Wildlife Response to Environmental Arctic Change

17-18 November, 2008

UAF International Arctic Research Center
UAF Institute of Arctic Biology
ABR Inc.
Wildlife Conservation Society
Working with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people.

- Protect
- Manage
- Restore
Desired Future Condition

The Way it Used to Be
The Dinosaurs of Arctic Alaska; December 2004; Scientific American Magazine; by Anthony R. Fiorillo
Painting by Karen Carr
October 2002 Storm at Barrow
Potential Vegetation 2100
Climate Change at 2.5 x 1990 Atmospheric CO₂
Uncertainty = Inaction?

• Biological systems are hugely complex
  – Our understanding of processes under current conditions is poor, much less future condition
Conceptual model of the Arctic Coastal Plain ecosystem in the Arctic National Wildlife Refuge
Uncertainty = Inaction?

• Biological systems are hugely complex

• Model results may not be reliable
  – Biologists cannot make accurate predictions until physical process models are more accurate and precise
Shaking off the Paralysis of Uncertainty

IPCC Fourth Assessment Report

There is *medium confidence* that approximately 20-30% of species assessed so far are *likely* to be at increased risk of extinction if increases in global average warming exceed 1.5 - 2.5°C (relative to 1980-1999). As global average temperature increase exceeds about 3.5°C, model projections suggest significant extinctions (40-70% of species assessed) around the globe.
It Takes a Government

or at least multi-agency, multi-organization cooperative…
Landscape Conservation Cooperatives

• Share capacities - modeling, statistical analysis, data management, GIS, biology
• Provide best available science and decision support related to changing climate
• Promote shared collection, analysis and dissemination of climate data, modeling results, and related decision tools
• Target stewardship/management activities at all geographic scales
Products and Outcomes

• Strategic Plan for Terrestrial and Freshwater Arctic Ecosystems
  – Contains needed research, monitoring, and modeling
  – Identifies priority or sensitive species
  – Informs conservation goals

• Multi-agency, organization, university partnership
Workshop Structure

Background Information -- Monday

- Climate
- Permafrost
- Coastal Processes
- Geomorphic Processes
- Vegetation
- Hydrologic Processes
What species are sensitive indicators of hypothesized changes in habitat availability?
What species are sensitive indicators of hypothesized changes in habitat availability?
Workshop Structure

Background Information -- Tuesday

- Trophic Systems - Herbivores
- Trophic System – Aquatic Systems
Workshop Structure
Working Group Breakout Session II

Climate Scenarios

Hydrologic Processes

Ecosystem Change Pathways

Develop conceptual models of climate effects broadly relevant across species.
Workshop Structure

Breakout Session II

Develop conceptual models of climate effects broadly relevant across species.
Workshop Structure

Background Information -- Tuesday

• Frame Based Modeling
• Bayesian Network Modeling
Identify data/modeling gaps, emphasizing physical and ecological process models that may affect species in all 3 groups of interest.
Workshop Structure

The Lucky Few will remain on Wednesday to begin synthesis of Workshop results into a 5-year Strategic Plan that identifies priority research, modeling, and synthesis activities needed to predict climate-related impacts to fish and wildlife populations in arctic Alaska.
THANK YOU!