A New Map of Important Bird Areas in Alaska

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What is an IBA?

The Important Bird Area (IBA) Program is a global effort to identify and conserve areas that are essential habitat for birds at global, continental, and state scales. To qualify as a globally significant IBA, a proposed site must hold a significant number of a globally threatened species, or a significant percentage of a global population, as evidenced by documented, repeated observation of substantial congregations in an area. In Alaska, most globally significant IBAs are places that regularly hold more than 1% of the North American population of a congregatory waterbird species, or more than 1% of the global population of a congregatory seabird species, defined by BirdLife International. Audubon Alaska used these criteria to map IBAs of four types: breeding colonies, and core areas at-sea, in the coastal/nearshore zone, or on land. These places are relied on for breeding, nesting, foraging, molting, resting, staging, and/or migration.

History of the IBA Program

Alaska's IBA program began in 2000, in cooperation with the Russian Union for Bird Conservation and the Asia Council of BirdLife International, to identify marine and coastal IBAs on both the Alaskan and Russian sides of the Bering Sea. In October 2001, with support from the US Fish and Wildlife Service, Audubon Alaska initiated a second IBA project in the Cook Inlet watershed of Southcentral Alaska. Sites were identified based on information provided by wildlife agencies, Audubon chapters, and others in the Cook Inlet area.

In 2004, Audubon Alaska received a State Wildlife Grant from the Alaska Department of Fish & Game to support a statewide IBA project. Building on the work already carried out in the Bering Sea and Cook Inlet regions, Audubon Alaska launched the statewide IBA project in 2005, and over the next few years identified IBAs across Alaska. An Alaska IBA Technical Committee was formed in April 2005 to help guide the process. By 2008 Alaska's first version of the IBA network was complete.

In 2010 we began developing methods to reassess Alaska's IBAs, utilizing a wealth of new spatial data. Our goal was to (1) devise methods for delineating IBAs that were driven by spatial data analysis, so that boundaries were objective, replicable, defensible, and transferable to other study regions; and (2) apply those methods to datasets in Alaska to improve boundaries for existing IBAs and identify additional IBAs.

With a second grant from the Alaska Department of Fish & Game awarded in 2011, we completed our new marine IBAs in late 2012 and new interior and coastal IBAs in 2014.

Methods

We developed a standardized and data-driven spatial method for identifying globally significant Important Bird Areas in Alaska. To delineate these areas we developed a six-step process:

(1) Binning data and accounting for unequal survey effort, (2) Filtering input data for persistence of species use, (3) Using a moving window analysis to produce maps representing a gradient from low to high abundance, (4) Drawing core area boundaries around major concentrations based on abundance thresholds, (5) Validating the results, and (6) Combining overlapping boundaries into important areas for multiple species.

The identification process for IBAs using at-sea survey data was published in Biological Conservation in April (Smith et al. 2014). The method for identifying colony IBAs was documented in Audubon's 2012 report on new marine IBAs (Smith et al. 2012). The process for interior and coastal IBAs was presented at this conference (Walker and Smith 2014a).

IBAs of the same color are ecologically similar.
Light gray lines represent ecoregion boundaries.

Results & Discussion

Ultimately, the new IBA network is a blend of the original versions and the new analysis. In total, we identified 207 IBAs across Alaska's land and sea covering over 370,000 km² (>90 million acres), or about 7% of Alaska's land and sea. The final IBAs include 127 previously recognized areas: 44 expert-derived, 8 revised expert-derived, and 75 with revised boundaries and trigger species using spatial analysis. Also included are 81 new IBAs: 4 expert-derived, and 77 identified based on spatial analysis. Alaska has 182 IBAs that meet the criteria for global significance, more than any other US state.

We identified globally significant IBAs spanning 20 degrees of latitude and 56 degrees of longitude, with climates ranging from temperate to polar. IBAs are identified for 85 different species, including geese, ducks, loons, grebes, albatrosses, shearwaters, storm-petrels, cormorants, raptors, shorebirds, gulls, terns, alcids, and songbirds.

There are large gaps in spatial data, especially on non-federal lands. Undoubtedly there are additional IBAs not yet identified, particularly for raptors, songbirds, and shorebirds. For example, IBA identification is incomplete in interior Alaska, the outer areas of the Alaska marine boundary, and stretches of coastline in Southcentral and Northwest Alaska.

This new map of IBAs in Alaska will be used for conservation planning, policy and management recommendations, and education around the state.

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Summary of IBA Input Data

IBA ID Process	Database	Provider	Data Type	Time Span Analyzed
Marine	NPPSD v2 (Drew and Piatt 2013)	US Geological Survey, compilation of multiple sources	Strip transect	1974 – 2009
Colony	Seabird Information Network (World Seabird Union 2011)	World Seabird Union, compilation of multiple sources, primarily from US Fish and Wildlife Service	Colony census	1971 – 2009
Interior	Alaska Waterbird Dataset (Walker and Smith 2014b)	Audubon Alaska, compilation of multiple sources, primarily from the US Fish and Wildlife Service, with additional data from the Alaska Bird Observatory, the National Park Service, PRISM, and the University of Alaska Fairbanks, and with assistance from the Alaska Natural Heritage Program	Strip transect, lake census, block census	1985 – 2010
Coastal	Alaska Waterbird Dataset (Walker and Smith 2014b)	Audubon Alaska, compilation of multiple sources, primarily from US Fish and Wildlife Service, with additional data from the National Park Service, and with assistance from the Alaska Natural Heritage Program	Coastal census	1997 – 2013

Summary of IBA Input Parameters

IBA ID Process	Species Groups	Seasons	Amount of Data	Bin Size	Bandwidth (Search Radius)
Marine	Seabirds Waterbirds	Summer (May—Sep) Winter (Oct—Apr)	126,000 transects in 16,000 10-km bins	10 km	25 km
Colony	Seabirds	Summer (Mar – Sep)	6400 populations at 1640 colonies	NA	10 km
Interior	Waterbirds	Summer (May – Sep)	710,000 group locations in 32,000 5-km bins	5 km	25 km
Coastal	Waterbirds	Spring (Jan to May) Fall (Jun to Oct)	250,000 group locations in 8,000 5-km bins	5 km	25 km