

Shared Wilderness, Shared Responsibility, Shared Vision: Protecting Migratory Wildlife

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Abstract—Wilderness plays a vital role in global and landscape-level conservation of wildlife. Millions of migratory birds and mammals rely on wilderness lands and waters during critical parts of their life. As large, ecologically intact landscapes, wilderness areas also play a vital role in addressing global climate change by increasing carbon sequestration, reducing fragmentation, and providing dispersal corridors. However, potential biome shifts, fragmentation, and the effects of urbanization threaten even remote wilderness areas. The National Wildlife Refuge System (U.S. Fish and Wildlife Service) protects over 18 million acres of designated wilderness in Alaska. Wildlife protected within this wilderness spend significant parts of their lives in Canada, Latin American, and other countries, which are also suffering the effects of global climate change. We briefly discuss three species that spend significant portions of their lives in the Arctic National Wildlife Refuge, but rely on habitat in other countries during other phases of their lives. Examples of successful international efforts are provided. We suggest that by enhancing hemispheric partnerships to preserve critical habitat as permanently protected wildlands, we can increase resiliency, redundancy, and representation of habitats for these shared species.

Introduction

Large, relatively pristine areas allow wildlife to naturally flourish. In the absence of habitat fragmentation, urbanization, and other human induced disturbances, evolutionary forces can persist without interference. These areas, often termed wilderness, can also function as natural laboratories for furthering the understanding of wildlife conservation and of the effects of climate change. Wilderness areas reduce habitat fragmentation, provide important dispersal corridors that connect landscapes, and play a vital role in addressing climate change by increasing carbon sequestration.

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While the preservation of wilderness is globally recognized as important for the conservation of biological diversity and integrity, climate change compels us to protect more of these valuable areas. Many hemispheric-migrating species, while benefitting from large conservation units, rely on intermediate stopover sites that may be half a world away, in many cases. Despite their perceived importance, research on the links between these temporary habitats for the conservation of migratory wildlife on a global scale is fairly limited. Large iconic species such as grizzly and polar bears that migrate only seasonally have received significant attention in the development of conservation plans. Less charismatic species receive less research attention, even though their migratory patterns and habitat requirements may be more complex and extensive. Through the development of hemispheric partnerships we may be able to protect the essential habitat that migratory species need to survive.

Wilderness Management in the Refuge System: A Look at Arctic National Wildlife Refuge

In Alaska, sixteen national wildlife refuges protect statutorily designated and de facto wildernesses, the largest being the 19.2 million acre Arctic National Wildlife Refuge (fig. 1). The United States established this area nearly 50 years ago to preserve unique wilderness, wildlife, and recreation values. The supporters were especially interested in protecting an area large enough to protect wilderness-dependent wildlife, like grizzly bears and wolves, that had mostly disappeared from the conterminous United States. Extending across more than 200 miles from north to south, the refuge spans five ecological zones from arctic coastal lagoons and barrier islands to subarctic boreal forest. The Arctic Refuge also includes over 150 miles of coastline and encompasses 97,000 acres of coastal lagoons and barrier islands. The Arctic Refuge may well exhibit the greatest ecological diversity of any protected area in the circumpolar arctic.

Eight million acres of the Arctic Refuge are designated wilderness under the Wilderness Act of 1964 and three rivers (Sheenjek, Wind, and Ivishak) are designated Wild Rivers under the Wild and Scenic Rivers Act of 1968. The Arctic Refuge's wilderness is free of non-climate stressors such as habitat fragmentation, barriers to migration, roads, and industrial development. All wildlife-dependent recreation including hunting and fishing is well regulated, as is subsistence use. Today, the Arctic Refuge is home to many wildlife species that benefit from its intact, wild ecosystems. The importance of protecting terrestrial and marine wilderness in the Arctic is intensifying. As temperatures increase and

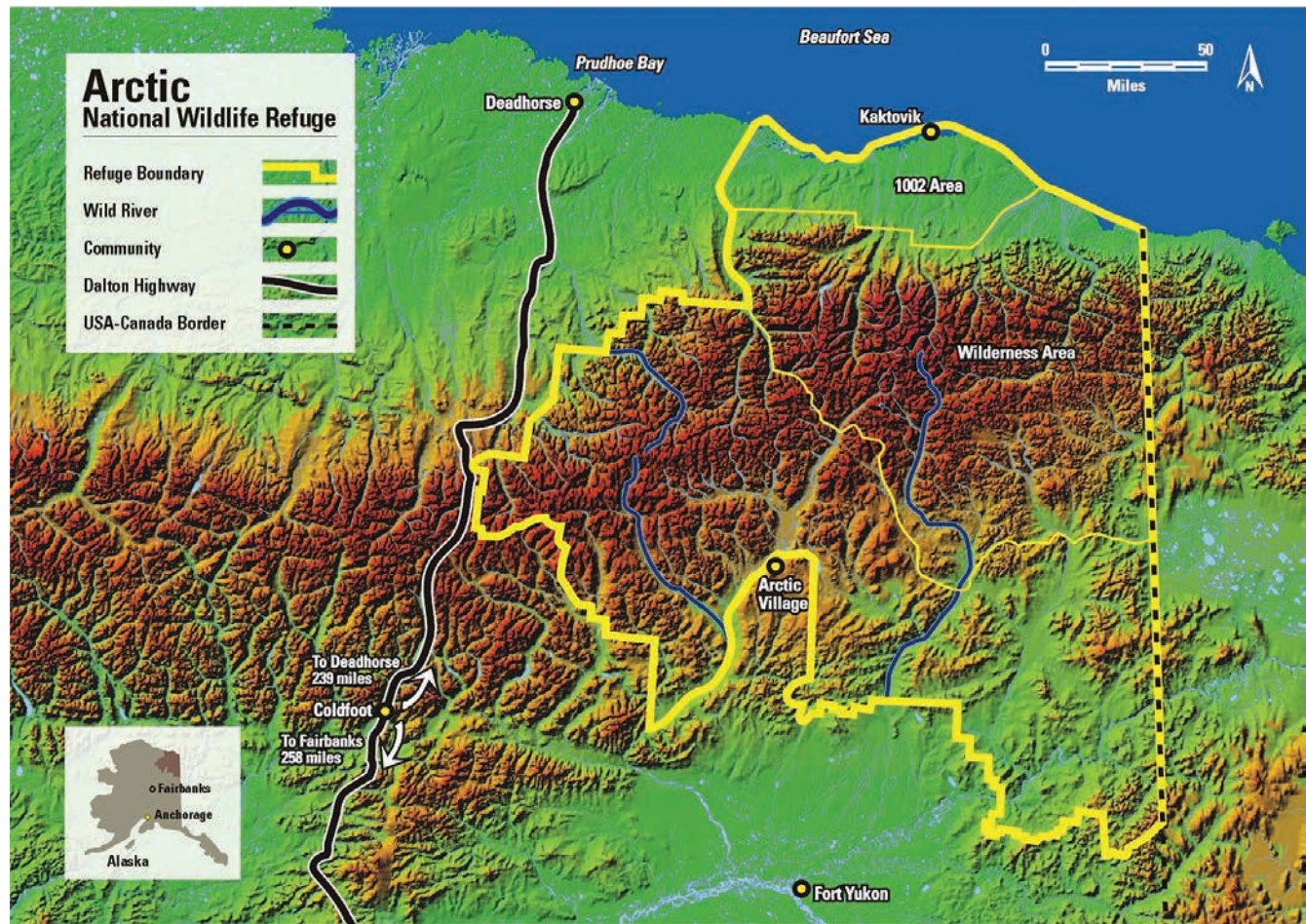


Figure 1—Location of Arctic National Wildlife Refuge.

sea ice recedes, the arctic will experience increasing potential for oil spills, shipwrecks, invasive species introductions, habitat fragmentation caused by development, and negative human-animal interactions. Within the boundaries of the refuge, habitats are expected to change as well. Scientists expect increasing coastal erosion; changing vegetation succession; shifts in plant phenology, animal migrations, life stages of invertebrates and shrub distribution; an increase in wildland fires; and significant changes to the surface hydrology. We highlight three species that exemplify the importance of arctic wilderness and discuss multinational opportunities to conserve these species.

Caribou

Caribou are a nomadic species of deer that naturally occur in the Arctic. More than 30 years of research on Alaska's North Slope around Prudhoe Bay indicate caribou are sensitive to habitat alteration and human disturbance, especially during calving. Nevertheless, there is much debate about the potential effects on caribou if the Arctic Refuge is opened to oil and gas development. The wilderness of the Arctic Refuge provides habitat for two distinct herds of barren ground

caribou: the Central Arctic Herd and the Porcupine Herd (fig. 2). The location of the birthing areas distinguishes the two herds. In recent years, female caribou of the Central Arctic Herd have calved across a broad swath of the arctic coastal plain from the Canning River drainage of the Arctic Refuge west to the Colville River. Most calves are born in areas on either side of the Prudhoe Bay oil complex. Soon after calving season, the herd moves outward both east and west to their summer range, which extends from the western portion of the Arctic Refuge coastal plain well west beyond Prudhoe Bay. In the fall, many of these caribou migrate south through the Brooks Range Mountains to spend the winter along south slope river drainages deep within the Arctic Refuge. Some members of the herd, however, remain on their summer range north of the mountains throughout the year, seeking out wind-blown valleys and tundra benches to find the lichens they need in order to survive the long, cold winters.

The Central Arctic Herd is growing in number, and recently its core calving area shifted southward away from the developed areas of Prudhoe Bay. Recently, scientists discovered the size of caribou born near the developed areas of Prudhoe Bay were smaller than caribou born to the east

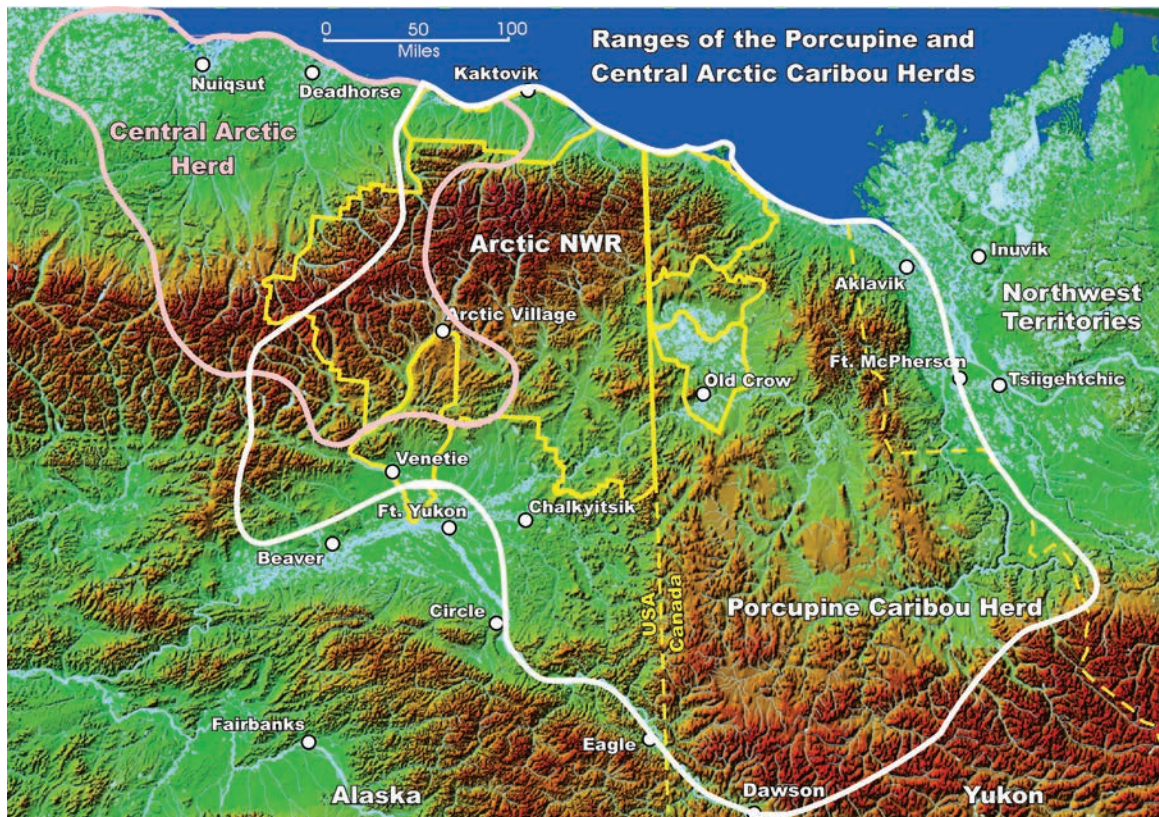


Figure 2—Ranges of the Porcupine and Central Arctic caribou herds. Both herds use portions of the Arctic National Wildlife Refuge; the Porcupine herd ranges extensively into Canada as well.

in an undeveloped area. These data suggest that when cow caribou are not using their preferred calving areas, their calves are smaller at birth and survival and growth are impeded (Arthur and Del Vecchio 2007). However, both groups moved eastward onto the Arctic Refuge coastal plain during periods of high insect activity.

The Porcupine Caribou Herd population status is unknown at this time, but many suspect it has declined since 2001 for unknown reasons. This herd normally calves on the coastal plain of the refuge, and ranges across the entire refuge and in the wilderness of Canada. At 250,000 km², this herd has a vast home range, and individuals have been observed to travel over 3,000 miles in a year. The herd uses the Arctic Refuge throughout the year. The fidelity of this herd to a fairly small specific area is unique.

Canada has also taken important steps to protect this shared caribou herd. In 1984, Canada created the Ivvavik National Park, Canada, which permanently protected a large portion of the herd's habitat as wilderness. The Vuntut National Park south of Ivvavik protects additional areas of the caribou's habitat from development. Most of the rest of the herd's Canadian range is located in areas that have either been withdrawn from development or are subject to Aboriginal land claim agreements that place stringent restrictions on development. Habitat changes caused by industrial development and climate change within its calving area threaten the Porcupine Caribou Herd.

Dunlins

Dunlins are diminutive shorebirds that nest in the high latitudes of North America and Eurasia and overwinter in coastal areas in the northern hemisphere. Thousands of dunlins use the Arctic Refuge coastal plain during the summer breeding and nesting season and as a fall staging area before migrating to Siberia and then moving southward along the coast of Japan and China (fig. 3). They breed in wet coastal tundra and prefer mudflats, estuaries, marshes, flooded fields, sandy beaches, and shores of lakes and ponds during the non-breeding season. The International Union for the Conservation of Nature lists the dunlin as abundant but populations may be declining. Loss of non-breeding habitat in eastern Asia is believed to be the greatest threat to this important migratory bird. For example, in South Korea, a large overwintering area has just recently been converted from coastal floodplain to a dry area for economic development.

Additional threats in the wintering areas include loss of water, pollution, unsustainable harvest of marine resources like shellfish, and human disturbance in critical feeding and roosting areas. This species is especially vulnerable because its wintering area is facing unsustainable environmental practices. Potential threats to this species at the Arctic Refuge include loss of feeding and roosting habitat due to coastal erosion and rising sea level, and potential for increased oil

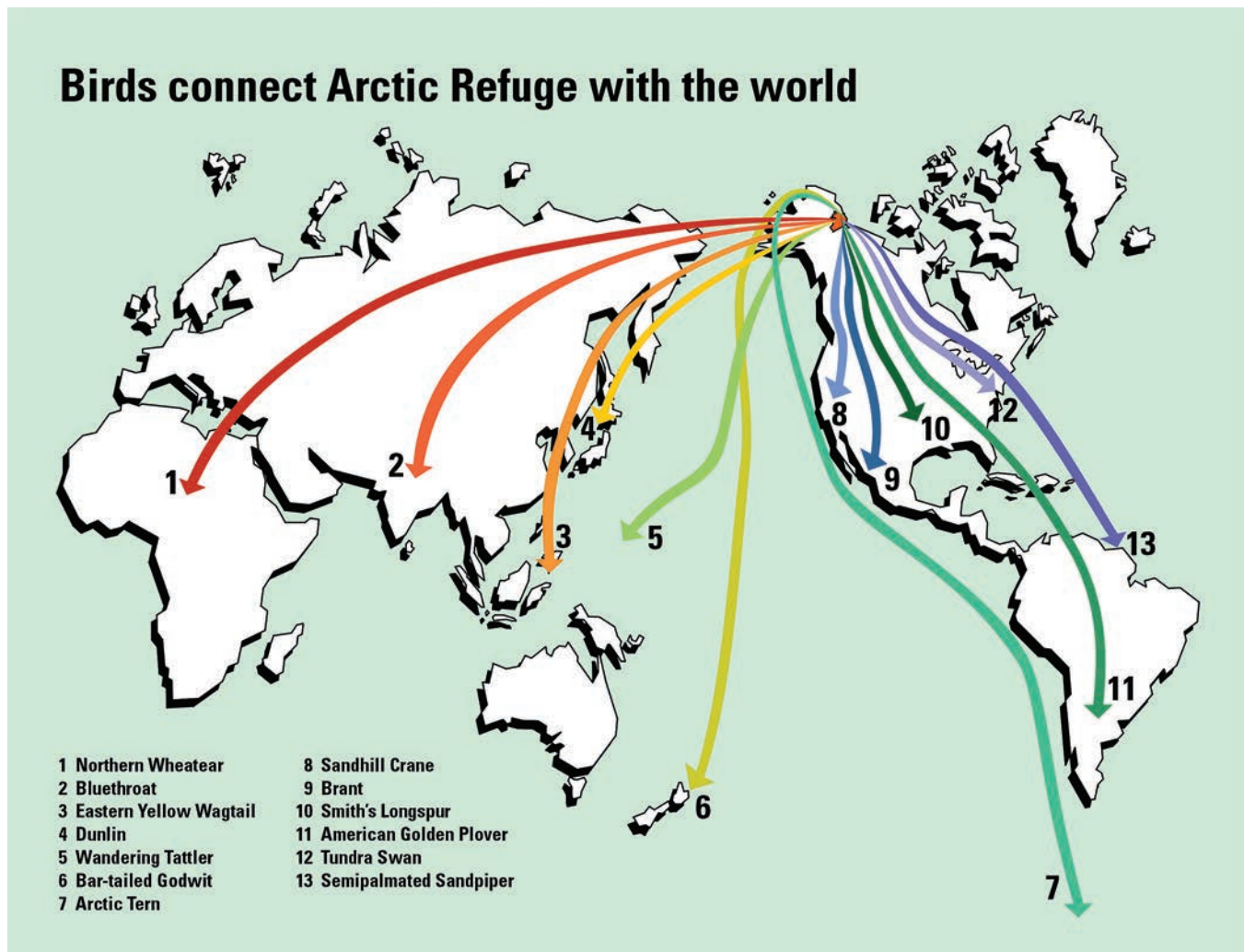


Figure 3—Schematic of 13 bird species, including dunlin, that migrate from the Arctic National Wildlife Refuge to other countries during the course of one year.

spills and shipwrecks. The wilderness areas of the refuge and the relatively unaltered habitat of the North Slope of Alaska provide habitat essential for this species' life cycle. The importance of these wilderness areas may become ever more critical to the survival of this species.

Polar Bears

The Arctic Refuge is home to members of the Southern Beaufort Sea population of polar bears. Polar bears that den on the refuge range over a large area in Alaska and Canada (fig. 4). Every year during the winter, several of these impressive animals come to the refuge to den and give birth on the adjacent uplands of the Arctic Refuge coastal plain. Up to 50 others congregate along the coast of the refuge in October and November. The bears spend most of their time on the drifting pack ice, feeding, resting, and denning. Each year, however, many of the pregnant females come to shore to dig maternity dens in snowdrifts.

Along Alaska's coast, the highest density of polar bear land dens occurs within the Arctic Refuge. Many more dens have been found here than would be expected if bears denned uniformly along the coast. One reason may be that the refuge coastal plain and northern foothills have more uneven terrain than areas to the west, allowing snowdrifts to form more readily. The Arctic Refuge is the only U.S. conservation area where polar bears regularly den and is the most consistently used polar bear land denning area in Alaska.

Polar bears den, breed, and forage on sea ice throughout the year. The Southern Beaufort Sea polar bear population is facing rapid change in their preferred habitat. Sea ice extent in the Arctic is receding at an unexpected rate. On May 14, 2008, the United States listed the polar bear as a threatened species under the Endangered Species Act because of the predicted continued loss of sea ice in the arctic. As sea ice disappears, the importance of the Arctic Refuge wilderness to polar bears as a place of refuge increases.

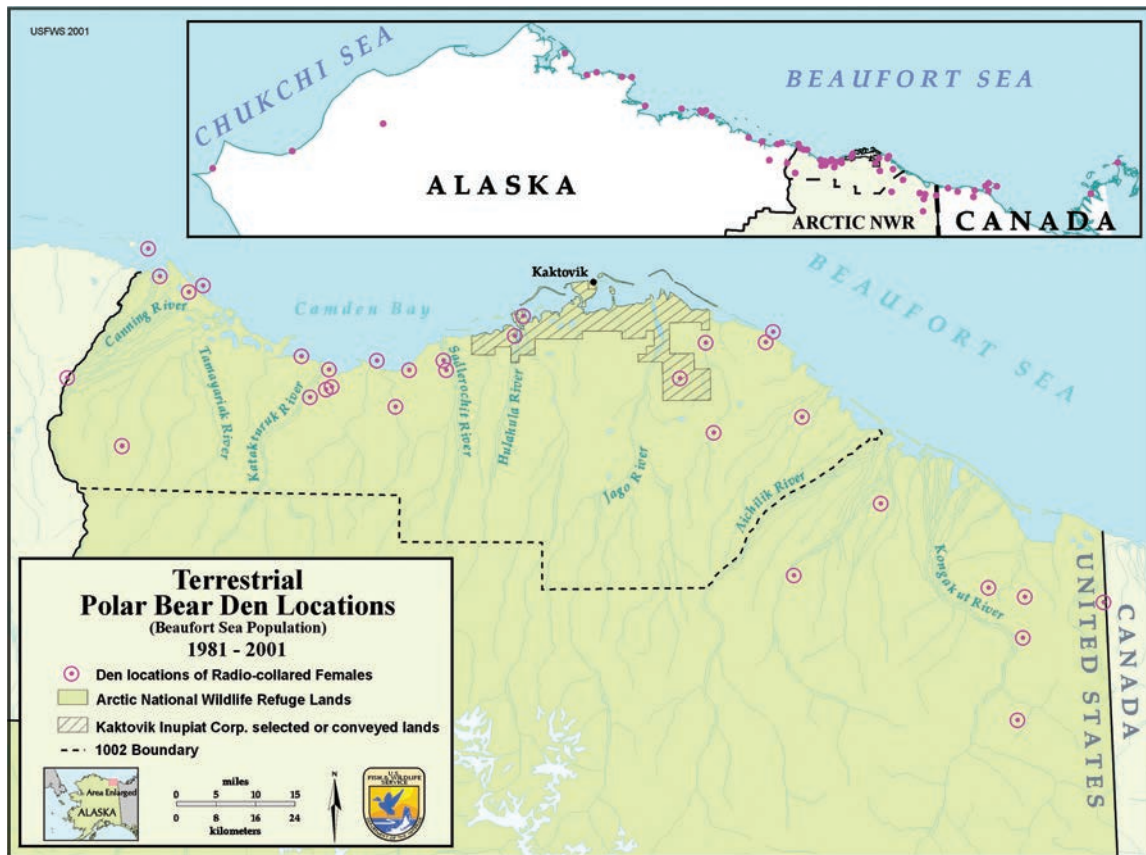


Figure 4—Terrestrial den locations of the Beaufort Sea population of polar bears.

Discussion

The three species discussed, caribou, dunlin, and polar bears, are just a fraction of the species that depend on the Arctic Refuge wilderness during part of their life cycle, and the wildlands and waters of other countries for other parts of their lives. In addition, there are many other North American migratory species that rely on habitat in two or more countries. We, therefore, have numerous opportunities for international cooperation to protect important wildlife habitat.

The U.S. Fish and Wildlife Service has a long-standing commitment to assist other nations in the conservation of wildlife species that share or cross United States' borders or whose range is on foreign soil. These obligations are contained in numerous treaties, laws, agreements, and cooperative programs with other nations. The Division of International Conservation cooperates with domestic and foreign governmental agencies, national and international non-governmental conservation organizations, universities, and other interested parties to conserve wildlife and their habitats. This is accomplished by strengthening the capabilities of local institutions to cultivate and train local nationals to effectively manage natural resources by focusing on enforcement of protected areas, buffer zones, and

corridors; catalyzing conservation partnerships at local and international levels to raise public awareness; and promoting communication and information exchange among communities, institutions, and countries.

An excellent example of a mechanism that promotes international cooperation on wildlife conservation is the Canada/Mexico/U.S. Trilateral Committee for Wildlife and Ecosystem Conservation and Management. The Trilateral Committee, which has been active since 1996, facilitates and enhances cooperation and coordination among the wildlife agencies of the three nations in projects and programs for the conservation and management of wildlife, plants, biological diversity, and ecosystems of mutual interest. The Trilateral also facilitates the development of partnerships with other associated and interested entities.

Species-specific agreements play an important role as well. There is already extensive international cooperation on studying and understanding the lives of polar bears. For example, there is an *International Union for Conservation of Nature* Polar Bear Specialist Group, and an International Agreement on the Conservation of Polar Bears signed in 1973 by the United States, Canada, Denmark, Norway, and the Union of Soviet Socialist Republics. Under this Agreement, the countries coordinate research programs related to the conservation and management of polar bears and exchange

information on management programs. Canada and the United States also work together to protect caribou through an Agreement on the Conservation of the Porcupine Caribou Herd and the International Porcupine Caribou Management Board.

Including wilderness as a component of wildlife conservation efforts could greatly enhance these international wildlife conservation treaties, agreements, and cooperative programs that have resulted in active partnerships accomplishing effective conservation on the ground. Unfortunately, the role wilderness plays in the conservation of wildlife has typically been undervalued. However, a new international agreement—the Memorandum of Understanding (MOU) on Cooperation for Wilderness Conservation—was signed by representatives from the United States, Mexico, and Canada at the 9th World Wilderness Congress in November of 2009. This timely agreement recognizes the growing evidence of the importance of wilderness conservation in climate change adaptation and mitigation and monitoring for climate change effects; the outstanding opportunities wilderness provides for increasing our understanding of global climate change, ecosystem adaptation, and resiliency; and as some of the least manipulated environments left, wilderness provides connectivity and wildlife migration corridors.

Formally protected wildlands and wild waters will help us meet the challenges of climate change and conserve wildlife. Recent studies suggest that to enable many species to endure climate change, we must establish relatively large, diversified, intact habitat areas to protect primary ecosystem functions (Locke and Mackey 2009). Providing connectivity among these areas is one of the best strategies

to allow species to adapt to a changing environment and for ecosystems to persist (Heller and Zaveleta 2009).

It is critical that we expand our pre-existing treaties, agreements, and MOUs on international wildlife conservation. We must develop programs that recognize the value of wilderness to wildlife conservation and our response to climate change, and incorporate wilderness conservation into their objectives. Wilderness areas can serve as protected corridors of intact ecosystems and limited human activity that can help increase resiliency, redundancy, and representation of habitats for native species. These efforts must also include international partners, to ensure that all the ecosystem components required by shared species are evaluated and protected. By enhancing hemispheric partnerships to preserve critical habitat as permanently protected wildlands, we may have a real chance at realizing our shared vision of protecting migratory wildlife. Only by working intensively with countries with which we share many of “our” species, will we truly have a chance to preserve sufficient habitat to permit their continued existence.

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The content of this paper reflects the views of the authors, who are responsible for the facts and accuracy of the information presented herein.
