# ENVIRONMENTAL MITIGATION

## Background

Roads, highways and bridges can have a wide variety of environmental impacts. The best way to avoid these impacts is to first identify and understand what environmental resources and issues exist in a proposed project area. This information can then be incorporated into the planning and design phases to minimize or all together avoid foreseeable negative impacts.

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) requires metropolitan transportation plans to include a discussion of potential environmental mitigation activities in consultation with federal, state, and tribal wildlife, land management and regulatory agencies. The mitigation activities identified in the plan are to be at the policy and/or strategic level and not project specific.

Typically mitigating project impacts focuses on replacing similar resources as close to the impact site as feasible. This approach generally focuses on meeting regulatory requirements while not necessarily serving the highest ecological needs in a given area. To help address this, the U.S. Department of Transportation Federal Highway Administration and its project partners released Eco-Logical: An Ecosystem Approach to Developing Infrastructure Projects. The purpose of this document was to guide agencies and partners to work proactively in developing and implementing and ecosystem approach for mitigating the effects of transportation infrastructure projects. www.environment.fhwa.dot.gov/ecological/eco_index.asp

An ecosystem approach can help agencies move from project boundary confinements and regulatory checklists to habitat conservation on broader ecosystem scales. This approach can also lead to more cost effective and efficient ways to avoid and minimize impacts while identifying and seizing conservation and mitigation opportunities that are quickly disappearing with development pressures.

The benefits to this approach include:

- Safer, improved infrastructure
- Improved watershed and ecosystem health
- Increased connectivity and conservation
- Efficient project development
- Increased transparency

While this approach will not necessarily eliminate all conflict, it does provide a mechanism to develop acceptable solutions that compliment multiple agency missions.

To address the requirements of SAFETEA-LU while also realizing the benefits of incorporating the ecosystem approach to transportation planning in Northwest Indiana, NIRPC has included this chapter on environmental mitigation and a plan for ongoing consultation with environmental and natural resource agencies as part of the Long Term Transportation Plan.

## State and Regional Conservation and Restoration Plans

The following state and regional plans are included here as a beginning discussion point for identifying critical areas for conservation and/or restoration in Northwest Indiana. In some cases a plan may not specifically identify critical areas (spatially) but in most cases they do include priorities.

### *Indiana Wetlands Conservation Plan*

The purpose of the Indiana Wetlands Conservation Plan (IWCP) is to achieve wetland conservation in a manner that is mutually beneficial. The IWCP serves as a framework for discussion and problem solving while establishing common ground on which progress of wetland conservation can be made. It also sets specific actions to achieve progress. While the IWCP does not specifically identify priority areas it does provide the following recommendations regarding prioritization.

1. Given that 85% of Indiana's wetlands have been lost, all remaining wetlands are important and should be considered important for conservation. However, a system for prioritizing wetlands for conservation must be developed.
2. Priorities for conserving wetlands based on water quality, flood control, and groundwater benefits should be made at the watershed or sub-watershed level.
3. Special concerns for water quality, flood control, and groundwater should be identified for each watershed.
4. Statewide priorities for conserving wetlands based on biological and ecological functions should be developed based on the following criteria:
   a. Rarity of wetland type
   b. Presence of endangered, threatened, or rare species
   c. Presence of endangered, threatened, or rare species habitat, but species not yet identified at the site
   d. Diversity of native species
   e. Diversity of wetland community types

f. Proximity of other valued ecosystem types
g. Natural quality (amount of disturbance/degradation)
h. Irreplaceability (can the wetland type be re-created)
i. Recoverability (can the wetland type recover from disturbance it has experienced)
j. Size
k. Location

The priorities should be identified based on the natural regions currently used by the Indiana Department of Natural Resources, Division of Nature Preserves and many other agencies and organizations.

5. Historical and recreational benefits of wetlands should be considered in identifying priorities.
6. Based on the statewide biological and ecological priorities, a process should be developed to assist in identifying wetland priorities at the watershed or subwatershed level.
7. Better information on Indiana's wetland resources is needed to more effectively identify scientifically based priorities described in Appendix G.

For more information about the IWCP please visit www.in.gov/dnr/fishwild/3350.htm.

### *Indiana Comprehensive Wildlife Strategy*

The Indiana Comprehensive Wildlife Strategy (CWS) was developed by the Indiana Department of Natural Resources (IDNR) in coordination with conservation partners across the state to protect and conserve habitats and associated wildlife at a landscape scale. It provides a comprehensive overview of conservation in Indiana and identifies needs and opportunities for helping prevent species from becoming threatened or endangered in the future. Species of greatest conservation need (SGCN) were identified utilizing the most current published list of federally endangered, threatened or candidate species and Indiana's list of endangered species and species of special concern. The Indiana CWS was developed using an information system designed to link SGCN to all wildlife species and the habitats on which they depend. This was done by using a set of representative species as surrogates for guilds including the SGCN and which were reflective of habitat needs for all wildlife species. Major habitat categories included agricultural lands, aquatic systems, barren lands, developed lands, forest lands, grasslands, subterranean systems, and wetlands.

The CWP provides implementation guidance organized by habitat focus areas. The possible threats as determined by technical experts to the SGCN and their habitat are listed. Indiana's priority conservation actions and implementation guidance are presented for both the SCGN and their habitats. While too numerous to list here for each habitat category, the following common elements are reoccurring.

- Habitat protection through regulation
- Habitat protection and restoration on public lands
- Habitat protection and restoration incentives
- Exotic/invasive species control
- Protection of adjacent buffer zone
- Pollution reduction
- Corridor development and protection
- Artificial habitat creation
- Cooperative land management agreements
- Adaptive management

For more information about the Indiana Comprehensive Wildlife Strategy please visit www.in.gov/dnr/fishwild/files/CWS_MANUSCRIPT.pdf

### *Indiana Statewide Forest Assessment & Strategy*

The Indiana Statewide Forest Strategy was developed by the IDNR in coordination with natural-resource professionals, landowners, conservationists, land stewards and forest stakeholders. It recognizes the most important issues that increasingly threaten the sustainability and ecological capacity of Indiana's forests to provide the benefits of clean air, carbon sequestration, soil protection, wildlife habitat, wood products and other values, goods and services. The plan addresses a limited forest base being fragmented or converted to other land uses, like subdivision housing, paved surfaces or row crop agriculture. The plan will enhance Indiana forests' ability to conserve soil and water resources by protecting existing targeted forest cover in watersheds and promoting reforestation along key streams and rivers. It will guide and improve efforts to control and combat the economically and ecologically disastrous effects of invasive plants in woodlands and make dramatic strides in the preservation of biological diversity by assuring that increasingly simplified and one-dimensional forests become more diverse and connected with one another.

The following long-term strategies have been identified:

1. Conserve, manage, and protect existing forests. Especially large patches.
2. Restore and connect forests, especially in riparian areas.
3. Expand Best Management Practices, with special attention to invasive species.
4. Coordinate education, training, and technical assistance, especially to develop strategic partnerships.
5. Maintain and expand markets for Indiana hardwoods, especially those that are sustainably certified and are for local use.

Figure 1 was generated as part of the Statewide Forest Assessment to prioritize and reflect the relative importance of Indiana forest issues. The figure was generated by compositing forest issues and assigning a relative weighting score based on stakeholder feedback.

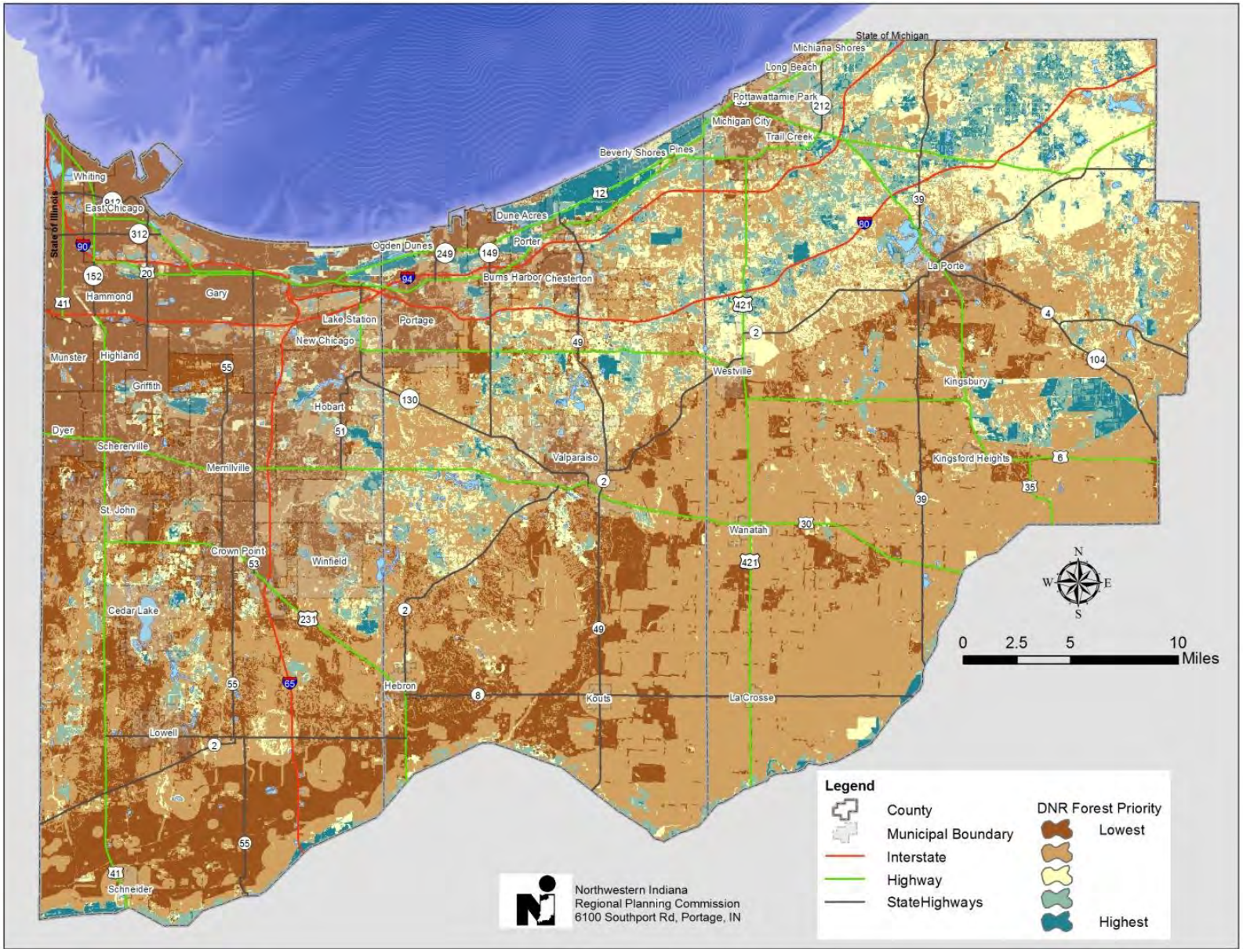


Figure 1. Forest Priority Areas. IDNR.

# Appendix B: Transportation

1. Congestion Management.....B-2

2. Environmental Mitigation.....B-100

3. Safety.....B-140

Appendices

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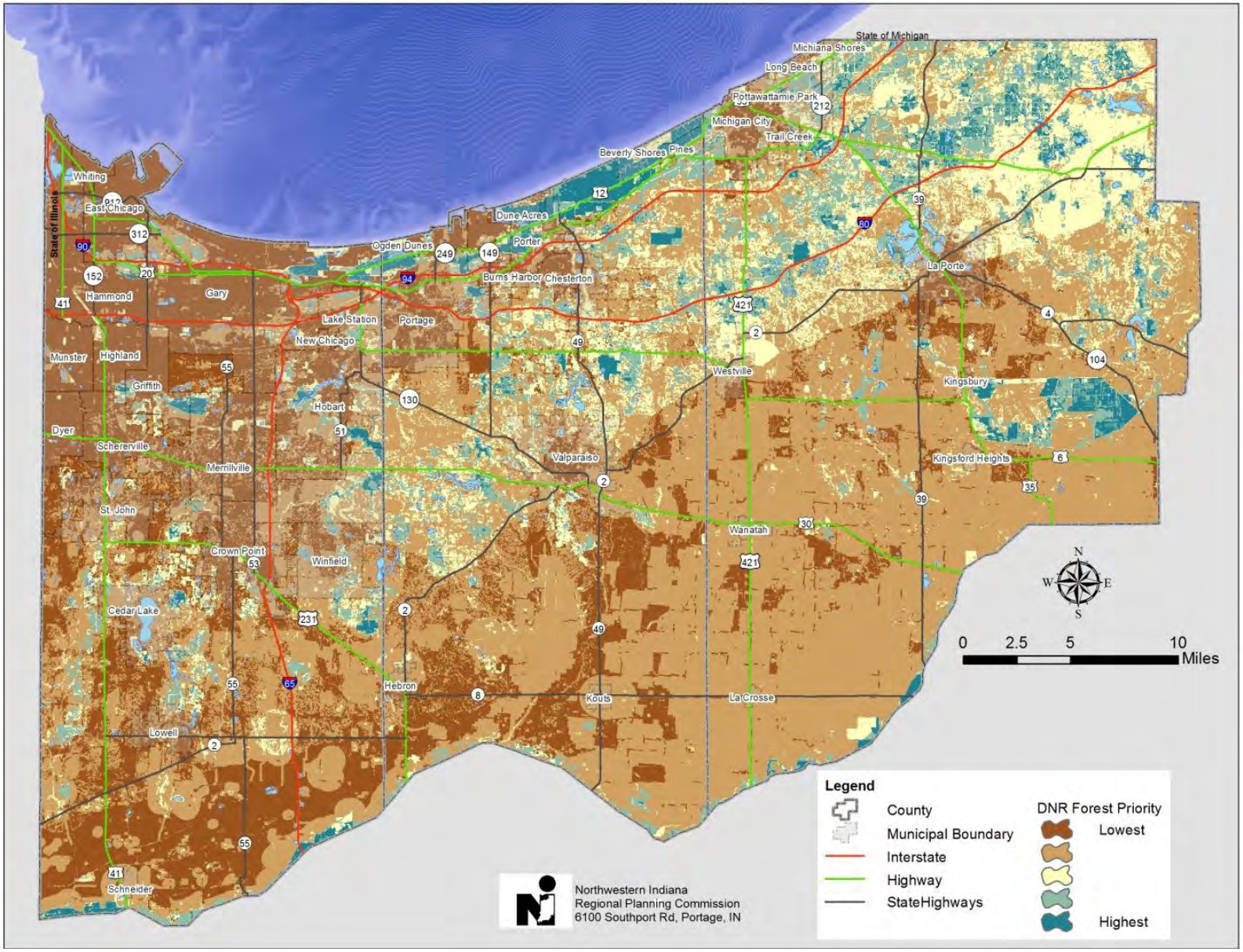


Figure 1. Forest Priority Areas. IDNR.

For additional information about the Indiana Statewide Forest Assessment and Strategy please visit www.in.gov/dnr/forestry/5436.htm.

### *Coastal & Estuarine Land Conservation Program Plan*

The Coastal & Estuarine Land Conservation Program (CELCP) Plan was developed by the IDNR Lake Michigan Coastal Program to prioritize land conservation needs and nominate potential projects for federal funding within Indiana's federally approved coastal program boundary. The purpose of the CELCP is to protect important coastal and estuarine areas that have significant conservation, recreation, ecological, historical, or aesthetic values, or that are threatened by conversion from their natural or recreational state to other uses. The CELCP gives priority to lands that can be effectively managed and protected, provide public access to coastal and estuarine resources, and have significant ecological value.

Indiana's CELCP Plan is based on the Indiana Biodiversity Initiative (IBI) model which identifies areas using Heritage plant occurrences and umbrella animal habitat information. The IBI project spatially identified ecologically sensitive areas critical for preservation. Figure 2 shows priority preservation areas within Indiana's coastal area based on the IBI methodology.

For additional information about the CELCP Plan please visit www.in.gov/dnr/lakemich/6133.htm.

For additional information about the Indiana Statewide Forest Assessment and Strategy please visit www.in.gov/dnr/forestry/5436.htm.

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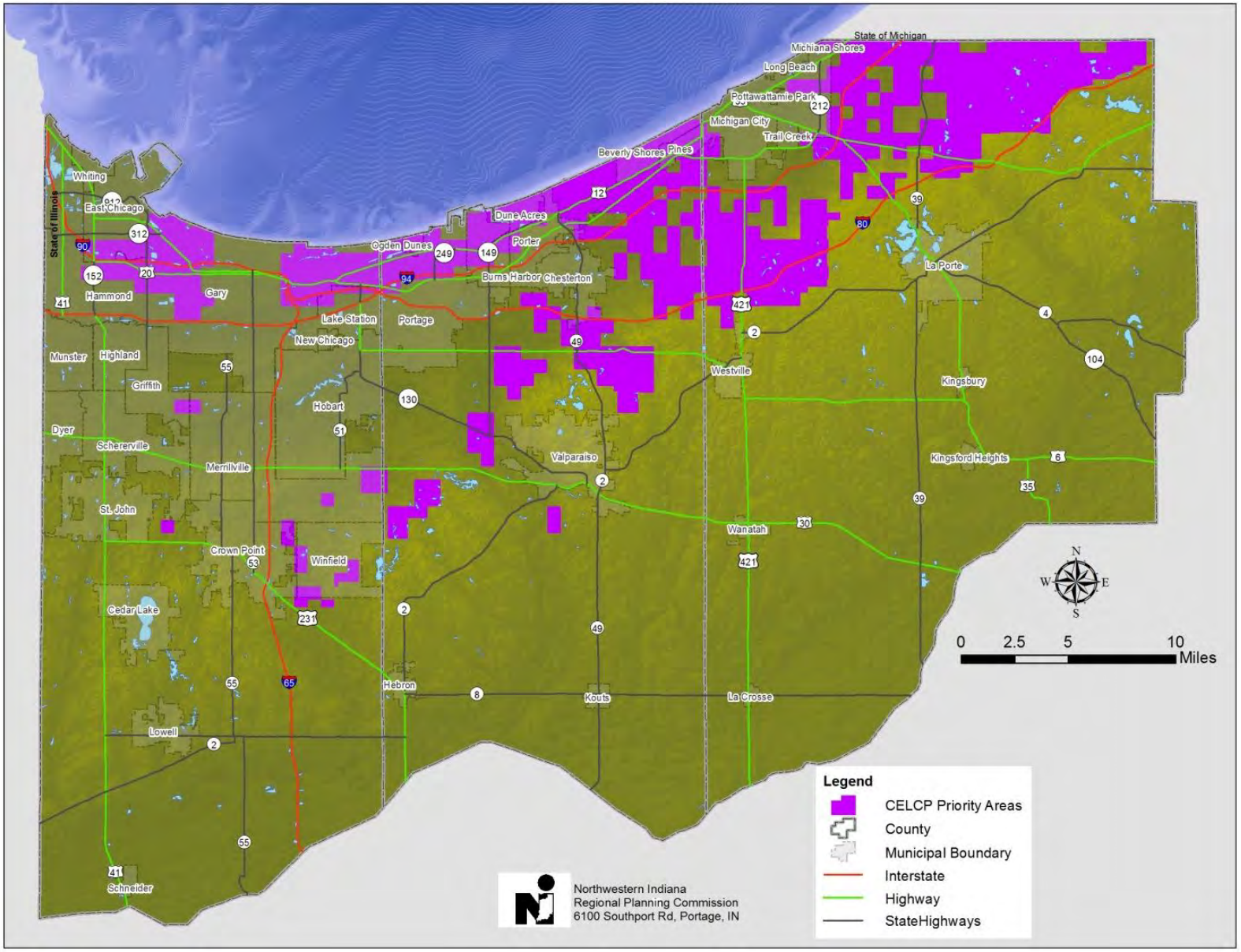



Figure 2. CELCP Plan Priority Areas. IDNR.

Appendices

### *Indiana Nonpoint Source Management Plan*

The Indiana Nonpoint Source Management Plan, prepared by the Indiana Department of Environmental Management (IDEM) Office of Water, reflects the current goals and direction of Indiana's Nonpoint Source Management Program. It documents the methods the state will use to meet the state's long-term goal of measurable improvements in water quality through education, planning, and implementation while also meeting United States Environmental Protection Agency's (U.S. EPA's) criteria. As required by Section 319(h), each state's Nonpoint Source Management Program Plan describes the state program for nonpoint source management and serves as the basis for how funds are spent. Three activity funding categories have been established by IDEM to provide a cost-effective approach to insuring pollutant load reductions at the local watershed scale (Figure 3). While the plan does not specifically identify critical areas it does identify where IDEM feels the greatest water quality improvements can be realized given limited Section 319 funding.

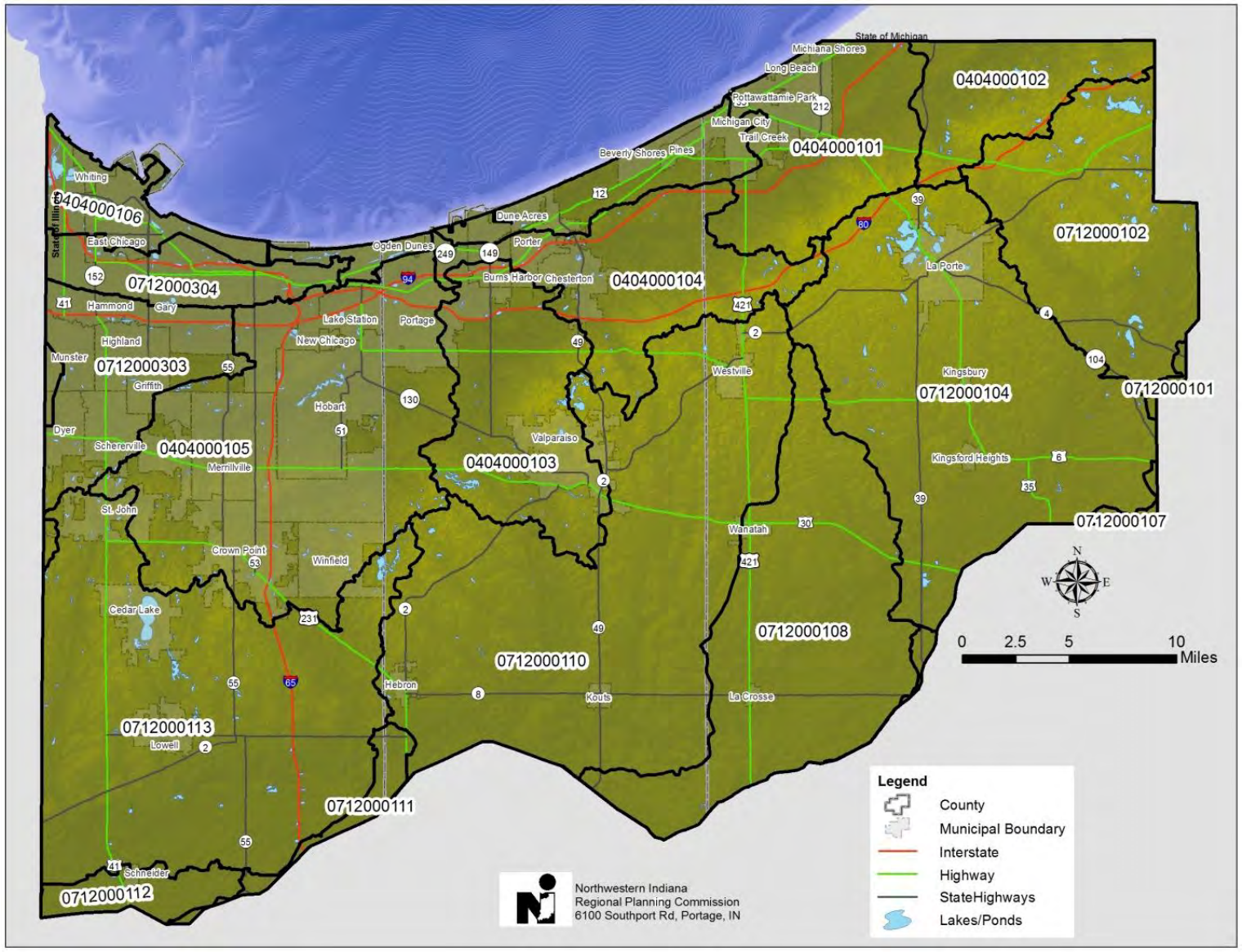



Figure 3. Watershed Boundaries. USGS.

Appendices

Category 1: Categories with this ranking are eligible for inclusion in Section 319 grant applications as the category historically has produced reliable load reductions, potentially has a high impact on water quality, and can reasonably be addressed at a local watershed level. Activities in the given category would be chosen first to address NPS pollution in critical areas.

Category 2: Categories with this ranking are potentially eligible for inclusion in Section 319 grant applications, provided applicants can demonstrate within a given watershed that all Category 1 priorities have been addressed by previous activities. The high cost of individual projects in these categories, when compared with Category 1 projects, makes these categories less desirable. IDEM will consider funding of these on a case-by-case basis.

Category 3: Categories with this ranking are likely not eligible for inclusion in a Section 319 application, even if applicants can demonstrate within a given watershed that all Category 1 and 2 projects have been addressed by previous activities. Many NPS sources in these categories are the responsibility of other state agencies or programs, or will require statewide solutions or expenditures of funds that far exceed the capacity of the 319 program. These categories could be counted as match towards grant activities, provided load reductions are ensured and a clear link is documented between the activity and the NPS problem that will be addressed.

Project activity categories:

- Agricultural Management (Category 1)
- Atmospheric Deposition (Category 3)
- Closed Landfills and Solid Waste Disposal Sites (Category 3)
- Ground Water (Category 2)
- Land Application of Non-Agricultural Wastes (Category 3)
- Urban Issues (Category 1)
- Natural Resource Extraction (Category 2)
- On-Site Sewage Disposal (Categories 1 & 3)
- Sediment Removal (Category 3)
- Stream Bank/Shoreline Erosion (Category 2)
- Timber Management (Category 2)
- Transportation (Category 2)

For more information about the Indiana Nonpoint Source Management Plan please visit www.in.gov/idem/5970.htm.

### *Local Watershed Management Plans*

To date most watershed management planning and implementation efforts have been focused in the Little Calumet-Galien sub-basin. Figure 4 shows the watershed plans developed and approved by IDEM under Section 319. Each watershed management plan includes a list of stakeholders involved in the project; a watershed characterization inventory, identification of problems and causes on which the stakeholder groups have chosen to focus; identification of potential pollutant sources and calculated loads; water quality improvement or protection goals; identification of critical areas where implementation projects will need to occur; and finally a list of measures and BMP's needed to achieve plan goals.

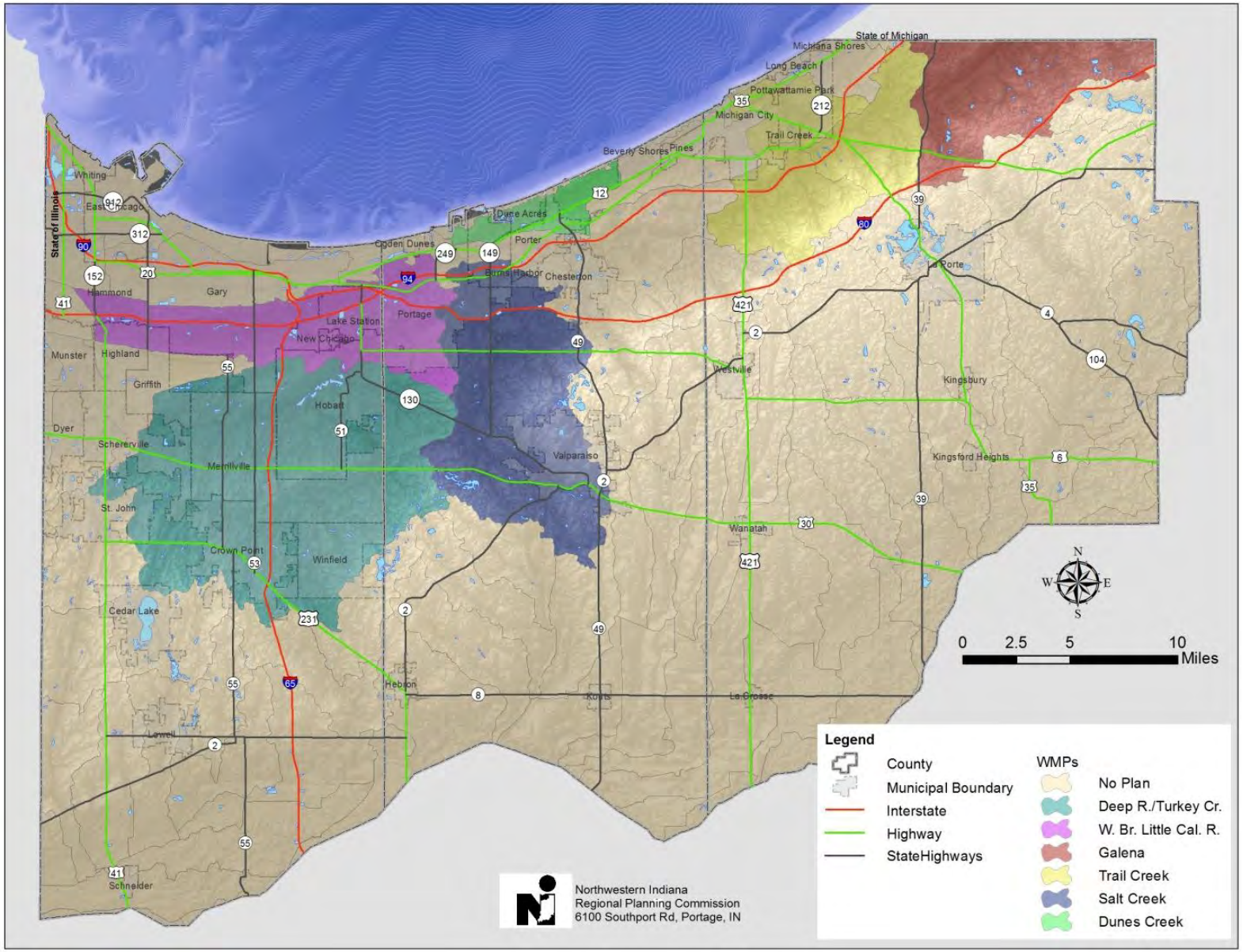



Figure 4. State Approved Watershed Management Plans. IDEM.

### *Deep River/Turkey Creek*

The Deep River/Turkey Creek watershed covers an area of approximately 124 square miles in Lake and Porter Counties. In the Deep River subwatersheds, there appeared to be a strong correlation between pollutant loading (total suspended solids, nutrients, and E. coli), potential soil erodiblity (T factor) ratings, and the presence of highly erodible lands (HEL). In the Turkey Creek subwatersheds, E. coli concentrations and poor in-stream habitat quality showed a correlation with urban land uses and channel modifications. Streambank erosion was also identified as an issue partly due to riparian zone and floodplain modifications.

For the most part this plan does not specifically identify critical areas for implementation. However the plan does encourage the following restoration strategies throughout the watershed where opportunities present themselves:

- Wetland and tree conservation
- Minimizing impervious surfaces
- Linear parks and open space preservation
- Constructed wetlands, bio-filters, catch basin inserts, buffer/ filter strips, etc.
- Shoreline and streambank bioengineering stabilization
- Native shoreline plantings
- Bridge storm water outlet retrofits
- Target BMP's towards highly erodible lands

The Deep River/Turkey Creek watershed management plan is available at http://www.in.gov/idem/nps/3254.htm.

### *West Branch Little Calumet River/Willow Creek*

The West Branch Little Calumet River/Willow Creek watershed management plan covers approximately 54 square miles of Lake and Porter Counties. The primary pollutants of concern identified in the plan include E. coli, total suspended solids, nitrogen and phosphorous.

The following long-term implementation goals were identified for critical areas within the watershed:

- Land acquisition and funding to restore 4,780 acres of wetland
- Install 300 rain gardens in participating communities
- Install 20 green roofs or green parking lots
- Install infiltration BMP's at 10 sites

- Install 2,000 lineal feet of vegetated buffer
- Install 10 retention/detention ponds
- Implement stream and riparian restoration at 5 sites
- Install 5,000 lineal feet of vegetated channel in urban area
- Identify 20 existing priority wetland and riparian restoration areas and mitigate/restore at least 10
- Acquire at least 10 existing priority wetland and riparian areas through purchase or conservation easement
- Design and construct at least five projects that improve connectivity along river
- Install at least three projects that increase navigability along river
- Acquire land and construct at least 3 new public access sites

The West Branch Little Calumet River/Willow Creek watershed management plan is available at http://www.in.gov/idem/nps/3228.htm.

### *Galena River*

The Galena River watershed management plan covers approximately 46 square miles of LaPorte County. The only pollutant of concern identified in the plan was E. coli. All other chemical and nutrient parameters met applicable water quality standards. Because the Galena River segments in Indiana have few measureable water quality problems, it was recognized that the watershed management plan should not focus strictly on improving water quality, but should also have a strong land preservation component, given the undeveloped and sensitive nature of the area.

The following implementation goals were identified for critical areas within the watershed:

- Restore 10% of the potential wetland restoration areas
- Preserve natural areas through government coordination and/or land trusts
- Reduce sediment loads by restoring stream buffers identified in stream buffer analysis
- Complete streambank restoration at Site 6.
- Restore the natural hydrology and hydraulics to extent possible including ability of migratory fish to utilize habitats

The Galena River Watershed Diagnostic Study and Management Plan is available at
http://www.in.gov/dnr/fishwild/files/fw-Galena_Watershed_Mgmt_Plan_LaPorte_County_June_2010.pdf.

### *Trail Creek*

The Trail Creek watershed management plan covers an area of approximately 59 square miles in LaPorte County. Four water quality problems were identified in the plan including E. coli, erosion and sedimentation, nutrient loading, and hydromodification.

The follow implementation goals were identified for critical areas within the watershed:

- Preserve existing riparian corridors and buffers
- Protect, enhance and restore riparian corridors and wetlands
- Restore natural hydrology to Trail Creek
- Plan and design any channel modification activities to reduce/eliminate negative physical, chemical, and habitat impacts to Trail Creek
- Reduce discharges from stormwater runoff
- Increase recreational access
- Encourage utilization of Low Impact Development (LID) practices

The Trail Creek watershed management plan is available at http://emichigancity.com/pdf/Trail_Creek_Watershed_Management_Plan.pdf.

### *Dunes Creek*

The Dunes Creek watershed management plan covers an area of approximately 11 square miles in Porter County. The primary concerns identified in the plan were excess nutrient and sediment loading, high pathogen, total dissolved solid, and chloride concentrations, and impaired biotic communities.

The following goals and action items were identified for the Dunes Creek watershed:

- Manage stormwater runoff by conducting targeted wetland restoration
- Implement stormwater BMP's such as vegetated swales, pervious pavement and bioretention
- Restore natual hydrology by daylighting segments of Dunes Creek, pluging ditches, restoring wetlands and promoting two-stage channels
- Restore, manage, and protect streambank habitat and riparian areas

The Dunes Creek waershd management plan is available at http://savedunes.org/water_program/water_program/.

### *Salt Creek*

The Salt Creek watershed management plan covers an area of approximately 77 square miles in Porter County. The primary concerns identified in the plan were excess nutrient and sediment loading, high pathogen concentrations, and impaired biotic communities.

The following activities were identified for critical areas within the Salt Creek watershed:

- Implement LID and other BMPs to address stormwater runoff from development
- Restore and manage streambank and riparian habitat to reduce erosion
- Restore natural hydrology and improve flow dynamics and hydrologic function
- Increase turbulence and reduce water temperatures within stream to increase dissolved oxygen
- Work with DOTs to reduce road salt related impacts
- Implement restoration projects that reduce nutrient and sediment pollution

The Salt Creek watershed management plan is available at http://savedunes.org/water_program/water_program/.

## Environmental Consultation

NIRPC began the environmental consultation process with a scoping meeting on December 16th, 2010. The participants at the meeting reviewed the list of federal and state documents, maps, and plans described above that NIRPC suggested for inclusion in the Environmental Mitigation section of the plan. They outlined the environmental consultation process roughly modeled after the air quality conformity consultation process. The group provided feedback on identified types of transportation projects for inclusion in the environmental consultation process. The transportation project categories identified as being appropriate for environmental review include: capacity expansion, intersection improvements, bridges, drainage, roadway preservation projects that include culvert or drainage repair and replacement, and other. Finally they discussed a set of common environmental issues to be addressed in the Environmental Mitigation Plan. These are discussed in detail below.

The Scoping meeting participants included representatives from the following federal, state, and local environmental, natural resource, and land management agencies:

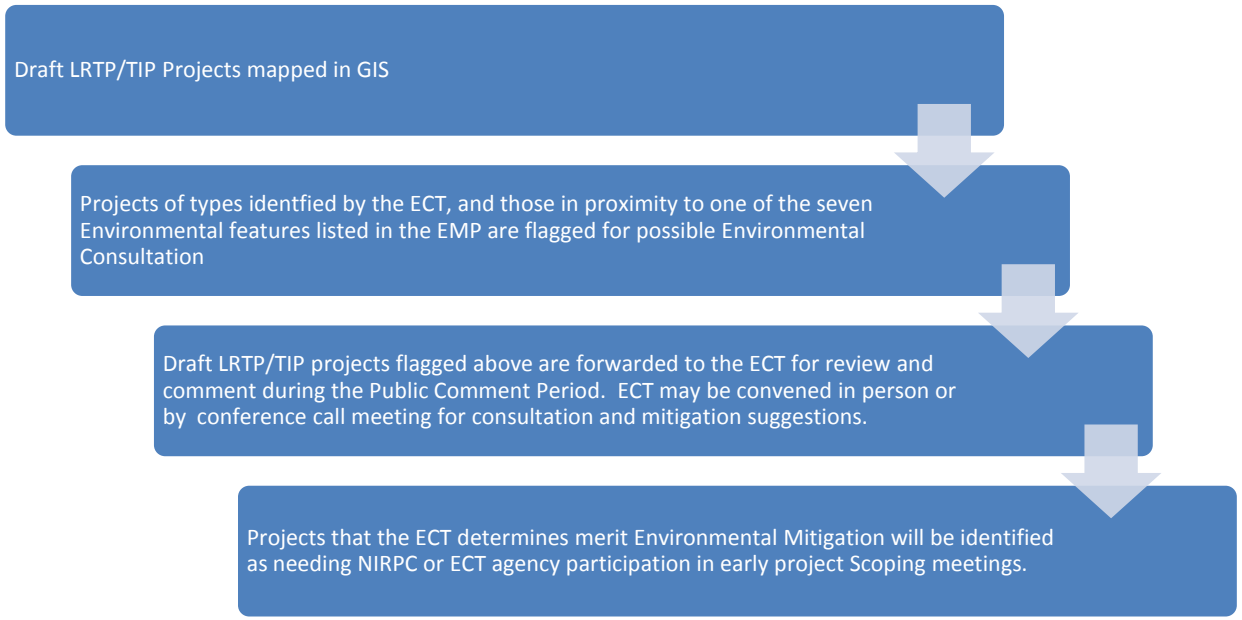
- U.S. Army Corps of Engineers, Chicago District Regulatory Program
- U.S. Federal Highway Administration, Indianapolis District
- U.S. Fish and Wildlife Service
- Indiana Department of Environmental Management
- Indiana Department of Natural Resources

- Indiana Department of Transportation
- Lake County Parks Department

Other federal, state, and local agencies invited and included in email communications:

- U.S. Environmental Protection Agency
- U.S. National Park Service, Indiana Dunes
- U.S. National Resources Conservation Service
- County Surveyors

Representatives of these agencies will make up the Environmental Consultation Team (ECT). The ECT will be convened in Northwest Indiana or via conference call for review of projects when a new Long Range Transportation Plans or new TIP is out for Public Comment. The group will provide feedback to NIRPC on projects for which early permit coordination or environmental mitigation should be sought. Prior to convening the ECT, NIRPC staff will screen proposed projects based on their proximity to environmental assets identified in the below discussion of environmental issues. As additional projects are proposed for amendment into the LRTP and the TIP, NIRPC staff will distribute maps and descriptions of screened projects to the ECT via email. At the request of an ECT member a conference call to discuss environmental mitigation needs for specific projects in greater detail will be held.




## Common Environmental Issues

In consultation with the ECT, NIRPC has identified seven common environmental issues for inclusion in the Environmental Mitigation section of the Long Range Transportation Plan. The environmental issues include:

- Wetlands
- Lakes and Streams
- Indiana Waters Designated for Special Protection
- Forestlands
- Endangered, Threated, and Rare Species & High Quality Natural Communities
- Managed Lands
- Cultural Resources

The following sections provide a brief description of each of these issues and map the resources where information is available to do so.

### *Wetlands*

Wetlands have many beneficial functions including floodwater storage, water quality improvement, fish and wildlife habitat, as well as aesthetics. Historically wetlands used to be a prevalent feature in Northwest Indiana covering a little more than 340,000 total acres based on Natural Resource Conservation Service (NRCS) hydric soils data. Hydric soils are a good indicator of where wetlands once existed since they developed under sufficiently wet conditions capable of supporting hydrophytic (water loving) plant species. Today only 72,410 acres or 21% of these wetlands remain (National Wetland Inventory (NWI) Update data- Ducks Unlimited). Much of the historical wetland loss can be attributed to "land reclamation" for development or agricultural purposes. Figure 5 displays approximate wetland locations based on NWI data overlain on hydric soils.

Any project that proposes to place fill materials, excavate, dredge, or use heavy equipment within a wetland must apply to the U.S. Army Corps of Engineers (Corps) for a permit under Section 404 of the federal Clean Water Act. If the Corps determines a 404 Permit is needed, then a Section 401 Water Quality Certification must be obtained first from IDEM. Projects cannot be conducted without a Corps permit, and cannot receive a Corps permit without IDEM 401 Water Quality Certification. The Corps may determine that certain wetlands on a proposed project site are isolated wetlands. Isolated wetlands are regulated by IDEM under Indiana's State Isolated Wetlands law. Any person proposing to impact an isolated wetland must apply for, and obtain, permits under Indiana's State Isolated Wetlands law.

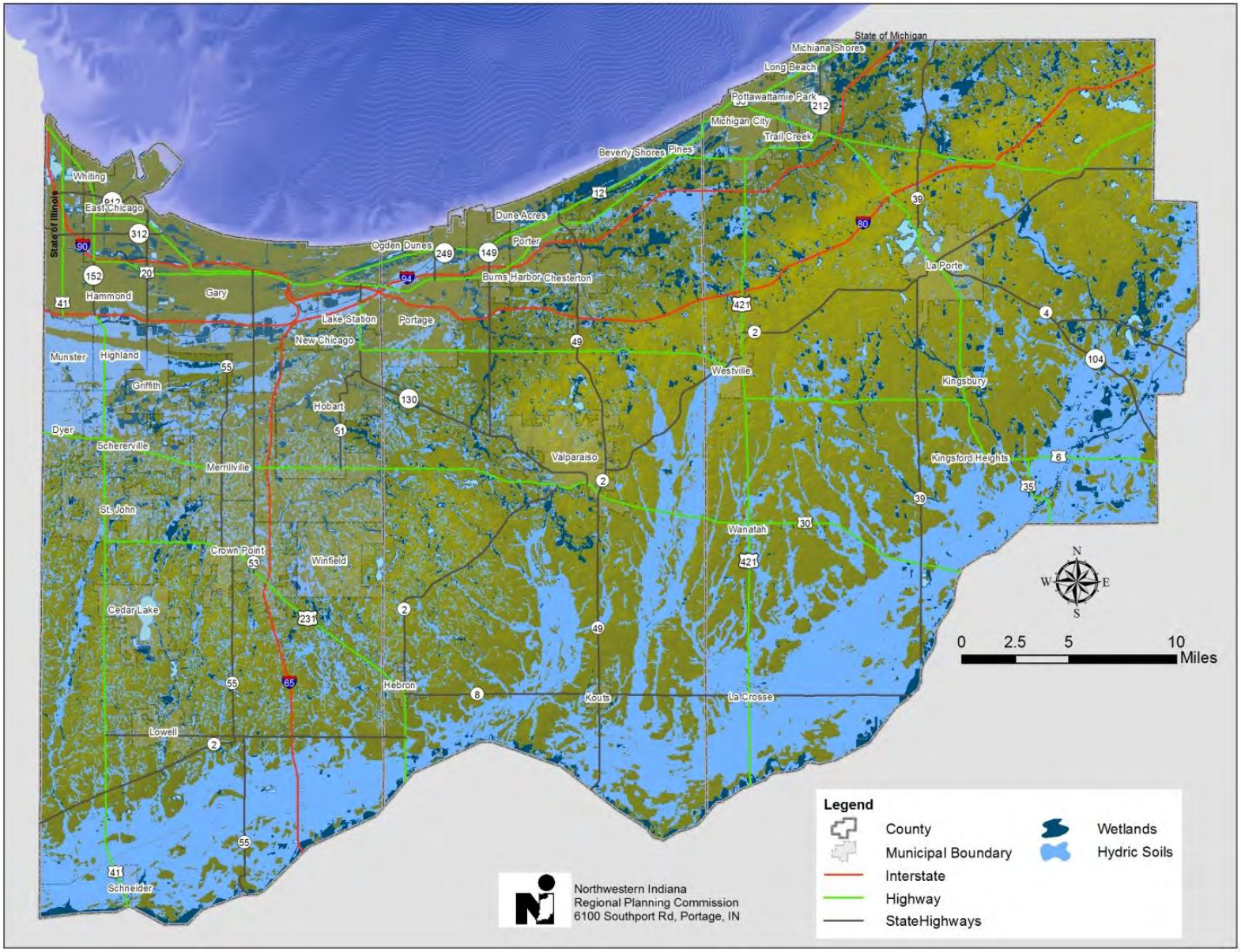



Figure 5. Existing Wetlands & Hydric Soils. NRCS & USFWS.

### *Lakes & Streams*

Lakes and streams are largely defined and influenced by their watersheds and the land uses within those watersheds. Northwest Indiana is divided into three sub-basins including the Little Calumet-Galien, the Kankakee, and the Chicago. The Kankakee sub-basin drains nearly two-thirds of southern Lake, Porter and LaPorte Counties into the Kankakee River. The Little Calumet-Galien, the second largest sub-basin in Northwest Indiana, drains nearly the northern third of Northwest Indiana into Lake Michigan. The Chicago sub-basin, historically once part of the Lake Michigan drainage, drains about five percent of northwestern Lake County towards Illinois through the West Branch of the Little Calumet River.

Figure 6 displays the myriad of streams and lakes in Northwest Indiana. Following the classification of the National Hydrography Dataset (NHD), there are approximately 934 miles of stream/river and another 743 miles of ditch draining Northwest Indiana. There are also approximately 495 ponds/lakes scattered across the landscape totaling some 9,164 acres. Most of the region's ponds/lakes are small surface waterbodies, averaging 18.5 acres.

Poor land use decisions and practices can have negative impacts on water quality and habitats. Road and highway development can be especially disruptive to adjacent waterbodies because they tend to accumulate pollutants which are carried in runoff, alter surface drainage patterns, change subsurface water tables and result in the loss of riparian habitat. Within our region there are nearly 622 miles of stream and 3 square miles of lake that are included on 2008 Indiana 303d List of Impaired Waters (Figure 6). The IDEM Office of Water Quality updates this list every two years, identifying the waters that do not or are not expected to meet water quality standards as required by the Clean Water Act.

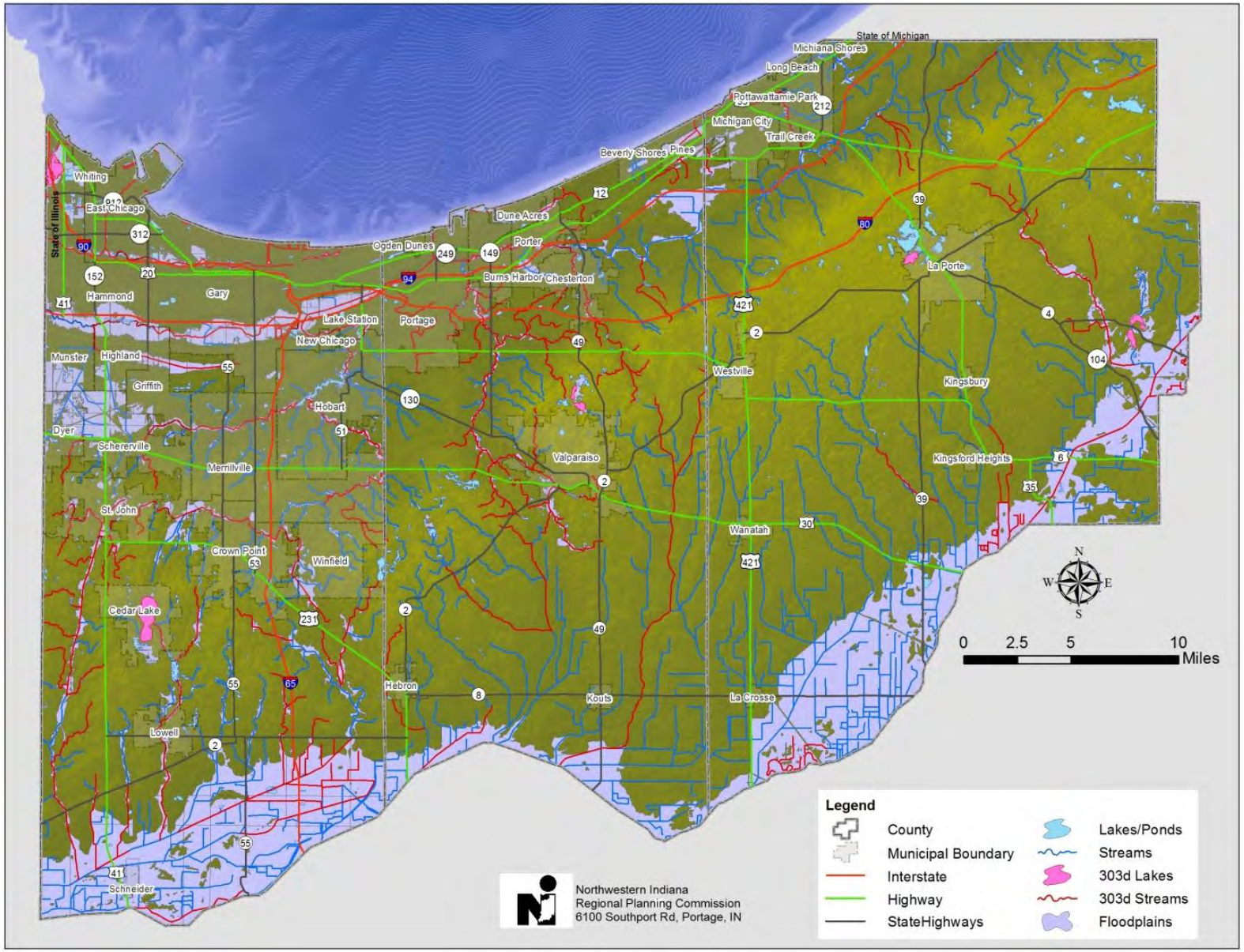



Figure 6. Lakes, Streams, Floodplains, and Impaired Waters. USGS, IDNR, IDEM.

Any project that proposes to place fill materials, excavate, dredge, or use heavy equipment within a lake, stream, river, pond, or other regulated waterbody must apply to the U.S. Army Corps of Engineers (Corps) for a permit under Section 404 of the federal Clean Water Act. If the Corps determines a 404 Permit is needed, then a Section 401 Water Quality Certification must be obtained first from IDEM. Projects cannot be conducted without a Corps permit, and cannot receive a Corps permit without IDEM 401 Water Quality Certification. Additionally permits may be required from the IDNR for construction in a floodway, navigable waters, public freshwater lakes, and tributaries.

### *Indiana Waters Designated for Special Protection*

Projects proposing an impact to any waters designated for special protection tend to be a "red-flag" to IDEM and sometimes require extensive agency coordination. IDEM approvals granted for work in waters designated for special protection generally include special permit conditions that restrict work timeframes or require specific mitigation requirements that may be above and beyond normal compensatory mitigation. Sometimes, proposed impacts to these streams, rivers, and wetlands are not allowed at all due to the inability to compensate for these resources.

### *Designated Salmonid Waters*

A number of tributaries and inland lakes within Northwest Indiana's Lake Michigan drainage are state designated salmonid (trout and salmon) streams (Figure 7). Trout and salmon species tend to be very sensitive to pollution and habitat alterations. In particular, they are sensitive to dissolved oxygen levels, water temperature, and sedimentation. As a result special rules, such as stream closure windows to protect juvenile migrations to Lake Michigan, are in place. The designated salmonid waters include:

- West Branch, Little Calumet River and its tributaries, downstream from the dam at 29th Avenue (Deep River) to Lake Michigan via Burns Waterway, Lake and Porter County.
- Galena River and its Tributaries, LaPorte County.
- Trail Creek and its tributaries, downstream to Lake Michigan, LaPorte County.
- East Branch, Little Calumet River and its tributaries, downstream to Lake Michigan, via Burns Waterway, Porter and LaPorte counties.
- Kintzele Ditch (Black Ditch) from Beverly Drive downstream to Lake Michigan, Porter County
- Salt Creek and its tributaries upstream of its confluence with the Little Calumet River, Porter County.
- Waters designated by IDNR for put-and-take trout fishing (*Note: this list changes annually*) (http://www.in.gov/dnr/fishwild/files/fw-Trout_Stocking_Locations.pdf)

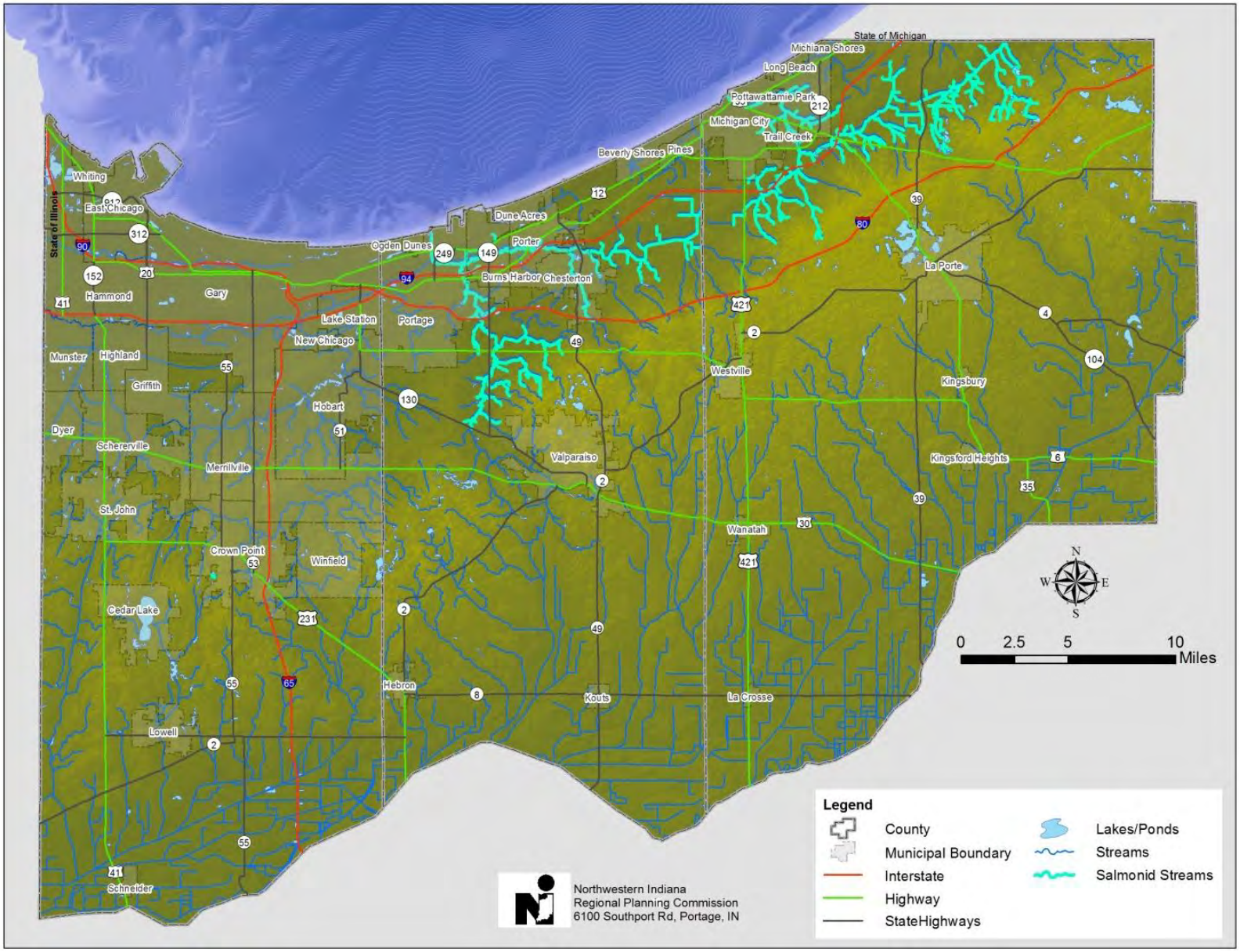



Figure 7. State Designated Salmonid Streams. IDNR.

### *Waterbodies which have been designated all or partially as Outstanding State Resource Waters:*

- The Indiana portion of Lake Michigan.
- All waters incorporated in the Indiana Dunes National Lakeshore.

### *Critical Wetlands and Critical Special Aquatic Sites*

In the interest of maintaining consistency with the State Regulated Wetland program established at 327 IAC 17, IDEM defines Critical Wetlands and Critical Special Aquatic Sites to be synonymous with Rare and Ecologically Important Wetland Types under 327 IAC 17-1-3(3)(B):

- **Acid bog:** Acid bog is an acidic wetland of kettle holes in glacial terrain. Bogs can be graminoid (*Carex* spp. and *Sphagnum* spp.) or low shrub (*Chamaedaphne calyculata* and *Betula pumila*). The graminoid bog can be a floating, quaking mat. The soils in acid bogs are saturated and acidic peat. Bogs have non-flowing or very slow flowing water. The water level fluctuates seasonally. When a sphagnum mat floats, it rises and falls with the water table. Acid bogs can be found in northern Indiana.
- **Circumneutral bog:** Circumneutral bog is a bog-like wetland that receives groundwater. Circumneutral bogs can be a mosaic of tall shrub bog, graminoid bog, and other communities. The graminoid bog often occurs on a quaking or floating mat. Although a few bogs occur in unglaciated regions, most are found in glacial ice-block depressions. The soils in circumneutral bogs are usually peat, or other low nutrient organic substrates, which are saturated and circumneutral to slightly acid. Circumneutral bogs have non-flowing or very slow flowing water. The water level fluctuates seasonally. Circumneutral bogs are usually found in northern Indiana.
- **Circumneutral seep:** The circumneutral seep (or seep-spring) is a groundwater-fed wetland on organic soil. It is primarily herbaceous. Species typically include marsh marigold (*Caltha palustris*) and skunk cabbage (*Symplocarpus foetidus*) with a scattered tree canopy. Circumneutral seep is typically situated on or near the base of a slope. The soil is typically circumneutral muck. This seep community is characterized by slowly flowing water during at least part of the year. Circumneutral seeps can be found scattered throughout Indiana.
- **Dune and swale:** Dune and swale is an ecological system consisting of a mixture of upland (black oak sand savanna, dry to mesic sand prairie) and wetland (pond, panne, sedge meadow, marsh, wet prairie) natural communities. These communities occur in long, narrow, linear complexes, with the dry communities occupying sand ridges, and the wet communities occurring in the intervening swales. Black oak (*Quercus velutina*), paper birch (*Betula papyrifera*), jack pine (*Pinus banksiana*), and prairie vegetation typically occur on the ridges, and sedges, reeds, and marsh/aquatic vegetation line are found in the swales. Water levels are directly influenced by ground water, with the interdunal swales controlled largely by lateral flow through porous beach ridges. Dune and swale is restricted to extreme northwest Indiana, near Lake Michigan.
- **Fen**: Fen is a calcareous, groundwater-fed wetland. Fens are often a mosaic of grassy areas, sedgy areas, graminoid-shrubby cinquefoil, and tall shrub areas. The extent of the tall shrub component of fens may be determined by fire frequency and/or soil moisture. Drying of the soil increases

the growth of shrubs. Fens typically occur in the vicinity of glacial moraines. Fens typically have a muck or peat substrate. The water level fluctuates seasonally and is fed by groundwater. Fens can be found in central and northern Indiana.

- **Forested fen:** Forested fen is a tree-dominated wetland on organic soil which receives groundwater. Forested fens are often a mosaic of treed areas, tall shrub areas, and herbaceous areas. A tall shrub layer is often well developed in forested fens. Indicative species typically include tamarack (*Larix laricina*), black ash (*Fraxinus nigra*), yellow birch (*Betula alleghaniensis*), poison sumac (*Toxicodendron vernix*), and red maple (*Acer rubrum*). Forested fens occur in wet lowlands, where moraines meet outwash features or depressions. Forested fens have saturated, poorly to very poorly drained soils that are often muck, but some seasonal flooding can occur in forested fens that are especially level. This community is a late successional stage of fen or circumneutral bog. Forested fens occur in northern Indiana.
- **Forested swamp:** Forested swamp is a seasonally inundated to intermittently exposed wetland of large river bottoms. Forested swamps do not receive direct flow from river flooding except under exceptional circumstances. Forested swamps occur in depressions, sloughs and large bottomlands, typically dominated by tree species such as swamp cottonwood (*Populus heterophylla*), green ash (*Fraxinus pennsylvanica*), and swamp white oak (*Quercus bicolor*). In northern Indiana important tree species include black ash (*Fraxinus nigra*), yellow birch (*Betula alleghaniensis*), and red maple (*Acer rubrum*). Poorly to very poorly drained and aerated soils characterize the swamp environment. Soils usually are mineral not muck or peat. This community type is found throughout Indiana.
- **Marl beach:** Marl beach is a fen-like community located on the marly muck shorelines of lakes. Marl precipitate is evident. A thin layer of water is present in spring, but dries down in summer. Draw-down of a lake creates additional area for this community to develop on. Marl beaches can be found in extreme northern Indiana, primarily in the northeast.
- **Muck flat:** Muck flat is a shoreline and lake community possessing a unique flora of sedges and annual plants, many of which are also found on the Atlantic and Gulf Coastal Plains. This community is found at the margins of lakes or covering shallow basins. This community has a peat substrate. The muck flats can float on the water surface, but during high water periods are usually inundated. The water level of a basin fluctuates during a season or from year to year in response to the amount of precipitation. This exposes bare substrate needed for germination by species of the community. Muck flats are found in northern Indiana.
- **Panne**: Panne is a groundwater fed herbaceous wetland occupying interdunal swales near Lake Michigan. Pannes are located on the lee side of the first or second line of dunes from the lakeshore. The soil is wet, calcareous sand. Pannes are located in counties bordering Lake Michigan.
- **Sand flat:** Sand flat is a shoreline and lake community possessing a unique flora of sedges and annual plants, many of which are also found on the Atlantic and Gulf Coastal Plains. This community is found at the margins of lakes or covering shallow basins. This community has a sand substrate. During high water periods sand flats at the margins of lakes or ponds are inundated. The water level of a basin fluctuates during a season or from year to year in response to the amount of precipitation. This exposes bare substrate needed for germination by species of the community. Sand flats occur in northern Indiana, and in the Plainville Sand Section of southwest Indiana.
- **Sedge meadow:** Sedge meadow is an herbaceous wetland typically dominated by graminoid species such as flat sedge (*Cyperus* spp.), spike rush (*Eleocharis* spp.), rushes (*Juncus* spp.) and sedges (*Carex* spp.). Sedge meadow is an herbaceous wetland of stream margins and river floodplains,

and lake margins or upland depressions. Streamside sedge meadows are frequently flooded in the spring and early summer. Sedge meadows of lake margins and depressions often contain standing water during wet months and after heavy rains; during dry periods, the water level is at or just below the substrate. Sedge meadow usually occupies the ground between a marsh and the uplands, or a shrub swamp or wet forest. Periodic high water can kill trees and shrubs invading sedge meadows. Sedge meadows can be found in the northern half of the state.

- **Shrub swamp:** Shrub swamp is a shrub-dominated wetland that is seasonally inundated to intermittently exposed. This community occurs in depressions and the substrate in either mineral soils or muck, as opposed to peat which is characteristic of bogs. Shrub swamp is characterized by non-flowing or very slowly flowing water with levels that fluctuate seasonally. Shrub swamps are persistent, though considered successional. Two opportunistic native shrubs, sandbar willow (*Salix exigua*) and gray dogwood (*Cornus racemosa*), by themselves, are not indicative of shrub swamps. This community type is found throughout Indiana.
- **Wet floodplain forest:** Wet floodplain forest is a broadleaf deciduous forest of river floodplains. Wet floodplain forests occur in depressions and flats on narrow to wide floodplains and also on recently exposed substrates that are frequently flooded. Wet floodplain forests are frequently flooded and may have standing water seasonally to permanently present. Wet floodplain forests occur statewide.
- **Wet prairie:** Wet prairie is an herbaceous wetland typically dominated by graminoid species such as prairie cordgrass (*Spartina pectinata*), bluejoint (*Calamagrostis canadensis*), and sedges (*Carex* spp.). Vegetation height is often 2-3 m. The species diversity of wet prairies is lower than that of mesic prairies. Wet prairies occur in deep swales and the substrate ranges from very deep black mineral soils (which are high in organic matter) to muck. Ponding in spring lasts for several weeks prior to drainage. Wet prairies commonly occur in the Grand Prairie Natural Region, the Tipton Till Plain and the Bluffton Till Plain, with a few examples found in the Northern Lakes Natural Region.
- **Wet sand prairie:** Wet sand prairie is an herbaceous wetland typically dominated by graminoid species such as prairie cordgrass (*Spartina pectinata*), bluejoint (*Calamagrostis canadensis*), and sedges (*Carex* spp.). Vegetation height is often 2-3 m. The species diversity of wet prairies is lower than that of mesic prairies. Wet lowland prairies occur in deep swales and the substrate is sand, sometimes mixed with muck. Flooding is a regular springtime occurrence in wet sand prairie and may last several weeks. This community occurs in a mosaic with marsh and other wetlands, and with upland prairies and sand savannas. Fire was frequent occurrence, but more common in the fall when waters had receded. This community occurs in northwest Indiana and in the Plainsville Sands area.

### *Forestland*

There are approximately 235 square miles of deciduous forest, evergreen forest, mixed forest, and palustrine forested wetland within the boundaries of Northwest Indiana (NOAA- Coastal Change Analysis Program, 2006). Between 1996 and 2006, nearly 762 total acres of forestland were converted to other land uses in Lake, Porter, and LaPorte Counties. While there is value in knowing how much forestland remains for conservation purposes it is equally if not more important to understand the quality of that forestland and its future threats.

According to the 2010 Indiana Statewide Forest Assessment, forest fragmentation and/or conversion of forests to other land uses is the most important threat to the sustainability of Indiana's forests. Forest fragmentation occurs when large, contiguous stands of mature forest are divided into smaller isolated patches known as "forest fragments." Forest fragmentation is caused by human activities, such as road construction, agricultural clearing, and urbanization. The degradation of core forest into fragments can cause biological diversity loss of native flora and fauna species, alterations to water cycles, and adverse impacts on air and water quality. Forests weakened by fragmentation become more susceptible to damage from insects and diseases, and this stress often degenerates into a condition of chronic ill health.

Forest fragmentation data from NOAA's 2006 CCAP land cover dataset is displayed below in Figure 8. The most critical areas are the core forests highlighted in dark green. While the figure can be used to identify critical core forest areas for conservation, it can also be used to identify mitigation opportunities through reforestation and corridor restoration practices.

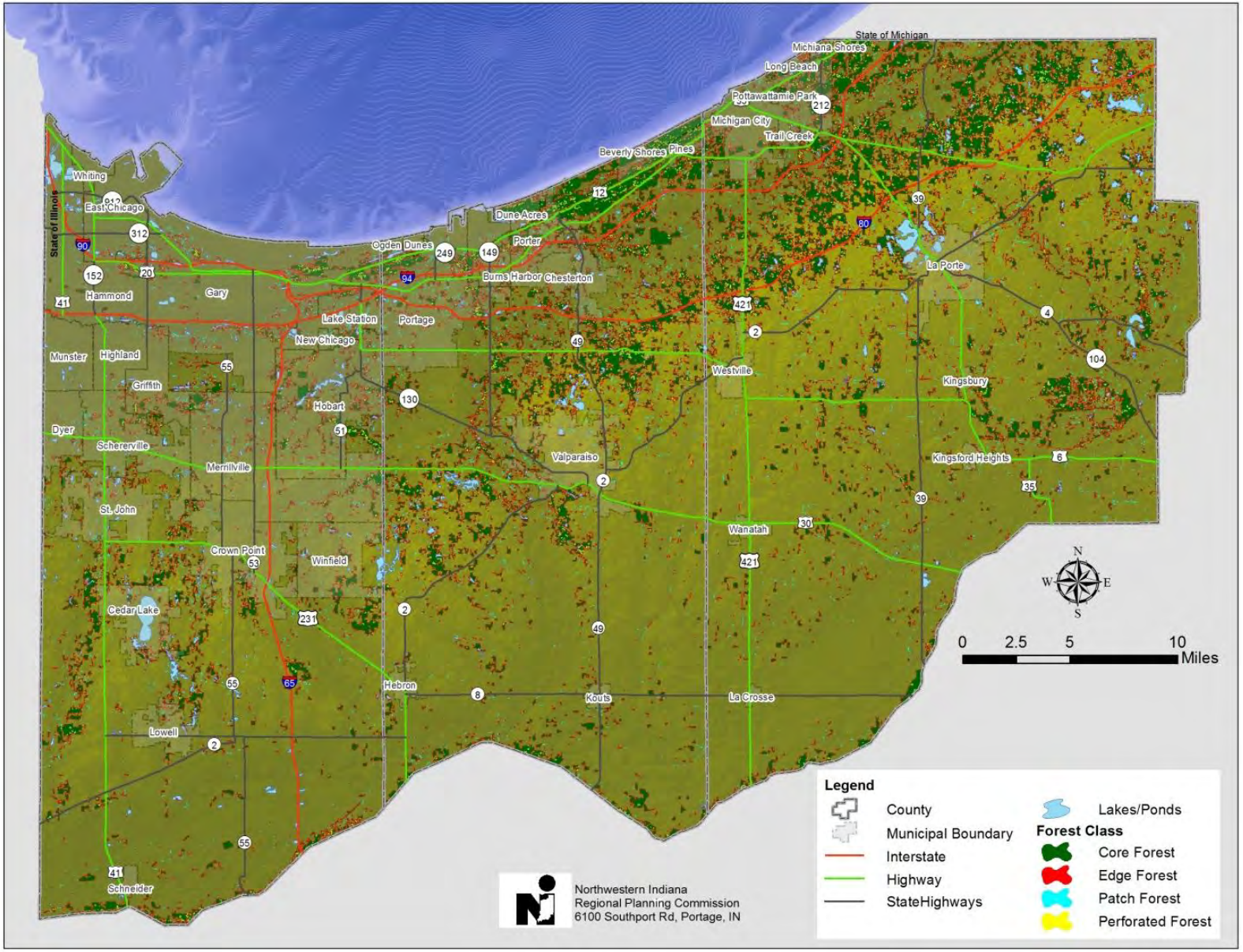



Figure 8. Forest Fragmentation. NOAA.

Appendices

The area known as the Moraine Forest follows the southern edge of Lake Michigan from northeast LaPorte County to north central Porter County. This forested area still exists today largely due to its high relief and unsuitability, historically, for agricultural purposes. Data presented in Figure 9 was generated by the Shirley Heinze Land Trust to help identify critical forest conservation areas within the Moraine Forest. Prioritization was based on a number of factors including area size, adjacency to managed lands, presence of wetlands and other forest quality indicators.

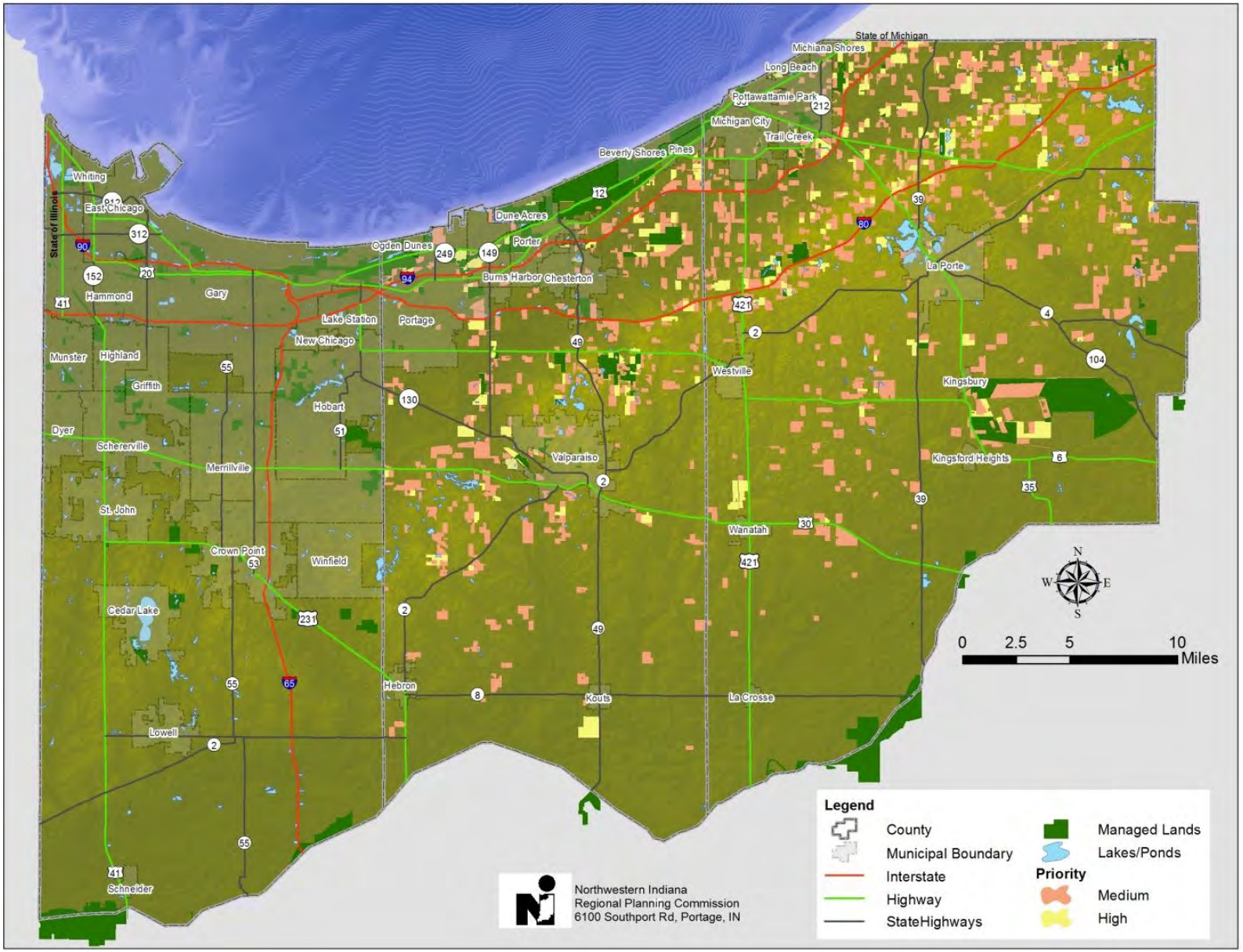



Figure 9. Moraine Forest Priority Areas & Managed Lands. Shirley Heinze Land Trust & IDNR.

Appendices

### *Endangered, Threatened, and Rare (ETR) Species & High Quality Natural Communities*

Due to the sensitivity of sharing specific locations of ETR occurrences, Figure 10 was generated to identify high concentration areas or "hot spots" within Northwest Indiana. Data used to generate this figure was provided by the IDNR Indiana Natural Data Center. It represents a comprehensive attempt to determine the state's most significant natural areas. Included in the figure are high quality natural areas and endangered, threatened and rare species occurrences for both state and federally listed species. Locations depicted in the figure are somewhat generalized due to the sensitivity of the data. Further information about the program and a list of ETR species by county is available at http://www.in.gov/dnr/naturepreserve/4746.htm.

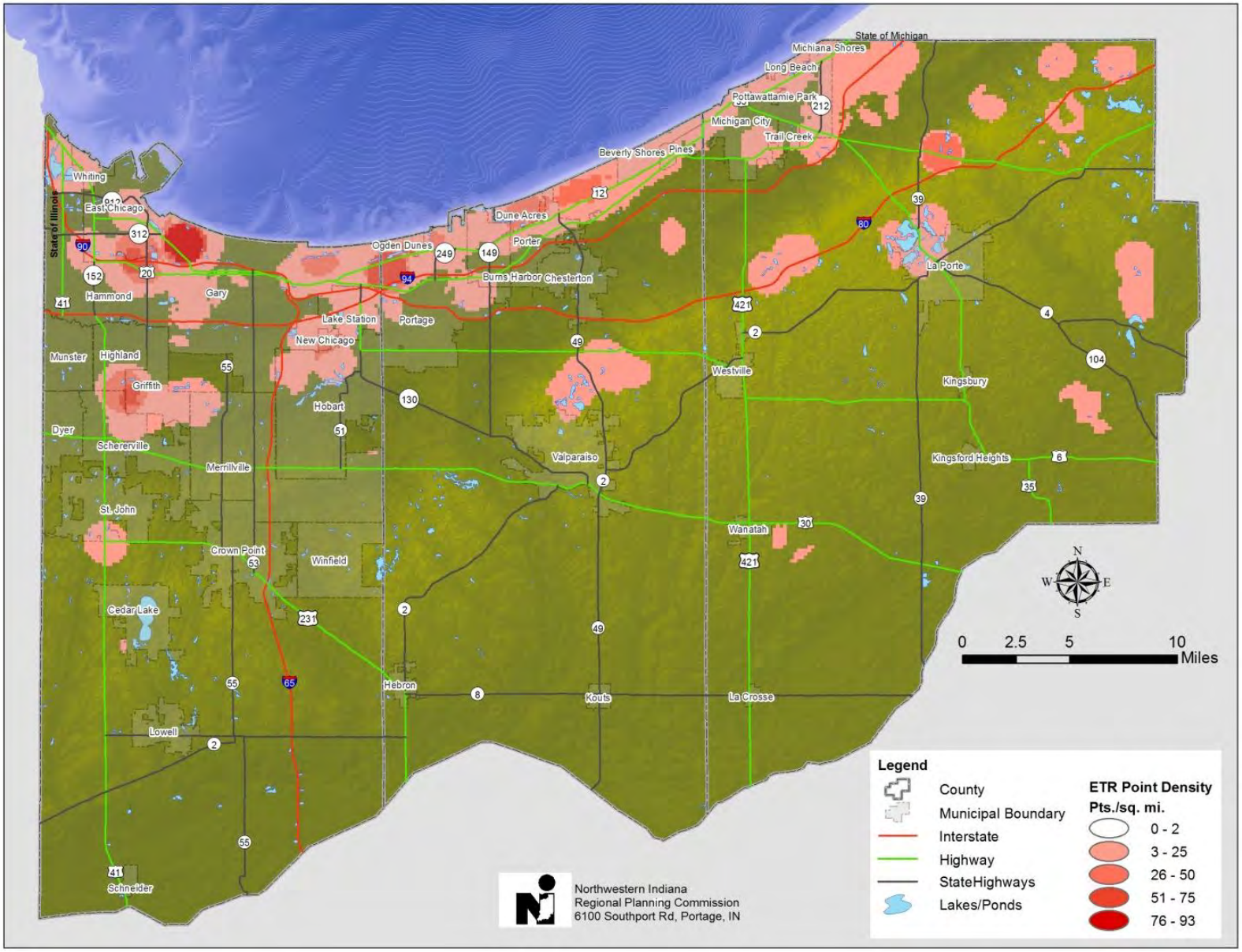



Figure 10. ETR Occurrences Point Density. IDNR.

Appendices

### *Managed Lands*

Section 4(f) of the Department of Transportation Act of 1966 requires that special effort be made to preserve public park and recreation land, wildlife and waterfowl refuges, and historic sites. In general, Section 4(f) specifies that federally-funded transportation projects requiring the use of land from a public park, recreation area, wildlife and waterfowl refuge or land of significant historical value can only occur if there is no feasible and prudent alternative. Using Section 4(f) land requires all possible planning to minimize harm.

There are approximately 315 natural or recreational areas within Northwest Indiana that are owned or managed by local, state or federal agencies, and non-profit organizations (Figure 11). In many, but not all, cases these areas correspond with sensitive habitats and recorded ETR occurrences.

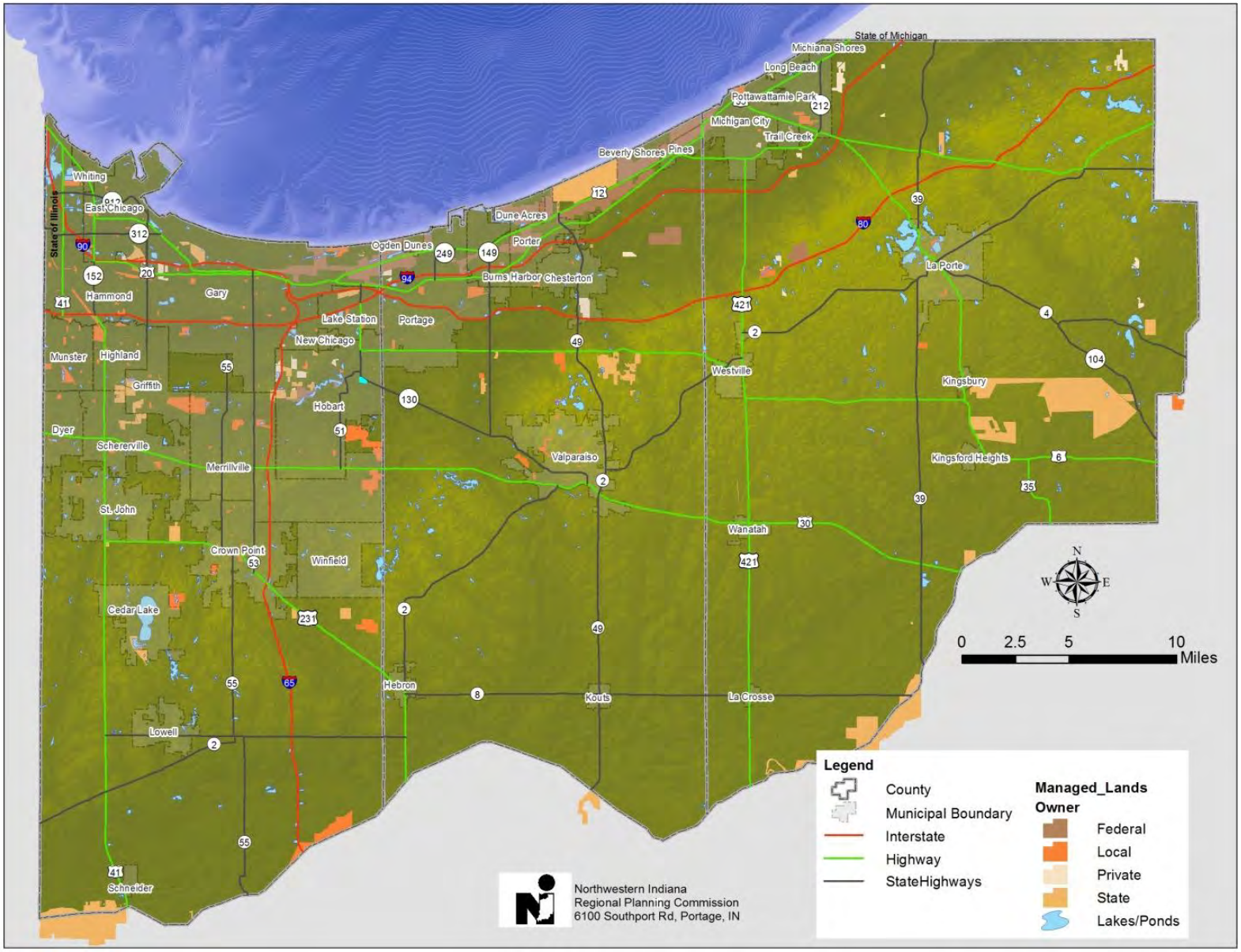



Figure 11. Managed Lands. IDNR.

Appendices

### *Cultural Resources*

Cultural resources are any prehistoric or historic remains or indicators of past human activities, including artifacts, sites, structures, landscapes, and objects of importance to a culture or community for scientific, traditional, religious, or other reasons.

Section 106 of the National Historic Preservation Act (NHPA) requires all federal agencies to take into consideration the effect of federally assisted, licensed, or permitted projects on cultural resources that are listed, or eligible for listing in the NRHP. In recognition of the fact that not all significant cultural resources may have been identified and recorded within a project area, 36 CFR Part 800.4(b) requires that federal agencies make reasonable and good faith efforts to identify any cultural resources (including unrecorded and previously recorded properties) that may be affected by their undertakings, and evaluate the eligibility of these resources for listing in the NRHP.

Under the National Environmental Policy Act of 1969 (NEPA), agencies have broad responsibilities to be concerned about the impacts of their activities on the environment, including historic properties. FHWA adopted the policy of managing the NEPA project development and decision making process as an "umbrella," under which all applicable environmental laws (including NHPA) and regulations are considered and addressed prior to the final project decision and document approval. The conclusion of the NEPA process results in a decision that addresses multiple concerns and requirements.

Under the provisions of Section 4(f) of the Department of Transportation Act of 1966, the Department of Transportation (DOT) is prohibited from using any historic site of national, state, or local significance (i.e. eligible for listing in the NRHP) for public transportation purposes without first determining that there is no prudent and feasible alternative to the use of such land. If no prudent and feasible alternative exists, then the DOT is required to develop measures to minimize harm to the resource resulting from the transportation project.

Any use of 4(f) property will require INDOT to submit the Section 4(f) documentation to FHWA for review and approval. The NEPA document must show that there is no “feasible and prudent” alternative to the use of the 4(f) property. If there is no feasible and prudent alternative, then the project must include all possible planning to minimize harm to the 4(f) property. A section 4(f) evaluation requires coordination with the U.S. Department of Interior (USDOI), and Housing and Urban Development (HUD) and U.S. Department of Agriculture (USDA) if required, and requires FHWA legal counsel to review the evaluation for legal sufficiency prior to approval.

FHWA will be the lead Federal agency for purposes of Section 106 consultation for all FHWA-IN projects, unless the FHWA Indiana Division Office specifically approves alternative arrangements. The level of involvement by FHWA will reflect the complexity of the historic preservation issues

involved in a project, and will be determined on a case-by-case basis, taking into account any views expressed by the applicant, the SHPO, the ACHP, and/or consulting parties.

Currently there is no GIS spatial data available for Northwest Indiana that shows the location of cultural resources. However, the IDNR maintains a list of properties on the National and State Register. The State and National Registers are an easy way to identify resources that have already been formally recognized for their historic character. Additionally, Indiana's Historic Sites and Structures Inventory (made up of individual County surveys of historic properties and sites) also offer a great way to identify historical properties throughout the state.
This information is available on the IDNR Division of Historic Preservation & Archeology website at www.in.gov/dnr/historic/2823.htm. Further information about cultural resources, including links to additional resources, can also be found on INDOT's Cultural Resources Section website at www.in.gov/indot/3335.htm.

## Environmental Mitigation Process

1) NIRPC will prepare a set of environmental mitigation reference documents to be kept online for easy updating. These will include:
    a. Series of GIS maps detailing environmental assets likely to require environmental mitigation both within existing state and federal environmental regulatory programs
        i. Long term goal would be for NIRPC to have on-line interactive GIS delivery capabilities, but initially these might be static maps.
    b. Links to federal and state environmental regulatory guidance documents, procedures, and contact information to request early permit coordination
    c. Links to mitigation guidance documents and best management practices
2) Instructions to review these documents will be provided with STP, TE, and other funding solicitations
3) Applicants will be required to submit GIS shapefiles for proposed projects
4) Specific project categories that will be required to identify proximity to assets identified in the environmental mitigation maps and demonstrate environmental mitigation consideration include:
    a. Capacity Expansion
    b. Intersection Improvements
    c. Bridges
    d. Drainage
    e. Roadway Preservation projects that include culvert or drainage repair and replacement
    f. Other
5) Mitigation priorities:

a. Avoidance
b. Minimization
c. Mitigation

## Potential Mitigation Activities

There are a number of existing state and federal guidance and technical documents that can be used to identify potential practices appropriate for a variety of mitigation activities.

### *Detroit District U.S. Army Corps of Engineers Mitigation Guidelines and Requirements*

This document establishes federal compensatory mitigation guidelines for permitted aquatic resource loss or for waters that are adversely affected in the U.S. Army Corps of Engineers' (Corps) Detroit regulatory district comprising Michigan and part of Indiana. Compensatory mitigation is the restoration or creation of areas to replace functions that would be otherwise lost as a result of an activity permitted by the Corps. These guidelines are for permit applicants and others in meeting the requirements of Section 404(b)(1) Guidelines of the Clean Water Act. Compensatory mitigation is required to offset impacts that cannot be avoided and minimized to the extent practicable. The purpose of these Mitigation Guidelines is to identify the types and extent of information that Corps personnel in the Detroit District require to assess a mitigation proposal. Success is generally defined as: a healthy sustainable wetland/water/stream that compensates for the lost functions of the impacted water in an appropriate landscape/watershed position. www.lre.usace.army.mil/functions/rf/html/MitigationGuidelinesDec2008.pdf

### *eFOTG*

The electronic Field Office Technical Guides are the primary scientific references for the Natural Resources Conservation Service (NRCS). Section IV of eFOTG provides practice standards and specifications. www.nrcs.usda.gov/technical/efotg/

### *Indiana Drainage Handbook*

The Handbook is intended to be used by the state and federal regulatory agencies as well as those doing drainage work. Pursuant to its enabling legislation, the Handbook: (1) explains and clarifies federal, state, and local laws and regulations affecting drainage improvement activities within the State of Indiana; (2) provides descriptions of specific "Best Management Practices", which define how work should be performed with a minimum of adverse environmental impact; and (3) explains procedures for timely access to agencies' drainage-related personnel. www.in.gov/dnr/water/4892.htm

### *Indiana Storm Water Quality Manual*

The Indiana Storm Water Quality Manual provides guidelines and specific storm water quality measures for controlling soil erosion; controlling and treating the nonpoint source pollution associated with sediment-laden runoff; and the management and treatment of pollutants associated with post-construction land uses. Adhering to these guidelines and properly applying appropriate storm water quality measures will help minimize the adverse impacts that land disturbance, construction activity, and development can have on soil and water resources, and ultimately, the cost of those impacts to society as a whole. In addition to a variety of storm water quality measures, the manual also discusses the philosophy and planning procedures critical to developing an effective storm water pollution prevention plan. www.in.gov/idem/4899.htm

### *National Management Measures to Control Nonpoint Source Pollution*

The US EPA has issued several guidance documents on measures to control nonpoint source pollution in several categories. The measures can be implemented in either a preventative or restorative mode depending on needs. Of specific relevance will be the documents issued for urban areas, hydromodification, and wetlands and riparian areas. Links to these US EPA documents can are provided by IDEM in the Indiana Nonpoint Source Management plan at www.in.gov/idem/5984.htm.