

*Mining Ideas 2: A Report on 106 Great Lakes Ecological Protection and Restoration Projects*  
**–PROJECT ACCOMPLISHMENTS–**  
 appendix B

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# Environmental Science and Management

The Environmental Science and Management and Public Stewardship sections below list project results by category. The numbers in parentheses refer to the project numbers. The 106 projects are numbered and listed in alphabetical order by project title at the end of this appendix. Each project is further described in Appendix A.

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## **A. Ecological Protection**

1. Three partnerships were established to protect natural resources.

- The International Alvar Conservation Initiative, a model for coordinated region protection action, was begun. (4)
- One local land trust, the Northeast Wisconsin Land Trust, was organized. (21)
- A community-driven plan for economic development provides for long-term protection of the biodiversity of the 36 Les Cheneaux Islands of Northern Lake Huron in Michigan. (67)

2. Physical barriers were constructed to prevent recreational damage to sensitive natural areas at Eastern Lake Ontario and Northwest Indiana sites.

- Dune crossovers and moveable trails were constructed to protect sensitive beaches and dunes (1,196 acres) in eastern Lake Ontario. (24, 66, 85)
- A fence was erected to keep out vehicular traffic at a Northwest Indiana site. (49)
- A sign and fence were erected to protect areas against midnight dumpers at a Northwest Indiana sites. (49)
- A nylon psychological fence was constructed to keep pedestrians out of sensitive dune areas at an eastern Lake Ontario site. (85)

3. Acquisition of land and protection agreements such as easements were facilitated in New York, Wisconsin, Ohio, and Illinois. (No grant dollars were used to directly acquire land or easements.)

- 110 acres of critical Door County, Wisconsin uplands were acquired. (27)
- 180 acres were protected through landowner agreements in Door County, Wisconsin. (27)
- 421 acres of land and 4,900 feet of barrier shoreline were acquired in eastern Lake Ontario. (28)
- 534 acres of land, including 38,850 feet of riparian corridors, were preserved through 12 easements, and one more that will be purchased after project completion in the Grand River, Ohio Watershed. (38)
- 15 land acquisitions and two rights of refusals were obtained at the Kitty Todd Preserve, Ohio. (81)
- Environmental, valuation and title information for several small prairies (48 acres) in Illinois were obtained. (84)

4. Best management practices were used on agricultural lands in Indiana and Pennsylvania to protect adjacent natural resources.

- 4,000 acres were enrolled in the Conservation Tillage Program in Indiana. (31)
- Nutrient management plans were developed for potato and dairy farms in the Genesee River Watershed, Pennsylvania. (34)
- Report: "Benthic Macroinvertebrate and Habitat Assessment" (34)
- Technical services and cost share incentives were used to encourage best management practices among farmers and loggers in the Genesee River Watershed, Pennsylvania. (34)
- 10,000 tons of soil were protected by implementing best management practices in the Hamilton Lake Watershed, Indiana. (51)

## **B. Ecological Restoration**

1. Ecological restoration was demonstrated at a variety of ecosystem types across the Great Lakes basin.

### Aquatic

- C. 5 acres of Chequamegon Bay were re-vegetated with aquatic plants. (14)

### Coastal Shore

- 1 acre barrier beach on Eastern Lake Ontario was restored. (24)

- 3400-5100 sq. yds. of coastal shoreline area in Rogers City, Michigan was successfully restored. (30)
- On 77 acres of the Sandy Pond Peninsula in New York, 15,500 clumps of leeward dune beach grass were planted, plus one extra acre of beach grass was restored on a dune; the beach is a model for conservation. (85)
- Trash removal on 13 acres, and 1,700 lineal feet of beach restored with filter strips at Whilhala Beach in Indiana. (102)

#### Forest/Savanna

- 400 acres of riparian forest were restored with the help of landowners, among others, along Fish Creek in Indiana, and in upland areas. (31)
- 5 projects with landowners led to reforestation along Fish Creek in Indiana. (31)
- 67 acres of trees were planted in the Hamilton Lake Watershed of Indiana. (51)
- Collected seeds, planted seeds, and removed exotic species throughout approximately 50 acres in Cook County, Illinois Forest preserves. (75)
- Initial restoration begun at the 60 acre Meilke Road Savanna in Ohio. (81)
- An oak openings seed nursery was established in Ohio. (81)
- 18 restoration projects in the Toledo, Ohio Metroparks have begun; 140 acres have been restored and 110 acres are in the process of being restored. (89)

#### Grassland

- A total of 735 acres of Ohio prairie is being restored by planting grasses at 50 different sites. (59)
- 276 acres of prairie are being restored in the Maumee River basin, Indiana. (70)

#### Streambank

- Riparian habitat was reconstructed at four sites along the Cuyahoga River in Ohio using bioengineering techniques. (23)
- With landowners, 20,000 feet of filter strips were laid along Fish Creek in Indiana. (31)
- One half mile of riverbank was stabilized along the Onion River, Wisconsin. (82)

#### Urban

- Restoration of 40 acres of slag fill on the Southeast tip of Wolf Lake in Northwest Indiana. (8)
- 10.6 acres at 3 sites along the Buffalo River in New York were restored and enhanced. (12)

#### Wetland

- 20 acres of former cropland in Lorain County, Ohio, are being restored to inland wetland habitat. (9)
- 3 acres of wetlands in the Maumee River basin, Ohio are being restored. (10)
- 1 project led to wetland restoration along Fish Creek in Ohio. (31)
- A pilot wetlands restoration on 30 acres in the Great Marsh, Indiana, was begun. (45)
- Wetland acreage was increased at the Hamilton Lake Watershed, Indiana. (51)
- 14 wetlands spanning 36 acres in Pennsylvania are being restored. (58)
- 400 acres of Lake Erie coastal wetlands in Ohio are being restored. (68)
- 42 acres in Ohio were restored. (69)
- 192 acres of wetlands were restored in the Maumee River basin, Indiana. (70)
- 908 acres of coastal wetlands in Metzger's Marsh in Ohio are being restored. (72)
- 25 different wetland projects spanning 58 acres were begun in the Saginaw Bay Watershed, Michigan. (90)

2. Practical restoration techniques were tested in the areas of best management practices, improvements to wildlife habitat, invasive species control, and physical site improvements.

#### Best Management Practices

- Established on site treatment technologies and best management practices and incorporated technologies to mitigate thermal and nutrient impacts of urban and suburban storm water on the 22,400 acre Genesee River and Irondequoit Bay, New York drainage basin. (20)
- Best management practices were used to restore critical habitat in the Genesee River Watershed, Pennsylvania. (34)
- Improved the conservation practices which led to better healthier crops, less erosion and sediment loading of the lake, and better water quality in northeast Indiana. (51)
- Replanted grassed waterways and installed filter strips in northeast Indiana. (51)

- Eliminated direct run-off from agriculture, barnyards, and milk houses in Pennsylvania. (58)
- Improved water quality through mitigation of agricultural run-off in Ohio. (68)
- Mitigated agricultural run-off in Metzger's Marsh, Ohio. (72)

#### Wildlife Habitat Improvement

- Wildlife nesting habitat was created at a barrier beach in eastern Lake Ontario, New York. (24)
- Wildlife areas were enhanced in northeast Indiana. (51)
- Native trees were planted on Hearing Island, Minnesota. (52)
- Expanded rare flora and fauna habitats in Pennsylvania. (58)
- Installed duck boxes to encourage wildlife habitat in Pennsylvania. (58)
- Coaster brook trout broodstock rearing facility was built on the Red Cliff Reservation in Wisconsin. (61)
- Restoration projects were managed at Hearing Island, Grassy Point and Sugarloaf Cove, Minnesota. (63)
- Maximized waterbird production and staging in Ohio. (68)
- Established biological corridor between a refuge and a state park in Ohio. (68)
- Increased wetland type diversity in Ohio. (68)
- Increased wildlife habitat and feeding areas in Metzger's Marsh, Ohio. (70)
- 3000 ft of ditches were filled, controlled burns were conducted, seeded and re-seeded (and otherwise managed areas) in Ohio. (81)
- Fish spawning and holding habitats were improved along the Onion River, Wisconsin. (82)
- Constructed, planted, and implemented restoration recommendations in the Saginaw Bay Watershed, Michigan. (100)

#### Invasive Species Control

- Exotics were controlled at a barrier beach in eastern Lake Ontario, New York. (24)
- Successful removal of invasive plant species from a selected area of Presque Isle State Park, Pennsylvania. (25)
- Conducted prescribed burns on 1,148 acres at sites in Northwest Indiana. (49)
- Brush and exotics encroaching on dune grasses and native plants were removed from 32 acres on Hearing Island, Minnesota. (52)
- Invasive plants were removed from 470 acres of Illinois Beach State Park. (87)
- Prescribed burns, shrub removal, tree girdling, hydraulic manipulation to restore the hydrologic regime on 175 acres of remnant wetland and lakeplain sites in Michigan. (88)
- Cleaned up, burned, and removed invasive species at the 80-acre Point Betsie, Michigan preserve. (86)
- Oak savanna restoration, canopy thinning, invasive plant removal, and prescribed burning in Northwest Indiana. (93)

#### Physical Site Improvements

- Weirs and channel constructed to simulate historic water levels on 74 acres at Buckhorn Marsh, New York. (11)
- Helped to control sheet erosion, and improved the physical condition of the watershed along Fish Creek in Indiana. (31)
- Removed trash at sites in Northwest Indiana. (49)
- Removed 11,000 cubic yards of waste and woody debris at Grassy Point in Duluth, Minnesota. (50)
- Created two small ponds and a channel to connect the creek and the St. Louis River, Minnesota impacting 100 acres. (50)
- Reduced wind erosion and chemical drift in northeast Indiana. (51)
- Partially restored the oxygen levels in the Irondequoit Bay, New York, impacting 1,648 acres. (53)
- Improved a drainage system by installing a subirrigation/drainage system and/or retrofitting on 42 acres in Ohio. (69)
- 40 acres of slopes were contoured and planted with native seeds at Grand Mere State Park, Michigan. (91)
- Stabilized highly erosive streambanks, reducing erosion and increasing fish spawning and living habitats along Whittlesey Creek in Wisconsin. (104)

3. Restoration of habitats at particular sites supported protection or reintroduction of specific species.
  - Osprey nesting platforms constructed at Buckhorn Marsh, New York. (11)
  - Breeding and rearing habitat for a state endangered species (common tern) was increased on two acres along the Wisconsin Lake Superior shoreline. (16)
  - A template of preferred conditions to guide mussel habitat restoration was produced in the St. Joseph Watershed of Indiana and Ohio. (48)
  - 14 Trumpeter Swans were introduced on the Bad River Reservation., Wisconsin. (64)
  - Reintroduced wild rice to the Wolf River, Wisconsin. (71)
  - Northern pike habitat was restored at three sites on the western shore of Green Bay, Wisconsin. (79)
  - Lupine populations were re-established at Illinois Beach State Park. (87)
  - Attempted to plant, grow, and harvest, and restore wild rice production in areas of the St. Louis River, Minnesota. (95)
  - Habitat for Franklin ground squirrel increased at Whilhala Beach, Indiana. (102)

**C. Planning, Coordination, Information Sharing, Technology Transfer**

1. A project vision, and numerous plans and strategies were developed at a number of locations throughout the basin.

Vision

- With partners, developed a conservation vision to sustain Great Lakes biodiversity. (4)

Strategies

- Conservation strategies were identified with partners for the Maumee Lake Plain and Northern Great Lakes. (13)
- Improved knowledge and development of models led to strategic planning for northern Lake Huron marshes and alvars and Lake Ontario longshore sediment transport. (33)
- Identified conservation strategies, launched a community-based protection action for high priority sites, and the site conservation approach (80)

Plans

- Results of inventories and baseline studies incorporated into Bad River Tribe of Wisconsin's Integrated Resource Management Plan. (3)
- The "Chicago Wilderness Biodiversity Recovery Plan" was produced along with a summary and guide; more than 175 individuals representing 120 organizations from 24 municipalities were involved. (15)
- A plan was developed to restore habitat at Presque Isle State Park in Pennsylvania. (25)
- Facilitated the implementation of a conservation plan for the Door County Peninsula, Wisconsin. (27)
- Site conservation plans were developed for the dune/wetland and limestone barren (alvar) ecosystems of eastern Lake Ontario. (28)
- Organized a steering committee of key natural resource managers to cooperate on native plant species and plan distribution of native landscaping information in Michigan. (35)
- Developed a conservation plan and identified restoration strategies for the biodiversity of the Grand Calumet River Basin, Indiana. (36)
- Initiated a conservation plan for Southeast Michigan greenways. (46)
- Developed management plans for Harding Island, Minnesota, and revised the wildlife management plan based on public meetings. (52)
- Completed a plan consistent with reducing the stresses of Kakagon Sloughs, Wisconsin biodiversity. (57)
- Planned stages for wild rice reintroduction to Pine Lake, Wisconsin. (71)
- Identified potential sturgeon fish-way studies on the Menominee Reservation in Wisconsin. (71)
- Finalized the Midwest oak ecosystems recovery plan, "Midwest Oak Ecosystems Recovery Plan: A Call to Action" and distributed it to about 900 people. (74)
- Put together a wetlands task force; made a restoration ecological plan for wildlife habitat at Nettle Lake, Ohio. (78)
- Management plan for Green Bay west shore, Wisconsin northern pike developed. (79)

- A management plan for Sandy Pond Beach, New York was developed. (85)
- Management plan for Point Betsie Preserve, Michigan was created. (86)
- Sand Mine Restoration Plan, Grand Mere State Park, Michigan was completed. (91)

2. Partnerships were developed around specific issues and natural resource needs.

- Organized a native plant growers cooperative in Michigan. (35)
- Formed the GreenWays Initiative and a leadership advisory group as well as developed partnerships with more than 75 southeast Michigan organizations and agencies. (46)
- Participated in the Lake Superior Task Force, Lake Superior Advisory Forum, and Lake Superior Work Group. (63)
- Created new partnerships with federal and private agencies to better manage Menominee Tribal forests, wild rice, and lake sturgeon. (71)
- Developed relationship between Native peoples and resource managers at a Natural Areas Association Conference held on Mackinaw Island, Michigan. (77)
- A Wisconsin Invasive Plant Council was formed. (83)
- Coalition of natural resource agencies in the Oak Openings of Ohio was formed to create habitat corridors between the preserves. (89)
- Tribal and non-tribal groups came together at the Wild Rice Conference, held in Minnesota to share information and work towards similar goals. (105)

3. Information was shared and technology transferred among natural resource managers and scientists in three ways: new information and technological delivery systems; conferences, symposia, and workshops; and, scientific papers and publications.

Information/Technological Delivery Systems

- Assisted state and international Nature Conservancy partners to design and implement effective conservation strategies. (4)
- Created an effective delivery system for basinwide ecological restoration practitioner information exchange. (43)
- Completed and distributed a final report and database about the Great Marsh in Indiana. (45)
- A technical compendium of restoration tools was prepared for the Habitat Conservation and Restoration Strategies Workshop. (47)
- Shared information about Lake Superior coastal wetlands with the Natural Heritage Program and other interested managers. (62)
- Developed a world wide web site for information exchange about Lake Superior habitat issues (<http://www.d.umn.edu/~pcollins/main.html>). (63)
- Brochure about the methodology for identifying conservation strategies was developed for the Northwestern Lake Superior Workshops. (80)
- Shared information about significant areas of biodiversity in the basin with National Heritage Data Centers, and managers and planners encouraged to contact these centers. (92)

Conferences/Symposia/Workshops

- The 1999 Midwest Fish and Wildlife Conference held in Chicago, December 1999, incorporated presentations for natural resource managers to better understand challenges and impediments to fish and wildlife restoration efforts. (1)
- Scientists and natural resource managers participated in 13 day-long workshops to identify priorities for Chicago Wilderness biodiversity. (15)
- The Chicago Wilderness Policy and Strategy Team held a series of workshops on key regional planning topics including biodiversity and the law, water management, and economics. (15)
- A workshop was held for fishery and water quality managers to discuss the status of fish community and water quality objectives in Areas of Concern and to increase the understanding of habitat rehabilitation. (32)
- A presentation about ecological processes and potential stressors to alvars was given at the International Alvar Conservation Initiative symposium held in Tobermory, Ontario. (33)

- Five workshops with hundreds of people attending, trained people in native plant use and Michigan ecosystems. (35)
- Information about the importance of alvar ecosystems was presented at the International Alvar Conservation Initiative symposium held in Tobermory, Ontario. (39)
- The Habitat Conservation and Restoration Strategies Workshop and followup technology transfer session was held November 14-18, 1994 in Barrie, Ontario, for natural resource managers to better understand the basis for protection and restoration of physical Great Lakes habitats. (47)
- Lake Superior Habitat Coordinators planned and hosted an annual Ecological Services training session. (63)
- The Midwest Oak Savanna and Woodland Ecosystem Conference, held in Springfield, Missouri, September 26-30, 1995, was a meeting of scientists, resource managers, and practitioners to produce a recovery plan for Midwest oak ecosystems. (74)
- Brought together natural resource managers to exchange information at the Natural Areas Conference held on Mackinaw Island, Michigan. (77)
- Two site conservation planning workshops were held in Ontario and Minnesota to assist local landowners and natural resource managers to utilize a methodology for identifying conservation strategies that integrate economic, social, and ecological information. (80)
- More than 600 people attended the Plants Out of Place/Invasive Plants in the Midwest Conference Eau Claire, Wisconsin March 1-2, 2001. (83)
- Exchanged information with managers and professionals about wild rice and promoted greater awareness of potential markets for rice, and of the threats to the wild rice habitat at the Wild Rice Conference, Minnesota. (105)

### *Conferences*

Conferences accomplished the following:

3,100 participants attended the 10 conferences. Conference and workshop topics:

- Identified challenges and impediments to fish and wildlife restoration efforts.
- Surveyed 43 Areas of Concern to determine the status of fisheries objectives.
- Increased understanding of habitat rehabilitation.
- Identified conservation strategies, launched a community-based protection action for high priority sites.
- Exchanged information about alvar ecosystems.
- Exchanged information about wild rice.
- Developed technical compendium of restoration tools.
- Developed methodology for identifying conservation strategies.
- Exchanged information about invasive plant species.
- Developed partnerships between Native peoples and natural resource managers.

Conference and workshop papers and reports:

- Paper for the 1994 State of the Lakes Ecosystem Conference (SOLEC), "Aquatic Community Health of the Great Lakes."
- Paper: "Great Lakes Fisheries Commission Ecosystem Partnership Coordination," the post conference version to the 1995 U.S./Canada State of the Lakes Report.
- Report: "A Survey of Fish Community and Habitat Goals/Objectives/Targets"
- Report: "Status in Great Lakes Areas of Concern and Toward Integrating Remedial Action and Fisheries Management Planning in Great Lakes Areas of Concern"
- Publication: "Status of Aquatic Habitat Rehabilitation and Conservation Efforts in the Watersheds of Great Lakes Areas of Concern"
- Publication: "Methods of Modifying Habitat to Benefit the Great Lakes Ecosystem"
- Proceedings: "Proceeding of the Wild Rice Research and Management Conference."
- Slide series: "Photographic History of the Eastern Lake Ontario Dunes and Wetlands."
- Videotape: "Lake Ontario Dunes and Wetlands: Aerial Photograph Interpretation."

Projects:

- Applied Research Symposia - 1999 Midwest Fish and Wildlife Conference (1), Illinois Conservation Foundation, (1,000 attendees)
- Aquatic Community Health Paper for State of the Lakes Ecosystem Conference (SOLEC 1994) (2), Great Lakes Fisheries Commission, (500 attendees)
- Fisheries Objectives and Aquatic Habitat Restoration (32), Wayne State University, Michigan
- Great Lakes Alvar Conservation Conference (39), The Nature Conservancy, (100 attendees)
- Habitat Conservation and Restoration Strategies (HABCARES) Workshop (47), U.S. Fish and Wildlife Service
- Lake Ontario Dune Restoration Workshop (60), New York Sea Grant Extension Program–Cornell University, (37 attendees)
- Natural Areas Association 1998 Conference (76), Natural Areas Association, (626 attendees)
- Northwestern Lake Superior Workshops (79), The Nature Conservancy (43 attendees)
- Plants Out of Place/Invasive Plants in the Upper Midwest Conference (82), River Country RC&D Council, Inc., (600 attendees)
- Wild Rice Conference (104), Great Lakes Indian Fish and Wildlife Commission, (250 attendees)

Partners: In addition to the 10 grantee organizations and more than 3,100 participants, hundreds of organizations and agencies contributed as co-sponsors to conference and workshop events.

Scientific Papers/Publications

- Paper for the 1994 State of the Lakes Ecosystem Conference (SOLEC): “Aquatic Community Health of the Great Lakes.” (2)
- “Great Lakes Fisheries Commission Ecosystem Partnership Coordination,” is the post conference version of the paper is an appendix to the 1995 U.S./Canada State of the Lakes Report. (2)
- Publication: “Status of Aquatic Habitat Rehabilitation and Conservation Efforts in the Watersheds of Great Lakes Areas of Concern” (32)
- Report, “Biodiversity Conservation Opportunities in the Toleston Strandplain of Northern Lake County, Indiana: A Strategic Plan for Conservation Success.” (36)
- A detailed summary of results of the Great Lakes Alvar Conservation Initiative Conference was produced for conservation specialists. (39)
- Publication: “Methods of Modifying Habitat to Benefit the Great Lakes Ecosystem” (47)
- Report: “Preliminary Summary of Important Habitat Data in the Minnesota Portion of the Lake Superior Basin.” (63)
- Report: “Criteria for the Identification of Important Habitat in the Lake Superior Watershed.” (63)
- Technical manual: “The Menominee Forest Management Tradition.” (71)
- Report for the journal *Ecological Restoration*: “Restoring Historical Wet Prairie, Oak Savanna, and Oak Woodland Communities in the Oak Openings Ecological Region of Northwest Ohio.” (89)
- Report: “Conservation of Biological Diversity in the Great Lakes Ecosystem: Issues and Opportunities” (96)
- Report: “Opportunities for Conservation in the Greater Pigeon River Ecosystem.” (97)
- Final report: “Proceedings of the Wild Rice Research and Management Conference.” (105)

**D. Inventory, Assessment, Classification**

1. Inventories were conducted at basinwide, regional, and local scales.

Basinwide

- Assembled updated natural heritage program datasets for the Great Lakes basin portions of 8 states and Ontario. (4)
- Completed baseline data for U.S. Great Lakes coastal marshes. (5)
- Selected Great Lakes basin conservation sites were mapped, key threats analyzed, data gaps identified, and opportunities for conservation identified. (13)
- Compiled a centralized biological and conservation database of Natural Heritage Program data for the eight



- Great Lakes states (the entire state, not just the Great Lakes basin). (17)
  - A digital inventory of rare, threatened and endangered species was developed and is being maintained for all 8 Great Lakes states. (26)
  - All 43 Areas of Concern were surveyed to determine the status of fisheries objectives. (32)
  - Report: “A Survey of Fish Community and Habitat Goals/Objectives/Targets” (32)
  - Produced computerized maps with site information (biodiversity, boundaries, and other values) for conservation sites across the Great Lakes basin. (92)
  - Two basinwide reports were completed:
- Report: “A Survey of Fish Community and Habitat Goals/Objectives/Targets” (32)
- Report: “Conservation of Biological Diversity in the Great Lakes Basin Ecosystem: Issues and Opportunities” (96)

### Regional

- Bad River Watershed, Wisconsin cover type and rare plant surveys were completed and digitized, and protected areas mapped. (3)
  - New York biodiversity data from many sources was incorporated into the Natural Heritage Program database to support conservation planning and environmental review and maps were produced; 100% of the total number of files which needed integration are now complete. (6)
  - The biodiversity of six Lake Michigan and Lake Huron islands, Michigan was identified. (7)
  - Biological information and historical research for several unexplored natural areas of Door County, Wisconsin were completed. (27)
  - Inventories of the rare plants, animals, and natural communities of eastern Lake Ontario, New York were completed, digitized, and maps produced. (28)
  - 21 Ohio Lake Erie basin counties were surveyed: 78 new high quality sites were identified, making a total of 148 sites. (29)
  - Survey of migratory birds on the Detroit River. (41)
  - The Wisconsin portion of the Niagara Escarpment was inventoried, stressors to the system identified, and GIS maps created. (56)
  - Wisconsin Lake Superior basin altered wetlands were inventoried. (62)
  - Pre-management data was collected; a general survey of rare species was conducted; species and community information was identified and recorded at previously undocumented sites; several high quality wet prairies were discovered; and GIS maps were developed for the Oak Openings of Northwest Ohio. (81, 89)
  - Plant and insect populations of the St. Clair Flats Region was inventoried. (94)
  - The biodiversity, habitat, and protection needs of the Saginaw Bay and Northern Lake Huron/St. Mary's River watersheds were inventoried. (101)
  - 13 regional reports were completed:
- Report: “Review of Existing Pertinent Information: Sand Transport Dynamics Operating Along the Eastern Shore of Lake Ontario in New York State” (28)
- Report: “The Role of Grikes in Limestone Pavement Formation in Northern New York, USA” (28)
- Report: “Summary of Original Land Survey Data for Northern New York Alvar Sites” (28)
- Report: “Recent Fire History Data for the Perch River Barrens Alvar Site” (28)
- Report: “An Addendum to: Summary of Original Land Survey Data for Northern New York Alvar Sites” (28)
- Report: “Hydroclimatic Reconnaissance of the Chaumont Barrens” (28)
- Report: “Life History of the Oswego County, New York Populations of the Bog Buckmoth” (28)
- Report: “Life History of the Bog Buckmoth in New York State” (28)
- Report: “Development of Research Methodologies for the International Alvar Conservation Initiative” (28)
- Report: “Biological and Hydrological Monitoring at the Chaumont Barrens Preserve” (28)
- Report: “Life History of Bog Buckmoth in Oswego County, New York” (28)
- Report: “Eastern Lake Ontario Littoral Processes: Review of Information and Management Implications” (28)
- Report: “An Inventory and Assessment of the Resources of the Niagara Escarpment in Wisconsin” (56)

### Local

- Chequamegon Bay, Wisconsin was surveyed to understand aquatic resources in relation to historic records. (14)
- One report, *Plant Survey Results*, about Chequamegon Bay aquatic vegetation was completed. (14)
- Wells were installed and baseline data collected at Ives Road Fen, Michigan. (22)
- Problem sites along the Cuyahoga River Area of Concern, Ohio were inventoried. (23)
- Invasive plant species populations were surveyed at Presque Isle State Park, Pennsylvania. (25)
- Habitat inventories, ownership information, and a threats analysis for Grand Calumet, Indiana were completed. (36)
- The substrate of the Grand Portage, Minnesota nearshore areas of Lake Superior was delineated and mapped, and areas that are possible habitat were classified. (37)
- The vegetation, hydrology, and sedimentation rates of the Great Marsh, Indiana were inventoried. (45)
- 80 mussel beds in Cedar Creek, Fish Creek, and the West Branch of sub-basins of the St. Joseph River, Indiana were assessed. (48)
- The plants and animals of the Gaylord II tract (Indiana) were inventoried. (49)
- Report: “An Assessment of Potential Impacts of a Proposed Roadbed Removal Project on the Butterflies of the Ivanhoe Sand Savanna.” (49)
- The present and desired vegetation of Hearing Island, Minnesota was digitized and mapped. (52)
- A wetland inventory of Cedar Creek Watershed, Indiana was conducted. (70)
- An inventory of the wildlife habitat of Nettle Lake, Ohio was completed. (78)
- The biodiversity of the Calumet City Prairie Addition and the Wentworth Prairies in Illinois was inventoried. (84)
- The most aggressive species of the Pt. Betsie Preserve in Michigan were inventoried and mapped. (86)
- Lupine populations at Illinois Beach State Park were mapped and evaluated. (87)
- Allegan State Game Area (SW Michigan), Fish Point Wildlife Area (Saginaw Bay), Algonac State Park (St. Clair River), St. Clair Flats, and Pointe Mouillee State Game Area (Monroe County), Michigan were surveyed for flora and fauna; baseline data for insect community composition was developed. (88)
- Places where wild rice could be successfully reintroduced to the St. Louis River of Minnesota were inventoried. (95)
- The flora and fauna, hydrology, and current and historical conditions of the Pigeon River Watershed of Indiana were inventoried. (97)

## 2. Assessments of ecological resources were conducted for basinwide and regional systems.

### Basinwide

- Data to identify conservation targets representing full range of biodiversity for the Great Lakes basin was compiled and analyzed. (4)
- A comprehensive ecological assessment of all natural quality coastal wetlands of significant size in the U.S. portion of the Great Lakes was conducted, including a clarification of vegetation types and processes, ranking based on natural quality and condition, and the impacts of human induced and natural water level fluctuations. (5)
- A portfolio of 271 sites (72 identified as high-priority conservation sites) in the US portion of the Great Lakes basin was constructed. (13)
- One report: “Status in Great Lakes Areas of Concern and Toward Integrating Remedial Action and Fisheries Management Planning in Great Lakes Areas of Concern” was completed. (32)
- 131 globally significant elements and communities were identified in the Great Lakes basin as a result of an analysis of Heritage data. (96)
- Data gaps were identified for geographic areas and target elements basinwide. (99)

### Regional

- A detailed assessment and evaluation, relying heavily upon GIS, of the types and functional values of 1,000,000 acres of wetlands and other critical areas of Wisconsin’s Lake Superior basin was conducted. (62)

- 78 tributaries on the western shore of Green Bay, Wisconsin were assessed as current or potential Northern pike habitat. (79)
- A report: “Vegetation Monitoring Plan for Three Natural Community Types in the St. Clair Flats Region” was completed. (94)
- Mercury, water, and nutrient levels and other factors impacting wild rice growth in the St. Louis River Watershed of Minnesota was assessed. (95)
- A threats analysis was conducted in the Pigeon River Watershed of Indiana. (97)
- An assessment of habitat losses and stresses was conducted for the White Lake Area of Concern, Michigan. (103)

3. Two new basinwide classification systems, regarding Great Lakes coastal wetlands and freshwater ecosystems, were developed and tested.

- Great Lakes coastal wetlands were classified based on physical characteristics and biota. (5)
- An aquatic freshwater classification system was developed. (98)

## **E. Scientific Study**

1. Fourteen studies added to our knowledge of Great Lakes ecosystems.

- A baseline aquatic productivity study (macrophyte and periphyton) was conducted in the Bad River Watershed, Wisconsin. (3)
- The effects of deer browse on conifers is being studied in the Bad River Watershed, Wisconsin. Results will not be available for several years. (18)
- In the St. Louis River, Minnesota, the actions of the invasive Eurasian Ruffe were examined in the presence of different pheromones. An understanding of how pheromones attract and affect Ruffe was gained. (19)
- Eight native plant demonstration gardens and a 12-acre seed propagation garden were established, and a list of key native plants developed in Michigan. (35)
- Our understanding of the coaster brook trout’s habitat on the Grand Portage Reservation in Minnesota was increased, compared and verified , and the groundwork laid for future studies. (37)
- Necessary management conditions for desired plant communities was estimated at the Great Marsh in Indiana. (45)
- The effectiveness of the oxygen supplementation process was studied in New York. (53)
- A better understanding of lake processes, was gained in New York. (53)
- The stresses to sloughs were studied, resulting in better understanding of Kakagon Slough, Wisconsin ecology. (57)
- Our understanding of economic, social, and cultural activities in relation to the Bad River Watershed was increased. (57)
- A study of Clay Banks Refuge, Lake Michigan, supported lake trout restoration using artificial spawning reefs. (65)
- The feasibility of lake sturgeon fish-way needs was studied on the Menominee Reservation in Wisconsin. (71)
- Wild rice plantings in the St. Louis River, Minnesota, were tested for growth success and possible causes for reproductive failure eliminated. (95)
- Amphibians and their habitats on 12 acres in Northeastern Illinois were studied in order to provide managers better protection measures. (106)

2. Seven new tools and techniques will assist in protection and restoration efforts.

- A replicable technique for restoring slag acres was developed and is being used in restorations throughout Northwest Indiana, where slag from steel making processes covers thousands of acres. (8)
- Use of constructed wetlands to filter pollution and reduce erosion in agriculturally dominated Ohio landscapes was tested. (10)
- Three functional models (Lake Huron marshes, Lake Ontario longshore sediment transport, alvar ecosystems) are enriching the base of ecosystem knowledge for practitioners. (33)
- A comprehensive, comparative methodology for conserving modestly sized, privately owned forest

resources without causing economic hardship (Forest Bank) was developed and field-tested. Potential sites in northern Wisconsin and New York were identified, legal and financial frameworks for operationalizing the Forest Bank were generated, and a sense of the core business operation that a Forest Bank must undertake to be successful financially and ecologically was studied. (44)

- A strategic framework for biodiversity conservation in the Great Lakes basin was developed. (96)
- A classification framework for aquatic communities, a universal methodology for all aquatic communities, was developed and standardized. (98)
- A methodology for understanding and assessing biodiversity that can be used in almost any area, was developed for northern Lake Huron/St. Mary's River and Saginaw Bay. (101)

3. Six scientific reports that fill knowledge gaps about Great Lakes ecosystems were prepared.

Report: "A Guide to Research Opportunities" (10)

Report: "Characterization of the Olfactory Sensitivity of the Eurasian Ruffe, *Gymnocephalus cernuus*, to Putative Pheromones" (19)

Report: "Preliminary Analysis of Conservation Issues in the Kakagon/Bad River Sloughs Watershed" (57)

Report: "Algonac Prairie: Species Response to Local Hydrology and Prescribed Burns" (88)

Report: "Sampling and Management of Lakeplain Prairies in Southern Lower Michigan" (88)

Report: "The Effect of Forest Structure on Amphibian Abundance and Diversity in the Chicago Region" (106)

## **F. Monitoring, Indicators**

1. Ten projects monitored various aspects of Great Lakes basin ecosystems including water quality, hydrology, ecosystem functions, stressors, and specific species.

- Water quality was monitored at Blue Creek in Ohio. (10)
- Effects of deer browse on conifer forests was monitored in Wisconsin. (18)
- The hydrology of Ives Road Fen in Michigan and of the lakeplain at four different sites in Michigan was being monitored. (22, 88)
- At the Great Marsh in Indiana, a hydrologic and vegetation monitoring network was established. (45)
- Birds, amphibians, and habitats along 575 routes in Canadian and United States Areas of Concern were monitored. (54)
- Evaluated water quality functions and the revegetation of restored wetlands in the Lake Erie Watershed. (58)
- Lake sturgeon on the Wolf River in Wisconsin were monitored. (71)
- 1,031 birds (78 species) at the Indiana Dunes National Lakeshore were banded over two years, and health, population, migration and breeding statistics were recorded for the Federal Bird Banding Laboratory and the Institute for Bird Populations. (76)
- The progress of northern pike habitat restoration off the Western Green Bay, Wisconsin shores was monitored. (79)
- Federally threatened plants were monitored at four sites in Michigan. (88)

2. Three indicators were developed as part of the *State of the Great Lakes 2001* report.

- Two indicators for wetland birds and amphibians were completed for the State of the Lakes Ecosystem Conference (SOLEC): Indicator #4504–Amphibian Diversity and Abundance, and Indicator #4507–Wetland-Dependent Bird Diversity and Abundance. (54)
- Completion of State of the Lakes Ecosystem Conference (SOLEC) Indicator #8135–Contaminants Affecting Productivity of Bald Eagles (55)

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## Public Stewardship

The Public Stewardship section lists project results by category. The numbers in parentheses refer to the project numbers. The 106 projects are numbered and listed in alphabetical order by project title at the end of this appendix. Each project is further described in Appendix A.

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### A. Outreach, Information Exchange

1. Nine projects used media coverage to publicize project activities results to the public.

- Bad River Tribe, Wisconsin Integrated Resource Management Plan. (3)
- Cuyahoga River, Ohio streambank restoration. (23)
- Michigan native landscaping efforts. (35)
- ORV restricted uses and legislation, Minnesota. (41)
- GreenWays Initiative, Michigan. (46)
- Hamilton Lake Watershed Project, Ohio. (51)
- Hearing Island, Minnesota Native Community Project. (52)
- Indiana Dunes National Lakeshore bird banding efforts. (75)
- Onion River, Wisconsin. (82)

2. Projects resulted in numerous publications, brochures, slide presentations, and videos as aids to informing the public.

- Summaries of New York biodiversity data and county maps with locations of ecologically sensitive heritage sites. (6)
- Portfolio of U.S. high priority conservation sites. (13)
- “Chicago Region Atlas of Biodiversity.” (15)
- Eastern Lake Ontario, New York lake/dune/marsh ecology. (24)
- Chaumont Barrens, New York self-guiding brochure. (28)
- Best management practices regarding preventing non-point source pollution, Pennsylvania, New York. (34)
- Three sets of plant landscaping brochures developed and 750,000 copies distributed, Michigan. (35)
- Great Lakes Alvar report for the general reader. (39)
- Poster about Great Lakes alvars. (40)
- Information about the last 2.4 miles of coastal wetlands in the Detroit, Michigan area. (41)
- Brochure about results of developmental pressures on ecosystems, Ohio. (41)
- Book/cassette tape of frog calls, Wisconsin. (41)
- Publication: “Great Lakes in the Balance: Protecting Our Ecosystem’s Rich Natural Legacy” (42)
- Fact sheet: important habitat and water quality characteristics necessary for the conservation of freshwater mussel biodiversity, Ohio. (48)
- Slide series: “Photographic History of the Eastern Lake Ontario Dunes and Wetlands,” New York. (60)
- Videotape: “Lake Ontario Dunes and Wetlands: Aerial Photograph Interpretation,” New York. (60)
- Birdwatchers’ guide, Michigan. (67)
- Marketing Wetlands for Profit educational slide show and video, Ohio. (69)
- Maumee River Basin, Indiana wetlands restoration brochure. (70)
- Brochure: “Menominee Tribal Enterprises,” Wisconsin. (71)
- Sustained forest yield video, Menominee Tribe of Wisconsin. (71)
- Educational brochure, native plant poster produced in Marquette, Michigan. (73)
- Newsletter: “The Seedling,” for Chicago area Mighty Acorn youth stewardship program participants. (75)
- Three slide shows about Indiana Dunes National Lakeshore bird banding program. (76)
- 2500 copies of a Nettle Lake, Ohio endangered species brochure. (78)
- 3 brochures, 1 educational packet, 1 display about Toledo, Ohio Oak Openings. (81)
- Brochure, 2 sets of interpretive panels and brochures, slide shows about New York’s Sandy Pond Peninsula. (85)
- Fliers, informative signs about significant habitat at four Michigan coastal sites. (86)
- 6 newsletters about southern Lake Michigan, Indiana conservation efforts. (93)

- Report: Conservation of Biological Diversity in the Great Lakes Ecosystem: Issues and Opportunities.” (96)
  - Guidebook: “Habitat Restoration and Erosion Control,” Saginaw Bay Watershed, Michigan. (100)
  - Newsletter (5,000 mailings): “The Swan: Environmental Reporter for the Swan Creek Watershed,” Saginaw Bay Watershed, Michigan. (100)
  - Poster, slide presentation, 12 page color brochure about Saginaw Bay Watershed, Michigan. (101)
  - Video, poster, coloring book, pamphlets on biodiversity and water quality of White Lake Area of Concern, Michigan. (103)
3. Workshops, presentations, and meetings brought together natural resource managers and scientists and the public to learn about project activities and results.
- Workshop: “Preserving the Natural Resources and Community Character of Beaver Island,” Michigan and presentation at an annual island meeting. ( 7)
  - Storm water pollution mitigation and available technologies informational meetings, Monroe County, New York. (20)
  - Maps and slide presentations about eastern Lake Ontario, New York ecological communities. (28)
  - Presentation about native landscaping in Michigan. (35)
  - Organized a workshop to develop and implement a conservation campaign for Wisconsin’s rivers. (41)
  - Meeting: potential effects of restoring the Great Marsh, Indiana. (45)
  - Seminar for foresters and loggers about Menominee Tribal Enterprises sustainable forestry program, Wisconsin. (71)
  - 2 regional Toledo Oak Openings, Ohio events. (81)
  - Presentations about the Toledo Oak Openings, Ohio. (81)
  - 5 meetings about the Toledo Oak Openings, Ohio. (81)
  - 7 presentations about Saginaw Bay Watershed, Michigan. (90)
  - Workshops and presentations about White Lake Area of Concern, Michigan. (103)
4. Site tours and nature walks introduced protection and restoration projects to the general public.
- Two site tours and a dedication ceremony to showcase the Black River Habitat Restoration, Ohio. (9)
  - Increased public awareness about habitat restoration and enhancement at Buffalo River sites, New York. (12)
  - Tours of Cuyahoga River, Ohio streambank restoration sites. (23)
  - Field day to demonstrate best management practices, Hamilton Lake Watershed, Indiana. (51)
  - Tours of Menominee Reservation, Wisconsin forest. (71)
  - Field trips to Sandy Pond Peninsula, New York restoration sites. (85)
  - Field trips to Point Betsie Preserve, Michigan. (86)
  - 2 tours of Saginaw Bay Watershed, Michigan wetland restoration project. (90)
  - Tours of Whittlesey Creek, Wisconsin restoration site. (104)
5. Informational signs and demonstration areas helped to focus attention on protection and restoration projects.
- Constructed informative signs around Fish Creek Sloughs, Wisconsin planting sites. (14)
  - Constructed two demonstration deer exclosures at the Northern Great Lakes Visitor Center, Wisconsin to illustrate the potential negative impacts of deer herbivory to the public. (18)
  - Signs at white cedars plantings in Wisconsin that demonstrate the importance of long term monitoring. (18)
  - Interpretive signs were erected to explain local ecology Deer Creek Marsh Wildlife Management Area, New York. (24)
  - An observation deck was constructed at Deer Creek Marsh Wildlife Management Area, New York. (24)
  - An interpretative trail and a three-panel kiosk at eastern Lake Ontario, New York sites. (28)
  - Best management practice demonstration sites in the Genesee River Watershed, Pennsylvania. (34)
  - Traveling display created about Michigan native landscaping. (35)
  - Interpretative signs installed at the Lakeview Wildlife Management Area, New York. (66)
  - Half-acre native plant garden demonstration in Michigan’s Upper Peninsula. (73)
  - Interpretive trail signs constructed at a demonstration garden in Marquette, Michigan. (73)

- 4 signs constructed about ecosystem and sensitive areas, Nettle Lake, Ohio. ( 78)
  - Tours of Toledo Oak Openings, Ohio restoration sites. (81)
  - Informative signs at four coastal Michigan preserves. (86)
  - Bicycle and pedestrian walkway and interpretive signs at Whilhala Beach, Indiana dune restoration. (102)
6. One-to-one contact was initiated with private landowners regarding natural resource protection.
- Land owner contact was initiated on six Lake Michigan Islands, Michigan. (7)
  - Non-law enforcement staff patrolled and monitored Deer Creek Marsh Wildlife Management Area dunes and explained the fragile nature of the ecosystem to recreational users. (24)
  - Shared information with local governments about Fish Creek, Indiana natural resources. (31)
  - Trained loggers in the Genesee River Watershed, Pennsylvania about soil erosion control. (34)
  - Conducted sales of native seeds in Michigan. (35)
  - Monitored, planned, and gathered information about pollution from a the waste mill in Ontario, Canada. (41)
  - Increased the support for the Fisher Creek Alliance in order to promote planning, education, documentation, meeting, and fund-raising, Wisconsin. (41)
  - Worked with state natural resource managers to exchange information and share tools that protect mussels in Ohio streams. (48)
  - Strengthened community support for long term protection of the Kakagon Sloughs, Wisconsin. (57)
  - The inventory was used to make a mailing list for initial landowner contacts in the Maumee River basin of Indiana. (70)
  - Increased the potential for education at Metzger's Marsh in Ohio. ( 72)
  - Demonstrated bird banding techniques to a local high school group in Indiana. ( 76)
  - Created a conservation program for Toledo, Ohio Oak Openings. (81)

## **B. Education**

Education regarding ecological protection and restoration concepts and projects utilized workshops, curricula, and one-on-one discourses.

- Educational workshops and materials have been developed for landowners and local officials about bioengineering techniques, invasive species, pollution and erosion prevention, wetlands, land management, environmental values and ecological restoration. (3, 23, 25, 58 71, 81)
- A restoration site in Ohio is utilized by local schools and universities. (10)
- In Illinois, the Chicago Wilderness Education and Communication Team held a series of workshops to discuss the most pressing educational needs. (15)
- At Northland College, Wisconsin, conifer-deer browse studies have been incorporated into curriculum. (18)
- One-on-one contact with landowners, and new innovative programs such as dune stewards, reinforce ecological protection and restoration concepts. (31, 51)
- Walks, ecological restoration workdays, and conversations with dunes stewards are used as opportunities to educate people, especially children, about the nature preserves. (49, 85, 89)
- In Michigan, 1,600 people toured the demonstration garden in 1996 and 1997. (73)
- In Michigan, more than 150 children every year participate in field trips to restoration sites and native plant gardens. (91)
- In Illinois and Wisconsin, more than 500 children are participating in educational restoration activities every year. (75, 82)
- One project in the Saginaw Bay Watershed of Michigan trained 5 contractors, 3 technicians, and 1 district conservationist in restoration techniques. (90)
- The Ashland, Wisconsin school district monitors bioengineering practices for water quality impacts. (104)

## **C. Partnership Building**

A variety of partnerships, including committees, cooperative agreements, and advisory groups, were formed between natural resource managers and the public to further protection and restoration projects.

- Partnerships were formed with local landowners, town governments, land trusts, tribes, associations,

academic institutions, government agencies, universities, institutions, and local citizen groups in Indiana, Wisconsin, New York, Minnesota, Ohio, Michigan, to responsibly and cooperatively manage specific sites. (3, 27, 28, 41, 48, 50, 52, 57, 59, 60, 67, 86, 90, 93)

- Three seminars were conducted for local citizens to introduce the concept of land trusts in the Fox-Wold basin of Wisconsin. (21)
- A Volunteer Preserve Committee was formed to guide projects at Ives Road Fen in Michigan. (22)
- Partnerships were set up with the local academic community and the Cleveland Museum of Natural History at Presque Isle State Park, Pennsylvania. (25)
- 10-year cooperative agreements with landowners to protect land were negotiated in the Fish Creek Watershed, Indiana. (31)
- A local advisory group was formed to guide the Hamilton Lake, Indiana project. (51)
- The Les Cheneaux project in Michigan constructed an economic/environmentally sustainable plan for the city and its growth, "A Plan for Les Cheneaux, Where Economy, Community and Nature Come Together." (67)
- A local partnership identified restoration needs on urban/suburban riparian lands in the Saginaw Bay Watershed. (100)
- Watershed Level Biodiversity Assessment Project coordinators developed partnerships by participating in other related ongoing projects. (101)

#### **D. Protection and Restoration Volunteers**

Volunteers participated in inventory, restoration, monitoring and planning activities.

- 70 volunteer workdays were held involving more than 240 individuals working over 2,000 hours at Ives Road Fen in Michigan. (22)
- Along the Cuyahoga River in Ohio, volunteers assisted with the river bank plantings. (23)
- A volunteer group to assist with ecological monitoring and restoration was formed along eastern Lake Ontario, New York. (28)
- Planting at a restoration in Rogers City, Michigan was done by volunteer Boy Scouts and Girl Scouts. (30)
- A network of volunteers was organized in Michigan to collect seeds from native plant species. (35)
- At several Northwest Indiana restoration sites, workdays and nature walks were held weekly and an effort was made to recruit neighbors and children as participants in restoration activities. (49)
- Volunteer workdays were held to restore Hearing Island in Minnesota. (52)
- 493 volunteers from across the Great Lakes basin monitored and submitted bird, amphibian and habitat data. (54)
- A dune steward program, whereby volunteers interface with dune visitors, was developed in Eastern Lake Ontario, and is a model for other efforts statewide. (60)
- In Northern Lake Huron, workdays with volunteers were held to restore local landscapes and to build community. (67)
- A five day training workshop to train volunteers in bird banding and monitoring was held in Northwest Indiana. (76)
- 627 volunteer hours were assisted Northwest Indiana's bird banding program. (76)
- At the Oak Openings of Ohio, a volunteer intern program to support Kitty Todd Preserve was started, and conservation activities were initiated at a high school. (81)
- 13 private landowners voluntarily registered their property in a land registry program in the Oak Openings of Northwest Ohio. (81)
- Friends of Sandy Pond volunteers worked 950 hours to restore the Sandy Pond Peninsula of New York. (85)
- Volunteer workdays were held to restore coastal habitats in Michigan. (86)
- At the Oak Openings Preserve Metropark in Toledo, Ohio, volunteers helped with oak savanna restoration. (89)
- At Grand Mere State Park in Michigan, 172 volunteers contributed 266 hours of time collecting seeds. (91)
- 2 groups of 14 helped with restoration at a number of sites across Northwest Indiana. (93)
- In the Saginaw Bay Watershed, local people were involved in remediation and restoration recommendation



implementation. (100)

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## Ecosystem Theme

The listing of project accomplishments for the Ecosystem Theme section differs from the Environmental Science and Management and Public Stewardship sections in several ways. First, GLNPO project dollars and leveraged dollars are totaled for the projects. This was not possible for the Environmental and Stewardship categories since project activities may have been split among any number of categories and therefore impossible to accurately tabulate. Second, project results are summarized in the Ecosystem Theme section rather than every detail listed. Third, to give a complete picture of each Ecosystem Theme, the projects and partners are listed. Again, this would not have been practical for the Environmental or Stewardship sections.

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### **A. Agriculture, Non-point Source Pollution, Erosion Control**

Agriculture, non-point source pollution, erosion control projects accomplished the following:

- *426 acres* restored or enhanced
- *58,850 feet of filter strips* placed along riparian corridors
- *4,400 acres* registered in Conservation Tillage Program
- *139,468 acres* impacted by best management practices
- *534 acres* placed in conservation easements
- *10,000 tons of soil* saved from erosion from one site alone
- Demonstrated best management practices to reduce non-point source pollution from animal waste and sediment erosion.
- Demonstrated use of wetlands to filter agricultural pollution runoff.
- With private landowners, controlled non-point source pollution and protected rare and endangered mussel and fish species in several watersheds by restoring wetlands and riparian forests, and installing buffer strips to protect streams.
- Conducted a wetland inventory database with local landowners.
- Filled drainage ditches and broke the tile lines in farm fields to create wetlands for wildlife.
- Installed a sub-irrigation drainage system and constructed wetland reservoirs to demonstrate a method for increasing crop yield and wildlife habitat while decreasing the cost outlays.
- Partnered with universities to provide demonstration and study sites for students.

Projects:

- Black River Habitat Restoration (9), Lorain County Soil and Water Conservation District, Ohio
- The Blue Creek Project: An Agricultural Wetland Demonstration Project (10), Toledo Metropolitan Area Council of Governments, Ohio
- Fish Creek Watershed Stewardship Program (31), The Nature Conservancy, Indiana
- Genesee River Critical Habitat Non-Point Source Pollution Control Demonstration (34), Headwaters Charitable Trust, Pennsylvania and New York
- Grand River Protection (38), Western Reserve Resource Conservation & Development Council, Ohio
- Hamilton Lake Watershed Land Treatment (51), Indiana Department of Natural Resources, Indiana
- Lake Erie Accelerated Wetland Restoration (58), Penn Soil Resource Conservation and Development Council, Pennsylvania
- Marketing Wetlands for Profit (69), Maumee Valley Resource Conservation & Development Area, Ohio
- Maumee River Basin Wetlands Restoration (70), Allen County Soil and Water Conservation District, Indiana
- Saginaw Bay Watershed Wetland Restoration Project (90), Lapeer County Soil and Water Conservation District, Michigan

Partners: *In addition to the ten grantee organizations and participation by numerous private landowners, 64 agencies and organizations were partners in the projects, including:*

*16 Soil and Water Conservation Districts, Resource Conservation and Development Councils, and Cooperative Extension Services: Allegany County Conservation District, Crawford Conservation District, DeKalb County Soil & Water Conservation District, Erie Soil & Water Conservation District, Geauga Soil and Water Conservation District, Headwaters Resource Conservation & Development Trust, Indiana Soil & Water Conservation District, Lake County Extension Service, Lucas Soil and Water Conservation District, New York Seneca Trail Resource Conservation & Development Council, Ohio Soil & Water Conservation District, Potter County Conservation District, Purdue Cooperative Extension Service, Steuben County Soil & Water Conservation District, Trumbull Soil and Water Conservation District, Williams County Soil & Water Conservation District*

*13 Land Trusts and Not-for-profit Organizations: Lorain County Chapter of Pheasants Forever, Black River Remedial Action Plan Coordinating Committee, The Nature Conservancy, Trout Unlimited, Grand River Partners Inc., Grand River Environmental Action Task Force, Holden Arboretum, Headwaters Land Trust, Trust for Public Land, Hamilton Lake Association, Wildfowl USA, Pheasants Forever, Michigan United Conservation Clubs*

*9 State Agencies: Indiana Department of Environmental Management, Indiana Department of Natural Resources, Michigan Agricultural Stabilization and Conservation Service, Michigan Department of Agriculture, Michigan Department of Natural Resources, New York State Department of Environmental Conservation, Ohio Department of Natural Resources, Ohio Environmental Protection Agency, Pennsylvania Fish Commission*

*9 County and Local Government Entities: Lorain County Commissioners, Ohio Operating Engineers Apprenticeship Fund, Local 18, Toledo Metropolitan Area Council of Government, City of Toledo, Lucas County Engineers, Cleveland Museum of Natural History, Maumee Rover Basin Commission, Land Improvement Contractors, Michigan County Drain Commissions*

*6 Universities: Oberlin College Biology Department, Bowling Green State University, University of Toledo, Pennsylvania State University, Michigan State University, Ohio State University*

*5 Park Districts: Lorain County Metropolitan Park District, Toledo Metroparks, Geauga County Park District, Lake County Metro Parks, Ashtabula County Park District*

*3 Corporations: Toledo Edison Company, Dow Chemical, General Motors*

*3 Federal Agencies: U.S. Fish and Wildlife Service, U.S.D.A. Natural Resources Conservation Service, U.S.D.A. Agriculture Research Service*

## **B. Alvars**

The alvar projects accomplished the following:

The International Alvar Conservation Initiative, a model for coordinated region protection action, was formed.

The Great Lakes Alvar Conservation Conference was held in Tobermory, Ontario.

7 scientific papers about alvars are contributing to protection efforts:

- “The Role of Grikes in Limestone Pavement Formation in Northern New York, USA”
- “Summary of Original Land Survey Data for Northern New York Alvar Sites”
- “Recent Fire History Data for the Perch River Barrens Alvar Site”
- “An Addendum to: Summary of Original Land Survey Data for Northern New York Alvar Sites”
- “Hydroclimatic Reconnaissance of the Chaumont Barrens”
- “Development of Research Methodologies for the International Alvar Conservation Initiative”
- “Biological and Hydrological Monitoring at the Chaumont Barrens Preserve”

A final technical report of the results of the International Alvar Conservation Initiative and conference: “Conserving Great Lakes Alvars,” (March 1999; <http://www.epa.gov/glnpo/ecopage/alvar/index.html>) produced the following results:

- assessment of alvar distribution and conservation status;
- documentation of priority sites;
- working knowledge of how alvar ecosystems function;
- conservation strategies for protection and stewardship of alvar ecosystems;
- increased awareness of the uniqueness and value of alvars;
- a mechanism for monitoring status; and,
- a model for regional collaboration.

A glossy report on the International Alvar Conservation Initiative and conference was created for the general reader. 1 poster about alvars was produced and distributed to the public. 1 functional model about alvar ecosystems enriched the base of ecosystem knowledge for practitioners. Inventories on rare plants, animals, and natural communities were completed and project areas were digitized, delineated, and mapped at alvar sites across the basin. Site conservation plans for alvar sites in New York were completed. An interpretative trail, a three-panel kiosk, and a self-guiding brochure were produced for Chaumont Barrens in New York.

Projects:

- Great Lakes Alvar Conservation Conference (39), The Nature Conservancy
- Great Lakes Alvar Poster (40), The Nature Conservancy

In addition, three projects had alvar ecosystem components:

- Basinwide Planning and Coordination of Biodiversity Protection Activities in the Great Lakes Ecosystem (4), The Nature Conservancy
- Eastern Lake Ontario Conservation Initiative (28), The Nature Conservancy, New York
- Functional Models of Priority Systems in the Great Lakes Basin (33), The Nature Conservancy

Partners: *In addition to the grantee organization, 33 agencies and organizations were partners in the alvar projects, including:*

*3 International Organizations:* Natural Heritage Programs in the United States and Canada, World Wildlife Fund, International Alvar Working Group

*1 Foundation:* Great Lakes Protection Fund

*6 Universities:* Cornell University, Finger Lakes Community College, State University of New York Colleges at Oswego, State University of New York Colleges at Geneseo, University of Michigan, University of Georgia

*4 State and Provincial Agencies:* New York Department of Environmental Conservation, New York Natural Heritage Partnership, New York Sea Grant Extension, Ontario Ministry of Natural Resources

*6 Land Trusts and Not-for-Profit Organizations:* Consultative Group on Biological Diversity, Lake Michigan Federation, Federation of Ontario Naturalists, Nature Conservancy of Canada, Ontario Dune Coalition, Tug Hill Tomorrow Land Trust

*3 Federal Agencies:* U.S. Geological Service, Bureau of Land Management, U.S.D.A. Natural Resource Conservation Service

*1 Soil and Water Conservation Districts, Resource Conservation and Development Councils, and Cooperative Extension Services:* Oswego County Soil and Water Conservation District

*7 County and Local Government Entities:* Town of Clayton, Town of Lyme, Town of Brownville, Town of Cape Vincent, Town of Ellisburg, Town of Sandy, Creek, Town of Richland,, New York

*2 Corporations:* Cutter and Associates (Watertown, New York), TV Ontario

**C. Fish and Wildlife/ Biodiversity/ Rare and Threatened Species**

Fish and wildlife, biodiversity, rare and threatened species projects accomplished the following:

1. More than 3,100 acres are being protected and restored for fish and wildlife at the following locations:

- 74 acres restored at Buckhorn Marsh in New York;
- 2 acres impacted in Wisconsin;
- 1,148 in Indiana (150 acres in the Ivanhoe Preserve and Ivanhoe South; 270 acres in the Clark and Pine Bongi Tract; 130 acres in the Gibson Woods; 49 acres in the Tollston Ridges; 440 acres in Hoosier Prairie; 109 acres in the Hoosier Prairie Gaylord Tract);
- 750 in the Indiana Dunes National Lakeshore (15 used for breeding study, and 20 for migration nets);
- 658 acres on the western shore of Green Bay (entire acreage of the watershed of concern);
- approximately 470 acres at Illinois Beach State Park;
- 12 acres studied in Northeastern Illinois.

2. Habitat for osprey, coaster brook trout, mussel species, Trumpeter swans, the Karner blue butterfly, Northern pike, and the Bald eagle was inventoried, assessed, evaluated, improved and restored at various locations throughout the basin.

- Weirs and channel constructed to simulate historic water levels and osprey nesting platforms were constructed in New York.
- Breeding and rearing habitat for the Wisconsin state endangered common tern was increased.
- The substrate of the Grand Portage nearshore areas of Lake Superior were delineated and mapped, and areas that are possible coaster brook trout habitat classified. Groundwork for future studies was laid.
- 80 mussel beds in Cedar Creek, Fish Creek, and the West Branch of sub-basins of the St. Joseph River were assessed and a template of preferred conditions to guide restoration of mussel habitat was produced.
- The Northwest Indiana Gaylord II tract surveyed, a fence to keep out vehicular traffic and off-road vehicles was erected, trash removed, prescribed burns conducted, and a sign and fence to protect areas against midnight dumpers were erected.
- A Coaster brook trout broodstock rearing facility was built at the Red Cliff Fish Hatchery in Wisconsin.
- 78 tributaries on the western shore of Green Bay were assessed as Northern pike habitat and a management plan developed.
- Lupine populations were mapped and evaluated, invasive plants removed, and lupine populations re-established to restore habitat for the Karner blue butterfly at Illinois Beach State Park.
- Research on amphibians and their habitats was conducted in Northeastern Illinois.

3. Knowledge about species was collected, organized, shared and disseminated to a variety of people.

- A fact sheet highlighted important habitat and water quality characteristics necessary for the conservation of freshwater mussel biodiversity in Northeastern Indiana.
- Federal and state natural resource managers worked together to exchange information and share tools and worked with local citizen groups such as Water Watchers of Indiana, and others connected to the St. Joseph River Watershed Initiative, to protect mussels in Northeastern Indiana and Northwest Ohio.
- In Northwest Indiana, nature walks and workdays were used as opportunities to educate people, especially children, about the nature preserves.
- Three slide shows, two newspaper articles, demonstrations to local high school groups, a five day training workshop to prepare bird banding volunteers, increased public awareness about monitoring avian migrations in Northwest Indiana. 627 volunteer hours were provided to the banding program..
- Report: "The Effect of Forest Structure on Amphibian Abundance and Diversity in the Chicago Region."
- Report: "An Assessment of Potential Impact of a Proposed Roadbed Removal Project on the Butterflies of the Ivanhoe Sand Savanna"

4. Fish and wildlife populations were re-established, monitored and indicators developed to track them.

- Birds, amphibians, and habitats were monitored by 493 volunteers along 575 routes in both Canada and the United States. Monitoring results were incorporated into the State of the Lakes Ecosystem Conference Suite of Great Lakes indicators.
- State of the Lakes Ecosystem Conference (SOLEC) Indicator #8135–Contaminants Affecting Productivity of Bald Eagles was completed for SOLEC 2000.
- 14 Trumpeter Swans were introduced to the Bad River Reservation in Wisconsin.
- 1031 birds (78 species) were banded in Northwest Indiana's Indiana Dunes National Lakeshore in two years. The health, population, migration and breeding statistics were monitored and recorded for the Federal Bird Banding Laboratory and the Institute for Bird Populations.
- Northern pike habitat is being restored at three sites on the western shore of Green Bay, Wisconsin.

Projects:

- Buckhorn Marsh (11), New York State Department of Environmental Conservation
- Colonial Nesting Birds Restoration (16), Wisconsin Department of Natural Resources
- Grand Portage Reservation Coaster Brook Trout Habitat Protection Program (37), Grand Portage Reservation Tribal Council, Minnesota

- Habitat Design for Mussel Restoration (48), United States Geological Survey, Ohio
- Habitat Protection and Restoration at Grand Calumet Nature Preserves (49), The Nature Conservancy, Indiana
- Implementation of the Marsh Monitoring Program in the Great Lakes Basin (54), Great Lakes United & Bird Studies Canada
- Improving SOLEC Indicator 8135: Bald Eagles (55), Clemson University
- Lake Superior Basin Brook Trout Broodstock Facility (61), Red Cliff Fish Hatchery, Wisconsin
- Lake Superior Trumpeter Swan Restoration (64), Wisconsin Department of Natural Resources
- Monitoring Avian Migrations, Productivity, and Survivorship in Northwest Indiana, 1999-2000 (76), Save the Dunes Conservation Fund
- Northern Pike Habitat Protection and Restoration (79), Wisconsin Department of Natural Resources
- Restoration of Habitat for the Endangered Karner Blue Butterfly in the Illinois Beach State Park (87), U.S. Fish and Wildlife Service and the Illinois Department of Natural Resources
- Woodland Quality and Amphibian Diversity (106), Citizens For Conservation, Illinois

Partners: In addition to the 15 grantee organizations from the 13 projects, 47 agencies and organizations were partners in the projects, including:

*3 Tribes:* 1854 Ceded Territory Authority, Bad River Tribe, Grand Portage Reservation Tribal Government

*8 Federal Agencies:* Bird Studies Canada Marsh Monitoring Program, Canadian Wildlife Service, Environment Canada, Indiana Dunes National Lakeshore, National Park Service, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, U.S. Geological Service

*5 Municipalities and Counties:* Brown County, Lake County Forest Preserve District, Oconto County, Town of Pensaukee, Will County Forest Preserve District

*16 Not-for-Profit Organizations:* Chipper Woods Bird Observatory, Dunes-Calumet Audubon, Hamlin Street Block Assoc., Institute for Bird Populations, National Audubon Society, Natural Resources Foundation of Wisconsin, Remedial Action Plan Coordinators basinwide, Shirley Heinz Environmental Fund, Federation of Ontario Naturalists, Gibson Woods Nature Preserve, Grand Calumet Task Force, Izaak Walton League, Trout Unlimited, Wildlife Forever, Windway Capital Foundation, Zoological Society of Milwaukee

*2 Universities:* Earlham College, Northeastern Illinois University;

*10 State and Provincial Agencies:* Illinois Dept of Natural Resources, Indiana Department of Environmental Management, Indiana Department of Natural Resources: Division of Nature Preserves, Michigan Department of Environmental Quality, Michigan Department of Natural Resources, Minnesota Department of Natural Resources, Ohio Department of Natural Resources, Ohio EPA: Division of Surface Water, Ontario Ministry of Natural Resources, Wisconsin Department of Natural Resources

*1 International Organization:* International Joint Commission

*2 Corporations:* Indianapolis Power and Light Company, NIPSCO

#### **D. Forests**

Forest projects accomplished the following:

- Achieved a better understanding of the impacts to and tools needed to restore northern Great Lakes forest ecosystems.
- Furthered the development of a new tool, the forest bank, to conserve modestly sized, privately owned forest resources without causing economic hardship.
- Disseminated information about model sustainable forestry practices through a conference for loggers, a brochure “Menominee Tribal Enterprises”, a technical manual “The Menominee Forest Management Tradition”, a sustained forest yield video, and a final project report on the GLNPO website.

Projects:

- Conifer Restoration in the Bad River Watershed (18), Northland College, Wisconsin
- Great Lakes Forest Bank Project (44), Center for Compatible Economic Development (The Nature Conservancy), Wisconsin, New York
- Menominee Habitat Protection and Restoration Project (71), Menominee Indian Tribe of Wisconsin, Wisconsin

Partners: *In addition to the three grantee organizations, participation in the Menominee conference by individuals interested in forestry and logging practices, and the Northland College students that helped with conifer restoration, 11 agencies and organizations were partners in the projects, including:*

*2 Not-for-Profit Organizations: Whittlesey Creek Conservation Project*

*1 Tribal Organization: Bad River Tribe*

*1 State Agency: Wisconsin Department of Natural Resources*

*3 Federal Agencies: Bureau of Indian Affairs, U.S. Fish and Wildlife Service, U.S. Geological Service*

*1 University: College of the Menominee Nation*

*4 Foundations: George Gund Foundation, Norcross Foundation, Moriah Fund, Great Lakes Protection Fund*

**E. Grasslands**

Grassland projects accomplished the following:

- More than 1,000 acres of prairie were restored at more than 50 different sites using prescribed burns, shrub removal, tree girdling, and hydraulic manipulation.
- More than 3,800 acres were inventoried and monitored, including plant and animal surveys, and hydrology monitoring.
- Environmental, valuation and title information for several small prairies were obtained.
- Partnerships were formed with landowners.
- Report: "Sampling and Management of Lakeplain Prairies in Southern Lower Michigan"
- Report: "Algonac Prairie: Species Response to Local Hydrology and Prescribed Burns"
- Report: "Vegetation Monitoring Plan for Three Natural Community Types in the St. Clair Flats Region"

Projects:

- Lake Erie Basin Grasslands Restoration Project (59), Erie-Ottawa-Sandusky Chapter of Pheasants Forever, Ohio
- Maumee River Basin Wetlands Restoration (70) Allen County Soil and Water Conservation District, Indiana
- Preservation and Implementation Plan for the Wentworth & Calumet Prairie Project (84), Corporation for OpenLands Project (CorLands), Illinois
- Restoration of Michigan Lakeplain Natural Communities (88), Michigan Natural Features Inventory
- St. Clair River Lakeplain Prairie and Oak Savanna Ecosystem Restoration Monitoring (94), Michigan Department of Natural Resources

Partners: *In addition to the 5 grantee organizations, 10 agencies and organizations were partners in the projects, including:*

*1 Universities: Purdue University*

*3 State Agencies: Indiana Department of Natural Resources, Michigan Department of Natural Resources, Ohio Department of Natural Resources, Division of Wildlife*

*Cedar Creek Watershed Alliance*

*3 Federal Agencies: Farm Services Agency, U.S. Fish and Wildlife Service, U.S.D.A. Natural Resource Conservation Service*

*3 Soil and Water Conservation Districts, Resource Conservation and Development Councils, and Cooperative Extension Services: Soil and Water Conservation Districts of Erie, Ottawa, and Sandusky Counties, Ohio*

## **F. Human-dominated Landscapes**

Urban projects accomplished the following:

1. New tools for dealing with urban ecological problems were developed.
  - A replicable technique for restoring slag acres (slag is left over from the steel making process and covers thousands of acres in Northwest Indiana) was developed.
  - A guidebook, "Habitat Restoration and Erosion Control," was disseminated.
  - On-site treatment technologies and best management practices were used to mitigate thermal and nutrient impacts of urban and suburban storm water on the 22,400-acre Genessee River and Irondequoit Bay drainage basin.
  - Available storm water pollution mitigation and available technologies were presented at informational meetings and in personal interactions with municipalities of Monroe County.
  
2. Ecological restoration and protection activities were initiated in Northwest Indiana, Northeast Ohio, and Buffalo, New York.
  - In Cleveland, Ohio: four streambank sites were restored using bioengineering techniques.
  - In Cook County, Illinois: seeds were collected and planted and exotic species were removed on 50 acres of the forest preserve district..
  - In Northwest Indiana: fences were erected around significant preserves to keep out vehicular traffic and off-road vehicles and protect against midnight dumpers; trash was removed; prescribed burns were conducted; and 40 acres of slag fill on the Southeast tip of Wolf Lake in Northwest Indiana is being restored.
  
3. Education and outreach tools were used to disseminate information about urban ecological protection and restoration projects.
  - Newsletter mailed to 5,000 people in the Swan Creek Watershed, Michigan.
  - An "Atlas of Biodiversity" was widely distributed in Northeastern Illinois.
  - Two-day workshop conducted for Northeast Ohio local officials and landowners and a handbook published about bioengineering techniques.
  - A quarterly newsletter called "The Seedling" was published and distributed to schools in Northeastern Illinois and 500 3-7th graders participate in ecological restoration as part of educational programs each year.
  
4. Partnerships were developed to assist in urban protection and restoration project planning and implementation.
  - The "Chicago Wilderness Biodiversity Recovery Plan" was produced along with a summary and guide. The plan involved more than 175 individuals representing 120 organizations from 24 municipalities, 13 day-long workshops to identify priorities for scientists and natural resource managers, and a series of workshops on key regional planning topics including biodiversity and the law, water management, and economics.
  - The report, "Biodiversity Conservation Opportunities in the Toleston Strandplain of Northern Lake County, Indiana: A Strategic Plan for Conservation Success," helped identify restoration strategies and a conservation plan for part of Northwest Indiana.
  - A conservation plan and citizen's advisory group for Southeast Michigan was initiated with citizens, landowners, businesses, municipalities, and environmental organization in Detroit and seven surrounding counties (more than 75 initial organizations and agencies).
  
5. The following inventories and assessments of biodiversity, threats, and land ownership were conducted.
  - Problem sites along the Cuyahoga River inventoried.
  - Habitat inventories and threats analyses were completed and ownership information updated in Northwest Indiana.
  - Report: "An Assessment of Potential Impact of a Proposed Roadbed Removal Project on the Butterflies of the Ivanhoe Sand Savanna"

Projects:

- Bioremediation Demonstration Project (8), City of Hammond, Indiana
- Buffalo River Fish and Wildlife Habitat Restoration Demonstration Project (12), Erie County Department of Environment and Planning, New York
- Chicago Region Biodiversity Atlas and Recovery Plan (15), The Nature Conservancy & Northeastern Illinois Planning Commission, Illinois
- Conversion of Dry Basins to Created Wetlands for Mitigation of Runoff Water Quality Project (20), Monroe County Environmental Health Laboratory, New York
- Cuyahoga River Remedial Action Plan (RAP) Project (23), Cuyahoga River Community Planning Organization, Ohio
- Grand Calumet River Basin Biodiversity Conservation Plan (36), The Nature Conservancy, Indiana
- The GreenWays Initiative (46), Rails-to-Trails Conservancy Michigan Field Office, Michigan
- Habitat Protection and Restoration at Grand Calumet Nature Preserves (49), The Nature Conservancy, Indiana
- Mighty Acorns Youth Stewardship Educational Program (75), The Nature Conservancy, Illinois
- Urban Stream and Wildlife Habitat Restoration (100), Saginaw County Planning Department, Michigan

Partners: In addition to the 10 grantee organizations, 60 agencies and organizations were partners in the projects, including (but not limited to):

*15 Not-for-Profit Organizations:* Altgeld Gardens, Buffalo River Remedial Advisory Committee, Erie County Water Quality Strategy Committee, Friends of the Buffalo River, Hamlin Street Block Assoc., Hammond Volunteer Group, The Nature Conservancy, Irondequoit Watershed Collaborative, Michigan Natural Features Inventory, Northeast Ohio Area wide Coordinating Agency, Pheasants Forever, Shirley Heinz Environmental Fund, The Habitat Subcommittee for the RAP for the Grand Calumet River and Indiana Harbor Ship Canal, The Irondequoit Watershed Collaborative, The Volunteer Stewardship Network

*5 State Agencies:* Indiana Department of Natural Resources: Division of Nature Preserves, Michigan Department of Natural Resources: Wildlife Division, New York State Department of Environmental Conservation, Ohio Department of Natural Resources, Ohio Environmental Protection Agency

*8 Federal Agencies:* Indiana Dunes National Lakeshore, U.S. Fish and Wildlife Service, USDA Forest Service, Natural Resources Conservation Service, Shiawassee National Wildlife Refuge, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Geological Service

*7 Universities:* Ball State University, Chicago State University, Indiana University Northwest, Northeastern Illinois University, Purdue University North Central, State University College at Buffalo (Great Lakes Center), State University of New York at Buffalo (Great Lakes Program),

*2 Soil and Water Conservation Districts:* Cuyahoga Soil and Water Conservation District, Saginaw County Cooperative Extension

*15 County and Local Government Entities:* City of Buffalo, City of Cleveland, City of Seven Hills, Cook County Forest Preserve District, Hammond Parks and Recreation Board, City of Chicago, Northeastern Illinois Planning Commission, MetroParks Serving Summit County, Monroe County Water Coordinating Committee, Northeast Ohio Four County Regional Planning and Development Organization, Northeast Ohio Regional Sewer District, Saginaw County Drain Commission, Saginaw County Natural Resource Conservation Service, The City of Rochester, Village of Highland Hills

*4 Public Institutions:* Brookfield Zoo, Chicago Academy of Sciences, Field Museum of Natural History, Morton Arboretum

*4 Corporations:* Biohabitats Inc., Indianapolis Power and Light Company, NIPSCO, Wetlands Nursery

**Areas of Concern (AOC)**

Areas of Concern projects accomplished the following:

- 40 acres of on slag fill on the Southeast tip of Wolf Lake in Northwest Indiana is being restored.
- Riparian habitat was reconstructed at four sites using bioengineering techniques, and problem sites along the Cuyahoga River, Ohio were inventoried.
- All 43 AOC's were surveyed to determine the status of fisheries objectives.



- Habitat inventories, ownership information, and threats analyses completed for Grand Calumet, Indiana.
- 11,000 cubic yards of waste and woody debris were removed, and two small ponds and a channel to connect a creek at Grassy Point in the St. Louis River, Minnesota.
- 493 volunteers monitored and submitted data regarding birds, amphibians, and habitats along 575 routes in Canadian and United States AOC wetlands.
- An assessment of habitat losses and stresses and a wildlife inventory were undertaken and a habitat map was created for White Lake, Michigan.

In addition, the seven projects disseminated information through the media and presentations, produced educational videos, posters, and pamphlets, held community workshops, and developed partnerships. Results from Marsh Monitoring Program bird, amphibian and habitat monitoring have been incorporated into two State of the Lakes Ecosystem Conference (SOLEC) indicators: Indicator #4504–Amphibian Diversity and Abundance, and Indicator #4507–Wetland-Dependent Bird Diversity and Abundance.

- Report: “A Survey of Fish Community and Habitat Goals/Objectives/Targets”
- Report: “Status in Great Lakes Areas of Concern and Toward Integrating Remedial Action and Fisheries Management Planning in Great Lakes Areas of Concern”
- Publication: “Status of Aquatic Habitat Rehabilitation and Conservation Efforts in the Watersheds of Great Lakes Areas of Concern”
- Report: “Biodiversity Conservation Opportunities in the Toleston Strandplain of Northern Lake County, Indiana: A Strategic Plan for Conservation Success.”

Projects:

- Bioremediation Demonstration Project (8), City of Hammond, IN
- Cuyahoga River Remedial Action Plan (RAP) Project (23), Cuyahoga River Community Planning Organization, Ohio
- Fisheries Objectives and Aquatic Habitat Restoration (32), Wayne State University, Michigan
- Grand Calumet River Basin Biodiversity Conservation Plan (36), The Nature Conservancy, Indiana
- Habitat Restoration of Minnesota’s Grassy Point (50), Minnesota Department of Natural Resources
- Implementation of the Marsh Monitoring Program in the Great Lakes Basin (54), Great Lakes United and Bird Studies Canada
- White Lake Area of Concern Habitat Assessment (102), Lake Michigan Federation, Michigan

Partners: *In addition to the 7 grantee organizations, 41 agencies and organizations were partners in the projects, including:*

*4 Universities:* Ball State University, Indiana University Northwest, Northeastern Illinois University, Purdue University North Central,

*5 State/Provincial Agencies:* Michigan Department of Environmental Quality/Department of Natural Resources, Minnesota Pollution Control Agency, Ohio Department of Natural Resources, Ohio Environmental Protection Agency, Ontario Ministry of Natural Resources

*12 Land Trusts and Not-for-Profit Organizations:* Federation of Ontario Naturalists, Hammond Volunteer Group, National Audubon Society, Remedial Action Plan Coordinators, River Watch, St. Louis River Remedial Action Plan Citizens' Advisory Committee, The Habitat Subcommittee for the RAP for the Grand Calumet River and Indiana Harbor Ship Canal, The Nature Conservancy, White Lake Area Sportfishing Association, White Lake Public Advisory Council

*9 Federal Agencies and Organizations:* Bird Studies Canada, Canadian Wildlife Service, Environment Canada, Fisheries and Oceans Canada, International Joint Commission, U.S.D.A. Natural Resource Conservation Service, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, U.S. Geological Service

*2 Soil and Water Conservation Districts, Resource Conservation and Development Councils, and Cooperative Extension Services:* Cuyahoga Soil and Water Conservation District, Muskegon County Natural Resource Conservation Service

*9 County and Local Government Entities:* City of Cleveland, City of Duluth, City of Seven Hills, Hammond Parks

and Recreation Board, MetroParks Serving Summit County, Northeast Ohio Area wide Coordinating Agency, Northeast Ohio Four County Regional Planning and Development Organization, Northeast Ohio Regional Sewer District, Village of Highland Hills

*1 Corporation: Biohabitats Inc.*

### **G. Invasive Species**

Invasive species projects accomplished the following:

- Invasive non-indigenous species were controlled on more than 4,100 acres in Northwest Indiana, Toledo, Ohio Metroparks and preserves, Michigan and Minnesota coastal and riverine areas, Chicago Wilderness, Presque Isle State Park, Pennsylvania, and New York wetlands.
- Control methods were improved upon and included: physical and chemical removal of invasive plants, prescribed burning, and hydraulic manipulation. Inventories of aggressive species were done, and maps and management control plans developed at most sites. In one project, the actions of the invasive Ruffe in the presence of different pheromones were examined as a possible control method.
- Thousands of people were educated about invasive non-indigenous species including the 600 people who attended the Plants Out of Place/Invasive Plants in the Midwest Conference.
- A Wisconsin Invasive Plant Council was formed.
- Nature walks, field trips, volunteer workdays, intern programs, newsletters, workshops, and educational programs provided education and outreach to communities.
- Report: "Sampling and Management of Lakeplain Prairies in Southern Lower Michigan"
- Report: "Algonac Prairie: Species Response to Local Hydrology and Prescribed Burns"
- Report: "Characterization of the Olfactory Sensitivity of the Eurasian Ruffe, *Gymnocephalus cernuus*, to Putative Pheromones."

Projects:

- Control of Harmful Exotic Fish Through Spawning Pheromone Attractants (19), Fond du Lac Reservation Business Committee, Minnesota
- Deer Creek Marsh Wildlife Management Area (24), New York State Department of Environmental Conservation
- Developing a Plan for Protecting and Restoring Successional Habitats on Presque Isle State Park by Controlling Exotic Plant Species (25), Presque Isle Partnership, Pennsylvania
- Habitat Protection and Restoration at Grand Calumet Nature Preserves (49), The Nature Conservancy, Indiana
- Hearing Island Native Community Project (52), Minnesota Department of Natural Resources
- Mighty Acorns Youth Stewardship Educational Program (75), The Nature Conservancy, Illinois
- Northwestern Ohio Lakeplain Conservation Initiative (81), The Nature Conservancy, Ohio
- Plants Out of Place/Invasive Plants in the Upper Midwest Conference (83), River Country RC&D Council, Inc.
- Restoration of Great Lakes Coastal Habitats (86), The Nature Conservancy, Michigan
- Restoration of Habitat for the Endangered Karner Blue Butterfly in the Illinois Beach State Park (87), Interagency Agreement with the U.S. Fish and Wildlife Service and the Illinois Department of Natural Resources
- Restoration of Michigan Lakeplain Natural Communities (88), Michigan Natural Features Inventory
- Restoring Biodiversity to Midwest Oak Savannas in Ohio (89), Metropolitan Park District of the Toledo, Ohio Area
- Southern Lake Michigan Conservation Initiative (93), The Nature Conservancy, Indiana
- St. Clair River Lakeplain Prairie and Oak Savanna Ecosystem Restoration Monitoring (94), Michigan Department of Natural Resources

Partners: *In addition to the 15 grantee organizations for the 14 grants, 64 agencies and organizations were partners in the projects, including:*

*11 Universities: Bowling Green University - Environmental Studies Program, Chicago State University, Edinboro*

University, Gannon University, Mercyhurst College, Northeastern Illinois University, Penn State University, University of Minnesota Department of Fisheries and Wildlife, University of Texas at Austin, University of Wisconsin at Stevens Point, University of Wisconsin Extension

*19 State, Provincial and Tribal Agencies:* Ceded Territory Fisheries Program, Fond du Lac Resources Program - Department of Fisheries and Wildlife, Great Lakes Indian Fish and Wildlife Commission, Illinois Dept of Natural Resources, Indiana Department of Environmental Management, Indiana Department of Natural Resources, Indiana Department of Natural Resources: Division of Nature Preserves, Indiana Dunes State Park, Lac Courte Oreilles Chippewa Band, Leech Lake Band of Chippewa Indians, Michigan Department of Natural Resources, Minnesota Department of Corrections, Minnesota Department of Natural Resources, Minnesota Pollution Control Agency, Minnesota Sea Grant, Ohio Department of Natural Resources, Pennsylvania Department of Environmental Protection, Presque Isle State Park, Wisconsin Department of Natural Resources

*19 Land Trusts and Not-for-Profit Organizations:* Altgeld Gardens, Boy Scouts, Cleveland Museum of Natural History, Friends of Gibson Woods, Girl Scouts, Grand Calumet Task Force, Hamlin Street Block Association, Morton Arboretum, Natural Resources Research Institute-Duluth, Oak Openings Working Group, Park Point Community Club, Save the Dunes Council, Shirley Heinz Environmental Fund, St. Louis River Remedial Action Plan Citizens' Advisory Committee, The Nature Conservancy, The Northwoods Weed Council, Volunteer Stewardship Network, Toledo Zoo

*6 Federal Agencies:* U.S. Geological Service, National Park Service, U.S.D.A. Natural Resource Conservation Service, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, U.S.D.A. Forest Service

*4 County and Local Government Entities:* Cook County Forest Preserve District, Erie County Health Department, Lake County Forest Preserve District, Lake County Parks,

*5 Corporations:* Amoco Corporation, DuPont Corporation, Indianapolis Power and Light Company; Key Bank, Northern Indiana Public Service Company

## **H. Islands**

Island projects accomplished the following:

- The biodiversity of six Lake Michigan and Lake Huron islands (Beaver, Hog, Garden, Bois Blanc, Drummond, Marquette, LaSalle) was inventoried.
- The present and desired vegetation of Beaver Island in Lake Michigan was digitized and mapped.
- Constructed an economic/ environmentally sustainable plan for the Les Cheneaux Islands on Lake Huron: "A Plan for Les Cheneaux: Where Economy, Community and Nature Come Together."
- Native trees were planted on Hearing Island, Minnesota.
- Workshop: "Preserving the Natural Resources and Community Character of Beaver Island."

Projects:

- Biological Inventory for Conservation of Great Lakes Islands: 1999 Progress Report (7), Michigan Natural Features Inventory
- Hearing Island Native Community Project (52), Minnesota Department of Natural Resources
- Les Cheneaux Compatible Economic Development Project (67), Les Cheneaux Chamber of Commerce, Michigan

Partners: *In addition to the 3 grantee organizations for the 3 grants, 30 agencies and organizations were partners in the projects, including:*

*3 Universities:* Central Michigan University Biological Station, Lake Superior State University, University of Michigan Museum of Zoology

*6 State Agencies:* Michigan Department of Environmental Quality - Michigan Coastal Management Program, Michigan Department of Natural Resources, Michigan Department of Natural Resources - Forest Management Division, Minnesota Department of Corrections Tourist Association, Minnesota Department of Natural Resources, Minnesota Pollution Control Agency

*17 Land Trusts and Not-for-Profit Organizations:* Artists' Association, Great Lakes Aquatic Habitat Fund, Historical Association, Islands Wildlife, Little Traverse Conservancy, Michigan Environmental Council, Michigan Works! Northern Initiatives, Park Point Community Club, Small Business Development Center in the Sault,

Sportsman's Club, St. Louis River Remedial Action Plan Citizens' Advisory Committee, The Center for Compatible Economic Development, Community Foundation, The Islands Association, The Land Information Access Association Natural Resources Research Institute, The Nature Conservancy  
2 *Federal Agencies*: Hiawatha National Forest, U.S.D.A. Natural Resource Conservation Service  
1 *County and Local Government Entities*: Clark Township Board  
1 *Corporation*: Corporation for Enterprise Development

## **I. Native Landscaping**

Native landscaping projects accomplished the following:

- A 12-acre seed propagation garden was established and seeds collected.
- A ½ acre native plant garden for educational uses was established. 600 children a year tour the garden.
- Eight demonstration gardens were established in eight Michigan conservation districts.
- A network of volunteers was organized to collect seeds.
- Successfully restored 3400-5100 sq. yds. of coastal shoreline using native species to demonstrate natural landscaping practices in Rogers City, Michigan.
- Three sets of plant landscaping brochures developed and 750,000 copies distributed.
- An educational brochure and native plant poster were developed for the Upper Peninsula of Michigan. More than 40,000 copies have been distributed since 1996.
- Five workshops with hundreds of people attending trained people in native plant use and Michigan ecosystems.
- A native plant growers cooperative was organized.
- A steering committee of key natural resource managers was organized to promote native landscaping.

Projects:

- Establishment of Native Plants/Habitat on Lake Huron (30), U.S. Department of Agriculture, Michigan
- Go Wild! With Michigan Native Plants (35), Michigan Association of Conservation Districts
- Michigan's Upper Peninsula Native Plant Demonstration Area (73), Upper Peninsula Resource Conservation and Development Council

Partners: *In addition to the three grantee organizations, 26 agencies and organizations were partners in the projects, including:*

3 *State Agencies*: Michigan Department of Natural Resources Private Lands Program, Wildlife Division, and Natural Heritage Program

6 *Land Trusts and Not-for-Profit Organizations*: Boy Scouts, Girl Scouts, Michigan Nursery and Landscape Association, Michigan Seedling Growers Association, The Nature Conservancy, Wildflower Association of Michigan

6 *Federal Agencies*: U.S. Fish and Wildlife Service, U.S.D.A. Forest Service, U.S.D.A. Rose Lake Plant Materials Center, United States Department of Agriculture - Natural Resource Conservation Service, United States Forest Service - Manistee and Hiawatha National Forest

8 *Soil and Water Conservation Districts, Resource Conservation and Development Councils, and Cooperative Extension Services*: Delta County Soil & Water Conservation District, Marketing Education Program for Conservation District, Conservation Districts of Benzie County, Grand Traverse County, Leelanau County, Muskegon County, St. Joseph County, Michigan, Presque Isle Natural Resources Conservation District

1 *County and Local Government Entities*: Rogers City

2 *Corporations*: Champion Forests, Mead Paper

## **J. Oak Savanna**

Oak savanna projects accomplished the following:

- 1,148 acres of black oak savanna in Northwest Indiana are being protected and restored: 150 acres in the Ivanhoe Preserve and Ivanhoe South; 270 acres in the Clark and Pine Bongi Tract; 130 acres in the Gibson Woods; 49 acres in the Tollston Ridges; 440 acres in Hoosier Prairie; 109 acres in the Hoosier Prairie Gaylord Tract.

- 200 acres of oak savanna in Toledo Oak Openings Ohio have been restored and 110 acres are in the process of being restored throughout 18 restoration projects.
- 3,120 acres in the St. Clair Flats region of Michigan, which includes large oak savanna tracts, have been surveyed and restoration activities have resulted in invasive species removal.
- An oak openings seed nursery, conservation program, and intern program was begun at the Toledo Oak Openings, Ohio.
- The Midwest Oak Ecosystems Recovery Plan: “Midwest Oak Ecosystems Recovery Plan: A Call to Action,” was finalized and distributed to about 900 people.
- Report: “An Assessment of Potential Impact of a Proposed Roadbed Removal Project on the Butterflies of the Ivanhoe Sand Savanna”
- Report: for the journal *Ecological Restoration*: “Restoring Historical Wet Prairie, Oak Savanna, and Oak Woodland Communities in the Oak Openings Ecological Region of Northwest Ohio.”
- Report: “Vegetation Monitoring Plan for Three Natural Community Types in the St. Clair Flats Region.”

Oak Savanna protection and restoration activities included plant and animal inventories, physical barriers to keep out vehicular traffic and protect against off-road vehicles and midnight dumpers, trash removal, prescribed burns, filling ditches, seeding with native species, private landowner registry, acquisition, canopy thinning, and invasive plant removal. Volunteer and school group participation in restoration activities was begun in each region. Numerous presentations, walks, tours, group meetings, and educational brochures and displays

Projects:

- Habitat Protection and Restoration at Grand Calumet Nature Preserves (49), The Nature Conservancy, Indiana
- Midwest Oak Ecosystems Recovery Plan (74), The Nature Conservancy
- Northwestern Ohio Lakeplain Conservation Initiative (81), The Nature Conservancy, Ohio
- Restoring Biodiversity to Midwest Oak Savannas in Ohio (89), Metropolitan Park District of the Toledo Area, Ohio
- Southern Lake Michigan Conservation Initiative (93), The Nature Conservancy, Indiana
- St. Clair River Lakeplain Prairie and Oak Savanna Ecosystem Restoration Monitoring (94), Michigan Department of Natural Resources

Partners: *In addition to the 6 grantee organizations, 44 other agencies and organizations were partners in the projects, including:*

*5 Universities:* Bowling Green University - Environmental Studies Program, Illinois State University, Northeastern Illinois University, University of Wisconsin-Madison Arboretum, University of Wisconsin-Stevens Point

*10 State Agencies:* Illinois Department of Natural Resources, Indiana Department of Environmental Management, Indiana Department of Natural Resources, Indiana Department of Natural Resources - Division of Nature Preserves, Iowa Department of Natural Resources, Michigan Department of Natural Resources, Minnesota Department of Natural Resources, Missouri Department of Conservation, Missouri Department of Natural Resources, Wisconsin Department of Natural Resources

*10 Land Trusts and Not-for-Profit Organizations:* Boy Scouts, Friends of Gibson Woods, Girl Scouts, Grand Calumet Task Force, Hamlin Street Block Association, Oak Openings Working Group, Save the Dunes Council, Shirley Heinz Environmental Fund, The Nature Conservancy, Toledo Zoo

*7 Federal Agencies:* Indiana Dunes National Lakeshore, U.S. Geological Service, U.S. Army Corp of Engineers, U.S. Dept. of the Army, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, U.S. Forest Service

*7 County and Local Government Entities:* Forest Preserve Districts of Cook County, DuPage County, Kane County, Lake County, McHenry County, Will County, Illinois, Lake County, Indiana Parks

*5 Corporations:* Amoco Corporation, DuPont Corporation, Indianapolis Power and Light Company, Key Bank, Northern Indiana Public Service Company

## **K. Rivers and Streams**

Rivers and streams projects accomplished the following:

1. Using best management practices and bioengineering techniques, ecological restoration and protection activities were initiated along ten Great Lakes rivers and streams.

- Riparian habitat was reconstructed at four sites in Ohio using bioengineering techniques. Volunteers assisted with the river bank plantings.
- With landowners, 20,000 feet of filter strips were laid, 5 projects led to reforestation, 1 project led to wetland restoration, 400 acres of riparian forest were restored, and 4,000 acres were involved in the Conservation Tillage Program in Indiana.
- Best management practices were used to restore land in the Genesee River Watershed of New York and Pennsylvania.
- 534 acres of land in Ohio was preserved, including 38,850 feet of riparian corridors through 12 easements, and one more that will be purchased after the project ends.
- 11,000 cubic yards of waste and woody debris were removed and two small ponds and a channel created to connect the creek and the St. Louis River at Grassy Point in Minnesota.
- One half mile of riverbank stabilized and fish spawning and holding habitats were improved on the Onion River, Wisconsin.
- Restoration recommendations were implemented in the Swan Creek Watershed of Michigan.
- Stabilized highly erosive streambanks, reducing erosion and increasing fish spawning and living habitats along Whittlesey Creek, Wisconsin.

2. Education, training and outreach tools were used to disseminate information about streambank protection and restoration projects.

- A two-day workshop bioengineering techniques was conducted for Ohio officials and landowners and information disseminated to the general Ohio public via various news media and tours. A handbook about streambank bioengineering techniques was published.
- Technical services and cost share incentives, newsletters, and best management practice demonstration sites were used to encourage farmers and loggers along the Genesee River of New York and Pennsylvania.
- A fact sheet highlighted important habitat and water quality characteristics necessary for the conservation of freshwater mussel biodiversity in Indiana. State natural resource managers, as well as local citizen groups such as Water Watchers of Indiana, and others connected to the St. Joseph River Watershed Initiative, exchanged information and share tools that protect mussels.
- Local newspapers covered the Onion River, Wisconsin restoration project, and 25 students participated in restoration activities.
- A guidebook, "Habitat Restoration and Erosion Control," for the Swan Creek Watershed of Michigan was created, and a newsletter, "The Swan: Environmental Reporter for the Swan Creek Watershed, Michigan," mailed to 5,000 people.
- Hundreds of school children, citizens, and professionals toured the Whittlesey Creek Watershed, Wisconsin restoration project area and an Ashland school district (with the Watershed project education program) monitored the bioengineering practices for water quality impacts.

3. Watershed partnerships were developed to assist in river and stream protection and restoration project planning and implementation.

- One-on-one contact with landowners in Indiana resulted in 10-year cooperative agreements and land management information shared with local governments.
- Nutrient management plans were developed for potato and dairy farms.
- Broad based protection and restoration planning took place with citizens, control agencies, and the City of Duluth, Minnesota.
- Restoration needs for urban/suburban riparian lands were identified and plans made with local citizens for the restoration of the Swan Creek Watershed, Michigan.

4. Inventories and assessments were conducted of river and stream flora and fauna, as well as problem sites.
  - Problem sites along the Cuyahoga River Area of Concern were inventoried.
  - Indiana landowners were surveyed to better understand how land use decisions are made.
  - 80 mussel beds in Cedar Creek, Fish Creek, and the West Branch of sub-basins of the St. Joseph River in Indiana were assessed and a template of preferred conditions to guide restoration of mussel beds produced.
  - The flora and fauna, hydrology, and current and historical conditions of the Pigeon River, Indiana were inventoried and a threats analysis conducted.

Projects:

- Cuyahoga River Remedial Action Plan (RAP) Project (23), Cuyahoga River Community Planning Organization, Ohio
- Fish Creek Watershed Stewardship Program (31), The Nature Conservancy, Indiana
- Genesee River Critical Habitat Non-Point Source Pollution Control Demonstration (34), Headwaters Charitable Trust, Pennsylvania
- Grand River Protection (38), Western Reserve Resource Conservation & Development Council, Ohio
- Habitat Design for Mussel Restoration (48), United States Geological Survey, Ohio, Indiana
- Habitat Restoration of Minnesota's Grassy Point (50), Minnesota Department of Natural Resources
- Onion River Fish Habitat Restoration (82), Wisconsin Department of Natural Resources
- Strategic Plan for Maintenance and Restoration of Biodiversity on the Pigeon River Ecosystem (97), Indiana Department of Natural Resources, Division of Nature Preserves
- Urban Stream and Wildlife Habitat Restoration (100), Saginaw County Planning Department, Michigan
- Whittlesey Creek Stabilization and Rehabilitation Demonstration (104), Wisconsin Department of Natural Resources

Partners: In addition to the 10 grantee organizations, 62 agencies and organizations were partners in the projects, including:

*10 Soil and Water Conservation Districts:* Allegany County Conservation District, Cuyahoga Soil and Water Conservation District, Geauga County Soil and Water Conservation District, Headwaters Resource Conservation & Development Trust, New York Seneca Trail Resource Conservation & Development Council, Saginaw County Cooperative Extension, Saginaw County Natural Resource Conservation Service, Sheboygan County Conservation Association, Trumbull County Soil and Water Conservation District, Western Reserve RC&D Council

*18 County and Local Government Entities:* Ashtabula County, Ashtabula County Park District, Barksdale Township, Bayfield County, City of Cleveland, City of Duluth, City of Seven Hills, City of Sheboygan, Geauga County Park District, Lake County Extension Service, Lake County Metro Parks, MetroParks Serving Summit County, Northeast Ohio Area wide Coordinating Agency, Northeast Ohio Four County Regional Planning and Development Organization, Northeast Ohio Regional Sewer District, Potter County Conservation District, Saginaw County Drain Commission, Village of Highland Hills

*3 Schools and Universities:* Ashland School District, Cedar Grove High School, University of Wisconsin

*12 Not-for-Profit Organizations:* Grand River Environmental Action Task Force, Grand River Partners Inc., Headwaters Land Trust, Holden Arboretum, Pheasants Forever, River Watch, Sauk Trail Conservation Club, St. Louis River Remedial Action Plan Citizens' Advisory Committee, The Nature Conservancy, Trout Unlimited, The Trust for Public Land

*10 State Agencies:* Indiana Department of Natural Resources, Michigan Department of Natural Resources, Michigan Natural Features Inventory, Minnesota Pollution Control Agency, New York State Department of Environmental Conservation, Ohio Department of Natural Resources, Ohio Environmental Protection Agency, Pennsylvania Fish Commission, Wisconsin Conservation Corps, Wisconsin Education Board

*6 Federal Agencies:* Shiawassee National Wildlife Refuge, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, U.S. Forest Service, U.S. Geological Service, USDA Natural Resources Conservation Service

*1 Public Institution:* The Cleveland Museum of Natural History

*2 Corporations:* Biohabitats Inc., Wetlands Nursery

## **L. Sand Beaches and Dunes**

Sand beach and dune projects accomplished the following:

- 15,500 clumps of dune grass were planted at one site alone.
- Wooden walkways and moveable trails to protect dunes were constructed at 3 sites.
- 2 scientific papers about sand communities are contributing to protection efforts:
  - “Review of Existing Pertinent Information: Sand Transport Dynamics Operating along the Eastern Shore of Lake Ontario in New York State”
  - “Eastern Lake Ontario Littoral Processes: Review of Information and Management Implications”
- 2 site conservation plans were completed.
- 1 model dune steward program was developed.
- 172 volunteers, plus many more Boy Scouts, Girl Scouts, and other community groups worked more than 1200 hours to restore sand dunes by planting native grasses.

In addition, wildlife nesting habitat was created, exotic species were controlled, inventories of rare plants, animals, and natural communities were completed, and maps were produced. Outreach and education activities were initiated at all sites. Non-law enforcement staff patrolled and monitored the dunes and explained the fragile nature of the ecosystem to recreational users. Interpretive signs, brochures, and slide and videotape presentations (“Photographic History of the Eastern Lake Ontario Dunes and Wetlands”; “Lake Ontario Dunes and Wetlands: Aerial Photograph Interpretation”) were developed to explain local dune ecology. Field trips were conducted to promote public understanding of dune systems. At one site, an observation deck was constructed. At another site, a volunteer group to assist with ecological restoration and monitoring was formed.

Projects:

- Deer Creek Marsh Wildlife Management Area (24), New York, New York State Department of Environmental Conservation
- Eastern Lake Ontario Conservation Initiative (28), New York, The Nature Conservancy
- Establishment of Native Plants/Habitat on Lake Huron (30), Michigan, U.S.D.A. Natural Resource Conservation Service
- Lake Ontario Dune Restoration Workshop (60), New York, New York Sea Grant Extension Program - Cornell University
- Lakeview Wildlife Management Area (66), New York, New York State Department of Environmental Conservation
- Protection and Restoration of Sandy Pond Peninsula (85), New York, The Nature Conservancy
- Sand Mine Ecological Restoration - Grand Mere State Park (91), Michigan, Michigan Department of Natural Resources
- Whilhala Beach Dune Restoration (102), Indiana, Lake County Parks and Recreation Board

Partners: In addition to the eight grantee organizations and participation by numerous private landowners, 49 agencies and organizations were partners in the projects, including:

8 Universities: Colgate University, Cornell University, Finger Lakes Community College, Michigan Natural Features Inventory (Michigan State University), State University of New York-Oswego, State University of New York-Genesco, Syracuse University, University of Georgia

6 State Agencies: Michigan Department of Environmental Quality, Michigan State Park Stewardship Program, New York Coastal Management Program, New York Natural Heritage Partnership, New York State Department of State, New York State Office of Parks, Recreation & Historic Preservation

14 Land Trusts and Not-for-Profit Organizations: 1000 Islands, Eastman Place Association, Friends of Sandy Pond Beach, Girl Scouts and Boy Scouts, International Alvar Working Group, Jefferson-Sunset Bluff Landowners Association, North Jefferson Park Landowners Association, North Rainbow Shores Landowners Association, North-South Sandy Pond Association, Onondaga Audubon Society, Ontario Dune Coalition, Renshaw Beach Association, Steadman Association, Tug Hill Tomorrow Land Trust

3 Federal Agencies: U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and



Wildlife Service

*3 Soil and Water Conservation Districts, Resource Conservation and Development Councils, and Cooperative Extension Services:* Black River Resource Conservation and Development, Oswego County Soil and Water Conservation District, Presque Isle Natural Resources Conservation District

*15 County and Local Government Entities:* Jefferson County, Jefferson County Cooperative Extension, Jefferson County Planning Department, Jefferson County Soil and Water Conservation District, North Rainbow Shores, Oswego County Cooperative Extension, Oswego County Planning Department, Rogers City, Michigan, Town of Brownville, New York, Town of Cape Vincent, New York, Town of Clayton, New York, Town of Ellisburg, New York, Town of Lyme, New York, Town of Richland, New York, Town of Sandy Creek, New York

*2 Corporations:* Eastman Tract, TechniSand

**M. Tribal Lands**

Great Lakes Tribal projects accomplished the following:

- 5 Great Lakes Tribes conducted inventories, assessed Tribal natural resources, and protected and restored Tribal lands.
- Wild rice, coaster brook trout, and lake sturgeon, culturally significant natural resources, and wetlands, forests, and nearshore aquatic habitats, were studied, protected and restored.

*Bad River Band of Lake Superior Chippewa:*

Riparian and wetland cover types were digitized; rare plant surveys were completed; protected areas along river corridors were mapped; baseline benthic and aquatic productivity studies (macrophyte and periphyton) were completed. The results of the inventories and baseline studies were incorporated into Bad River Tribe's Integrated Resource Management Plan. Tribal and non-tribal partnerships were cultivated. Multimedia educational efforts to Tribal members about pollution and erosion prevention, land management, environmental values were conducted. Report: "Preliminary Analysis of Conservation Issues in the Kakagon/Bad River Sloughs Watershed"

*Grand Portage Tribe:*

The substrate of the Grand Portage nearshore areas of Lake Superior was delineated and mapped. Possible coaster brook trout habitat areas were studied.

*Red Cliff Tribe:*

A coaster brook trout broodstock rearing facility was built.

*Menominee Indian Tribe of Wisconsin:*

The feasibility of lake sturgeon fish-way needs were researched; stages for wild rice reintroduction in Pine Lake were researched; potential sturgeon fish-way studies were identified; wild rice was reintroduced to the Wolf River; lake sturgeon planted above the hydro-project were monitored; a layman's brochure about good forestry practices: "Menominee Tribal Enterprises," was produced; a sustained forest yield video was produced; a seminar for foresters and loggers about the Menominee Tribal Enterprises sustainable forestry program was held; new partnerships with federal and private agencies and Memorandums of Understanding were signed to carry out the educational part of the project.

Technical manual: "The Menominee Forest Management Tradition."

*Fond du Lac Tribe:*

Places where wild rice reintroduction would be successful were identified; mercury, water, and nutrient levels and other factors impacting wild rice growth were assessed; wild rice plantings were tested for growth success; wild rice was planted and harvested in identified areas.

*Wild Rice Conference:*

Information about wild rice was exchanged with more than 300 natural resource managers, scientists, and Tribal members. The conference promoted greater awareness of potential market of rice, and of the threats to wild rice habitats.

Report: "Proceeding of the Wild Rice Research and Management Conference."

Projects:

- Bad River/Kakagon Watershed Management Project and Coordinator (3), Bad River Band of Lake Superior Chippewa, Wisconsin
- Grand Portage Reservation Coaster Brook Trout Habitat Protection Program (37), Grand Portage Reservation Tribal Council, Minnesota
- Kakagon Sloughs Plan Implementation and Sustainability Analysis (57), The Nature Conservancy, Wisconsin
- Lake Superior Basin Brook Trout Broodstock Facility (61), Red Cliff Fish Hatchery, Wisconsin
- Menominee Habitat Protection and Restoration Project (70), Menominee Indian Tribe of Wisconsin
- St. Louis River Wild Rice Restoration (94), Fond du Lac Reservation Business Committee, Minnesota
- Wild Rice Conference (104), Great Lakes Indian Fish & Wildlife Commission

Partners: *In addition to the seven grantee organizations, 28 agencies and organizations were partners in the projects, including:*

*7 Tribes and Tribal Organizations:* 1854 Ceded Territory Authority, 1954 Authority, Bad River Band of Lake Superior Chippewa Indians, Fond du Lac Ceded Territory Wildlife Program, Grand Portage Reservation Tribal Government, Leech Lake Natural Resources Program, Minnesota Chippewa Laboratory

*3 Universities:* College of the Menominee Nation, Northland College/Sigurd Olson Environmental Institute, University of Wisconsin-Madison

*4 State and Provincial Agencies:* Michigan Department of Natural Resources, Minnesota Department of Natural Resources, Ontario Ministry of Natural Resources, Wisconsin Department of Natural Resources

*4 Land Trusts and Not-for-Profit Organizations:* National Wildlife Federation, Natural Resources Research Institute, The Nature Conservancy, Trout Unlimited

*6 Federal Agencies:* Bureau of Indian Affairs, Farmers Home Administration, U.S. Geological Service, National Park Service, U.S. Fish and Wildlife Service, U.S.D.A. Forest Service, U.S.D.A. Natural Resources Conservation Service

*3 County and Local Government Entities:* Ashland County, Bayfield County, Iron County

*1 Corporation:* Minnesota Power

## **N. Wetlands**

Wetland projects accomplished the following:

1. A comprehensive ecological assessment of all natural quality coastal marshes of significant size in the US portion of the Great Lakes was completed. The assessment included the impacts of human induced and natural water level fluctuations, a clarification of diversity of vegetation types and processes that sustain the marshes, a classification of marshes based on physical characteristics and biota, the ranking and clarification of each type of marsh based on natural quality and condition, and information on vegetation, hydrology, and sedimentation rates.

2. 1,733 acres of wetlands are being protected or restored throughout the basin, including:

- Restoration of 20 acres of former cropland to inland wetland habitat in the Black River Watershed of Ohio.
- 3 acres of wetlands were restored at the Blue Creek Wetland of Ohio.
- 74 acres restored by constructing weirs and channels to simulate historic water levels at Buckhorn Marsh in New York.
- Started a pilot wetlands restoration on a 30 acre site at the Great Marsh in Northwest Indiana.
- 14 wetlands, spanning 36 acres are being restored in Pennsylvania. Practices include eliminating direct run-off from agriculture, barnyards, and milk houses and installing duck boxes to encourage wildlife.
- 400 acres of Ohio Lake Erie coastal wetlands are being restored, thus establishing a biological corridor between Maumee Bay State Park and Little Cedar Point National Wildlife Refuge.
- Water quality was improved on 42 acres in Ohio through mitigation of agricultural run-off by improving a drainage system by installing a subirrigation/drainage system and retrofitting one-half of the system..

- 276 acres of prairie and 192 acres of wetlands were restored in the Cedar Creek Watershed of Indiana.
  - Restored 908 acres of coastal wetland at Metzger's Marsh in Ohio.
  - Finished 25 different wetland projects spanning 58 acres in the Saginaw Bay Watershed of Michigan.
3. A detailed inventory, assessment and evaluation of the types and functional values of coastal wetlands, altered wetlands, and other critical areas in approximately one million acres of Wisconsin's Lake Superior basin was conducted.
4. In the Bad River/Kakagon Watershed, riparian and wetland cover types were digitized, rare plant surveys were completed, protected areas along river corridors were mapped, a baseline aquatic and benthic productivity studies were conducted, necessary management conditions for desired plant communities were assessed, the stresses to the Kakagon sloughs were identified. A report: "Preliminary Analysis of Conservation Issues in the Kakagon/Bad River Sloughs Watershed," was completed. Results of inventories and baseline studies were incorporated into Bad River Tribe's Integrated Resource Management Plan.
5. Information about wetlands and management activities was shared among the non-management public and led to greater participation in project activities.
- Tribal and non-tribal partnerships were cultivated as a result of the work in the Bad River/Kakagon Watershed and community support for long term protection of the Kakagon Sloughs was strengthened.
  - 70 volunteer workdays were held involving more than 240 individuals working over 2,000 hours at Ives Road Fen in Michigan and a volunteer preserve committee was formed.
  - A meeting to discuss the potential effects of restoring the Great Marsh was held with Beverly Shore, Indiana citizens.
  - Information about the Lake Superior coastal wetlands evaluation was shared with the Natural Heritage Program and other interested natural resource managers.
  - The Cedar Creek Watershed, Indiana wetland inventory was used to make a mailing list for initial landowner contacts.
  - Landowner partnerships were developed in the Saginaw Bay Watershed.
6. Wetland monitoring provided information for several projects.
- Water quality is being monitored at Blue Creek in Ohio.
  - Wells were installed and baseline data was collected throughout Ives Road Fen, Michigan. A hydrological monitoring plan was developed and monitoring is continuing, and a followup evaluation will occur in 2003.
  - A hydrologic and vegetative monitoring network was established at the Great Marsh in Northwest Indiana.
  - Birds, amphibians, and habitats were monitored by 493 volunteers along 575 routes in both Canada and the United States and results incorporated into the State of the Great Lakes 2001 report and the suite of Great Lakes indicators.
  - Evaluated the water quality functions and the revegetation of the restored wetlands in Pennsylvania.
7. Project activities included education and outreach.
- Articles about the Bad River/Kakagon project were published in the Tribal newspaper and multimedia educational efforts to Tribal members about pollution and erosion prevention, land management, environmental values.
  - Two site tours and a dedication ceremony were held to showcase the Black River habitat restorations.
  - The Blue Creek Project demonstrated how wetlands in agriculturally dominated landscapes can filter pollutants and reduce erosion. A report, "A Guide to Research Opportunities," was distributed. The site is utilized by local schools and universities.
  - Educational programs were conducted for landowners about the Lake Erie Accelerated Wetlands Project.
  - Educational slide show and a video produced about the Marketing Wetlands for Profit Project.
  - A brochure about the Maumee River Basin Wetlands Restoration Project was produced and distributed.

- As a result of the Metzger's Marsh Project, the potential for education in the region was increased..
- 7 presentations and 2 tours were given regarding the Saginaw Bay Watershed restoration. 5 contractors, 3 technicians, and 1 district conservationist were trained in restoration techniques.

Projects:

- Bad River/Kakagon Watershed Management Project and Coordinator (3), Bad River Band of Lake Superior Chippewa, Wisconsin
- Basinwide Survey of Great Lakes Marshes (5), Michigan Natural Features Inventory
- Black River Habitat Restoration (9), Lorain County Soil and Water Conservation District, Ohio
- The Blue Creek Project: An Agricultural Wetland Demonstration Project (10), Toledo Metropolitan Area Council of Governments, Ohio
- Buckhorn Marsh (11), New York State Department of Environmental Conservation
- Critical Habitat Restoration and Protection at Ives Road Fen, Lenawee County, Michigan (22), The Nature Conservancy
- Great Marsh Wetland Habitat Restoration (45), Indiana University
- Implementation of the Marsh Monitoring Program in the Great Lakes Basin (54), Great Lakes United
- Kakagon Sloughs Plan Implementation and Sustainability Analysis (57), The Nature Conservancy, Wisconsin
- Lake Erie Accelerated Wetland Restoration (58), Penn Soil Resource Conservation and Development Council, Pennsylvania
- Lake Superior Coastal Wetlands Evaluation (62), Wisconsin Department of Natural Resources
- Mallard Club Marsh Wildlife Area Wetland Restoration (68), Ohio Department of Natural Resources, Division of Wildlife
- Marketing Wetlands for Profit (69), Maumee Valley RC&D, Ohio
- Maumee River Basin Wetlands Restoration (70), Allen County Soil and Water Conservation District, Indiana
- Metzger's Marsh Wildlife Area (72), Ohio Department of Natural Resources, Division of Wildlife
- Saginaw Bay Watershed Wetland Restoration Project (90), Lapeer County Soil and Water Conservation District, Michigan

Partners: In addition to the 16 grantee organizations, 81 agencies and organizations were partners in the projects, including:

*10 County and local government entities:* Ann Arbor Parks & Recreation Department, Ashland County, City of Superior, Iron County, Lorain County Commissioners, Lorain County Metropolitan Park District, Lucas County Engineers, City of Toledo, Toledo Metropolitan Area Council of Government, Toledo Metroparks

*3 Tribal organizations:* Bad River Band of Lake Superior Chippewa Indians, Bureau of Indian Affairs, Great Lakes Indian Fish and Wildlife Commission

*21 Not-for-profit organizations:* Black River Remedial Action Plan Coordinating Committee, Cedar Creek Watershed Alliance, Ducks Unlimited, Federation of Ontario Naturalists, Lake Erie Wildfowlers, Lorain County Chapter of Pheasants Forever, Maumee Bay Audubon, Maumee Valley Audubon Club, Michigan United Conservation Clubs, National Audubon Society, National Wildlife Federation, Ohio Decoy Carvers, Ohio Fish and Wildlife Management Association, Ohio Operating Engineers Apprenticeship Fund, Pheasants Forever, Remedial Action Plan Coordinators basinwide, Save the Dunes Council, Shelby Conservation League, The Nature Conservancy, Wildfowl USA, Wolf Creek Sportsmen's Club

*10 Schools and universities:* Bowling Green State University, Michigan State University, Northland College/Sigurd Olson Environmental Institute, Oberlin College Biology Department, Ohio State University, Pennsylvania State University, Purdue University, Tecumseh Middle School, University of Toledo, University of Wisconsin-Madison

*13 U.S. and Canadian federal agencies:* Bird Studies Canada Marsh Monitoring Program, Canadian Wildlife Service, Environment Canada, Farm Service Agency, Farmers Home Administration, Indiana Dunes National Lakeshore, National Park Service, U.S. Fish and Wildlife Service, U.S. Geological Service, US Army Corps of Engineers, USDA Agriculture Research Service, USDA Forest Service, USDA Natural Resources Conservation

Service, USGS Lake Michigan Ecological Station

*4 Soil and water conservation districts:* Crawford Conservation District, Erie Soil & Water Conservation District, Lucas Soil and Water Conservation District, Western Reserve Resource Conservation & Development

*16 State and provincial agencies:* Indiana Department of Natural Resources, Indiana Geological Survey, Michigan Department of Agriculture, Michigan Department of Natural Resources, Minnesota Department of Natural Resources, New York Department of Natural Resources, New York Heritage Program, Ohio Department of Natural Resources, Ohio Environmental Protection Agency, Ontario Ministry of Natural Resources, Pennsylvania Department of Natural Resources, Wisconsin Coastal Management Program, Wisconsin Department of Administration Coastal Management Program, Wisconsin Department of Natural Resources, Wisconsin Department of Transportation Aeronautics Division, Wisconsin's Natural Heritage Inventory Program

*1 International organization:* International Joint Commission

*3 Corporations:* Dow Chemical, General Motors, The Toledo Edison Company

#### **LIST OF PROJECTS** (in alphabetical order by project title)

#1 - Applied Research Symposia - 1999 Midwest Fish and Wildlife Conference (FY1999-GL975164-01-0) Illinois Conservation Foundation

#2 - Aquatic Community Health Paper for State of the Lakes Ecosystem Conference (SOLEC 1994) (FY1992 - X995909) Great Lakes Fisheries Commission

#3 - Bad River/Kakagon Watershed Management Project and Coordinator (FY1995, 1996 - GL985001-01-0, -02-0) Bad River Band of Lake Superior Chippewa

#4 - Basinwide Planning and Coordination of Biodiversity Protection Activities in the Great Lakes Ecosystem (See "Great Lakes Ecosystem Protection" description of the cluster grant to The Nature Conservancy for more information.) (FY1993 - GL995819-01, 02) The Nature Conservancy

#5 - Basinwide Survey of Great Lakes Marshes (See "Great Lakes Ecosystem Protection" description of the cluster grant to The Nature Conservancy for more information.) (FY1993 - GL995819-02) Michigan Natural Features Inventory

#6 - Biodiversity of New York's Great Lakes Shoreline (See "Great Lakes Ecosystem Protection" description of the cluster grant to The Nature Conservancy for more information.) (FY1993 - GL995819-01, 02) New York State Department of Environmental Conservation

#7 - Biological Inventory for Conservation of Great Lakes Islands: 1999 Progress Report (FY1998 GL985161-01-0) Michigan Natural Features Inventory

#8 - Bioremediation Demonstration Project (FY1994 - GL995709-01-0) City of Hammond, Indiana

#9 - Black River Habitat Restoration (FY1993 - GL995439-01-0) Lorain County Soil and Water Conservation District

#10 - The Blue Creek Project: An Agricultural Wetland Demonstration Project (FY1992- X995959-01) Toledo Metropolitan Area Council of Governments

#11 - Buckhorn Marsh (See "Lake Ontario Barrier Beach/Wetlands Habitat Restoration Project" description of the cluster grant to New York State Department of Environmental Conservation for more information.) (FY1994 - GL995663-01-0) New York State Department of Environmental Conservation

#12 - Buffalo River Fish and Wildlife Habitat Restoration Demonstration Project (FY1993 - GL995960-01-1) Erie County Department of Environment and Planning

#13 - Building a Conservation Vision for Great Lakes Biodiversity (FY 1997 - GL985513-01-0) The Nature Conservancy

#14 - Chequamegon Bay Aquatic Vegetation Restoration (See “Great Lakes Fish and Wildlife Program” description of the cluster grant to Wisconsin Department of Natural Resources for more information.) (FY1993 - GL995427-0)  
Wisconsin Department of Natural Resources

#15 - Chicago Region Biodiversity Atlas and Recovery Plan (FY1995 GL985055-01, GL985200-02-4) The Nature Conservancy

#16 - Colonial Nesting Birds Restoration (FY1992 - GL995872-01) Wisconsin Department of Natural Resources

#17 - Compiling Site Specific Information for Imperiled Species within the Great Lakes States (FY1995 - GL985178-01-0) The Nature Conservancy

#18 - Conifer Restoration in the Bad River Watershed (FY 1997 - GL985515-01-0) Northland College

#19 - Control of Harmful Exotic Fish Through Spawning Pheromone Attractants (FY1995 - GL985052-01-1) Fond du Lac Reservation Business Committee

#20 - Conversion of Dry Basins to Created Wetlands for Mitigation of Runoff Water Quality Project (FY1993 - GL995957-01-0) Monroe County Environmental Health Laboratory

#21 - Critical Habitat Protection in the Fox-Wolf River Basin (FY 1995-GL985124-01-0) Fox-Wolf Basin 2000, Inc.

#22 - Critical Habitat Restoration and Protection at Ives Road Fen, Lenawee County, Michigan (FY1997 - GL985701-01) The Nature Conservancy

#23 - Cuyahoga River Remedial Action Plan (RAP) Project  
(FY1995 - GL985134-01-2) Cuyahoga River Community Planning Organization

#24 - Deer Creek Marsh Wildlife Management Area (See “ Lake Ontario Barrier Beach/Wetlands Habitat Restoration Project” description of the cluster grant to New York State Department of Environmental Conservation for more information.) (FY1994 - GL995663-01-0) New York State Department of Environmental Conservation

#25 - Developing a Plan for Protecting and Restoring Successional Habitats on Presque Isle State Park by Controlling Exotic Plant Species (FY 1997 - GL985589-01-0) Presque Isle Partnership

#26 - Developing Imperiled Species Occurrence Information  
Eastern Pennsylvania (FY1995 - GL985179-01-0)  
Illinois (FY1995 - GL985183-01-0)  
Indiana (FY1995 - GL985184-01-0)  
Michigan (FY1995 - GL985181-01-0)  
Minnesota (FY1995 - GL985187-01-0)  
New York (FY1995 - GL985186-01-0)  
Ohio (FY1995 - GL985185-01-0)

Western Pennsylvania (FY1995 - GL985182-01-0)  
Wisconsin (FY1995 - GL985190-01-0)

#27 - Door County Conservation Initiative (See “Great Lakes Ecosystem Protection” description of the cluster grant to The Nature Conservancy for more information.) (FY1993 - GL995819-02-0) The Nature Conservancy

#28 - Eastern Lake Ontario Conservation Initiative (See “Great Lakes Ecosystem Protection” description of the cluster grant to The Nature Conservancy for more information.) (FY1993 - GL995819-01, 02) The Nature Conservancy

#29 - Ecological Targeting in Ohio’s Great Lake Basin (See “Great Lakes Ecosystem Protection” description of the cluster grant to The Nature Conservancy for more information.) (FY1993 - GL995819-02-0) The Nature Conservancy

#30 - Establishment of Native Plants/Habitat on Lake Huron (FY1995 - DW929477-01-0) U.S. Department of Agriculture

#31 - Fish Creek Watershed Stewardship Program (See “Great Lakes Ecosystem Protection” description of the cluster grant to The Nature Conservancy for more information.) (FY1993 - GL995819-02-0) The Nature Conservancy

#32 - Fisheries Objectives and Aquatic Habitat Restoration (FY1993 - X995291-01) Wayne State University

#33 - Functional Models of Priority Systems in the Great Lakes Basin (See “Great Lakes Ecosystem Protection” description of the cluster grant to The Nature Conservancy for more information.) (FY1993 - GL995819-02-0) The Nature Conservancy

#34 - Genesee River Critical Habitat Non-Point Source Pollution Control Demonstration (FY1994 - GL995655-01-0) Headwaters Charitable Trust

#35 - Go Wild! With Michigan Native Plants (FY1997 - GL985594-01) Michigan Association of Conservation Districts

#36 - Grand Calumet River Basin Biodiversity Conservation Plan (FY1997 - GL985556-01-1) The Nature Conservancy

#37 - Grand Portage Reservation Coaster Brook Trout Habitat Protection Program (FY 1997 - GL985618-01-0) Grand Portage Reservation Tribal Council

#38 - Grand River Protection (FY1994 - GL995650-01-0) Western Reserve Resource Conservation & Development Council

#39 - Great Lakes Alvar Conservation Conference (FY1998 GL985831-01) The Nature Conservancy

#40 - Great Lakes Alvar Poster (FY 1998- GL985667-01-0) The Nature Conservancy

#41 - Great Lakes Aquatic Habitat Network and Fund (FY1999 - GL005567-01-0) Tip of the Mitt Watershed Council

#42 - Great Lakes Biodiversity Publication (See “Great Lakes Ecosystem Protection” description of the cluster grant to The Nature Conservancy for more information.) (FY1993 - GL995819-02-0) The Nature Conservancy

#43 - Great Lakes Conservation Technology Transfer Program (See “Great Lakes Ecosystem Protection” description of the cluster grant to The Nature Conservancy for more information.) (FY1993 - GL995819-02-0) The Nature Conservancy

#44 - Great Lakes Forest Bank Project (FY1997 - GL985905-01) The Nature Conservancy

#45 - Great Marsh Wetland Habitat Restoration (FY1995 - GL985140-01-0) Indiana University

#46 - The GreenWays Initiative (FY1999 - GL975109-01-1) Rails-to-Trails Conservancy Michigan Field Office

#47 - Habitat Conservation and Restoration Strategies (HABCARES) Workshop (FY1994 - DW14947690-01-0) Interagency Agreement with: U.S. Fish and Wildlife Service

#48 - Habitat Design for Mussel Restoration (FY1997 - DW14947824-01-2) Interagency Agreement with: United States Geological Survey

#49 - Habitat Protection and Restoration at Grand Calumet Nature Preserves (FY1992 - X995281-01-0; FY1995 - GL985066-01-0) The Nature Conservancy

#50 - Habitat Restoration of Minnesota’s Grassy Point (FY1994 - GL995662-01) Minnesota Department of Natural Resources

#51 - Hamilton Lake Watershed Land Treatment (FY1992 - GL995954-01, 02, & 03) Indiana Department of Natural Resources

#52 - Hearing Island Native Community Project (FY1994 - GL995662-01) Minnesota Department of Natural Resources

#53 - Hypolimnetic Oxygen Supplementation Project (FY1993 - GL995956-01-0) Monroe County Environmental Health Laboratory

#54 - Implementation of the Marsh Monitoring Program in the Great Lakes Basin (FY1997 - GL985590-01-0; FY1999 - GL975139-01) Great Lakes United

#55 - Improving SOLEC Indicator 8135: Bald Eagles (FY2000 - GL973591-01-0) Clemson University

#56 - An Inventory and Assessment of the Resources of the Niagara Escarpment in Wisconsin (FY1998 - GL985956-01) Bay-Lake Regional Planning Commission

#57 - Kakagon Sloughs Plan Implementation and Sustainability Analysis (See “Great Lakes Conservation Planning and Implementation” and “Great Lakes Ecosystem Protection” descriptions of the cluster grants to The Nature Conservancy for more information.) (FY1992 - X995819-01-0, FY1993 - GL995819-02) The Nature Conservancy

#58 - Lake Erie Accelerated Wetland Restoration (FY1993 - GL995432-01-0) Penn Soil Resource Conservation and Development Council

#59 - Lake Erie Basin Grasslands Restoration Project (FY1998 - GL985094-01) Erie-Ottawa-Sandusky Chapter of Pheasants Forever

#60 - Lake Ontario Dune Restoration Workshop (FY 1998 - GL985787-01-0) New York Sea Grant Extension Program - Cornell University



- #61 - Lake Superior Basin Brook Trout Broodstock Facility (FY1998 - GL985873-01-0) Red Cliff Fish Hatchery
- #62 - Lake Superior Coastal Wetlands Evaluation (See the “Great Lakes Fish and Wildlife Program” description of the cluster grant to the Wisconsin Department of Natural Resources for more information.) (FY1993 - GL995427-01) Wisconsin Department of Natural Resources
- #63 - Lake Superior Habitat Coordination  
 Minnesota Pollution Control Agency (FY 1992, 93 - X995813-01/01-1)  
 Minnesota Department of Natural Resources (FY1994 - GL995662-01-0; FY1995 - GL985189)  
 Michigan Department of Natural Resources (FY1992, 93, 94 - X995809-01, -02)  
 Wisconsin Department of Natural Resources (FY1992, 93, 94 - GL995872-01-01, -02, -03)
- #64 - Lake Superior Trumpeter Swan Restoration (See “Great Lakes Fish and Wildlife Program” description of the cluster grant to Wisconsin Department of Natural Resources for more information.) (FY1993 - GL995427-01) Wisconsin Department of Natural Resources
- #65 - Lake Trout Spawning Reef Feasibility Study (See “Great Lakes Fish and Wildlife Program” description of the cluster grant to Wisconsin Department of Natural Resources for more information.) (FY1993 - GL995427-01) Wisconsin Department of Natural Resources
- #66 - Lakeview Wildlife Management Area (See “Lake Ontario Barrier Beach/Wetlands Habitat Restoration Project” description of the cluster grant to New York State Department of Environmental Conservation for more information.) (FY1994 - GL995663-01-0) New York State Department of Environmental Conservation
- #67 - Les Cheneaux Compatible Economic Development Project (FY1997 - GL985489-01-0) Les Cheneaux Chamber of Commerce
- #68 - Mallard Club Marsh Wildlife Area Wetland Restoration (FY1993-GL995430-01) Ohio Department of Natural Resources, Division of Wildlife
- #69 - Marketing Wetlands for Profit (FY1994 - GL995652-01-0) Maumee Valley RC&D Area
- #70 - Maumee River Basin Wetlands Restoration (FY1992 - X995958-01, FY1994 - GL995575-01-0) Allen County Soil and Water Conservation District
- #71 - Menominee Habitat Protection and Restoration Project (FY 1994- GL995661-01-0) Menominee Indian Tribe of Wisconsin
- #72 - Metzger’s Marsh Wildlife Area (FY1993 - GL995431-01) Ohio Department of Natural Resources, Division of Wildlife
- #73 - Michigan’s Upper Peninsula Native Plant Demonstration Area (FY 1995- GL985160-01-0) Upper Peninsula Resource Conservation & Development Council
- #74 - Midwest Oak Ecosystems Recovery Plan (FY1994 - GL995653-01-0) The Nature Conservancy
- #75 - Mighty Acorns Youth Stewardship Educational Program (FY1994, ‘97- GL995612-01-0, -02-1) Nature Conservancy
- #76 - Monitoring Avian Migrations, Productivity, and Survivorship in Northwest Indiana, 1999-2000 (FY1998 - GL985903-01) Save the Dunes Conservation Fund

- #77 - Natural Areas Association 1998 Conference (FY1998 - GL985676-01-0) Natural Areas Association
- #78 - Nettle Lake Habitat Restoration Project (FY1993 - X995943-01-0; FY1994 - GL995630-01-0) Maumee Valley Resource Conservation and Development Area
- #79 - Northern Pike Habitat Protection and Restoration FY1993 - GL995427-01-0, -1; FY1997 - GL985712-01) (Also see “Great Lakes Fish and Wildlife Program” description of the cluster grant to Wisconsin Department of Natural Resources for more information.) Wisconsin Department of Natural Resources
- #80 - Northwestern Lake Superior Workshops (FY1999 - GL97505201-0) The Nature Conservancy
- #81 - Northwestern Ohio Lakeplain Conservation Initiative (See “Great Lakes Ecosystem Protection” description of the cluster grant to The Nature Conservancy for more information.) (FY1993 - GL995819-02-0) The Nature Conservancy
- #82 - Onion River Fish Habitat Restoration (See “Great Lakes Fish and Wildlife Program” description of the cluster grant to Wisconsin Department of Natural Resources for more information.) (FY1993 - GL995427-01) Wisconsin Department of Natural Resources
- #83 - Plants Out of Place/Invasive Plants in the Upper Midwest Conference (FY2001 - GL975488-01-0) River Country RC&D Council, Inc.
- #84 - Preservation and Implementation Plan for the Wentworth & Calumet Prairie Project (FY1997 - GL985741-01) Corporation for OpenLands Project (CorLands)
- #85 - Protection and Restoration of Sandy Pond Peninsula, Lake Ontario Project (FY1994 - GL985129-01-0; FY1996 - GL985129-02-0) The Nature Conservancy
- #86 - Restoration of Great Lakes Coastal Habitats (FY1995 - GL985180-01-0) The Nature Conservancy
- #87 - Restoration of Habitat for the Endangered Karner Blue Butterfly in the Illinois Beach State Park (FY 1995 - DW 14947739-01-0) Interagency Agreement with the U.S. Fish and Wildlife Service
- #88 - Restoration of Michigan Lakeplain Natural Communities (FY1992, FY1993 - X995944-01) Michigan Natural Features Inventory
- #89 - Restoring Biodiversity to Midwest Oak Savannas in Ohio (FY1997, '98 - GL985592-01-0) Metropolitan Park District of the Toledo Area
- #90 - Saginaw Bay Watershed Wetland Restoration Project (FY1993 - GL995429-01-0) Lapeer County Soil and Water Conservation District
- #91 - Sand Mine Ecological Restoration - Grand Mere State Park (FY1997 - GL985669-01) Michigan Department of Natural Resources
- #92 - Significant Areas of Biological Diversity in the Great Lakes Basin (See “Great Lakes Conservation Planning and Implementation” description of the cluster grant to The Nature Conservancy for more information.) (FY1992 - X995819-01-0) The Nature Conservancy
- #93 - Southern Lake Michigan Conservation Initiative (See “Great Lakes Ecosystem Protection” description of the cluster grant to The Nature Conservancy for more information.) (FY1993 - GL995819-02-0) The Nature

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- #94 - St. Clair River Lakeplain Prairie and Oak Savanna Ecosystem Restoration Monitoring (FY1997 - GL985694-01-0) Michigan Department of Natural Resources
- #95 - St. Louis River Wild Rice Restoration (FY1993 - GL995480-01; FY1994 - GL995651-01, -02) Fond du Lac Reservation Business Committee
- #96 - Strategic Overview of Biodiversity Conservation (See “Great Lakes Conservation Planning and Implementation” description of the cluster grant to The Nature Conservancy for more information.) (FY1992 - X995819-01) The Nature Conservancy
- #97 - Strategic Plan for Maintenance and Restoration of Biodiversity on the Pigeon River Ecosystem (FY1995 - GL985125-01-1) Indiana Department of Natural Resources, Division of Nature Preserves
- #98 - Targeting System for Aquatic Biodiversity Conservation (See “Great Lakes Ecosystem Protection” description of the cluster grant to The Nature Conservancy for more information.) (FY1993 - GL995819-02-0) The Nature Conservancy
- #99 - Upper Midwest GAP Analysis Project (FY1993 - DW14947667-01-0) National Biological Service Environmental Management Technology Center
- #100 - Urban Stream and Wildlife Habitat Restoration (FY1994 - GL995730-01-0) Saginaw County Planning Department
- #101 - Watershed Level Biodiversity Assessments (See “Great Lakes Ecosystem Protection” description of the cluster grant to The Nature Conservancy for more information.) (FY1993 - GL995819-02) Michigan Natural Features Inventory
- #102 - Whihala Beach Dune Restoration (FY1993 - GL995428-01-0) Lake County Parks and Recreation Board
- #103 - White Lake Area of Concern Habitat Assessment (FY1995 - GL985147-01-0) Lake Michigan Federation
- #104 - Whittlesey Creek Stabilization and Rehabilitation Demonstration (See “Great Lakes Fish and Wildlife Program” description of the cluster grant to Wisconsin Department of Natural Resources for more information.) (FY1994 - GL995427-01-1) Wisconsin Department of Natural Resources
- #105 - Wild Rice Conference (FY1998 - GL005322-01-0) Great Lakes Indian Fish & Wildlife Commission
- #106 - Woodland Quality and Amphibian Diversity (FY1998 - GL985924-01-0) Citizens For Conservation