

Seabirds – Introduction

Alaska's productive seas and isolated islands provide habitat for one of the largest and most diverse assemblages of marine birds in the world. The marine ecosystems that sustain marine birds also support some of the world's largest commercial marine fisheries and support numbers of coastal communities through economics related to fisheries or by providing subsistence food. Marine birds are indicators of the health of the marine ecosystem. Because various species of seabirds use different portions of the marine food web, they provide insight into changes in both the plankton and forage fish communities.

In April 2004, ADF&G convened a group of marine bird experts and asked these scientists to develop a short list of species and/or species groups to feature in the CWCS, including specific conservation actions that could be started in the next decade. More than 40 species of seabirds occur in Alaska, but the group decided to select species based on 2 types of criteria. One group was selected because Alaska has the majority of the world's populations and/or there is concern because they have declining populations. The group included: Red-faced Cormorant, Red-legged Kittiwake, Aleutian Tern, Arctic Tern, Kittlitz's Murrelet, and Marbled Murrelet. The second group included species that are recognized indicators of change in marine ecosystem. Species included to represent plankton feeders were Fork-tailed and Leach's Storm-Petrels (surface feeders) and Least and Crested Auklets (divers). Species that prey on forage fish included Black-legged Kittiwake, and Common and Thick-billed Murres.

The Short-tailed Albatross was first listed under the federal Endangered Species Act on June 2, 1970. It is currently designated as endangered throughout its entire range. A draft formal recovery plan is expected to be completed by the USFWS in mid 2005. NOAA – Fisheries actively engages the commercial fishing industry to minimize take in longline fisheries. Japan provides legal protection for the species, and actively manages its nesting habitat. Commercial import, export, or trade across international borders is prohibited by the CITES. Additional information on the Short-tailed Albatross can be found at <http://alaska.fws.gov/fisheries/endangered/pdf/STALfactsheet.pdf>

Conservation actions designed to protect marine birds and their habitats shown on the following templates will likely benefit seabirds, but also provide insight into processes that cause change in the marine ecosystem, thereby assisting managers in long-term conservation of these important areas.

Leach's and Fork-tailed Storm-Petrels

Rationale for selection:

These species were selected because:

- Species are endemic (i.e., occur primarily in Alaska or occur entirely within an ecoregion found in Alaska). *O. furcata furcata* is endemic in southwest Beringia and the Kuril region of Russia.

- Species are sensitive to environmental disturbance.

Species are representative of broad array of other species found in a particular habitat type (surface-feeding planktivore).

Species are important internationally (e.g., targeted for cross-jurisdictional action and/or recognized in bi- or multilateral agreements; or useful for cross-jurisdictional monitoring), and will require cooperative monitoring with Canadian Wildlife Service.

Human uses: none known

A. Species group description

Common names: Fork-tailed Storm-Petrel and Leach's Storm-Petrel

Scientific names: *Oceanodroma furcata* and *Oceanodroma leucorhoa*

B. Distribution and abundance (see maps pages 225–226, Appendix 4)

Range:

Fork-tailed Storm-Petrel: (*O. furcata*):

Global range:

Breeding: Alaska and Eastern Russia (to Kuril islands) (Boersma and Silva 2001).

Winter: at sea near breeding areas (Boersma and Silva 2001).

State range:

Breeding: Western Aleutians to Southeast Alaska to Northern Gulf of Alaska (Boersman and Silva 2001). *O. f. plumbea* breeds in Southeast Alaska

Winter: near breeding areas (Boersma and Silva 2001).

Leach's Storm-Petrel (*O. leucorhoa leucorhoa*)

Global range:

Breeding: Holarctic

Wintering: Offshore central Pacific, usually south of 35°north (Huntington 1996)

State range:

Breeding: Southern coast from Western Aleutians to Southeast Alaska

Wintering: Outside Alaska (Huntington 1996)

Abundance:

O. furcata:

Global abundance: 4 million individuals (Boersma and Silva 2001)

State abundance: 3.2 million individuals (USFWS 2003)

O. leucorhoa leucorhoa:

Global abundance: 8 million individuals (Huntington 1996)

State abundance: 3.5 million individuals (USFWS 2003)

Trends:

O. furcata:

Global trends: Stable or increasing since mid 1970s (Dragoo et al. 2003)

State trends: Stable or increasing since mid 1970s (Dragoo et al. 2003)

O. leucorhoa leucorhoa:

Global trends: Declines on Atlantic coast prior to 1900 (Huntington 1996) but apparently stable in 20th century.

State trends: Stable or increasing since mid 1970s (Dragoo et al. 2003)

C. Problems, issues, or concerns for species group

- Populations are sparsely monitored
- Specific winter range is not well defined

Existing

- Human disturbance at particular times
- Introduced predators (e.g, rats, foxes)
- Prey abundance variability
- Oil pollution, including chronic oiling (maybe bilge dumping)
- Light pollution (from fishing vessels anchored near colonies and in forage areas)

Potential

- Oil spills
- Highly susceptible to disturbance at nesting sites due to collapse of earthen burrows (humans, ungulates, dogs, etc.)
- Contaminants
- Rat spills
- Heavy predation (gulls and Northwestern Crows) (supplemental food from fish processing and community landfills near nesting colonies could artificially increase avian predator populations)

D. Location and condition of key or important habitat areas

Summer:

Breeding: Earthen burrows and rock crevices on oceanic islands. Degraded in some locations due to introduced mammals (Boersma and Silva 2001).

Foraging: Inshore and offshore waters relatively near breeding sites. (Boersma and Silva 2001). Condition not known.

Winter:

Foraging: over deep waters in North Pacific, usually north of 40°. Condition unknown.

Areas of significance: Buldir, Chagulak and Petrel Islands

E. Concerns associated with key habitats

Threat of rat spills, chronic oiling, climate change (changes in the food web), attraction/collisions with fishing vessels and platforms in the ocean due to light pollution

Attributes surrounding species success: Most of the nesting habitat lies within federal conservation system units; no commercial harvest currently occurs for forage species; oil discharge regulations; lack of human disturbance; foxes removed from certain islands.

F. Goal: Ensure storm-petrel populations remain sustainable throughout their range within natural population-level variation and historical distribution across Alaska.

G. Conservation objectives and actions

State conservation and management needs:

Objective: Restore storm-petrel populations and distribution to pre-mammal introduction conditions (i.e. reestablish populations on islands after introduced mammals are removed).

Target: Maintain Alaska-wide populations at least at levels existing in year 2000.

Measure: Populations at index locations would be surveyed (e.g., Buldir, Ulak, Aiktak, East Amatuli, St. Lazaria Islands) at least once every 3 years for 20 years; monitor islands where introduced mammals have been removed to detect reestablished populations.

Issue 1: Populations are sparsely monitored; specific winter range is not well-defined.

Conservation actions:

- a) Determine wintering locations.
- b) Maintain a monitoring program.
- c) Complete a nesting inventory.

Issue 2: Introduced predators, such as rats and foxes, cause increased mortality by consuming eggs and killing adults and young. This results in effectively eliminating or greatly reducing the population size of many seabirds.

Conservation actions:

- a) Prevent additional rat introductions.
- b) Educate ship crews about rat introduction.
- c) Evaluate reestablishment on islands where introduced mammals have been removed.

Issue 3: Human disturbance at particular times may contribute to mortality rates through such things as “seabird wrecks” (where large numbers of seabirds are attracted to a fishing boat in bad weather and then are injured or killed while landing on the boat).

Conservation actions:

- a) Evaluate disturbance at index colonies.
- b) Monitor and evaluate instances of “seabird wrecks” with fishing boats from fishery observer notes; then seek ways to minimize them (Rojek 2001).

Issue 4: Prey abundance variability

Conservation action: Monitor foraging species status and trends (state-managed waters, 0–3 miles).

Issue 5: Contaminants, oil pollution, including chronic oiling (maybe bilge dumping)

Conservation actions:

- a) Conduct research to measure contaminants in eggs.
- b) Ensure compliance with discharge regulations for oil and other contaminants.

Issue 6: Light pollution (from fishing vessels working near colonies or in major foraging areas) may attract or disorient seabirds, leading to collisions and mortality, which is known as a type of “seabird wreck” (see Issue 3).

Conservation actions:

- a) Educate (ship crews) about light pollution issue and care and release of birds that come aboard.
- b) Encourage efforts to shield lights laterally.

Issue 7: Climate change (changes in the food web).

Conservation action: Monitor foraging species status and trends (state-managed waters, 0–3 miles).

Global conservation and management needs:

Conservation action: Add an index location site in Russia for monitoring within 5 years.

H. Plan and time frames for monitoring species and their habitats

- Surveys would be conducted at index locations once every 3 years for 20 years.
- Add a site in Russia within 5 years.
- Colony surveys would be conducted at the index locations (all within the federal refuge system). USFWS is a potential partner.
- TNC to take a lead on adding Russian site.

I. Recommended time frame for reviewing species status and trends

Ten years, or at more frequent intervals in response to additional information.

J. Bibliography

Dragoo, D.E., G.V. Byrd, and D.B. Irons. 2003. Breeding status, population trends and diets of seabirds in Alaska, 2001. USFWS. Report AMNWR 03/05.

Boersma, P.D. and M.C. Silva. 2001. Fork-tailed Storm-Petrel (*Oceanodroma furcata*). In: A. Poole and F. Gill, editors. The Birds of North America, No. 569.

Huntington, C.E., R.G. Butler, and R.A. Mauck. 1996. Leach’s Storm-Petrel (*Oceanodroma leucorhoa*). In: A. Poole and F. Gill, editors. The Birds of North America, No. 233.

Rojek, N. 2001. Biological Rationale for Artificial-Lighting Concerns in the Channel Islands. Unpublished report. California Department of Fish and Game, Marine Region, Monterey, California.

Red-faced Cormorant

Rationale

This species was selected because:

Species¹ has noticeably declined in abundance or productivity from historical levels outside the range of natural variability.

Species is rare (i.e., small/low overall population size/density).

Species is designated as at risk (threatened, candidate, or endangered under ESA; state endangered or species of concern; depleted under Marine Mammal Protection Act).

Species is endemic (i.e., occurs primarily in Alaska or occurs entirely within an ecoregion found in Alaska).

Species makes seasonal use of a restricted local range (breeding, wintering, and migration).

Species is sensitive to environmental disturbance.

Species is representative of broad array of other species found in a particular habitat type.

Species is important internationally (e.g., targeted for cross-jurisdictional action and/or recognized in bi- or multilateral agreements; or useful for cross-jurisdictional monitoring).

Human Uses

Viewing, ceremonial/subsistence

A. Species description

Common name: Red-faced Cormorant

Scientific name: *Phalacrocorax urile*

B. Distribution and abundance (see map page 227, Appendix 4)

Range:

Global range comments: Southern Alaska, Prince William Sound, Aleutian Islands, Commander Islands, Kuril Islands (USFWS 2003)

Breeding: Russia, northern Sea of Japan and Kuril Islands (Causey 2002).

Winter range: Dispersed throughout breeding range (Causey 2002).

State range comments: Thought to be largely resident

Breeding: Gulf of Alaska extending throughout the Alaska Peninsula and Aleutian Islands. (Causey 2002).

Wintering range: Dispersed throughout breeding range (Causey 2002).

Abundance:

Global abundance comments: 155,000 individuals (as of 1993) (Causey 2002, USFWS 2003)

State abundance comments: 20,000 individuals (USFWS 2003)

¹ Use of the word “species” includes species, subspecies and distinct populations.

Trends:

Global trends: Generally declining, unknown for Russian populations (Causey 2002)

State trends: Declining (Dragoo et al. 2003)

C. Problems, issues, or concerns for species

Existing

- Incidental mortality in fishing gear (Manly et al. 2003; 2 were taken in Kodiak setnet fishery, which extrapolated to ~ 28/year; this was high relative to local population)
- Exotic mammals (e.g., rats, foxes)
- Habitat change, such as the kelp forest changing and warming temperatures
- Prey abundance variability
- Oil pollution, including chronic oiling (maybe bilge dumping)

Potential

- Oil spills
- Highly susceptible to disturbance at nesting sites (commercial fishing, tourism near to shore)
- Contaminants
- Disease
- Localized overharvests

D. Location and condition of key or important habitat areas

Nesting and roosting: Cliff ledges on oceanic islands or the mainland coast, the majority of which lie within designated conservation lands. These areas are generally pristine, but some have introduced predators.

Foraging: Inshore marine waters, generally less than 50 m deep (Causey 2002): some areas are degraded by chronic oiling; this habitat includes kelp forests that will decline as sea otter populations decline. May also be subject to effects of bottom trawling and derelict fishing gear.

The Near Islands are a particularly high concentration area, probably due to the large expanse of shallow feeding areas. This area is subject to chronic oiling and substantial changes in the kelp forest due to changes in sea otter populations.

Areas of significance: Attu, Agattu, and Semichi Islands.

E. Concerns associated with key habitats

Summer

Nesting: threat of rat spills, change in land management and/or status, land use regulations.

Foraging: chronic oiling, climate change (changes in the food web), gillnet mortality and entanglement in derelict fishing gear.

Winter

Foraging: chronic oiling, climate change (changes in the food web), gillnet mortality and entanglement in derelict fishing gear.

Attributes surrounding species success: Most of the nesting/roosting habitat lies within conservation units; no commercial harvest currently occurs for forage species such as capelin, sand lance, small demersal fishes, but cormorants also eat juveniles of rockfish, cod, pollock, flatfish, and herring, all of which are fished commercially; oil discharge regulations; lack of human disturbance; foxes removed from certain islands.

F. Goal: Ensure Red-faced Cormorant populations remain sustainable throughout their range within natural population-level variation and historical distribution across Alaska.

G. Conservation objectives and actions

State conservation and management needs:

Objective: Restore Red-faced Cormorant population levels to those of the late 1970s by 2025. (1970s represent first “comprehensive” baseline numbers).

Target: Alaska-wide population of 50,000 individuals.

Measure: Populations at index locations would be surveyed (Near Islands, Kodiak, Amak, Rat Islands, Pribilofs) once every 5 years for 20 years.

Issue 1: Cause of the population decline is unknown; issues preventing population recovery are unknown.

Conservation actions:

- a) Measure shifts in nesting colonies, adult mortality, reproductive success, and other vital rates to evaluate conservation status using demographic models.
- b) Evaluate disease and gillnet mortality as a factor in population declines.
- c) Evaluate preferred habitat features and changes in nearshore, benthic habitats, and fishes.

Issue 2: Incidental mortality in fishing gear.

Conservation actions:

- a) Reduce mortality related to fishing and fishing gear – learn more about fisheries occurring in Red-faced Cormorant habitat and extent of interactions (temporal and spatial overlap and factors associated with entanglement).
- b) Conduct studies to devise bird-safe gillnet gear and practices.

Issue 3: Predation by or impacts from exotic mammals (e.g., rats or foxes).

Conservation actions:

- a) Conduct additional predator removal programs.
- b) Prevent rat introductions.
- c) Conduct rat response program.

Issue 4: Habitat or climate change, such as the kelp forest changing and warming temperatures (concerns with changes in the food web).

Conservation action: Monitor changes in nearshore marine habitats in selected areas to evaluate the status and trends of forage fish species used a prey by cormorants (state-anaged waters, 0–3 miles).

Issue 5: Prey abundance variability.

Conservation action: (see above, Habitat or Climate change)

Issue 6: Contaminants, oil pollution, including chronic oiling (maybe bilge dumping).

Conservation actions:

- a) Bilge control (chronic oiling); monitor/improve oil spill planning and response (product shippers).
- b) Evaluate contaminants in Red-faced Cormorant eggs.
- c) Conduct regular beach bird surveys in selected areas.

Issue 7: Human disturbance at nesting sites (tourism near shore, commercial fishing).

Conservation action: Monitor increase of ecotourism at or near cormorant nesting areas; educate to avoid disturbance of Red-faced Cormorants.

Issue 8: Localized overharvest.

Conservation actions:

- a) Monitor harvest or other human use.
- b) Educate subsistence users to identify different cormorant species and teach them about population problems of this species, its rarity and uniqueness to Alaska, and ecotourism interest.

Global conservation and management needs:

Objective: Determine global population trends outside Alaska and interchange between Russian and U.S. populations.

Target: 5-year review and update of available data and use of genetics and telemetry to evaluate interchange.

Measure: Maps, population estimates and trends for key areas.

Issue: Consolidate bycatch information available outside Alaska and determine whether Russian populations are unique genetically compared to Alaska populations.

Conservation action: Education; provide our products to international lists.

H. Plan and time frames for monitoring species and their habitats
--

Surveys would be conducted at index locations once every 5 years for 20 years. Colony surveys would be conducted at the index locations (all within the federal refuge system). USFWS is a potential partner.

I. Recommended time frame for reviewing species status and trends
--

Ten years, or at more frequent intervals in response to additional information.

J. Bibliography

Causey, D. 2002. Red-faced Cormorant (<i>Phalacrocorax urile</i>). In: A. Poole and F. Gill, editors. The Birds of North America, No. 617.
--

Dragoo, D.E., G.V. Byrd, and D.B. Irons. 2003. Breeding status, population trends and diets of seabirds in Alaska, 2001. USFWS. Report AMNWR 03/05.

USFWS. 2003. Beringian Seabird Colony Catalog–computer database and Colony Status Record archives. Anchorage: USFWS Migratory Bird Management.
--

Manly, B.F.J., A.S. Van Atten, K.J. Kuletz, and C. Nations. 2003. Incidental catch of marine mammals and birds in the Kodiak Island set gillnet fishery in 2002. Final report by Western EcoSystems Technology, Inc., Cheyenne, WY, for NMFS, Juneau, AK.

Black-legged Kittiwake

Rationale

This species was selected because:

- Species is sensitive to environmental disturbance.

- Species is representative of broad array of other species found in a particular habitat type. (For marine environment: fisheries, maybe other seabird habitat and surface fish feeders).

- Species is important internationally (e.g., targeted for cross-jurisdictional action and/or recognized in bi- or multilateral agreements; or useful for cross-jurisdictional monitoring).

Human Uses

Subsistence eggging, and viewing.

A. Species description

Common name: Black-legged Kittiwake

Scientific name: *Rissa tridactyla*

B. Distribution and abundance (see map page 228, Appendix 4)

Range:

Global range comments: circumpolar, sub-Arctic and Arctic regions

Breeding: Baffin Island, Jones Sound, Prince Leopold Island, Barrow Strait, Newfoundland, Nova Scotia, New Brunswick, Northwest Territories (Baird 1994), Greenland, and Alaska.

Winter range: range extends widely from breeding areas (Baird 1994).

State range comments:

Breeding: in Alaska: Southeast through Gulf of Alaska and Aleutian Islands, north to Point Hope (Baird 1994).

Winter range: pelagic, south of ice edge, Gulf of Alaska, Aleutians and Southeast Alaska (Baird 1994).

Abundance for *Rissa tridactyla pollicaris*:

Global abundance comments: 2.6 million (Pacific region) (Baird 1994).

State abundance comments: 1.4 million (USFWS 2003).

Trends:

Global trends: Variable (Baird 1994).

State trends: Variable since the mid 1970s (Dragoo 2003).

C. Problems, issues, or concerns for species

Existing

- Exotic mammals (for example, rats, foxes)
- Habitat change due to changing and warming temperatures
- Prey abundance variability
- Oil pollution, including chronic oiling (may be bilge dumping)

Potential

- Oil spills
- Disturbance at nesting sites (commercial fishing, tourism near to shore)
- Contaminants
- Artificially enhanced concentrations of natural predators (e.g., gulls, eagles)

D. Location and condition of key or important habitat areas

Summer

Breeding: cliff ledges on oceanic islands or the mainland coast, the majority of which lie within designated conservation lands. Condition: These areas are generally pristine, but some have introduced predators.

Foraging: marine waters. Condition: good

Winter

Foraging: in marine waters in Gulf and in Southeast Alaska. Condition: very good

Areas of particular significance: Beringian Seabird Colony Catalog suggests that largest colonies are northern and western Gulf of Alaska and Bering Sea (USFWS 2003).

E. Concerns associated with key habitats

Summer breeding: threat of rat spills, change in land management status and land use regulations

Summer foraging: oil spills, climate change (changes in the food web), changes in land use regulations

Winter foraging: oil spills, climate change (changes in the food web)

Attributes surrounding species success: Most of the nesting habitat lies within protected areas; no commercial harvest currently occurs for forage species; oil discharge regulations; lack of human disturbance; foxes removed from certain islands.

F. Goal: Ensure Black-legged Kittiwake populations remain sustainable and viable throughout their range within natural population-level variation and historical distribution across Alaska.

G. Conservation objectives and actions

Objective: Maintain 2004 population levels of Black-legged Kittiwake.

Target: Maintain Alaska population of 2.5 million, along with viable global population.

<p>Measure: Index of abundance; Black-legged Kittiwake currently monitored by USFWS periodically (some annually, others not) at approximately 16 locations in Alaska, mostly federal refuges but also some state lands (e.g., Round Island) and Native lands, and reported regularly in “Breeding Status, Population Trends and Diets of Seabirds in Alaska” (e.g., see Dragoo et al. 2003); continue current level or increase monitoring, since this species has been included as an indicator species.</p>
<p><u>Issue 1: Additional introduction of exotic predators and artificially concentrating native predators; failure to address the above mentioned threats.</u></p> <p>Conservation actions:</p> <ul style="list-style-type: none"> a) Continue or expand existing level of research. b) Continue or expand existing monitoring of abundance. c) Conduct additional predator removal programs. d) Prevent rat introductions. e) Conduct rat response program. f) Regulate supplement feeding or open trash near kittiwake colonies.
<p><u>Issue 2: Oil pollution, including chronic oiling (maybe bilge dumping).</u></p> <p>Conservation actions:</p> <ul style="list-style-type: none"> a) Bilge control (to prevent chronic oiling). b) Oil spill planning and response (product shippers) – one idea/measure is to develop and distribute a multilingual press kit/education and outreach program designed to reduce chronic oiling.
<p><u>Issue 3: Prey abundance variability.</u></p> <p>Conservation action: Monitor status and trends of forage fish used by Black-legged Kittiwake as prey (state-managed waters, 0–3 mi).</p> <p><u>Issue 4: Climate change.</u></p> <p>Conservation action: Monitor changes in the marine environment relative to Black-legged Kittiwake population parameters.</p>
<p>H. Plan and time frames for monitoring species and their habitats</p> <p>Surveys would be conducted at index locations on the current schedule of once every 1–5 years.</p> <p>USFWS is currently lead on surveys, with assistance from ADF&G. Continue this relationship.</p>
<p>I. Recommended time frame for reviewing species status and trends</p> <p>Ten years, or at more frequent intervals in response to additional information.</p>

J. Bibliography

- Baird, P.H. 1994. Black-legged Kittiwake, *Rissa tridactyla*. In: A. Poole and F. Gill, editors. The Birds of North America, 92.
- Dragoo, D.E., G.V. Byrd, and D.B. Irons. 2003. Breeding status, population trends and diets of seabirds in Alaska, 2001. USFWS. Report AMNWR 03/05.
- USFWS. 2003. Beringian Seabird Colony Catalog—computer database and Colony Status Record archives. Anchorage: USFWS Migratory Bird Management.

Red-legged Kittiwake

Rationale

This species was selected because:

- Species has noticeably declined in abundance or productivity from historical levels outside the range of natural variability.
- Species is rare (i.e., small/low overall population size/density).
- Species is endemic (i.e., occurs primarily in Alaska or occurs entirely within an ecoregion found in Alaska).
- Species makes seasonal use of a restricted local range (breeding, wintering, migration).
- Species is disjunct (i.e., isolated from other populations or occurrences in adjacent ecoregions).
- Species is important internationally (e.g., targeted for cross-jurisdictional action and/or recognized in bi- or multilateral agreements; or useful for cross-jurisdictional monitoring).

Human Uses

Subsistence eggging and subsistence hunting in Pribilofs and possibly Commander Islands

A. Species description

Common name: Red-legged Kittiwake

Scientific name: *Rissa brevirostris*

B. Distribution and abundance (see map page 229, Appendix 4)

Range:

Global range:

Breeding: Southern Bering Sea, Aleutian, Pribilof and Commander Islands (Byrd and Williams 1993).

Winter range: At sea, probably North Pacific (Byrd and Williams 1993).

<p><u>State range:</u> Breeding: Pribilof Islands (St. George and St. Paul), Bogoslof Island, and Buldir Island. (Byrd and Williams 1993). Winter range: North Gulf of Alaska and the Bering Sea. (Byrd and Williams 1993).</p> <p>Abundance: <u>Global abundance:</u> approximately 200,000 individuals (Byrd unpublished data). <u>State abundance:</u> approximately 195,000 individuals (over 80% on St. George Island) (Byrd unpublished data).</p> <p>Trends: (based on Pribilof data) <u>Global trends:</u> Declined from mid 1970s to mid 1980s, but have increased since, to near 1970s levels (Dragoo et al. 2003). <u>State trends:</u> Declined from mid 1970s to mid 1980s, but have increased since, to near 1970s levels (Byrd et al. 1997, Dragoo et al. 2003).</p>
<p>C. Problems, issues, or concerns for species</p> <ul style="list-style-type: none"> • Winter range and winter threats are poorly understood. • Reasons for large population fluctuations in Pribilofs not well understood. <p><i>Existing</i></p> <ul style="list-style-type: none"> • Prey abundance and quality variability • Oil pollution, including chronic oiling (may be bilge dumping) <p><i>Potential</i></p> <ul style="list-style-type: none"> • Oil spills • Contaminants • Rat spills
<p>D. Location and condition of key or important habitat areas</p> <p>Summer: Nesting and roosting: cliff ledges on oceanic islands. Condition: good, mostly protected. Foraging: marine waters, near breeding colonies near the continental shelf edge. Condition: unknown</p> <p>Winter: Foraging: poorly known, probably marine waters in North Pacific. Condition: unknown</p> <p>Main nesting colonies: St. Paul, St. George, Bogoslof, Buldir, and Commander Islands (USFWS 2003).</p>
<p>E. Concerns associated with key habitats</p> <ul style="list-style-type: none"> • Rat spills, chronic oiling, climate change (changes in the food web) • Change in land management status and/or land use regulations

<p>Attributes surrounding species success: The entire nesting/roosting habitat lies within protected areas; no commercial harvest currently occurs for forage species; oil discharge regulations; lack of human disturbance.</p>
<p>F. Goal: Ensure Red-legged Kittiwake populations remain sustainable throughout their range within natural population-level variation and historical distribution across Alaska.</p>
<p>G. Conservation objectives and actions</p> <p>State conservation and management needs:</p> <p><u>Objective:</u> Restore population levels of Red-legged Kittiwake to 1970s levels.</p> <p>Target: Maintain Alaska-wide population of at least 200,000 individuals (mid 1970s estimate).</p> <p>Measure: Develop and use an index of abundance at key locations.</p> <p><u>Issue 1:</u> Contamination, oil pollution, including chronic oiling (may be bilge dumping)</p> <p>Conservation actions:</p> <ul style="list-style-type: none"> a) Bilge control (to prevent chronic oiling). b) Oil spill planning and response (product shippers) – one idea/measure is to develop and distribute a multilingual press kit/education and outreach program designed to reduce chronic oiling. c) Measure contaminants in eggs and determine if negative effects are occurring. <p><u>Issue 2:</u> Prey abundance and quality variability</p> <p>Conservation action: Monitor foraging species status and trends (state-managed waters, 0–3 mi).</p> <p><u>Issue 3:</u> Rat spills</p> <p>Conservation actions:</p> <ul style="list-style-type: none"> a) Prevent rat introductions. b) Educate regarding rat introductions. <p><u>Issue 4:</u> Reasons for large population fluctuations in Pribilofs not well understood.</p> <p>Conservation actions:</p> <ul style="list-style-type: none"> a) Determine wintering locations. b) Measure productivity (to evaluate fluctuations based on prey variability). c) Evaluate prey variability. d) Maintain a population monitoring program. e) Evaluate disturbance at index colonies. <p>Global conservation and management needs:</p> <p><u>Objective:</u> Determine amount of interaction between Russian and Alaska populations</p>

<p>Target: Genetic markers and/or radiotelemetry in place on an adequate sample of birds from each population to determine interaction</p> <p>Measure: Number of genetic markers and/or radiotelemetry in place relative to the population sizes</p> <p>Issue: Genetic distinctiveness of populations is not well understood.</p> <p>Conservation action: If distinct, Alaska populations need even more scrutiny.</p>
<p>H. Propose plan and time frames for monitoring species and their habitats</p> <p>Surveys would be conducted at index locations once every 3 years for 20 years.</p> <p>Colony surveys would be conducted at the index locations by USFWS. Audubon is a potential partner especially at Commander Islands.</p>
<p>I. Recommended time frame for reviewing species status and trends</p> <p>Ten years, or at more frequent intervals in response to additional information.</p>
<p>J. Bibliography</p> <p>Byrd, G.V. and J.C. Williams. 1993. Red-legged Kittiwakes <i>Rissa brevirostris</i>. In: A. Poole and F. Gill, editors. The Birds of North America, No. 60,</p> <p>Byrd, G.V., J.C. Williams, Y.B. Artukhin and P.S. Vyatkin. 1997. Trends in populations of Red-legged Kittiwake <i>Rissa brevirostris</i>, a Bering Sea endemic. Bird Conservation International 7:167–180.</p> <p>Dragoo, D.E., G.V. Byrd, and D.B. Irons. 2003. Breeding status, population trends and diets of seabirds in Alaska, 2001. USFWS. Report AMNWR 03/05.</p> <p>USFWS. 2003. Beringian Seabird Colony Catalog—computer database and Colony Status Record archives. Anchorage: USFWS Migratory Bird Management.</p>

Arctic Tern

Rationale

This species was selected because:

- Species has noticeably declined in abundance or productivity from historical levels outside the range of natural variability.
- Species is sensitive to environmental disturbance.
- Species status is unknown (e.g., population information is unknown, or taxonomy is questionable).
- Species is representative of broad array of other species found in a particular habitat type.
- Species is important internationally (e.g., targeted for cross-jurisdictional action and/or recognized in bi- or multilateral agreements; or useful for cross-jurisdictional monitoring).

Human Uses

Possible subsistence egging at Nunivak and Yakutat

A. Species description

Common name: Arctic Tern

Scientific name: *Sterna paradisaea*

B. Distribution and abundance (see map page 230, Appendix 4)

Range:

Global range:

Breeding: Circumpolar from the shores of the Arctic Ocean to as far south as 41°, nests widely inland in the far north.

Winter: Principally Antarctica, but little data. Birds seen as far south as Ross Sea, numerous sightings around Australia and a few from South Africa.

State range:

Breeding: Nests coastally and inland from the Arctic Ocean to Southeast Alaska

Winter: Thought that birds from around the circumpolar north winter principally in Antarctica, but little data. Birds seen as far south as Ross Sea, numerous sightings around Australia and a few from South Africa.

Abundance:

Global abundance comments: incomplete data, but likely 1–2 million individuals (Hatch 2003)

State abundance comments: ~10,000 individuals nesting coastally, unknown inland (USFWS 2003)

Trends:

Global trends: Population is not monitored, but thought to be declining

State trends: Population is not monitored, but coastal population has declined (Agler 1999, Stephensen et al. 2002, Stephensen et al. 2003).

C. Problems, issues, or concerns for species

- Population is not monitored, especially at inland breeding areas
- Winter range is not known well for Alaskan birds
- Potential for identification confusion with Aleutian Terns

Existing

- Human disturbance at particular times
- Introduced predators (e.g., rats, foxes) and human-caused increases in corvids, gulls, and other native predators
- Prey abundance variability
- Oil pollution, including chronic oiling (possibly bilge dumping)

Potential

- Oil spills
- Highly susceptible to disturbance at nesting sites (commercial fishing, tourism near to shore)
- Contaminants
- Rat spills
- Ship wakes
- Heavy predation (gulls)

D. Location and condition of key or important habitat areas

Summer:

Breeding: Flat, grassy or mossy areas, coastal spits; frequently mixed with Aleutian Terns. Some colonies degraded due to disturbance from humans.

Relatively large colonies occurred in Prince William Sound and on Kodiak Island in the Gulf of Alaska, but those populations have declined by more than 90%. These habitats are dynamic and subject to dramatic change (e.g., earthquakes and marine erosion).

Foraging: Inshore marine waters, coastal lagoons, streams and lakes (Hatch 2003). Condition good (as far as we know).

Winter:

Foraging: little known, but probably nearshore waters. Condition unknown.

Arctic Tern habitat may be affected by climate change (change in distribution of prey species). Arctic Terns are susceptible to disturbance by humans and domestic dogs.

E. Concerns associated with key habitats

- Rat spills, chronic oiling, climate change (changes in the food web)
- Change in land management status and/or land use regulations (research: how many sites are within/outside protected areas)

Attributes surrounding species success: Most of the nesting/roosting habitat lies within protected areas; no commercial harvest currently occurs for forage species; oil discharge regulations; lack of human disturbance in remote areas; foxes removed from certain islands.

F. Goal: Ensure Arctic Tern populations remain sustainable throughout their range within natural population-level variation and historical distribution across Alaska.

G. Conservation objectives and actions

State conservation and management needs:

Objective: Restore Arctic Tern coastal population levels to those of the late 1970s by 2025 (1970s represent first “comprehensive” baseline numbers).

Target: Alaska coastal population of at least 30,000 individuals.

Measure: Populations at index locations would be surveyed (e.g., Prince William Sound, Kodiak Island, Port Moller, Yakutat, Andreanof Islands) once every 5 years for 20 years.

Issue 1: Except for effects of the 1964 earthquake, factors causing the population decline or preventing population recovery are unknown.

Conservation action: Determine factors affecting population decline and recovery.

Issue 2: Population is not monitored; winter range is unknown.

Conservation actions:

- a) Establish a monitoring program including species identification training.
- b) Determine wintering locations (e.g., access Seabird Observer Database from fisheries observers).
- c) Measure productivity.
- d) Complete a nesting inventory.

Issue 3: Human disturbance.

Conservation actions:

- a) Evaluate disturbance at index colonies.
- b) Educate public to avoid disturbance of Arctic Terns.

Issue 4: Introduced predators.

Conservation actions:

- a) Prevent rat introductions.
- b) Control domestic and feral dogs and cats.
- c) Control sources of human-caused increases in predators (e.g., uncovered dumps near colonies).

Issue 5: Prey abundance variability.

Conservation action: Determine foraging habits.

Issue 6: Contaminants; oil pollution, including chronic oiling (e.g., bilge pumping).

Conservation actions:

- a) Measure contaminants in Arctic Tern eggs.
- b) Monitor compliance with regulations on oil and other contaminants discharges.

Issue 7: Ship wakes can cause waves that flood nests.

Conservation action: Develop an education program for vessel users operating near colonies

Issue 8: Heavy predation by gulls.

Conservation action: Control sources of gull attraction/supplemental feeding.

Global conservation and management needs:

Objective: Determine the extent of interaction and genetic exchange with Russian populations.

Target: Genetic markers and/or radiotelemetry in place on an adequate sample of birds from each population to determine interaction.

Measure: Number of genetic markers and/or radiotelemetry relative to the population sizes.

Issue: Genetic distinctiveness of populations is uncertain.

Conservation action: If distinct, Alaska populations need even more scrutiny.

H. Plan and time frames for monitoring species and their habitats

Surveys would be conducted at index locations once every 5 years for 20 years.

Colony surveys would be conducted at the index locations by ADF&G, USFWS, NPS, USFS, and the Copper River Delta Inst. (USFS), the Prince William Sound Science Center, and TNC are potential partners.

I. Recommended time frame for reviewing species status and trends

Ten years, or at more frequent intervals in response to additional information

J. Bibliography

Agler, B.A., S.J. Kendall, D.B. Irons, and S.P. Klosiewski. 1999. Declines in Marine Bird Populations in Prince William Sound, Alaska Coincident with a Climatic Regime Shift. *Waterbirds* 22 (1): 98–103.

Bibliography (continued)

Hatch, J.J. 2002. Arctic Tern (*Sterna paradisaea*). In: A. Poole and F. Gill, editors. The Birds of North America, No. 707.

Stephensen, S.W., D.C. Zwiefelhofer, and R.J. Howard. 2002. Seabird Colony Survey of South and East Kodiak Island, Alaska, June 2001. USFWS Report. Migratory Bird Management, Anchorage, AK.

Stephensen, S.W., D.C. Zwiefelhofer, and L. Slater. 2003. Seabird Colony Survey of North and West Kodiak Island, Alaska, June 2002. USFWS Report. Migratory Bird Management, Anchorage, AK.

USFWS. 2003. Beringian Seabird Colony Catalog—computer database and Colony Status Record archives. USFWS. Migratory Bird Management, Anchorage, AK.

Aleutian Tern

Rationale

This species was selected because:

- The population has recently declined
- Small restricted range
- Rare species, endemic to Alaska
- Winter range unknown
- Imperiled
- Species is sensitive to environmental disturbance

Human Uses

Possible subsistence eggging at Nunivak and Yakutat

A. Species description

Common name: Aleutian Tern

Scientific name: *Sterna aleutica*

B. Distribution and abundance (see map page 231, Appendix 4)

Range:

Global range comments:

Breeding: Alaska and Eastern Russia (Sakalin Island) (North 1997)

Winter range: Outside Alaska, location unknown, probably Southeast Asia (North 1997)

State range comments:

Breeding: Extend patchily along coast from Yakutat to Attu, and north to southeastern Chukchi Sea (USFWS 2003)

Abundance:

Global abundance comments: 20,400 individuals (North 1997)

State abundance comments: 12,900 individuals (North 1997)

Trends:

Global trends: Population is not monitored, but thought to be declining

State trends: Population is not monitored, but thought to be declining

C. Problems, issues, or concerns for species

- Population is not monitored
- Winter range is not known
- Potential for confusion of identification with Arctic Tern

Existing

- Competition with Arctic Tern
- Human disturbance at particular times
- Introduced predators (e.g., rats, foxes)
- Human-caused increases in natural predators (e.g. gulls, corvids)
- Prey abundance variability
- Oil pollution, including chronic oiling (may be bilge dumping)

Potential

- Oil spills
- Highly susceptible to disturbance at nesting sites (commercial fishing, tourism near to shore)
- Contaminants
- Rat spills
- Ship wakes
- Heavy predation (gulls)

D. Location and condition of key or important habitat areas

Summer:

Breeding: flat grassy or mossy areas, coastal spits; frequently mixed with Arctic Terns. Some colonies degraded due to disturbance from humans

Relatively large colonies occur at Yakutat, Icy Bay, Port Moller Spit, Safety Lagoon and Amchitka Island. The Copper River Delta, which was formerly a large nesting location, is apparently no longer used. These habitats are dynamic and subject to dramatic change (e.g., earthquakes and marine erosion).

Foraging: Inshore marine waters, coastal lagoons (North 1997). Condition good (as far as we know).

Winter:

Foraging: little known, but probably nearshore waters. Condition of habitat unknown.

Aleutian Tern habitat may be affected by climate change (change in distribution of prey species). Aleutian Terns are susceptible to disturbance by humans and domestic dogs.

Areas of Significance: Port Moller Spit, Yakutat, Icy Bay, Safety Lagoon and Amchitka Island

E. Concerns associated with key habitats

- Summer breeding: threat of rat spills, chronic oiling, climate change (changes in the food web)
- Change in land management status and/or land use regulations (research: how many sites are within/outside conservation areas)
- Winter foraging: oil spills

Attributes surrounding species success: Most of the nesting/roosting habitat lies within protected areas; no commercial harvest currently occurs for forage species; oil discharge regulations; lack of human disturbance; foxes removed from certain islands.

F. Goal: Ensure Aleutian Tern populations remain sustainable throughout their range within natural population-level variation and historical distribution across Alaska.

G. Conservation objectives and actions

State conservation and management needs:

Objective: Restore Aleutian Tern population levels to those of the late 1970s by 2025 (1970s represent first “comprehensive” baseline numbers).

Target: Alaska-wide population of at least 10,000 individuals (late 1970s estimate).

Measure: Populations at index locations would be surveyed (e.g. Port Moller Spit, Yakutat, Icy Bay, Safety Lagoon and Amchitka Island) once every 5 years for 20 years.

Issue 1: Except for effects of the 1964 earthquake, factors causing the population decline or preventing population recovery are unknown.

Conservation action: Determine factors affecting population decline and recovery.

Issue 2: Population is not monitored; winter range is unknown.

Conservation actions:

- a) Establish a monitoring program including species identification training.
- b) Determine wintering locations.
- c) Measure productivity.
- d) Complete a nesting inventory.

Issue 3: Human disturbance.

Conservation actions:

- a) Evaluate disturbance at index colonies.
- b) Educate public to avoid disturbance of Aleutian Terns.

Issue 4: Introduced predators.

Conservation actions:

- a) Prevent rat introductions.
- b) Control domestic and feral dogs and cats.

Issue 5: Prey abundance variability.

Conservation action: Determine foraging habits.

Issue 6: Contaminants; oil pollution, including chronic oiling (e.g., bilge pumping).

Conservation actions:

- a) Measure contaminants in Aleutian Tern eggs.
- b) Monitor compliance to regulations on oil and contaminant discharges from ships.

Issue 7: Ship wakes can cause waves that flood nests.

Conservation action: Develop an education and outreach program to fishing, tour, and recreational vessels.

Issue 8: Heavy predation by gulls.

Conservation action: Control sources of gull attraction (e.g., uncovered dumps) near tern colonies.

Global conservation and management needs:

Objective: Determine the extent of interaction and genetic exchange with Russian populations.

Target: Genetic markers and/or radiotelemetry in place on an adequate sample of birds from each population to determine interaction.

Measure: Number of genetic markers and/or radiotelemetry relative to the population sizes.

Issue: Are the populations distinct genetically?

Conservation action: If distinct, Alaska populations need even more scrutiny.

H. Plan and time frames for monitoring species and their habitats

Surveys would be conducted at index locations once every 5 years for 20 years.

Colony surveys would be conducted at the index locations by ADF&G, USFWS, NPS, USFS, and the Copper River Delta Inst. (USFS), the Prince William Sound Science Center, and TNC are potential partners.

I. Recommended time frame for reviewing species status and trends
Ten years, or at more frequent intervals in response to additional information.
J. Bibliography
North, M.R. 1997. Aleutian Tern (<i>Sterna aleutica</i>) In: A. Poole and F. Gill, editors. The Birds of North America, No. 291.
USFWS. 2003. Beringian Seabird Colony Catalog—computer database and Colony Status Record archives. Anchorage: USFWS Migratory Bird Management.

Common and Thick-billed Murres

Rationale

These species were selected because:

- Species are sensitive to environmental disturbance.
- Species are representative of broad array of other species found in a particular habitat type.
- Species are important internationally (e.g., targeted for cross-jurisdictional action and/or recognized in bi- or multilateral agreements; or useful for cross-jurisdictional monitoring).

Human Uses

Subsistence egging, subsistence hunting, and viewing.

A. Species group description
<p>Common names: Common Murre and Thick-billed Murre</p> <p>Scientific names: <i>Uria aalge</i> and <i>Uria lomvia</i></p>
B. Distribution and abundance (see maps pages 232–235, Appendix 4)
<p>Range:</p> <p><i>Common Murre</i></p> <p>Global range comments: circumpolar, sub-Arctic and Arctic regions</p> <p>Breeding: Greenland, Iceland, Norway, Sea of Okhotsk, and Chukchi Sea along Asian coast of Bering Sea to Kamchatka.</p> <p>Wintering: pelagic south of ice edge, little islands in the Pacific</p> <p>State range comments:</p> <p>Breeding: Southeast through Gulf of Alaska and Aleutian Islands, north to Cape Lisburne.</p> <p>Winter range: Pelagic, south of ice edge, Gulf of Alaska, Aleutians and Southeast Alaska.</p>

Thick-billed Murre

Global range comments: circumpolar, sub-Arctic and Arctic regions

Breeding: Canada, Greenland, Iceland, Norway, Siberian Coast, Kamchatka, and Sea of Okhotsk.

Wintering: open waters off of breeding sites

State range comments:

Breeding: Southeast through Gulf of Alaska and Aleutian Islands, north to Cape Lisburne.

Winter range: Pelagic, south of ice edge, Gulf of Alaska, Aleutians and Southeast Alaska.

Abundance:

Common Murre

Global abundance comments: 13.0–20.7 million individuals (Ainley 2002)

State abundance comments: each species approximately 5 million (USFWS 2003)

Thick-billed Murre

Global abundance comments: 15–20 million individuals (Gaston 2000).

State abundance comments: both species approximately 5 million (USFWS 2003)

Trends:

Common Murre

Global trends: Changes in decadal sea surface temperatures in climatic indices seem to be associated with changes in murre population levels. Overall, no clear trend direction. Likely declining in Atlantic, but unclear trends in Pacific. (D. Irons, USFWS, unpubl. data)

State trends: Unclear (Dragoo 2003).

Thick-billed Murre

Global trends: Eastern Canada stable or increasing, Greenland substantially decrease during 1940s to 1980s probably unchanged since then. (Gaston 2000).

State trends: Unclear (Dragoo 2003).

C. Problems, issues, or concerns for species group

Existing

In the past, gillnet fisheries impacted murre populations, particularly in California, but this problem has been resolved in California. Gillnets are still a source of mortality in Alaska; murre were the most common bycatch in gillnets in studies done in Prince William Sound, South Unimak, and Kodiak (Wynne et al. 1991; Manly et al. 2003).

- Exotic mammals (e.g., rats, foxes)
- Habitat change due to changing and warming temperatures
- Prey abundance variability
- Oil pollution, including chronic oiling (may be bilge dumping); most of birds killed in 1989 Exxon Valdez oil spill were murre (Piatt et al. 1990)
- Interactions with fisheries – gillnets, etc.
- Mortality in derelict fishing gear
- Winter die-offs (most common species in seabird die-offs) (Piatt and Van Pelt 1997) may indicate starvation problems in winter, or presence of marine biotoxins, which can increase as sea temperatures increase

Potential

- Oil spills
- Disturbance at nesting sites (commercial fishing, tourism near to shore)
- Contaminants
- Egging and harvest
- Increased occurrence of toxic algae blooms, etc., due to warming of water temperature

D. Location and condition of key or important habitat areas

Summer:

Breeding: Cliff ledges on oceanic islands or the mainland coast, the majority of which lie within designated conservation lands. These areas are generally pristine, but some have introduced predators.

Foraging: Common murre, marine waters within 60–0 km of colony; thick-billed murre, up to 170 km from colony (Gaston 2000).

Winter:

Foraging: In offshore marine waters (though they occasionally occur in large numbers in some inside waters, such as Prince William Sound, Resurrection Bay [USFWS unpubl. data])

Areas of particular significance:

Common Murre: St. George, Round Island, Hall Island (USFWS 2003). Cape Pierce, Bluff, Chammisso, Puffin Islands, St. Lawrence Island, and Little Diomed Island. Most big Bering Sea islands (St. Matthew, Hall, St. Lawrence, Little Diomed are about 50% Common Murre and 50% Thick-billed Murre, and so are significant to both species.

Thick-billed Murre: St. George (USFWS 2003) and Cape Lisburne. Cape Thompson and Cape Lisburne in the eastern Chukchi Sea are about 70% Thick-billed Murres and 30% Common Murres.

E. Concerns associated with key habitats

- Summer breeding: threat of rat spills, change in land management status and land use regulations
- Summer foraging: oil spills, climate change (changes in the food web), changes in land use regulations, toxic algae blooms
- Winter foraging: oil spills

Attributes surrounding species success: Most of the nesting habitat lies within conservation units; no commercial harvest currently occurs for forage species; oil discharge regulations; lack of human disturbance; foxes removed from certain islands; introduced rat prevention programs; minimal subsistence harvest by Alaskans (relative to Atlantic communities)

F. Goal: Ensure murre populations remain sustainable throughout their range within natural population-level variation and historical distribution across Alaska.

G. Conservation objectives and actions

Objective: Maintain 2004 population levels of murres.

Target: Maintain Alaska breeding population of 5 million individuals of each species, along with a viable global population.

Measure: Index of abundance for both murres, (They are currently monitored by USFWS periodically [some annually, others not] at locations in Alaska [common: at approximately 15 locations; thick-billed at approximately 10 sites] mostly federal refuges but also some state lands [e.g., Round Islands] and Native land [Gull Island in Kachemak Bay]. These trends reported regularly in “Breeding Status, Population Trends and Diets of Seabirds in Alaska”). Continue current level or increase monitoring, since these species have been included as indicator species.

Issue 1: Additional introduction of exotic predators and rats (often called “rat spills” when animals escape from shipwrecks) can cause reduced productivity and population declines because introduced predators eat adults, chicks, and eggs.

Conservation actions:

- a) Conduct additional predator removal programs.
- b) Prevent rat introductions.
- c) Conduct rat response program.

Issue 2: Prey abundance variability can cause reproductive failures.

Conservation action: Monitor foraging species status and trends (state-managed waters, 0–3 mi).

Issue 3: Contaminants, oil pollution, including chronic oiling (may be bilge dumping).

Conservation actions:

- a) Bilge control (chronic oiling); oil spill planning and response (product shippers)—one idea/measure is to develop and distribute a multilingual press kit/education and outreach program designed to reduce chronic oiling.
- b) Continue or expand existing level of research/monitoring.

Issue 4: Climate change (changes in food web).

Conservation actions:

- a) Monitor winter die-offs more consistently; implement regular beach surveys with set protocol. Combine with lab analysis of body condition, contaminants, toxins.
- b) Continue or expand existing level of research/monitoring.
- c) Monitor species status and trends (state-managed waters, 0–3 mi).

Issue 5: Disturbance at nesting sites (commercial fishing, tourism near shore).

Conservation actions:

- a) Reduce fishing around colonies, especially trawl and gillnet fisheries.
- b) Educate pilots about low flight around active colonies.
- c) Clean up derelict fishing gear, especially pots and gillnets.

Issue 6: Egging and harvest by Alaska Natives may cause local reductions in productivity and potentially reduce local populations.

Conservation actions:

- a) Improve certainty of population counts in Alaska
- b) Monitor egging and compare colonies subject to egging vs. not egged.

H. Plan and time frames for monitoring species and their habitats

Surveys would be conducted at index locations on the current schedule of once every 1–5 years.

USFWS is currently lead on surveys, with assistance from ADF&G. Continue with this relationship.

I. Recommended time frame for reviewing species status and trends

Ten years, or at more frequent intervals in response to additional information.

J. Bibliography

Ainley, D.G., D.N. Nettleship, H.R. Carter, and A.E. Storey. 2002. Common Murre (*Uria aalge*). In: A. Poole and F. Gill, editors. The Birds of North America, No. 666.

Croll, D.A., J.L. Maron, J.A. Estes, E.M. Danner, and G.V. Byrd. 2005. Introduced predators transform subarctic islands from grassland to tundra. *Science* 307:1959–1961.

Dragoo, D.E., G.V. Byrd, and D.B. Irons. 2003. Breeding status, population trends and diets of seabirds in Alaska, 2001. USFWS. Report AMNWR 03/05.

Drew, G.S., J.F. Piatt, G.V. Byrd, and D.E. Dragoo. 1996. Seabird, fisheries, marine mammal, and oceanographic investigations around Kasatochi, Koniuji, and Ulak Islands, August, 1996. USFWS, Homer, AK. 38 p.

Gaston, A.J. and J.M. Hipfner. 2000. Thick-billed Murre (*Uria lomvia*). In: A. Poole and F. Gill, editors. The Birds of North America, No. 497.

Manly, B.F.J., A.S. Van Atten, K.J. Kuletz, and C. Nations. 2003. Incidental catch of marine mammals and birds in the Kodiak Island set gillnet fishery in 2002. Final report by Western EcoSystems Technology, Inc., Cheyenne, WY, for NMFS, Juneau, AK.

Piatt, J.F., C.J. Lensink, W. Butler, M. Kendziorek, and D.R. Nysewander. 1990. Immediate impact of the 'Exxon Valdez' oil spill on marine birds. *Auk* 107:387–397.

Piatt, J.F. and T.I. Van Pelt. 1997. Mass-mortality of Guillemots (*Uria aalge*) in the Gulf of Alaska in 1993. *Marine Pollution Bulletin* 34:656–662.

USFWS. 2003. Beringian Seabird Colony Catalog—computer database and Colony Status Record archives. Anchorage: USFWS Migratory Bird Management.

Wynne, K, D. Hicks, and N. Munro. 1991. 1990 salmon gillnet fisheries observer programs in Prince William Sound and south Unimak Alaska. Report by Saltwater Inc., Anchorage, AK. Available from NMFS, Juneau, AK.

Marbled Murrelet

Rationale

This species was selected because:

Species is imperiled.

Species has noticeably declined in abundance or productivity from historical levels outside the range of natural variability.

Species is designated as at risk (threatened, candidate, or endangered under ESA; state endangered or species of concern; depleted under Marine Mammal Protection Act).

Species is sensitive to environmental disturbance.

Human Uses

Viewing

A. Species description

Common name: Marbled Murrelet

Scientific name: *Brachyramphus marmoratus*

B. Distribution and abundance

Range:

Global range comments: Nests in coastal forests in North American and Asia, in the Pacific.

Breeding: Coastal areas of Russia and Japan (Nelson 1997)

Wintering: Few data, marine habitat similar to breeding

State range comments: From Southeast Alaska through the Aleutian Islands and Bristol Bay

Breeding: Coastal areas of Alaska; primarily bays, inlets and fjords (Nelson 1997).

Wintering: Few data, marine habitat similar to breeding, farther off shore in some areas of Gulf of Alaska (Nelson 1997).

Abundance:

Global abundance comments: Unknown, but over 947,500 (McShane 2004)

State abundance comments: About 850,000 individuals as of 1994 (Agler 1998), but this estimate includes surveys > 10 yrs old, and likely now lower.

Trends:

Global trends: Unknown for Asian populations, declining in United States (Stephenson 2001)

State trends: Declining (Nelson 1997, Stephensen 2001) in most areas; exception is Kenai Fjords, where numbers increased between 1986 and 2002 (after decline between 1976 and 1986; Van Pelt and Piatt 2003).

C. Problems, issues, or concerns for species

Existing

- Declining populations
- Incidental mortality in fishing gear (Manly et al. 2003; Wynne et al. 1991, 1992; Carter et al. 1995)
- Prey abundance variability
- Oil pollution, including chronic oiling (possibly bilge dumping)
- Vessel disturbance
- Avian and mammal predation
- Spruce beetle kill in areas with potential nesting habitat.

Potential

- Contaminants
- Aquaculture
- Logging

D. Location and condition of key or important habitat areas

Summer

Nesting: Generally, individually nest in trees in older coastal forests; a few nest on the ground in tundra, scree slopes, or cliffs. Many forest nesting areas have been degraded by logging.

Foraging: Inshore marine waters. Conditions range from pristine to degraded.

Winter

Foraging: Inshore marine waters to continental shelf. Conditions from pristine to degraded.

Areas of significance: Prince William Sound, Southeast Alaska, Lower Cook Inlet/Kenai Peninsula. (Afognak was a high-density nesting area [USFWS, unpubl data], and Kodiak bays may be important wintering area for some populations [D. Zwiefelhofer, Kodiak Natl. Wildl. Refuge, Unpubl. data]).

E. Concerns associated with key habitats

Summer

Nesting: Habitat degradation due to logging nest trees. Spruce beetle infestation and other conifer diseases (i.e., cedars in Southeast Alaska) degrading nesting habitat (currently associated with global warming, and this may increase).

Foraging habitat: Disturbance, degradation (i.e., by dumping of pollutants, waste, and toxins), and mortality by cruise and fishing vessels, climate change, oil spills. Rich, well-protected bays are prized by aquaculture.

Winter

Foraging: Potential chronic oiling from bilge pumping, climate change, oil spills.

Attributes surrounding species success: No commercial harvest currently occurs for some forage species (capelin, sand lance, Myctophids, smelts), but Marbled Murrelets also feed on juveniles of herring (important prey in many areas), cod, pollock, and older age classes of these species are harvested.

F. Goal: Ensure Marbled Murrelet populations remain sustainable throughout their natural range within natural population-level variation and historical distribution across Alaska.

G. Conservation objectives and actions

State conservation and management needs:

Objective: Restore Alaska’s Marbled Murrelet population to 1994 levels by 2025.

Target: Alaskan population of about 750,000 individuals.

Measure: Apply index of abundance for determining population levels at key sites, including Southeast Alaska, Prince William Sound, Kodiak Island, and Cook Inlet.

Issue 1: Habitat degradation due to logging nest trees.

Conservation actions:

- a) First step: Identify important nesting areas of murrelets (not well mapped in Alaska).
- b) Quantify effect of logging on Marbled Murrelet nesting habitat.
- c) Reduce logging in high density Marbled Murrelet nesting habitat.
- d) Manage re-planted areas to increase large trees and “old-growth” effects, such as thinning, selected cutting, etc.

Issue 2: Marine and inland effects of climate change.

Conservation actions:

- a) Monitor marine changes relative to murrelet population; compare sites with positive trend (Kenai Fjords) to those with negative trends (Prince William Sound, Glacier Bay), and identify reasons.
- b) Monitor effect of degradation/loss of nesting habitat from beetle infestation and other diseases. Quantify effect on nesting behavior and success.
- c) Manage forests to reduce infestation and/or provide best nesting options (i.e., thinning, managing for “old-growth” forest effect, etc.).

Issue 3: Incidental mortality in fishing gear.

Conservation actions:

- a) Quantify mortality related to fishing gear, including spatial/temporal overlap.
- b) Develop gillnet gear or practices that reduce bycatch of diving birds; fund studies for this.

Issue 4: Prey abundance variability.

Conservation action: Determine the status and trends of primary forage species (state-managed waters, 0–3 mi).

Issue 5: Contamination, oil pollution, including chronic oiling (possibly bilge pumping).

Conservation actions:

- a) Research to measure contaminants in Marbled Murrelet.
- b) Monitor compliance with contaminant discharges and oil pollution prevention/preparedness.
- c) Work to reduce small-vessel sinkings and related oil spills, especially for inside waters.

Issue 6: Cruise and fishing vessel disturbance.

Conservation actions:

- a) Determine extent of potential for disturbance, what specifically are problems, and where.
- b) Determine potential for murrelet habituation to disturbance.
- c) Determine effects of very fast boats, especially hydrofoils, jet boats, etc.; determine “safe” speeds under different habitat conditions.
- d) Outreach for proper vessel operation where tourism, fishing, and murrelets overlap.

Issue 7: Avian and mammal predation.

Conservation actions:

- a) Reduce human-caused increases in corvids (jays, magpies, crows, and ravens prey on eggs and chicks), Bald Eagles, and gulls (Glaucous-winged and Herring gulls take adults).
- b) Monitor predation on murrelet adults by bald eagles in areas where artificially high concentrations of eagles are created by supplemental feeding. Reduce such activities.

Global conservation and management needs:

Objective: Determine extent of population interactions and distinctiveness.

Target: Assess genetic distinctiveness of major populations.

Measure: Blood, tissue, feather samples used for genetic analyses.

Issue 1: Determination of “distinct population segments”

Conservation action: Develop collection protocols, coordinate collection of samples and lab analysis, synthesis.

H. Plan and time frames for monitoring species and their habitats

Surveys will be conducted every 3 years to determine population change at index locations, including Southeast Alaska, Kodiak Island, Cook Inlet, and Prince William Sound. Kenai Fjords. Less regularly – the outer coast from Cross Sound to Icy Bay.

USFWS is a potential partner with the state for this effort.

Other potential partners include land owners in key Marbled Murrelet areas, such as the USFS (Chugach, Tongass), NPS (Kenai Fjords, Wrangell-St. Elias, Glacier Bay), and Native groups (Afognak Island, parts of Kenai and Southeast Alaska).

I. Recommended time frame for reviewing species status and trends

Five years, or at more frequent intervals in response to additional information.

J. Bibliography

Agler, B.A., S.J. Kendall, and D.B. Irons. 1998. Abundance and distribution of Marbled Murrelets and Kittlitz’s Murrelets in southcentral and southeast Alaska. *Condor* 100:254–265.

Carter, H.R., M.L.C. McAllister, and M.E.P. Isleib. 1995. Mortality of Marbled Murrelets in gill nets in North America. Pages 271–284 In: C.J. Ralph, G.L. Hunt, Jr., M.G. Raphael and J.F. Piatt, editors. *Ecology and Conservation of the Marbled Murrelet*. USFS. Gen. Tech. Rep. PSW-GTR-152.

Manly, B.F.J., A.S. Van Atten, K.J. Kuletz, and C. Nations. 2003. Incidental catch of marine mammals and birds in the Kodiak Island set gillnet fishery in 2002. Final report by Western EcoSystems Technology, Inc., Cheyenne, WY, for NMFS, Juneau, AK.

McShane, C., T. Hamer, H. Carter, G. Swartzman, V. Friesen, D. Ainley, R. Tressler, K. Nelson, A. Burger, L. Spear, T. Mohagen, R. Martin, L. Henkel, K. Prindle, C. Strong, and J. Keany. 2004. Evaluation report for the 5-year status review for the Marbled Murrelet in Washington, Oregon, and California. Unpubl. report, EDAW, Inc., Seattle, WA.

Nelson, S.K. 1997. Marbled Murrelets, *Brachyramphus marmoratus*. *The Birds of North America*, No. 276, A Poole and F Gill, (eds).

Bibliography (continued)

- Stephensen, S.W., D.B. Irons, S. J. Kendall, B.K. Lance, and L. L. McDonald. 2001. Marine bird and sea otter population abundance of Prince William Sound, Alaska: trends following the *T/V Exxon Valdez* oil spill, 1989–2000. *Exxon Valdez* Oil Spill Restoration Project Annual Report (Restoration Project 00159), USFWS, Anchorage, AK.
- Van Pelt, T.I. and J.F. Piatt. 2003. Population status of Kittlitz's and Marbled Murrelets and surveys for other marine bird and mammal species in the Kenai Fjords area, Alaska. Annual Report to USFWS, USGS Science Support Project. Alaska Science Center, Biological Science Office, Anchorage, AK.
- Wynne, K, D. Hicks, and N. Munro. 1991. 1990 salmon gillnet fisheries observer programs in Prince William Sound and south Unimak Alaska. Report by Saltwater Inc., Anchorage, AK. Available from NMFS, Juneau, AK.
- Wynne, K., D. Hicks, and N. Munro. 1992. 1991 marine mammal observer program for the salmon driftnet fishery of Prince William Sound Alaska. Final report., Saltwater Inc., Anchorage, AK. Available from NMFS, Juneau, AK.

Kittlitz's Murrelet

Rationale

This species was selected because:

- Species is imperiled.
 - Species has noticeably declined in abundance or productivity from historical levels outside the range of natural variability.
 - Species is rare (i.e., small/low overall population size/density).
 - Species is designated as at-risk (threatened, candidate, or endangered under ESA; state endangered or species of concern; depleted under Marine Mammal Protection Act.
 - Species is endemic (i.e., occurs primarily in Alaska or occurs entirely within an ecoregion found in Alaska).
 - Species makes seasonal use of a restricted local range (breeding, wintering, and migration).
 - Species is sensitive to environmental disturbance.
- Species is disjunct (i.e., isolated from other populations or occurrences in adjacent ecoregions).

Human Uses

Viewing

A. Species description

Common name: Kittlitz's Murrelet

Scientific name: *Brachyramphus brevirostris*

B. Distribution and abundance (see map page 236, Appendix 4)

Range:

Global range comments: Alaska and Russian Far East (Day 1999).

Breeding: Arctic, sub-Arctic and boreal waters off of Eastern Russia (Day 1999).

Wintering: Range is poorly known, recorded along outer edge of pack ice in southeast Bering Sea (Day 1999). Found in low densities in northern Gulf of Alaska; prefer the Alaska Coastal Current and mid-shelf regions, and avoid the shelf-break front and Alaska Stream (Day and Prichard 2001).

State range comments:

Breeding: Glaciated areas, from Glacier Bay to Alaska Peninsula; small populations south of Glacier Bay in Holkham Bay, and in some nonglaciated areas of northwestern Alaska (Day 1999).

Wintering: Range is poorly known, recorded in open waters of Prince William Sound and in Southeast Alaska over open continental shelf near submerged shoals (Day 1999). Also in low densities throughout the Alaska Coastal Current and mid-shelf regions of northern Gulf of Alaska (Day and Prichard 2001).

Abundance:

Global abundance comments: Unknown; Day et al. (1999) estimated Russian population to be only 5% of total; thus, based on estimate for Alaska (USFWS 2004), global population may be about 10,000–28,000. Russian population not well surveyed and may be higher than previously noted (Vyatkin 1999).

State abundance comments: Based on rigorous surveys and anecdotal accounts for smaller populations, estimated to be about 9500–26,700 individuals (as of 2003) (USFWS 2004).

Trends:

Global trends: Declining (unknown for Russian populations)

State trends: Declining

C. Problems, issues, or concerns for species

- Habitat loss (receding glaciers)
- Gillnet mortality
- Vessel disturbance
- Mining in some areas
- Climate change
- Regime shifts in marine habitat, (e.g., possible impacts on foraging habitat from

D. Location and condition of key or important habitat areas

Summer

Nesting: Individually nest in recently de-glaciated sites. These areas are generally pristine.

Foraging: Inshore marine waters generally associated with tidewater glaciers. Condition ranges from pristine to degraded.

Winter

Foraging: Inshore marine waters to continental shelf.

Areas of significance: Glacier Bay, Prince William Sound, Kenai Fjords, Yakutat Bay, Icy Bay, Lower Cook Inlet, outer coast from Palma Bay to Fairweather Glacier.

E. Concerns associated with key habitats

Summer

Nesting: Disturbance from mineral exploration in some areas.
Glacial recession and subsequent vegetation (nesting habitat retreat farther inland).

Foraging Habitat: Disturbance and possible mortality from cruise and fishing vessels, climate change, oil spills, gillnet mortality.

Winter

Foraging: Oil spills, potential chronic oiling from bilge pumping, climate change

Attributes surrounding species success: No commercial harvest currently occurs for many forage species; oil discharge regulations; lack of human disturbance in nesting habitat.

F. Goal: Ensure Kittlitz's Murrelet populations remain sustainable throughout their range within natural population-level variation and historical distribution across Alaska.

G. Conservation objectives and actions

State conservation and management needs:

Objective: Halt the decline of Kittlitz's Murrelet populations within 5 years.

Target: Zero population decline by 2010.

Measure: Conduct annual index of abundance at key locations, including Prince William Sound, Kenai Fjords, and Glacier Bay, areas of Lower Cook Inlet.

Issue 1: Disturbance by cruise and fishing vessels/associated mortality from fishing gear

Conservation actions:

- a) Quantify mortality related to boat traffic and fishing gear.
- b) Reduce the amount of boat and fishing activity in Kittlitz's Murrelet habitats
- c) Reduce mortality related to boat traffic and fishing gear.
- d) Quantify physical parameters of summer foraging habitat and compare where Kittlitz's now occur and where they used to occur.

Issue 2: Prey abundance variability can cause reproductive failure.

Conservation action: Determine species status and trends of primary forage species used by murrelets (state-managed waters, 0–3 mi).

Issue 3: Contaminants, oil pollution, including chronic oiling (may be bilge dumping).

Conservation actions:

- a) Research to measure contaminants in Kittlitz's Murrelet.
- b) Monitor compliance with contaminate discharges and oil pollution prevention/preparedness.
- c) Work to reduce small-vessel sinkings and related oil spills, especially in inside waters.

Issue 4: Avian and mammal predation.

Conservation actions:

- a) Reduce human-caused increases in corvids, gulls, and Bald Eagles in areas used by Kittlitz's Murrelet.
- b) Monitor avian and mammal movement into higher elevations as glaciers recede.

Issue 5: Climate change; habitat loss from melting glaciers.

Conservation action: Quantify physical parameters of summer foraging habitat and compare where Kittlitz's now occur and where they used to occur.

Issue 6: Disturbance from mineral exploration in some areas.

Conservation action: Prior to exploration, survey or assess potential for Kittlitz's Murrelet nesting in the area.

Global conservation and management needs:

Objective: Determine size and genetic relatedness of Russian population.

Target: Obtain statistically valid population estimates with confidence intervals for key regions.

Measure: At-sea surveys, extrapolations from birds/km².

Issue: Gillnet mortality (has been documented in Russian waters), oil spills.

Conservation actions:

- a) Document location and extent of gillnet mortality, overlap of Kittlitz's and fisheries.
- b) Monitor oil spills, sites and sources of chronic pollution.

H. Plan and time frames for monitoring species and their habitats

To determine rate of population decline, surveys will be conducted every other year at index locations, including Prince William Sound, Kenai Fjords, Glacier Bay, Cook Inlet; at lower intervals for sections of Southeast Alaska outer coast.

USFWS and landowners* in important murrelet areas are potential partners with the state for this effort.

*USFS (Chugach), NPS (Kenai Fjords, Wrangell-St. Elias, Glacier Bay), and communities (Homer, Kachemak Bay in Cook Inlet).

I. Recommended time frame for reviewing species status and trends

Five years, or at more frequent intervals in response to additional information.

J. Bibliography

Day, R.H., K.J. Kuletz, D.A. Nigro. 1999. Kittlitz's Murrelet, *Brachyramphus brevirostris*. In: A. Poole and F. Gill, editors. The Birds of North America, No. 435.

Day, R.H. and A. K. Prichard. 2001. Biology of wintering marine birds and mammals in the northern Gulf of Alaska. Exxon Valdez Oil Spill Restoration Project Final Report (Restoration Project 00287). USFWS, Anchorage, AK.

Kuletz, K.J., E.A. Labunski, and K.M. Brenneman. 2003. Distribution and abundance of Kittlitz's Murrelets in Prince William Sound, Alaska, summer 2001. Final Report for Western Alaska Ecological Services, USFSW, Anchorage, AK.

USFWS. 2004. Candidate and listing priority assessment form for Kittlitz's Murrelet. USFWS, Anchorage, AK.

Vyatkin, P.S. 1999. New data about the range and numbers of the Kittlitz's Murrelet (*Brachyramphus brevirostris*) over the Bering Sea over the Western coasts. In: Kondratyev, A. Y. and L. A. Zelenskaya, editors. Beringian Seabird Bulletin No. 4. Russian Academy of Sciences, Magadan. p. 31–33.

Least and Crested Auklets

Rationale

These species were selected because:

- Species are endemic (i.e., occur primarily in Alaska or occur entirely within an ecoregion found in Alaska).
- Species are sensitive to environmental disturbance.
- Species are representative of broad array of other species found in a particular habitat type (diving planktivore).
- Species are important internationally (e.g., targeted for cross-jurisdictional action and/or recognized in bi- or multilateral agreements; or useful for cross-jurisdictional monitoring). Cooperative monitoring with Russia.

Human uses: Subsistence eggging, subsistence hunting, and viewing

A. Species group description

Common names: Least Auklet and Crested Auklet

Scientific names: *Aethia pusilla* and *Aethia cristatella*

B. Distribution and abundance (see maps pages 237–240, Appendix 4)

Range:

Least Auklet (*Aethia pusilla*)

Global range:

Breeding: Alaska and Eastern Russia (Jones 1993)

Winter: Poorly known but at sea near breeding areas where ice-free (Jones 1993).

State range:

Breeding: Western Aleutians to western Gulf of Alaska throughout Bering Sea to Diomed Island (Jones 1993).

Winter: Poorly known but at sea near breeding areas where ice-free as far south as Japan (Jones 1993).

Crested Auklet (*Aethia cristatella*)

Global range:

Breeding: Alaska and Eastern Russia (Jones 1993)

Winter: Poorly known but at sea near breeding areas where ice-free (Jones 1993).

State range:

Breeding: Western Aleutians to western Gulf of Alaska throughout Bering Sea to Diomed Island (Jones 1993).

Winter: Poorly known but at sea near breeding areas where ice-free (Jones 1993).

Abundance:

Aethia pusilla

Global abundance: 17 million individuals (Jones 1993; USFWS 2000)

State abundance: 9 million individuals (Jones 1993; USFWS 2000)

Aethia cristatella

Global abundance: 6 million individuals (Jones 1993; USFWS 2000)

State abundance: 3 million individuals (Jones 1993; USFWS 2000)

Trends:

Aethia pusilla

Global trends: Largely unknown (Jones 1993; Dragoo et al. 2003)

State trends: Largely unknown (Jones 1993; Dragoo et al. 2003)

Aethia cristatella

Global trends: Largely unknown (Jones 1993; Dragoo et al. 2003)

State trends: Largely unknown (Jones 1993; Dragoo et al. 2003)

C. Problems, issues, or concerns for species group

- Population is sparsely monitored.
- Specific winter range not well defined.

Existing

- Rat spills
- Human disturbance at particular times
- Introduced predators (e.g., rats, foxes)
- Prey abundance variability
- Oil pollution, including chronic oiling (may be bilge dumping)
- Mortality by attraction to large fishing vessel lights

Potential

- Oil spills
- Contaminants
- Heavy predation (gulls). (Supplemental food from fish processing could artificially increase gull populations.)
- Light pollution (from fishing vessels anchored near colonies)

D. Location and condition of key or important habitat areas

Summer:

Breeding: rock crevices in talus slopes, cliffs, boulder fields and lava flows. Degraded in some locations due to introduced mammals, and degraded in some locations by the growth of vegetation and associated soil closing the entrances to crevices. (Jones 1993)

Foraging: Inshore and offshore waters relatively near breeding sites. (Jones 1993).
Condition not known.

Winter:

Foraging: Ice-free areas in the North Pacific as far south as Hokkaido Japan (Jones 1993). Condition unknown.

Areas of significance: Kiska, Buldir, Little Diomedes, Gareloi, and Segula Islands; Ivek Mountains, Cape Myaughee, Sevuokuk Mountains.

E. Concerns associated with key habitats

Threat of rat spills, chronic oiling, climate change (changes in the food web)

Attributes surrounding species success: Most of the nesting habitat lies within protected areas; no commercial harvest currently occurs for forage species.

F. Goal: Ensure auklet populations remain sustainable throughout their range within natural population-level variation and historical distribution across Alaska.

G. Conservation objectives and actions

Objective: Restore Least and Crested Auklet population and distribution to pre-fox, pre-rat introduction conditions (i.e., reestablish populations on islands after introduced mammals are removed).

Target: Maintain Alaska-wide populations at least at year 2000 levels.

Measure: Populations at index locations would be surveyed (e.g., Buldir, Kiska, Kasatochi, St. Matthew, and St. Lawrence Islands) at least once every 3 years for 20 years. Evaluate also reestablishment on islands where introduced mammals have been removed.

Issue 1: Population is sparsely monitored.

Conservation actions:

- a) Determine wintering locations.
- b) Maintain a monitoring program.
- c) Complete a nesting inventory.

Issue 2: Human disturbance at particular times.

Conservation actions:

- a) Minimize human disturbance.
- b) Evaluate disturbance at index colonies.

Issue 3: Introduced predators (e.g., rat spills, foxes).

Conservation actions:

- a) Remove foxes from certain islands.
- b) Evaluate reestablishment on islands where introduced mammals have been removed.
- c) Educate ship crews about rat introduction.
- d) Prevent additional rat introductions.

Issue 4: Light pollution attracts birds and may result in death or injuries from collisions.

<p>Conservation actions:</p> <ul style="list-style-type: none"> a) Educate (ship crews) about light pollution issue and care and release of birds that come aboard. b) Encourage the use of shielded lights on ships and ocean platforms that eliminate lateral light emissions. <p>Issue 5: Prey abundance variability.</p> <p>Conservation action: Monitor foraging species status and trends (state-managed waters, 0–3 mi).</p> <p>Issue 6: Oil pollution and chronic oiling; contaminants.</p> <p>Conservation actions:</p> <ul style="list-style-type: none"> a) Monitoring compliance with oil discharge regulations. b) Conduct research to measure contaminants in eggs. c) Conduct beached bird surveys in selected areas.
<p>H. Plan and time frames for monitoring species and their habitats</p> <p>Surveys would be conducted at index locations once every 3 years for 20 years.</p> <p>Add a site in Russia within 5 years.</p> <p>Colony surveys would be conducted at the index locations (all within the federal refuge system). USFWS is a potential partner with ADF&G or others.</p>
<p>I. Recommended time frame for reviewing species status and trends</p> <p>Ten years, or at more frequent intervals in response to additional information.</p>
<p>J. Bibliography</p> <p>Dragoo, D.E., G.V. Byrd, and D.B. Irons. 2003. Breeding status, population trends and diets of seabirds in Alaska, 2001. USFWS Report AMNWR 03/05.</p> <p>Jones, I.L. 1993. Crested Auklet (<i>Aethia cristatella</i>). In: A. Poole and F. Gill, editors. The Birds of North America, No. 70.</p> <p>Jones, I.L. 1993. Least Auklet (<i>Aethia pusilla</i>). In: A. Poole and F. Gill, editors. The Birds of North America, No. 69.</p> <p>USFWS. 2000. Beringian Seabird Colony Catalog--computer database and Colony Status Record archives. USFWS, Migratory Bird Management, Anchorage, AK.</p>

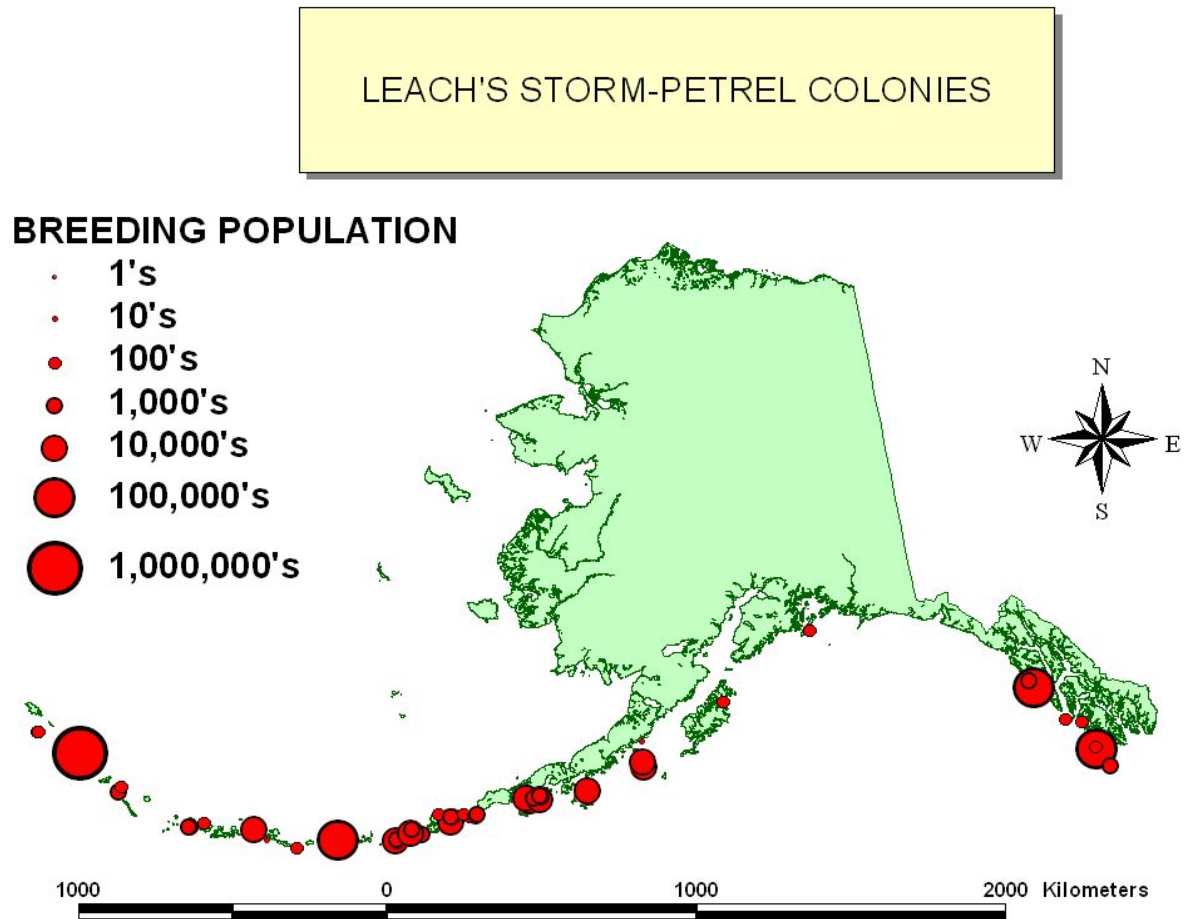


Figure 4.1 Leach's Storm-Petrel colonies in Alaska

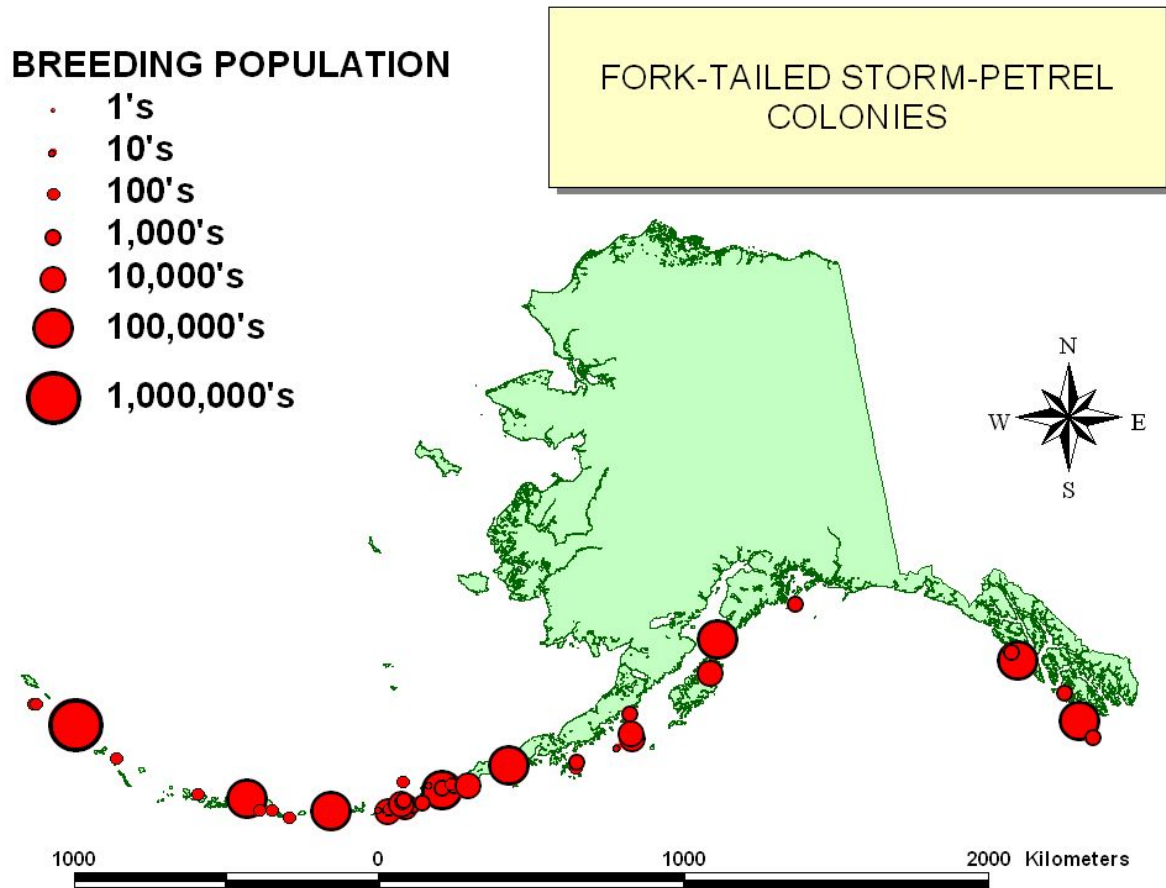


Figure 4.2 Fork-tailed Storm-Petrel colonies in Alaska

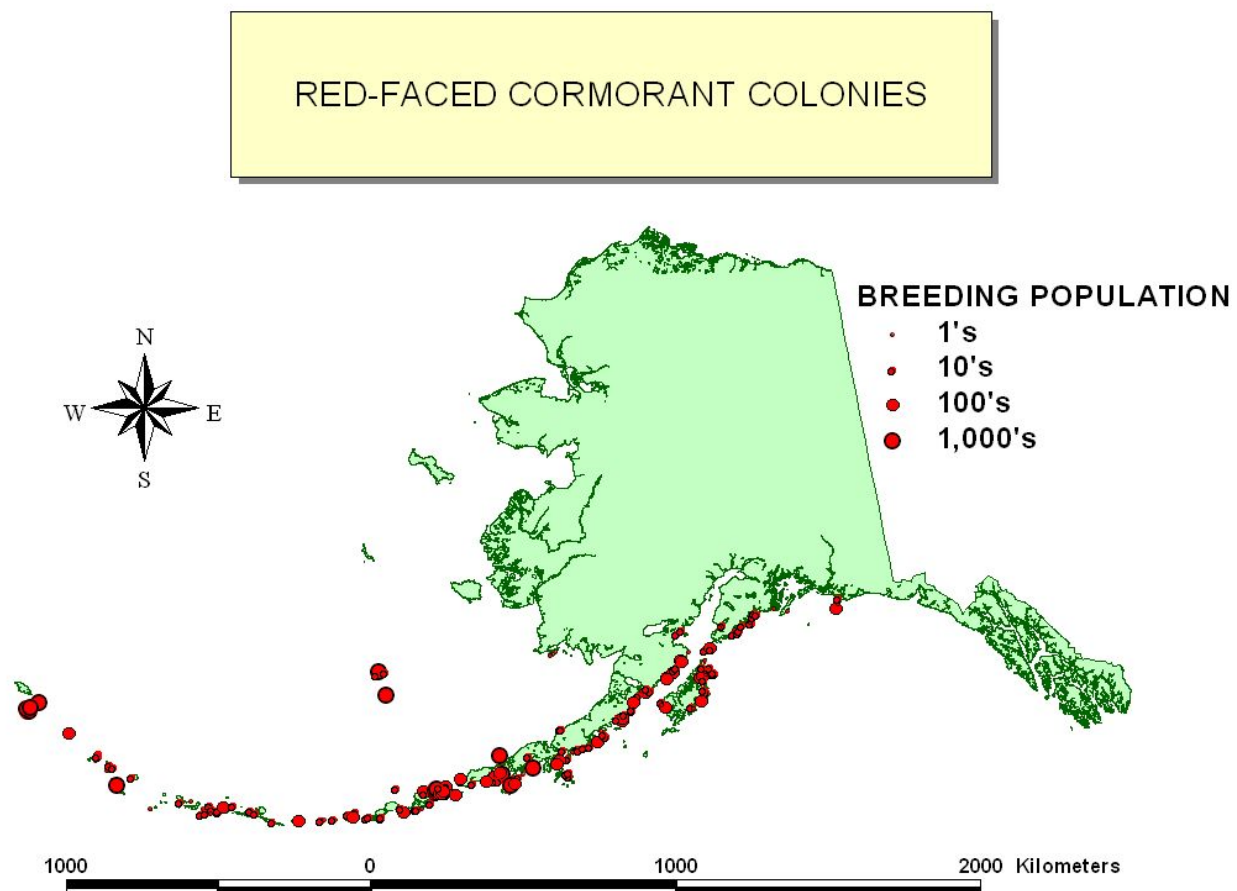


Figure 4.3 Red-faced Cormorant colonies in Alaska

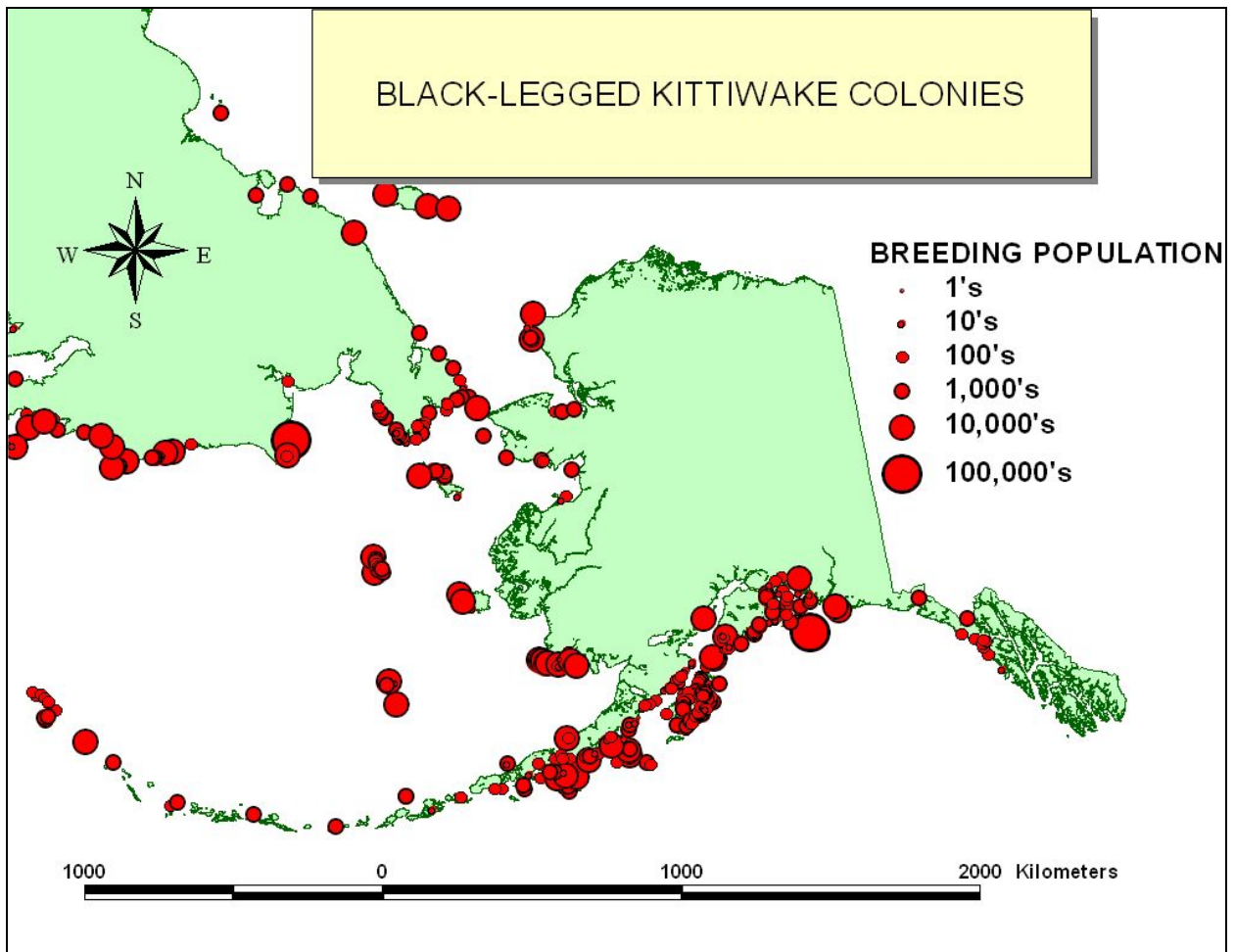


Figure 4.4 Black-legged Kittiwake colonies in Alaska

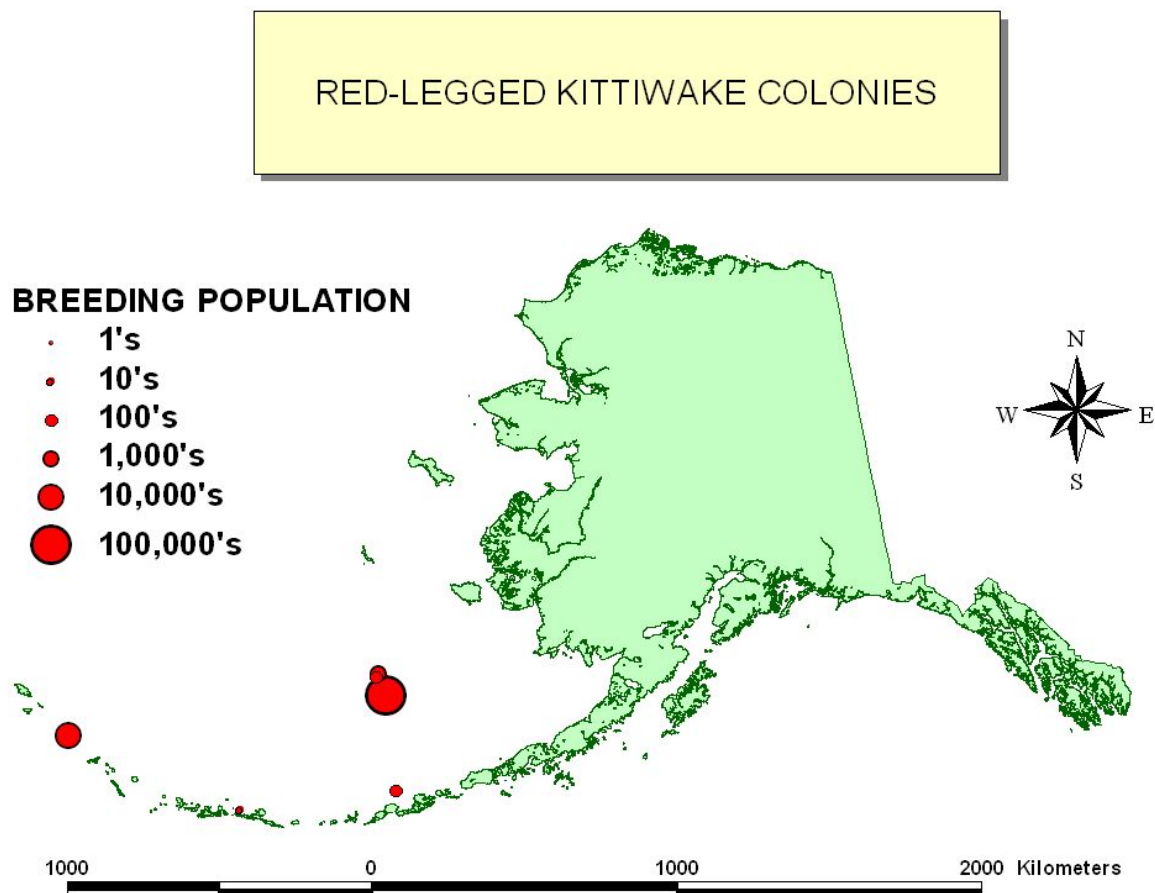


Figure 4.5 Red-legged Kittiwake colonies in Alaska

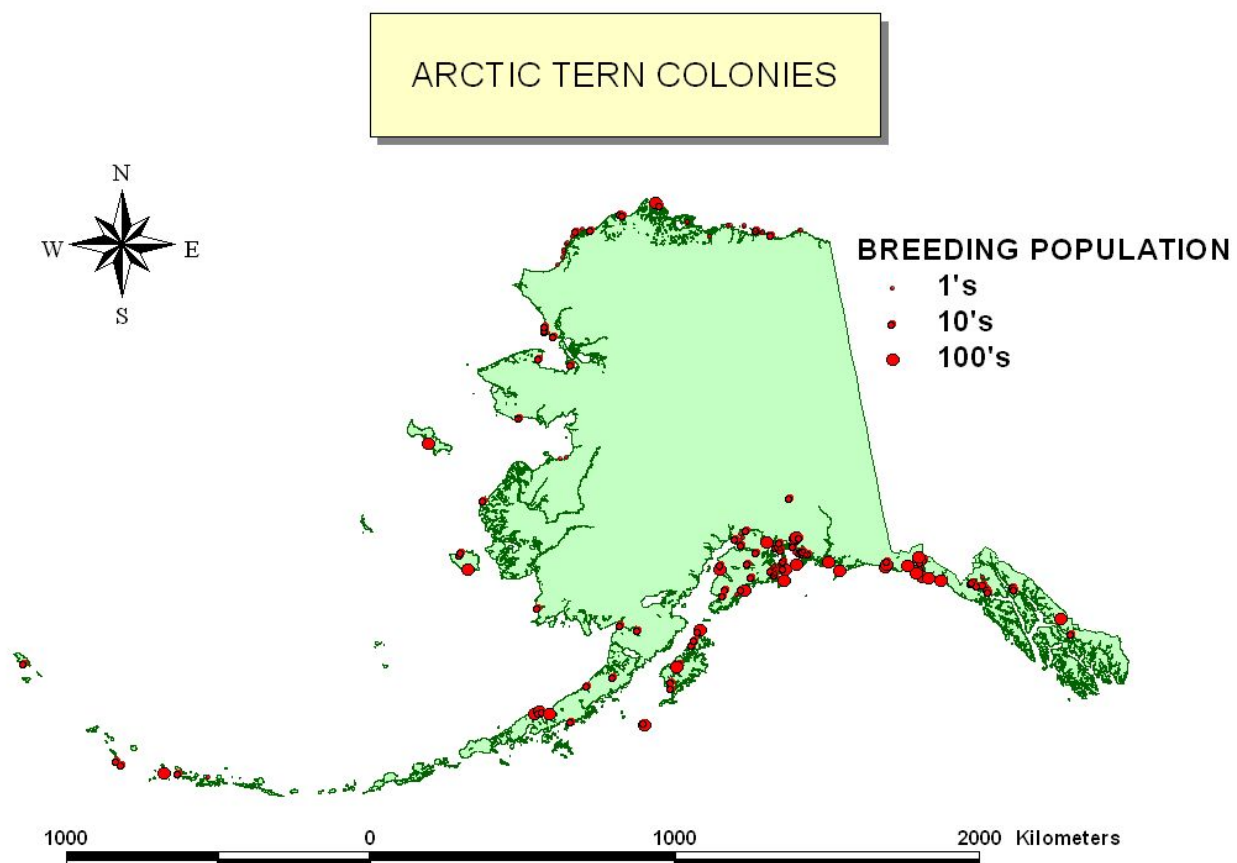


Figure 4.6 Arctic Tern colonies in Alaska

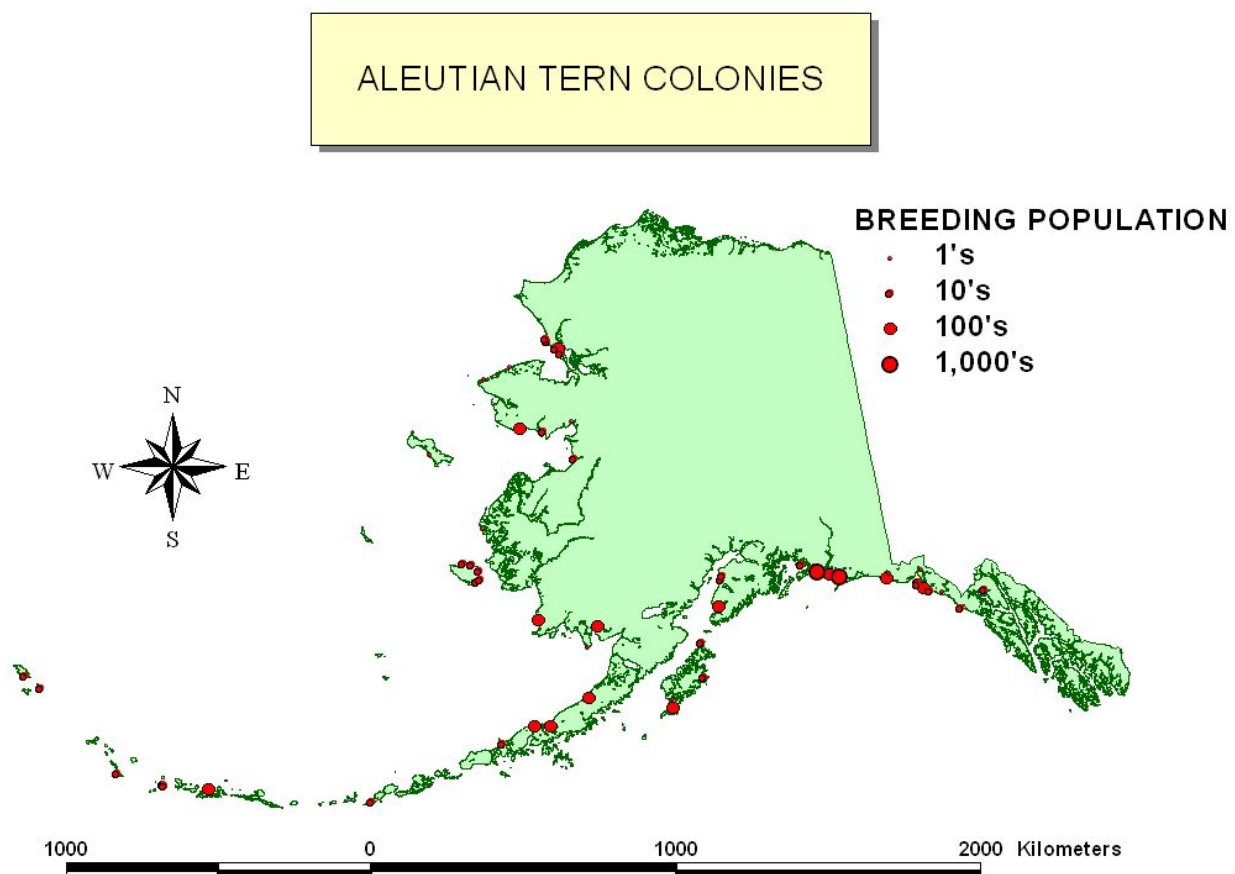


Figure 4.7 Aleutian Tern colonies in Alaska

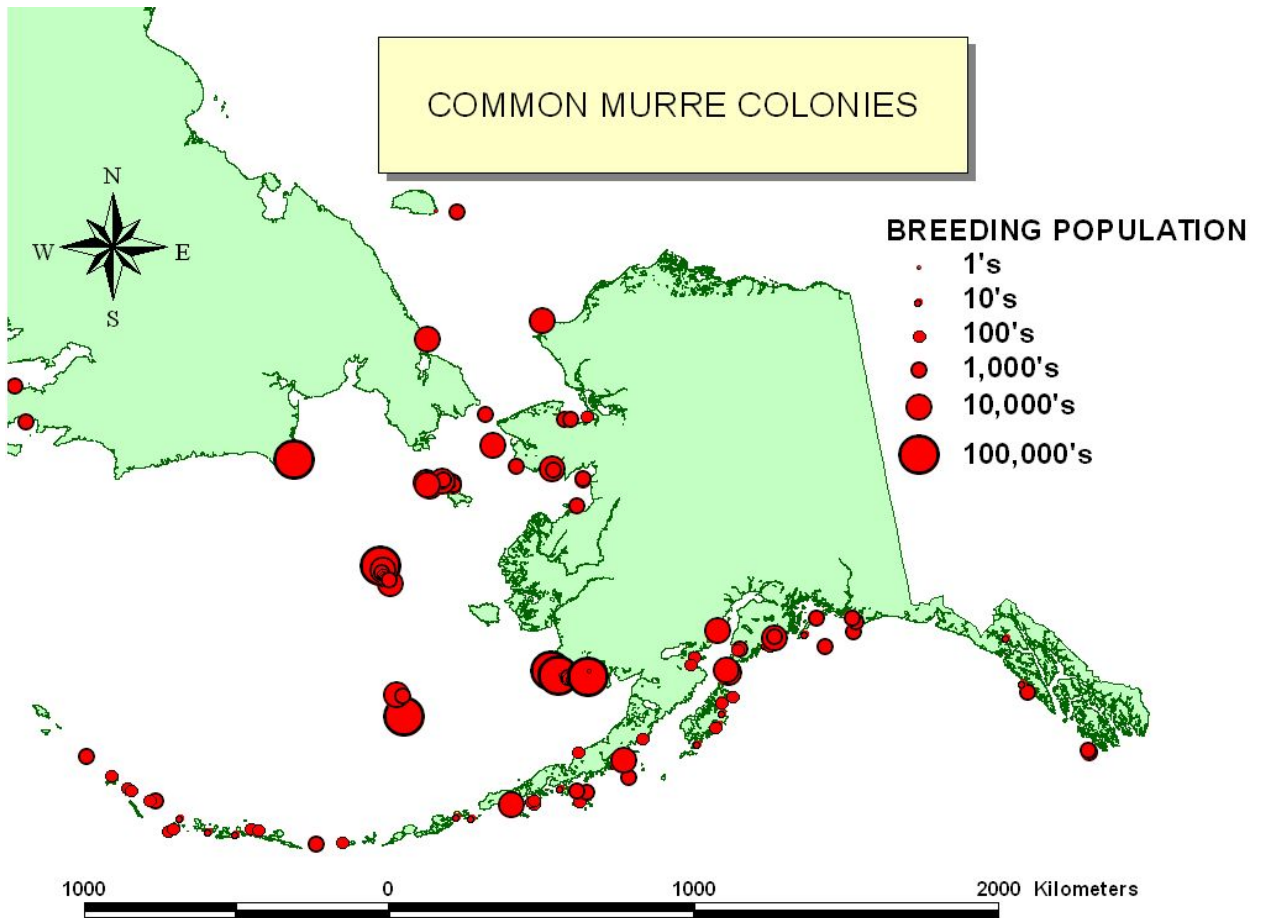


Figure 4.8 Common Murre colonies in Alaska

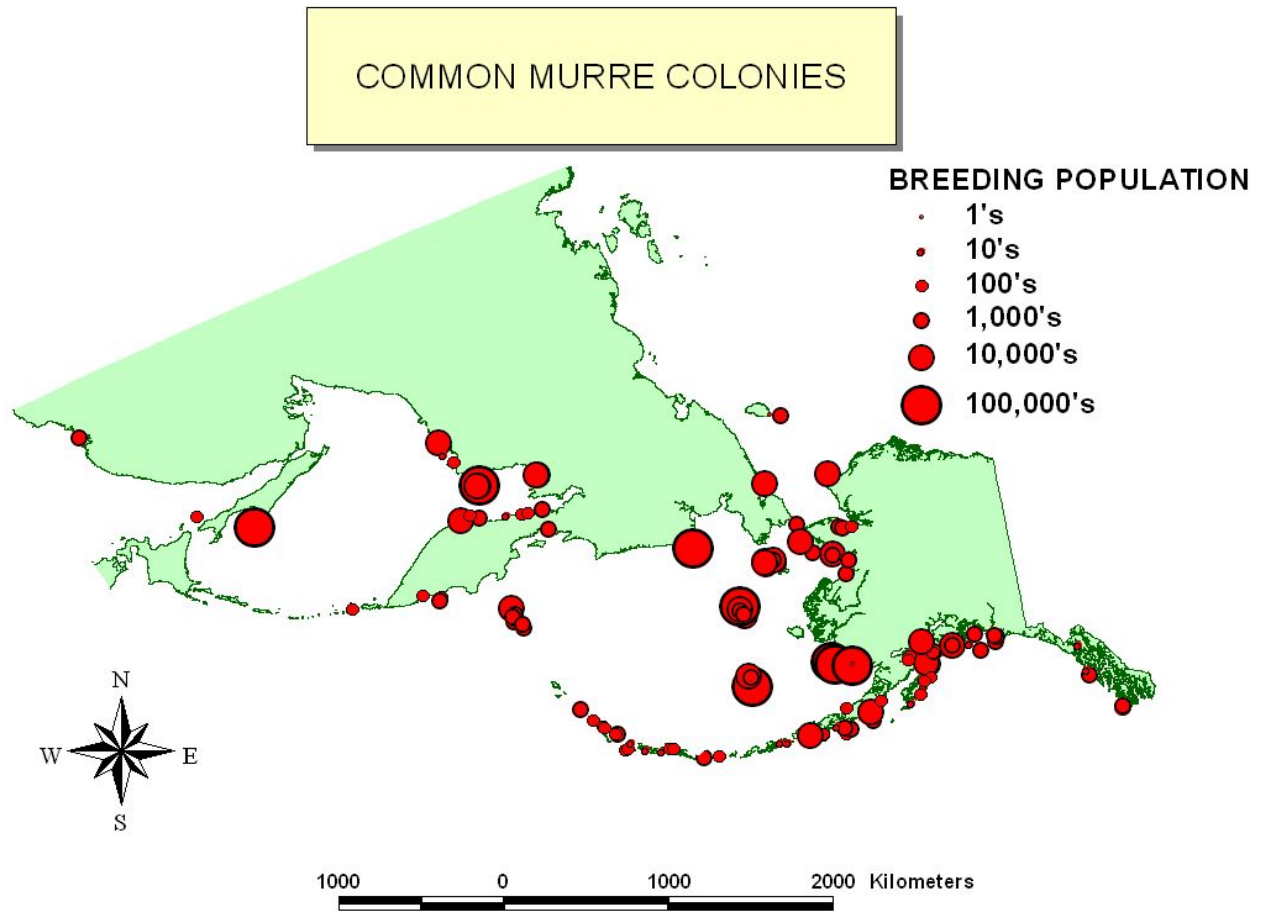


Figure 4.9 Common Murre colonies in Alaska and Russian Far East

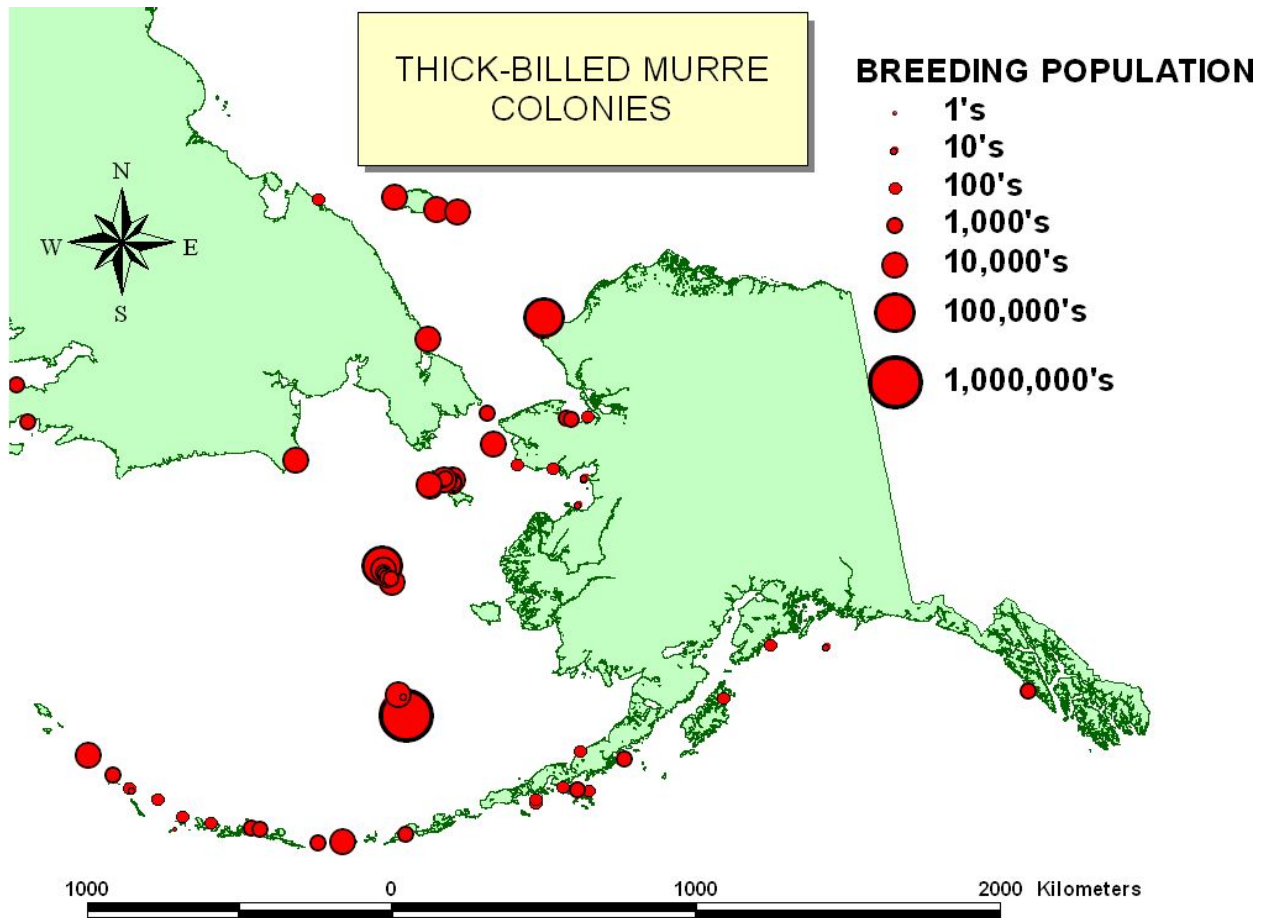


Figure 4.10 Thick-billed Murres in Alaska

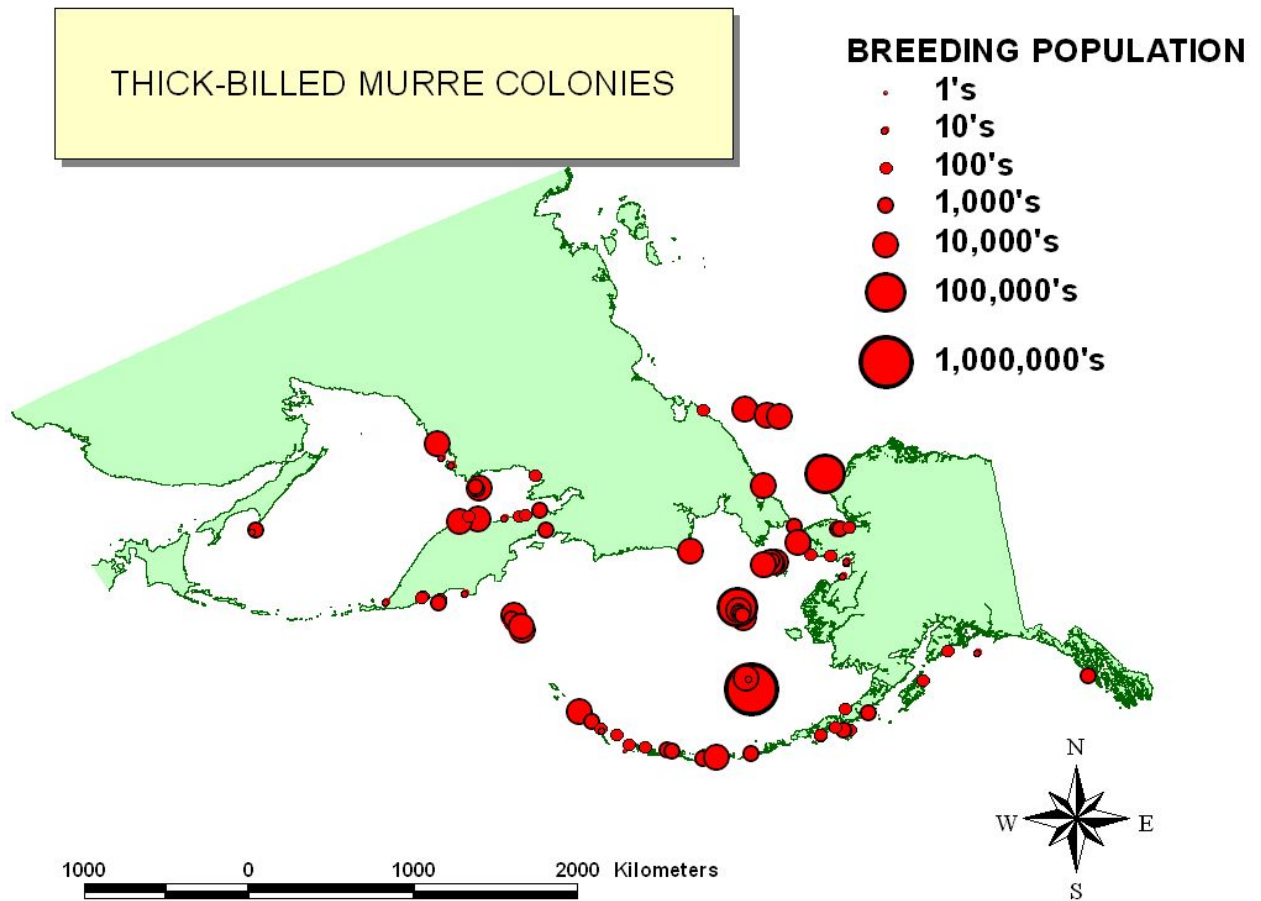


Figure 4.11 Thick-billed Murres in Alaska and Russian Far East



Figure 4.12 Distribution of Kittlitz's Murrelets in Alaska

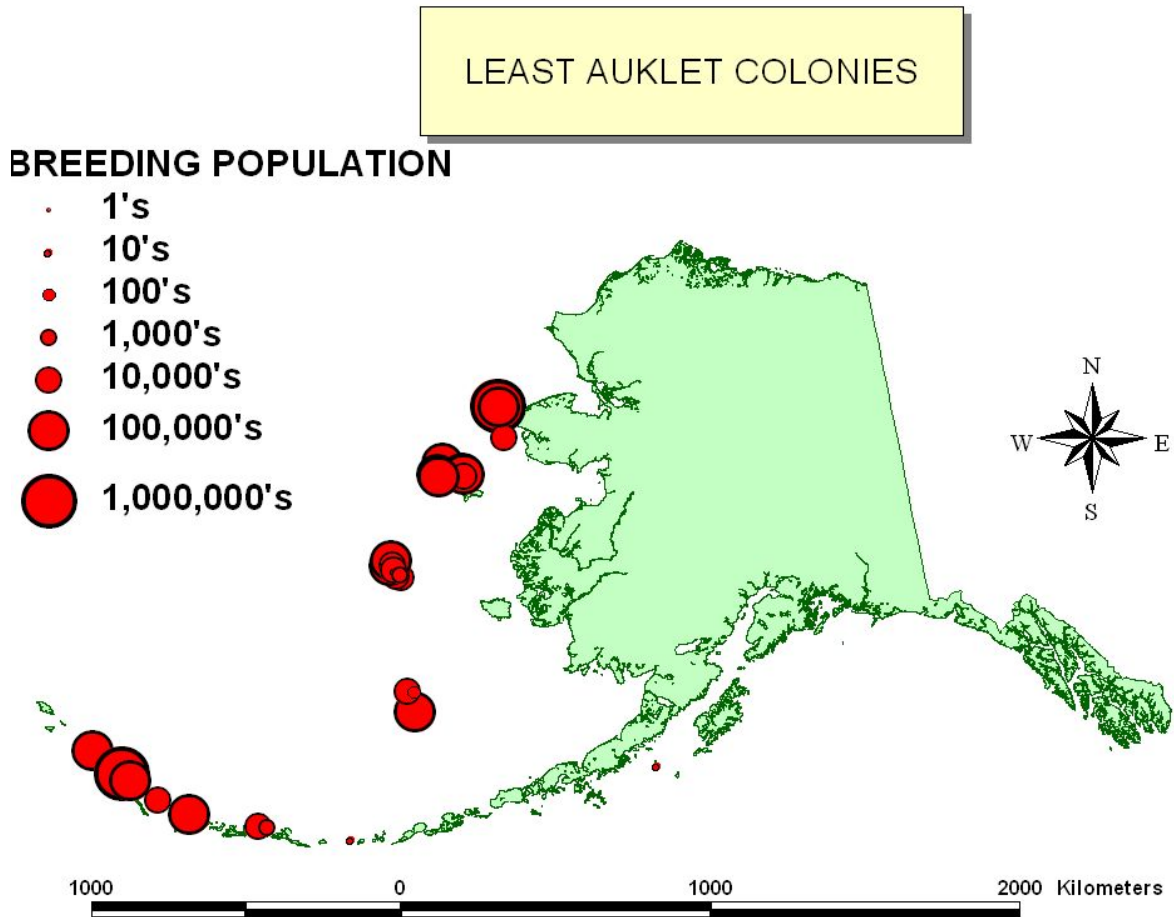


Figure 4.13 Least Auklet colonies in Alaska

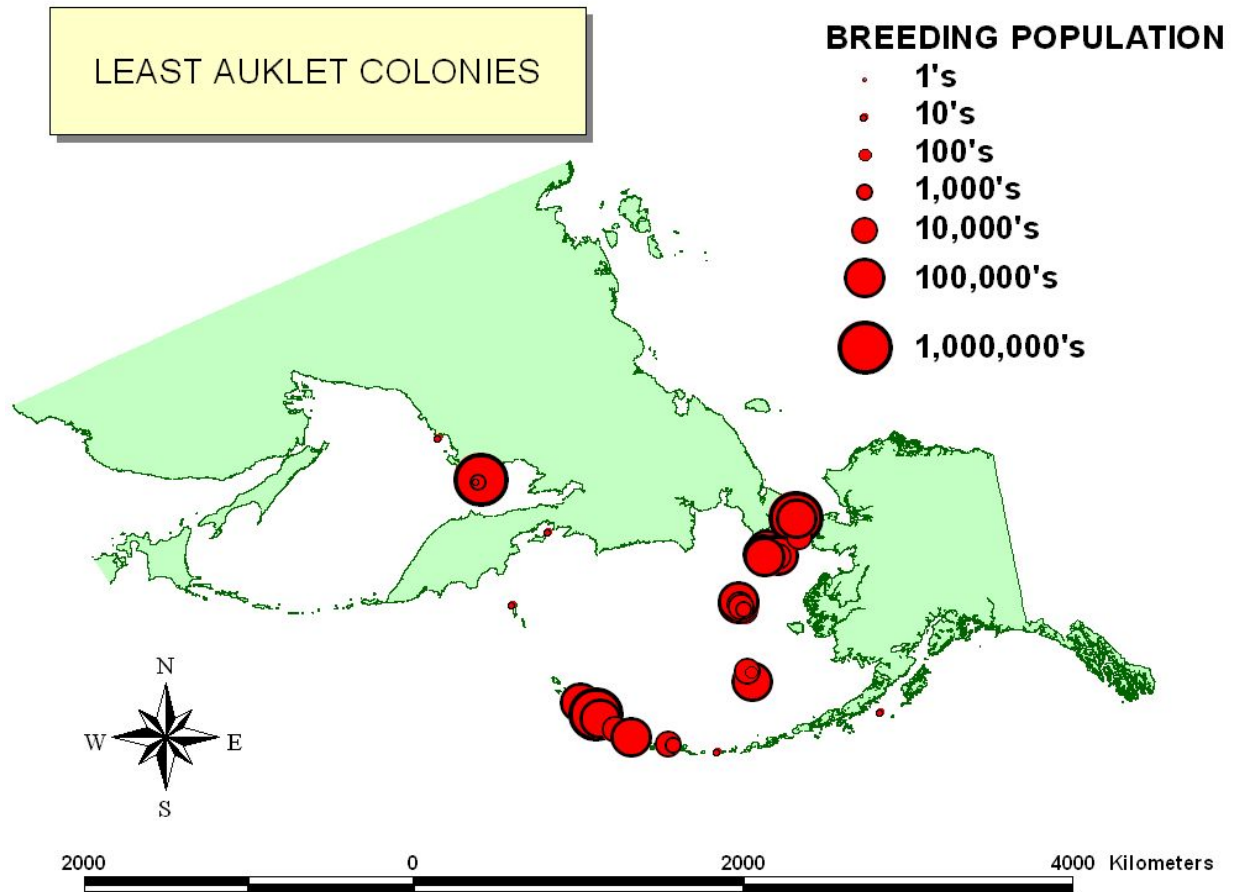


Figure 4.14 Least Auklet colonies in Alaska and Russian Far East

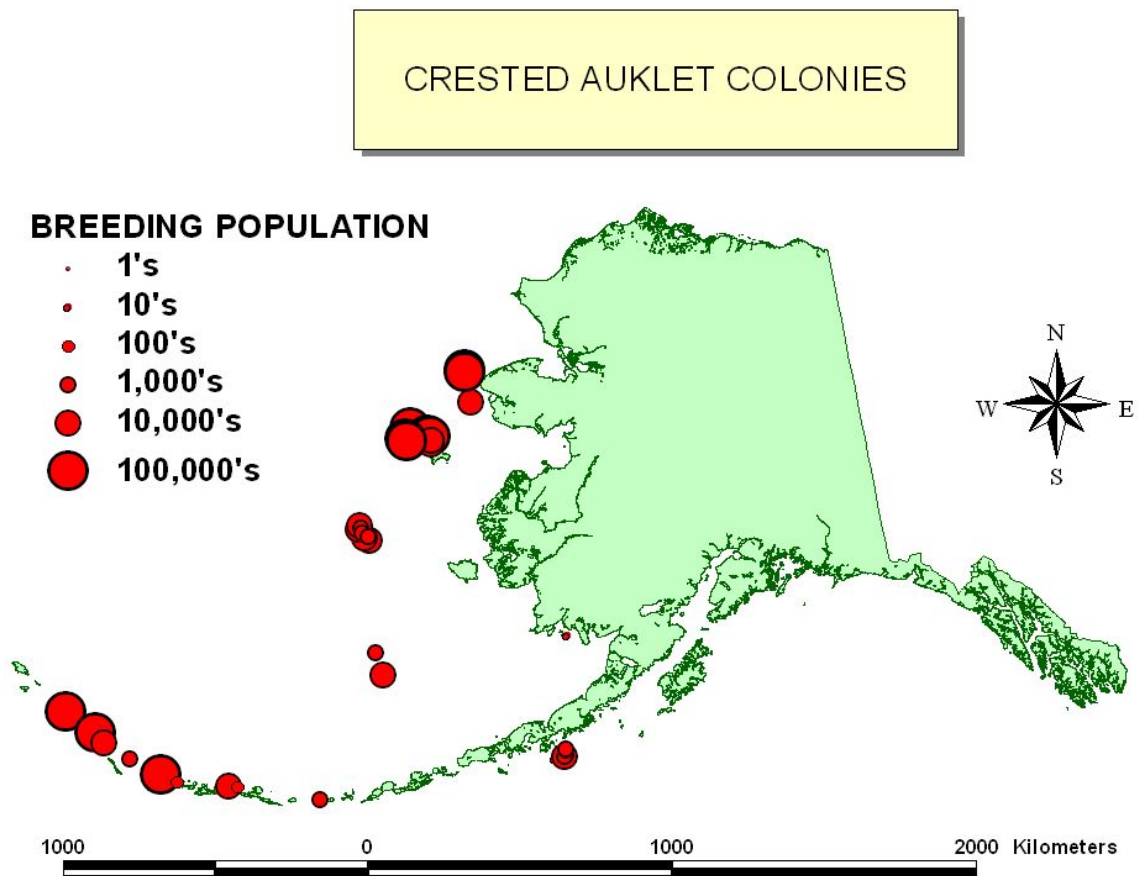


Figure 4.15 Crested Auklet colonies in Alaska

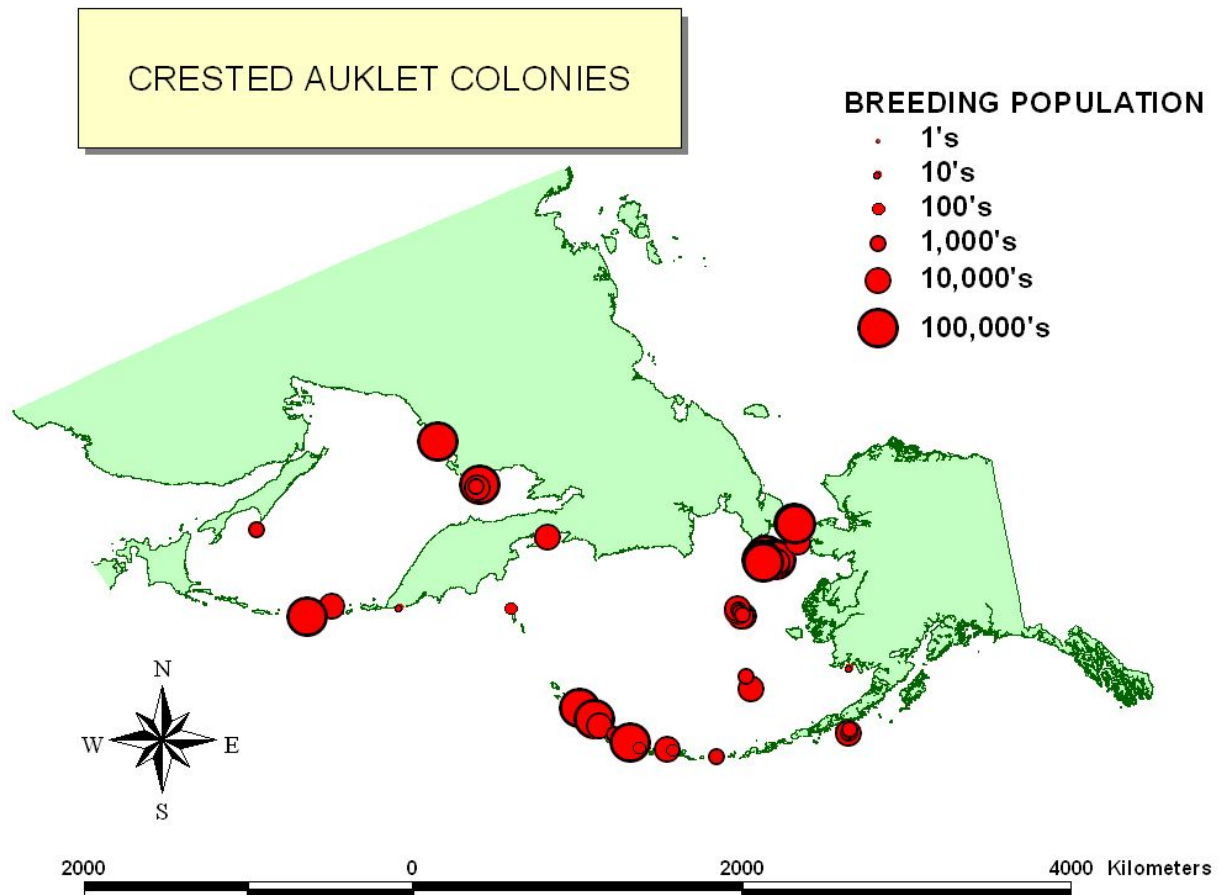


Figure 4.16 Crested Auklet colonies in Alaska and Russian Far East