

CLIMATE CHANGE EFFECTS	1.BRAINSTORM: IMPACTS/ ISSUES (List of all impacts and issues affected by the Climate Change Effect)	2.*SPECIES, SPECIES GROUPS OR SYSTEMS (List taxa or systems in needing assessment as they relate to #1.)	3. PRIORITY SPECIES/SPECIES GROUPS/SYSTEMS (Top priority taxon, groups of species, or systems from #2.)	4.RESEARCH/ MONITORING (What research/ monitoring activities have occurred or should occur in the future to address the issues for the taxon, group or system identified in 3?)	5.MANAGEMENT ISSUES/OPTIONS (What management activities need to be considered relative to 3; what is currently being done, what needs to change or be considered in the future? Are we meeting our mission?)	6.OUTREACH (audiences, messages, products)	7.PARTNERS (Identify partners that have shared interests regarding 3, and consider ways to economize activities that address 4,5,6)	8. Next Steps (How are we going to accomplish # 4, 5 6. Consider feasibility & urgency – possibly in a stepwise progression.

Ecological Planning Unit Discussion: **CLIMATE CHANGE EFFECTS**

- **WETLANDS** Permafrost thawing will cause lakes and wetlands to drain in some areas, while creating new wetlands in other places. The balance of these changes is not known, but as freshwater habitats are modified, major species shifts are likely.
- **SPECIES MOVEMENTS** Ranges of many plant and animal species are projected to shift northward, resulting in an increased number of species in the Arctic. Some currently widespread arctic species are likely to suffer major declines.
- **LAND SPECIES** Species specifically adapted to the arctic climate are especially at risk, including many species of mosses and lichens, lemmings, voles, arctic fox, and snowy owl.
- **VEGETATION** Vegetation zones are projected to shift northward, with forests encroaching on tundra, and tundra encroaching on polar deserts. Limitations in amount and quality of soils are likely to slow this transition in some areas.
- **INCREASING FIRES** Forest fires are projected to increase in frequency and intensity. Such events subject habitats to invasion by non-native species.
- **INSECTS, VIRUSES, BACTERIA & OTHER DISEASE VECTORS** Infestations/disease outbreaks will likely increase in frequency & intensity.
- **MARINE SPECIES** Marine species dependent on sea ice, including polar bears, ice-living seals, walrus, and some marine birds are very likely to decline, with some species facing extinction.
- **UV** Increased ultraviolet radiation reaching the earth's surface as a result of stratospheric ozone depletion and reduction in spring snow and ice cover will impact ecosystems on land and water.
- **FOREST ECOLOGY** Old-growth forest is rich in species of lichens, mosses, fungi, insects, woodpeckers, and birds that nest in tree cavities. Climate warming would increase forest and insect-caused tree death, further reducing this valuable habitat which is already declining due to human activities.
- **NORTHERN FRESHWATER FISHERIES** Decreased abundance and local and global extinctions of arctic-adapted fish species are projected for this century. Arctic char, broad whitefish, and Arctic cisco, which are major contributors to the subsistence diet, are species threatened by a warming climate.
- **CARBON CYCLE** Replacement of arctic vegetation with more projective vegetation from the south is likely to increase carbon dioxide uptake. On the other hand, methane emissions, from warming wetlands and thawing permafrost, will likely increase.
- **SUBSISTENCE CULTURE** For coastal Alaska Natives, warming is likely to disrupt hunting/fishing and food sharing, as reduced sea ice causes animals on which these people depend decline, become less or not at all accessible. Access to traditional foods statewide is likely to be seriously impacted by climate warming.
- **WILDLIFE HERDS** Caribou and reindeer herds will face a variety of climate-related changes in their migration routes, calving grounds, and forage availability as snow and river ice conditions change.

Disclaimer: The following topics were redacted from *ACIA, Impacts of a Warming Arctic: Arctic Climate Assessment. Cambridge Univ. Press, 2004*, for the Climate Change Forum to generate discussion and should not be construed to be determining factors. We chose these topics simply as a beginning point, knowing other relevant issues may have been missed. We encourage participants to bring up any pertinent missed issues.