Climate Change Update to the Chicago Wilderness Biodiversity Recovery Plan:

What Does it Mean to the Calumet Region?

Dr. Abigail Derby Lewis, Climate Change Ecologist
The Field Museum
A Changing Global Climate

✧ Higher temperatures
✧ Changing landscapes
✧ Wildlife at risk
✧ Rising seas
✧ Increased risk of drought, fire & floods
✧ Stronger storms & increased storm damage
✧ More heat-related illness & disease
✧ Economic losses
Extreme Precipitation

Average Days Per Year > 2" Precip

- Historical
- Low emissions future
- High emissions future

1961-1990  |  2010-2039  |  2040-2069  |  2070-2099
Higher Emissions:

31 days

Projected number of 100-degree days per year in Chicago

Lower Emissions:

8 days
Impacts of Climate Change in Indiana

By the end of the century, Indiana summers may feel like those of current-day Oklahoma.

Union of Concerned Scientists, 2009

**Climate protection policies, if implemented quickly, could reduce emissions significantly below the emissions scenario considered here**
Impacts of Climate Change in Illinois

By the end of the century, Illinois summers may feel like those of current-day east Texas.

Union of Concerned Scientists, 2009

**Climate protection policies, if implemented quickly, could reduce emissions significantly below the emissions scenario considered here.**
Climate Change Impacts: Vegetation

- Projected to move northward
- Within next several decades: 5b – 6a*
- By end of century: 6b (L) – 7a (H)

*Irrespective of future emissions scenarios
(Hellmann et al. 2010)
Climate Change Impacts: Animals

Changes in Abundance & Distribution

American goldfinch
(Carduelis tristis)
Climate Change Impacts: Animals

Changes in Abundance & Distribution

- Responses of species will depend on their climatic tolerances and on responses of key species they rely on.

American goldfinch (Carduelis tristis)

National Wildlife Federation
Climate Change Impacts: Animals

Changes in Abundance & Distribution

- Specialists and threatened species likely to be most challenged (e.g., Karner Blue butterfly: *Lycaeides melissa samuelis*)
Major Threats To Biodiversity

- Habitat Destruction
- Invasive Species
- Pollution

Photo: Mike MacDonald/ChicagoNature.com
Major Threats To Biodiversity

• Habitat Destruction
• Invasive Species
• Pollution

**CLIMATE CHANGE IS A THREAT AMPLIFIER**
Climate Action Plans

City of Chicago Climate Action Plan

- Human population
- Buildings
- Transportation infrastructure
- Landscaping

Chicago Wilderness Climate Action Plan for Nature

- Urban forests
- Water infrastructure
- Vacant land

- Rivers and lakes
- Restored natural areas
- Remnant natural areas
- Native species
Climate Action Plans

Chicago Wilderness Climate Action Plan for Nature

Over 360,000 acres of protected open space
What Is It?

- Identify and understand the specific ways natural communities, and existing threats, will be affected by climate change

- Examine if strategies needed to promote biodiversity adaptation differ from current restoration/conservation strategies

- Outline actions to help natural communities adapt to both current and future landscapes
Biodiversity Recovery Plan
Climate Change Review

*Climate Change Update*

- What Is The Process?
  - Composite information from 2 workshops (Feb, July 2009)
  - Input and feedback from members of the CW Climate Change Task Force
  - Input and feedback from regional/local experts in climatology, ecology, biology, genetics, environmental science, and natural resource and land management
Biodiversity Recovery Plan
Climate Change Review

*Climate Change Update*

- **Where Are We Now?**
  - Internal content review by the Task Force and Research Specialists
  - Workshop with land managers to get input on adaptation strategies
  - Open review for CW members
  - Living document on-line web portal: interactive with blog and chat applications, annual updates of content
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Wetlands, Wet Prairies, Wet Swales

- 62% of Calumet Region Restoration Sites

CW Magazine Calumet Region Map - Bouman et al 2009
Data from: An Assessment of Restoration and Stewardship in the Calumet Region of Illinois and Indiana, 2009; Restoration Inventory Project, 2006
Hydrology in the Calumet Region

- Most of the hydrologic systems in the Calumet region have been altered

- Changing precipitation patterns change (e.g., overall drier summers, more severe flood events) will create even greater challenges for these systems
Most of the hydrologic systems in the Calumet region have been altered

Changing precipitation patterns change (e.g., overall drier summers, more severe flood events) will create even greater challenges for these systems

- Wetlands disconnected from lake, floodplains, and from each other
- Emergent marshes drying up
General Adaptation Strategies

Examples

- Make current projects “climate smart”: e.g., sediment remediation project along West Branch of Grand Calumet River
- Manage species that reduce water from permanent water habitats (e.g., cottonwoods, cattails, *Phragmites* in Spangler Fen)
- Keep full hydrologic gradient intact within natural communities
Wetlands, Wet Prairies, Wet Swales

- Total acres in CW Calumet Bi-State area: 551,000
- Total managed acres: 42,000

CW Magazine Calumet Region Map - Bouman et al 2009
Data from: An Assessment of Restoration and Stewardship in the Calumet Region of Illinois and Indiana, 2009; Restoration Inventory Project, 2006
Wetlands, Wet Prairies, Wet Swales

- Total acres in CW Calumet Bi-State area: 551,000
- Total managed acres: 42,000
- GIV: 169,000

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Shifting Landscapes, Shifting Perspectives?

**Examples**

- How might our perspective on ecological concepts change?
  - “Native” species
  - Best Management Practices
  - Restoration
Shifting Landscapes, Shifting Perspectives?

Examples

- How might our perspective on ecological concepts change?
  - “Native” species
  - Best Management Practices
  - Restoration

- Overall focus on ecosystem functionality
  - Managing for the arenas, not the players
ACKNOWLEDGEMENTS

Laurel Ross
Doug Stotz
Mark Bouman
Bob Moseley
Paul Labus
Kirk Anne Taylor
Kim Hall
CW Climate Change Task Force