

Catalyzing Climate Adaptation at the Community Scale



Photo: USFS/Terry Cacek

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Photos: Corbis, Eyewire, Comstock



Presentation Overview

- Climate-Smart Communities Program
- Climate-Smart Conservation in the Great Lakes Region
- Nature-Based Approaches to Urban Adaptation
- Moving from the Site – Community Scale



Photos courtesy of various sources



Climate-Smart Communities Program

- Promote nature-based approaches to build resilience in urban areas & protect people, property, and habitats.
 - What is the appropriate mix of grey and green infrastructure in urban areas?
- Encourage local governments, utilities, and regional planning organizations to incorporate nature-based approaches into climate action, sustainability, and land use, and other planning activities.
- Provide guidance for local re-building and recovery efforts after natural disasters.
- Help ensure that long-term disaster risk reduction & hazard mitigation activities incorporate best-available climate change science & prioritize nature-based approaches.



Climate Impacts Addressed

- SLR & Coastal Flooding
 - Living shorelines/natural bank stabilization
- Drought & Increasing Aridity
 - Water conservation, native plants
- Inland River Flooding
 - Restore natural floodplains
- Stormwater Flooding
 - Green infrastructure, including LID
- Urban Heat Island Effect (UHIE)
 - Increase natural areas, trees

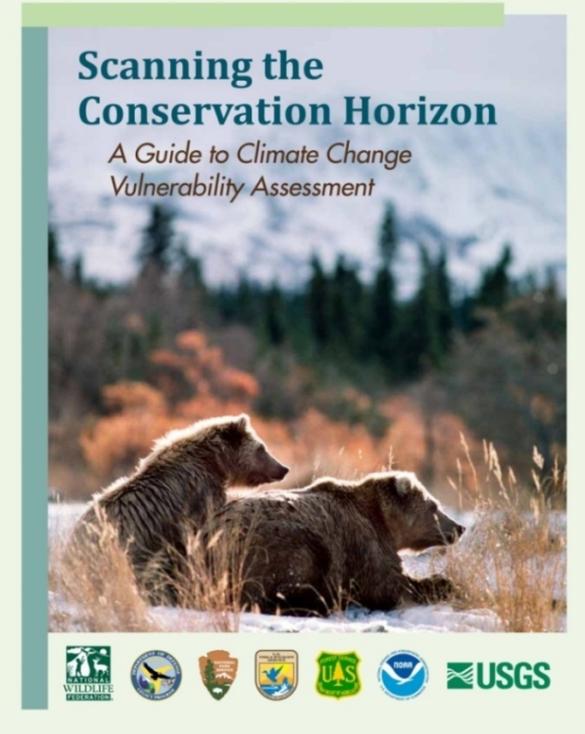


Climate-Smart Conservation

Adaptation:

Identifying, preparing for, and responding to expected climate change impacts on people & ecosystems

- Rethinking the way we protect wildlife - in a warmer world, some conservation strategies we've used in the past may not work.
- We might need to work in different places or protect plants and animals that haven't needed our help before.
- Restoring & enhance natural systems in a climate-smart way.
 - Use nature to protect people from the impacts of climate change, while also supporting wildlife (ecosystem based adaptation).

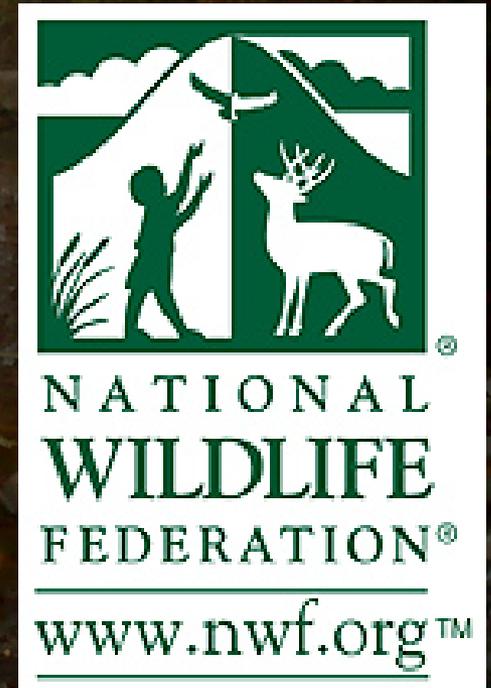
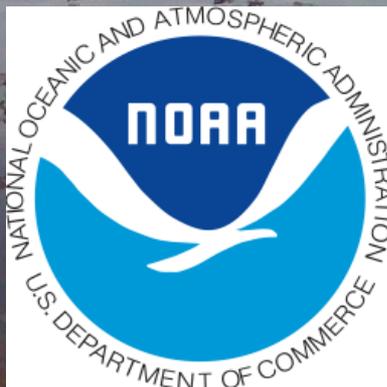


Catalyzing Adaptation in the Great Lakes

- NWF has been providing climate-smart guidance for 7 Great Lakes Restoration Initiative (GLRI) projects.
- Two of these projects are serving as pathways to better understand the needs of coastal communities to help them prepare for the impacts of climate change.
 - Black River – Lorain, Ohio
 - Clinton River Spillway – Macomb County, Michigan



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Black River Watershed AOC & Climate Change

- Entire watershed is designated an Area of Concern by U.S.-Canada Great Lakes Water Quality Agreement
 - AOC is a location that has experienced environmental degradation
 - Industrial history (steel) has left the Black River severely degraded
 - Other sources of pollution include stormwater and agricultural runoff

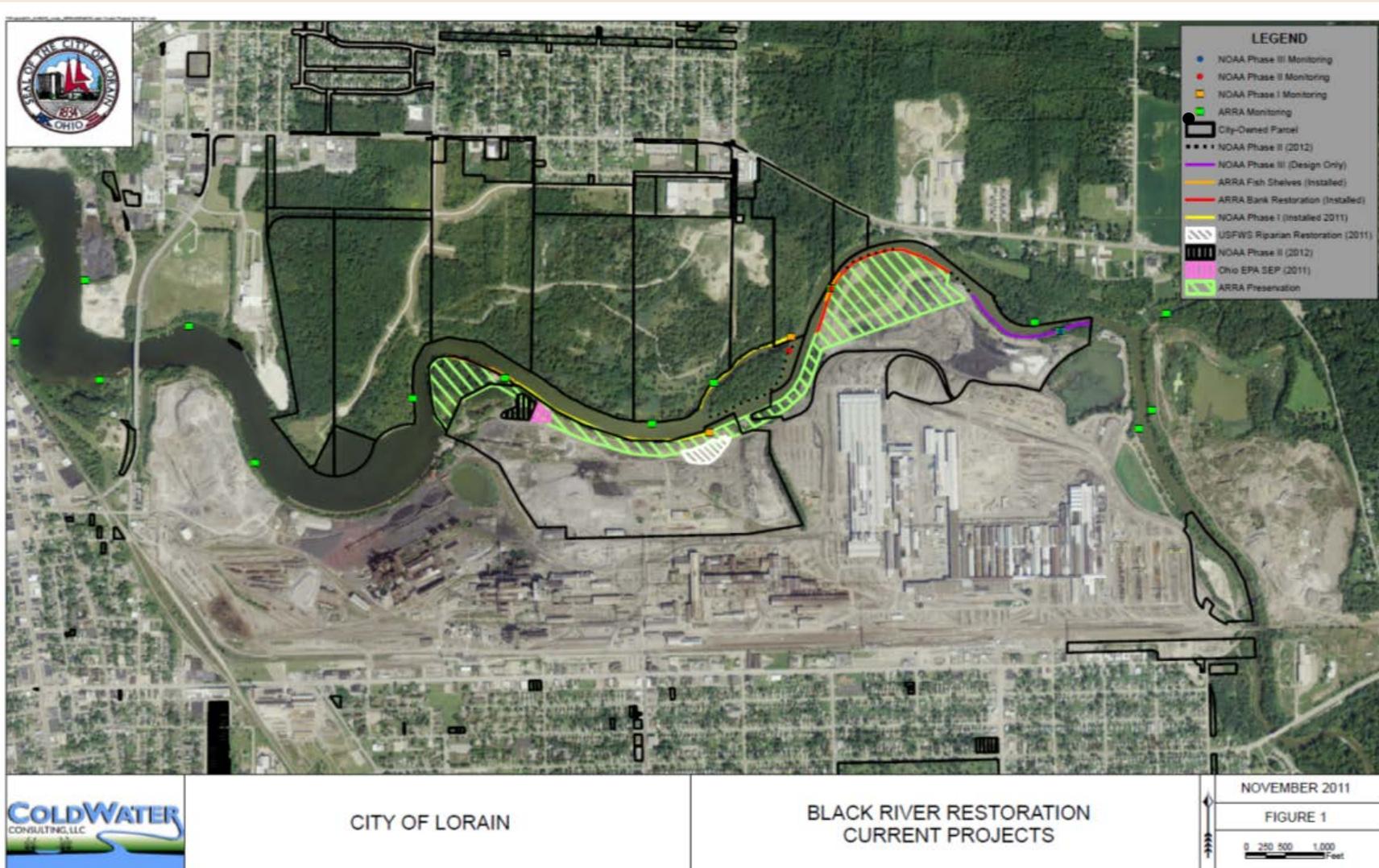


Project Scale

- \$1.1 million GLRI funding awarded from NOAA
- 2,800 feet fish habitat shelves
- 1,570 feet bank restoration
- 2.3 acres riparian restoration
- 0.3 acres invasive species removal
- 45,000 cubic yards of slag removal
- Construction completed 2012

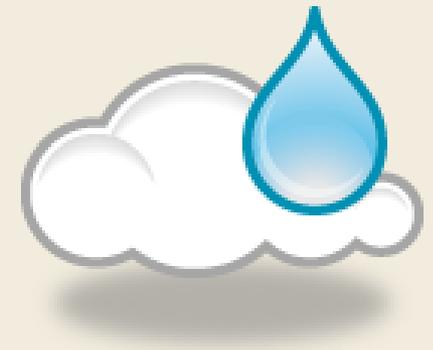


City of Lorain Black River Projects



Key Climate Impacts

- Water Temperatures
- More winter precipitation
- More flash flooding
- More extreme drought



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Climate Change Factor: Increasing Air & Water Temperatures

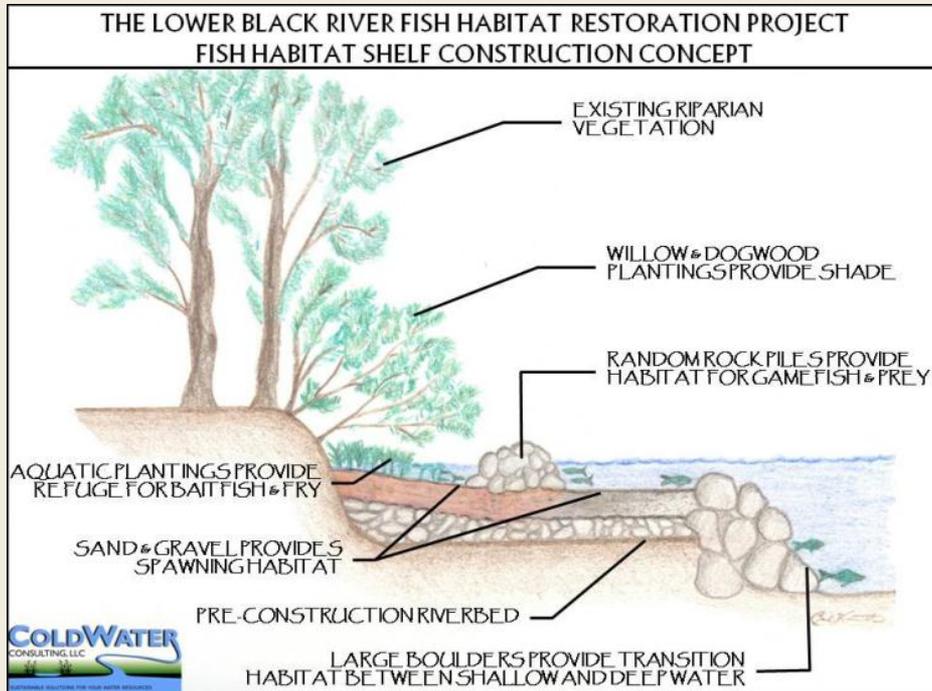


Climate-smart option:

Re-vegetation of stream sides



Climate Change Factor: Water Level Fluctuations



Climate-smart option: Construct fish shelves at varying elevations



Climate Change Factor: Hardiness Zones Changes

Species Previously Used for Restoration	Scientific Name	Suitability in Historic Climate	Suitability in Future Climate	USFS Model Reliability
Black Walnut	<i>Juglans nigra</i>	Okay	Okay	Medium
Black Willow	<i>Salix nigra</i>	Okay	Okay	Low
Chokecherry	<i>Prunus virginiana</i>	Okay	Okay	Low
Eastern Cottonwood	<i>Populus deltoides</i>	Okay	Okay	Low
Eastern Redbud	<i>Cercis canadensis</i>	Okay	Okay	Medium
Eastern White Pine	<i>Pinus strobus</i>	Okay	Low	High
Flowering Dogwood*	<i>Cornus florida</i>	Okay	Okay	High
Northern Red Oak*	<i>Quercus rubra</i>	Okay	Okay	High
Pin Oak	<i>Quercus palustris</i>	Okay	Okay	Medium
Red Maple*	<i>Acer rubrum</i>	Okay	Okay	High
River Birch	<i>Betula nigra</i>	Okay	Okay	Low
Serviceberry	<i>Amelanchier spp.</i>	Okay	Okay	Medium
Shagbark Hickory	<i>Carya ovata</i>	Okay	Okay	Medium
Shortleaf Pine	<i>Pinus echinata</i>	Low	Okay	High
Silver Maple	<i>Acer saccharinum</i>	Okay	Okay	Medium
Slippery Elm*	<i>Ulmus rubra</i>	Okay	Okay	Medium
Swamp White Oak	<i>Quercus bicolor</i>	Okay	Okay	Low
Sycamore	<i>Platanus occidentalis</i>	Okay	Okay	Medium
Wild Plum	<i>Prunus americana</i>	Low	Low	Low
Yellow-Poplar	<i>Liriodendron tulipifera</i>	Okay	Okay	High

* Species Likely to fare best in both existing and future projected climate

Climate-Smart Option:
Plant trees suitable for a
changing climate

- Use models when available (eg., USFS)
- Plant trees on northern edge of range
- Plant heat-tolerant trees (USDA heat index)



Moving from the Site-Community Scale

- NWF climate-smart guidance is now being applied across projects along the Black River.
- Climate-Smart projects along the Black River are local examples we use to educate the community about climate change and nature-based approaches to build resilience.
- Leveraging existing relationships with City of Lorain, Coldwater Consulting and other partners.
- Climate-smart restoration projects are pathways to move from the site-level to the community scale to build urban climate resilience.



Coastal Communities Toolkit

- Case study on climate-smart projects
- How is climate change is affecting the community?
- Examples of nature-based approaches to provide natural protection
- Regulatory, policy, land-use/zoning, and other ways to implement nature-based approaches
- Collaborating with the City of Lorain, Soil and Water Conservation Districts, and others to understand how this tool can be used to meet their needs
 - Eg., City of Lorain has a high % of vacant properties



Nature-Based Approaches

- Enhance and protect urban tree canopy; plant trees that can survive and thrive in a changing climate
 - Provide shade and cooling, manage stormwater (and reduce GHGs)
 - Planting list we developed for the restoration project could be adapted for use in the community
- Green infrastructure (landscape features like trees and green spaces, as well as low impact development approaches, like rain gardens)
 - Capture increased precipitation due to climate change
 - Reduce polluted run-off into the Black River and Lake Erie



Climate-Smart Re-Cap

- Strategies to restore habitats in a climate-smart way can be linked to / catalyze community resilience
 - eg., Stormwater flooding not only causes damage to property in Lorain, but also pollutes the Black River and the areas we are working to restore!
- NWF's climate-smart restoration activities have provided a unique opportunity to engage communities about urban adaptation.
- Coastal Communities Toolkit will be shared by partnering with regional and national organizations, hosting webinars, etc.
 - Expected release: November 2013



For more information:

www.nwf.org/climate-smart-communities

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Photos courtesy of Eyalim Kuznetsov

