

Key Site 19: Beaufort Sea Coastal Lagoons, Alaska

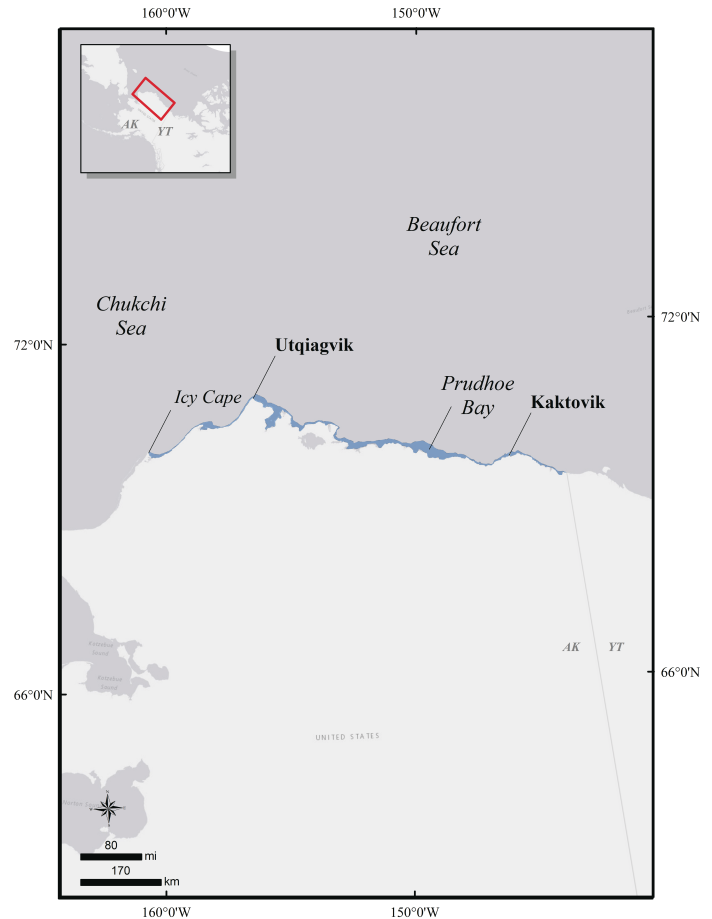
Location: 70°30'7"N, 151°18'58"W

Size: 6145 km²

Description: This key habitat site encompasses a narrow strip of Alaska's Arctic coastline from Icy Cape on the Chukchi Sea eastward along the Beaufort Sea to the Canadian border. The site is about 850 km long and extends up to 20 km from the mainland coast. Barrier islands and spits enclose lagoons, bays, and estuaries along the coast (Boggs et al. 2016). Despite the name of this key site, it also borders the Chukchi Sea at its western end. The Chukchi is a very productive shallow Arctic sea separated from the Beaufort by the Barrow Canyon (Smith et al. 2017). This deep trough in the continental shelf creates mixing and upwelling, contributing to the area's tremendous productivity, including high benthic biomass (mainly polychaetes, mollusks, and crustaceans; Smith et al. 2017). The Beaufort has lower overall productivity than the Chukchi, but with strong benthic-pelagic coupling there are rich resources for bottom feeders such as sea ducks (Smith et al. 2017).

In this dynamic ecosystem, barrier islands and spits are composed of sand and gravel, with deposition determined by prevailing winds and waves and longshore drift (Boggs et al. 2016). Barrier islands and spits, up to 9 km in length, are low (<2 m) and narrow (50 to 200 m) and almost completely unvegetated due to ice scour and mobility of the sediment (Boggs et al. 2016). Lagoons and estuaries are generally shallow, with tidal flats and marshes along the landward shoreline (Boggs et al. 2016). The dry, cold Arctic climate here has very short summers and long winters. Mean annual precipitation is 10 to 26 cm, mostly as snow, with freezing temperatures possible in any month (Boggs et al. 2016). Lagoons and brackish waters usually remain frozen from October to June, while there is generally some open water present between the coast and pack ice from July to October (Willms and Crowley 1990).

Communities within this region include Wainwright, Utqiagvik (formerly Barrow), Nuiqsut, and Kaktovik. There are also several petroleum drilling and production facilities in the area (Alpine, Prudhoe Bay, NorthStar, etc.) which may have thousands of workers on-site at any time.



Precision and Correction of Abundance

Estimates Presented: Correction factors have not been applied to abundance estimates presented for this key habitat site, thus abundance estimates should be considered minimal indices.

Biological Value: This site provides important habitat for molting sea ducks, particularly Long-tailed Ducks (*Clangula hyemalis*). Surveys conducted during 1999 to 2003 indicate that in late July and early August there are, on average, >80,000 sea ducks present at this site (Lysne et al. 2004). Long-tailed Ducks are by far the most abundant species, with >70,000 individuals (~7% of continental population). The site is also used by about 4500 Pacific Common Eiders (*Somateria mollissima v-nigrum*), 4000 Surf Scoters (*Melanitta perspicillata*), and 2500 King Eiders (*S. spectabilis*), with <100 Black Scoters (*M. americana*) as well as a few White-winged Scoters (*M. deglandi*) and Spectacled and Steller's eiders (*S. fischeri* and *Polysticta stelleri*) (Lysne et al. 2004). The highest numbers and densities of Long-tailed Ducks were observed in northeastern Kasegaluk Lagoon,

Elson Lagoon, McClure and Stockton islands, and lagoons of the Arctic National Wildlife Refuge (Arctic Refuge); there were also significant numbers at Jones and Return islands, Peard Bay, Admiralty Bay, and Smith Bay (Lysne et al. 2004). In 1985, there were nearly 25,000 Long-tailed Ducks observed in the Arctic Refuge lagoons; during 1999 to 2003 the mean count in this area was less than 16,000 but in 2003 nearly 28,000 were observed with particularly high densities (>40 birds/km²) in the eastern Arctic Refuge, from around Barter Island to Beaufort Lagoon (Brackney et al. 1987, Lysne et al. 2004). Pacific Common Eiders were most abundant in Peard Bay (in 2003, about 4000 birds were observed in this area alone), as well as Kasegaluk Lagoon and McClure and Stockton islands (Lysne et al. 2004). The distribution of King Eiders and Surf Scoters varied annually; highest numbers of King Eiders were seen at Peard Bay, Elson Lagoon, and McClure and Stockton islands, while Surf Scoters were most abundant at Harrison Bay and Jones and Return islands (Lysne et al. 2004).

Within this site, Long-tailed Ducks and Pacific Common Eiders (*v-nigrum*) are particularly associated with lagoon habitats inside barrier islands (Fischer et al. 2002). While some Long-tailed Ducks nest in the surrounding uplands, the lagoons are used primarily as molting and staging areas by Long-tailed Ducks that breed elsewhere in Alaska and Arctic Canada (Lysne et al. 2004, Bartzen et al. 2017); peak abundance of Long-tailed Ducks occurs in early August, with numbers declining through mid-September (Brackney et al. 1987). More than 50% of Long-tailed Ducks marked with satellite transmitters during molt in the Northwest Territories, Canada, used this area during their westward fall migration through the Beaufort and Chukchi seas (Bartzen et al. 2017).

This site provides important breeding habitat for Pacific Common Eiders, with 500 to 1000 pairs nesting along this stretch of coastline, usually among driftwood on low-elevation barrier islands (Flint et al. 2004, Dau and Bollinger 2009). This region is also used by King and Spectacled eiders during breeding, staging, and molting, and by Steller's Eiders during breeding and staging (Smith et al. 2017). Male Spectacled Eiders captured during the breeding season in the Prudhoe Bay area spent several weeks in coastal waters of the Beaufort and Chukchi seas, which may provide important staging

and foraging habitat during post-breeding migration (Petersen et al. 1999). Adult and juvenile Spectacled Eiders marked in the Colville River delta used the western Beaufort Sea important area during breeding or post-fledging dispersal, respectively (Sexson et al. 2014). Adult female and juvenile Spectacled Eiders from fledged broods used nearshore marine waters (Elson Lagoon) near Utqiagvik, Alaska, in late August and early September (Safine 2012).

Seaward of the barrier islands, just outside this key site, high densities of Long-tailed Ducks (35 to 50 birds/km²) have also been observed (Brackney et al. 1987), along with fewer numbers of King Eider, scoter, Common Eider, and Spectacled Eider (Fischer et al. 2002).

Sensitivities: Lagoon habitats within this site are particularly important, with tens of thousands of molting Long-tailed Ducks feeding primarily in the open-water areas of the lagoons and resting in sheltered areas near the barrier islands at night (Flint et al. 2016). This system may be vulnerable to the impacts of climate change; as sea ice diminishes and sea levels rise, storm surges and erosion become more frequent and significant. Due to these changes, combined with permafrost thaw in coastal tundra, the barrier island lagoon systems may change dramatically. The total surface area of barrier islands in the central Beaufort Sea has decreased about 4% from the 1940s to 2000s (Boggs et al. 2016). Furthermore, with warming ocean temperatures and changes in sea ice cover, altered timing of phytoplankton blooms may cause marine ecosystems to shift from benthic-driven to pelagic-driven systems, which could have negative consequences for benthic-feeding sea ducks (Smith et al. 2017).

Large aggregations of migrating or molting sea ducks may be particularly sensitive to disturbance and marine pollution events. The barrier island lagoon system is also considered to be highly susceptible to damage from oil spills and human use (Boggs et al. 2016). However, proximity to oil field activity in Beaufort Sea lagoons did not appear to affect foraging activity of molting male Long-tailed Ducks (Flint et al. 2016).

Potential Conflicts: Although most of the terrestrial area bordering this key habitat site is undeveloped and sparsely populated, there are major

petroleum production facilities present. In the 1970s, oil was discovered near Prudhoe Bay; operated by BP in partnership with ExxonMobil and ConocoPhillips Alaska, it became the largest oilfield in North America. Since then, various other oil and gas production facilities have been developed, both on- and offshore. There has recently been renewed interest in development in the National Petroleum Reserve-Alaska (Houseknecht et al. 2017) as well as in the Arctic Refuge.

Oil and gas exploration and development can negatively affect sea ducks by causing loss or alteration of habitat, disturbance, disorientation from or collision with offshore structures, and contamination from oil spills or other pollutants (including chronic exposure to low-level pollution) (Bartzen et al. 2017). During spring migration, Long-tailed Ducks staged in the Alaska Chukchi Sea less than 80 km from offshore oil and gas leases, and during fall migration some staged nearshore (less than 50 km) and were in or near oil and gas leases and active drilling platforms (Bartzen et al. 2017).

In addition, as Arctic sea ice decreases due to climate change, this area will likely experience increased shipping traffic associated with transportation, resource development, and tourism, thereby increasing the risk of oil spills or other contamination, disturbance, and collisions.

Sea ducks provide an important subsistence resource, and conservation of this key habitat site requires consideration of subsistence hunting traditions by residents of coastal communities.

Status: The State of Alaska has jurisdiction over tidelands (between mean high water and mean low water) and nearshore submerged lands (from mean low water to the three-nautical-mile line), with the authority to manage, develop, and lease resources. However, the federal government regulates commerce, navigation, power generation, national defense, and international affairs throughout state waters. The federal government administers the Outer Continental Shelf (OCS), which includes all submerged lands seaward of the state limit. The Bureau of Ocean Energy Management (BOEM) is mandated to develop energy and mineral resources on the OCS in an environmentally and economically responsible manner. An executive order in 2016 declared federal waters in the Arctic Ocean (includ-

ing the entire Chukchi and most of the Beaufort) off-limits to oil and gas development, due to significant risk of oil spills and limited clean-up ability. However, in 2018 the Department of the Interior released a draft proposal that would open up almost all of Alaska's waters for offshore oil development. Subsequently, this was halted in court and as of 2022, the 2016 restrictions hold. The Alaska Division of Oil and Gas currently leases state lands (including Prudhoe Bay oil field and nearshore marine waters) for oil, gas, and geothermal exploration.

A variety of government bodies are responsible for administering lands adjacent to this site. Village lands, owned by Native corporations, surround each of the four small communities in the area: Wainwright (Olgoonik Corporation), Utqiagvik (formerly Barrow; Ukpeaġvik Inupiat Corporation), Nuiqsut (Kuukpiik Native Corporation), and Kaktovik (Kaktovik Inupiat Corporation) (ASRC 2013).

Bordering the western segment of this site is the 22-million-acre National Petroleum Reserve-Alaska (NPR-A): federally managed by the Bureau of Land Management (BLM), it is the largest tract of undisturbed public land in the United States. Within the NPR-A, there are five designated Special Areas (Kasegaluk Lagoon, Peard Bay, Teshekpuk Lake, Colville River, and Utukok River Uplands) with Kasegaluk Lagoon, Peard Bay, and Teshekpuk Lake specifically managed to protect waterbird habitat in nearshore and onshore areas (BLM 2013). With the exception of the eastern part of the Teshekpuk Lake Special Area, oil and gas leasing is prohibited in these areas, as are drilling pads or processing facilities in coastal waters or on lands within one mile of the coast. Currently, 52% of the land is available for oil and gas leasing, primarily in the northeastern portion of the reserve, near Teshekpuk Lake and the Colville River. Infrastructure regulations would also permit pipelines to pass through the Peard Bay Special Area, if required to support development of offshore leases in the Chukchi and Beaufort seas (BLM 2013).

The BLM is currently (March 2022) evaluating a new Integrated Activity Plan and Environmental Impact Statement for the NPR-A, which could open new areas to leasing, examine current boundaries of Special Areas, and alter lease stipulations and best management practices. The process will also consider the options of building pipelines and other infrastructure to transport oil and gas resources

from offshore leases to the Trans-Alaska Pipeline System and consider potential for a road system connecting North Slope communities (BLM 2018).

The BLM is currently (March 2022) reviewing a 2020 Integrated Activity Plan and Environmental Impact Statement for the NPR-A. If BLM's preferred alternative is confirmed, conservation measures of the 2013 IAP/EIS will remain.

Along the eastern portion of this site, the U.S. Fish and Wildlife Service manages the 19-million-acre Arctic National Wildlife Refuge (Arctic Refuge). When the refuge was created in 1980, a large portion was designated as wilderness and the 1.5-million-acre coastal plain (the "1002 area") was identified as very important wildlife habitat that also has potentially enormous oil and gas reserves. The Tax Cuts and Jobs Act of 2017 directs the secretary of the interior to establish and administer a competitive oil and gas program in the 1002 area, with a maximum of 2000 surface acres to be authorized. In August 2020, the Department of Interior released a final record of decision for the Coastal Plain Oil and Gas Leasing Program, but the program was blocked in late 2020 by several lawsuits. In June 2021, the Department of Interior suspended all activities related to the oil and gas leasing program in the Arctic Refuge, pending completion of a comprehensive analysis under the National Environmental Policy Act, which was started in January 2022.

Essentially this entire key habitat site overlaps with several Important Bird Areas (IBAs): Kasegaluk Lagoon IBA, Chukchi Sea Nearshore IBA, Barrow Canyon and Smith Bay IBA, Teshekpuk Lake-East Dease Inlet IBA, Colville River Delta IBA, Beaufort Sea Nearshore IBA, Northeast Arctic Coastal Plain IBA (Audubon Alaska 2016). Designation as an IBA recognizes important avian resources, but does not confer any legal protection of a site.

Literature Cited

Arctic Slope Regional Corporation (ASRC). 2013. Arctic Slope Regional Corporation: Communities. <https://www.asrc.com/Communities/Pages/Communities.aspx>

Audubon Alaska. 2016. Alaska's Important Bird Areas. <http://ak.audubon.org/important-bird-areas-4>.

- Bartzen, B. A., D. L. Dickson, and T. D. Bowman. 2017. Migration characteristics of long-tailed ducks (*Clangula hyemalis*) from the western Canadian Arctic. *Polar Biology* 40:1085–1099.
- Boggs, K., L. Flagstad, T. Boucher, A. Steer, P. Lema, B. Bernard, B. Heitz, T. Kuo, and M. Aisu. 2016. Alaska ecosystems of conservation concern: Biophysical settings and plant associations. Report prepared by the Alaska Center for Conservation Science, University of Alaska Anchorage, for the Alaska Department of Fish and Game. 300 pp.
- Brackney, A. W., R. M. Platte, and J. M. Morton. 1987. Migratory bird use of the coastal lagoon system of the Beaufort Sea coastline within the Arctic National Wildlife Refuge, Alaska, 1985. ANWR Progress Report No. FY86-15. *In* Arctic National Wildlife Refuge coastal plain resource assessment: 1985 update report baseline study of the fish, wildlife, and their habitats (vol. 1). U.S. Fish and Wildlife Service, Fairbanks, Alaska.
- Brackney, A. W., and R. M. Platte. 1987. Habitat use and behavior of molting oldsquaw on the coast of the Arctic National Wildlife Refuge, 1985. ANWR Progress Report No. FY86-17. *In* Arctic National Wildlife Refuge coastal plain resource assessment: 1985 update report baseline study of the fish, wildlife, and their habitats (vol. 1). U.S. Fish and Wildlife Service, Fairbanks, Alaska.
- Bureau of Land Management (BLM). 2013. National Petroleum Reserve-Alaska: Integrated Activity Plan Record of Decision. https://eplanning.blm.gov/epl-front-office/projects/nepa/117408/162665/198385/NPR-A_FINAL_ROD_2-21-13.pdf
- Dau, C. P., and K. S. Bollinger. 2009. Aerial population survey of common eiders and other waterbirds in near shore waters and along barrier islands of the Arctic Coastal Plain of Alaska, 1–5 July 2009. U.S. Fish and Wildlife Service, Anchorage, Alaska.
- Fischer, J. B., T. J. Tiplady, and W. W. Larned. 2002. Monitoring Beaufort Sea waterfowl and marine birds: Aerial survey component. OCS Study MMS 2002-002, U.S. Fish and Wildlife Service, Anchorage, Alaska.
- Flint, P. L., J. A. Reed, D. L. Lacroix, and R. B. Lanctot. 2016. Habitat use and foraging patterns of molting male Long-tailed Ducks in lagoons of the central Beaufort Sea, Alaska. *Arctic* 69:19–28.

- Flint, P. L., J. A. Reed, J. C. Franson, T. E. Hollmén, J. B. Grand, M. D. Howell, R. B. Lanctot, D. L. Lacroix, and C. P. Dau. 2004. Monitoring Beaufort Sea waterfowl and marine birds. OCS Study MMS 2003-037. U.S. Geological Survey, Anchorage, Alaska.
- Houseknecht, D. W., R. O. Lease, C. J. Schenk, T. J. Mercier, W. A. Rouse, P. J. Jarboe, K. J. Whidden, C. P. Garrity, K. A. Lewis, S. J. Heller, W. H. Craddock, T. R. Klett, P. A. Le, R. A. Smith, M. E. Tennyson, S. B. Gaswirth, C. A. Woodall, M. E. Brownfield, H. M. Leathers-Miller, and T. M. Finn. 2017. Assessment of undiscovered oil and gas resources in the Cretaceous Nanushuk and Torok Formations, Alaska North Slope, and summary of resource potential of the National Petroleum Reserve in Alaska, 2017. U.S. Geological Survey Fact Sheet 2017-3088. <https://doi.org/10.3133/fs20173088>.
- Lysne, L. A., E. J. Mallek, and C. P. Dau. 2004. Near shore surveys of Alaska's Arctic coast, 1999-2003. U.S. Fish and Wildlife Service, Fairbanks, Alaska.
- Petersen, M. R., W. W. Larned, and D. C. Douglas. 1999. At-sea distribution of Spectacled Eiders: A 120-year old mystery resolved. *Auk* 116:1009-1020.
- Safine, D. E. 2012. Breeding ecology of Steller's and Spectacled eiders nesting near Barrow, Alaska, 2011. U.S. Fish and Wildlife Service, Fairbanks Fish and Wildlife Field Office, Fairbanks, Alaska. Technical Report. 65 pp.
- Sexson, M. G., J. M. Pearce, and M. R. Petersen. 2014. Spatiotemporal distribution and migratory patterns of Spectacled Eiders. BOEM 2014-665. Bureau of Ocean Energy Management, Alaska Outer Continental Shelf Region, Anchorage, Alaska.
- Smith, M. A., M. S. Goldman, E. J. Knight, and J. J. Warrenchuk. 2017. Ecological atlas of the Bering, Chukchi, and Beaufort seas, 2nd ed. Audubon Alaska, Anchorage, Alaska. <https://ak.audubon.org/conservation/ecological-atlas-bering-chukchi-and-beaufort-seas>.
- Willms, M. A., and D. W. Crowley. 1990. Migratory bird use of potential port sites on the Beaufort Sea coast of the Arctic National Wildlife Refuge. U.S. Fish and Wildlife Service, Anchorage, Alaska.