



FINAL REPORT

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For the project entitled:

A landscape-level analysis of ecological values of the Arctic National Wildlife Refuge

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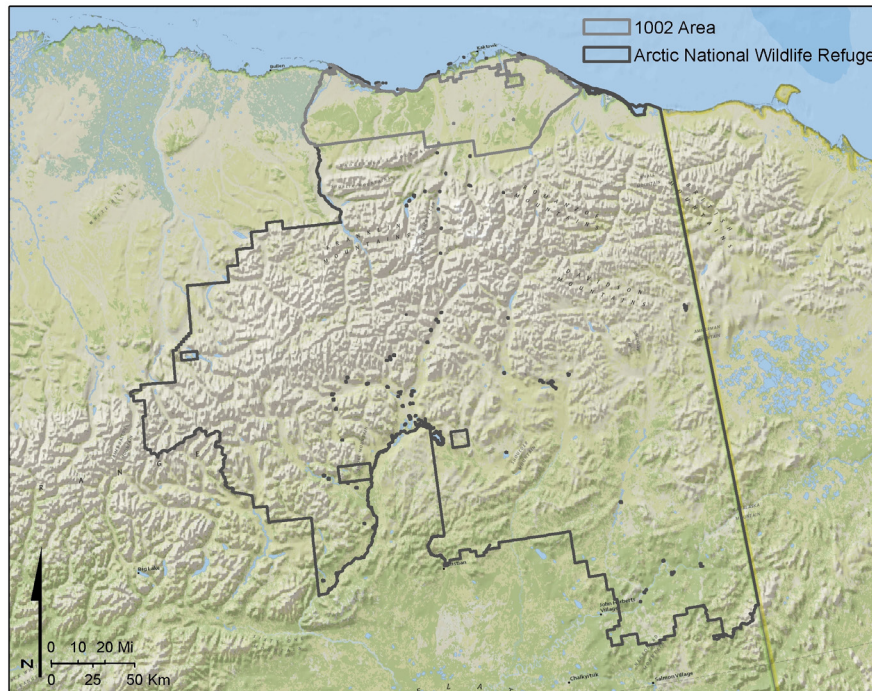


Figure 1. The Arctic National Wildlife Refuge in northeastern Alaska and the 1002 Area within the coastal plains region.

Methods and Results

We analyzed publicly available data to map ecological values within the Arctic National Wildlife Refuge related to the four purposes that guide its management. These include:

- (i) **to conserve fish and wildlife populations and habitats in their natural diversity;**

We identified areas of highest conservation concern for fish and wildlife populations (Fig. 2.) using a state-agency developed ranking of important wildlife habitat available from the Western Association of Fish and Wildlife Agencies (WAFWA) Crucial Habitat Assessment Tool (CHAT) (WAFWA 2015). The rankings incorporate information on species richness, the occurrence of terrestrial and aquatic species of concern, and freshwater integrity (described [here](#)). Rank values of one indicate most crucial habitats and rank values of six indicate least crucial habitats. Ninety-eight percent of all Rank 1 and 2 habitats within the Arctic Refuge are located within the 1002 Area (Table 1).

Table 1. Percentages of Crucial Habitat Assessment Tool Rank 1 and 2 habitats that are within the 1002 Area.

CHAT Rank	Percentage of habitat in the Arctic Refuge that is in the 1002 area
Rank 1	38%
Rank 2	59%
Rank 1+2	98%

(ii) to fulfill the international fish and wildlife treaty obligations of the United States;

Four international treaty obligations are identified in the Arctic National Wildlife Refuge Comprehensive Conservation Plan (USFWS 2011). Three of these have relevance to the 1002 Area. These include:

The Migratory Bird Treaty Act

We identified 18 species that potentially occur within the Arctic Refuge and are protected by the Migratory Bird Act using the USFWS Information for Planning and Consultation (IPac) Tool. We mapped the distributions of the 16 species for which data were available through the Alaska Natural Heritage Program (Gotthardt et al. 2014; Fig. 3). Of these species, 13 had mapped distributions within the Arctic Refuge, nine of which occur within the 1002 Area. Of the nine species, six of these have over 1/3 of their habitat within the Arctic Refuge located in the 1002 Area (Table 2). As a result, the 1002 Area has the highest migratory bird species richness in the Arctic Refuge (Fig. 3).

Table 2. Distributions of bird species protected by the Migratory Bird Act that are within the Arctic Refuge and 1002 Area.

Migratory species name	Percentage of habitat in the Arctic Refuge that is in the 1002 Area
American golden-plover (<i>Pluvialis dominica</i>)	14%
Bartailed godwit (<i>Limosa lapponica</i>)	33%
Black turnstone (<i>Arenaria melanocephala</i>)	60%
Buff-breasted sandpiper (<i>Tryngites subruficollis</i>)	51%
Dunlin (<i>Calidris alpina hudsonia</i>)	46%
Lesser yellowlegs (<i>Tringa flavipes</i>)	0%
Olive-sided flycatcher (<i>Contopus cooperi</i>)	0%
Red-throated loon (<i>Gavia stellata</i>)	35%
Rusty blackbird (<i>Euphagus carolinus</i>)	21%
Semipalmated sandpiper (<i>Calidris pusilla</i>)	22%
Snowy owl (<i>Bubo scandiacus</i>)	0%
Whimbrel (<i>Numenius phaeopus</i>)	0%
Yellow-billed loon (<i>Gavia adamsii</i>)	73%

The Agreement on the Conservation of Polar Bears

We mapped polar bear (*Ursus maritimus*) Critical Denning Habitat (Fig. 3) using data available from the U.S. Fish and Wildlife Service (2010). We found that 33% of the Critical Habitat for denning polar bears in all of Alaska and 65% of that in the Arctic Refuge is located within the 1002 Area.

The International Porcupine Caribou Agreement

We mapped the calving distributions of the Porcupine caribou (*Rangifer tarandus granti*) herd (Fig. 3) using data available from the BLM's Rapid Ecoregional Assessment of the North Slope

Region (BLM 2012). All Porcupine caribou calving habitat in Alaska occurs within the Arctic Refuge, with 44% occurring in the 1002 Area.

(iii) to provide the opportunity for continued subsistence uses by local residents;

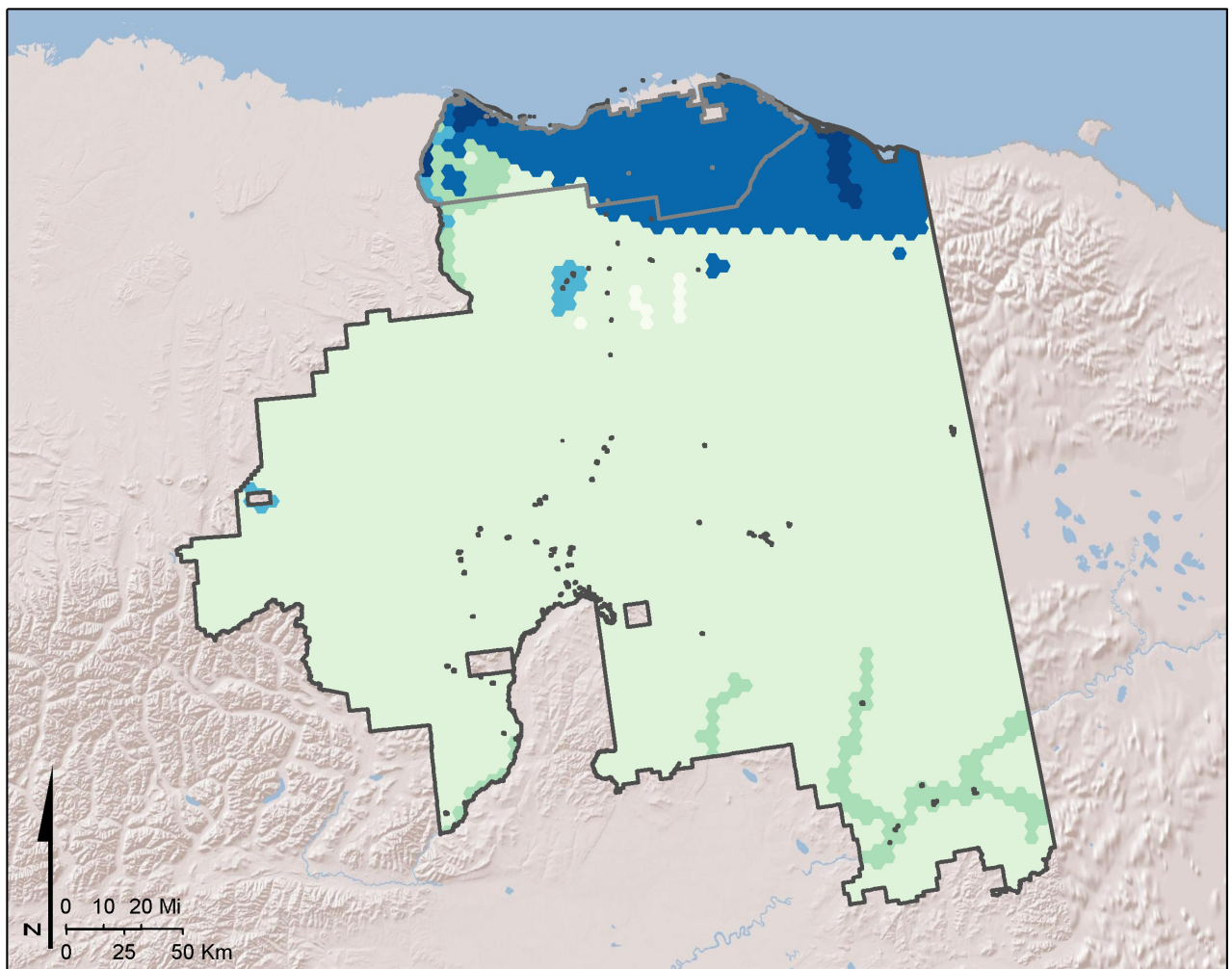
We mapped the number of subsistence uses of for the Inupiat village of Kaktovik (Fig. 4) based on data available from the BLM's Rapid Ecoregional Assessment of the North Slope region (BLM 2012). Subsistence uses mapped include fish, furbearers, caribou, wild fowl, moose, and vegetation. We found that 18 to 41% of all Kaktovik subsistence use areas in Alaska and 37 to 60% of areas within the Arctic Refuge are located in the 1002 Area.

Table 3. Subsistence use areas for the native village of Kaktovik that are within the 1002 Area.

	Percentage of use area in AK that is in the 1002 Area	Percentage of use area in the Arctic Refuge that is in the 1002 Area
Caribou	32%	51%
Fish	18%	44%
Furbearers	36%	47%
Moose	18%	20%
Wildfowl	41%	60%
Vegetation	28%	37%

(iv) to ensure water quality and necessary water quantity within the refuge.

Because waters are so widely distributed within the Arctic Refuge, we included maps of anadromous fish streams based on data available from the AK Department of Fish and Game (2010), as these represent some of the most important waterways in the refuge (Fig. 3). Of these, 25% of the stream length occurs within the 1002 Area.



1002 Area
 Arctic National Wildlife Refuge

Alaska Crucial Habitat Ranking



1 2 3 4 5 6

Landscape Analysis of the Arctic National Wildlife Refuge



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Figure 2. Alaska Fish and Game crucial habitat ranks within the Arctic National Wildlife Refuge. Rank values of one indicate most crucial habitats and rank values of six indicate least crucial habitats.

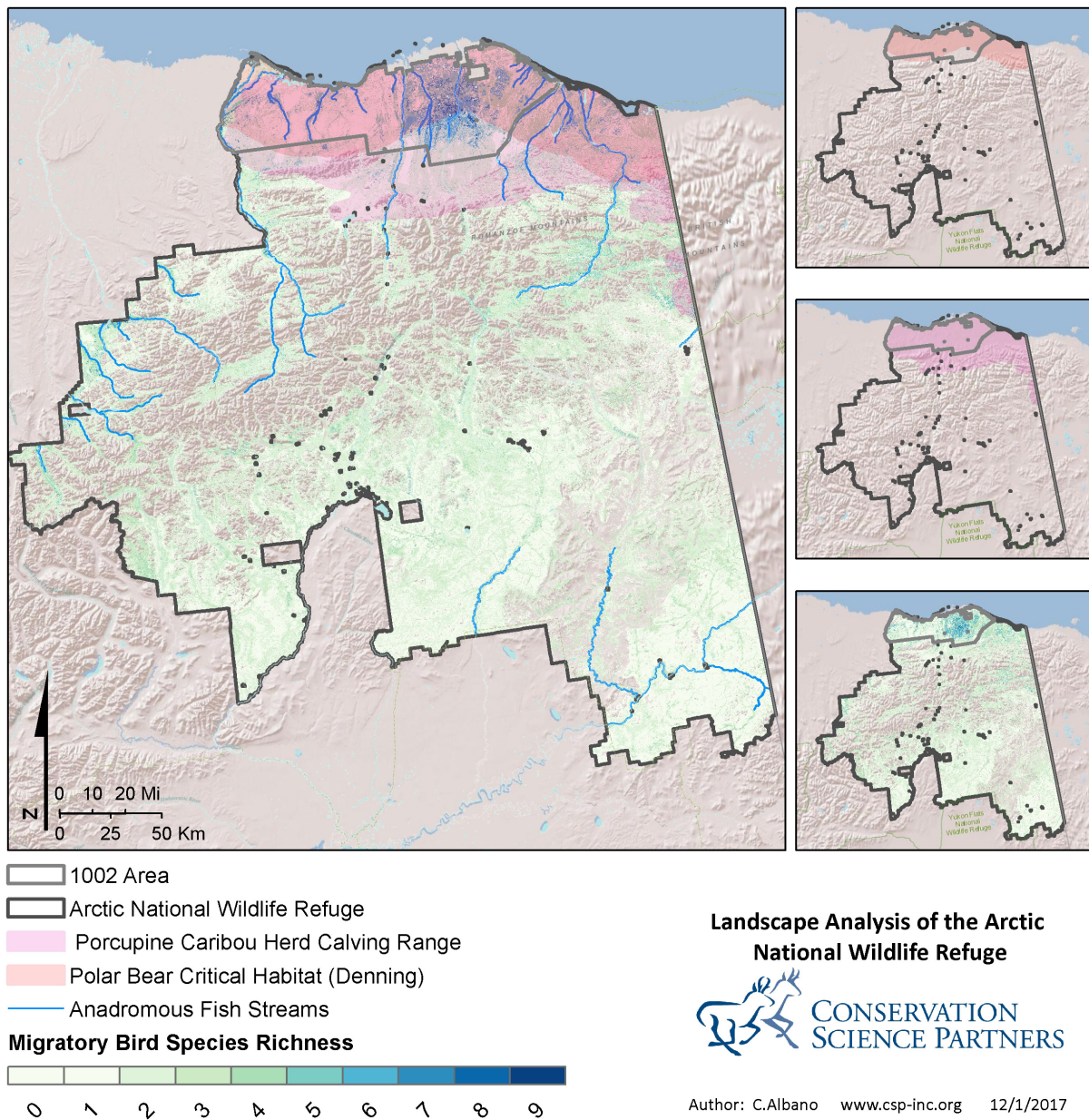
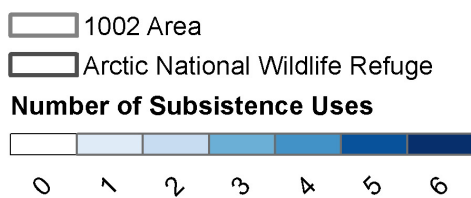
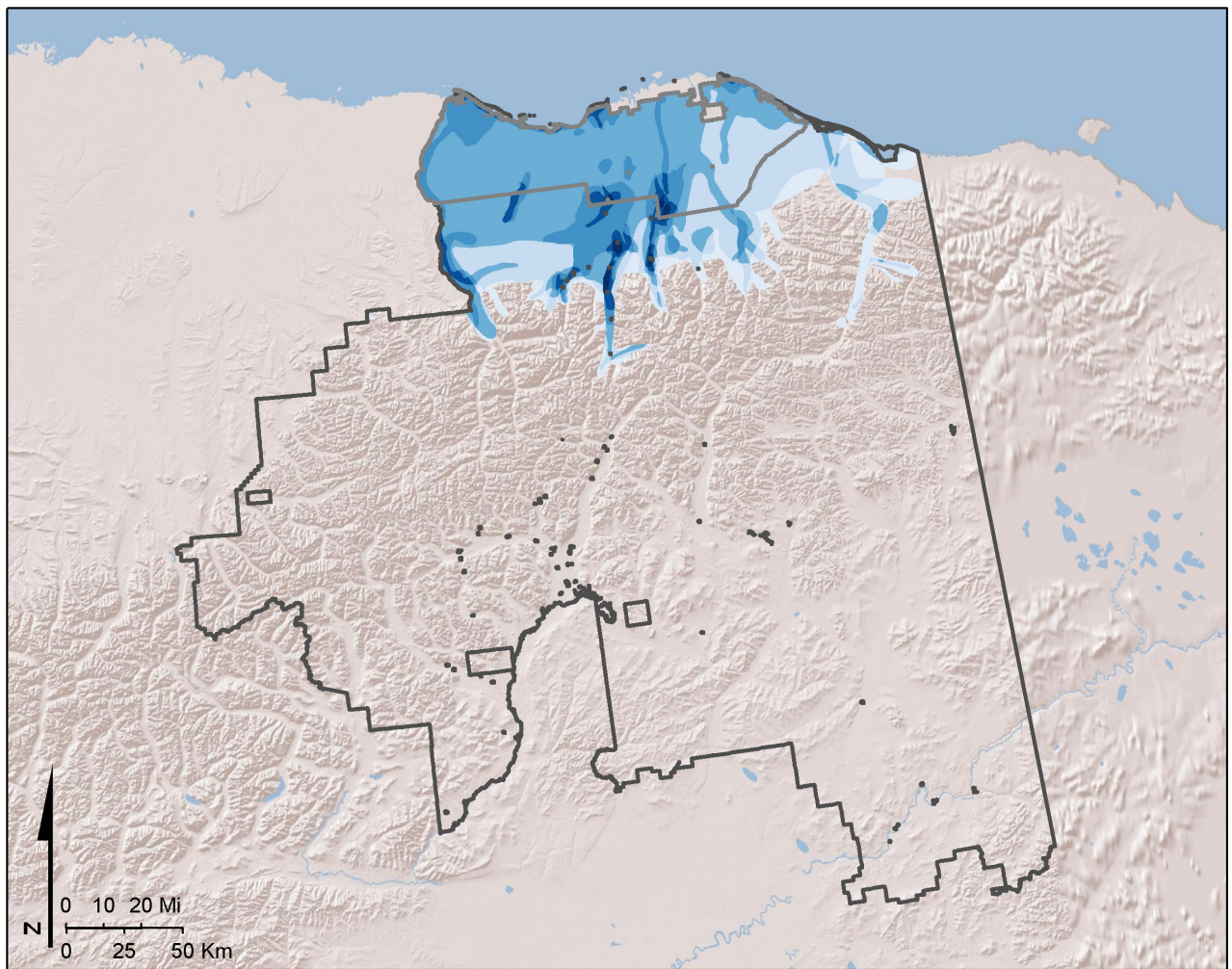


Figure 3. Distributions of fish and wildlife species with special protections based on international treaties.



Landscape Analysis of the Arctic National Wildlife Refuge



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Figure 4. Number of subsistence uses for the native village of Kaktovik within the North Slope region of the Arctic National Wildlife Refuge.

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