Photo credit: Carol Freeman

Climate Change Impacts on Regional Biodiversity

Climate Update to the Biodiversity Recovery Plan

Climate change is affecting both people and nature in the Chicago Wilderness region. Scientific studies project the following local impacts:

- Changes to precipitation patterns, resulting in wetter winters and springs and drier summers
- Increased length and intensity of heat waves in summer, with higher levels of humidity
- Increased frequency of extreme weather events, leading to more frequent and more severe dry spells as well as more flooding from heavy rains
- Milder winters, mainly due to a rise in the average nighttime minimum temperature
- More lake-effect snow as warmer weather increases the chance of heavy snows
- Earlier arrival of spring

All of these changes have the potential to both **directly** and **indirectly** affect and threaten our region's local plant and animals. Direct affects could include changes in temperature and water availability that impact a species' ability to survive in a given environment. Indirect affects could include species responding differently and at different rates to climate change, which could disrupt important relationships between plants and animals.

To better understand these changes and help communities prepare for them, Chicago Wilderness has produced a **Climate Change Update to the Biodiversity Recovery Plan**. This tool is intended to be a detailed and stand-alone reference that supports the development of specific adaptation strategies for the natural communities of Chicago Wilderness. The Update is a tool that assists land managers, policy makers and individuals in creating and implementing strategies for biodiversity recovery and adaptation.

The original Biodiversity Recovery Plan was produced in 1999 and still drives conservation strategies of the alliance today. As there is now overwhelming scientific evidence of climate change, this Update is a natural progression for this living document. The Update is intended to encourage discourse on the ways in which climate change may influence how we think and act. The goals of the Update are to:

1. discuss the impacts of climate change on specific Chicago Wilderness conservation targets and threats
2. evaluate the conservation strategies currently being used in Chicago Wilderness through a climate change lens
3. outline actions and strategies that can help promote biodiversity adaptation for specific conservation targets
4. encourage communication among managers, and between managers and researchers, on what research is needed to help inform adaptive management decisions

This is a **living document**, meant to promote dialogue between Chicago Wilderness members on all facets of biodiversity adaptation in our region, from research and planning to implementation and outcomes. This document is an online resource for two reasons. The first is to enable land managers and others who are implementing these strategies to give their feedback. Second, to allow the document to be kept up to date as new information becomes available. If you have comments either on current content or patterns/trends being observed at particular sites, please add these to the comment section at the end of each webpage. Comments will be reviewed and integrated on a regular basis.

As explained in the Climate Update to the Biodiversity Recovery Plan, plants and animals, especially at-risk species, face many direct and indirect impacts as a result of our changing climate:

Plant Species

From wild flowers to mighty oaks, climate change will affect our familiar regional plant species. For example, the rich, plant-filled wetlands of our region could suffer. The Chicago Wilderness region has one of the most diverse and highest quality collections of wetlands in North America, which are home to threatened, endangered and even globally rare plant and animal species. Wetlands are important habitat areas, but they also provide services for people and our communities. Wetlands have great capacity to store excess water and can reduce flooding damage. Wetlands also can filter pollutants from water, which can improve our water quality.

Yet, as a result of climate change, increased storm intensity and flooding may increase non-point source pollution from agricultural and urban areas, threatening the wetlands' water quality. Additionally, there is a possibility that some wetlands may begin to dry out as temperatures rise, evaporation rates increase and there is more pressure on groundwater resources; this could create a feedback loop that further fragments and stresses the remaining wetland habitats.

Animal Species

Climate change will also impact the region's animals. For example, a number of bird species will experience significant changes in their range. As many as 44 species of birds that currently breed in Illinois may no longer breed in the state by the end of the century. We could lose such familiar species as tree swallow, black-capped chickadee, white breasted nuthatch, house wren, gray catbird, red-eyed vireo, yellow warbler, ovenbird, scarlet tanager, chipping sparrow, Baltimore oriole and American goldfinch.

Some research has suggested that climate change may also negatively impact pollinator species like bees, butterflies and bats. As temperatures change, plants may open earlier in the year, before bees emerge or butterflies leave their chrysalis. This could make it harder for animals and insects to remain in our region if they missed their primary food supply because the plants changed to a different schedule. Also, in general, many kinds of pest insects, like mosquitoes, prefer warmer weather. Warmer weather earlier in the year may result in greater damage from insect pests.

At-Risk Species

Because some species depend on rare natural areas that are fragmented by roads and developments in this region, their ability to move within or to a new habitat in response to climate change will be limited. Climate warming will be a particular challenge for endangered, threatened, highly

specialized, and other at- risk species because climate change will compound the stresses these species already face, and may push them beyond their ability to cope.

To learn more about how climate change may impact the forest preserves in our region, visit Forest Preserves and Climate Change, a resource developed by students at Northwestern University.

To help protect our region's plants, animals and at-risk species, Chicago Wilderness is organizing the alliance's vast network of conservation experts to create tools, strategies, and local solutions to climate change that can have a global impact.

For more information on climate change impacts, check out:
Hayhoe, K., VanDorn, J., Croley II, T., Schlegal, N. and Wuebbles, D. 2010. Regional climate change projections for Chicago and the US Great Lakes. *Journal of Great Lakes Research* 36(sp2): 7-21.

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