

Wildlife Response to Environmental Change in the Arctic (WildREACH): Predicting Future Habitats of Arctic Alaska

Workshop Prospectus

Rationale

The U.S. Fish and Wildlife Service is faced with the challenge of managing fish, wildlife, and habitat in an arctic environment that will likely be significantly altered by a changing climate over the next century. There is a strong scientific consensus that changes in temperature, precipitation, and sea level will significantly impact natural systems, and observational evidence indicates that warming of the Arctic is occurring at almost twice the rate of the global average. Low temperature is the dominant influence on phenology, productivity, and habitat structure in the Arctic, thus a warming trend will undoubtedly lead to changes in habitat suitability for a suite of arctic-adapted species. The mechanisms by which a changing climate may affect biological communities are exceedingly complex and poorly understood, however. Currently, there are few tools available to assist wildlife managers in predicting the net effect of climate-driven changes on habitat availability and quality.

The Wildlife Response workshop is intended to lay a foundation for providing the information needed to support wildlife management decisions in the context of arctic climate change. The workshop will focus on linking predicted change in driving physical processes to habitat changes expected to strongly influence the distribution and abundance of arctic birds, fish, and mammals. The goal is to advance development of spatially explicit models that predict changes in habitat availability and suitability. Such models will help the FWS and other land and resource managers prioritize management/conservation efforts on species and habitats most vulnerable to adverse impacts.

Objectives

Identify critical research, modeling, and synthesis activities necessary to advance our understanding of the effects of climate change on birds, fish, and mammals dependent on the terrestrial and freshwater systems of arctic Alaska. Find areas of common interest among researchers and managers, and promote collaborative efforts to improve the quality of information available to support management decisions.

Scope

The geographic/ecological scope of the workshop will be freshwater and terrestrial systems of the North Slope of Alaska, with a focus on the Arctic Coastal Plain and Foothills ecoregions. Montane areas and nearshore marine waters will also be included where there is an essential ecological or physical tie (e.g., glacial input of water into North Slope river systems; nearshore lagoons used by anadromous fish and molting/migrating water birds).

Pre-Workshop Preparation

Briefing books will be prepared for workshop participants. The content will include a description, in general terms, of distribution and habitat use by arctic birds, fish, and mammals. It will also include examples of conceptual models illustrating pathways by which climate change will influence habitat availability and quality.

Workshop Structure

The workshop will be organized into two parts, the first of which will be a 2-day session attended by approximately 100 people. This portion will provide the common background needed by the Working Groups (see below). Plenary presentations by Consulting Specialists in climate, permafrost, hydrology, coastal geomorphology, plant community ecology, and ecological modeling will present summaries of the latest observational and modeling results. Three taxonomically-oriented Working Groups (birds, fish, and mammals) will take part in breakout sessions to identify potential indicator species, develop conceptual models for climate influences on species groups, and identify critical research/modeling data gaps. At the conclusion of the session, the participants will compare priority information needs, and identify common themes and overlapping priorities.

In addition to the three Working Groups, a Manager's Workshop will convene on Day One to provide an opportunity for management agency and non-governmental organization representatives to discuss management challenges of climate change. The goal for the Manager's Workshop is to identify common goals that can be best met through cooperative data collection and sharing efforts among agencies.

The third part of the workshop will be a half-day session in which a small sub-group of FWS staff and other invited participants will begin synthesis of workshop products into a written report.

Participants

Consulting Experts will be drawn from research agencies and academia. It is anticipated that most participants will be from Alaska institutions. Participants on the Fish and Wildlife Working Groups will consist of professionals with expertise in arctic fish and wildlife, drawn from federal agencies (FWS, USGS, NPS, BLM, CRREL), Alaska Department of Fish and Game, North Slope Borough, academic institutions (University of Alaska, University of Delaware), consulting firms (ABR Inc.), and nongovernmental organizations (Wildlife Conservation Society, Audubon Alaska, The Nature Conservancy, The Wilderness Society). It is anticipated that there may be interest in participation by additional agency and NGO staff and managers. Attendance by persons not explicitly invited as Working Group or Consultants will be primarily as observers; participation in technical discussions will be welcome, subject to the constraints of effective process.

Workshop Product

The workshop will result in a peer-reviewed report articulating the most urgent information needs and tasks needed to build capacity to predict climate-related impacts to fish and wildlife populations in the Arctic. The primary audience for this report will be the Department of Interior, with the intention of building support within the Department for funding the recommended work. Secondly, it is hoped that institutions with independent funding capacity (e.g., NSF, NOAA, non-governmental organizations) will incorporate the results of the workshop into their work plans in a collaborative fashion.