# The Nature Conservancy's Ohio Stream and Wetland In-Lieu-Fee Mitigation Program Prospectus



The Nature Conservancy
Protecting nature. Preserving life.™

The Nature Conservancy with support from the Ohio Water Development Authority

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# Table of Contents

## Objectives

The purpose of establishing The Nature Conservancy's Ohio Stream and Wetland ILF Program is to provide an additional mechanism for compensatory mitigation for unavoidable and minimized impacts to aquatic resources that helps to maximize the benefit to the aquatic environment and the public interest. This mitigation may be pursuant to impacts authorized by the Clean Water Act (33 U.S.C. § 1251 *et seq*.) and/or Sections 9 and 10 of the Rivers and Harbors Act of 1899 and/or the Ohio Revised Code (ORRC Chapter 611 – Isolated Wetlands) and/or Ohio Administrative Code (OAC 3745-1). The overall goal of this and other stream and wetland mitigation programs in the state of Ohio is to achieve no net loss of existing wetland acreage or stream footage, or associated functions. As the sponsor of this program, TNC and implementation partners will use a watershed approach to accomplish mitigation projects in Ohio efficiently and at beneficial economies of scale to provide for a significant net gain of stream and/or wetland resource functions and values where possible.

This document represents the Program Prospectus, the first step toward developing a watershed-based in-lieu-fee (ILF) stream and wetland mitigation program for Ohio. This and future documents will be used to develop and document guidelines, responsibilities and standards for the establishment, use, operation and maintenance of an in-lieu-fee stream and wetland mitigation program that brings it into compliance with one or more of the laws referenced above, governing compensatory mitigation for activities authorized by permits issued by the Department of the Army (DA) and/or Ohio EPA. The Ohio Stream and Wetland ILF Program proposed in this Program Prospectus is referred to herein as the "Program" for convenience.

## Need

The intent of this Program is that it will be used for compensatory mitigation for unavoidable[1] impacts to waters of the United States and State Waters that result from activities authorized under Section 404 and/or 401 of the Clean Water Act, the Ohio Revised Code (ORRC Chapter 611 – Isolated Wetlands) and/or Ohio Administrative Code (OAC 3745-1) and/or Section 10 of the Rivers and Harbors Act (33 U.S.C. § 403). More specifically, the Program may be utilized to provide compensatory mitigation for impacts permitted by the Corps or Ohio EPA involving: (a) Corps General Permits; (b) Ohio EPA General Permits; (c) Corps and Ohio EPA Individual Permits and unauthorized activities impacting less than three (3) acres of waters (including wetlands) other than streams and/or less than two thousand (2,000) linear feet of streams; and (d) in other cases if agreed upon by the Corps, Ohio EPA and TNC.

In the early 1700s, Ohio's environment was described by early settlers as a predominantly forested landscape with scattered openings, clean streams and numerous wetlands with lush vegetation and abundant wildlife. The Natural Vegetation Map of Ohio at the time of the earliest land surveys (Gordon, 1966), shows large and widely distributed areas comprised of elm-ash

[1] Avoidance of impacts on water resources is the most desired outcome of any permitted activity.

swamp forests, prairie, freshwater marshes and fens, sphagnum peat bogs and bottomland hardwood forest wetlands in Ohio (ODNR and OEPA, 1999).

Urban development, farming, mining and logging have had a significant impact on Ohio's wetlands and streams. It has been estimated that nearly 90 percent of Ohio's original wetlands have disappeared. From the 1780s to the 1980s, Ohio's wetland areas declined from about 5,000,000 acres to about 483,000 acres (Dahl, 1990). The water flow in many streams was impeded or altered by dams or diversions, and ditches were installed to drain the land more quickly. As development continues, there is an ongoing need to retain the streams and wetlands that still exit in Ohio, and to mitigate or offset any losses. References and additional information on trends and needs are provided in Appendix B of this document.

In 2008, the Department of the Army (DA) and U.S. Environmental Protection agency published the Federal Rule on Compensatory Mitigation: Mitigation for Losses of Aquatic Resources; Final Rule (33 CFR Parts 325 and 332) dated April 10, 2008. This rule was established to improve upon historical mitigation approaches, and changes were based on observations of strengths and weakness of mitigation activities leading up to that date. Among other things, the rule suggests the need for a watershed-based approach to mitigation, and expresses a preference for various types of mitigation in the following order: 1) mitigation bank credits; 2) in-lieu-fee program credits; and 3) permittee-responsible mitigation.

While there are numerous mitigation banks located throughout the State of Ohio, portions of the state are not currently covered. Furthermore, there are currently very few stream mitigation banks in the state and no in-lieu-fee programs for either wetlands or streams have yet been established. A permittee-responsible approach is the only option where neither banks nor in-lieu-fee programs exist.

Compared to permittee-responsible approaches, ILF projects have a number of potential benefits. In particular they can be used to target larger, more ecologically valuable, parcels that have been prioritized through a watershed-based approach. The consistent approach and structure of an ILF program enables improved and more scientific site selection, mitigation plan development, implementation, and financial assurances that translate into a reduction in uncertainty for project success (33 CFR Part 332). Through this approach, the Program will consider watershed scale features including habitat diversity, habitat connectivity, hydrologic connectivity and compatibility with local land uses.

It is the intent of the sponsor that the standards of specific compensatory mitigation sites or projects authorized under the Program will be selected and designed using a watershed-based approach to mitigation based on those established for mitigation banks. Wherever possible and appropriate, equivalent templates and policies will be used for the Program as are used for mitigation banks. The Program sponsor will endeavor to use the best available science and guidance from public and private partners in the design and operation of the Program, including the document titled Guidelines for Wetland Mitigation Banking in Ohio, dated March 2011 or later.

Establishment and Operation

The Nature Conservancy intends to establish itself as a qualified in-lieu-fee mitigation sponsor for USACE and Ohio EPA authorizations in Ohio. This Program Prospectus sets the general framework under which TNC-sponsored mitigation sites would be identified, funded, operated, maintained and managed, but the selection of particular projects and project partners for mitigation will occur on an ongoing basis as ILF mitigation needs are realized. The appropriate DA representatives of the Interagency Review Team (IRT) will be responsible for approving the program and projects contained within it, and will advise The Nature Conservancy on the establishment and management of the ILF Program. The Ohio Water Development Authority (OWDA) will receive and manage deposits into Accounts established specifically for this Program.

As the program sponsor, The Nature Conservancy may decide to reject payments for impacts greater than three (3) acres of wetlands, greater than two thousand (2,000) linear feet of streams, or payment from impacts to particularly sensitive, important, or irreplaceable natural resources. In determining whether to accept a payment for any impact described in the preceding sentence, The Nature Conservancy may consider various factors in its discretion, including but not limited to: (a) the effect of the impact(s) on TNC's conservation priorities, (b) the ability of the project proponent to mitigate for the impacts in the appropriate watershed, and (c) compliance with Conservancy policies and procedures.

The Nature Conservancy will work with representatives of the IRT to identify the most appropriate projects available for mitigation based on the impacts to be mitigated, and the watershed-based approach to project selection. The mitigation projects will be selected based on IRT review of proposals brought forward by TNC in collaboration with non-governmental organizations (NGOs), governmental entities, and others. TNC may implement some projects, but is unlikely to be the lead implementing organization in large portions of the state. Regardless of who is the proposed implementing organization, the appropriate USACE district engineer will make the final decision to approve projects.

Sponsor Qualifications

The Nature Conservancy is a tax-exempt 501(c)(3) organization managed from its worldwide office in Arlington, Virginia. Founded in 1951, The Nature Conservancy now works in all 50 United States and in more than 30 countries. The organization has protected more than 119 million acres of land and 5,000 miles of rivers around the world — and operates more than 100 marine conservation projects globally. The Nature Conservancy is supported by more than 1 million members and employs about 3,200 staff worldwide, over 700 of whom are scientists. The Nature Conservancy has been named a "Top-Rated Charity" by the American Institute of Philanthropy and the organization's strong performance is recognized by Charity Navigator as exceeding or meeting industry standards.

The mission of The Nature Conservancy is to conserve the lands and waters on which all life depends. At global, national, regional and state scales, the organization employs a scientific, systematic analysis to identify places large enough and rich enough in plant and animal species to ensure meaningful conservation results. At each place, the Conservancy employs a range of

strategies tailored to local circumstances and communities, including: buying land and interests in land; helping landowners, private and public, manage their properties; facilitating public-private partnerships; and collaborating with likeminded partners to seek pragmatic, cost-effective solutions to the most pressing conservation threats at the largest scale.
To achieve the Conservancy's place-based mission, the worldwide Board of Directors has established chapters of The Nature Conservancy at the state and country level. Each state and country program is run by a director who manages the program's annual plan and budget in support of the Conservancy's mission and goals.

In 1950, the Ecologist Union met in Columbus and changed its name to The Nature Conservancy. In 1958, the Ohio Chapter of The Nature Conservancy was incorporated by a small group of scientists and nature lovers. The Chapter's first land purchase, Lynx Prairie in Adams County, was made in 1959. Since then, the Ohio Chapter has gone on to help conserve over 55,000 acres of land in Ohio. Of these, almost 20,000 acres are owned and managed by The Nature Conservancy. The other 35,000 acres are now owned and managed by other natural resource management agencies, most prevalently the Ohio Department of Natural Resources, United States Forest Service, County Park Systems, and partner land trusts. Through this work, TNC has experience related to high quality wetland and stream corridor acquisition, restoration and stewardship. The Nature Conservancy also has direct experience with stream and wetland mitigation. The most significant single example of stream restoration accomplished by TNC and partners in Ohio is probably the 7,000+ linear feet of stream rehabilitation at the Darby Headwaters Preserve in Logan County.

As of summer 2012, the Ohio Chapter consisted of 46 paid positions (34 long-term and 12 short-term staff).The Ohio Chapter is advised and assisted by a volunteer Board of Trustees which provides guidance on strategic issues, assists in setting goals and, most importantly, subjects the chapter's work to additional critical thinking.

The Nature Conservancy has developed robust databases and procedures to track and manage all aspects of the compensatory mitigation process in other states. The Ohio Chapter is drawing upon these resources, particularly those from Virginia and Maine, in developing the Ohio Program. The tracking systems range from tracking of permitted impacts, through the competitive proposal process to the award and monitoring of compensation projects. The Conservancy also has experience managing regional Funds for the collection of impact fees, award of grants for compensation projects, facilitating the competitive grant process, program marketing and outreach, supporting prospective applicants, management of proposal review, development of Project Agreements for mitigation fund awards, and transactional due diligence on all projects.

Technical Feasibility

The Nature Conservancy and state agencies have undertaken various assessments of habitat quality and opportunities for restoration throughout the state. These include identification of the most ecologically intact streams and wetlands (e.g. TNC ecoregional portfolio sites, Ohio EPA stream quality classifications), and highest priority opportunities for conservation and restoration (Division of Forestry FRAS Priority areas, Division of Wildlife Focus Areas, and Ohio EPA TMDL locations). These and other assessments provide science-based indications of important

places to conserve and restore, offering a solid foundation from which to move forward under a watershed approach.

The intention of TNC is to facilitate projects that will deliver high quality stream and wetland mitigation credits throughout Ohio. Ohio has an array of agencies and organizations equipped to conserve and restore lands, who, in partnership with The Nature Conservancy, are positioned to deliver high quality stream and wetland mitigation and to manage lands throughout the state. These likely partners include, most predominantly, the Ohio Department of Natural Resources, Metro Parks, and other conservation NGOs. Additionally, there are numerous private consultants with extensive experience restoring both streams and wetlands, and monitoring the effectiveness of mitigation. By seeking proposals, and evaluating them against scientific and other objective criteria, the program will identify the most effective partners to work with, and efficiently deploy stream and wetland mitigation funding through both TNC and partners.

Proposed Service Areas

The proposed areas in which this Program is authorized to provide compensatory mitigation required by Corps and Ohio EPA permits ("Service Areas") are the whole or partial watersheds or geographic areas defined as Primary and Secondary Service Areas. Primary Service Areas are the Fourth Level (8-digit) hydrologic unit codes ("HUCs") watersheds, which serve to focus mitigation for impacts to higher quality wetlands and streams. In addition to the Primary Service Areas, Secondary Service Areas are defined as Ecological Drainage Units (EDUs), which consider watershed boundaries and ecological similarities and are being used by federally led-Landscape Conservation Cooperatives and others. Some modifications to the EDUs were made to correspond to DA district boundaries. These larger service areas serve to focus mitigation for smaller impacts to lower quality aquatic resources in a way that maximizes the aquatic and larger ecological benefit of the mitigation. These Service Areas are further described and illustrated in the Compensation Planning Framework in Exhibit B.

Specifically, where there are impacts to Category 1 wetlands of any size, or 0.5 acres and less of impacts to isolated Category 2 wetlands, mitigation may be implemented within the Primary Service Area or the larger Secondary Service Area (EDU) within which the impact was located. In all cases, each Secondary Service Area is located wholly within, and is smaller than, the USACE District. These Secondary Service Areas are appropriate in this context because their definition is based on ecological and watershed factors, or a watershed-based approach. They also keep the mitigation closer to impacts than is suggested by the Guidelines for Wetland Mitigation Banking in Ohio. For all other wetland impacts, the 8-digit HUC (Primary Service Area) where the impact is located will be the service area. These include impacts to Category 3 Wetlands, impacts of any size to jurisdictional Category 2 wetlands, or greater than 0.5 acres of impact to isolated Category 2 wetlands (Table 1).

For streams, a parallel approach will be taken where the impacts to designated limited resource water, limited warmwater habitat, modified warmwater habitat, Class I and Class II primary headwater habitat, and general warmwater habitat may be implemented within the Primary Service Area or the larger Secondary Service Area (EDU) within which the impact was located. All other stream impacts will be mitigated within the Primary Service Area (8-digit HUC) where the impact occurred (Table 2).

If, within any 8-digit HUC, the cumulative amount of impacts to be mitigated through the ILF Program in any given year are less than three acres of wetlands or 2,000 linear feet of stream, or no acceptable Mitigation Project opportunities are found, TNC may submit a proposal to satisfy the mitigation obligation liability through projects in an adjacent 8-digit HUC inside the same Secondary Service Area, through the use of Released Credits or Bank Credits from within the same Secondary Service Area, use of preservation in the same 8-digit HUC or Secondary Service Area, deferring the mitigation liability to the next year, or other mitigation options as approved by the appropriate USACE district engineer.

**Table 1. Eligible Mitigation Service Areas for Wetland Impacts**

| Impacted Resource Type | Primary Service Area | Secondary Service Area |
|---|---|---|
| General Quality Wetland | | |
| Category 1 Wetlands of any type or size | X | X |
| Isolated Category 2 Wetlands of 0.5 acres and less | X | X |
| Higher Quality Wetland | | |
| Isolated Category 2 Wetlands of more than 0.5 acres | X | |
| Jurisdictional Category 2 Wetlands of any size | X | |
| Category 3 Wetlands of any Type or Size | X | |

**Table 2. Eligible Mitigation Service Areas for Stream Impacts**

| Impacted Resource Type | Primary Service Area | Secondary Service Area |
|---|---|---|
| General Quality Water | | |
| Limited Resource Water | X | X |
| Limited Warmwater Habitat | X | X |
| Modified Warmwater Habitat | X | X |
| Class I and Class II Primary Headwater Habitat | X | X |
| Warmwater Habitat* | X | X |
| Higher Quality Water | | |
| Class III Primary Headwater Habitat | X | |
| Exceptional Warmwater Habitat | X | |
| Coldwater Habitat | X | |
| Seasonal Salmonid Habitat | X | |
| Antidegradation Category of Superior High Quality Water | X | |
| Antidegradation Category of Outstanding National Resource Water | X | |
| Antidegradation Category of Outstanding State water | X | |
| State Wild and Scenic rivers | X | |
| National Wild and Scenic Rivers | X | |
| Water Bodies Which Harbor Federally Listed Threatened and/or Endangered Species | X | |

*Except for warmwater habitat that is also a State Wild and Scenic River, a National Wild and Scenic River, or that harbors federally listed threatened and/or endangered species.
Note: These categories draw from the OAC 3745-1-07 list of Beneficial Stream Uses as defined by Ohio EPA, and Ohio EPA's March 30, 2012 submission to the USACE regarding 2012 Nationwide Permit Reauthorization and Ohio EPA's stream anti-degradation categories.

Program activities, including impacts, payments, Credits and projects will be tracked and reported by both Primary (8-digit HUCs) and Secondary Service Areas. Service Areas may be further refined and possibly limited in project-specific Site Development Plans as recommended and approved by the appropriate USACE district engineer.

In-Lieu-Fee Program Accounts

*Contributions or payments* made by permit applicants, permittees or other parties, as approved by the Corps and Ohio EPA, will be organized by impact type and according to the 8-digit HUC where the impact occurred. The funds will be deposited into interest-bearing accounts (the "Accounts") managed by the Ohio Water Development Authority (OWDA). All interest and earnings from the Accounts must remain in the Accounts until approved for use by the

appropriate USACE district engineer. Monies from the Accounts shall be used to pay for selection, design, acquisition, implementation, monitoring, administration, management and protection of Mitigation Projects approved by the appropriate USACE district engineer. Funds expended may be charged to specific or multiple Mitigation Projects. Funds may be approved and expended for the benefit of multiple watersheds or for the Program itself. In any event, all funds expended reflect, and therefore help establish, the minimum cost of Credits in each watershed.

The OWDA shall hold any funds collected pursuant to this Agreement in the Accounts, which shall be interest-bearing accounts in a federally-insured financial institution to maximize the safety and preservation of the principal funds in the Accounts. Funds will be invested by OWDA based on investment guidelines approved by the Corps and Ohio EPA. OWDA shall account for the funds so held in accordance with generally accepted accounting principles, and the Accounts shall be subject to audit by the Corps and Ohio EPA from time to time, as determined by the Corps and Ohio EPA, at the expense of the party requesting such audit. Notwithstanding the foregoing, OWDA is audited annually by the State of Ohio. The funds held and disbursed for the ILF program will be part of this annual audit. Interest and any other earnings produced by the Program, and proceeds from the sale of Mitigation Site lands, shall remain in the Accounts until approved for use by the appropriate USACE district engineer.

Those approved funds received by the Program in excess of the amount needed for mitigation or restoration projects shall remain with the Program, and shall be disbursed in accordance with this Agreement for other Mitigation Projects or other uses approved by the USACE district engineer. The Nature Conservancy shall ask OWDA to set aside contingency funds from the Accounts sufficient to guarantee the success of each Mitigation Site undertaken in accordance with Corps and Ohio EPA regulations, including remediation of catastrophic events and long-term management of each Mitigation Site.

The Accounts may only be used, upon approval by the appropriate USACE district engineer, for selection, design, acquisition, implementation, monitoring, management and protection of compensatory Mitigation Projects, and other related uses, including administration of the Program. Requests to expend funds for the Long-Term Maintenance and Management of a Mitigation Project must be accompanied by a description of needs, annual cost estimates for these needs and a discussion of inflationary adjustments and other contingencies, as appropriate. The Nature Conservancy shall receive an administrative fee amounting to 7.5% of the funds when the funds are deposited. In addition, the OWDA will receive an administrative fee amounting to 0.35% of the funds from the funds deposited. The fees will come from the deposited funds, and are deemed to represent and reimburse reasonable overhead and related administrative costs of administering the Program and Program Accounts to accomplish the Mitigation Projects described herein.

The district engineers shall have oversight of the Accounts. Complete budgets for Mitigation Projects must be approved by the appropriate USACE district engineer. The OWDA shall submit to the appropriate representatives of the IRT an Annual Report by March 31 of each year. The Annual Report shall include detailed summaries of Account deposits and disbursements made for each Mitigation Project over the previous calendar year (January 1-December 31). Any

increase from the total approved budget for a Mitigation Plan will require the district engineer's approval before additional funds may be disbursed. The Corps and Ohio EPA may review Account records with 14 days written notice. When so requested by a district engineer, the OWDA and TNC shall provide all books, accounts, reports, files, and other records relating to the Accounts.

Program Accounting Procedures

TNC shall establish and maintain a system for tracking Credits in relation to Projects, the debit or sale of Credits and financial transactions in relation to Credits between TNC and permittees. The adopted system shall be approved by the appropriate USACE district engineers. Credit production (the generation of an amount of Credits based on Projects), Credit transactions (purchase by permittees and debit by TNC of Credits) and financial transactions (the exchange of money in relation to Credits) shall be tracked both on a programmatic basis (*i.e.*, the number of available Credits for the entire program that is across all of the service areas), within each basin, and separately for each individual compensatory Mitigation Project undertaken by the Program. Credits will be tracked by credit type, mitigation site, and 8-digit HUC.

The sale, conveyance, or transfer of Credits includes all natural services, functions and values associated with the natural resources (*e.g.* wetlands, streams) from which Credits were derived. Credits may be used to compensate for environmental impacts under other programs (civil works, Superfund Program removal and remedial actions, supplemental environmental projects for state and federal enforcement actions, etc.), but Credits may not simultaneously serve as mitigation for more than one activity; *e.g.*, a Credit may be used to offset impacts under any Federal , State, or local program related to wetlands and streams, however that credit may only be counted against permitted impacts one time. If funds from entities other than permittees are accepted for projects, those funds will be kept in separate accounts.

Compensation Planning Framework

The purpose of compensatory mitigation is to offset unavoidable impacts to waters of the U.S. and State Waters, including wetlands and streams. Therefore, priority is given to mitigation that replaces lost functions and values of waters, wetlands and streams, as determined by the IRT Chairs. No Credits will be approved unless and until the appropriate USACE district engineer determines that the mitigation does constitute compensatory mitigation for lost functions and values relevant to permitted impacts to waters, wetlands and streams.

Based on precedents set in other states, in particular Virginia, TNC's Conservation by Design approach results in a watershed-based compensatory mitigation. TNC agrees to employ the Conservation by Design approach or other approved watershed management plan in the administration of the Program and compensatory mitigation. A Compensation Planning Framework based on this approach is incorporated as a part of this Program Prospectus as Exhibit B.

Mitigation Project Establishment and Operation

**a. Credit Need and Availability**

The primary emphasis of the Program is on aquatic resource restoration and protection. The use of this Program for compensatory mitigation shall occur only after the relevant permitted activity has complied with Corps, Ohio EPA, and/or ODNR regulations and policies regarding avoidance and minimization of impacts or as stated in the "Objectives" in this document, or otherwise herein. TNC and its partners shall play no role in the Corps' or Ohio EPA's decision to approve or deny a permit or whether mitigation is a necessary condition of any such permit.

The Corps and Ohio EPA will determine the number of Credits required to compensate for permitted impacts utilizing accepted procedures used in Ohio for evaluating compensatory mitigation credits. TNC will determine the fee amount needed to provide mitigation credit and provide this information to the Ohio Water Development Authority (OWDA), which will manage the ILF Program Accounts. The OWDA, pursuant to the terms of this Agreement, will act as a recipient of mitigation funds that are required of permittees and other parties as identified by the Corps and/or Ohio EPA. When a payment is provided to OWDA for mitigation Credits, OWDA shall record the payment and TNC will record the associated Credits on the Credit Ledger for that Service Area and 8-digit HUC.

The Program will have two types of credits available for purchase by permittees, Advance Credits and Released Credits. Advance Credits are in-lieu-fee credits sold in advance of mitigation sites generating released credits. Released Credits are for mitigation projects already implemented, and upon meeting success monitoring and approved by the appropriate district engineer. These credits are equivalent to mitigation bank credits and may be sold to satisfy mitigation requirements.

Credits will be requested by applicants as follows:

- Applicant contacts TNC for credit availability and requests number and type of credits required.
- Applicant completes and submits a Credit Availability Voucher, which provides information on the impacts that will require mitigation, information on providing the Credit availability, the type of Credit (Advance or Released), and the pre-set cost per unit of Credit in a particular service area and/or 8-digit HUC. The Credit Availability Voucher shall contain identifying information regarding the impact site and other information deemed necessary by the Corps, Ohio EPA, OWDA and TNC.
- If credits are available in the appropriate service area, TNC will issue a Letter of Credit Availability with a specific deadline for payment.
- Applicant submits Letter of Credit Availability with their permit documents to the regulatory agencies.
- When the applicant is ready to purchase the mitigation credits (before the deadline has passed), the applicant / permit manager must complete a Payment Voucher. This will reflect any changes since the initial request and the final mitigation requirements of the permit.

- Applicant returns the payment voucher to OWDA and TNC, and the actual payment to OWDA.
- TNC issues acknowledgement of payment to OWDA and assumes liability for impacts and mitigation requirements.

Credits may be provided in the form of advance or released credits. The approach for setting credit prices will be elaborated in the Program Instrument, and will consider those being used in other ILF Programs, as well as prices charged by mitigation banks.

**b. Project Identification and Selection**

To offset impacts to aquatic resources that resulted in payments into the Accounts, TNC shall solicit and submit proposals for funding approval in accordance with this Agreement. It is anticipated that project proposals will come from established mitigation banking corporations, conservation NGOs including TNC, and state and local governmental agencies. Mitigation Project proposals will be based on the Compensation Planning Framework (See Exhibit B and must include/address the 12 elements of mitigation plans at 33 CFR §332.4(c)(2)-(14)). Each plan and associated funding requires approval by the IRT Chairs (appropriate district engineers), in consultation with the IRT members (33 CFR §332.8(j); 33 CFR §332.8(i)).

The Ohio EPA has expressed to TNC that where the permittee requiring mitigation is the Ohio Department of Transportation (ODOT), mitigation should be accomplished, when possible, at project sites that are priorities for ODNR. Where ODOT is the permittee, TNC will request proposals from ODNR for Mitigation Projects that meet the criteria described in the Comprehensive Planning Framework (Exihibit B) for all projects in this program. TNC will review and evaluate proposals based on these and potentially additional criteria, and if no projects are proposed, or if proposed projects do not adequately meet criteria, will seek additional proposals from ODNR or others.

As outlined in the 2008 rule, the IRT shall meet on a regular basis with TNC to review proposed Mitigation Projects and to discuss relevant issues with Program procedures. The IRT Chairs, after seeking comments from the IRT members**,** shall allow for public comment on the proposed projects and may suggest revisions. The Corps district engineer where the impact and mitigation project occur will ultimately approve or deny specific Mitigation Project proposals for restoration, creation, enhancement, buffering, preservation of aquatic resources and their adjacent uplands, or the purchase of credits from an approved mitigation bank. Such approval or denial will be based on factors including site suitability, long-term sustainability, impacts to aquatic resources mitigated via the Program, the ratio of restoration to impacts of Program projects in particular watersheds, maximum return on expended funds, benefits to rare and endangered natural resources, and an acceptable Mitigation Plan.

**c. Site Development Plans**

Following general approval by the district engineer of a proposed Mitigation Site, TNC or identified project proponents shall submit for approval a Site Development Plan, which will be prepared by the project proponent or TNC. Site Development Plans should include, if

applicable, a description of the proposed project and site specific plan including location, baseline conditions, Credit composition, assessment methodology, schedule of Credit availability, a site-specific Service Area, a schedule for conducting the project, monitoring, maintenance and reporting provisions, provisions for protection and management in perpetuity with appropriate real estate arrangements and performance standards for determining ecological success of Mitigation Projects. The Site Development Plan should also include an Adaptive Management (AM) component to identify factors which may cause the site to not perform as proposed, and a management strategy or contingency plan for corrective action, including the party or parties responsible for implementing adaptive management measures.

In keeping with the Guidelines for Wetland Mitigation Banking in Ohio, ILF stream and wetland mitigation sites will contain features that make each site conducive to the development or restoration of high quality streams and wetlands that:

- replace the desired type of wetlands or streams (typically the same as what is being lost)
- provide multiple functions
- are appropriate for the landscape
- are compatible with surrounding land use
- can be managed in a relatively easy and sustainable manner
- are ecologically of the highest quality achievable and compatible with current and historic site conditions

Site Development Plans shall also include specific provisions addressing Mitigation Project default and other provisions as recommended by the IRT including but not limited to, Force Majeure, Eminent Domain and transfer of Mitigation Site ownership (taking into account restrictions imposed by Section 170(h) of the Internal Revenue Code and the regulations promulgated thereunder, as appropriate).

Site Development Plans may request funding approval for costs associated with accomplishment of Mitigation Projects including, but not limited to, labor, land acquisition, appraisals, project design, project management, restoration, creation, monitoring, stewardship, legal, closing, equipment and materials necessary to accomplish mitigation, and monitoring.

In the event TNC and/or its partners determine that modifications must be made to a Site Development Plan to ensure successful establishment of a Mitigation Project, TNC and/or the project proponent shall submit a written request for such modification, including a timeframe for any actions associated with the request, to the district engineer for approval.

<u>Ownership Arrangements and Long-Term Management</u>

**a. Protection of Mitigation Sites**

When monies from the Program are used for Mitigation Projects, the land associated with that Mitigation Site must be protected by a recorded document that preserves the land in perpetuity with the protection "running with the land." Land protection documents must be

approved by the Corps and Ohio EPA and must be recorded in the appropriate real property records depository for the locality where such project is located. In appropriate circumstances, and upon approval by the appropriate district engineer, portions of land not used for mitigation may be exempted from, and conveyed separately free and clear of, such easement or restriction(s). No Credits will be sold, debited or released until the Corps and Ohio EPA have acknowledged that they have received proof that appropriate land protection documents are recorded. TNC may engage in Mitigation Projects on land in which TNC, public agencies, or other non-profits own fee simple rights provided that appropriate protection mechanisms are approved by the district engineer, in accordance with Section 332.7(a) of the Final Rule.

**b. Closure of Mitigation Project Sites**

Upon satisfaction of the Success Criteria and performance standards, as determined by the district engineer, but not sooner than the end of the 5-year monitoring period, the district engineer shall issue written confirmation to TNC, and thereafter any remaining contingency funds in excess of that needed for use in long-term management of the Mitigation Project Site shall be used on other mitigation project activities within the same service area. Approved Preservation projects may request closure once Success Criteria have been met.

Prior to closure of a Mitigation Project Site that has been approved subsequent to the Effective Date of this Program, the district engineer may perform a final compliance inspection to evaluate whether all success criteria have been achieved. The district engineer shall provide written confirmation promptly upon their determination, in consultation with TNC, that:

(1) All applicable Success Criteria have been achieved;

(2) All Released Credits for that Mitigation Project Site have been debited;

(3) TNC has reviewed and revised, if necessary, the Long-Term Management and Maintenance Plan, and the revised Long-Term Management and Maintenance Plan has been approved by the district engineer;

(4) TNC has prepared and submitted to the district engineer a GIS shapefile or similar exhibit depicting the location and extent of the Mitigation Project;

(5) TNC has ensured that a capable Long-Term Steward is in place; and

(6) The Mitigation Project has complied with the terms of this Agreement and the mitigation plan.

Then the Mitigation Project Site will close, and the period of Long-term Stewardship and Preservation will commence.

**d. Long-term Ownership and Management**

A Long-Term Management and Maintenance Plan for each Mitigation Project shall contain specific objectives that address the long-term management requirements of the site. TNC, a

partner, or subsequent Long-Term Steward, shall provide the appropriate district engineer with 60 days advance notice before any actions are taken to modify the Long-Term Management and Maintenance Plan. The Long-Term Management and Maintenance Plan may only be amended or modified with the written approval of all signatory parties. The Long-Term Steward shall document that it is achieving each objective or standard by submitting status reports to the IRT on a schedule approved by the IRT chair. As part of the Long-Term Management and Maintenance Plan, the Long-Term Steward will allow the IRT access to the site. A primary goal of the Mitigation Project is to create or restore a self-sustaining natural aquatic system that achieves the intended level of aquatic ecosystem functionality with minimal human intervention, including long-term site maintenance.

The Long-Term Management and Maintenance Plan shall include, at a minimum, provisions for:

(1) Periodic patrols of the site for signs of trespass and vandalism. Maintenance will include reasonable actions to deter trespass and repair vandalized features.

(2) Monitoring the condition of structural elements and facilities of the site such as signage, fencing, roads, in-stream structures and trails. The Long-Term Plan will include provisions to maintain and repair these improvements as necessary to achieve the objectives of the Mitigation Project and comply with the provisions of the real estate instrument providing protection to the site. Improvements such as access roads, berms or water control structures that are no longer needed to facilitate or protect the ecological function of the site may be removed or abandoned if consistent with the terms and conditions of the recorded Protection Document.

The Long-Term Steward may modify the Long-Term Management and Maintenance Plan, subject to review and written approval by the district engineer and TNC.

Once long term management responsibilities have been established with the Long-Term Steward, as evidenced by the signature of TNC and the Long-Term Steward on the Long-Term Management and Maintenance Plan, said party is thereby responsible for meeting any and all long-term management responsibilities outlined in the project-specific Long-Term Management and Maintenance Plan, this Program and any other applicable project requirements approved by the district engineer. TNC is responsible for developing a Long-Term Management and Maintenance Plan for each Mitigation Project. Each Long-Term Management and Maintenance Plan will specify all anticipated management activities and the necessary capacity to accomplish those activities. OWDA shall report annually on beginning and ending balances, including deposits and withdrawals from accounts established to provide funds for long-term management of Mitigation Projects.

### e. Contingencies

If the district engineer determines that the in-lieu fee program is not meeting performance standards or complying with the terms of the instrument, appropriate action will be taken. Such actions may include, but are not limited to, suspending credit sales, adaptive management,

decreasing available credits, utilizing financial assurances, and terminating the Program Instrument.

### f. Programmatic Personnel

Funds to be allocated to cover labor costs for TNC personnel for multiple projects and/or fixed periods of time require written consent of the district engineer. TNC shall track the time of any such personnel, and only labor (duties and tasks) directly related to accomplishing Program activities shall be charged. These costs shall be included in the cost of Credits in each watershed. TNC may decide when to hire outside contractors, parties or consultants to accomplish Mitigation Projects and remediation via the normal approval process for mitigation proposals as stated herein. Primary considerations in all Mitigation Project proposals and approval decisions shall be: 1) the benefit to the waters of Ohio; 2) compliance with federal and state regulations; and 3) the most cost-effective approach to accomplishment of Mitigation Projects. All funds shall be used solely for the delivery and accomplishment of compensatory mitigation as described herein and no Program funds may be expended except as provided for in this Agreement. Administrative fees do not require approval for expenditure.

## Exhibit A: ILF Program Contacts

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## Acknowledgements

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# Exhibit B: Compensation Planning Framework

# COMPENSATION PLANNING FRAMEWORK:

# A WATERSHED APPROACH TO COMPENSATION PLANNING FOR THE NATURE CONSERVANCY'S OHIO STREAM AND WETLAND IN-LIEU FEE MITIGATION PROGRAM

The Nature Conservancy
Protecting nature. Preserving life.™

**SEPTEMBER 2012**

**TABLE OF CONTENTS** **PAGE**

# COMPENSATION PLANNING FRAMEWORK

# A WATERSHED APPROACH TO COMPENSATION PLANNING

## BACKGROUND

The Nature Conservancy's Ohio Stream and Wetland In-Lieu Fee Mitigation Program (TNC-Ohio ILF Program) is a statewide compensatory mitigation program administered by The Nature Conservancy (TNC). Funds designated for management and implementation of approved projects in the TNC-Ohio ILF Program will be received and disbursed by the Ohio Water Development Authority (OWDA). The Ohio EPA (OEPA) and the United States Army Corps of Engineers (ACOE) are the regulatory agencies that will oversee the establishment and operation of the in-lieu fee program. The TNC-Ohio ILF Program provides an alternative option for a permit applicant to address compensatory mitigation requirements associated with Section 404 and 401/Ohio Water Quality Certifications issued by the ACOE and the OEPA, respectively.

In 2008, the US EPA created a new rule to regulate in-lieu fee mitigation programs such as the proposed TNC-Ohio ILF Program which requires that a "compensation planning framework" be used for selecting and permitting mitigation projects funded through an in-lieu fee mitigation program. The rule states the following: "The approved instrument for an in-lieu fee program must include a compensation planning framework that will be used to select, secure, and implement aquatic resource restoration, establishment, enhancement, and/or preservation activities. The compensation planning framework must support a watershed approach to compensatory mitigation."

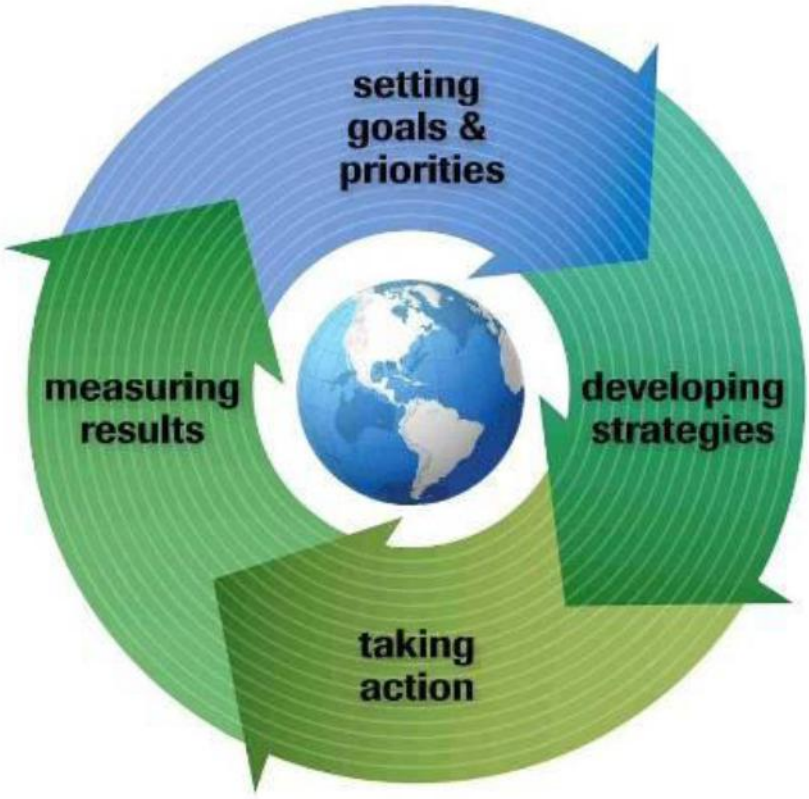
The required compensation framework must include the following ten elements:

1. The geographic service area(s), including a watershed-based rationale for the delineation of each service area;
2. A description of the threats to aquatic resources in the service area(s), including how the in-lieu fee program will help offset impacts resulting from those threats;
3. An analysis of historic aquatic resource loss in the service area(s);
4. An analysis of current aquatic resource conditions in the service area(s), supported by an appropriate level of field documentation;
5. A statement of aquatic resource goals and objectives for each service area, including a description of the general amounts, types and locations of aquatic resources the program will seek to provide;
6. A prioritization strategy for selecting and implementing compensatory mitigation activities;
7. An explanation of how any preservation objectives identified in element 5 and addressed in the prioritization strategy in element 6 satisfy the criteria for use of preservation;
8. A description of any public and private stakeholder involvement in plan development and implementation, including coordination with federal, state, tribal and local aquatic resource management and regulatory authorities;
9. A description of the long-term protection and management strategies for activities conducted by the in-lieu fee program sponsor;

10. A strategy for periodic evaluation and reporting on the progress of the program in achieving the goals and objectives above, including a process for revising the planning framework as necessary.

Based on TNC's own experience and the best practices of colleagues and partners, TNC established a science-based conservation approach for setting goals and priorities, developing strategies, taking action and measuring results, which is called "*Conservation by Design*" (TNC, 2001). This methodology satisfies all of the requirements of the 2008 compensatory mitigation rule for aquatic and wetland resources, and is the basis for the proposed prioritization strategy for selecting and implementing compensatory mitigation activities. The *Conservation by Design* approach is described below.

## PART I. THE NATURE CONSERVANCY'S *CONSERVATION BY DESIGN*




The mission of The Nature Conservancy is to conserve the lands and waters on which all life depends. In order to fulfill this mission, TNC uses a collaborative, science-based conservation approach and a common set of analytical methods to identify the biodiversity that needs to be conserved, decide where and how to conserve it and measure effectiveness of those efforts. Together this conservation approach and set of analytical methods form the core of *Conservation by Design*. The basic concepts of this conservation approach are simple and follow an adaptive

management framework of setting goals and priorities, developing strategies, taking action and measuring results.

**Setting Goals and Priorities.** Conservation goals describe the results we want to achieve for biodiversity. Based on the best available scientific information, TNC sets long-term goals for the abundance and geographic distribution of species and ecological systems necessary to ensure their long-term survival. To make the most effective progress toward these goals, TNC establishes priorities in places with high biodiversity that are most in need of conservation action or promise the greatest conservation return on investment.

*Priority places are identified through ecoregional assessments.* An ecoregion is a large area of land or water that contains a geographically distinct assemblage of ecosystems and natural communities, and is differentiated by climate, geology, physiography, hydrology, soils, and vegetation. TNC works with partners to assess ecoregions using data on the distribution and status of biodiversity, habitat condition, current and future threats and the socio-political conditions that influence conservation success within those ecoregions.

These data allow us to set long-term conservation goals for conservation targets — ecosystems, natural communities and imperiled or declining species representative of an ecoregion, and to establish ecoregional priorities for resource allocation — specific landscapes, threats to biodiversity and strategic opportunities that affect one or more ecoregions and demand immediate attention. Ecoregional data also provide a baseline against which we can measure progress toward long-term conservation goals for representative ecosystems and species within an ecoregion.

**Developing Strategies.** TNC works with others to transform ecoregional priorities into conservation strategies through Conservation Action Planning. This method is used to design and manage conservation projects that advance conservation at any scale — from efforts to conserve species and ecosystems in a single watershed or landscape, to efforts to reform regional or national policies. As with ecoregional assessments, Conservation Action Planning is driven by data on the distribution and status of biodiversity, current and future threats, and the socio-political conditions within the project area. These data are used to develop strategies of sufficient scope and scale to abate threats, maintain or restore biodiversity and strengthen capacity to ensure long-term results. The data also provide a baseline for evaluating effectiveness of strategies and progress in achieving project goals, and for modifying strategies to changing circumstances as needed.

**Taking Action.** The Nature Conservancy is committed to place-based results by taking action locally, regionally and globally, as called for by conservation strategies developed with partners. The strategies are varied, but typically include investing in science to inform decision-making; protecting and managing land and water; forging strategic alliances with a variety of groups from all sectors; creating and maintaining supportive public policies, practices and incentives; strengthening the institutional capacity of governments and non-governmental organizations to achieve conservation results; developing and demonstrating innovative conservation approaches; building an ethic and support for biodiversity conservation; and, generating private and public funding.

**Measuring Results.** TNC measures effectiveness by answering two questions: "How is the biodiversity doing?" and "Are the strategic actions having the intended impact?" The first question evaluates the status of species and ecosystems. The second question more specifically evaluates the effectiveness of conservation strategies and actions. Tracking progress toward goals and evaluating the effectiveness of strategies and actions provide the feedback needed to adjust the goals, priorities and strategies.

## *Element 1. The geographic service area(s), including a watershed-based rationale for the delineation of each service area.*

As described above, The Nature Conservancy uses ecoregions (terrestrial and freshwater) to stratify biological diversity and select geographic priorities. TNC uses terrestrial ecoregions, based on U.S. Forest Service descriptions (Bailey, 1995), for identifying and prioritizing representative and rare forested and wetland ecosystems, other natural communities and species. Freshwater ecoregions based on Abell et al. (2000) and Maxwell et al. (1995) encompass one or more similar freshwater systems that contain distinct assemblages of natural freshwater communities and aquatic species. TNC's ecoregion designations also correspond closely with the ecoregions based on work supported by the US EPA (Omernik, 1995; Omernik and Bailey, 1997); therefore, in an effort to be consistent, this document follows the EPA's ecoregion boundaries when referencing ecoregions in the remainder of this prospectus. As defined by the US EPA, Ohio contains portions of the Eastern Corn Belt Plains, Huron/Erie Lake Plains, Erie/Ontario Drift and Lake Plain, Western Allegheny Plateau, and Interior Plateau ecoregions (Figure 1).

Within each freshwater ecoregion, The Nature Conservancy has developed further stratification levels called ecological drainage units (EDUs) (Figure 2). EDUs delineate areas within a freshwater ecoregion that correspond roughly with large watersheds ranging from 3,000–10,000 square miles. EDUs are likely to have a distinct set of freshwater fish assemblages and habitats associated with them. They are defined by aggregating the watersheds of major tributaries (8-digit HUCs) that share a common zoogeographic history, as well as local physiographic and climatic characteristics. EDUs can be used as a tool for characterizing the ecology of watersheds and have been used by various state and federal agencies (e.g. in Texas, Iowa, and Missouri and federally led-Landscape Conservation Cooperatives) as the descriptive geographic boundaries for conservation planning purposes. EDUs are, therefore, an appropriate designation to use in a statewide in-lieu fee mitigation program and satisfy the 2008 rule requirement to delineate watershed based geographic service areas.

The proposed Service Areas in which the TNC-Ohio ILF Program would be authorized to provide compensatory mitigation required by Corps and Ohio EPA permits are whole or partial watersheds or geographic areas defined by TNC as Primary and Secondary Service Areas. Service Areas may be further refined and possibly limited in project-specific Site Development Plans as recommended and approved by the appropriate USACE district engineer.

Primary Service Areas are defined by the Fourth Level (8-digit) hydrologic unit code ("HUC") watersheds, where mitigation would take place for impacts to higher quality wetlands and streams.

Secondary Service Areas are defined by the larger Ecological Drainage Units (EDUs), which consider watershed boundaries and ecological similarities. The Secondary Service Areas are similar in geographic boundaries to 6-digit HUCs, although some modifications were made to group watersheds ecologically and to correspond to US ACE district boundaries (Figure 3). These larger service areas would serve to focus mitigation for smaller impacts to lower quality aquatic resources in a way that maximizes the aquatic and larger ecological benefit of the mitigation.

## *Element 2. A description of the threats to aquatic resources in the service area(s), including how the in-lieu fee program will help offset impacts resulting from those threats.*

Threats to aquatic resources, or any ecosystem chosen as a priority for conservation, are defined as past, current, or future human activities that directly cause degradation, impairment, or destruction of the species and habitat associated with the ecosystem, or the natural processes that support the ecosystem. Threats are identified and prioritized in the planning process so that impacts from the threat can be avoided or mitigated. Drawing on TNC's statewide ecoregional assessments the highest ranked threats to Ohio's aquatic resources are described below.

***Habitat Loss and Fragmentation.*** Residential, commercial, and industrial development with its associated infrastructure, such as roads and utilities, is the most significant cause of habitat loss and fragmentation. In addition to the loss of wetlands, floodplains, and coastal areas, land development also contributes to the hardening and erosion of shorelines, and changes to the hydrological connection of wetlands and streams with their surrounding landscape. While conversion of land to agriculture has also contributed significantly to wetland fragmentation and degradation, loss of wetland or stream habitat is more often the result of permanent structures such as buildings and roads. Floodplain modifications to allow development close to streams generally results in destruction of riparian forest and other floodplain habitat that can radically alter meandering flow or other physical characteristics of a stream. The placement of roads can cause multiple impacts to aquatic resources by altering hydrological connections through accelerated water flow and sediment transport, disrupting wildlife corridors, and providing pathways for the establishment of invasive species.

***Altered Hydrology.*** Urban and rural development along with many other land-based activities can affect natural hydrology by altering surface flow and hydrological connections that can degrade aquatic resources. Removal of vegetation, channelization of streams, excessive water withdrawals from streams and wetlands, draining and filling of wetlands, sand and gravel removal, and dams of various sizes are examples of activities that can change the natural hydrology.

Degradation of aquatic resources can result from contaminated runoff flowing directly from impervious surfaces such as parking lots into streams and wetlands. Dams and structures at road crossings can create barriers for species that require stream migration to successfully complete their reproductive cycle or other critical life stages. These alterations can cause changes in water flow patterns, flood storage capacity, substrate composition, temperature, and water quality which are all important factors for healthy streams and wetlands. Cumulative impacts from altered hydrology within a watershed can be especially damaging when certain disturbance thresholds are reached.

***Nutrient Enrichment and Sedimentation.*** Elevated nutrients in streams can lead to excessive algal growth, decreased light penetration, low concentrations of dissolved oxygen, and loss of desirable flora and fauna either through displacement or mortality (e.g. fish kills). Harmful algal blooms (HABs), toxin-producing algae that form during the summer, are increasingly problematic in Lake Erie and some inland waterways like Grand Lake St. Marys. Triggered

primarily by excess phosphorus, HABs adversely impact aquatic life and human health as well as recreation opportunities, fishing, and property values.

In recent years, severe outbreaks of blue-green algae in western Lake Erie and Grand Lake St. Marys have become a huge public health concern. For extended periods of time public access to beaches and lake waters has been restricted or banned over concern about the algae's toxic effects on humans and pets. Although, the problem is most often associated with agricultural watersheds, nutrients (primarily phosphorus and nitrogen) that contribute to HABs originate from a variety of sources. Major sources of phosphorus and other non-point source pollution include animal wastes, human wastes (commonly from failing septic systems or inadequate wastewater treatment), fertilizers, pesticides, and herbicides. Municipal wastes and fertilizers are also significant nutrient sources from urban areas.

Sedimentation is a natural occurrence in healthy stream systems, but it is also a common source of pollution in Ohio streams. Floodplains with intact riparian forests and wetlands provide natural filters and buffer areas from the damaging effects of excessive sedimentation. When these habitats are modified or destroyed, the negative impacts of nutrient and sediment pollution greatly increase. Excessive sedimentation can result when people fail to use best management practices in agriculture, forestry or construction activities, creating harmful stream conditions with devastating consequences, especially on fish and mussel populations.

***Invasive Species.*** Introduced non-native species, either deliberate or accidental, that become well established in streams and wetlands can pose a serious threat to the survival of Ohio's native species. Zebra mussel and purple loosestrife are two familiar examples of non-native invasive species that have had a negative impact on Ohio's wetlands and waters. The common reed *Phragmites australis* is one example of a widespread plant invader of wetlands throughout Ohio. Disturbed or modified wetlands can accelerate the establishment of this species which can quickly displace native wetland plants and ultimately create a monoculture and highly degraded wetland of little benefit to wildlife.

Not all introduced species become invasive, but those that do can readily displace native species through competition for food and habitat, predation on native species (e.g. round goby on native fish eggs), and by transmitting diseases, thereby causing serious ecological and economic harm. Once established, it can become difficult or nearly impossible, to eradicate or control some invaders. Many destructive insects, fungal diseases, and other aquatic invaders are introduced through international trade routes or spread by infected plants sold in the commercial plant industry. This is the reality of the expanding global economy. New methods of early detection and rapid response will need to be developed to prevent future introductions from causing devastating consequences.

***Climate Change.*** Naturally occurring changes in climate are not necessarily problematic, but the rapid change we are seeing today is a concern driven almost completely by increased greenhouse gas emissions from human sources—driving cars, heating buildings, cutting and burning trees, and generating electricity from fossil fuels. In Ohio, records show that spring is arriving earlier, summers are growing hotter, winters are becoming warmer, ice on Lake Erie is forming later and melting earlier, and severe weather is more frequent (Williamson et al, 2008). Climate change is

likely to exacerbate loss and degradation of aquatic ecosystems and the services they provide. Some of the changes that are occurring, or that scientists believe will occur (Chou and Schroeder, 2012; Groves et al, 2010) are discussed below.

Changes in amount and timing of precipitation and an increase in severe weather could increase costly flooding. Reduced summer precipitation and a loss of ice cover in winter will drive down water levels in Lake Erie. Decreased snow cover and winter precipitation will result in less available moisture in the spring, threatening freshwater wetlands, streams, and floodplains which depend on this seasonal inundation. Increased flooding will impair the ability of wetlands and floodplains to absorb excess water, resulting in altered stream hydrology and increased water pollution from excessive nutrient and sediment runoff.

In some watersheds, changes in temperature and water availability will likely cause isolation of nearby wetlands and a loss of habitat for wetland dependent fish and amphibians. The cold water streams in Ohio would be especially vulnerable. Warmer temperatures will cause some aquatic species to disappear or migrate. Coldwater species are likely to decline, while species that can adapt to the warmer water temperatures and are more tolerant of other stressors like invasive species and nutrient enrichment, will increase in numbers. Some species will have difficulty adapting without habitat corridors to migrate within.

Severe rainfall events and warmer temperatures anticipated with climate change are expected to exacerbate harmful algal blooms. Early season warming also will drive both an increase in magnitude and duration of harmful algal blooms. In areas of the state with combined sewer systems, heavy seasonal precipitation is likely to increase the number of overflow events which will increase the flow of untreated sewage and other pollutants into our waterways.

The TNC-Ohio ILF Program will offset the threats described above by focusing projects on areas where improvements can be achieved. The program will concentrate on developing effective mitigation projects in priority conservation areas identified within each service area that will compensate for the resources being impacted within the service area. As mitigation needs develop in each service area we will consult local watershed management plans and assessments to inform the site location and design of proposed mitigation projects. We can also develop projects that will promote adaptation and resilience to climate change and other stresses by conserving larger, more diverse areas, creating connecting corridors, and by restoring hydrology and reducing invasive species and other threats. This approach could provide benefits to the people that depend on these systems for water quality, flood control, recreation, building materials and good health. Healthy ecosystems offer some of the most cost-effective and powerful protection from the consequences of climate change and other impacts on Ohio's aquatic resources.

## *Element 3. An analysis of historic aquatic resource loss in the service area(s).*

In the early 1700s, Ohio's environment was described by early settlers as a predominantly forested landscape with scattered openings, clean streams and numerous wetlands with lush vegetation and abundant wildlife. The Natural Vegetation Map of Ohio at the time of the earliest land surveys (Gordon, 1966), shows large and widely distributed areas comprised of elm-ash swamp forests, prairie, freshwater marshes and fens, sphagnum peat bogs and bottomland hardwood forest wetlands in Ohio (ODNR and OEPA, 1999). It has been estimated that nearly 90 percent of Ohio's original wetlands have disappeared. From the 1780s to the 1980s, Ohio's wetland areas declined from about 5,000,000 acres to about 483,000 acres (Dahl, 1990).

Wetlands are typically located in low-lying areas that are covered or saturated by water during at least part of each year resulting in specialized soil types and water-dependent plants. Ohio's wetlands are found across the state and include such diverse communities as marshes, swamps, wet meadows, vernal pools, bogs and fens. Ohio's original wetlands were very large. Over time, most of Ohio's wetlands have been drained and filled to make way for farms, roads, houses and other development. Today, the scale is much different—wetlands that are considered to be large today would actually be very small in comparison to original wetlands. Approximately 63 percent of Ohio's wetland losses (2,850,000 acres of 4,500,000 acres) occurred through alteration of the Great Black Swamp in northwest Ohio.

During the past 200 years human activities have also resulted in dramatic changes to the physical, chemical and biological characteristics of Ohio's streams. As cities were built, forests were cleared, wetlands were drained, and the quality of streams also declined. Industries such as mining and logging have had a significant impact on Ohio's wetlands and streams. The water flow in many streams was impeded or altered by dams or diversions, and ditches were installed to drain the land more quickly. Many streams were heavily polluted as there was limited or no sewage treatment and rivers were used to dispose of human and industrial waste.

Stream and wetland degradation continued unabated for the most part until the 1960s and 1970s when state and federal laws were passed in an effort to reverse the degradation, and protect the remaining freshwater resources that were still in good condition. In addition, watershed groups and concerned citizens organized across the state to protect and restore streams and wetlands (Sanders, ed. and Zimmerman, 2002). As a result, Ohio has benefited from improvements in water quality and there is a higher value placed on maintaining healthy aquatic resources.

Historical documentation of the loss or alteration of Ohio's streams and wetlands is based on comparisons between early descriptions of the landscape by European settlers and the landscape that exists today. Prior to the Clean Water Act of 1972, there were no systematic methods in place to classify or quantify the diversity of streams and wetlands that were lost over time, nor was there enough concern over wetland loss to demand such an accounting. While the passage of the Clean Water Act and its regulatory authority provided an opportunity to document the type and location of wetlands and streams that were being impacted, we are not aware of any comprehensive database with that information for Ohio. As more specific mitigation needs arise for each service area in the TNC-Ohio ILF Program, we will make every attempt to locate that

type of detailed information within a service area in order to develop projects that will maintain or add to the diversity of wetland types that have been historically lost within that watershed.

## *Element 4. An analysis of current aquatic resource conditions in the service area(s), supported by an appropriate level of field documentation.*

The US Fish & Wildlife 2011 report, Status and Trends of Wetlands in the Conterminus United States 2004-2009, indicates that while there have been some gains in wetland conservation in recent years across the country, cumulative effects of losses and reductions in wetland extent may limit opportunities for wetland reestablishment and watershed rehabilitation. While the report doesn't provide a report for each state, it would be reasonable to assume that in a state like Ohio where 90% of its original wetlands have been lost, the national trends apply. The report concludes that because wetland abundance and distribution affect biodiversity, mitigation could improve ecological processes if wetland type and geospatial interspersion were taken into consideration. The report does not address wetland condition or quality but states that the U.S. Environmental Protection Agency (EPA), in collaboration with other state and federal agencies will conduct the first-ever National Wetland Condition Assessment (NWCA) to be completed by 2013. The NWCA will characterize wetland condition nationwide for different wetland types and with the status and trends report will provide national information on wetland quantity and quality.

The Ohio EPA recently released its draft Ohio 2012 Integrated Report on water quality, http://www.epa.ohio.gov/dsw/tmdl/2012IntReport/index.aspx . This report summarizes information about the current condition of Ohio's aquatic resources, recent monitoring data, and considerations for future monitoring and assessments. Ohio's rich water resources support a diverse and strong economy based in manufacturing, agriculture, and recreation, as well as the emerging energy industry associated with oil and gas production in the region of Utica shale deposits. With Lake Erie to the north and the Ohio River to the south, and many miles of streams and rivers that drain the land between them, there is an abundance of water to meet the daily needs for maintaining a high quality of life for Ohio residents.

The Ohio EPA is recognized as a nationwide leader for the methods it has developed to assess water quality. In particular, in addition to considering chemical pollution, Ohio EPA assesses biological integrity and habitat, and uses the combined measures to assess the progress with which the state's waters are meeting goals outlined in the Clean Water Act. These assessments allow for an understanding of current conditions and the identification of specific needs for improving water quality. The 2012 Integrated Report outlines recent monitoring results that indicate, while some Ohio waterways are impaired and not in full attainment of the water quality goals, water quality continues to improve statewide.

Ohio's large rivers (those that drain more than 500 square miles) show the most improvement with 89% of the large rivers meeting water quality standards today compared to 62% in the 1990s. Overall, smaller watersheds show increases in water quality, although at lower levels than large rivers. In general, lower water quality is typically associated with smaller drainage areas or streams. The report also states that most water quality impairments are related to modifications in the landscape that result from various land use practices. The report goes on to recommend that, in addition to managing land use more effectively, restoring and protecting natural stream function is critical to improving Ohio's surface water quality and will require a collaborative effort. This suggests that the TNC-Ohio ILF Program could be an effective

mechanism for improving water quality in impaired watersheds. Additional information can be found on the Ohio EPA's Division of Surface Water web site http://www.epa.ohio.gov/dsw and related links.

## *Element 5. A statement of aquatic resource goals and objectives for each service area, including a description of the general amounts, types and locations of aquatic resources the program will seek to provide.*

In keeping with the Guidelines for Wetland Mitigation Banking in Ohio, ILF stream and wetland mitigation sites will contain features that make each site conducive to the development or restoration of high quality streams and wetlands that:

- replace the desired type of wetlands (typically the same as what is being lost)
- provide multiple functions
- are appropriate for the landscape
- are compatible with surrounding land use
- can be managed in a relatively easy and sustainable manner
- are ecologically of the highest quality achievable and compatible with current and historic site conditions

In determining appropriate sites for mitigation, priority will be placed on locating projects within the Service Areas following the implementation guidelines in Tables 1 & 2, and, ideally, in close proximity to high quality wetlands and streams identified through The Nature Conservancy's ecoregional assessments. These areas were identified based on the presence of rare or native species and natural communities, the landscape context for long term viability, and overall natural condition. Where mitigation projects can preserve, enhance or restore additional wetland acreage or stream segments within or adjacent to these areas, preference may be given for those projects, assuming that they contain the features stated in the list above.

Goals and objectives for aquatic resources in this program will be primarily determined by the impacts that will need to be mitigated in each service area and replacing those resources accordingly. In addition, an objective for wetland resources will be to mitigate for the same wetland type and size in an effort to achieve no net wetland loss, or to gain wetland acreage, and to restore some of the wetland diversity that Ohio has lost over time.

Goals and objectives for streams in each service area will also be determined using the completed TMDL (Total Maximum Daily Load) implementation plans for guidance. The objective of the TMDL process is to systematically identify impaired or threatened waterbodies and the pollutant(s) causing the impairment and ultimately establish a scientifically based strategy – a TMDL – for correcting the impairment or eliminating the threat and restoring the waterbody.

Through the TMDL process the Ohio EPA establishes restoration targets that will result in attainment of water quality standards for Ohio watersheds, and develops strategies to achieve those targets. A restoration target is a quantitative or qualitative determination of the changes needed to reduce a stress in an aquatic system to meet and/or maintain water quality standards. Actions identified in the TMDL implementation plan will be incorporated into the TNC-Ohio ILF Program as appropriate to meet mitigation requirements for each project. All types of mitigation - restoration, establishment, enhancement, and/or preservation - will be offered as appropriate in all watersheds to meet mitigation requirements.

The TMDL process provides a road map for the specific implementation of a watershed-based delivery of Ohio EPA resources aimed at eliminating impairments to Ohio waters. Additional information on the TMDL plans, assessment unit summaries, and stream mitigation protocol can be accessed at the Ohio EPA web sites below.

http://www.epa.ohio.gov/portals/35/tmdl/FinalTMDLReport.pdf

http://www.epa.ohio.gov/dsw/tmdl/index.aspx

http://www.epa.ohio.gov/dsw/tmdl/2012IntReport/2012IRAssessmentSummaries.aspx

http://epa.ohio.gov/portals/35/rules/DraftStreamMitigationProtocol_presentation_Anderson_050311.pdf
*(Ohio's draft stream mitigation protocols will be used until a final version has been approved.)*

## *Element 6. A prioritization strategy for selecting and implementing compensatory mitigation activities.*

The proposed Service Areas in which the TNC-Ohio ILF Program would be authorized to provide compensatory mitigation required by Corps and Ohio EPA permits are whole or partial watersheds or geographic areas defined by TNC as Primary and Secondary Service Areas. Service Areas may be further refined and possibly limited in project-specific Site Development Plans as recommended and approved by the appropriate USACE district engineer. These Service Areas, with emphasis on the larger Secondary Service Areas, are further described and illustrated below in Part II of the Draft Compensation Planning Framework.

Primary Service Areas are defined by the Fourth Level (8-digit) hydrologic unit code ("HUC") watersheds, where mitigation would take place for impacts to higher quality wetlands and streams.

Secondary Service Areas are defined by the larger Ecological Drainage Units (EDUs), which consider watershed boundaries and ecological similarities. The Secondary Service Areas are similar in geographic boundaries to 6-digit HUCs, although some modifications were made to group watersheds ecologically and to correspond to US ACE district boundaries (Figure 3). These larger service areas would serve to focus mitigation for smaller impacts to lower quality aquatic resources in a way that maximizes the aquatic and larger ecological benefit of the mitigation.

Specifically, where there are impacts to Category 1 wetlands of any size, or 0.5 acres and less of impacts to isolated Category 2 wetlands, mitigation may be implemented within the Primary Service Area or the larger Secondary Service Area (EDU) within which the impact was located. In all cases, each Secondary Service Area is located wholly within, and is smaller than, the USACE District. These Secondary Service Areas are suggested as an alternative because their definition is based on ecological and watershed factors, or a watershed-based approach. They also keep the mitigation closer to the impacts than is suggested by the Guidelines for Wetland Mitigation Banking in Ohio. For all other wetland impacts, the 8-digit HUC (Primary Service Area) where the impact is located will be the service area. These include impacts to Category 3 Wetlands, impacts of any size to jurisdictional Category 2 wetlands, or greater than 0.5 acres of impact to isolated Category 2 wetlands (Table 1).

For streams, a parallel approach will be taken where the impacts to designated limited resource water, limited warmwater habitat, modified warmwater habitat, class I and class II primary headwater habitat, and general warmwater habitat may be implemented within the Primary Service Area or the larger Secondary Service Area (EDU) within which the impact was located. All other stream impacts will be mitigated within the Primary Service Area (8-digit HUC) where the impact occurred (Table 2).

**Table 1. Eligible Mitigation Service Areas for Wetland Impacts**

| Impacted Resource Type | Primary Service Area | Secondary Service Area |
|---|---|---|
| General Quality Wetland | | |
| Category 1 Wetlands of any type or size | X | X |
| Isolated Category 2 Wetlands of 0.5 acres and less | X | X |
| Higher Quality Wetland | | |
| Isolated Category 2 Wetlands of more than 0.5 acres | X | |
| Jurisdictional Category 2 Wetlands of any size | X | |
| Category 3 Wetlands of any Type or Size | X | |

**Table 2. Eligible Mitigation Service Areas for Stream Impacts**

| Impacted Resource Type | Primary Service Area | Secondary Service Area |
|---|---|---|
| General Quality Water | | |
| Limited Resource Water | X | X |
| Limited Warmwater Habitat | X | X |
| Modified Warmwater Habitat | X | X |
| Class I and Class II Primary Headwater Habitat | X | X |
| Warmwater Habitat* | X | X |
| Higher Quality Water | | |
| Class III Primary Headwater Habitat | X | |
| Exceptional Warmwater Habitat | X | |
| Coldwater Habitat | X | |
| Seasonal Salmonid Habitat | X | |
| Antidegradation Category of Superior High Quality Water | X | |
| Antidegradation Category of Outstanding National Resource Water | X | |
| Antidegradation Category of Outstanding State water | X | |
| State Wild and Scenic rivers | X | |
| National Wild and Scenic Rivers | X | |
| Water Bodies Which Harbor Federally Listed Threatened and/or Endangered Species | X | |

*Except for warmwater habitat that is also a State Wild and Scenic River, a National Wild and Scenic River, or that harbors federally listed threatened and/or endangered species.

Note: These categories draw from the OAC 3745-1-07 list of Beneficial Stream Uses as defined by Ohio EPA, Ohio EPA's March 30, 2012 submission to the USACE regarding 2012 Nationwide Permit Reauthorization, and anti-degradation categories.

If, within any 8-digit HUC, the cumulative amount of impacts to be mitigated through the ILF Program in any given year are less than three acres of wetlands or 2,000 linear feet of stream, or no acceptable Mitigation Project opportunities are found, TNC may submit a proposal to satisfy the mitigation obligation liability through projects in an adjacent 8-digit HUC inside the same Secondary Service Area, through the use of Released Credits or Bank Credits from within the same Secondary Service Area, use of preservation in the same 8-digit HUC or Secondary Service Area, deferring the mitigation liability to the next year, or other mitigation options as approved by the appropriate USACE district engineer.

## OTHER PRIORITY SETTING FACTORS TO BE CONSIDERED

**Distribution & Abundance:** Capture multiple occurrences of each aquatic system within each Service Area to ensure representative conservation of biodiversity and habitat types by using all available options to meet mitigation requirements.

**Design:** Create a network of hydrologically connected aquatic systems to ensure representative and functional conservation areas within the service area and across the state.

**Landscape context factors:** Maximize potential for success for each mitigation option by considering the surrounding land use patterns, local ecological processes and environmental regimes that establish and maintain the aquatic system (e.g. hydrologic flow, seasonal hydroperiods, presence of invasive species, climate regimes).

**Connectivity:** Include such factors as species having access to habitats/resources needed for life cycle completion, proximity to other protected ecological communities and systems, and the ability of aquatic species to adapt to environmental change through dispersal, migration, or re-colonization.

By consolidating the mitigation requirements of multiple small projects in selective situations, TNC will be able to use the TNC-Ohio ILF Program to implement large-scale watershed efforts that restore, enhance, and protect water quality and ecosystem functionality.

## *Element 7. An explanation of how any preservation objectives identified in Element 5 and addressed in the prioritization strategy in Element 6 satisfy the criteria for use of preservation.*

The 2008 rule (73 FR 19670, Apr. 10, 2008) requires that goal setting for and prioritization of aquatic resources as required by Elements 5 and 6 above also satisfy the criteria for use of preservation. In the rule, preservation may be used to provide compensatory mitigation for activities when the following criteria [§332.3(h)] are met:

(i) The resources to be preserved provide important physical, chemical, or biological functions for the watershed;
(ii) The resources to be preserved contribute significantly to the ecological sustainability of the watershed. In determining the contribution of those resources to the ecological sustainability of the watershed, the district engineer must use appropriate quantitative assessment tools, where available;
(iii) Preservation is determined by the district engineer to be appropriate and practicable;
(iv) The resources are under threat of destruction or adverse modifications; and
(v) The preserved site will be permanently protected through an appropriate real estate or other legal instrument (e.g., easement, title transfer to state resource agency or land trust).

Where preservation is used to provide compensatory mitigation, to the extent appropriate and practicable the preservation shall be done in conjunction with aquatic resource restoration, establishment, and/or enhancement activities. This requirement may be waived by the district engineer where preservation has been identified as a high priority using a watershed approach described in paragraph (c) of this section (§332.3), but compensation ratios shall be higher.

TNC's approach to setting goals for preservation and the criteria used for selecting and prioritizing aquatic systems and occurrences of species and communities is designed with the explicit purpose of capturing critical environmental gradients (changes in abiotic factors or biotic interactions over space and time that are linked to connectivity and natural disturbance), ecological processes, and genetic diversity to ensure the persistence and sustainability of viable biological diversity, ecological systems and functional landscapes in the Service Area.

Conservation actions at those sites are designed to abate threats and maintain and restore the viability, function and sustainability of the aquatic systems and diversity with the intent of providing permanent protection of the resource. The design principles discussed in this document are wholly consistent with the criteria articulated in the 2008 rule.

## *Element 8. A description of any public and private stakeholder involvement in plan development and implementation, including coordination with federal, state, tribal and local aquatic resource management and regulatory authorities.*

TNC works closely with public and private partners and experts to develop a conservation vision and set priorities through ecoregional assessments and to design and implement effective conservation strategies at multiple scales to conserve biological diversity. We depend on a wide diversity of partners from state and federal agencies, non-governmental organizations, industry, and academic institutions to inform and influence our work while supporting the alliances necessary to achieve meaningful conservation results.

For example, the proposed TNC-Ohio ILF Program is an exemplary partnership involving the Ohio Environmental Protection Agency, Ohio Department of Natural Resources, Ohio Department of Transportation, US Army Corps of Engineers, US Fish & Wildlife Service, and The Nature Conservancy by which multiple conservation objectives are accomplished through collaborative action.

Moreover, we have involved partners in our conservation action planning efforts in Ohio in which we identify conservation targets, threats to targets, develop measurable conservation objectives and design conservation actions to abate threats and restore viability to targets. Relying on the expertise of agency and academic scientists is crucial to the scientific integrity of establishing our conservation priorities.

During the course of developing this prospectus, TNC met with the Interagency Review Team to discuss this proposed approach to an Ohio In-Lieu Fee stream and wetland program and to invite preliminary feedback. In addition, TNC conducted a WebEx presentation for conservation partners for the specific purpose of getting perspective and comments from stakeholders on the draft prospectus for this Ohio Stream and Wetland In-Lieu Fee Program. Partner support and engagement in implementing mitigation projects through this program will be critical to its success.

TNC will request mitigation project proposals from qualified partners, such as public agencies or conservation NGOs that meet the criteria of the TNC-Ohio ILF Program. In practice, it is anticipated that a significant portion of the lands included in this program will be owned and managed by other organizations, with TNC in the role of seeking proposals, selecting those to be considered by the IRT, and playing a support role to the lead organization for the specific project.

## *Element 9. A description of the long-term protection and management strategies for activities conducted by the in-lieu fee program sponsor.*

The Nature Conservancy implements a variety of restoration and conservation strategies at multiple scales across the state and region to conserve biological diversity in priority conservation areas. Strategies are developed with partners and designed to abate a range of threats at the scales at which they occur including global climate change, habitat loss and fragmentation, invasive species, nutrient and sediment runoff, and altered hydrological regimes of streams and wetlands. Stewardship strategies include wetland and stream restoration, the use of prescribed fire, invasive species control, and rare species recovery efforts. In general, strategies are designed to achieve clearly articulated, measurable conservation objectives.

As the sponsor of the Ohio Stream and Wetland In-Lieu Fee Program, TNC will evaluate proposed projects based on the qualifications of the project applicant to successfully secure and implement the long term protection and restoration goals of the project. Project requirements will include a long term management and monitoring plan that will provide quantitative results for evaluating whether the project meets the mitigation goals and the standards developed by the US Army Corps of Engineers and Ohio Environmental Protection Agency.

Legal mechanisms will be established for long term protection and management of the mitigation site. Potential long term site managers include public agencies, land trusts, park districts, watershed groups and other conservation entities with the capacity to follow through on the long term protection, monitoring, and management of the mitigation site. Long term protection mechanisms could include conservation easements or restrictive covenants held by a third party, deed restrictions, or other legal mechanisms to ensure land protection and fulfillment of the mitigation requirements.

## *Element 10. A strategy for periodic evaluation and reporting on the progress of the program in achieving the goals and objectives above, including a process for revising the planning framework as necessary.*

The business of TNC is to implement conservation strategies that are intended to maintain or restore biodiversity and ecosystem processes for the long term. To be successful, it is necessary to know whether the trends in the viability and integrity of biodiversity, the status of threats, and the ecological management of conservation lands and waters are heading in a positive direction, holding steady, or declining. Moreover, it is essential to know whether our strategies are having the intended outcomes and fulfilling measurable conservation objectives. A major component of *Conservation by Design* is measuring results and making changes as necessary to achieve those results. This is the cornerstone of all good adaptive management. TNC's organizational commitment to measuring results is a high priority.

A great deal of monitoring work is already being done by state agencies and academic institutions in Ohio's wetlands, streams, and other aquatic habitats and waterways. Examples include Ohio EPA's water quality assessment and biological monitoring methodology (e.g. ORAM, FQAI, VIBI, AmphIBI, QHEI) and ODNR's stream monitoring and rare species assessments. TNC strategically uses and tracks this type of data to better inform conservation strategies now and into the future.

In addition, TNC seeks to measure whether individual strategies and associated actions taken within a conservation project are having their intended effect on abating threats and restoring ecological targets. These measures of strategy effectiveness are used to evaluate progress in achieving desired outcomes and results that stem from implementing strategies, by tracking progress toward measurable objectives. This approach will be required of all mitigation projects submitted for consideration to the IRT through the TNC-Ohio ILF Program.

TNC will submit an annual report on its TNC-Ohio ILF Mitigation Program to the IRT providing an opportunity to assess the program and recommend changes to improve implementation and ecological outcomes of the mitigation projects and overall administration of the program.

# CONCLUSION

The Nature Conservancy will utilize the locations identified on the following pages (Part II) as priority areas for siting mitigation projects. As necessary, secondary locations may be identified when mitigation needs exist and projects cannot be implemented within the first priority locations, or where additional information suggests a more suitable site location.

This section of the prospectus addresses the ways in which TNC's *Conservation by Design* approach including ecoregional assessments and conservation action plans satisfy the elements required by the compensation planning framework rule required for in-lieu fee mitigation programs.

*Conservation by Design* provides an integrated approach that can be used in a comprehensive statewide mitigation program to establish conservation goals and priorities, guide actions, and direct resources to gain the greatest ecological results from mitigation projects. It is an adaptive approach that can operate at multiple scales, from local to global, and has been successfully employed in diverse geographic and cultural settings. It is a highly effective method "to select, secure, and implement aquatic resource restoration, establishment, enhancement, and/or preservation activities" as required by the 2008 rule for compensatory mitigation.

Many of the concepts and methods of *Conservation by Design* have been incorporated into the *Open Standards for the Practice of Conservation* Version 2.0 developed by the Conservation Measures Partnership which is a partnership of conservation non-governmental organizations, including The Nature Conservancy, that seek better ways to design, manage, and measure the impacts of their conservation actions. The *Open Standards* represent the collective experience of its members in conservation project design, management, and monitoring and, as such, provides the steps and general guidance necessary for the successful implementation of conservation projects, including mitigation.

The *Open Standards for the Practice of Conservation* can be found at http://www.conservationmeasures.org/CMP/

Moreover, the methods and tools associated with *Conservation by Design* are available to the public through TNC's *Conservation by Design* Gateway website at http://www.conservationgateway.org/

The *Conservation by Design* Gateway is a workspace for the global conservation community to find and share guidance, tools and resources supporting *Conservation by Design* or the process of setting goals, developing strategies, implementation and measuring results for biodiversity conservation. Industry, state agencies and other non-profit conservation groups can use and adapt this approach to satisfy mitigation requirements, resulting in more strategic project selection and success in conserving Ohio's aquatic resources.

## PART II. OVERVIEW OF CONSERVATION PRIORITIES IN PRIMARY AND SECONDARY SERVICE AREAS

# Service Areas and U.S. Army Corps of Engineers Districts


PRIMARY SERVICE AREAS (8-DIGIT HUC)

The Primary Service Areas have been defined using the Ohio HUC-8 boundaries.

SECONDARY SERVICE AREAS (EDU) – Western Lake Erie; Southern Lake Erie, Great Miami/Little Miami; Scioto Basin; Unglaciated Ohio River Tributaries-West; Unglaciated Ohio River Tributaries-East; Southern Allegheny Plateau.

The Secondary Service Areas (EDUs) have been defined by incorporating the Ohio ecoregion boundaries and descriptions as defined by Omernik (1987, 1995) with Ecological Drainage Unit boundaries described below. More complete descriptions of the ecoregion characteristics can be found on the poster-sized map, *Ecoregions of Indiana and Ohio* (Woods et al, 1998).

**Ecoregions** are areas with similar ecosystems and patterns of biotic and abiotic features such as geology, physiography, vegetation, soils, wildlife, hydrology, and climate. They can be used as a spatial framework for developing plans, assessments, management, and monitoring. They are relevant for taking an integrated approach to ecosystem management and natural resource conservation.

**Ecological Drainage Units (EDUs)** are groups of watersheds (8-digit hydrologic unit codes [HUCs] as defined by USGS) that share ecological and biological characteristics. EDUs typically contain sets of aquatic system types with similar patterns of drainage density, gradient, hydrologic characteristics, and connectivity. EDUs provide a stratification scheme to identify environmental gradients. EDUs are also useful as a framework for planning that allows for evaluation of patterns of aquatic community diversity and for setting conservation goals.

Highlighted on the maps below are general locations identified as conservation priority sites within each service area. TNC establishes conservation priorities in places with high biodiversity that are most in need of conservation action or promise the greatest conservation return on investment. Conservation priority sites are identified by TNC and its conservation partners through ecoregional assessments using data on the distribution and status of biodiversity, habitat condition, current and future threats and the socio-political conditions that influence conservation success within those ecoregions.

These data allow us to set long-term conservation goals for conservation targets — ecosystems, natural communities and imperiled or declining species representative of an ecoregion, and to establish protocol for resource allocation. While some targets may be in excellent natural condition at a given site with a high probability of long term viability, others may benefit from restoration or by having additional buffer lands from the surrounding landscape brought into conservation ownership. These situations offer great potential for future mitigation project sites.

**Examples of aquatic resources identified as conservation priority sites within service areas:**

1. Category 3 wetlands;
2. Streams with aquatic life use designation of exceptional warmwater habitat, cold water habitat, seasonal salmonid or any equivalent designation and/or performance;
3. Streams with antidegradation category of superior high quality water, outstanding national resource water or outstanding state water;
4. State wild and scenic rivers;
5. National wild and scenic rivers;
6. General high quality waters which harbor federal and/or state listed threatened and/or endangered mussel species;
7. Class III primary headwater habitat streams.

All of the conservation priority sites identified in this prospectus signify The Nature Conservancy's attempt to identify the best examples of aquatic biodiversity across Ohio. These sites should serve as a starting point for selecting areas where mitigation projects through an Ohio In-Lieu Fee Mitigation Program might be most appropriately located to achieve maximum success in meeting the mitigation requirements. The plan presents a framework for thinking about conservation and restoration of aquatic systems, particularly in a landscape with heavily fragmented and disconnected aquatic systems.

## WESTERN LAKE ERIE

### A. DESCRIPTION

*Ecoregions: Huron-Erie Lake Plains (57 a, b, c, d); Eastern Corn Belt Plains (55a); Erie-Ontario Drift and Lake Plain (61a)*

The Huron-Erie Lake Plains ecoregion is a broad, fertile, flat plain with relict sand dunes, beach ridges and end moraines. Originally, soil drainage was poor and wetland forests dominated. Much of the area has been cleared and drained for agriculture and urban land uses. Stream habitat and quality have been degraded by this activity. Oak savanna is commonly found, but restricted to the sandy dunes and beach ridges.

The Eastern Corn Belt Plains section is rolling till plain with local end moraines. It was originally more forested with beech and elm-ash forests. Much of it has been drained for agriculture and its low gradient streams are not extremely rich in fish communities.

A small portion of the Erie/Ontario Drift and Lake Plain occurs in the eastern end of this service area. Fairly level lacustrine deposits with beach ridges and swales are found here. Land use is agriculture, industrial and urban development. The area's proximity to the lake moderates its weather, extending the growing season but also increasing winter snowfall.

Major stream systems include the Maumee River with its many tributaries and the Sandusky River. All streams in this service area flow into western Lake Erie.

### B. CONSERVATION PRIORITY SITES

**WETLANDS**

1. Blakeslee Virginia Mallow
2. Dietrich Woods
3. DuPont Marsh
4. Erie Marsh
5. Goll Woods
6. Killdeer Plains
7. Marblehead
8. Marie DeLarme Creek Woods
9. Mentor Marsh and Mentor Headlands
10. Oak Openings
11. Resthaven Wildlife Area
12. Sheldon's Marsh
13. Springville Marsh
14. State Line Woods/Mud Lake Bog
15. Western Lake Erie Islands and Reefs
16. Western Lake Erie Marshes/Cedar Point National Wildlife Refuge

**STREAMS**

1. Blanchard River
2. Huron River
3. Lower Vermillion River
4. Maumee River
5. Old Woman Creek
6. Portage River
7. Sandusky Bay
8. Sandusky River
9. St. Mary's River Wetlands
10. Upper Auglaize River
11. Upper St. Joseph River

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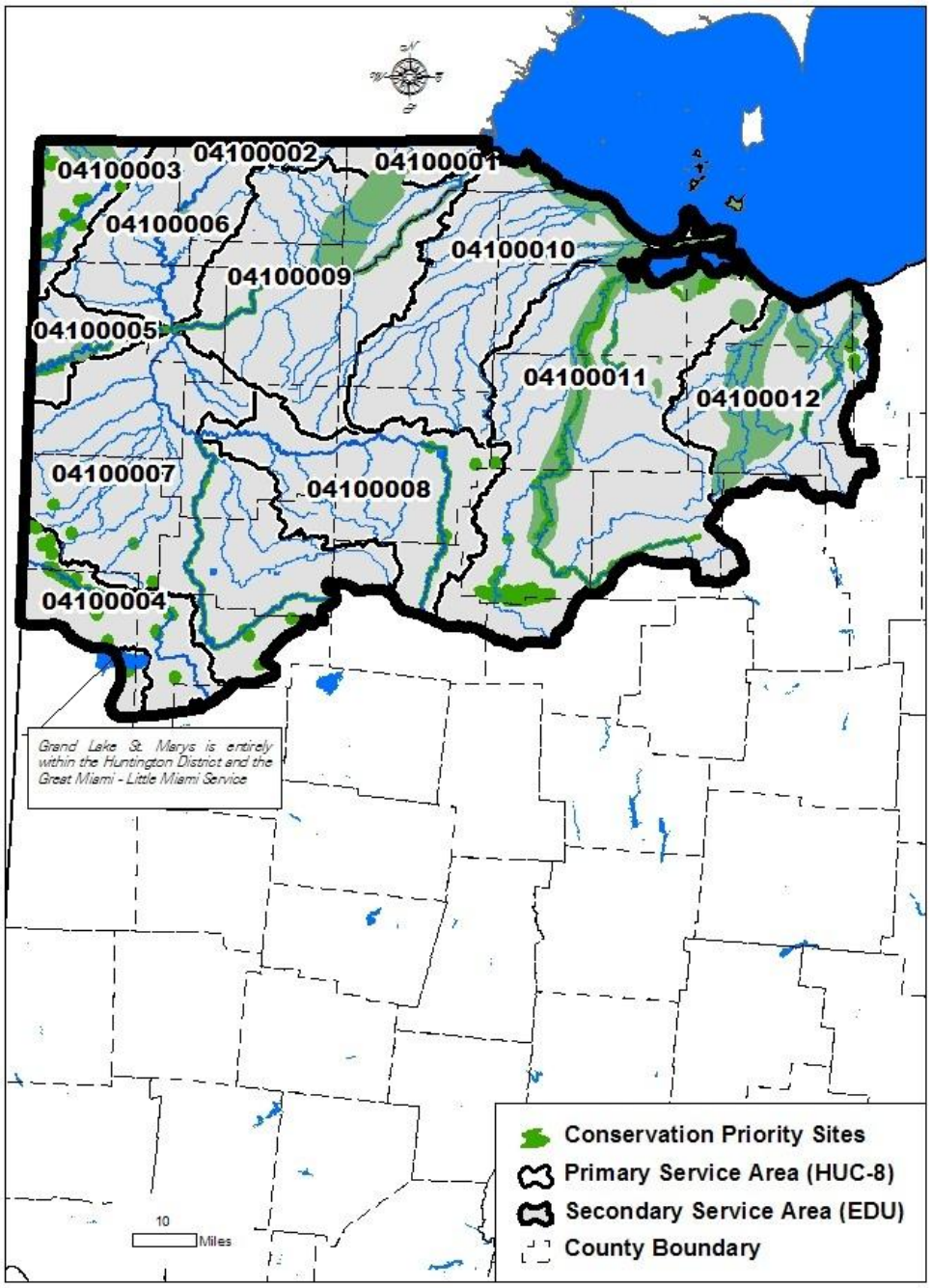
## Western Lake Erie Service Area



## SOUTHERN LAKE ERIE

### A. DESCRIPTION

*Ecoregions: Erie-Ontario Drift and Lake Plain (61a, b, c, d, e)*

This region contains lacustrine deposits with rolling to level terrain. Glacial wetlands, lakes, and streams predominate and soil is less fertile than in other areas of glaciation. Urban development and industry is widespread in the western portion, while agriculture is more widespread in the east. Agriculture tends toward fruit and vegetables, dairy, and commercial nurseries. The growing season is extended due to lake effect in the north, but that effect diminishes further south. Lake effect winter snow increases precipitation and moisture levels in the eastern end.

Beach ridges and swale habitat are found close to the lake in the Lake Plain region. Moving inland, poor drainage leads to low-gradient streams, swampy wetlands and woodlands. Glacial wetlands or peatlands, such as sphagnum bogs, fens, and kettlehole lakes are common in the Summit Interlobate Area.

Major river systems include the Cuyahoga River and the Grand River. All streams and rivers flow into Lake Erie.

### B. CONSERVATION PRIORITY SITES

**WETLANDS**

1. Chagrin River Valley
2. Lower Cuyahoga Valley
3. Summit Kames
4. Tinkers Creek Wetlands
5. Perry Nuclear Plant-Lakeshore Metropark

**STREAMS**

1. Arcola Creek
2. Conneaut Creek
3. East Branch Black River
4. Grand River
5. Upper Cuyahoga River

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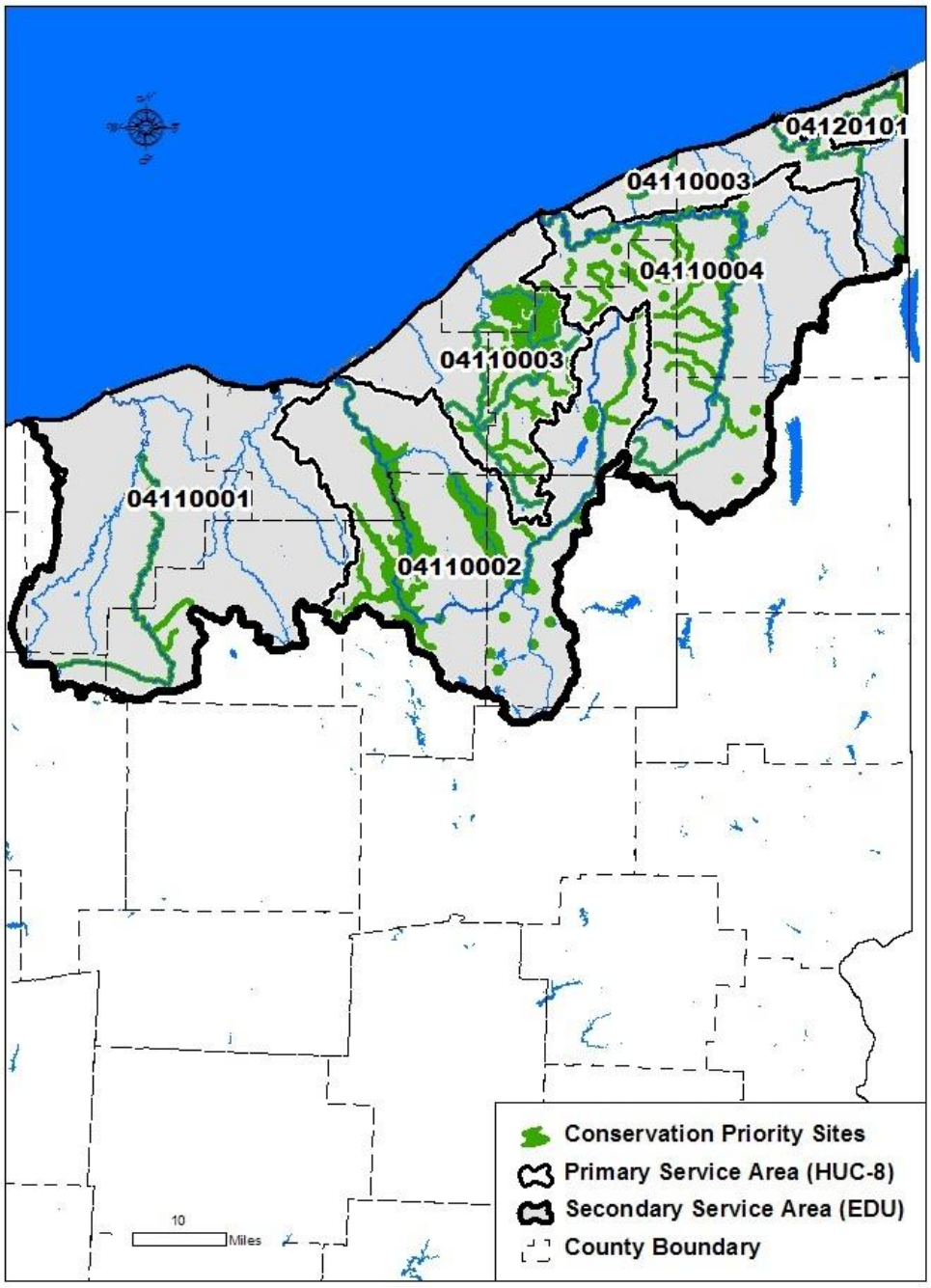
**Southern Lake Erie Service Area**



## GREAT MIAMI / LITTLE MIAMI

### A. DESCRIPTION

*Ecoregions: Eastern Corn Belt Plains (55 b, c, d, f); Interior Plateau (71 d)*

The Eastern Corn Belt is primarily rolling glaciated till plain and moraine. As its name implies this region has rich soils with extensive glacial deposits which were once heavily forested but now dominated by agricultural row crops and livestock production. There are abundant ground water resources in the Mad River and Whitewater Interlobate Areas which have distinctive cold water streams. Freshwater fens and prairies are locally abundant in association with the glacially influenced springs and seeps found here.

The Interior Plateau, primarily the Northern Bluegrass region, is represented by rolling to deeply dissected, rugged terrain with areas of karst topography. Original forest vegetation ranged from beech to oak-hickory on the well-drained exposed ridges and slopes. Farming is common on the less rugged lands, although the soils are less productive than in the Corn Belt. Woodland is more typical on the steep slopes. Urban and industrial development is common, extending out from Cincinnati and along the Ohio River.

Primary stream systems are the Great and Little Miami Rivers, Mad River, and the Stillwater River, all of which eventually drain into the Ohio River.

### B. CONSERVATION PRIORITY SITES

**WETLANDS**

1. Beavercreek Wetlands
2. Caldwell Woods
3. Clermont County Flatwoods
4. Clifton Gorge
5. Dean Culbertson Woods
6. Germantown Woods
7. Hueston Woods
8. Lewisburg Mine
9. Mad River Plains
10. Richardson Forest

**STREAMS**

1. East Fork Lake
2. East Fork Little Miami River
3. Little Miami River Mainstem
4. Macochee Creek/Mad River Headwaters
5. Spring Valley Fens/Caesar Creek
6. Stillwater River
7. Stonelick Lake
8. Twin Creek

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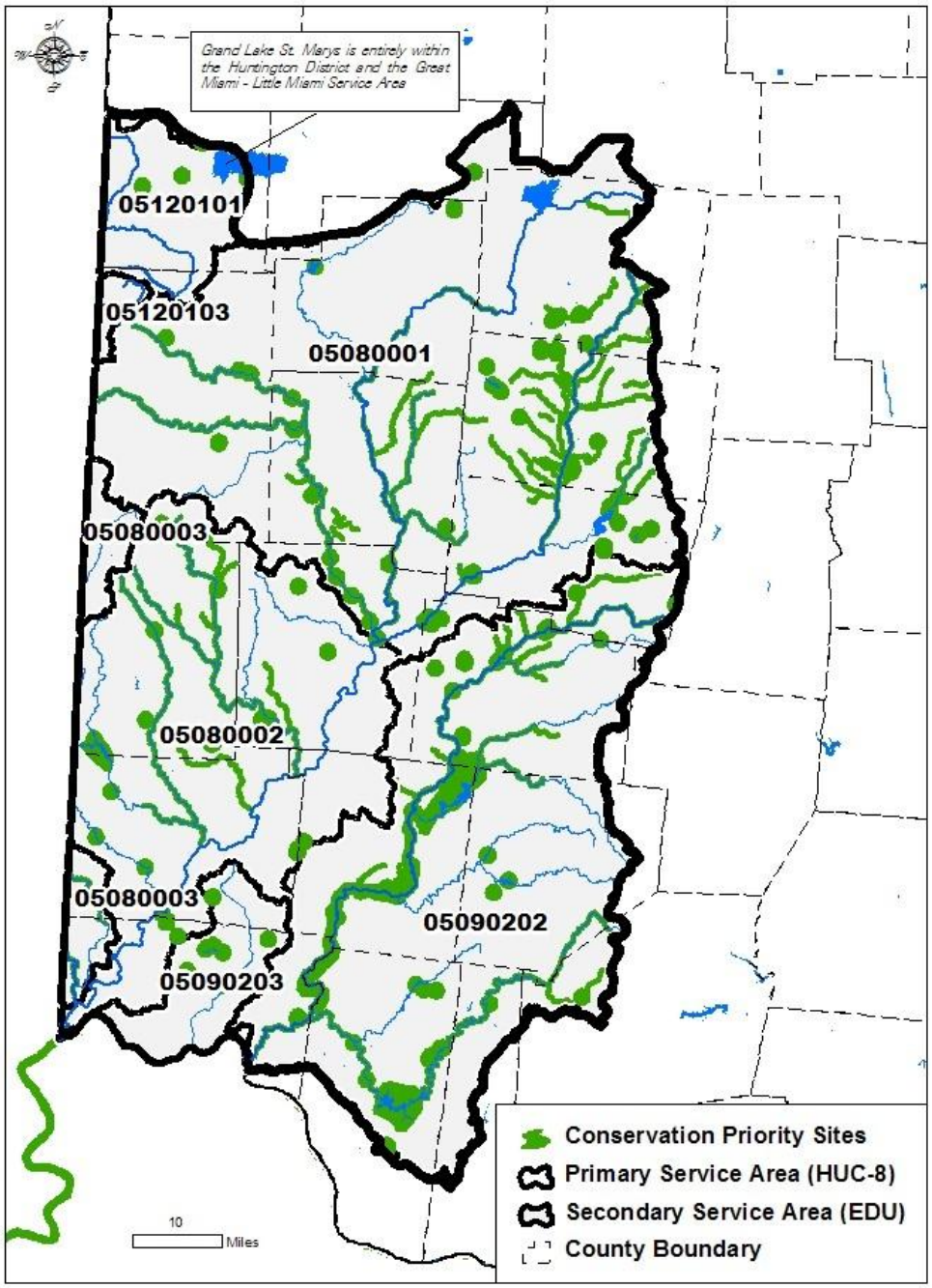
## Great Miami - Little Miami Service Area



## SCIOTO BASIN

### A. DESCRIPTION

*Ecoregions: Eastern Corn Belt Plains (55 a, b, d, e); Western Allegheny Plateau (70 d)*

The Eastern Corn Belt is characterized by rolling till plains and end moraines. Soil is well-drained and loamy, making it rich and suitable for farming. Sedimentation, nutrient runoff, and land use practices associated with extensive farming have affected water quality in this region. Forests and open woodland were once common in the landscape across the ecoregion. Prairie and oak savanna were more common in the Darby Plains due to the presence of abundant end moraines, gravel-filled preglacial valleys, and seasonally wet areas.

The Western Allegheny Plateau is hilly and wooded, more rugged compared to the till plains. The region is heavily forested for the most part. Some areas in the eastern portion have been extensively mined and are currently an area of intense focus and exploration for oil and gas development from the abundant shale deposits. The Lower Scioto Dissected Plateau region of the Scioto Basin is characterized by steep ridges and rugged terrain. Much of this terrain is still heavily wooded, although the lower lying areas are more likely to be used for farming.

Major stream systems in this service area include the highly diverse Big and Little Darby Creeks and other tributaries to the Scioto River which then flows into the Ohio River at Portsmouth.

### B. CONSERVATION PRIORITY SITES

**WETLANDS**

1. Betsch Fen
2. Edge of Appalachia
3. Gahanna Woods
4. Great Seal Woods
5. Hocking Hills
6. Lake Katherine Forest
7. Paint Creek Escarpment
8. Scioto Trail State Forest
9. Shawnee Forest
10. Tar Hollow State Forest
11. Teays Valley Wetland

**STREAMS**

1. Darby Creek
2. Lower Scioto River
3. Paint Creek
4. Salt Creek
5. Scioto Brush Creek

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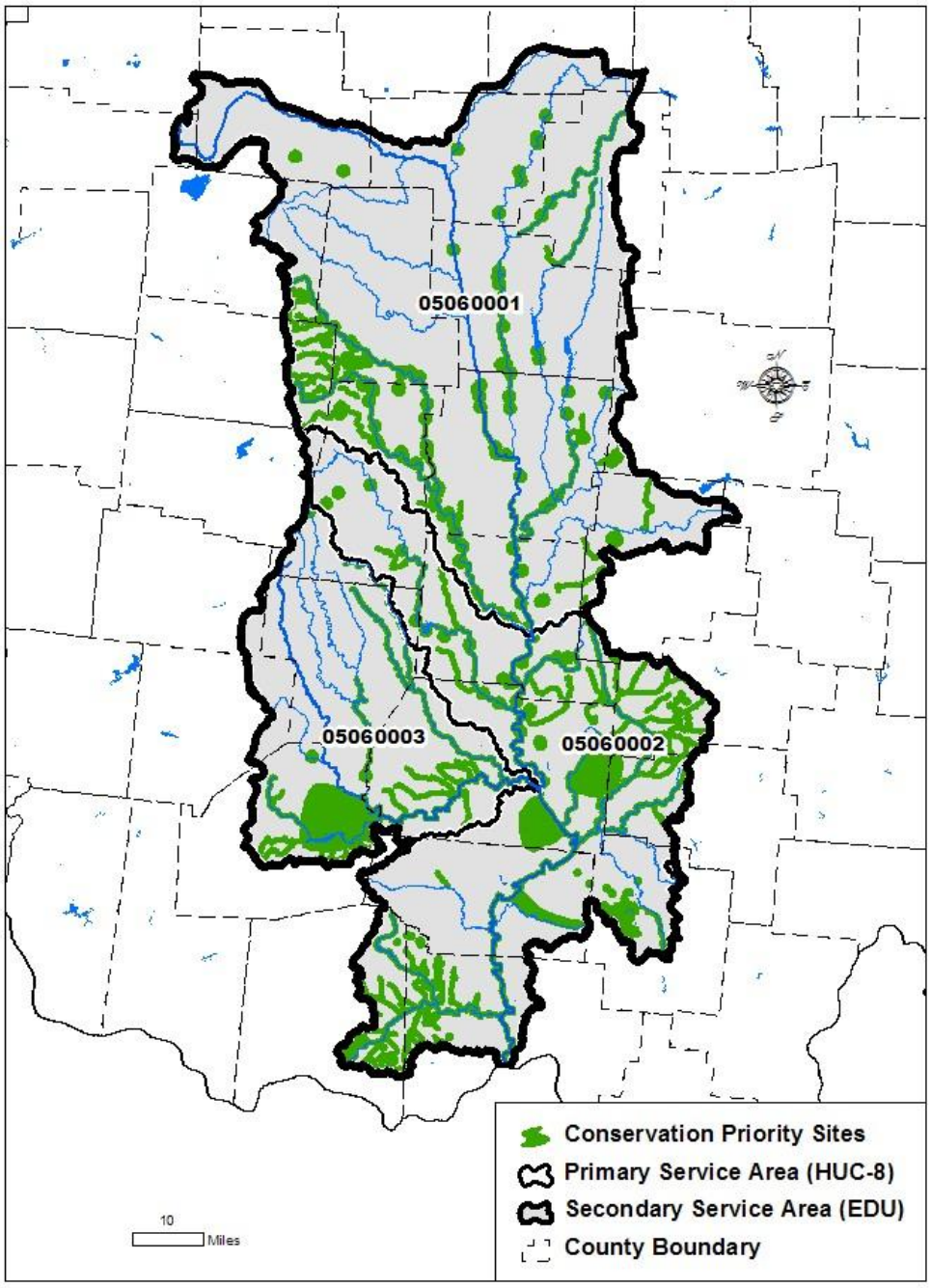
**Scioto Basin Service Area**



## UNGLACIATED OHIO RIVER TRIBUTARIES – WEST

### A. DESCRIPTION

*Ecoregions: Erie/Ontario Drift and Lake Plain (61 c, e); Western Allegheny Plateau (70 a, b, d, e, f)*

The Erie/Ontario Drift and Lake Plain ecoregion contains lacustrine deposits with rolling to level terrain. Glacial wetlands, lakes, and streams are common and soil is less fertile than in other areas of glaciation. Agriculture tends more toward fruit and vegetables, dairy, and commercial nurseries rather than row crops. The growing season is extended due to the lake effect in the north, but the lake effect diminishes further south. Portions of the region are within the "snow belt" and receive considerably more snowfall during the winter than other areas in the region.

The Drift Plain area has a rolling hilly landscape with scattered moraines and kettle lakes. The terrain is distinct from the unglaciated areas further south. The growing season is progressively shorter with increasing distance from Lake Erie. Glacial wetlands or peatlands, such as sphagnum bogs, fens, and kettlehole lakes are common in the Summit Interlobate Area. Scattered woodlands, agriculture, and quarries coincide with urban-suburban development that extends into this region.

The Western Allegheny Plateau is hilly and wooded and more rugged compared to the till plains to the west. The region remains forested in many areas where logging is an important industry, but dairy and livestock farms thrive as well. Steep hillsides with high gradient streams, as well as broad valleys with low gradient streams are common. Much of the area is underlain by shale and sandstone. Some areas in this region have been heavily mined and are currently an area of intense focus for oil and gas development from deep shale deposits.

Located within the Western Allegheny Plateau, the Muskingum River with its extensive network of tributaries flows south into the Ohio River.

### B. CONSERVATION PRIORITY SITES

**WETLANDS**

1. Brown's Lake Bog
2. Burr Oak
3. Hocking Hills
4. Kokosing Forest
5. Marietta Forest
6. Shallenberger Woods
7. Stillfork Swamp
8. Tick Ridge

**STREAMS**

1. Clear Fork Mohican River
2. Federal Creek
3. Killbuck Creek
4. Kokosing River
5. Kokosing River-N. Branch
6. Leith Run
7. Little Muskingum R./Cranenest Fork
8. Muskingum River-Lower
9. Muskingum River-Middle
10. Muskingum River- Upper
11. Wakatomika Creek
12. Walhonding River

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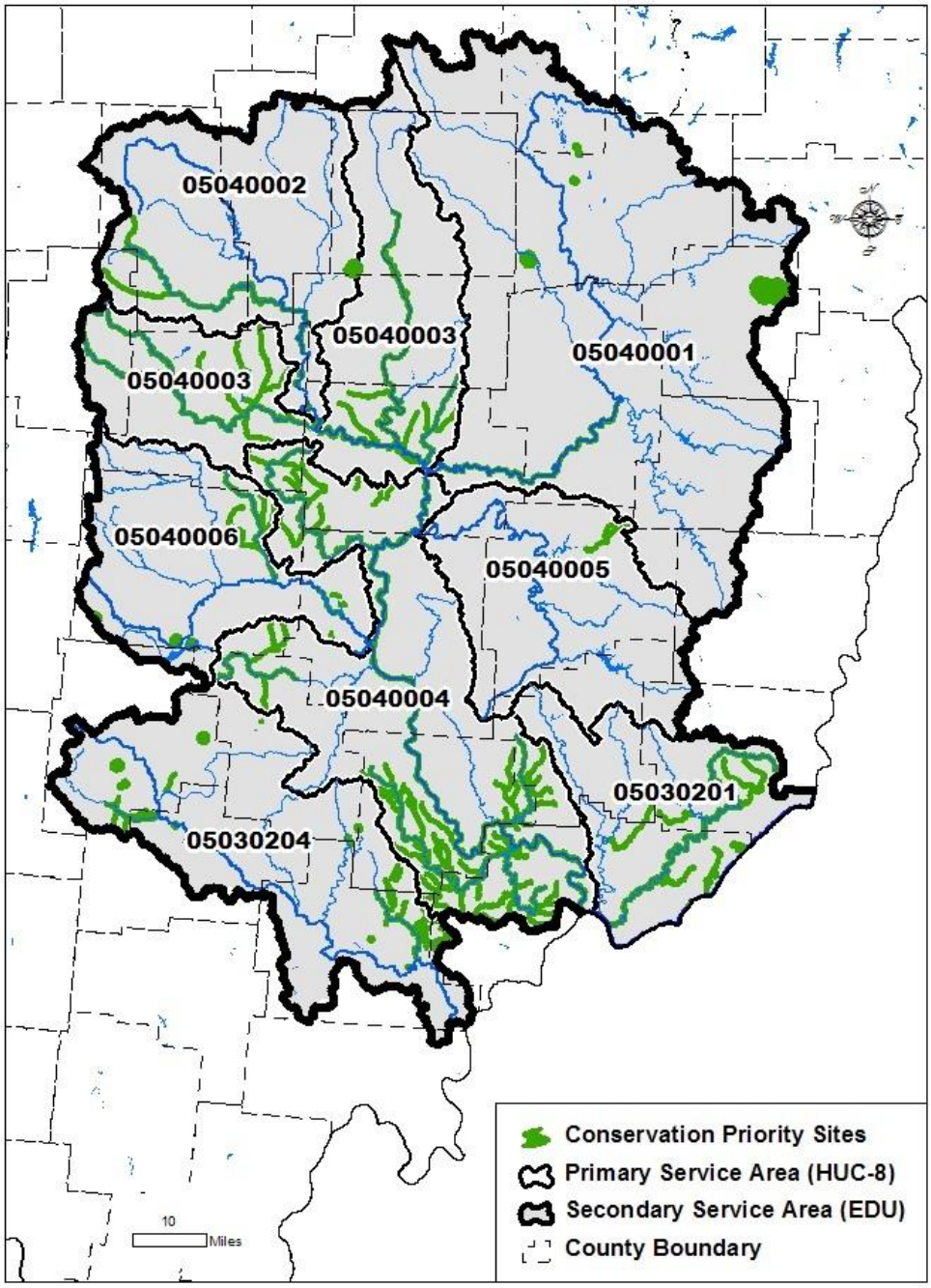
## Unglaciated Ohio River Tributaries West Service Area



## UNGLACIATED OHIO RIVER TRIBUTARIES – EAST

### A. DESCRIPTION

*Ecoregions: Western Allegheny Plateau (70 a, b, c)*

The Western Allegheny Plateau is hilly and wooded and more rugged compared to the till plains to the west. The region remains forested in many areas where logging is an important industry, but dairy and livestock farms thrive as well. Steep hillsides with high gradient streams, as well as broad valleys with low gradient streams are common. Much of the area is underlain by shale and sandstone. Some areas in this region have been heavily mined and are currently an area of intense focus for oil and gas development from deep shale deposits.

The Pittsburgh Low Plateau section is largely unglaciated with rounded, forested hills and narrow valleys. Streams in this area are predominantly high gradient with rocky substrates. Less coal mining occurred in this area than in other parts of the ecoregion.

Two notable tributaries to the Ohio River, Little Beaver Creek and Captina Creek, flow through this service area.

### B. CONSERVATION PRIORITY SITES

**WETLANDS**

1. Little Beaver Creek Forest
2. Mahoning Kames
3. Pennline Bog

**STREAMS**

1. Captina Creek
2. Little Beaver Creek
3. Mahoning River
4. Pymatuning Creek

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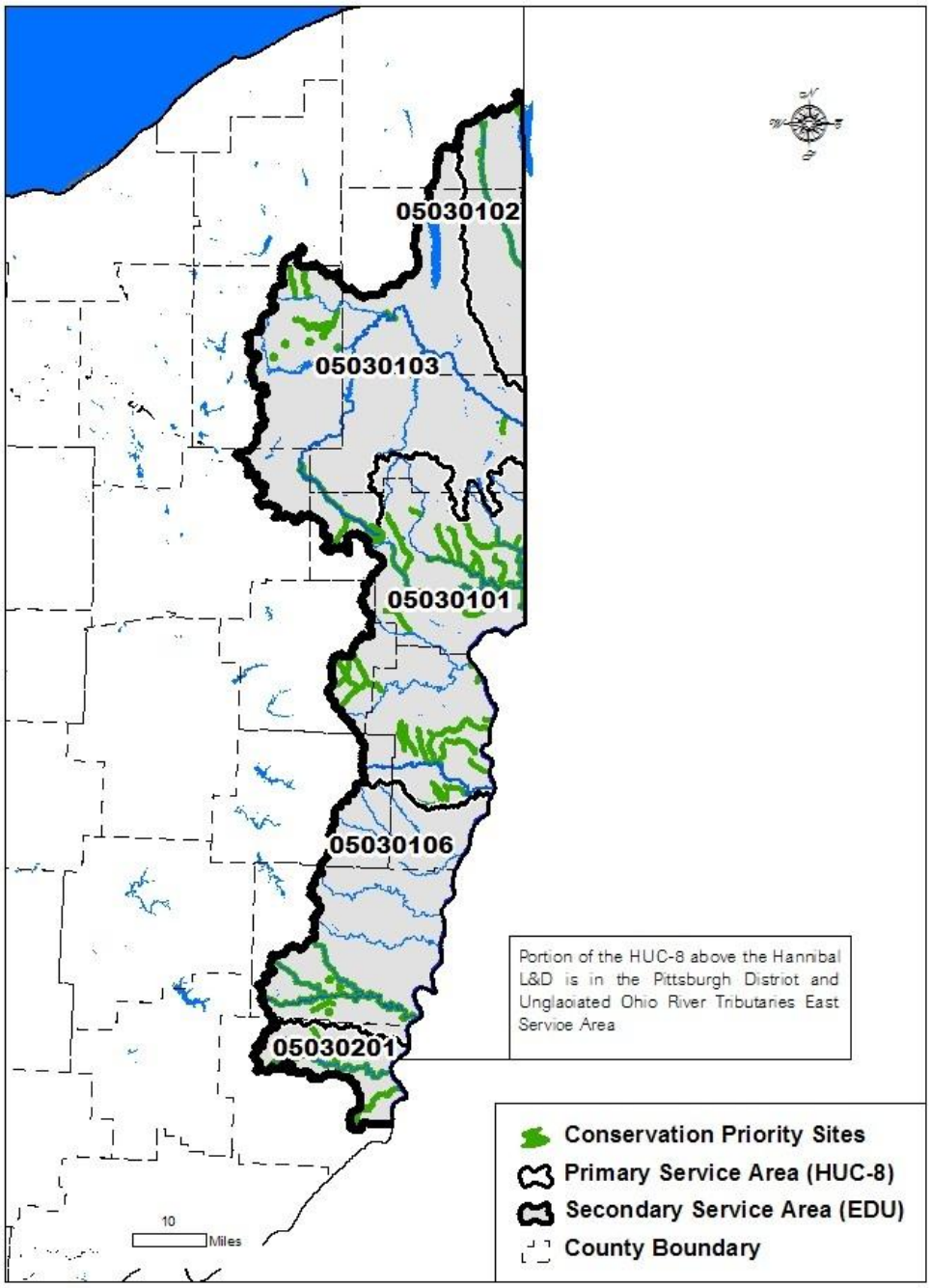
## Unglaciated Ohio River Tributaries East Service Area



## SOUTHERN ALLEGHENY PLATEAU

### A. DESCRIPTION

*Ecoregions: Eastern Corn Belt Plains (55d); Interior Plateau (71d); Western Allegheny Plateau (70 a, b, d, f)*

The Southern Allegheny Plateau is characterized by high hills, sharp ridges, and narrow valleys. An exception is the broad Teays Valley which was created by a large, preglacial river. The valley was dammed by a Pleistocene ice sheet and abandoned by the river after ice melt. Streams are numerous, and gradients vary from high gradient headwater streams to low gradient rivers flowing into the Ohio River. Bedrock consists of sandstone, siltstone, shale, limestone, and coal.

Urban and industrial development is common in this service area along the Ohio River and its tributaries. Level land has been cleared for agriculture, although the soils are less productive than in the Eastern Corn Belt. Some agricultural lands with poor soils or severe erosion have been abandoned and are undergoing succession. Oil and gas exploration and production are expanding as is the case in the Western Allegheny Plateau. Much of the land in this area is forested, characterized by mixed mesophytic forests and Appalachian oak forests. Logging is an important component of the local economy.

Ohio Brush Creek and Leading Creek are two streams that flow south through this ecoregion into the Ohio River.

### B. CONSERVATION PRIORITY SITES

**WETLANDS**

1. Brown County Flatwoods
2. Buckeye Furnace
3. Buckskin Cave
4. Chaparral Prairie/Brodt Post Oak Openings
5. Edge of Appalachia
6. Fern Cave
7. Fletcher Woods
8. Freeland Cave
9. Frost Cave
10. Lake Vesuvius Forest
11. Pike State Forest
12. Pott's Post Oak Opening
13. Shawnee Forest
14. Young's Branch

**STREAMS**

1. Little Scioto River
2. Ohio Brush Creek
3. Pine Creek
4. Symmes Creek
5. Tar Hollow State Forest
6. Teays Valley Wetlands
7. Vinton Forest
8. Zaleski Wetlands

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## Southern Allegheny Plateau Service Area

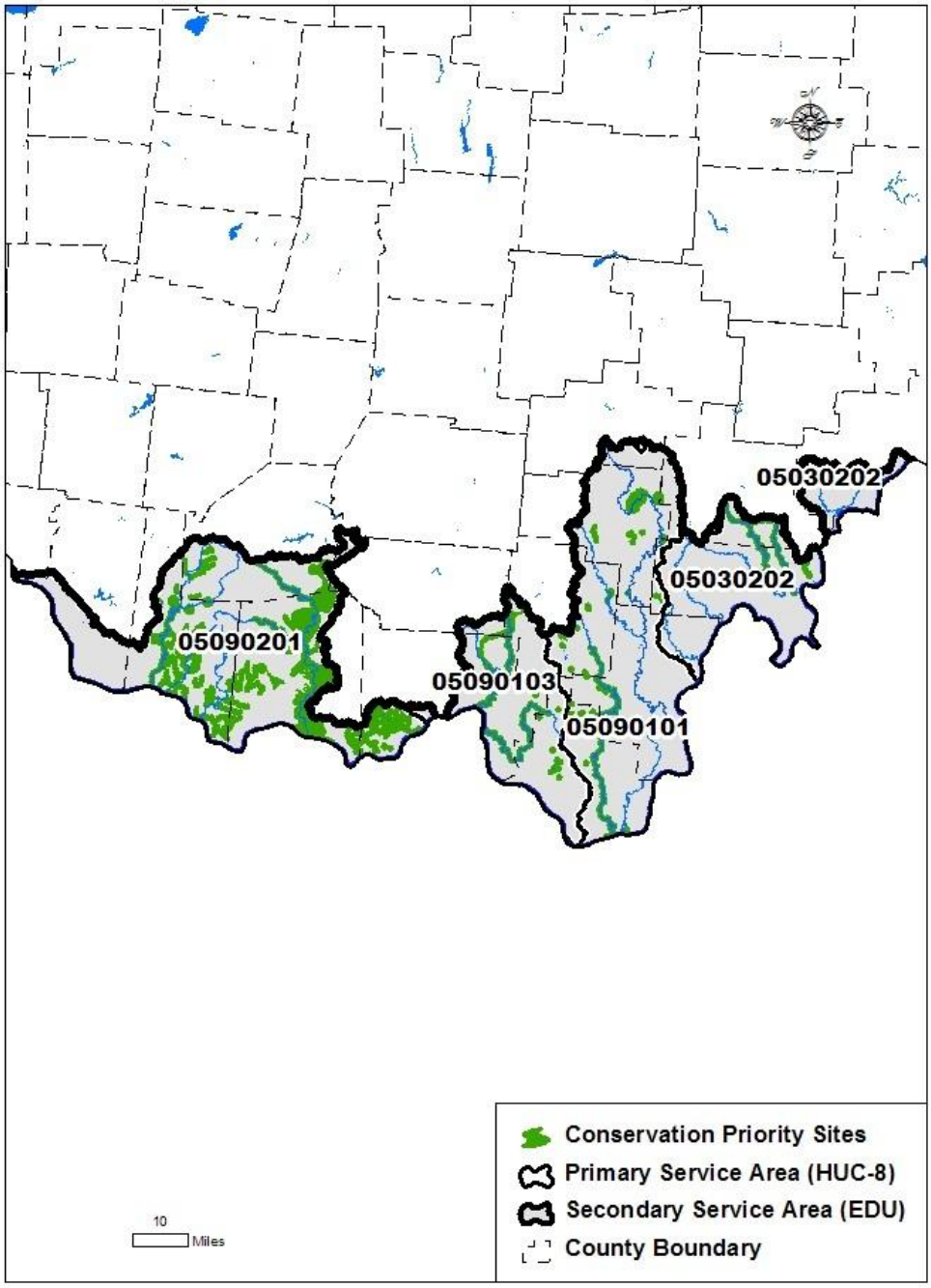


**FIGURE 1. U.S. EPA ECOREGIONS**

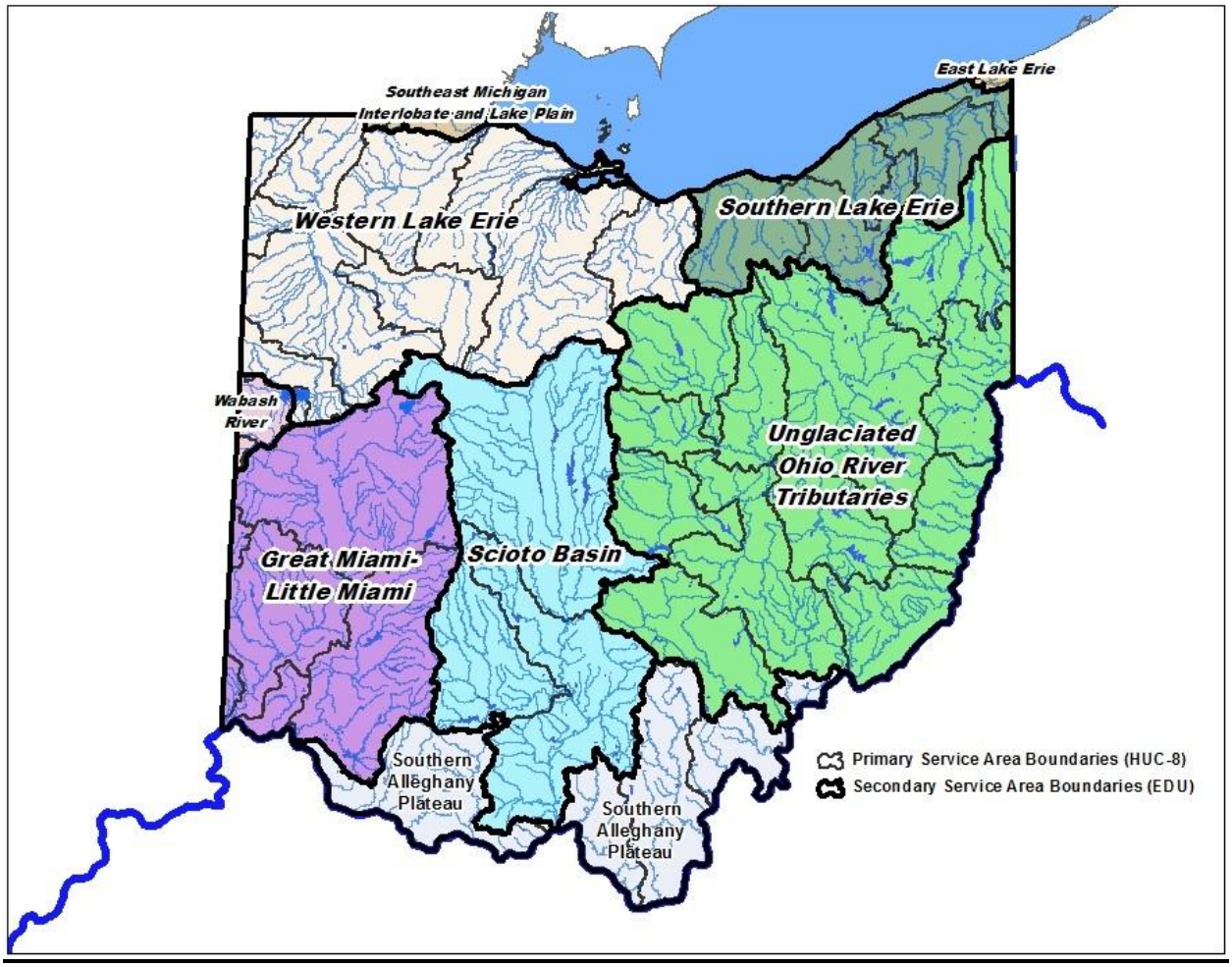


**FIGURE 2. HUC-8 and ECOLOGICAL DRAINAGE UNIT BOUNDARIES**

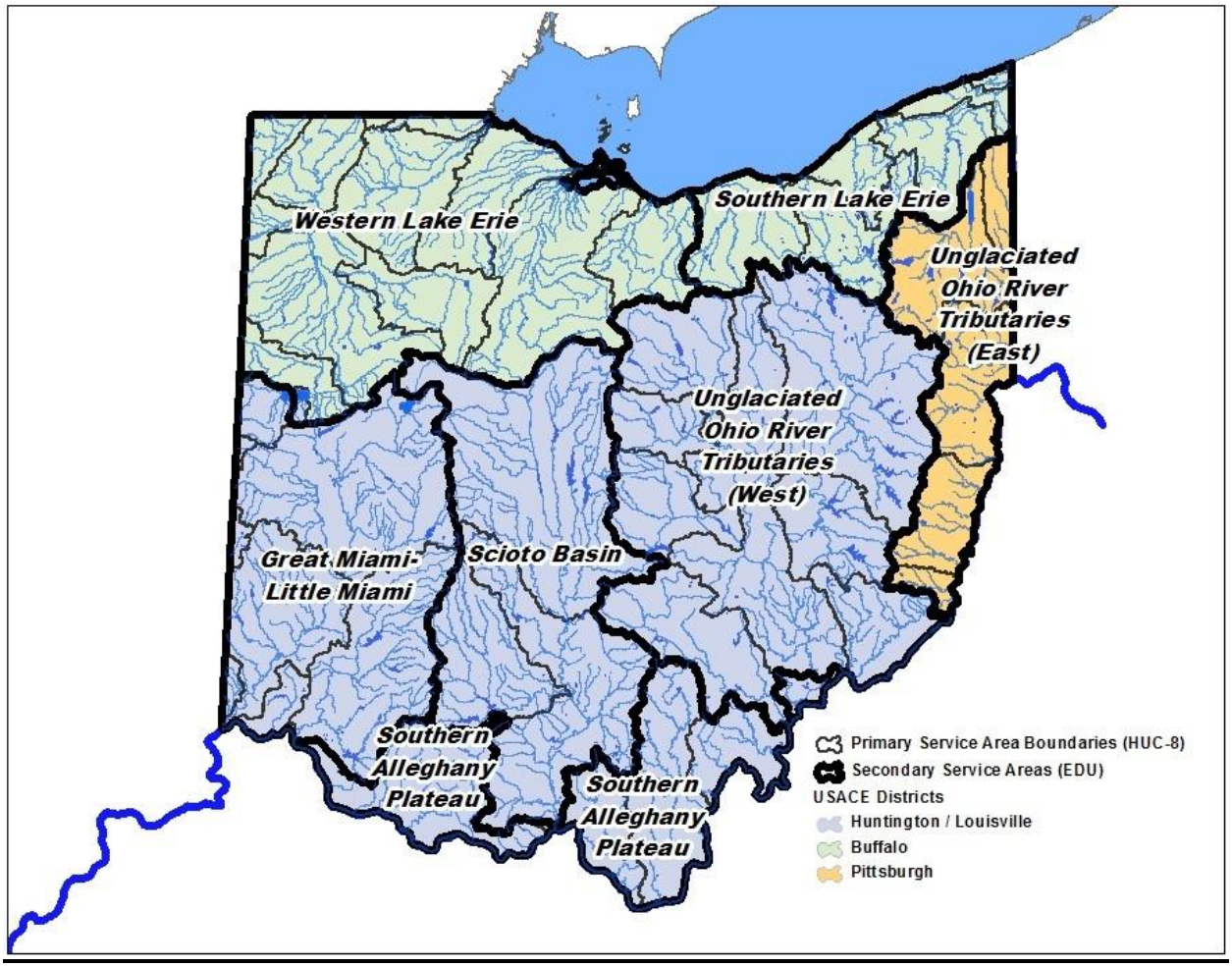


**FIGURE 3. SERVICE AREAS AND U.S. ARMY CORPS OF ENGINEERS DISTRICTS**

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