Scaup	*Aythya affinis*	Pomarine Jaeger[B]	*Stercorarius pomarinus*
Lesser Yellowlegs	*Tringa flavipes*	Purple Sandpiper	*Calidris maritima*
Little Curlew	*Numenius minutus*	Red Knot	*Calidris canutus*
Little Ringed Plover	*Charadrius dubius*	Red Phalarope	*Phalaropus fulicarius*
Little Stint	*Calidris minuta*	Red-breasted Merganser	*Mergus serrator*
Long-billed Dowitcher	*Limnodromus scolopaceus*	Red-faced Cormorant[B]	*Phalacrocorax urile*
Long-tailed Duck	*Clangula hyemalis*	Redhead	*Aythya americana*
Long-tailed Jaeger[B]	*Stercorarius longicaudus*	Red-legged Kittiwake[B]	*Rissa brevirostris*
Long-toed Stint	*Calidris subminuta*	Red-necked Grebe	*Podiceps grisegena*
Mallard	*Anas platyrhynchos*	Red-necked Phalarope	*Phalaropus lobatus*
Manx Shearwater	*Puffinus puffinus*	Red-throated Loon	*Gavia stellata*
Marbled Godwit	*Limosa fedoa*	Rhinoceros Auklet[B]	*Cerorhinca monocerata*
Marbled Murrelet[B]	*Brachyramphus marmoratus*	Ring-necked Duck	*Aythya collaris*
Marsh Sandpiper	*Tringa stagnatilis*	Rock Sandpiper	*Calidris ptilocnemis*
Mew Gull[B]	*Larus canus*	Ruddy Turnstone	*Arenaria interpres*
Mongolian Plover	*Charadrius mongolus*	Ruff	*Philomachus pugnax*
Mottled Petrel	*Pterodroma inexpectata*	Rufous-necked Stint	*Calidris ruficollis*
		Sabine's Gull[B]	*Xema sabini*
Northern Fulmar[B]	*Fulmarus glacialis*	Sanderling	*Calidris alba*
Northern Pintail	*Anas acuta*	Semipalmated Plover	*Charadrius semipalmatus*

Table 3.9-1: Representative Birds Known to Occur or Breed in the Coastal Zones within the GOA (continued)

Common Name	Genus and Species	Common Name	Genus and Species
Semipalmated Sandpiper	*Calidris pusilla*	Temminck's Stint	*Calidris temminckii*
Sharp-tailed Sandpiper	*Calidris acuminata*	Terek Sandpiper	*Xenus cinereus*
Short-billed Dowitcher	*Limnodromus griseus*	Thick-billed Murre [B]	*Uria lomvia*
Short-tailed Albatross[E, B]	*Phoebastria albatrus*	Trumpeter Swan	*Cygnus buccinator*
Short-tailed Shearwater[B]	*Puffinus tenuirostris*	Tufted Puffin[B]	*Fratercula cirrhata*
Slaty-backed Gull[B]	*Larus schistisagus*	Tundra Swan	*Cygnus columbianus*
Snow Goose	*Chen caerulescens*	Upland Sandpiper	*Bartramia longicauda*
Snowy Plover	*Charadrius alexandrinus*	Wandering Tattler	*Tringa incana*
Solitary Sandpiper	*Tringa solitaria*	Western Grebe	*Aechmophorus occidentalis*
Sooty Shearwater [B]	*Puffinus griseus*	Western Sandpiper	*Calidris mauri*
Spectacled Eider	*Somateria fischeri*	Whimbrel	*Numenius phaeopus*
Spoonbill Sandpiper	*Eurynorhynchus pygmeus*	Whiskered Auklet[B]	*Aethia pygmaea*
Spotted Redshank	*Tringa erythropus*	White-rumped Sandpiper	*Calidris fuscicollis*
Spotted Sandpiper	*Actitis macularius*	White-winged Scoter	*Melanitta fusca*
Steller's Eider[T]	*Polysticta stelleri*	Wilson's Phalarope	*Phalaropus tricolor*
Stilt Sandpiper	*Calidris himantopus*	Wilson's Snipe	*Gallinago delicata*
Surf Scoter	*Melanitta perspicillata*	Wood Sandpiper	*Tringa glareola*
Surfbird	*Aphriza virgata*	Yellow-billed Loon	*Gavia adamsii*

Notes: [E] Endangered, [T] Threatened, [C] Candidate Species, [BCC] Bird of Conservation Concern, [B] Breeding

Based loosely on their geographic distribution and feeding habits, birds observed in the TMAA are divided into two groups, (Department of Commerce [DOC] 1993), seabirds and waterfowl.

- Seabirds, such as alcids, shearwaters, and gulls. These feed in open waters ranging from the shoreline and estuaries to the open ocean. Some seabirds are strictly pelagic, while others prefer the nearshore environment.
- Waterfowl, such as ducks and geese. These familiar species are found near shore on the open coast and in estuaries, but some also use inland freshwater habitats.

In general, seabird activity is most concentrated along the GOA coastline, while waterfowl are found primarily in the bays and shallow waters of the southern coast (DOC 1993). Waterfowl (e.g., ducks and geese) can be hunted, but seasons and bag limits are established in federal and/or state regulations.

Seabirds

The seabird colonies off the coast of Alaska are among the largest in population in the continental United States. About 50 million seabirds nest on Alaska's coast each summer; this is 87 percent of all the seabirds in the United States (USFWS 2008). Alaska's seabirds nest in more than 1,600 seabird colonies around the coast of Alaska due to the fact that the State's coast is very long (approximately 30,000 miles [mi]), the coast has many cliffs and islands that provide habitat for nesting seabirds, and the nearby seas

(Bering Sea, Gulf of Alaska, and north Pacific Ocean) provides an abundant food source for the species (USFWS 2008).

Seabirds known to occur within the GOA include those that are pelagic (generally foraging far offshore over the continental shelf and in oceanic waters) and those that feed in nearshore zones. Pelagic seabirds go ashore primarily to breed (Piatt and Springer 2003). Pelagic species include albatross, petrels, shearwaters, cormorants, jaegers, skuas, gulls, terns, and alcids. Nearshore seabirds feed within sight of land and include Pacific (*Gavia pacifica*) and red-throated loons (*Gavia stellata*), western grebes (*Aechmorphorus occidentalis*), brown pelicans, several species of gulls and cormorants, common murres (*Uria aalge*), and red-necked phalaropes (*Phalaropus lobatus*). Coastal rocks, headlands, and islands along the outer coast are critical nesting and roosting sites for many seabird species (DOC 1993). Colony sites are important habitat for seabirds because reproductive success and continuation of species depend on these sites.

Alcids are a distinctive family of seabirds present in the GOA and along the coast that includes the tufted puffin (*Fratercula cirrhata*), rhinoceros auklet (*Cerorhinca monocerata*), Cassin's auklet (*Ptychoramphus aleuticus*), common murre, ancient murrelet (*Synthliboramphus antiquus*), marbled murrelets (*Brachyramphus marmoratus*), and pigeon guillemot (*Cepphus columba*) (DoC 1993). They are long-lived colonial nesters that reproduce slowly and are found in shallower nearshore waters, especially in summer when birds are closely tied to nesting sites (DOC 1993). Large colonies of tufted puffins, rhinoceros auklets, cassin's auklets, and common murres are present on the Aleutian islands. Common murres are circumpolar and number in the millions worldwide. They are the dominant member of the breeding seabird community on the west coast. They nest on open rock or dirt ledges along the Alaskan outer coast and sometimes shift colony sites. These birds are strong fliers and forage long distances from their colonies. They dive to considerable depths to capture fish, crustaceans, and cephalopods. In late summer and fall, adult females of the Washington coastal population fly into Puget Sound to molt and winter (DOC 1993).

The following ESA-listed and ESA-candidate species seabird species are known to occur in the GOA:

Short-tailed Albatross

The short-tailed albatross is the largest of the three north Pacific albatrosses (Harrison 1984). Adult short-tailed albatrosses are distinguishable from other Pacific albatrosses by their entirely white back and large bubble-gum pink bill that is strongly hooked at the end (Roberson 2000).

The short-tailed albatross was listed as endangered throughout its range under the ESA in 2000 (USFWS 2000). There is no designated critical habitat under ESA for the short-tailed albatross. During the late 1800s, the world population of short-tailed albatrosses was severely reduced by aggressive hunting for their plumage, resulting in the death of an estimated five million birds. Short-tailed albatrosses nest on isolated, windswept, offshore islands owned and administered by Japan that have restricted human access. The population has been rebounding in recent years because several Pacific rookeries have been protected from human use. The world population of short-tailed albatross is currently estimated at approximately 1,200 birds and is increasing (USFWS 2001).

Current human-induced threats include hooking and drowning on commercial long-line gear, entanglement in derelict fishing gear, ingestion of plastic debris, contamination from oil spills, and potential predation by introduced mammals on breeding islands (USFWS 2001). Plastic bags and plastic sheeting are most commonly swallowed by birds but balloons, Styrofoam beads, monofilament fishing line, and tar are also known to be ingested (Lutz 1990, Bjorndal et al. 1994, Tomas 2002). Invasive species at colonies, including cats, rats, and plants, also can be a significant source of mortality (USFWS 2005).

Short-tailed albatrosses have a lifespan of more than 40 years. Sexual maturity is reached at age 7 or 8 (Harrison 1990, USFWS 2001). The nesting season lasts from August to December on two rugged islands in Japan in October, with the hatching of a single egg occurring in late December and January. Both adults incubate the egg during this period. Fledging occurs in late April to early June, and the colony is totally deserted by mid-July (Roberson 2000). This species disperses throughout the north Pacific when it is not breeding.

Short-tailed albatrosses are pelagic wanderers, traveling thousands of miles at sea during the nonbreeding season (DoN 2006). Foraging occurs over open, offshore, ocean waters (DoN 2006). Most of their travel is concentrated along the continental shelf edge upwelling zones where they forage, utilizing shallow dives between 15 and 40 ft (4.5 and 12 m) in depth, on squid, fish, shrimp and other crustaceans, and flying-fish eggs (USFWS 2005). Their at-sea distribution includes the entire Pacific north of about 20°N, but they tend to concentrate along the Aleutians in the Bering Sea (Piatt et al. 2006).

Historic records indicate frequent use of nearshore and coastal waters in the eastern north Pacific from California through Alaska (Committee on the Status of Endangered Wildlife in Canada [COSEWIC] 2002, USFWS 2001). Current sightings in the eastern north Pacific and in the TMAA are concentrated offshore of Alaska and British Columbia. Sightings off the continental United States are gradually increasing as the population rebounds (Unitt 2004). Sightings of short-tailed albatross have the potential to increase in frequency as the species continues recovering.

Kittlitz's Murrelet

The Kittlitz's murrelet, *Brachyramphus brevirostris*, a small diving bird in the family Alcidae, may today be the rarest seabird regularly breeding in Alaska. Current population estimates range from 9,000-25,000 birds (USFWS 2003). The Kittlitz's murrelet has undergone steep population declines in several of its core population areas. Reasons for the population declines have not been conclusively determined. Because the species may warrant listing as threatened or endangered under the Endangered Species Act, the U.S. Fish and Wildlife Service named the murrelet as a candidate for protection under the Act in 2004 (USFWS 2004a).

Most of the world population inhabits Alaskan waters, with an estimated 5% of the remaining birds in eastern Siberia (Day et al. 1999). Anecdotal accounts of birds at sea and standardized surveys in a few areas suggested that Kittlitz's murrelets were declining in coastal areas of the northern Gulf of Alaska (GOA) at least since the early 1970s (USFWS 2003). Small breeding populations of Kittlitz's murrelet occur along the Aleutian Islands and as far north as the central Chuckchi Sea (Day et al. 1999). However, most of the Alaska population appears to have a quite restricted set of habitat preferences, being primarily found near tidewater glaciers or in nearshore waters with glacial runoff (Day et al. 1999, Kulentz et al. 2003).

As these population cores are north of the TMAA, Kittlitz's murrelets are not likely to be present in the TMAA or be affected by any of the proposed activities and will not be considered further in this analysis.

Waterfowl

Waterfowl are flat-billed birds that spend most of their lifecycle on the water (DOC 1993). Waterfowl typically breed in freshwater habitats, but many species move to shoreline or nearshore habitats when breeding is complete. Many species of waterfowl stage and winter in Alaskan waters and winter in the western Arctic plain. Species such as the harlequin duck (*Histronicus histronicus*), scoters (*Melanitta* sp.), bufflehead (*Bucephala albeola*), mergansers, goldeneyes, long-tailed duck (*Clangula hyemalis*), and scaup winter in the nearshore waters of the open coast (DOC 1993). Scoters and eiders are by far the most

numerous species of sea ducks in nearshore waters, with all four species of eider, king (*Somateria spectabilis*), common (*S. mollissima*), Steller's and spectacled (*S. fischeri*) breeding in Alaska.

The following ESA-listed waterfowl species is known to occur in the GOA:

Steller's Eider

The Alaska breeding population of Steller's eiders was listed as threatened under ESA on June 11, 1997 (62 FR 31748). Steller's eiders are not expected to occur in the TMAA, and there is no critical habitat or foraging areas in or within the vicinity of the TMAA. During the months of April to October, when the training activities are planned to occur, Steller's eiders can be found in nearshore areas, and in particular protected lagoons with tidal flats located hundreds of miles to the northwest and west of the TMAA (Alaska Department of Environmental Conservation 2009). During the winter, the distribution of Steller's eiders includes the nearshore areas around Kodiak Island, Cook Inlet, the southern side of the Alaska Peninsula, and the eastern Aleutian Islands. Though these areas are north and west of the TMAA, there will be no Navy activities in the TMAA during the winter. Therefore, Steller's eiders are not likely to be present in the TMAA or be affected by any of the proposed activities and will not be considered further in this analysis.

Hearing Capabilities of Birds

While little is known about the general hearing or underwater hearing capabilities of birds, research suggests an in-air maximum auditory sensitivity between 1 and 5 kilohertz (kHz) for most bird species (National Marine Fisheries Service [NMFS] 2003). It is possible that birds are likely to hear some mid-frequency sound in air. However, there is little published literature on the effects of underwater sound on diving birds. A review of available literature shows that most research focused on effects of pile-driving and seismic surveys. During such studies, airguns did not cause harm to birds. Similarly explosives used during ship shock trials did not cause harm unless birds were within 200 meters of the detonation site (Turnpenny and Nedwell 1994).

NMFS issued an environmental assessment with regards to the harassment of marine mammals in 2003 in accordance with the Marine Mammal Protection Act of 1972 (MMPA). As part of the environmental documentation, birds were analyzed for potential effects associated with exposure to active sonar. The operating frequency of the system was greater than 20 kHz, with a maximum source level at or less than 220 decibels (dB) at a reference pressure of 1 microPascal at 1 meter (re 1 µPa-m) in individual pulses less than 1 second for a duty cycle (time on over total time) of less than 10 percent. For example, in an 8-hour day, maximum sonar use would be less than 48 minutes (NMFS 2003). The potential hearing capability of birds was outside the proposed high frequency of the operating system and there is no evidence that birds utilize sound underwater to forage or locate prey (NMFS 2003). Thus, it was concluded that effects were unlikely. In addition, birds would not be an effective receptor because they are submerged only for short periods and birds at the surface can rapidly fly away from disturbance and annoying sounds.

3.9.1.2 Current Requirements and Practices

Standard operating procedures and best management practices implemented by the Navy for resource protection would reduce potential effects to birds. Avoidance of birds and their nesting and roosting habitats provides the greatest degree of protection from potential impacts within the TMAA or coastal areas of the GOA. For example, pursuant to Navy instruction (OPNAVINST) 3750.6R, measures to evaluate and reduce or eliminate bird/aircraft strike hazards to aircraft, aircrews, and birds are implemented during operations in the TMAA. See Chapter 5 for details.

3.9.2 Environmental Consequences

As noted in Section 3.9.1, the ROI for birds includes the TMAA. Navy training activities that occur within the Air Force inland Special Use Airspace (SUA) and the Army inland training lands were evaluated under previous National Environmental Policy Act (NEPA) documentation (USAF 1995, USAF 2007, Army 1999, Army 2004). These documents are incorporated by reference. Environmental effects in the open ocean beyond the U.S. territorial seas (outside of 12 nautical nm [22 km]) are analyzed in this EIS/OEIS pursuant to Executive Order (EO) 12114.

3.9.2.1 Previous Analyses

Impacts related to birds were previously evaluated in Sections 3.5 and 4.5 of the *Alaska MOA EIS* (USAF 1995), Sections 3.3 and 4.0 of the *Improvements to Military Training Routes in Alaska Environmental Assessment* (USAF 2007), Sections 3.12 and 4.12 of the *Alaska Army Lands Withdrawal Renewal Final Legislative EIS* (Army 1999); and Sections 3.9, 3.10, 4.9, and 4.10 of the *Transformation of U.S. Army Alaska FEIS* (Army 2004).

3.9.2.2 Regulatory Framework

Migratory Bird Treaty Act

The MBTA of 1918 (16 U.S.C. 703 et seq.) and the Migratory Bird Conservation Act (16 U.S.C. 715–715d, 715e, 715f–715r) of 18 Feb 29, (45 Stat. 1222) are the primary legislation in the United States established to conserve migratory birds. These statutes implement the United States' commitment to four bilateral treaties, or conventions, for the protection of a shared migratory bird resource. Current treaties are with the countries of Great Britain, Mexico, Canada, Japan, and the Soviet Union. The MBTA prohibits the taking, killing, or possessing of migratory birds or the parts, nests, or eggs of such birds, unless permitted by regulation. The species of birds protected by the MBTA appears in Title 50, Section 10.13 of the Code of Federal Regulations (50 C.F.R. 10.13) and represents almost all avian families found in North America. In general, there are only three species that are not protected by the MBTA and they include the rock pigeon (*Columba livia*), European starling (*Sturnus vulgaris*), and house sparrow (*Passer domesticus*).

On December 2, 2003, the President signed the 2003 National Defense Authorization Act. The Act provides that the Secretary of the Interior shall exercise his/her authority under the MBTA to prescribe regulations to exempt the Armed Forces from the incidental taking of migratory birds during military readiness activities authorized by the Secretary of Defense. Take under the MBTA is defined to be "unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported, or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export, any migratory bird, any part, nest, or eggs of any such bird, or any product, whether or not manufactured, which consists, or is composed in whole or part, of any such bird or any part, nest, or egg thereof, included in the terms of the conventions between the United States and Great Britain for the protection of migratory birds concluded August 16, 1916 (39 Stat. 1702), the United States and Mexico for the protection of migratory birds and game mammals concluded February 7, 1936, the United States and the Government of Japan for the protection of migratory birds and birds in danger of extinction, and their environment concluded March 4, 1972 and the convention between the United States and the Union of Soviet Socialist Republics for the conservation of migratory birds and their environments concluded November 19, 1976."

The final rule authorizing the Department of Defense (DoD) to take migratory birds during military readiness activities was published in the Federal Register on February 28, 2007. The regulation can be

found at 50 C.F.R. Part 21. The regulation provides that the Armed Forces must confer and cooperate with the USFWS on the development and implementation of conservation measures to minimize or mitigate adverse effects of a military readiness activity if it determines that such activity may have a "significant adverse effect" on a population of a migratory bird species. An activity has a significant adverse effect if, over a reasonable period of time, it diminishes the capacity of a population of a migratory bird species to maintain genetic diversity, to reproduce, and to function effectively in its native ecosystem. A population is defined as "a group of distinct, coexisting, same species, whose breeding site fidelity, migration routes, and wintering areas are temporally and spatially stable, sufficiently distinct geographically (at some point of the year), and adequately described so that the population can be effectively monitored to discern changes in its status." Virtually all bird species found within the TMAA and coastal areas of the GOA are covered by the MBTA (exceptions are noted above). Two of the species covered under the MBTA are also federally listed as threatened or endangered and have additional protection under the ESA.

Migratory bird conservation relative to non-military readiness activities is addressed separately in a Memorandum of Understanding (MOU) developed in accordance with EO 13186, signed January 10, 2001, "Responsibilities of Federal Agencies to Protect Migratory Birds." This document encourages conservation measure integration into regional or state management plans, management of military lands to support conservation measures, avoidance or minimization of impacts to migratory birds, and the periodic evaluation of conservation measurements. The MOU between the DoD and the USFWS was signed on July 31, 2006.

Endangered Species Act

As the TMAA is more than 12 nm (22 km) from the closest point of land and thus outside of U.S. territorial seas, this EIS/OEIS analyzes potential effects to birds in the context of the ESA, NEPA, and EO 12114. For purposes of ESA compliance, effects of the action were analyzed to make the Navy's determination of effect for listed species (i.e., no effect or may affect). The definitions used in making the determination of effect under Section 7 of the ESA are based on the USFWS and NMFS *Endangered Species Consultation Handbook* (USFWS and NMFS 1998).

"No effect" is the appropriate conclusion when a listed species will not be affected, either because the species will not be present or because the project does not have any elements with the potential to affect the species. "No effect" does not include a small effect or an effect that is unlikely to occur.

If effects are insignificant (in size) or discountable (extremely unlikely), a "may affect but not likely to adversely affect" determination is appropriate. Insignificant effects relate to the magnitude or extent of the impact (that is, they must be small and would not rise to the level of a take of a species). Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur. These factors were also considered in determining the significance of effects EO 12114.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c), enacted in 1940 and amended several times since, prohibits anyone without a permit issued by the Secretary of the Interior from "taking" bald eagles, including their parts, nests, or eggs. The Eagle Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." However, bald eagles are not expected in the TMAA due to lack of proximity (> 12 nm [22 km]) to the Alaskan shoreline. As such, there is little indication that military activities in the TMAA will result in the take of bald eagles and therefore a permit is not needed. For these reasons, bald eagles are discounted from any further analysis and will not be discussed further in this document.

3.9.2.3 Approach to Analysis

Data Sources

A systematic review of relevant literature and data has been conducted to complete this analysis for seabirds. Of the available scientific literature (both published and unpublished), the following types of documents were utilized in the assessment: journals, books, periodicals, bulletins, DoD operations reports, theses, dissertations, endangered species recovery plans, species management plans, and other technical reports published by government agencies, private businesses, or consulting firms. The scientific literature was also consulted during the search for geographic location data (geographic coordinates) on the occurrence of marine resources within the TMAA and the coastal environments of the GOA.

Assessment Methods

The analysis considered effects on seabirds as a group from:

- Vessel movements;
- Aircraft overflights, including aircraft disturbance (such as noise) and aircraft strikes on birds;
- Ordnance use;
- Explosions and impacts; and
- Expended materials, including ordnance-related materials, target-related materials, and entanglement.

Each of the species that was identified as a federally listed threatened and/or endangered, or candidate species was then individually evaluated for each of these stressors. An assessment was not conducted on the effects of sonar on seabirds. As described in Section 3.9.1.1 (Hearing in Birds), a study documented by NMFS (2003) concluded that effects to seabirds from sonar were unlikely. Although some species may be able to hear sonar, several factors combine to make effects improbable, most notably the fact that seabirds spend a very small fraction of time submerged and most return to the surface within seconds of diving. Because seabirds spend relatively little time beneath the water surface, there would be a low likelihood of seabird exposure. Given that there is no evidence of sonar causing harm to seabirds, this issue is not addressed further in the analysis of effects on this resource.

As discussed in Section 3.1 (Air Quality) and Section 3.3 (Water Resources), some air and water pollutants would be released into the environment as a result of the Proposed Action. The analyses presented in Sections 3.1 and 3.3 indicate that any increases in air or water pollutant concentrations resulting from Navy training activities in the TMAA would be negligible and localized, and impacts to air and water quality would be minor. Based on these analyses, air and water quality changes would have no effect or negligible effects on birds. Accordingly, the effects of air and water quality changes on birds are not addressed further in this section.

As previously discussed in Section 3.9.2.2, military readiness activities are exempt from the take prohibitions of the MBTA provided they do not result in a significant adverse effect on a population of a migratory bird species. The migratory bird species that are protected under ESA are discussed in the analyses that follow.

3.9.2.4 No Action Alternative

Under the No Action Alternative, baseline levels of activities would remain unchanged from current conditions. Birds would have the potential to be affected by vessel movement, aircraft overflights, weapons firing/non-explosive ordnance use, explosive ordnance, and expended materials.

Vessel Movements

Many of the ongoing and proposed activities within the TMAA involve maneuvers by various types of surface ships and submarines (collectively referred to as vessels). Currently, the number of Navy vessels participating in training under the No Action Alternative is 23, consisting of 4 military vessels and up to 19 contracted vessels and boats, but can vary based on training schedules and scenarios. Activities involving vessel movements occur intermittently and are short in duration, generally a few hours in duration. These activities are widely dispersed throughout the TMAA, which is a vast area encompassing 42,146 square nautical miles (nm^2) (144,557 square kilometers [km^2]) of surface/subsurface ocean. Ship movements on the ocean surface have the potential to affect birds by disturbing or striking individual animals. The probability of ship and seabird interactions occurring in the TMAA depends on several factors, including the presence and density of birds; numbers, types, and speeds of vessels; duration and spatial extent of activities; and protective measures implemented by the Navy.

Birds respond to moving vessels in various ways. Some species, such as gulls and albatross, commonly follow vessels (Hamilton 1958, Hyrenbach 2001, Hyrenbach 2006), while other species, such as plovers and curlews, seem to avoid vessels (Borberg et al. 2005, Hyrenbach 2006). Vessel movements could elicit brief behavioral or physiological responses, such as alert response, startle response, or fleeing the immediate area, such responses typically conclude as rapidly as they occur. However, the general health of individual birds is not compromised (see additional discussion of these responses below for aircraft overflights).

Direct collisions with vessels or a vessel's rigging, such as wires, poles, or masts, could result in bird injury or mortality. Bird/vessel collisions are probably rare events during daylight hours, but the possibility of collisions could increase at night, especially during inclement weather. Birds can become disoriented at night in the presence of artificial light (Black 2005), and lighting on vessels may attract some birds (Hunter et al. 2006), increasing the potential for harmful encounters.

Based on the low density of Navy vessels and the high mobility of birds, the probability of bird/vessel collisions is low. Navy mitigation measures (see Chapter 5), which include avoidance of seabird colonies and habitats where birds may concentrate, would further reduce the probability of bird/vessel collisions. In accordance with EO 12114, harm to birds from vessel movements in nonterritorial seas (beyond 12 nm [22 km]) would be unlikely.

Short-tailed albatross exposure to vessels could occur while foraging or migrating in open water environments within the TMAA. Periods of exposure of individual birds would be extremely short given the low density and constant movement of naval vessels at sea. If birds were to respond to vessel movements, the responses would be limited to short-term behavioral or physiological reactions. Direct collisions with vessels or a vessel's rigging could result in bird injury or mortality, but is unlikely based on the low density of Navy vessels and the high mobility of birds. In accordance with the ESA, vessel movements under the No Action Alternative may affect, but are not likely to adversely affect, ESA-listed seabirds.

Aircraft Overflights

Aircraft Disturbance

Various types of fixed-wing aircraft and helicopters are used in training activities throughout the TMAA. For this reason, birds in the TMAA could be exposed to airborne noise associated with these aircraft. Numerous studies have documented that birds respond to anthropogenic noise, including aircraft overflights, weapons firing, and explosions (National Park Service [NPS] 1994, Larkin 1996, Plumpton 2006). The manner in which birds respond to noise 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 or absence of associated visual stimuli, and previous exposure.

Researchers have documented a variety of behavioral responses of birds to noise, such as alert behavior, startle response, flying or swimming away, diving into the water, and increased vocalizations. While they are difficult to measure in the field, some of these behavioral responses are likely accompanied by physiological responses, such as increased heart rate, or stress (NPS 1994). Chronic stress can compromise the general health of birds, but stress does not necessarily result in negative consequences to individual birds or to populations (NPS 1994; Larkin 1996). For example, the reported behavioral and physiological responses of birds to noise exposure are within the range of normal adaptive responses to external stimuli, such as predation, that birds face on a regular basis. Unless they are repeatedly exposed to loud noises or simultaneously exposed to a combination of stressors, individuals may return to normal behavior and physiology almost immediately after exposure. Studies also have shown that birds can become habituated to noise following frequent exposure and cease to respond behaviorally to the noise (NPS 1994; Larkin 1996; Plumpton 2006); however, such frequent exposure is not anticipated to occur in the TMAA.

Under the No Action Alternative, most overflights would occur over marine environments, at elevations in excess of 15,000 ft (4,752 m) above mean sea level (MSL), and beyond 20 nm (37 km) from shore. Bird exposure to aircraft noise would be brief as aircraft quickly passed overhead. Exposures would be infrequent to seabirds and practically nonexistent to waterfowl based on the distance of the TMAA from coastal environments, large operational area of the TMAA, dispersed nature of the overflights, and the low probability of repeated exposure of individual birds over a short period of time (hours or days).

Most documented responses of birds have been to low-level aircraft overflights occurring below 3,000 ft (914 m) (NPS 1994). Unlike the situation at a busy commercial airport or military landing field, repeated exposure of individual birds or groups of birds is unlikely within the TMAA based on the dispersed nature of the overflights. If birds were to respond to an overflight, the responses would be limited to brief behavioral or physiological reactions and the general health of individual birds would not be compromised. Aircraft transiting between the TMAA and inland special use areas do so within a designated corridor that is above 15,000 ft (4,752 m), well above altitudes that would cause an exposure to birds near the surface from aircraft noise.

Unlike fixed-wing aircraft, helicopter training activities often occur at low altitudes (75 to 100 ft [22.8 to 30 m]), which increases the likelihood that birds would respond to helicopter overflights. In addition, some studies have suggested that birds respond more to noise from helicopters than that from fixed-wing aircraft (Larkin 1996; Plumpton 2006). Noise from low-altitude helicopter overflights would be expected to elicit brief behavioral or physiological responses in exposed birds. Repeated exposure of individual birds or groups of birds would be unlikely, based on the distance of the TMAA from coastal environments, large operational area of the TMAA, and the dispersed nature of the overflights. The general health of individual birds would not be compromised.

Aircraft noise under the No Action Alternative would not adversely affect populations of migratory birds and their habitat. Aircraft noise over territorial seas would have minimal impacts on birds. In accordance with EO 12114, aircraft noise over nonterritorial seas would not cause considerable harm to birds.

Short-tailed albatross exposure to aircraft noise could occur while foraging or migrating in open water environments within the TMAA. Periods of elevated noise levels would be brief and repeated exposure of individual birds would be extremely short given the constant movement of naval vessels at sea. If birds were to respond to an overflight, the responses would be limited to short-term behavioral or physiological reactions. In accordance with the ESA, aircraft noise under the No Action Alternative may affect but is not likely to adversely affect ESA-listed seabirds.

Aircraft Strikes

Aircraft strikes on birds are a major concern for the Navy because they can cause harm to aircrews, damage equipment, and produce bird mortality. During maritime operations, OPNAVINST 3750.6R identifies measures to evaluate and reduce or eliminate bird/aircraft strike hazards to aircraft, aircrews, and birds and requires the reporting of all strikes when damage or injuries occur as a result of a bird – aircraft strike. However, the numbers of bird deaths that occur annually from all Navy activities are insignificant from a bird population standpoint. From 2002 through 2004, an annual average of 596 known wildlife/aircraft strike events occurred Navy-wide. While most of these involved birds (Navy Safety Center [NSC] 2004), only five of the known bird strikes occurred involving vessel-based aircraft.

While bird strikes can occur anywhere aircraft are operated, Navy data indicate that they occur most often over land or close to shore. The potential for bird strikes to occur in offshore areas is relatively low because activities are widely dispersed and at relatively high altitudes (above 15,000 ft [4,752 m] for fixed-wing aircraft) where bird densities are low. Approximately 95 percent of bird flight during migrations occurs below 10,000 ft (3,048 m) with the majority below 3,000 feet (914 m) (USGS 2006). Aircraft transiting between the TMAA and inland special use areas do so within a designated corridor that is above 15,000 ft (4,752 m), in regions where bird density is extremely low.

Aircraft strikes under the No Action Alternative would not adversely affect migratory bird populations and their habitat. Aircraft strikes over territorial seas are not anticipated and would have minimal impacts on birds. In accordance with EO 12114, harm to birds from aircraft strikes over nonterritorial seas would not be expected.

Short-tailed albatross could be exposed to airborne noise associated overflights and to potential aircraft strike. Fixed wing aircraft overflights generally occur at altitudes above that where albatross are present. Additionally, Navy helicopter pilots are vigilant with regard to strike hazards and avoid interactions with birds. Aircraft strikes under the No Action Alternative may affect, but are not likely to adversely affect, ESA-listed seabirds.

Weapons Firing Nonexplosive Ordnance Use

Current Navy training activities in the TMAA include firing a variety of weapons. As listed in Table 3.9-2, these weapons employ a variety of nonexplosive and explosive training rounds, including bombs, missiles, naval gun shells, cannon shells, and small caliber ammunition. These materials are used in the open ocean beyond 12 nm (22 km) from shore. These activities account for the majority of naval shells and rounds used in the TMAA.

Direct ordnance strikes from firing weapons are a potential, but unlikely, stressor to seabirds. Seabirds both in flight and resting on the water's surface would be vulnerable to an ordnance strike. Seabirds exposed to an ordnance strike would suffer sublethal injury or mortality. However, the vast area over

which training activities occur and implementation of Navy resource protection measures, combined with the small size and ability of birds to flee disturbance, would make direct strikes unlikely. Individual birds may be affected, but ordnance strikes have no effect on species or community populations. Ordnance strikes under the No Action Alternative will not have a significant adverse effect on migratory bird populations. Furthermore, in accordance with EO 12114, harm to seabirds from ordnance strikes in waters beyond the U.S. territorial sea is improbable. Ordnance strikes under the No Action Alternative may affect, but are not likely to adversely affect, ESA-listed seabirds.

Direct ordnance strikes from firing weapons are potential, but very unlikely, threats to short-tailed albatross. Based on a TMAA size of 42,146 nm^2 (144,557 km^2) and assuming distribution of activities within 20 percent of the TMAA (8,429 nm^2 [28,911 km^2]), 1.86 items per nm^2 per year (0.5 kg per km^2) would be used in within the TMAA. However, the potential for a direct bird strike by ordnance would remain quite low. Effects could include disturbance and relocation, sub-lethal injury, and mortality. However, the vast area of 42,146 nm^2 (145,482 km^2) over which training activities could occur and combined with the small size of the birds and the ability of the birds to flee, would make direct strikes unlikely. Additionally, Navy guidance indicates that activities involving explosions must have a cleared buffer area of 600 yards around the detonation area before the activity can be conducted (See Mitigation, Section 3.9.3) further reduces the possibility of a direct ordnance strike. In accordance with the ESA, ordnance and ordnance-related materials under the No Action Alternative may affect, but are not likely to adversely affect, ESA-listed seabirds.

Explosive Ordnance (At-Sea Explosions)

Under the No Action Alternative, activities involving explosions and impacts occur at or just below the surface in the TMAA. These explosions missiles and bombs used during Bombing Exercises (BOMBEX); and high-explosive shells fired during Gunnery Exercises (GUNEX) and BOMBEX. Missiles used in air-to-air training events at sea (MISSLEX), although part of live fire events, are designed to detonate in the air (typically above 15,000 feet where expected bird density is low) and do not constitute an at-sea explosion occurring in water as analyzed in this document. Birds in the immediate vicinity and exposed to explosions and impacts could suffer temporary effects, and these effects would be in proportion to the proximity to the explosion and size of the detonation. Birds that may be present in proximity to these activities could be disturbed and relocate, or they could be injured or killed (NMFS 2002). Based on a TMAA size of 42,146 nm^2 (144,557 km^2) and assuming distribution of activities within 20 percent of the TMAA (8,429 nm^2 [28,911 km^2]), 0.01 explosions per nm^2 per year (0.003 per km^2) could occur in within the TMAA. This usage would produce a very low density of offshore detonations per year within the TMAA. This, coupled with Navy resource protection measures implemented prior to these activities (Section 3.9.3) would provide a high level of protection for the birds during these exercises, making the potential for effects quite low.

At-sea explosions under the No Action Alternative would not adversely affect migratory bird populations and their habitat. In accordance with EO 12114, minimal harm to birds from at-sea explosions in nonterritorial seas (beyond 12 nm [22 km]) would occur.

Direct impacts from at-sea explosions are possible, but are unlikely threats to short-tailed albatross. Explosions have the potential to affect the short-tailed albatross only if the bird is in the immediate vicinity above the explosion. Impacts would be possible, but have a low potential for occurrence given the large area of the TMAA, limited use of live ordnance, and implementation of Navy protective measures. In accordance with the ESA, at-sea explosions under the No Action Alternative may affect, but are not likely to adversely affect, ESA-listed seabirds.

Expended Materials

The Navy expends a variety of materials during training exercises in the TMAA. The types and quantities of expended materials used, and information regarding fate and transport of these materials within the marine environment, are discussed in Section 3.2 (Expended Materials) and Section 3.3 (Water Resources).

The effect of materials expended during training in the TMAA is assessed by the number of expended items per unit area. Under the No Action Alternative, an estimated 15,982 items would be expended in this area (Table 3.9-2). Based on a TMAA size of 42,146 nm^2 (144,557 km^2) and assuming distribution of activities within 20 percent of the TMAA (8,429 nm^2 [28,911 km^2]), 1.9 items per nm^2 per year (0.5 kg per km^2) would be deposited in the ocean. More than 97 percent of these items would be from gunshells and small caliber rounds.

Table 3.9-2: Expended Training Materials in the TMAA – All Alternatives

Training Material	No Action Alternative	Alternative 1		Alternative 2	
	Number	Number	% Increase from No Action	Number	% Increase from No Action
Bombs	120	180	50	360	200
Missiles	22	33	50	66	200
Naval Gunshells	10,564	13,188	25	26,376	150
Small Caliber Rounds	5,000	5,700	14	11,400	128
Sonobuoys	24	793	3,200	1,587	6,500
Targets & Pyrotechnics	252	322	28	644	160
PUTR	0	7	N/A	7	N/A
SINKEX	0	0	N/A	858	N/A
Total	**15,982**	**20,223**	**26**	**41,298**	**160**

Expended materials resulting from ordnance use include remnants and shrapnel from explosive rounds and nonexplosive training rounds. These solid materials, many of which have a high metal content, quickly drop through the water column to the sea floor. Ingestion of expended ordnance does not occur in the water column because ordnance-related materials quickly sink.

The probability of birds ingesting expended ordnance depends on factors such as the location of the spent material, size of the material, likelihood the material would be mistaken for prey, and extent of benthic foraging that occurs in the impact area. Some materials, such as nonexplosive training bombs, would be too large to be ingested by a bird, but other materials, such as small-caliber ammunition and shrapnel, are small enough to be swallowed. Marine debris can pass through the digestive tract and be voided naturally without causing harm, or it can cause sublethal or lethal effects. Sublethal effects include nutrient dilution, which occurs when nonnutritive debris displaces nutritious food in the gut, leading to slow growth or reduced reproductive success (McCauley and Bjorndal 1999). While ingestion of marine debris has been linked to bird mortalities, sublethal effects are more common (Bjorndal et al 1994, Tomas 2002, McCauley and Bjorndal 1999). It is possible that persistent expended ordnance could be colonized by benthic organisms (such as clams and oysters) and then mistaken by birds for prey, or that expended ordnance could be accidentally ingested by birds while they were foraging for natural prey items. As foraging depths of diving birds is restricted to shallow depths, it is highly unlikely that benthic foraging by birds would occur in areas of ordnance use, or that ingestion of expended ordnance would affect birds. Most benthic foraging by birds occurs in nearshore areas (Lutcavage et al. 1997). All ordnance use in the

TMAA would occur in areas beyond 12 nm (22 km) from shore where water depths in excess of 3,000 ft would exclude benthic foraging.

Ordnance-related materials under the No Action Alternative would not adversely affect migratory bird populations and their habitat. In accordance with EO 12114, harm to birds from ordnance-related materials would be unlikely in waters beyond the U.S. territorial sea.

Additional materials expended during training include illuminating flares, chaff, and marine markers. These materials are dismissed from further analysis because, for both canisters and markers, the majority of the constituents are consumed by heat and smoke, both of which dissipate in the air. MK-58 marine markers produce chemical flames and surface smoke and are used in training exercises to mark an ocean surface position to simulate divers, ships, and points of contact. The smoke dissipates in the air and has little or no effect on birds. The marker burns similarly to a flare, producing a flame until all combustible components have been consumed. Any remaining materials from marine markers would sink into bottom sediments or become encrusted by chemical processes or by marine animals. Phosphorus contained in the markers reacts with seawater to produce phosphoric acid, a variable, but normal, component of seawater.

Chaff is a thin polymer with an aluminum coating that is cut in various lengths to affect and block various radar frequencies. All of the components of the aluminum coating are present in seawater in trace amounts, except magnesium, which is present at 0.1 percent. The stearic acid coating is biodegradable and nontoxic. The fibers are too short and fine to pose an entanglement risk. Although they potentially could be ingested by marine life, the fibers are non-toxic. Chemicals leached from the chaff would be diluted by the surrounding seawater to levels below those that can affect sediment quality and benthic habitats. In accordance with the ESA, military expended materials under the No Action Alternative may affect, but are not likely to adversely affect, ESA-listed seabirds.

Target-Related Materials

A variety of at-sea targets are used in the TMAA, ranging from high-technology, remotely operated airborne and surface targets (such as airborne drones) to low-technology, floating, at-sea targets (such as inflatable targets) and airborne, towed banners. Many of the targets are designed to be recovered for reuse and are not destroyed during training. The expendable targets used in the TMAA include the BQM-74E Tactical Air Launched Decoy (TALD), floating targets, and MK-58 marine marker. These units are 2 and 3 ft (0.6 and 0.9 m) in length, respectively, sink to the bottom intact, and present no ingestion hazard to birds.

The TALD is an air launched, preprogrammed, unpowered vehicle used to deceive and saturate enemy integrated air defenses during strike aircraft operations. It is approximately 7.5 ft (2.3 m) long, with a wing span of 5 ft (1.5 m). It operates as an expendable vehicle with no recovery capabilities. Under the No Action Alternative, eight TALDs would be used annually. Based on the large size of the TMAA, low number of TALDs used, and abilities of birds to readily disperse from disturbance, it is very unlikely that birds would be measurably affected by use of TALDS.

Floating targets, such as naval gunnery target balloons (known as Killer Tomatoes) are required and utilized by Navy units to maintain a state of readiness in target acquisition and gunnery skills. Surface targets are made from urethane fabric, are relatively lightweight, easily stored, inflated, and deployed by just a few personnel. Most target balloons are radar enhanced with reflective metal foil material intended to simulate a small-craft on electronic systems. This allows radar system operators to lock onto their target to ascertain range and azimuth information for use by commanders to initiate simulated combat, interdiction, or rescue missions. Though the naval gunnery target balloons are attempted to be recovered after training activities, a destroyed floating target could fill with water and sink to the bottom of the water column. Combined with the low number of floating targets that could sink in this manner, the large

area of the TMAA, and the depth of the expended target after completing the exercise, it is very unlikely that birds would be measurably affected by use of floating targets.

Target use under the No Action Alternative would not adversely affect migratory bird populations and their habitat. In accordance with EO 12114, harm to birds from targets and marine markers would be unlikely in nonterritorial seas.

Target use under the No Action Alternative is an unlikely threat to short-tailed albatross. The expendable targets used in the TMAA quickly sink to the bottom, and present little to no ingestion hazard to short-tailed albatross. Impacts would be possible, but have a low potential for occurrence due to the large area of the TMAA and low numbers of targets used. Target use in nonterritorial seas under the No Action Alternative may affect, but is unlikely to adversely affect, ESA-listed seabirds.

Entanglement

Expended material such as parachutes from sonobouys, associated parachute lines, or shrouds may be encountered by birds in the waters of the TMAA. Entanglement in persistent marine debris causes mortality in birds in the eastern Pacific Ocean. Birds that become entangled could drown, starve to death, lose a limb, or attract predators with their struggling (Melvin and Parrish 2001). There is a potential for birds to become entangled in expended materials that are on or near the surface. Materials that are expended in training activities, including sonobuoys and markers, usually sink shortly after they are deployed. As a result, the potential for entanglement in these materials is low.

Under the No Action Alternative, approximately 24 parachutes associated with sonobuoys are deployed and not recovered. These parachutes deliver sonobuoys during training activities in the TMAA. Given the infrequent occurrence of birds in the study area and the low concentration of entanglement hazards, the potential for bird entanglement in military expended material would be low. Entanglement hazards under the No Action Alternative would not adversely affect migratory bird populations. In accordance with EO 12114, harm to birds from military expended material would be unlikely in nonterritorial seas.

Similar to target use, parachute lines or shrouds sink shortly after being deployed. Given the low density of short-tailed albatross in the TMAA and the low concentration of entanglement hazards, the potential for short-tailed albatross entanglement in Navy expended material is low. In accordance with the ESA, expended material under the No Action Alternative may affect, but is not likely to adversely affect, ESA-listed seabirds.

Threatened and Endangered Species

Within the TMAA, the single endangered species is the short-tailed albatross. As part of the EIS/OEIS process the Navy entered into consultation with the appropriate federal and state agencies. Utilizing criteria and analysis methodology as presented for non-listed species, vessel movements, aircraft overflight, ordnance use, explosions, and military expended materials (entanglement) may affect, but are not likely to adversely affect individual or populations of short-tailed albatross under the No Action Alternative in the TMAA. The USFWS signed a letter indicating concurrence with this position on 24 March 2010 (see correspondence in Appendix C).

Migratory Bird Treaty Act

All activities that would take place under the No Action Alternative fall within the MBTA definition of military readiness activities. The take of an individual bird from these activities is allowed under the MBTA provided it does not result in a significant adverse effect on a population of a migratory bird species. The activities associated with the No Action Alternative would not diminish the capacity of a population of a migratory bird species to maintain genetic diversity, to reproduce, and to function

effectively in its native ecosystem, nor would it adversely affect migratory bird populations. As a result and in accordance with 50 C.F.R. Part 21, the Navy is not required to confer with the USFWS on the development and implementation of conservation measures to minimize or mitigate adverse effects to migratory birds that are not listed under the ESA.

3.9.2.5 Alternative 1

Under Alternative 1, the general level of some activities in the TMAA would increase relative to those under the No Action Alternative. In addition, training activities associated with force structure changes would be implemented for the EA-18G Growler, SSGN, P-8 MMA, DDG 1000, and UASs. Force structure changes associated with new weapons systems associated with new training instrumentation include the PUTR. Birds would have the potential to be affected by vessel movements, aircraft overflights, weapons firing / non-explosive ordnance use, explosive ordnance, and expended materials under Alternative 1.

Vessel Movements

As discussed for the No Action Alternative, the number of Navy vessels operating during training activities varies, but generally includes up to 27 surface ships and one submarine (collectively referred to as vessels). Vessel movements would be widely dispersed throughout the area. Under Alternative 1, steaming hours would increase from current conditions. The small increase in steaming hours would not measurably increase potential effects to birds from disturbance or vessel collision. Impacts would be the same as those described for the No Action Alternative.

Vessel movements under Alternative 1 would not adversely affect migratory bird populations. In accordance with EO 12114, harm to birds from vessel movements in nonterritorial seas would be unlikely. In accordance with the ESA, vessel movements in nonterritorial seas under Alternative 1 may affect but are unlikely to adversely affect ESA-listed seabirds.

Aircraft Overflights

As discussed for the No Action Alternative, most flights under Alternative 1 would occur over marine environments, at elevations in excess of 3,000 ft (914 m), and beyond 12 nm (22 km). Most sound exposure levels would be lower than 97 A-weighted decibels (dBA) because a majority of the overflights would occur above 15,000 ft (4,752 m). Overflights occurring between the TMAA and inland operating areas occur at altitudes above 15,000 ft, well above those flight levels that would cause exposure to sound. Impacts to birds from aircraft disturbance would be the same as those described for the No Action Alternative. Under Alternative 1, aircraft overflight noise would elicit brief behavioral responses in exposed birds, but the general health of individual birds would not be compromised.

As discussed for the No Action Alternative, relatively few vessel-based Navy aircraft strike birds each year. The potential for bird strikes to occur offshore is low because activities are widely dispersed and at altitudes above 15,000 ft (914 m) where bird densities are low. Overflights occurring between the TMAA and inland operating areas occur at altitudes above 15,000 ft (4,752 m), where bird densities are much lower than those at lower altitudes. The proposed increase in aircraft overflights would not measurably change impacts from those described for the No Action Alternative. Few, if any, birds would be struck by vessel-based Navy aircraft under Alternative 1.

Aircraft overflights under Alternative 1 would not adversely affect migratory bird populations. In accordance with EO 12114, harm to birds from aircraft overflights in nonterritorial seas is possible, but would be unlikely. Aircraft overflights in nonterritorial seas under Alternative 1 may affect, but are not likely to adversely affect, ESA-listed seabirds.

Weapons Firing/Nonexplosive Practice Ordnance

As described for the No Action Alternative, the potential for birds to be struck by ordnance is low, given the patchy distribution of birds, ability of birds to flee from disturbance, and low concentration of dispersed rounds. Individual birds may be affected, but ordnance strikes would have no effect on species or community populations. Avoidance measures are implemented prior to and during these activities to minimize impacts to birds (see Section 3.9.3 and Chapter 5, Mitigation). In accordance with the ESA, weapons firing or nonexplosive ordnance use in waters beyond the U.S. territorial sea under Alternative 1 may affect, but is unlikely to adversely affect, ESA-listed seabirds.

Explosive Ordnance (At-Sea Explosions)

Under Alternative 1, explosions from missiles and bombs used during BOMBEX and MISSILEX; and shells fired during GUNEX and BOMBEX would increase. As mentioned previously, missiles used in air to air training events at sea (MISSLEX), although part of a live fire event, are designed to detonate in the air (typically above 15,000 ft (4,752 m) where expected bird density is low) and do not constitute an at-sea explosion occurring in water as analyzed in this document. In addition, there would also be subsurface explosions that involve the use of explosive sonobuoys used during a Tracking Exercise (TRACKEX). Birds in relatively close proximity to these activities could be disturbed and relocate, or be injured or killed. Based on a TMAA size of 42,146 nm^2 (144,557 km^2) and assuming distribution of GUNEX and BOMBEX activities within 20 percent of the TMAA (8,429 nm^2 [28,911 km^2]), 0.015 explosions per nm^2 per year (0.004 per km^2) would occur in within the TMAA. Although the potential for birds to be injured by explosions exists, the chance of this occurrence is low. Navy avoidance measures (see Section 3.9.3) implemented prior to explosive activities would provide a high level of protection for birds during at-sea explosions.

Under Alternative 1, explosions and impacts would not adversely affect migratory bird populations. In accordance with EO 12114, harm to birds from at-sea explosions in nonterritorial seas would be unlikely. In accordance with the ESA, explosions in nonterritorial seas under Alternative 1 may affect, but is unlikely to adversely affect, ESA-listed seabirds.

Expended Materials

Under Alternative 1, an estimated 20,223 items would be expended in the TMAA, a 26 percent increase over the No Action Alternative (see Table 3.9-2). Based on an open ocean area of 42,146 nm^2 (144,557 km^2) and assuming a distribution of activities over 20 percent of this area, 2.4 items per nm^2 per year (0.7 kg per km^2) would be deposited in the ocean. More than 93 percent of these expended items would be gunshells and small caliber rounds that sink through the water column quickly. It is highly unlikely that benthic foraging by birds occurs in the area where ordnance would be found. All ordnance use in the TMAA would occur in areas more than 3 nm offshore where water depths are in excess of 3,000 ft (914 m). Under Alternative 1, ingestion of military expended materials may affect, but is not likely to adversely affect, ESA-listed seabirds.

As indicated in Table 3.9-2, use of targets and pyrotechnics would increase by 28 percent under Alternative 1 from 252 to a total of 322 targets. As discussed for the No Action Alternative, the expendable targets used in the TMAA are the Expendable Mobile Anti-Submarine Warfare (ASW) Training Target (EMATT), floating targets, and TALD. An EMATT is a small device (approximately 2 ft in length and 3 inches in diameter) shaped like a torpedo that can be launched by hand from a surface vessel or deployed from a submarine or aircraft. EMATTs are programmed to move through the water and provide acoustic and other sensor that mimic a submarine. At the end of its use, an EMATT will sink to the floor of the ocean. Expended EMATTs are unlikely to result in any physical impacts to the sea floor. Expended EMATTs would sink into a soft bottom or would lie on a hard bottom, where they may provide a substrate for benthic colonization and may be covered eventually by shifting sediments. All

EMATTs used in the TMAA would occur in areas beyond 12 nm (22 km) from shore where water depths in excess of 3,000 ft (914 m) would exclude benthic foraging on materials resting on the bottom following exercises. The modest change in use of these materials and the inclusion of EMATTs would not measurably change the impacts to birds over existing conditions. Thus, effects would be the same as those described for the No Action Alternative.

Under Alternative 1, approximately 793 parachutes associated with sonobuoys would be deployed and not recovered. Assuming a distribution of hazards covering only 20 percent of the TMAA, the concentration of entanglement hazards would be 0.09 per nm^2. As described for the No Action Alternative, given the infrequent occurrence of birds in the TMAA and the low concentration of entanglement hazards, the potential for bird entanglement in military expended material would be low.

Expended materials under the Alternative 1 would not adversely affect migratory bird populations. In accordance with EO 12114, harm to birds from expended materials in nonterritorial seas would be unlikely. In accordance with the ESA, military expended materials in nonterritorial seas under Alternative 1 may affect, but are not likely to adversely affect, ESA-listed seabirds.

Threatened and Endangered Species

Within the TMAA, the single endangered species is the short-tailed albatross. As part of the EIS/OEIS process the Navy entered into consultation with the appropriate federal and state agencies. Utilizing criteria and analysis methodology as presented for nonlisted species, vessel movements, aircraft overflight, ordnance use, explosions, and military expended materials (entanglement) may affect, but are unlikely to adversely affect, individual short-tailed albatross under Alternative 1 in the TMAA. The USFWS signed a letter indicating concurrence with this position on 24 March 2010 (see correspondence in Appendix C).

Migratory Bird Treaty Act

All activities that would take place under Alternative 1 fall within the MBTA definition of military readiness activities. The take of an individual bird from these activities is allowed under the MBTA provided it does not result in a significant adverse effect on a population of a migratory bird species. The activities associated with Alternative 1 would not diminish the capacity of a population of a migratory bird species to maintain genetic diversity, to reproduce, and to function effectively in its native ecosystem, nor would it adversely affect migratory bird populations. As a result and in accordance with 50 C.F.R. Part 21, the Navy is not required to confer with the USFWS on the development and implementation of conservation measures to minimize or mitigate adverse effects to migratory birds that are not listed under the ESA.

3.9.2.6 Alternative 2

Implementation of Alternative 2 would include all elements of Alternative 1 (accommodating training activities currently conducted, increasing specific training activities to include the use of active sonar, and accommodating force structure changes). In addition, under Alternative 2 the following activities would occur:

- Conduct one additional separate summertime CSG exercise lasting up to 21 days within the ATA.
- Conduct a SINKEX in each summertime exercise (a maximum of two) in the TMAA.

Birds would have the potential to be affected by vessel movements, aircraft overflights, sonar, weapons firing/nonexplosive ordnance use, explosive ordnance, and expended materials under Alternative 2.

Vessel Movements

Under Alternative 2, there may be up to 30 surface vessels and 1 submarine participating in training activities during two distinct training periods. Under Alternative 2, steaming hours would increase from current conditions, although the increase in steaming hours would not measurably increase potential effects to birds. Disturbance impacts to birds from vessel movements under Alternative 2 would be the same as those described for the No Action Alternative.

Vessel movements under Alternative 2 would not adversely affect migratory bird populations. In accordance with EO 12114, harm to birds from vessel movements in nonterritorial seas would be unlikely. In accordance with the ESA, vessel movements in nonterritorial seas under Alternative 2 may affect, but are not likely to adversely affect, ESA-listed seabirds.

Aircraft Overflights

As discussed in the analyses for the No Action Alternative and Alternative 1, bird responses to noise from aircraft overflights would be limited to brief behavioral or physiological reactions and the general health of individual birds would not be compromised. The increase in potential exposure to visual and sound disturbance would not measurably increase effects to birds. Aircraft noise effects of Alternative 2 would be the same as the described for the other alternatives.

As described for the No Action Alternative and Alternative 1, the potential for bird strikes to occur in offshore areas is relatively low because activities are widely dispersed and at relatively high altitudes where bird densities are low. Few, if any, aircraft strikes are expected to occur in the TMAA. The potential for bird strikes to occur between the TMAA and inshore areas is much lower than those for offshore areas, as the bird densities at the altitudes of these overflights (above 15,000 ft) is extremely low.

Aircraft overflights under Alternative 2 would not adversely affect migratory bird populations. In accordance with EO 12114, harm to birds from aircraft overflights in nonterritorial seas would be unlikely. In accordance with the ESA, aircraft overflights in nonterritorial seas under Alternative 2 may affect, but are not likely to adversely affect, ESA-listed seabirds.

Weapons Firing / Nonexplosive Ordnance Use

As described for the other alternatives, birds could be vulnerable to a direct ordnance strike. However, the potential for birds to experience strike would remain quite low. Avoidance measures are implemented prior to and during these activities to minimize impacts to birds (see Section 3.9.3). The large area over which ordnance is used, small size of the birds, and ability of birds to readily flee would make direct strikes unlikely. Individual birds may be affected, but ordnance strikes would have no effect on species or community populations.

Ordnance strikes under Alternative 2 would not adversely affect migratory bird populations. In accordance with EO 12114, harm to birds from ordnance use in waters beyond the U.S. territorial sea would not be likely. In accordance with the ESA, ordnance use in nonterritorial seas under Alternative 2 may affect, but is not likely to adversely affect, ESA-listed seabirds.

Explosive Ordnance (At-Sea Explosions)

Under Alternative 2, explosions and impacts would occur either at the water's surface, or underwater at depth. Birds in relatively close proximity to these activities could be disturbed and relocate, or be injured or killed. However, the rate of occurrence of these effects would be quite low. Based on a TMAA size of 42,146 nm^2 (144,557 km^2) and assuming distribution of GUNEX and BOMBEX activities within 20 percent of the TMAA (8,429 nm^2 [28,911 km^2]), 0.02 explosion per nm^2 per year (0.006 per km^2) would

occur in the TMAA. Navy avoidance measures (see Section 3.9.3 and Chapter 5, Mitigation) implemented prior to explosive activities would provide a high level of protection for birds during at-sea explosions, and the likelihood of birds being affected is expected to be quite low.

Birds exposed to explosions could suffer temporary effects, sublethal injury or mortality (Yelverton et al. 1973, Yelverton 1981). Although the potential for birds to be injured by explosions exists, the chance of this occurrence is low. At-sea explosions under Alternative 2 would not adversely affect migratory bird populations. In accordance with EO 12114, harm to birds from at-sea explosions in nonterritorial seas would be unlikely. In accordance with the ESA, at-sea explosions in nonterritorial seas under Alternative 2 may affect, but are not likely to adversely affect ESA-listed seabirds.

Sinkex

Under Alternative 2, additional explosions would occur in the Study Area associated with two sinking exercises (SINKEX) that use explosive ordnance. In a SINKEX, weapons are typically fired in order of decreasing range from the source with weapons fired until the target is sunk. For each SINKEX, up to 14 missiles, 14 bombs, 400 gunnery rounds, and 1 torpedo are utilized during SINKEX activities.

More than 93 percent of these items would be gunnery (5-inch) rounds. As described for other activities involving ordnance, individual birds may be affected, but ordnance strikes would have no effect on species or community populations. Birds exposed to underwater explosions would suffer temporary effects, sub-lethal or lethal injuries, or direct mortality, in proportion to the proximity to the explosion and size of the detonation. Avoidance measures are implemented prior to and during these activities to minimize impacts to birds (see Section 3.9.3 and Chapter 5). Typical areas where large numbers of birds congregate are located in nearshore and intertidal areas. Offshore explosives use in the TMAA is a considerable distance from areas where most birds would be expected, therefore impacts to birds from offshore explosions are possible, but have a low potential for occurrence.

Under Alternative 2, ordnance use and explosions associated with SINKEX would not adversely affect migratory bird populations. In accordance with EO 12114, harm to birds from at-sea ordnance use and explosions in nonterritorial seas would be unlikely.

Direct impacts from explosions associated with SINKEX activities are possible, but are unlikely threats to short-tailed albatross. Explosions have the potential to affect the short-tailed albatross only if the bird is in the immediate vicinity above the explosion. Effects would depend on the distance from the detonation and size of the explosion and would include disturbance and relocation, temporary effects, sub-lethal injuries, or direct mortality. Impacts would be possible, but have a low potential for occurrence given the use of live ordnance is limited. In accordance with the ESA, ordnance use and explosions in nonterritorial seas associated with SINKEX under Alternative 2 may affect, but are not likely to adversely affect, ESA-listed seabirds.

Expended Materials

Under Alternative 2, an estimated 41,298 items would be expended in the TMAA, a 160 percent increase over the No Action Alternative (Table 3.9-2). Based on an open ocean area of 42,146 nm^2 (144,557 km^2) and assuming distribution of activities over 20 percent of the TMAA, 4.9 items per nm^2 per year (1.4 kg per km^2) would be deposited in the ocean. As described for the other alternatives, all ordnance use would occur in areas beyond 12 nm (22 km) from shore where water depths in excess of 3,000 ft (914 m), excluding seabird benthic foraging. Although a small potential for expended materials to be ingested by birds may exist, the low concentration of expended rounds and the great depth to benthic habitats in the TMAA would make this occurrence highly unlikely.

Under Alternative 2, 644 target related materials would potentially be expended in the TMAA. As described for the other alternatives, many of the targets are designed to be recovered for reuse, but the EMATT, and TALD would be expended. Based on the large size of the TMAA, low number of targets used, and abilities of birds to readily disperse from disturbance, it is not likely that birds would be measurably affected by use of at-sea targets.

Under Alternative 2, approximately 1,587 parachutes associated with sonobuoys would be deployed with at-sea targets and marine markers in offshore areas and not recovered. Assuming a distribution of activities over 20 percent of the TMAA, the concentration of these expended parachutes which represent an entanglement hazard would be 0.18 per nm^2. Given this low concentration, the potential for bird entanglement in military expended material would be low. Under Alternative 2, birds may be affected by entanglement in military expended material, but the effects would be small because of the infrequent occurrence of birds and low concentration of military expended material.

Expended materials would not adversely affect migratory bird populations. In accordance with EO 12114, harm to birds from expended materials in nonterritorial seas would be possible, but unlikely. In accordance with the ESA, expended materials in nonterritorial seas under Alternative 2 may affect, but are not likely to adversely affect, ESA-listed seabirds.

Threatened and Endangered Species

Within the TMAA, the single endangered species is the short-tailed albatross. As part of the EIS/OEIS process, the Navy entered into consultation with the appropriate federal and state agencies. Utilizing criteria and analysis methodology as presented for nonlisted species, vessel movements, aircraft overflight, ordnance use, explosions, and military expended materials (entanglement) may affect individual short-tailed albatross under Alternative 2 in the TMAA. The USFWS signed a letter indicating concurrence with this position on 24 March 2010 (see correspondence in Appendix C).

Migratory Bird Treaty Act

All activities that would take place under Alternative 2 fall within the MBTA definition of military readiness activities. The take of an individual bird from these activities is allowed under the MBTA provided it does not result in a significant adverse effect on a population of a migratory bird species. The activities associated with Alternative 2 would not diminish the capacity of a population of a migratory bird species to maintain genetic diversity, to reproduce, and to function effectively in its native ecosystem, nor would it adversely affect migratory bird populations. As a result and in accordance with 50 C.F.R. Part 21, the Navy is not required to confer with the USFWS on the development and implementation of conservation measures to minimize or mitigate adverse effects to migratory birds that are not listed under the ESA.

3.9.3 Mitigation

As summarized in Section 3.9.4, the actions proposed in this EIS/OEIS could affect some individual birds within the TMAA, but community- or population-level effects would not be expected under any of the alternatives. Current mitigation measures include:

- Guidance involving explosions contains instructions to personnel to observe the surrounding area within 600 yards for 30 minutes prior to detonation. If diving birds (or marine mammals or sea turtles) are seen, the activity must be relocated to an unoccupied area or postponed until animals leave the area.

Current protective measures would continue to be implemented by the Navy, and no additional mitigation measures would be needed to protect birds or their habitats.

3.9.4 Summary of Effects

The Alaska Training Area (ATA) encompasses important foraging habitats for birds. Migratory birds utilize the productive offshore waters associated with the Pacific coast upwelling to forage during wintering and migratory movements. Coastal developments, loss of habitat, commercial fishing, and introduced species have caused populations of many seabird species to decline in recent decades. Navy activities in the TMAA however, would not be expected to increase effects to bird populations. Based on the analysis of the proposed alternatives, it is thought that impacts to individual protected and migratory birds could occur, but the number of individual birds affected would be low and poses minimal impact potential to seabird populations. Table 3.9-3 summarizes the effects of the No Action Alternative, Alternative 1, and Alternative 2 on birds under both NEPA and EO 12114.

Under the No Action Alternative, Alternative 1, or Alternative 2 (Preferred Alternative) at the TMAA, vessel movements, aircraft overflight, ordnance use, at-sea explosions, and military expended materials (entanglement) may affect, but not likely to adversely affect, individual short-tailed albatross.

Table 3.9-3: Summary of Effects by Alternative

Alternative	NEPA (U.S. Territorial Seas, 0 to 12 nm)	EO 12114 (Non-U.S. Territorial Seas, > 12 nm)
No Action Alternative	• Due to flight altitude, behavioral responses to overflights in territorial seas are not expected. • Potential for harm to birds from aircraft strikes is extremely low and is not anticipated.	• Harm due to vessel movements is unlikely. • Brief behavioral response to overflights.. Low potential for harm to birds from aircraft strikes. • Low potential for harm to birds from ordnance use. • Low potential for harm to birds from explosives use. • Low potential for harm from military expended materials. • Within the TMAA, the single endangered species is the short-tailed albatross. Vessel movements, aircraft overflight, ordnance use, at-sea explosions, and military expended materials (entanglement) may affect, but are not likely to adversely affect individual ESA-listed seabirds.
Alternative 1	• Due to flight altitude, behavioral responses to overflights in territorial seas are not expected. • Potential for harm to birds from aircraft strikes is extremely low and is not anticipated.	• Harm due to vessel movements is unlikely. • Brief behavioral response to overflights. Low potential for harm to birds from aircraft strikes. • Low potential for harm to birds from ordnance use. • Low potential for harm to birds from explosives use. • Low potential for harm from military expended materials. • No considerable harm to birds, migratory birds, bald eagles, or their habitat. • Within the TMAA, the single endangered species is the short-tailed albatross. Vessel movements, aircraft overflight, ordnance use, at-sea explosions, and military expended materials may affect, but not likely to adversely affect individual ESA-listed seabirds.

Table 3.9-3: Summary of Effects by Alternative (continued)

Alternative	NEPA (U.S. Territorial Seas, 0 to 12 nm)	EO 12114 (Non-U.S. Territorial Seas, > 12 nm)
Alternative 2 (Preferred Alternative)	• Due to flight altitude, behavioral responses to overflights in territorial seas are not expected. • Potential for harm to birds from aircraft strikes is extremely low and is not anticipated.	• Harm due to vessel movements is unlikely. • Brief behavioral response to overflights. Low potential for harm to birds from aircraft strikes. • Low potential for harm to birds from ordnance use. • Low potential for harm to birds from explosions and impacts. • Low potential for harm from military expended materials. • No considerable harm to birds, migratory birds, bald eagles, or their habitat. • Within the TMAA, the single endangered species is the short-tailed albatross. Vessel movements, aircraft overflight, ordnance use, at-sea explosions, and military expended materials may affect, but not likely to adversely affect individual ESA-listed seabirds.

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