JFNew

• Ecological Consulting • Native Plant Nursery •

• Restoration Services • Cultural Resource Management •

Calumet Summit 2010

Linking Science to Restoration

Science-based Restoration

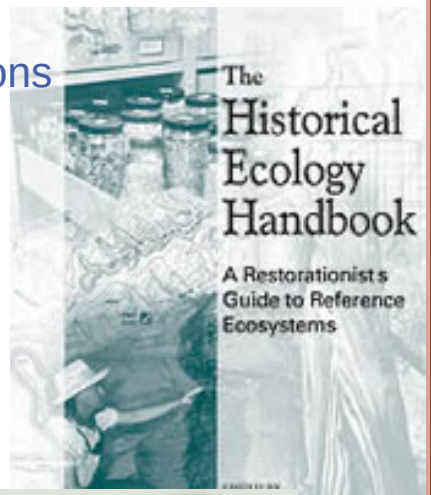
Baseline data

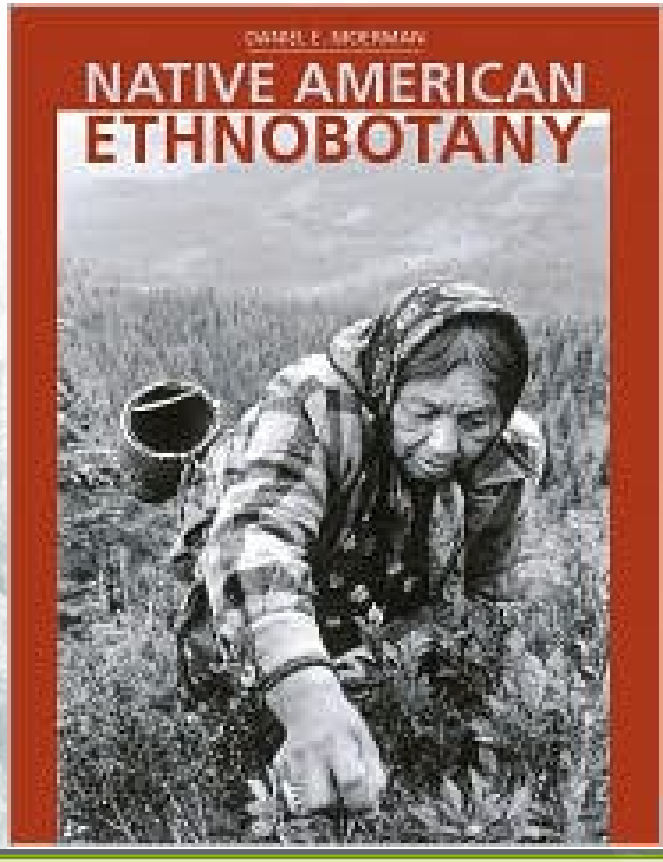
- Biotic-abiotic data sets
- Metrics/Indicators
- Timeframe and budget constraints
- Assumptions based on previous research
- Ethnobotanical-cultural investigations
- Economics, public heath etc..

Best Available Science

- Innovation
- Design

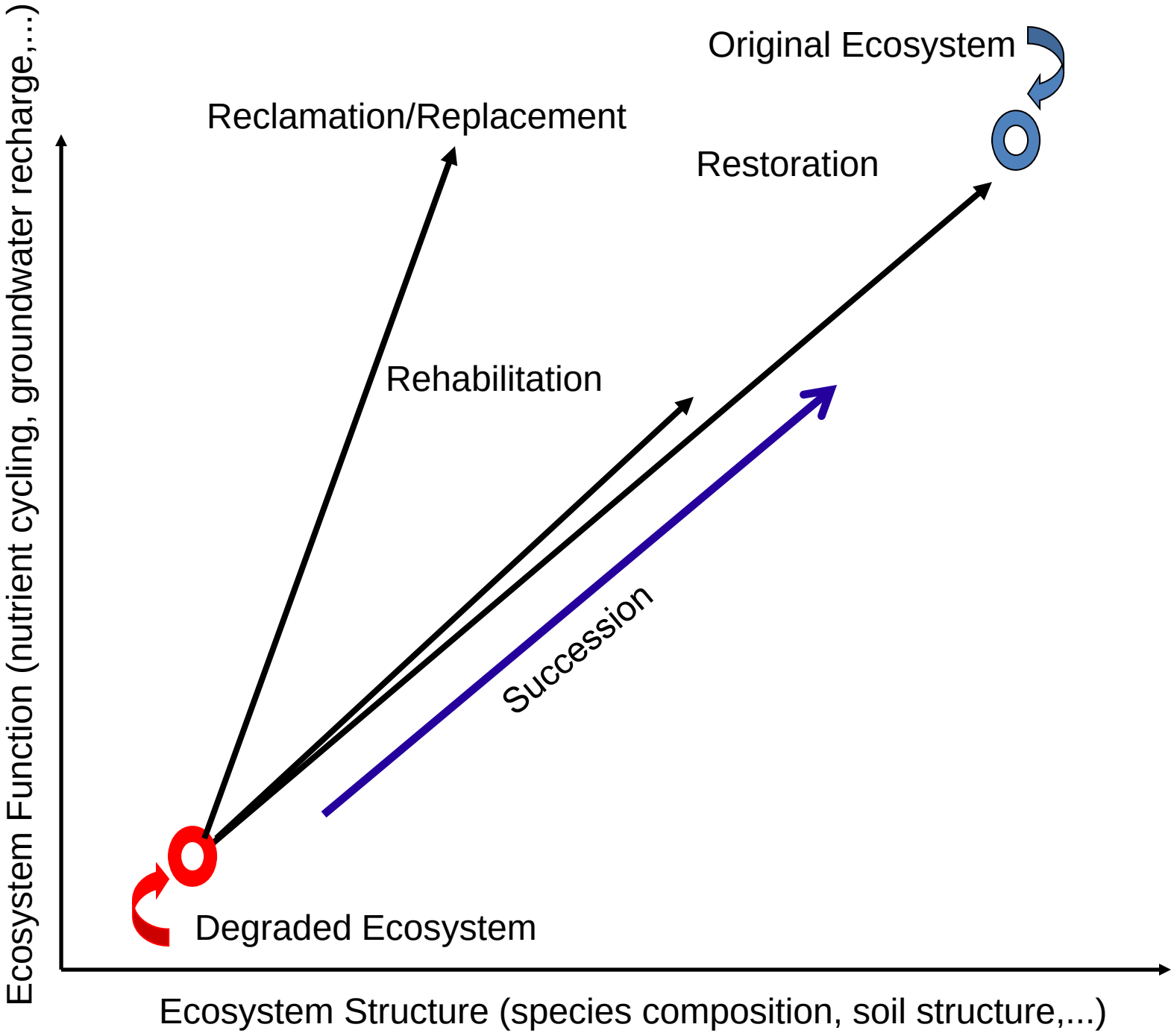
Implementation



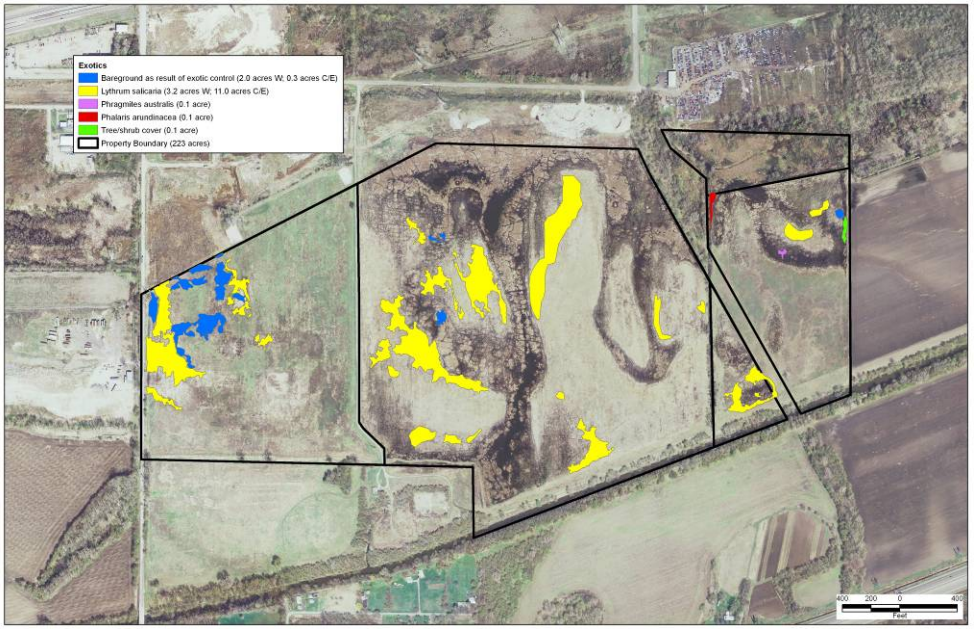


Textbook Definitions

- Restoration: “return to exact pre-disturbance conditions”
  - Example: Remove invasive species from an otherwise intact system
- Reclamation: Create a site similar in ecologic function with similar but not necessarily the same organisms (the new state is useful, but not necessarily the same)
  - Example: Seed site of a former prairie with “JFNew Basic Prairie Mix”
- Reallocation: Directing a site to a state that does not necessarily reflect pre-disturbance conditions
  - Example: Planting a site that had once been forested to prairie
- Reconciliation, remediation, creation, etc…


Original Ecosystem
Reclamation/Replacement
Restoration
Rehabilitation
Succession
Degraded Ecosystem
Ecosystem Function (nutrient cycling, groundwater recharge,...)
Ecosystem Structure (species composition, soil structure,...)

Reclamation



Restoration

Great Lakes Multi-Year Restoration Action Plan Outline

Tracking Progress

- Targets and Measures toward Restoration and Protection Goals and Objectives
- Accountability System to allow systematic reporting and public access to expenditures and progress

Annual Reports starting in 2011

Appropriate <u>science</u> will guide future actions

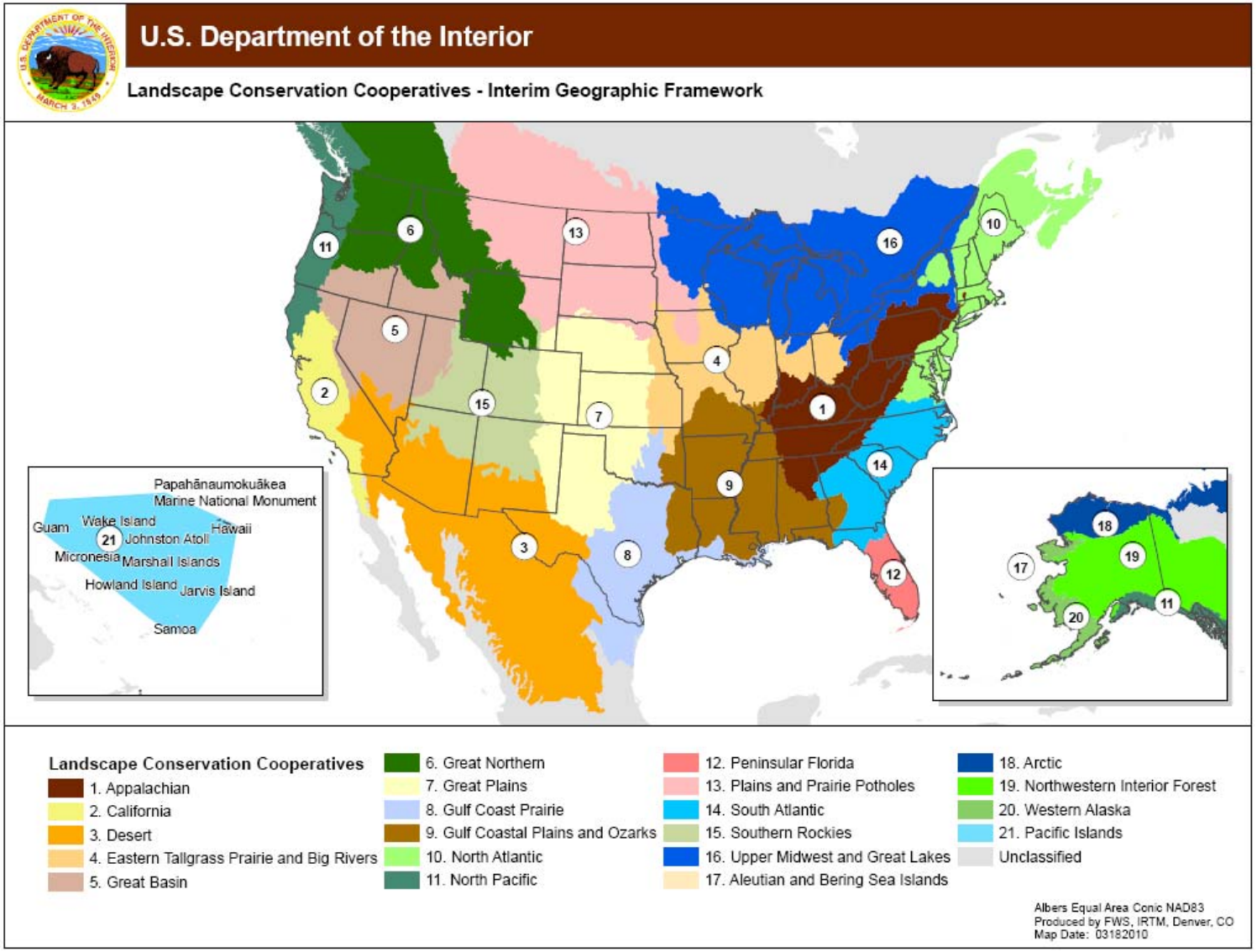
“[Restoration monitoring] may allow restoration practitioners to detect early warnings that the restoration effort is not on track, to gauge how well a restoration site is functioning, to coordinate projects and efforts for consistent and successful restoration, and to evaluate the ecological health of specific coastal habitats both before and after project completion.”

- Science-Based Restoration Monitoring of Coastal Habitats (NOAA)

Accountability, Monitoring, Evaluation, Communication, and Partnerships

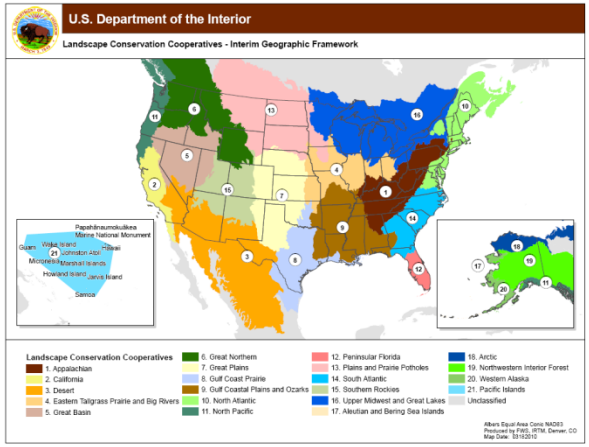
Information needs to be based on best available science, and compiled and communicated consistently to decision-makers to allow assessment of ecosystem conditions and tracking of restoration progress.

Landscape Conservation Cooperatives



Landscape Conservation Cooperatives

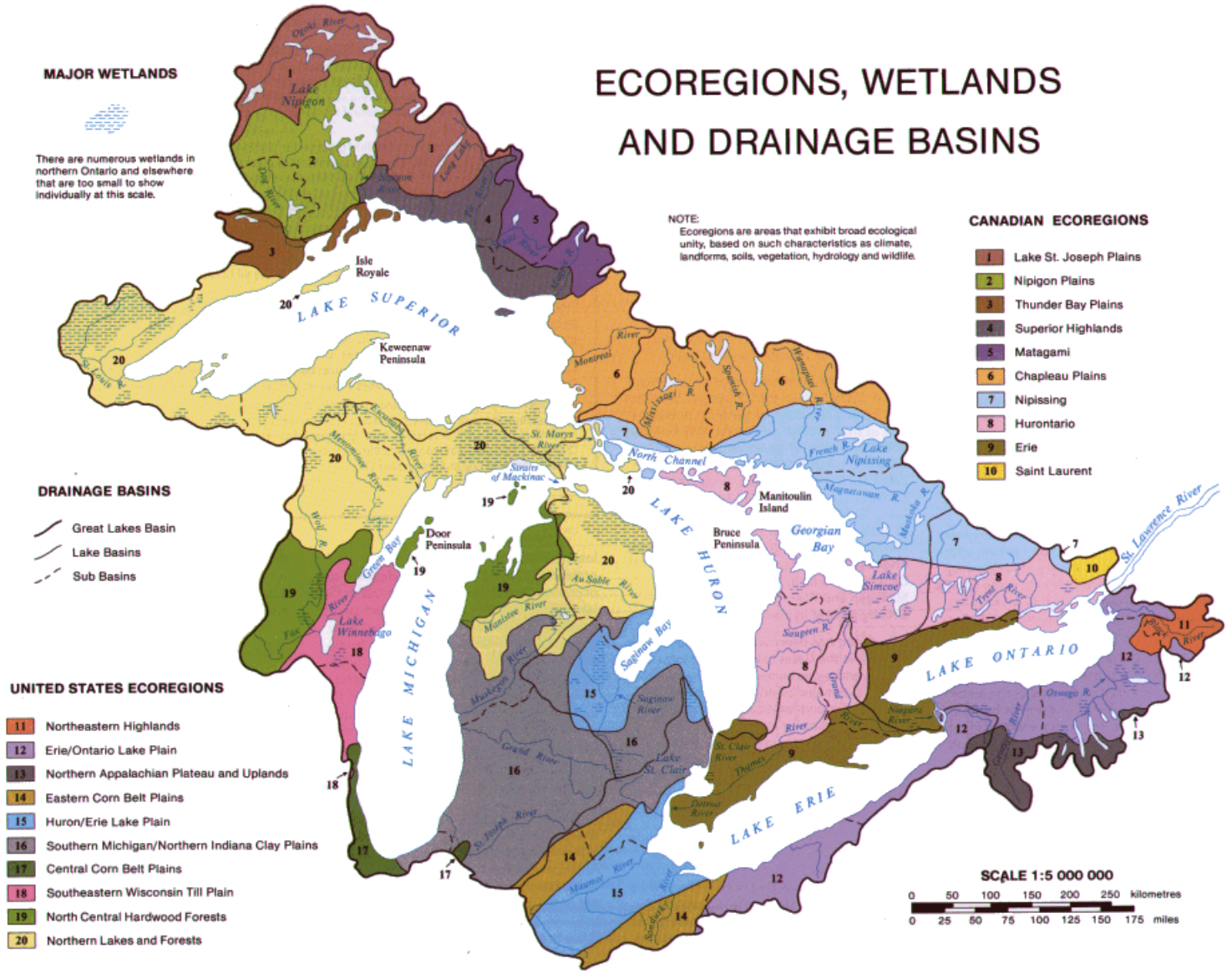
"[LCCs] will provide a strong link between science and conservation delivery without duplicating existing partnerships or creating burdensome or unnecessary bureaucracy."



LCCs:

- Provide scientific and technical support for conservation at "landscape" scales
- Focus on the entire range of an identified priority species or group of species
- Support biological planning, conservation design, prioritizing and coordinating research, and designing species inventory and monitoring programs

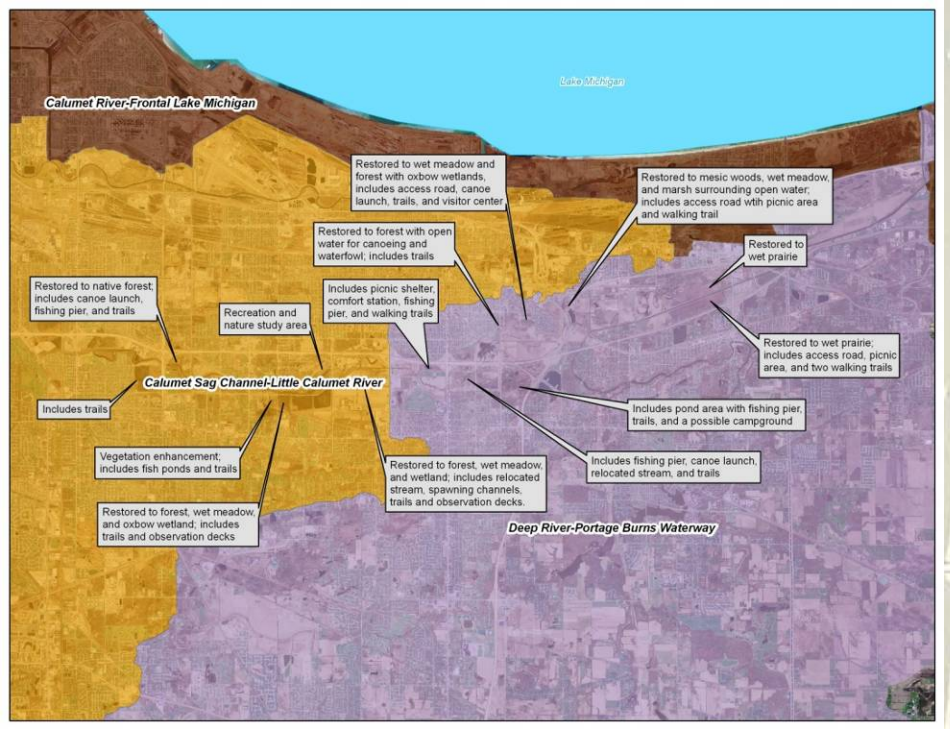
ECOREGIONS, WETLANDS AND DRAINAGE BASINS

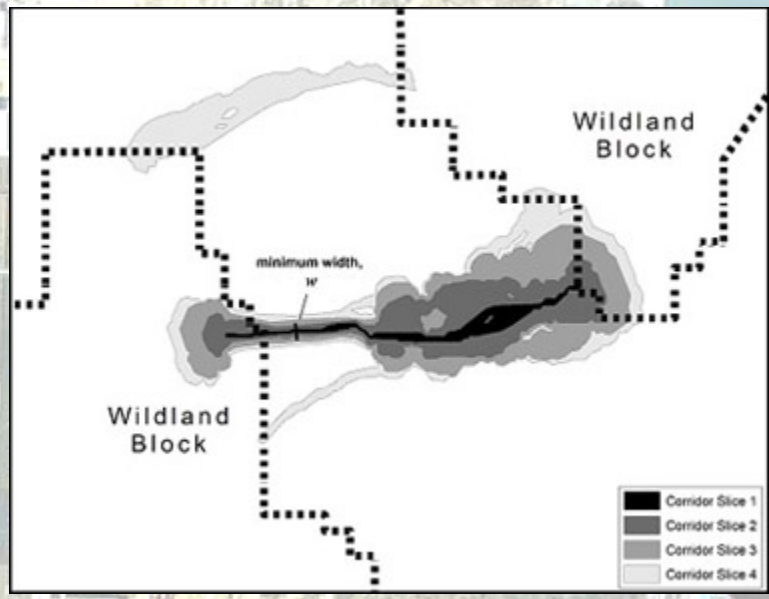


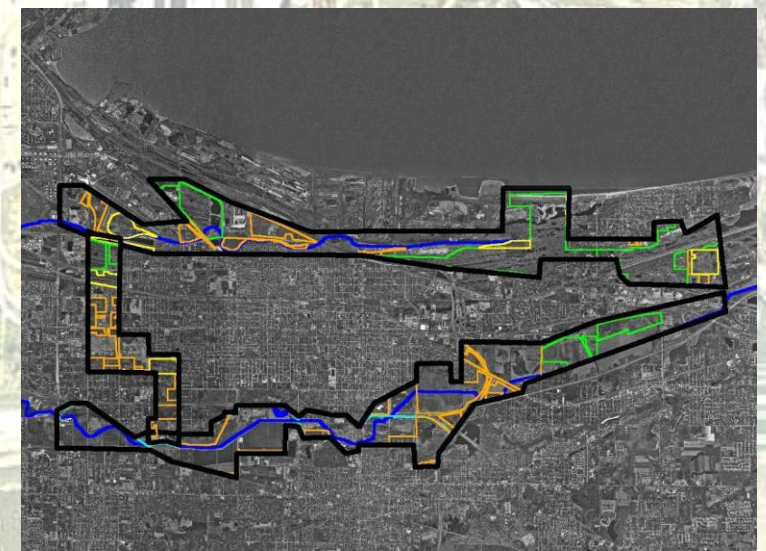
Environmental Systems

"Everyone lives downstream from someone else." - Anonymous

Great Konomick River Restoration







Native Plants:

Their Role in the Landscape & Ecosystem

What are native plants?

Naturally occurring plants within a specific habitat of a specific geographic region.

- Adaptable
- Resistant to disease
- Drought and pest tolerant
- Support wildlife habitat
- Provide food / shelter
- Promote ecosystem health
- Promote ecosystem resilience
- Improve water / air quality
- Reduce maintenance costs

Not All Green Space is Created Equal… (but does it work?)

Figure 1. Comparison of native prairie and turf grass root and shoot growth

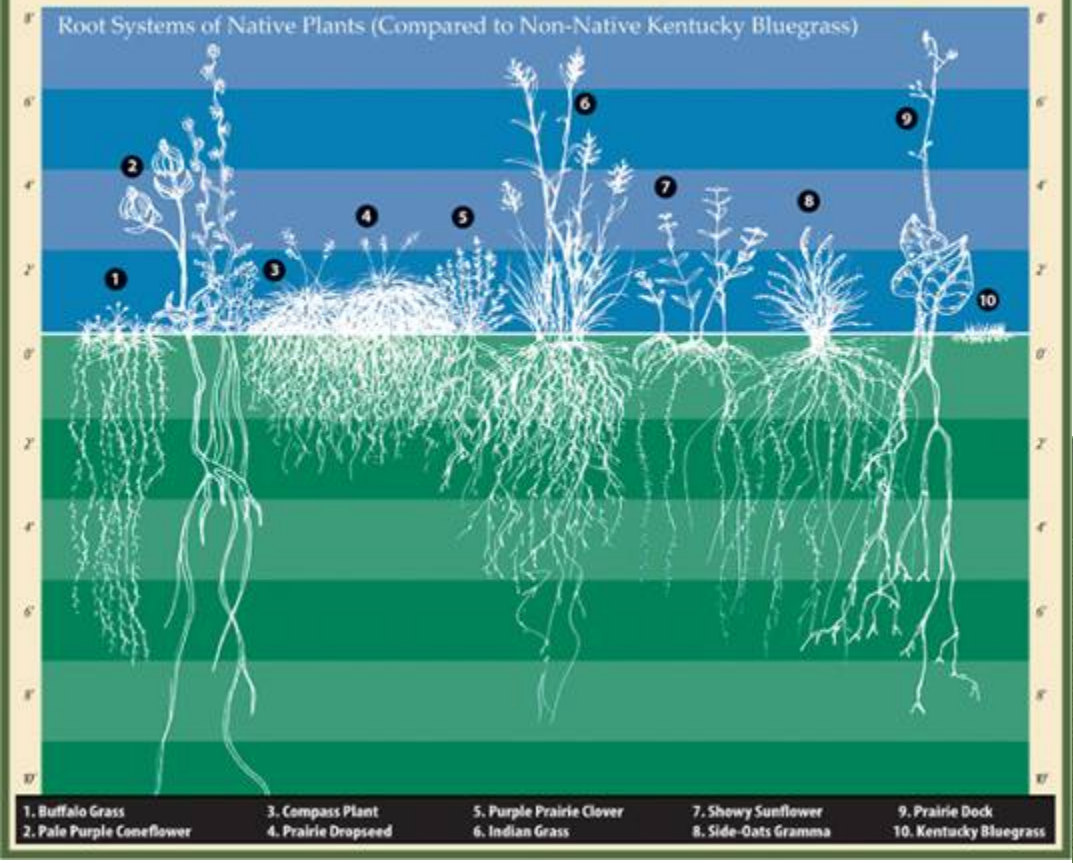


Figure 4. Comparison of measured hourly infiltration rates and soil bulk density under multispecies buffer, crops, and grazed pasture (from Bharati et al. 2002)

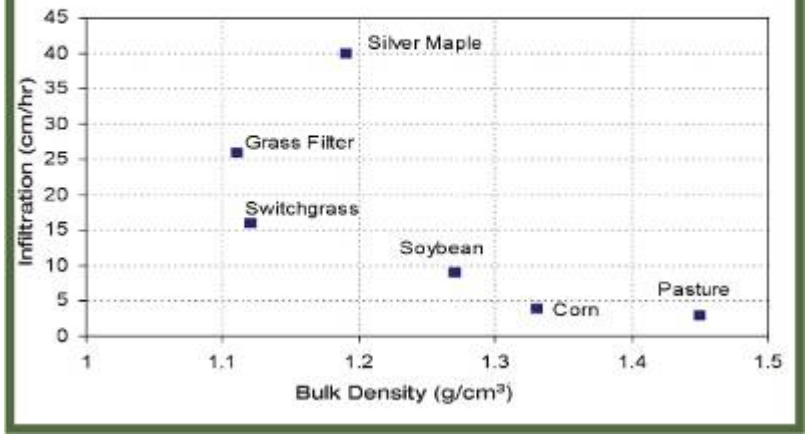
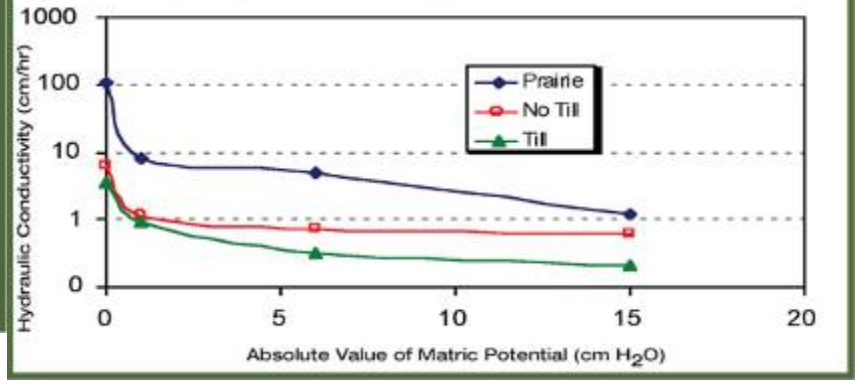


Figure 2. Near-saturated hydraulic conductives at 0- to 5-cm depth of natural prairie, no-till, and conventional till farm fields in the Palouse region of eastern Washington (Fuentes, Flurry, and Bezdicek 2004)



Management v. Restoration

Giant reed grass (*Phragmites australis*)

Chemical Methods
- Spot Spraying
- Hand Wicking
- Boom/Aerial Spraying

Mechanical Methods
- Cutting/Mowing
- Hand Pulling
- Burning

Biological Methods
- Natural competition
- Introduced competitors

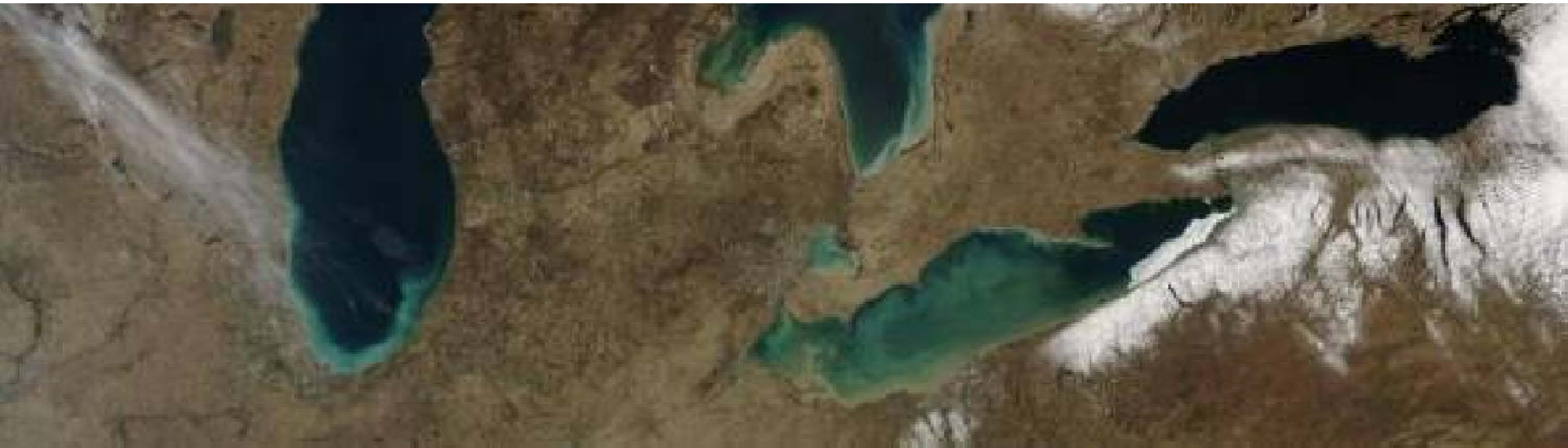
Hydrological Methods
- Water level alteration

Techniques are usually selected based on effectiveness, available resources, proximity of desirable vegetation, plant growth form, site accessibility, hydrology, or other factors.

IVM, or Integrated Vegetation Management, is a practice that utilizes multiple techniques, and often produces the best results.

Ecosystem Resiliency

"Ecosystem resilience describes the capacity of an ecosystem to cope with disturbances, such as storms, fire and pollution, without shifting into a qualitatively different state. A resilient ecosystem has the capacity to withstand shocks and surprises and, if damaged, to rebuild itself. In a resilient ecosystem, the process of rebuilding after disturbance promotes renewal and innovation."



Adaptive Management

- Use best available science, and adapt as new science, information and methodologies become available.
- ID and evaluate conservation targets
- Information/data distribution
- Improve products, services and restoration programs.
- Detect new and emerging environmental challenges

Science, Innovation and Design…

Increased complexities in Calumet – contamination - where will it move/migrate in reaction to climate change

Approaches to Stabilization

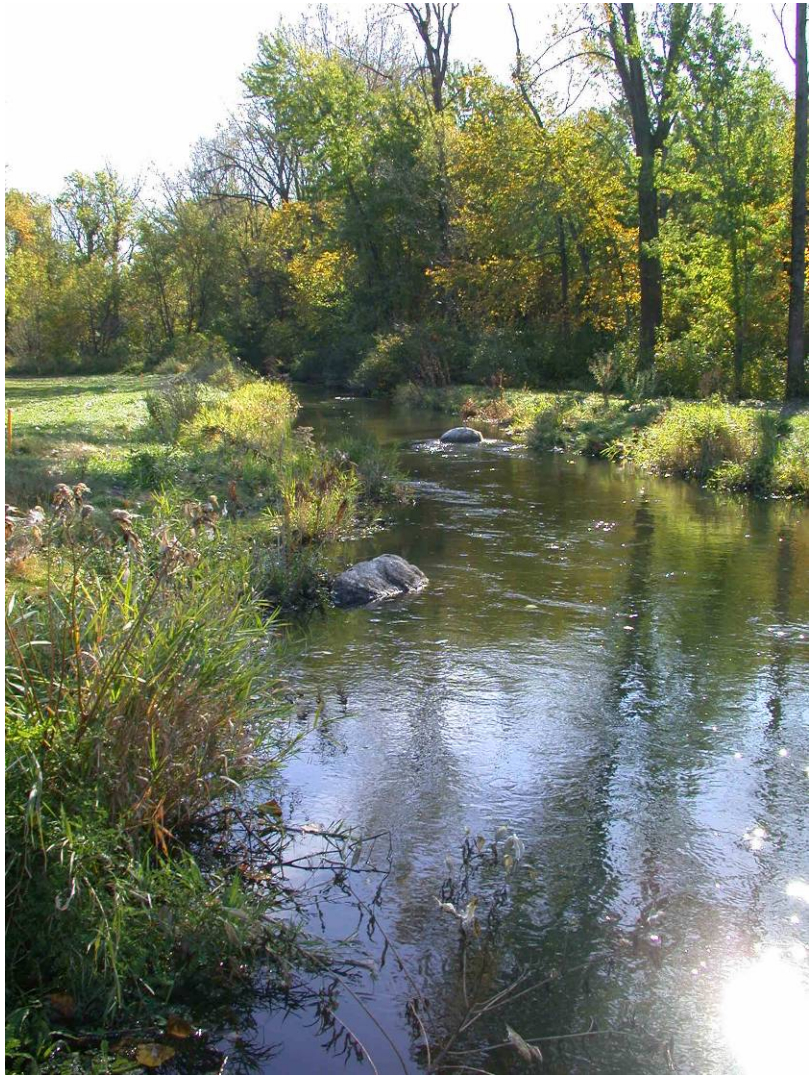
Conventional Stabilization	Ecological Stabilization
• Shear strength/shear stress • Armor-based approach • Design considerations focus on velocities, flood flow elevations, site-specific conditions.	• Shear strength/shear stress • Biotechnical armor-based or redirective approaches • Design considerations focus on velocities, flood flows, site-specific conditions AND bankfull elevations, geomorphology, aquatic/riparian habitat availability and potential, reach and watershed conditions.

Hydrologic/Geomorphology Field Assessment

(forensic H_2O accounting)

Streams/Channels/Banks

- Geologic setting
- Watershed setting
- Bank and watershed soils/vegetation
- Velocity/Flow measurements
- Bed sediment
- Bed/bank stability
- Bankfull ID
- Stream classification, e.g., Rosgen
- Water quality




Indiana Dunes State Park
Auxiliary Parking Area
November 2004

Live Web Cam

Dunes Creek Watershed Restoration

Chesterton, IN

EarthCam Webcam Technology

NOAA CZM Project Webcam

http://www.earthcam.com/clients/noaa/indianadunes/

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In Summary

- Restoration ecology is the art of managing an ecosystem, dynamic as it is, to a target successional state
- Assess targets, resources, and timeframe
- Ecological restoration standards needed
- Transfer of information
- Adaptive management
- Best available science and technology will lead to innovation and sustainable design.

THURSDAY PORTER COUNTY APRIL 22, 2010 |

Post-Trib

NORTHWEST INDIANA'S WATCHDOG

Earth Day:
Environment in the

A haze covers the industrial section of Northwest Indiana in 1960 in an area that inclu

CHESTERTON

European Market wi
be open month earli

Popular attraction ready for business May 1, PA

INSIDE: WIN ONE OF FIVE $200 CASH

Valpo H.S. allows 10 outside students PAGE 9

WEDNESDAY PORTER COUNTY APRIL 21, 2010 | WWW.POST-TRIB.COM | 75 CENTS

Post-Tribune

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MOREL SUPPORT IN THE KITCHEN

SEE LIFESTYLE

NORTHWEST INDIANA'S WATCHDOG

Gary's park gem gets polished

Work begins in July on $28 million restoration project >> PAGES 2-4

Creating Destination through Restoration

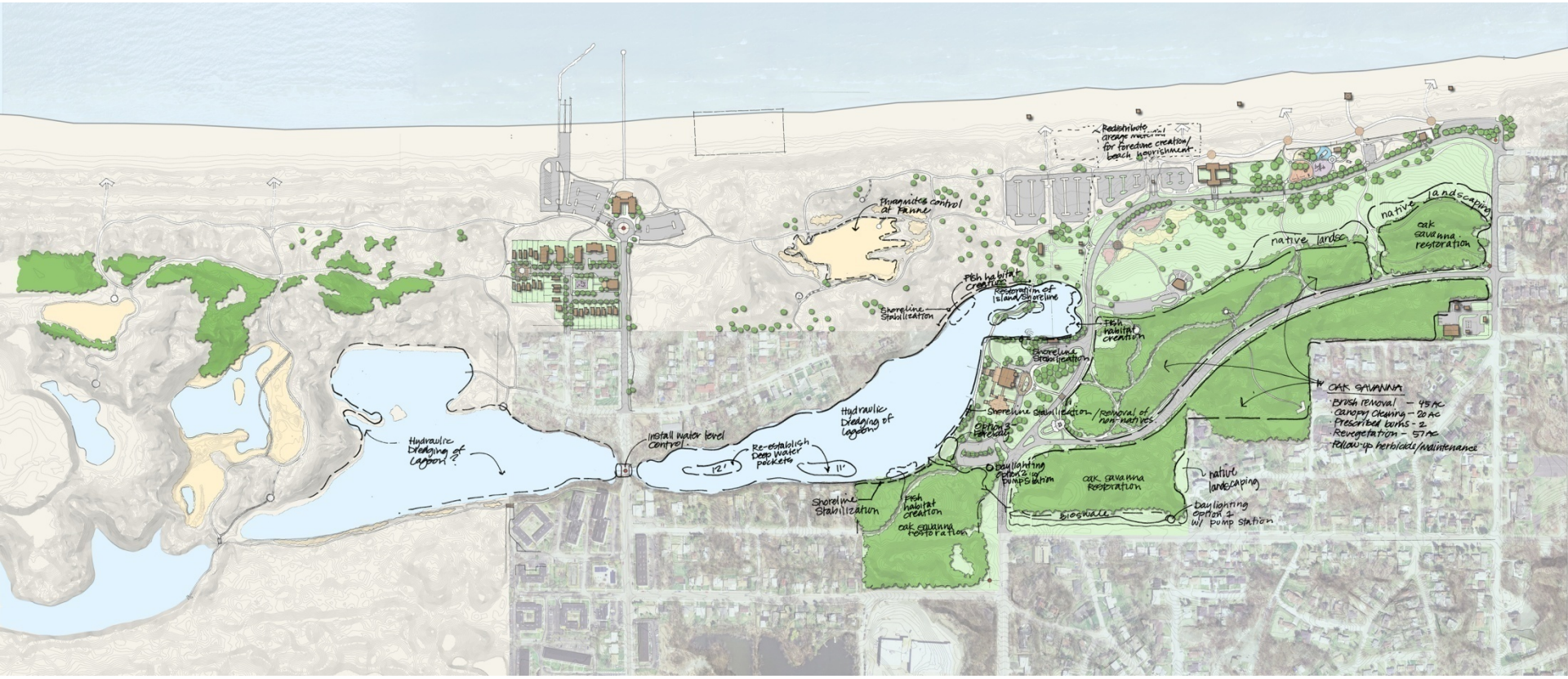

Image courtesy of Hitchcock Design Group

Linking Research to Action…

…will invariably connect People to Places.

Direct Additional Questions to:

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