

2017 Assessment of Wildlife Values in the Teshekpuk Lake Wetlands Complex within the National Petroleum Reserve – Alaska (NPR)

Teshekpuk Lake and its surrounding wetlands complex form one of the premier habitats for birds and wildlife in the entire circum-polar Arctic. The world-class “surface values” of Teshekpuk Lake merit ongoing protection from development infrastructure.

High in Alaska’s Western Arctic lies the 23-million acre National Petroleum Reserve–Alaska (NPR). Although the NPR was first designated as a federal Naval petroleum reserve in 1923, Congress transferred the Reserve to the Department of the Interior in 1976. The change in jurisdiction was coupled with an explicit move away from the single-use of naval petroleum toward a multi-use statutory mandate. Congress directed the Interior Department to manage the NPR for the subsurface resources of oil and gas. But Congress also required the agency to provide “maximum protection” for what the law termed “surface values,” to include “significant subsistence, recreational, fish and wildlife, or historical or scenic value.”¹

SURFACE & SUBSURFACE VALUES

The value of the NPR’s subsurface oil and gas resources fluctuates with the price of oil (which today remains low) and an evolving global context in which nations must inevitably transition away from nonrenewable energy sources in favor of sustainable energy options. But the “surface values” of the NPR will only continue to rise in value as cumulative effects of climate change and development encroach on remaining Arctic wildlife habitat.

Surface values of the NPR include wildlife, subsistence, recreation, history, and scenery, but wildlife values form the very foundation

for the broad array of other surface values found within the NPR. Subsistence values rely on healthy populations of birds, caribou, and polar bears. Recreation values depend heavily on the birds and wildlife, which are a main draw for visitors seeking sporthunting, wildlife-watching, or wilderness. The birds and wildlife also provide a biological heartbeat to the timeless scenery and history of the Western Arctic. This report focuses on the bird and wildlife values of the Teshekpuk Lake wetlands complex, but wildlife values abound throughout the NPR, particularly in the Colville and Ikpikpuk Rivers, Utukok Uplands, and Kasegaluk Lagoon.

THE TESHEKPUK LAKE WETLANDS COMPLEX

Teshekpuk Lake is nestled into the northeastern corner of the NPR. The name “Teshekpuk” literally means “great enclosed water” or “big coastal lake” in the Iñupiaq language, a reference to the lake’s comparatively impressive size. At 22 miles wide and 320 square miles in area, Teshekpuk Lake is the largest lake in Alaska’s Arctic and the largest thermokarst lake in the world. Thermokarst lakes form when the freeze-thaw cycle of permafrost warps the tundra landscape into numerous shallow depressions, and when permafrost meltwater subsequently collects in those depressions.

The tundra landscape around Teshekpuk and its dotted ponds



Pacific Brant crowd together in the Teshekpuk Lake wetlands complex to undergo their annual molt. Photo: Gerrit Vyn.



Dunlin. Photo: Milo Burcham.



provide a suite of benefits to wildlife, from breeding grounds, to rich foraging areas for those preparing for migration, to places of refuge during vulnerable periods in the animal's life history. The network of smaller lakes and wetlands surrounding the great enclosed waters of Teshekpuk collectively form the Teshekpuk Lake wetlands complex, supporting world-class concentrations of shorebirds and waterfowl, as well as providing prime habitat for a full complement of Arctic wildlife including caribou and polar bears.

The Teshekpuk Lake wetlands complex provides staggering value in the form of immense bird and wildlife value: more than 78,000 molting geese of several species, approximately 600,000 shorebirds, high densities of loons and eiders, denning polar bears, and tens of thousands of caribou forming the Teshekpuk Caribou Herd. The wetland complex leaps off the page as one of the most critical conservation areas of Alaska's northern coastal plain, and perhaps the premier bird habitat area in the circumpolar Arctic. Overall nest density of breeding birds in the Teshekpuk Lake area is significantly higher than at other sites in Arctic Alaska,² and breeding densities of shorebirds are the highest known in any region of the international global Arctic.³

PEOPLE RELY ON TESHEKPUK'S WILDLIFE VALUES

Humans use the wildlife values of Teshekpuk Lake on a regional, national, and international scale. People in the Arctic, across Alaska, and hunters in the Lower 48, harvest geese and ducks that nest or molt at Teshekpuk. Migratory shorebirds from Teshekpuk Lake are enjoyed and welcomed by people in other states and nations; these shorebirds are known by one name in Alaska's Arctic but called other names in many languages along their international flyways.

Prehistoric hunting implements at Teshekpuk imply that people have relied on these wildlife values for thousands of years.

The Teshekpuk Caribou Herd is a crucial subsistence hunting resource for nearby communities. It has been estimated that the Herd provides approximately 95 percent of the caribou harvested by the communities of Utqiagvik (formerly Barrow) and Atkasuk and approximately 85 percent of the caribou harvested by Nuiqsut.⁴ The polar bear is another hunted species, though climate change and other exacerbating pressures may put this time-honored tradition at risk.

A PLACE WORTHY OF PROTECTION

When transferring the Reserve from the Navy to the Department of the Interior, Congress specifically named Teshekpuk Lake as an area worthy of maximum protection. The Secretary of the Interior immediately designated Teshekpuk Lake as a Special Area in 1977. Ever since and for 40 years, the Teshekpuk Lake wetlands complex has been repeatedly noted for its importance to birds, especially molting geese. Every finalized land management plan has included special provisions for wildlife values. The current management plan, finalized in 2013, carries forward this long history by making the Teshekpuk Lake wetlands complex unavailable for oil and gas leasing.

Maintaining some Arctic areas that are entirely free from development will help provide wildlife with much-needed space to remain resilient or even adapt to climate change and cumulative impacts. The lands and waters around Teshekpuk Lake contain a high concentration of many species; protecting these areas is a crucial piece of an effective and responsible Arctic management strategy.

MOLTING GEESE use areas in and around Teshekpuk Lake as a safe haven where they undergo their annual molt. After nesting across the Arctic, up to 100,000 geese flock to the Teshekpuk Lake wetlands each summer. As many as 40,000 Greater White-fronted Geese, 37,000 Brant, and thousands of Cackling Geese and Snow Geese crowd into the areas around Teshekpuk. ^{5,6} There are no other known areas that support such large numbers of four species of molting geese across the Arctic.

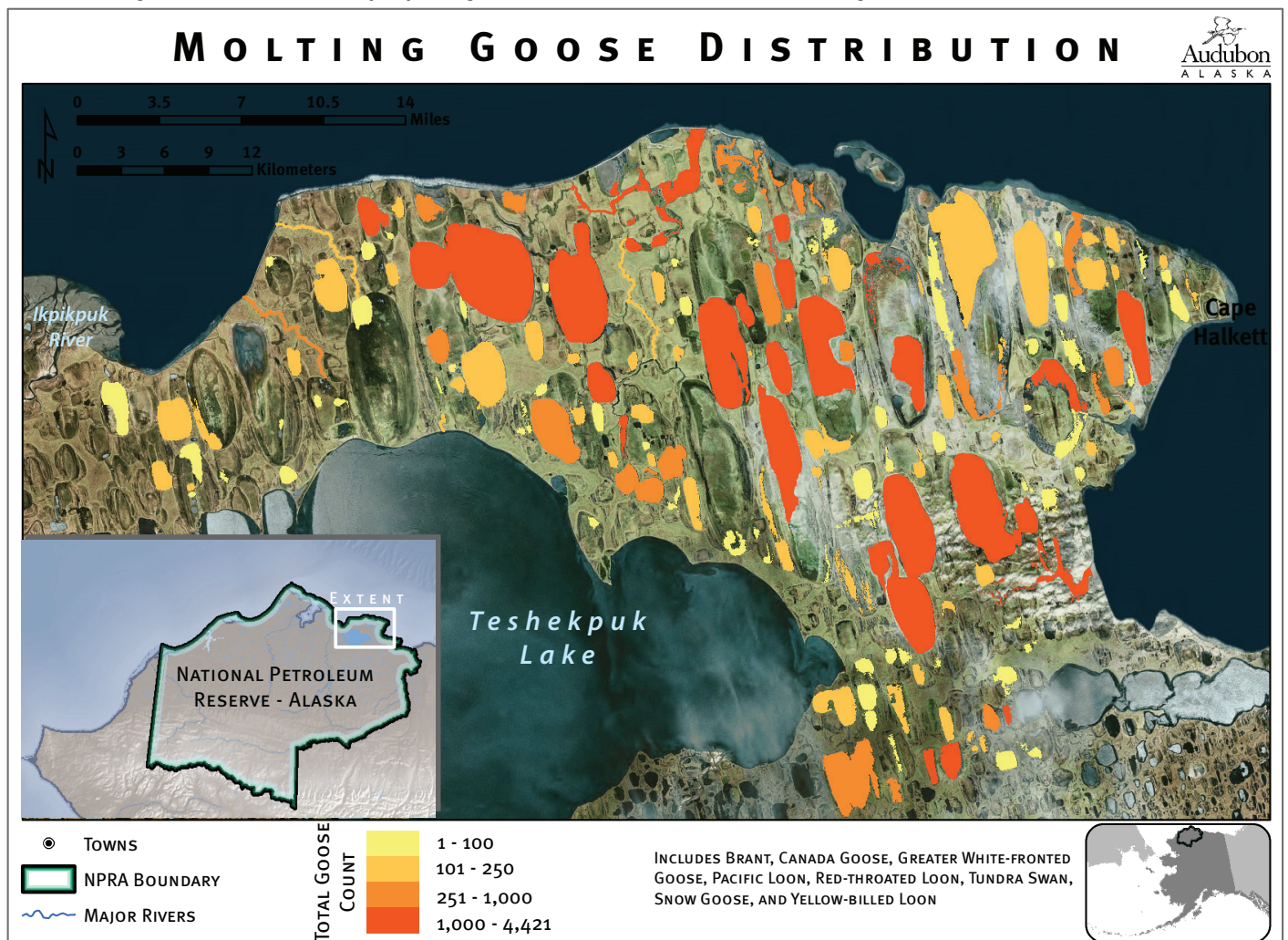
The areas north and east of Teshekpuk Lake provide ideal conditions for the geese seeking food and safety during their molt. When geese molt—the process of replacing old, worn flight feathers—they become flightless and vulnerable to predation and highly sensitive to disturbance. ^{7,8} The remote, deep-water lakes in the Teshekpuk area provide shelter and safety, where the temporarily flightless birds may escape from predators. As the largest sedge wetlands in the Arctic, the lands and waters of Teshekpuk also provide tender grasses to fuel the birds' high energy demands.

The geese of Teshekpuk are connected to the rest of North America. Banding records show a strong connection between waterfowl in the NPRA and the Lower 48 states. White-fronted Geese banded in the NPRA migrate down the Central Flyway, along the Dakotas,



Greater White-fronted Geese. Photo: Mick Thompson.

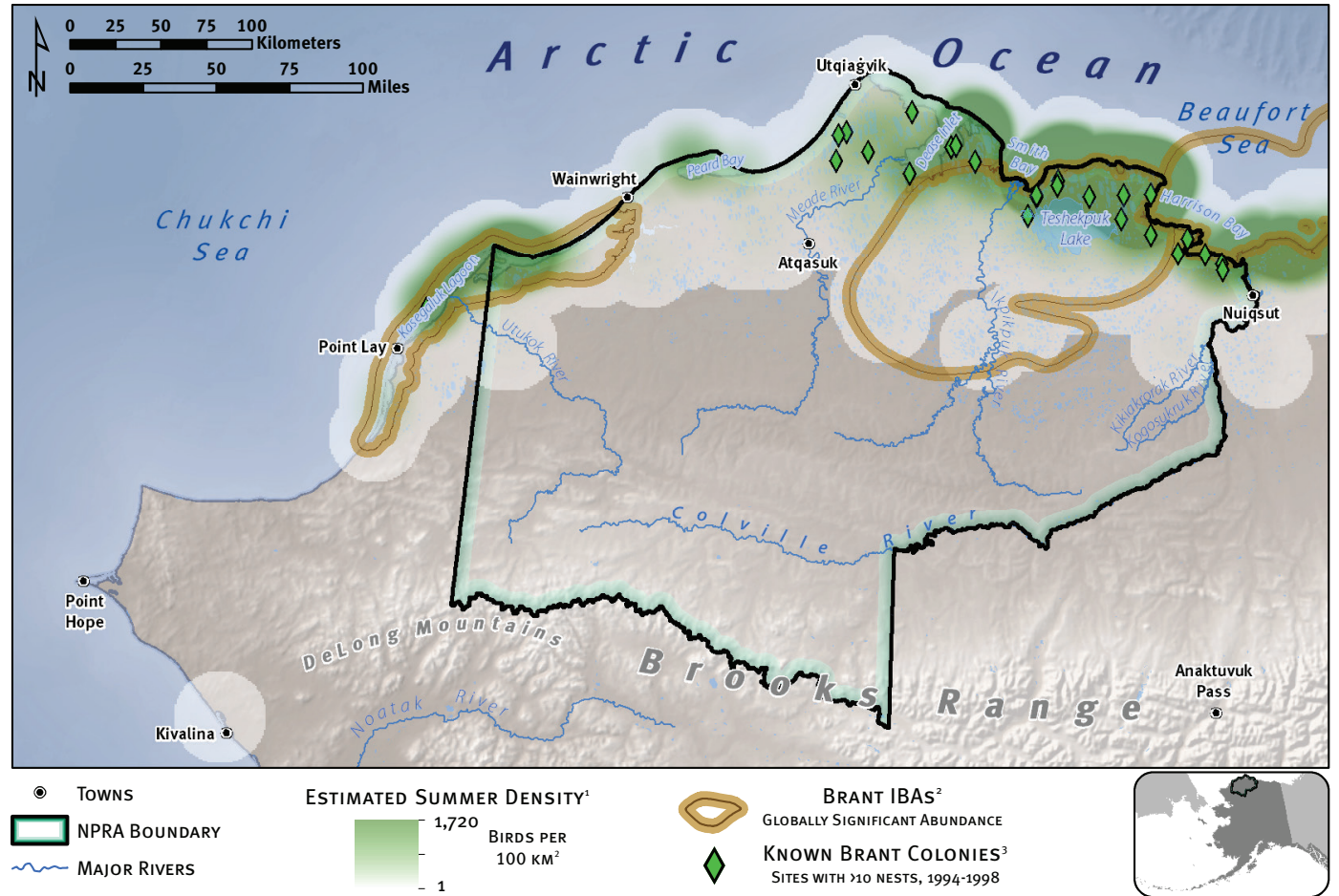
Nebraska, Kansas, Oklahoma, and Texas, including as far east as Illinois, Missouri, Arkansas, and Louisiana, to winter along the Gulf Coast and into Mexico. Banded Snow Geese show a similar pattern along the Central Flyway, but numerous individuals also migrate and winter the Pacific Flyway states of Washington, Oregon, and California. Cackling Geese banded in the NPRA were later found along the Pacific Flyway, from British Columbia to California, and a few records of encounters New Mexico and Texas, with one individual found as far as Michigan.



Source: USFWS 2015.

1:337,060

B R A N T



Sources: 1) Audubon Alaska 2014, based on USFWS 2014 and NPPSD 2013; 2) Audubon Alaska 2014; 3) Alaska Biological Research 2002.

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PACIFIC BRANT are particularly reliant on the wetlands around Teshekpuk Lake. About 30 percent of the entire Pacific Brant population uses the Teshekpuk Lake area for breeding and molting. Some birds use this area only once in their lifetime, others occasionally, and still others return many times. Brant congregate in the north-east section of the NPRA near Teshekpuk Lake to molt and fuel up for migration, arriving from areas around the North Slope, from the Yukon-Kuskokwim Delta and the western Canadian Arctic, and from as far away as Siberia. The diverse origins of Teshekpuk's molting

goose population, arriving from such distant nesting sites, further emphasizes the global importance of the Teshekpuk Lake wetland complex for Brant and other waterfowl.

Following their molt, fall-staging Brant concentrate in Beaufort Sea lagoons, bays, and deltas, and large numbers also stage along the Chukchi Sea coast. Most (if not all) of the Brant from around Teshekpuk Lake then fly to Izembek National Wildlife Refuge. An increasing number of Pacific Brant are remaining to over-winter at Izembek, while the rest will move down to eelgrass habitat in coastal waters off British Columbia, Washington, Oregon, California, and Mexico. Brant are valued by subsistence hunters in northern and western Alaska as well as by sport hunters and bird enthusiasts along the Pacific coastline into Mexico.



A flock of Pacific Brant at Teshekpuk Lake. Photo: Gerrit Vyn.

When in the flightless stage as they undergo their molt, Brant will run at the sight of a distant person, and do not habituate to disturbance,^{7,8} making industrial activity around Teshekpuk a major concern. Behavioral responses to disturbance add stress to the already-taxing physiological requirements of molting geese. Running away takes energy and reduces time for feeding, and may compromise fitness, survival, or reproduction.

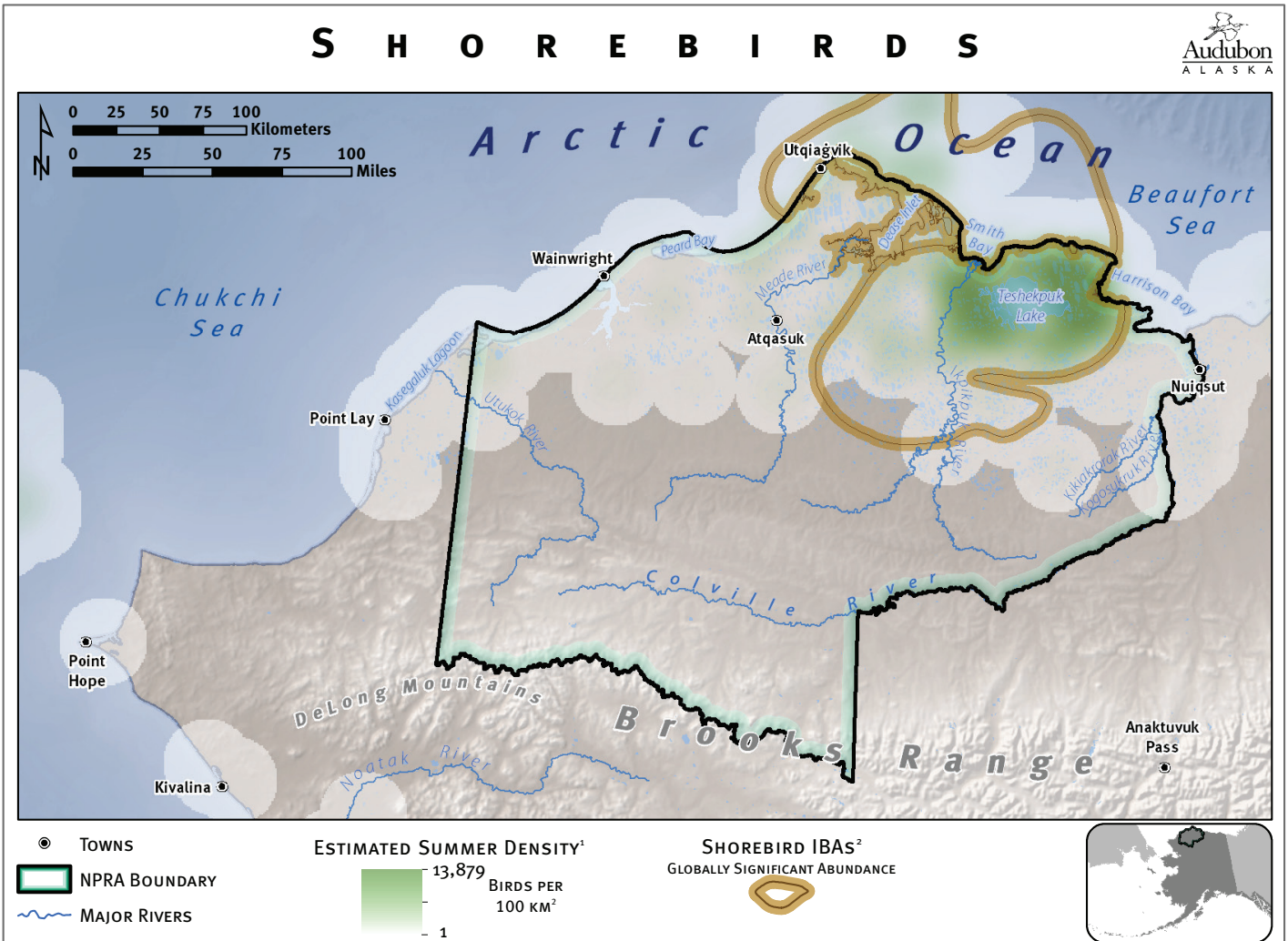
SHOREBIRDS flock to nest and stage in the lands and wetlands around Teshekpuk Lake, boasting high numbers and diversity, as well as international connections. People can easily spot shorebirds running along lakefronts and coastlines during the migration season, making these birds excellent ambassadors for global connectivity, while also vulnerable to the pressure of increasing coastal development.⁹ Millions of shorebirds breed in the NPRA, with 600,000 breeding in the Teshekpuk Lake area alone.³

The Teshekpuk Lake wetlands complex is nationally and internationally recognized as one of the premier Arctic breeding habitats for shorebirds. This area supports globally significant percentages of populations of three species of shorebird: Dunlin (*Calidris alpina arctica* subspecies) 19%; Black-bellied Plover 10%; and Semipalmated Sandpiper (western population) 10%.³ The Alaska Shorebird Group has identified an area from Teshekpuk Lake to Dease Inlet as a candidate for inclusion in the Western Hemisphere Shorebird Reserve Network (WHSRN) due to its significance for the Pectoral Sandpiper, Black-bellied Plover, American Golden-Plover, Long-billed Dowitcher, Dunlin, and Semipalmated Sandpiper. A site adjacent to Teshekpuk Lake is recognized internationally as an East-Asian Australasian Flyway Network site, for its nesting value to shorebirds.

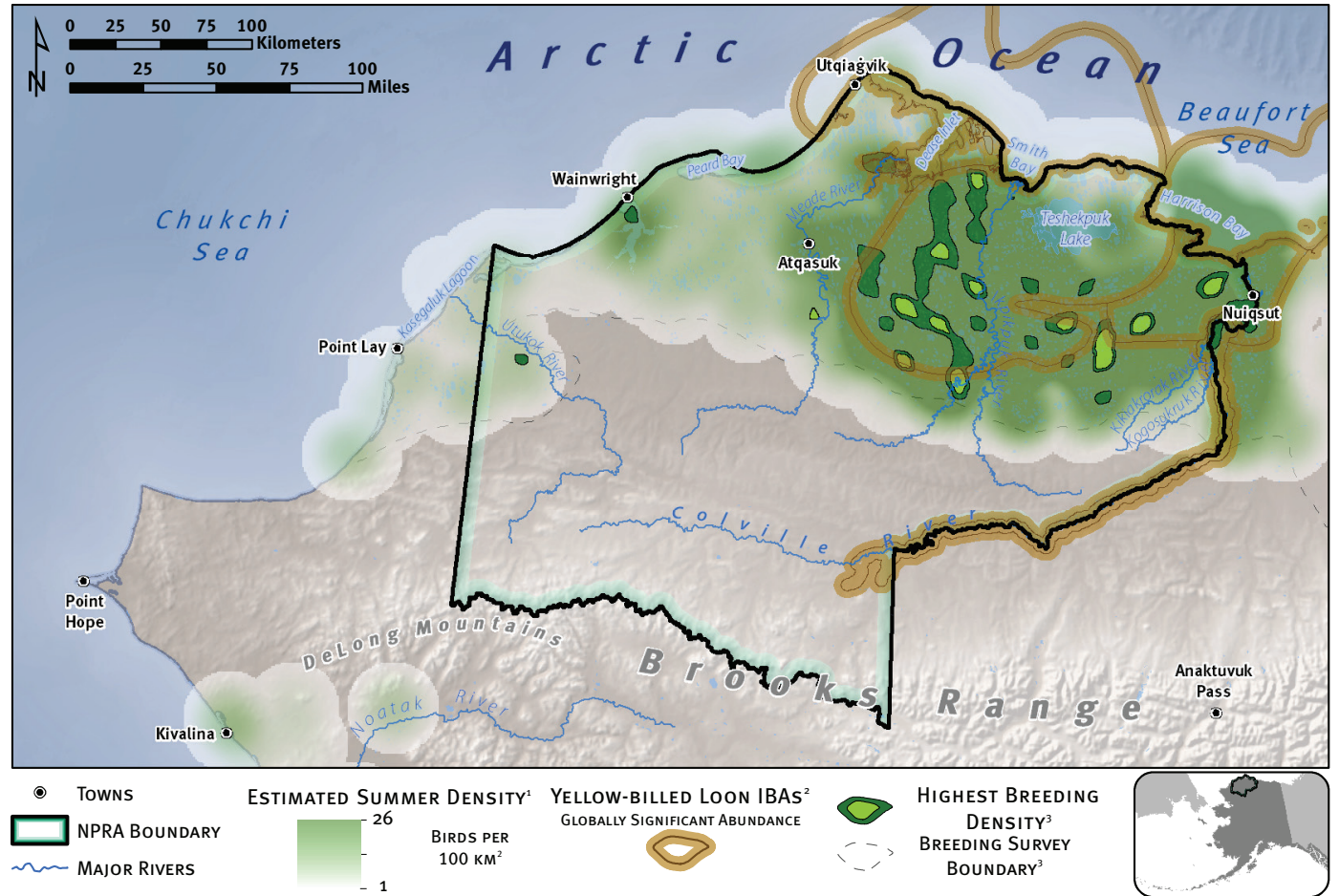


Semipalmated Sandpipers. Photo: Dave Shaw.

Shorebirds from the Western Arctic, including those around Teshekpuk Lake, display remarkable migratory patterns that span the globe. Banded Dunlin from the NPRA migrate along the East-Asian Australasian Flyway, including into Russia and Japan. Banding records also show that Semipalmated Sandpipers nesting in the NPRA later fly east across the nation and head over the Southeast U.S., to wintering grounds along the Caribbean coastline of northern South America.



YELLOW-BILLED LOON



Sources: 1) Audubon Alaska 2014, based on USFWS 2014 and NPPSD 2013; 2) Audubon Alaska 2014; 3) USFWS 2010.

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YELLOW-BILLED LOONS nest around Teshekpuk Lake in high densities. Yellow-billed Loons are very similar in appearance to Common Loons, but can be differentiated based on their distinct yellow bills and high Arctic range. The Common Loon's high lonely yodel is well-known to people in the lower latitudes, and Yellow-billed Loons share this characteristic cry, a sound synonymous with wilderness and freedom. Yellow-billed Loons are highly territorial, nesting on banks and foraging in waters of freshwater lakes and ponds, which they defend from others of their species. Loons nesting around Teshekpuk Lake

will stage for migration in nearby coastal waters, including Harrison Bay, Smith Bay, and off Utqiagvik (formerly Barrow), before migrating south to spend the winter in coastal waters of the North Pacific Ocean, including around Alaska, Puget Sound, and parts of Asia.

This species finds breeding habitat throughout the Arctic coastal areas, from Russia, to Alaska's Seward Peninsula and North Slope, and into the Canadian Arctic. It is estimated that approximately one-fifth of the worldwide population (16,000) of Yellow-billed Loons breed in western and northern Alaska with a substantial portion of those birds (37%) found on the Arctic coastal plain.¹⁰ Breeding concentrations are highest in the lakes and wetlands around Teshekpuk Lake. The largest high-concentration nesting area for Yellow-billed Loons in the NPRA lies between the Meade and Ikpikpuk Rivers south of Dease Inlet, in areas just west and southwest of Teshekpuk Lake. Two other species of loons—Red-throated Loon and Pacific Loon—also nest in areas around Teshekpuk Lake. The Yellow-billed Loon is classified as "near-threatened" by the IUCN Red-list, and is an Audubon Alaska Red WatchList species, due to a past population decline attributed to unsustainable harvest. Yellow-billed Loon populations in Alaska probably remain depressed after this past decline, but today appear to be stable.¹¹



Yellow-billed Loon. Photo: Ryan Askren / USGS

ALL FOUR SPECIES OF THE WORLD'S EIDERS (map and photo in this section depict Steller's Eider) can be found nesting in the wetlands and ponds around Teshekpuk Lake. Eiders are enigmatic, deep-diving sea ducks, and are among the most northernmost nesters on the planet. With their thick, warm, downy feathers acting like a diver's drysuit, eiders are extraordinarily well-adapted to their frigid Arctic marine environment. These sea ducks spend most of their lives diving for shells and crabs along the coastal areas of the Arctic Ocean, but they must return to land to nest. The Teshekpuk Lake wetlands complex offers nesting habitat to all four species of eiders, two of which (Steller's Eider and Spectacled Eider) are recognized as threatened under the Endangered Species Act (ESA).



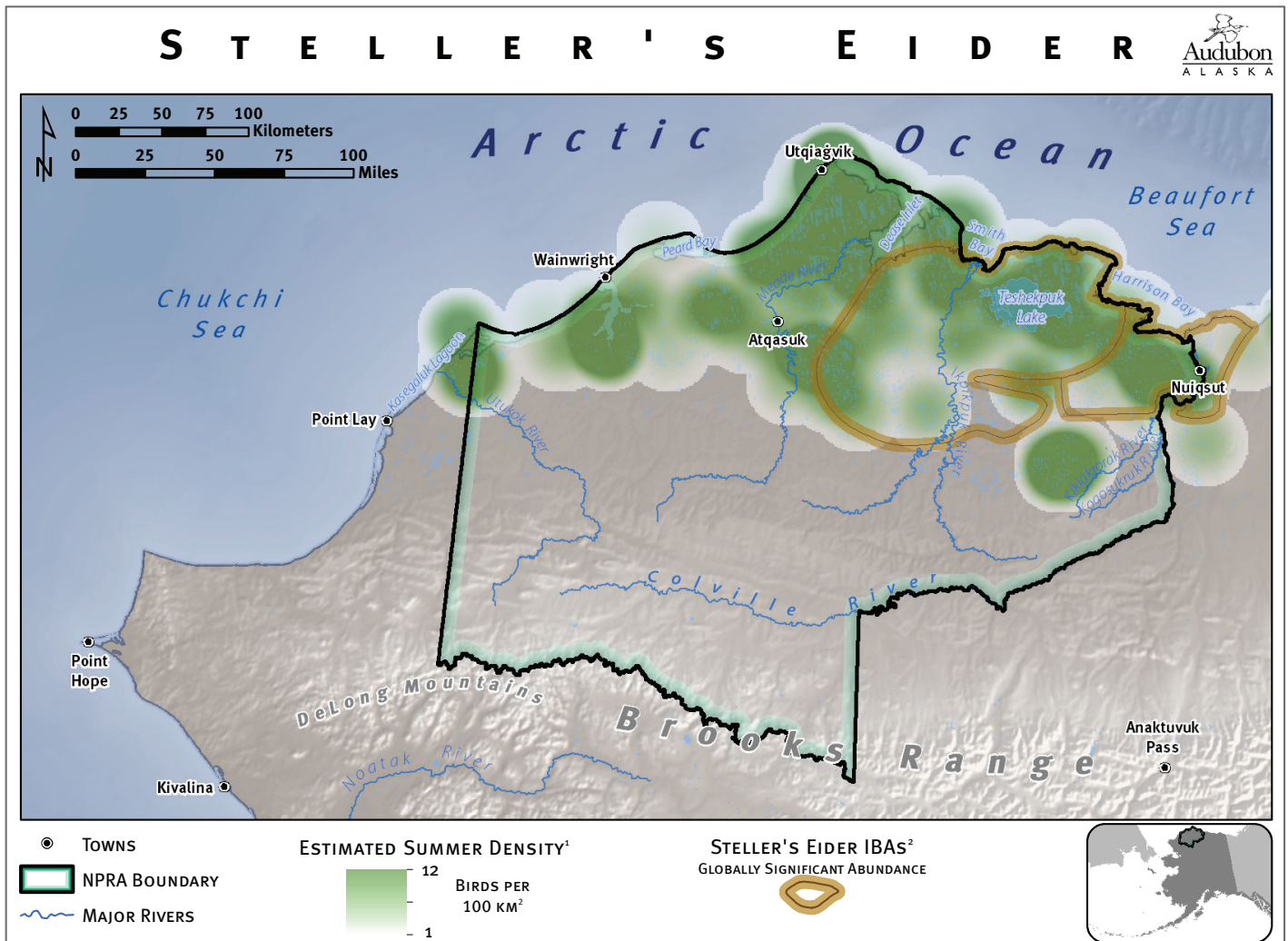
Steller's Eider. Photo: Milo Burcham.

Steller's Eiders congregate in areas around Teshekpuk Lake in abundances that are globally significant for a species of conservation concern. Steller's Eiders also have high breeding concentrations around Utqiagvik. The Alaska breeding range of Steller's Eider, which once extended from Wainwright east to the Canadian border, is now far more restricted. The last population estimate in 2012 noted a 2% decrease in the global population of Steller's Eiders.¹²

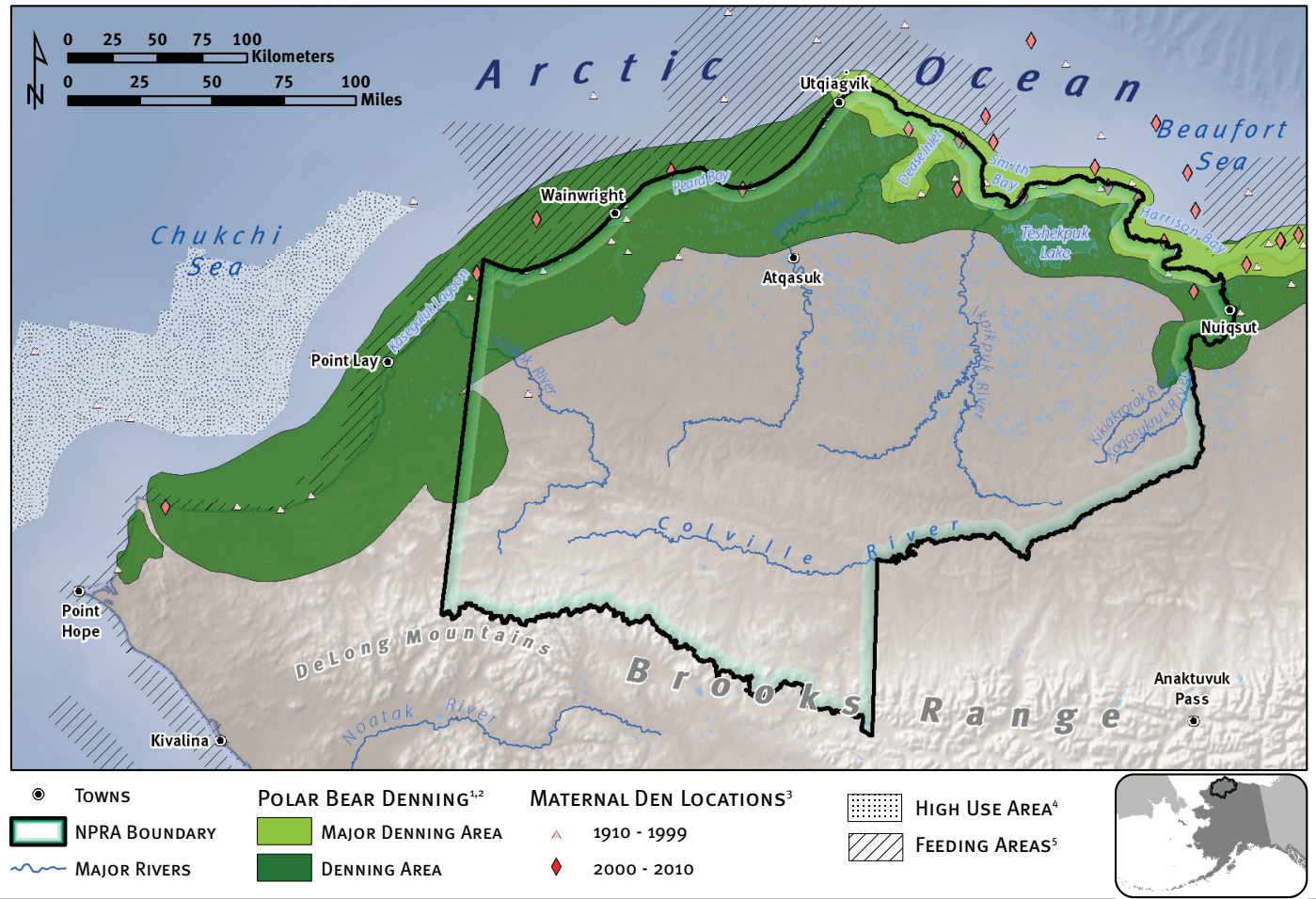
Spectacled Eider breeding concentrations within the NPRA occur northeast of Teshekpuk Lake and in the coastal area between Utqiagvik and Wainwright in the vicinity of Peard Bay.

About 5% of the global population for Spectacled Eider breeds in coastal habitats along the Beaufort Sea. The highest remaining

King Eider and Common Eider also nest around Teshekpuk Lake. The largest concentration of King Eiders in the NPRA is immediately south and east of Teshekpuk Lake. Although Common Eiders do not breed extensively within the NPRA, high concentrations of these birds use coastal lagoons north and east of Teshekpuk Lake.



POLAR BEAR DENNING AND FEEDING AREAS



Sources: 1) NOAA 1988; 2) USFWS 1995; 3) Durner et al. 2010; 4) USFWS 2010; 5) Kalxdorff 1997.

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POLAR BEARS use areas surrounding Teshekpuk Lake as maternal denning sites and foraging areas. Polar bears closely track the boundary between sea ice and water, where they hunt for prey such as ice seals. The bears mate in spring but pregnant females do not begin to seek out dens until fall or early winter. Polar bear females around Teshekpuk Lake will select denning sites on fast ice (ice fastened to land). Terrestrial sites along the coastline, riverbanks, barrier islands, and coastal bluffs of Alaska's North Slope are increasingly important denning habitat areas as well. There has been an apparent

shift in recent years to more terrestrial denning (relative to dens on fast ice). Numbers of polar bears on land during the summer open water period will likely increase as sea ice continues to retreat very far from land.

In the American Arctic, the polar bear Southern Beaufort Sea subpopulation stretches from the Western Arctic, including areas around Teshekpuk Lake, eastward through the Arctic National Wildlife Refuge, and into Canada. This subpopulation is in decline. The polar bear is a threatened species under the Endangered Species Act due to the mounting pressure of climate change and receding sea ice, and is also protected under the Marine Mammal Protection Act.



Polar Bear. Photo: Milo Burcham.

Polar bear conservation is closely tied to their sea-ice habitat. As an apex predator with a relatively small population and slow rate of reproduction, polar bears are particularly vulnerable to further population decline in years to come, and may become more reliant on available terrestrial habitat. Barring such adaptation, the Southern Beaufort Sea subpopulation of polar bears faces an uncertain future.¹³ Polar bears may one day only persist in other more stable ecoregions where sea ice remains, such as the high Arctic archipelago islands of Canada, as well as Greenland.

THE TESHEKPUK CARIBOU HERD uses the lands surrounding Teshekpuk Lake as seasonally important habitat—including calving areas, insect relief, and seasonal movement corridors. The Teshekpuk Caribou Herd is currently estimated at 39,000 individual animals, a decline from a high count of 69,000 in 2008.⁴ In the past, higher populations of Arctic caribou have been used to support the narrative that caribou and oil development are compatible. However, today, three out of the four Arctic North Slope caribou herds, including the Teshekpuk Herd, are declining.¹⁴ Overall caribou population patterns normally fluctuate in response to their natural environment. But human infrastructure and activity can add pressure, worsening a downward trend, or dampening the rate of an increasing trend.

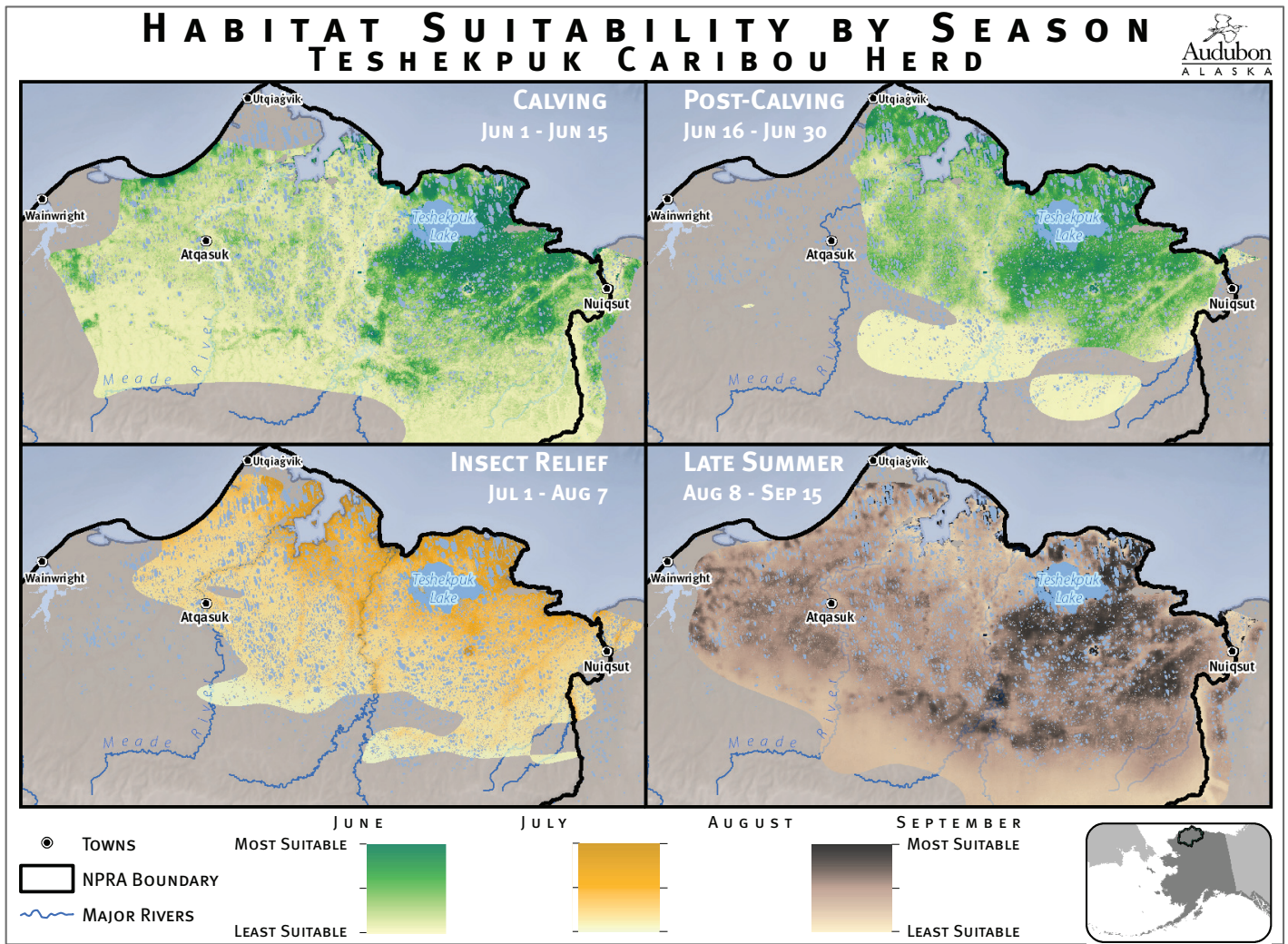


Teshekpuk Caribou Herd. Photo: Gerrit Vyn.

Roads and other oil and gas infrastructure have documented impacts on individual caribou. Extensive research has found potential for oil and gas development to drive caribou away from their customary habitats. For example, the Central Arctic Herd uses areas around the industrialized areas of Prudhoe Bay as calving grounds, but this herd’s use patterns demonstrate a slow shifting pattern of movement away from infrastructure, suggesting that pregnant or calving caribou are avoiding developed areas during calving season.¹⁵

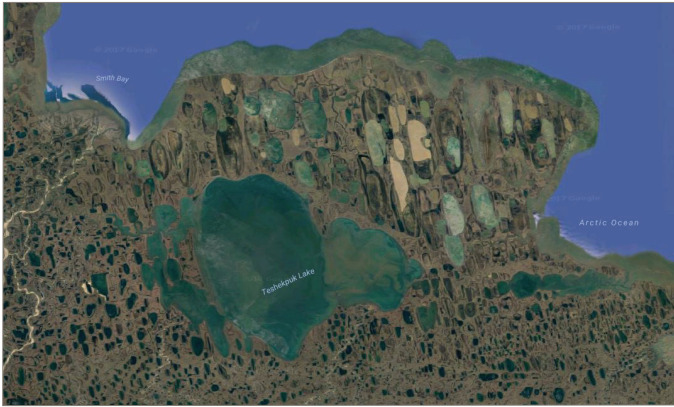
Warmer temperatures could increase insect abundance and harassment of caribou and compromise herd productivity as well as accelerate green-up in a way that disrupts the current synchronous nature of caribou calving and peak green-up.¹⁹ Climate and development effects may simply add together, or could combine to create a greater effect that is difficult to anticipate.

Climate change and its subsequent effects present another



Source: Wilson et al. 2012.

1:3,000,000



Teshekpuk Lake and surrounding wetlands complex, as seen from satellites. Photo: Google Earth.

40 years—Teshekpuk Lake has been federally recognized for its extraordinary bird and wildlife values.

RESULTS OF THE WILDLIFE VALUES ASSESSMENT

- **A premier global bird and wildlife site.** The sheer abundance and concentration of so many wildlife species in the Teshekpuk Lake wetlands complex is remarkable and indisputable. Recognized as a globally significant Important Bird Area for numerous bird species, and on par with our nation's wildlife refuges for its conservation importance, Teshekpuk Lake and its surrounding lands and wetlands are an area to refrain from development. The bird and wildlife surface resources at Teshekpuk merit protection, regardless of estimates of subsurface mineral potential.
- **Maintain Teshekpuk wetlands as a climate refuge.** Global warming trends will be accentuated in the Arctic. Increasing temperatures, loss of sea ice, melting permafrost, increased erosion, changed hydrology and vegetation, and other climate change-driven dynamics are already impacting Arctic wildlife. Ecosystems, wildlife, and subsistence resources negatively impacted by climate change may be exacerbated by these pressures when combined with cumulative energy development infrastructure and impacts. Keeping areas like the Teshekpuk Lake wetlands free from development will offer a vital place of refuge for wildlife populations.
- **Manage caribou herds cautiously.** The critical importance of caribou as a wildlife and subsistence resource merits a strong precautionary approach. Climate change and development are two pressures that could interact in unpredictable and extremely negative ways. The tipping point for caribou population decline may not become apparent until it is too late to remedy.



Teshekpuk Lake Special Area. Photo: Gerrit Vyn.

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