Susquehanna Basin Headwaters and Adjacent Basins

In-Lieu Fee Program Instrument

Developed under
Part 332.8,
Federal Register Volume 73, Number 70

Sponsor:

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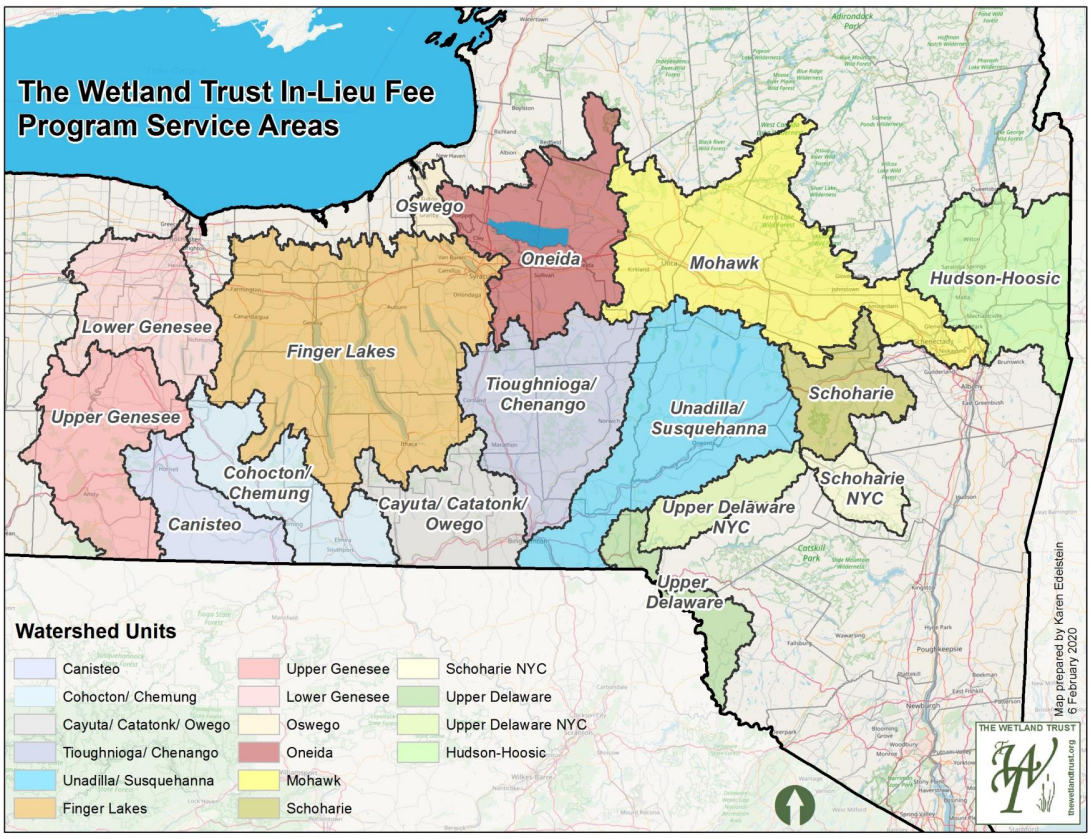

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Introduction

On 10 April 2008 the final rules for wetland mitigation were published in Federal Register Volume 73(70): 19594-19,705 for Compensatory Mitigation for Losses of Aquatic Resources AGENCIES: U.S. Army Corps of Engineers, Department of Defense and Environmental Protection Agency.

The rules describe the requirements for an In Lieu Fee Wetland Mitigation Program. This Instrument describes an in lieu-fee program covering fourteen 8-digit HUAs comprising the Susquehanna River headwater and adjacent watersheds in New York State. It provides for a "revolving fund" of 255 advance wetland mitigation credits spread across fifteen service areas that will fund a mix of re-establishment, establishment, rehabilitation, preservation and enhancement opportunities~~. It also describes an innovative "assurance" component that provides the necessary confidence that mitigation acres will be successfully completed. The assurance approach will substantially increase the overall number of high-quality wetlands being preserved while still meeting the "no net loss" requirements for impacted wetlands.~~

USACE approval of this Instrument constitutes the regulatory approval required for the **Susquehanna Basin Headwaters and Adjacent Basins In-Lieu Fee Program Instrument** to be used to provide compensatory mitigation for Department of the Army permits pursuant to 33 C.F.R. 332.8(a)(1). This Instrument is not a contract between TWT and USACE or any other agency of the federal government. Any dispute arising under this Instrument will not give rise to any claim by TWT for monetary damages. This provision is controlling notwithstanding any other provision or statement in the Instrument to the contrary.

Objectives

The primary goal of the Susquehanna Basin Headwaters and Adjacent Basins In-Lieu Fee Program (ILFP) is to provide wetland mitigation services on a watershed scale to compensate for permitted wetland losses. More specifically, the ILFP will:

1. match mitigation needs with opportunities and priorities in the watershed;
2. target specific sites or sub-watersheds that can provide long-term wetland sustainability and better watershed functionality;

3. use a science-based analysis of existing information (e.g. NY Natural Heritage Program and other databases) in conjunction with field data to ensure quality sites are selected;
4. use known high quality wetlands as reference wetlands to help design mitigation efforts;
5. replace and increase the acreage, quality, diversity and functionality of wetland community types found in the basin, and limit the species and biodiversity lost to development and other stressors;
6. develop a required mitigation plan for each site that contains all elements listed in Federal Register Volume 73, Number 7033CFR 332.4; and
7. To further TWT's core mission to restore, conserve, and protect wetlands.

Section 1. Service Areas

This ILFP encompasses 12,421,971 acres covering 16 Service Areas, each being all or part of an 8-digit Hydrological Unit Area (HUA) – depicted in Figure 1 and described in Table 1. The Schoharie and Upper Delaware HUA's have been separated to accommodate needs of the New York City (NYC) Water Supply Watershed. The use of 8 Digit HUA's allows for wetland planning on a watershed scale that is large enough to be successful while still addressing the need for local compensation. The Wetland Trust, Inc. (TWT) will provide compensatory mitigation for permitted impacts within the same service area in which the impacts occur, unless the district engineer in consultation with the IRT has agreed to an exemption. The exemption request would be for an adjacent service area.

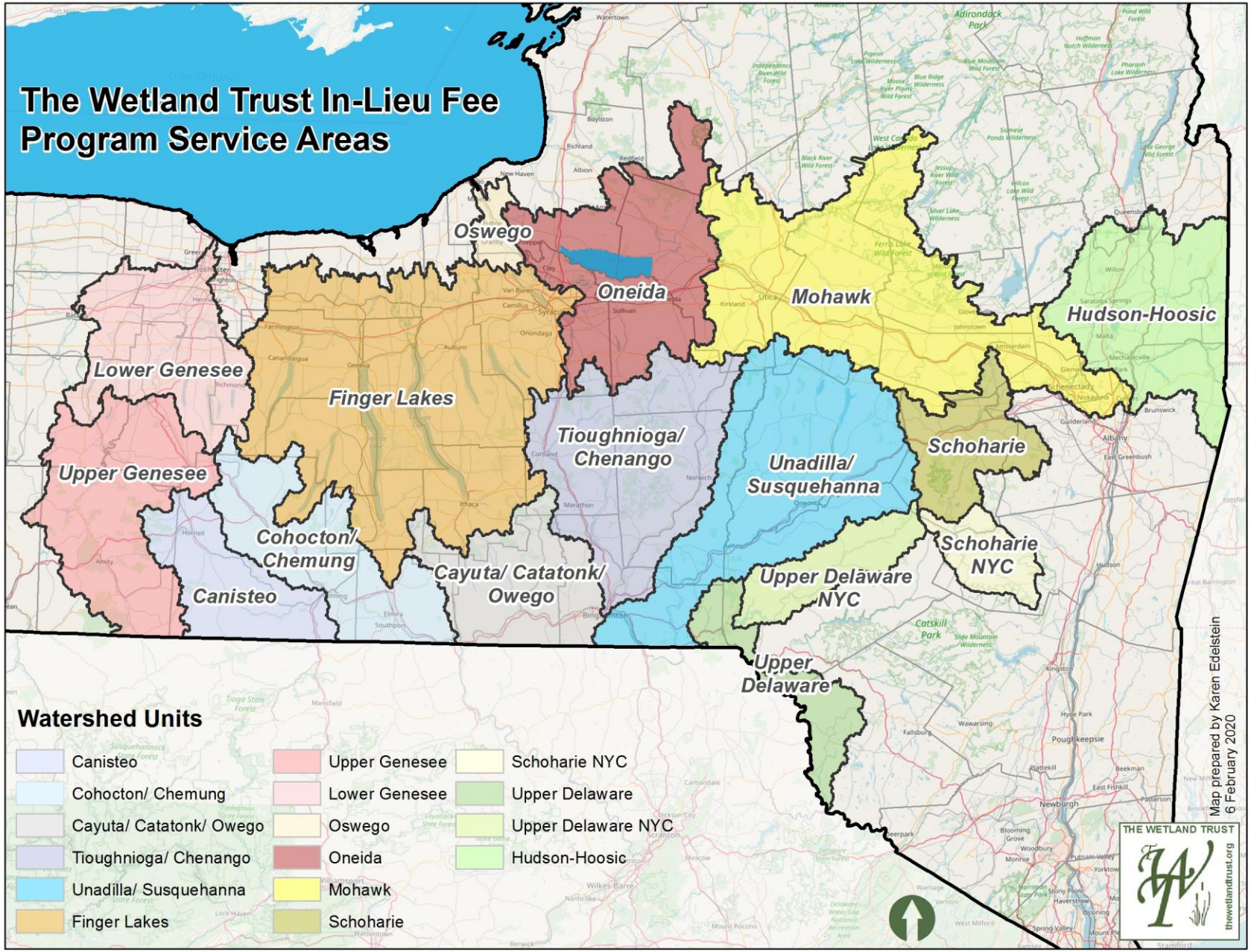

Figure 1. Service Areas in the Susquehanna Basin Headwaters and Adjacent Basins In-Lieu Fee Wetland Mitigation Program.

Table 1. Service Area size and land use composition.

8 Digit HU	Service Area HU 8 Name	Size Acres	NWI Acres	% Wetlands	% Forest	% Ag
02050101	Unadilla/Susquehanna	1,286,275	73,985	5.8	69.1	25.1
02050102	Tioughnioga/Chenango	1,027,924	46,523	4.5	68.2	27.2
02050103	Cayuta/Catatonk/Owego	578,368	15,077	2.6	71.5	23.1
02050104	Canisteo	455,957	6,374	1.4	68.5	30.0
02050105	Cohocton/Chemung	659,586	19,766	3.0	67.9	27.3
02020004	Mohawk	1,631,397	88,782	5.4	44.1	25.7
02020005	Schoharie	593,414	14,543	2.5	67.8	20.0
02040101	Upper Delaware	574,665	16,627	2.9	73.6	18.5
04130002	Lower Genesee	683,224	61,652	9.0	21.6	55.2
04130003	Upper Genesee	851,558	33,173	3.9	50.6	38.4
04140201	Finger Lakes	2,213,707	267,403	12.1	25.2	46.9
04140202	Oneida	957,947	130,786	13.6	41.1	25.1
04140203	Oswego	92,822	13,238	14.3	32.0	27.8
02020003	Hudson-Hoosic	822,202	58,206	10.6	47.2	26

Section 2. Accounting Procedures

TWT will establish and maintain an accounting system for tracking credit production, credit transactions, and financial transactions between TWT and permittees. Credit production, credit transactions, and financial transactions will be tracked separately for each of the 16 service areas, and within each service area for each individual mitigation project that has its own mitigation plan. The Program Account and its functions are described in **Section 11. Program Accounting Information**.

Section 3. Legal Responsibility for Providing Compensatory Mitigation

TWT assumes all legal responsibility for satisfying the mitigation requirements of the Clean Water Act sections 404 and 401, Section 10 of the Rivers and Harbors Act, and other state and federal authorizations as appropriate for which fees have been accepted. This responsibility includes design, implementation, performance, permanent preservation, long-term management, and meeting approved performance criteria.

The transfer of liability from the Permittee to TWT is established by:

1. the approval of this In-Lieu Fee instrument;
2. receipt and acceptance by the District Engineer of a credit sale form that is signed and dated by TWT (see **Section 5. Reporting Protocols**); and
3. the transfer of fees from the permittee to TWT.

Section 4. Program Default and Closure Provisions

Program Default: If the Corps determines that TWT has failed to provide the required compensatory mitigation in a timely manner, that is, TWT has failed to:

- meet performance -based milestones set forth in the project-specific mitigation plan;
- submit monitoring reports in a timely manner;
- establish and maintain an annual ledger report and individual ledgers for each project in accordance with the provisions in **Section 2. Accounting Procedures** and/or **Section 11. Program Accounting Information**;
- submit an annual financial assurances and long-term management funding report;
- report approved credit transactions;
- complete land acquisition and initial physical and biological improvements by the third full growing season after the first advance credit in that service area is secured by a permittee; and/or
- otherwise comply with the terms of this instrument.

The district engineer must take appropriate action to achieve compliance with the terms of this instrument and all approved mitigation plans. Such actions may include suspending credit sales, decreasing available credits, requiring adaptive management measures, terminating the agreement, directing that the financial assurances or contingency funds be used to provide alternative

compensation, directing the use of in-lieu fee program account funds to provide alternative mitigation (e.g., securing credits from another third-party mitigation provider), or referring the non-compliance with the terms of the instrument to the Department of Justice.

Any delay or failure of TWT to comply with the terms of this agreement shall not constitute a default if it is primarily caused by any force majeure or other conditions that the district engineer determines is beyond TWT's reasonable control. ~~Conditions may include flood, fire, landslide, lightning, earthquake, drought, disease, regional pest infestation or condemnation or other taking by a governmental body.~~ However should such events occur during the mitigation process (e.g., before closure) the Corps may require for those site plans to be modified, unsold credits be reduced or suspended, and the mitigation credits sold but not completed (still having to meet success criteria and reverting to long-term management) be replaced at TWT's expense. TWT shall give written notice to the district engineer if the performance of any of its in-lieu fee projects is affected by any such event as soon as is reasonably practicable.

Program Closure: Either party to this agreement may terminate the agreement within 60 days of written notification to the other party. In the event that the ILF Program operated by TWT is terminated, TWT is responsible for fulfilling any remaining project obligations including the successful completion of ongoing mitigation projects, relevant maintenance, monitoring, reporting and long-term management requirements. ~~In other words,~~ TWT~~, the sponsor,~~ will remain responsible for the fulfillment of all credits sold.

TWT shall remain responsible for fulfilling these obligations until such time as the long-term financing obligations have been met and the long-term ownership of all mitigation lands has been established (either transferred to a party responsible for ownership and all long-term management of the project(s) or owned and managed by TWT). Funds remaining in the ILF Program accounts after these obligations are satisfied must continue to be used for the re-establishment, establishment, rehabilitation, preservation, and enhancement of aquatic resources in the same service area from which the credits were sold.

Should this instrument be terminated, the Corps shall direct TWT to use ILF Program funds to secure credits from another source of third-party mitigation, including but not limited to another in-lieu fee

program, mitigation bank, or another entity such as a governmental (i.e., NYS Department of Environmental Conservation (NYS DEC), Soil and Water Conservation Districts) or non-profit natural resource management entity willing to undertake the compensation activities. Should closure provisions be taken, 100% of the remaining funds from advance credit sales must be transferred to an appropriate entity and no administrative funds may be deducted. The funds should be used, to the maximum extent practicable, to provide compensation for the amount and type of aquatic resource for which the fees were collected. The Corps itself cannot accept directly, retain, or draw upon those funds in the event of a default or closure.

Section 5. Financial and Credit Accounting Reporting Protocols

TWT must report to the district engineer and the IRT the following information:

- Monitoring reports, on a schedule and for a period as defined by each project-specific mitigation plan;
- credit transaction notifications;
- an annual program report summarizing activity from the program account (financial and credit accounting); and
- annual financial assurances and long-term management funding report.

5.1 Monitoring reports

Monitoring is required of all compensatory mitigation projects to determine if the project is meeting its performance standards and if additional measures are necessary to ensure that the compensatory mitigation project is accomplishing its objectives. If TWT fails to submit reports within 60 days of the deadlines outlined in the mitigation plan(s), or fails to make a formal written request for the approval of a monitoring report extension within that timeframe, the Corps may take appropriate compliance action as described in **Section 4. Default and Closure Provisions**.

Each project-specific mitigation plan is required to detail the monitoring report requirements including monitoring parameters, length of the monitoring period, and the party responsible for conducting the monitoring. In almost all cases this will be TWT or the Upper Susquehanna Coalition (USC), working under a Memorandum of Agreement (MOA) between TWT and USC that provides for shared services. Monitoring reports will be available to the public from Army

Corp's Regulatory In-lieu fee and Bank Information Tracking System (RIBITS) found at http://geo.usace.army.mil/ribits/index.html.

5.2 Credit transaction notification

Section 3. Legal Responsibility for Providing Compensatory Mitigation establishes the terms by which the legal responsibility for compensation requirements is transferred from the permittee to TWT. These terms require TWT to submit a credit sale form to the Corps. The document must be signed and dated by TWT. The credit transaction form must include the permit number(s) for which TWT is accepting fees, acres and resource type(s) (e.g., Cowardin or HGM class) of impacts, and the number of credits being purchased. See Appendix A for a sample credit transaction form. TWT must submit the signed and dated credit transaction form within 15 days of receiving the fees from the permittee. A copy of each credit transaction form will be retained in both the Corp's and TWT's administrative and accounting records for the ILF Program. Copies of the Credit Transactions forms will also be ~~emailed~~ delivered to the USFWS and other IRT members if requested.

5.3 Annual program report

TWT must submit an annual report on the financial and wetland credit accounts to the District Engineer and the IRT. Credit ledgers will be available to the public from the Army Corp's RIBITS found at http://geo.usace.army.mil/ribits/index.html. The annual program report must be submitted no later than 31 March for the previous year. The annual report (see Appendix B) must include information as follows:

Reporting - General:

- All income received, disbursements and interest earned by the program account for the program and by service area;
- The amount paid to the in-lieu fee program, total and by service area;
- The balance of advance credits and released credits at the end of the report period for the program and by service area;
- All additions and subtractions of credits;
- Other changes in credit availability (e.g., additional credits released, increase or decrease in credit development at an ILF project site); and
- Any site-specific data required by individual ILF project plans.

Reporting - by Expenditure Category:

- A listing of in-lieu fee program expenditures/disbursements from the account (i.e., the costs of

land acquisition, planning, construction, monitoring, maintenance, contingencies, adaptive management and administration) for the program and by service area.

Reporting - by Permit Number:

- A list of all permits for which in-lieu fee program funds were accepted by service area, including the Corps permit number;
- The service area in which the authorized impacts are located;
- The amount and type of authorized impacts;
- The amount of required compensatory mitigation; and
- The date the funds were received from the permittee.

5.4 Annual financial ~~and alternative~~ assurances and long-term management funding report

Assurance for securing short-term financial assurances will be site-specific. Assurance options include a traditional bond for all up-front planning and construction costs. Other options may be used, but only as approved by the DE acting in consultation with the IRT.

TWT must submit an annual report (using the calendar year as the reporting time period) on financial assurances and long-term management to the district engineer and the IRT. TWT is required to give the Corps at least 60 days advance notice if required financial assurances will be terminated. In addition, any financial assurance instrument must state that it is the obligation of the bonding company or financial institution to provide the Corps notice. Inclusion of a summary of any changes to the financial assurances in the reporting year does not alter this separate obligation. The financial assurances and long-term management funding report must include:

- Beginning and ending balances of the individual project accounts providing funds for financial assurance and long-term management;
- Deposits into and any withdrawals from the individual project accounts providing funds for financial assurance and long-term management; and
- Information on the amount of required financial assurances (i.e., bond) and the status of those assurances, including the potential expiration of the financial assurances for each individual project ("potential expiration" refers to whether the financial assurances that are in place are somehow of a limited duration and could expire before the project closure occurs; "final" expiration occurs when the project is completed and approved by the district engineer).
- ~~In the case of Alternative Assurances, an accounting of assurance credits held in each Service Area will be provided.~~

Section 6. Compensation Planning Framework

6.1 Geographic service area

This ILF Instrument includes 16 geographic service areas each covering all or a portion of the 8-digit HU in New York State encompassing the headwaters of the Susquehanna River and adjacent basins. Much of the 16 service areas are rural with similar land cover, composed of largely forest, agriculture and wetlands (total >75%). All have rolling hill topography, flashy streams and a history of extensive agriculture in the early 20th century that has reverted to a more forested landscape at present. The three exceptions are the Lower Genesee and Hudson-Hoosic, which still has extensive dairy operations; the Finger Lakes, which has a combination of vineyards and row crops; and portions of the Hudson-Hoosic, which includes Saratoga County, one of the fastest-growing counties in NYS.

6.2 Threats

There are several major threats to habitat loss in the service areas: construction, logging and flooding. The first threat is related to new construction and development, especially linear developments such as power lines/smart grid upgrades, highway maintenance and construction, and to a lesser degree development of infrastructure (e.g. solar farms), shopping malls, housing (population shifts due to climate change or pandemics) or other factors that may arise. Past impacts may not be a good predictor of future issues. ~~for example, in 2005 only 2.08 wetland acres required mitigation (USACE data) in the Susquehanna service areas and if development of the Marcellus or other gas fields becomes reality one can expect a substantial increase in wetland impacts.~~ For example, the Mohawk Service Area was considered to have relatively little mitigation needs when added in 2015 and it became the most active service area by 2019.

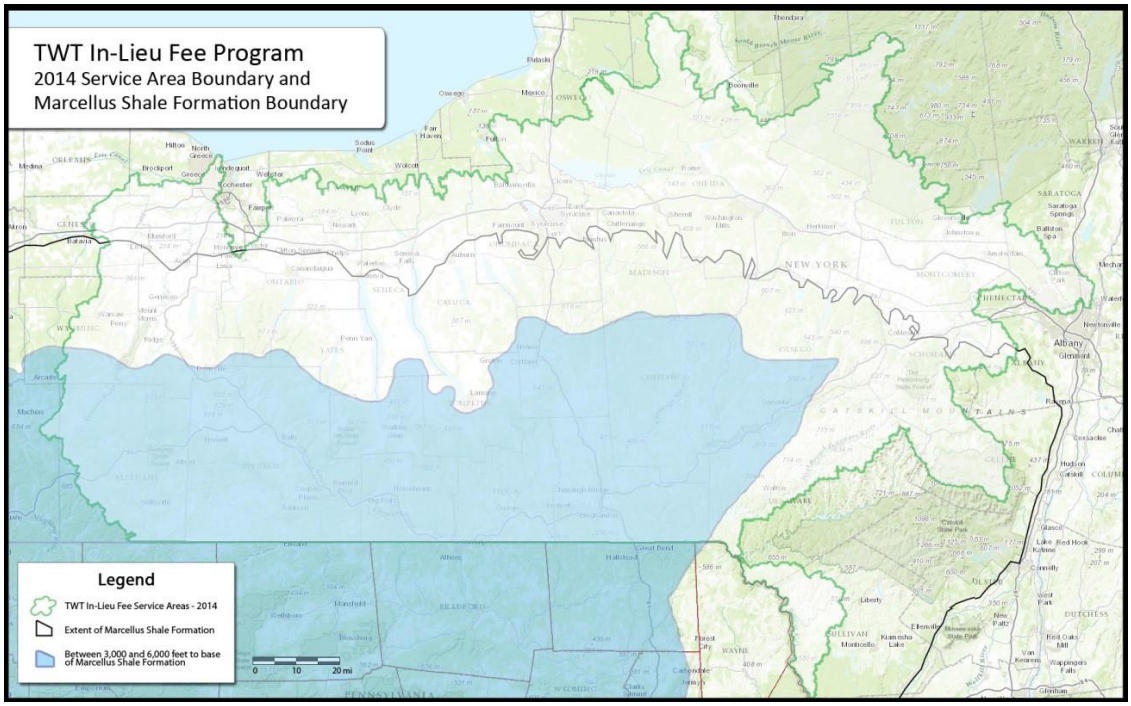

Figure 2. Area Most Likely Developed for Gas in the Marcellus Shale Layer

Recent information obtained from the PA Department of Environmental Protection provides some insight into the extent for potential development (http://www.portal.state.pa.us/portal/server.pt/community/oil_and_gas_reports/20297).

For example, Bradford and Susquehanna counties in PA are about a quarter of the size of the "most likely" gas development area in NY (light blue area in Figure 2) and there were 2,302 gas wells drilled between 2009 and November 2014.

Figure 3. Map of Active Gas Wells in Bradford and Susquehanna Counties, PA November 6, 2014 courtesy of http://www.depgis.state.pa.us/PaOilAndGasMapping/

Gas development in the Utica shale formation, which extends farther north than Marcellus, is also possible. NY holds a tremendous amount of gas resources and future development may occur, though we expect gas development to occur much slower in NY due to the regulatory climate and price of natural gas. Sufficient credits need to be available to meet gas development potential, especially the ancillary projects that still may be implemented such as pipeline construction and/or replacement.

On 1 July 2011 the NYS DEC issued a revised Draft Supplemental Generic Environmental Impact Statement (DGEIS) on gas development and on 18 December 2014 NYS DEC announced that it would not allow fracking of gas wells, ~~which would~~ precluding development of the Marcellus formation~~. This will~~ , greatly reduce gas development in NY~~. in at least the near future.~~

We 30 acres of wetland impacts in the general region over the next fifteen years in NY due to gas development in PA that results in new pipelines that run through NY. We believe 2 to 10 acres per permit for a pipeline and related is a reasonable assumption for the size of impact.

Related to gas development are the gas transmission lines necessary to transport newly developed reserves. These transmission lines may be constructed regardless of whether natural gas is developed in NY. Indeed, at this time there are at three gas transmission lines at various stages of planning that run through several of the existing and newly added service areas. We believe these transmission lines will be an important potential impact as efforts are made to move gas reserves to major metropolitan areas and possibly to coastal locations in order to transport liquefied gas to Europe. Pipelines development is also not related to highways or centers of human habitation, but rather are more likely will be spread throughout the landscape, adding an additional potential for loss of wetland functions and values through habitat fragmentation.

With the addition of the Hudson-Hoosic SA, construction and land clearing for residential and industrial development can be an issue, especially in the outskirts of Albany where the population is expanding. Interestingly since this Instrument was written the Finger Lakes SA has an increase in wineries, and associated business and new clearing for vineyards, and construction for primary and secondary homes. Topsoil, sand, and gravel mining that support these construction activities adds to the potential for disturbance.

A second threat is related to the historical land uses in the Susquehanna and adjacent Basins, namely agriculture and logging. These ongoing activities, many times working within the present wetland regulatory framework, have modified wetlands over the years through land clearing, wetland draining and surface modifications to flow. Agricultural practices, especially tile draining of wet soils (see Section **6.4** Historic resource loss) represent both historic and existing threats to wetlands. Dairy is the most common agricultural industry in the region and there is continual pressure on the landscape for developing corn/hay fields on well-drained soils. ~~even when the soils are not actually well-drained.~~ Dairy operations may increase as Greek yogurt continues to increase in popularity; and NY presently is the third largest yogurt producer in the United States. (any sources?)

Logging occurs extensively with little oversight or regulation; most loggers are small operations, which are ~~very hard~~ difficult to track. Many properties are logged intensively just before being sold.

Logging and the associated roads reduced canopy cover, increased soil exposure, and compaction increases runoff and erosion. Logging can easily disrupt the forest hydrology and combined with

the past extensive forest removal and agricultural plowing, has greatly impacted (e.g., flattened) forest microtopography. Forested wetlands can be logged even if they are regulated by NYS DEC. Smaller logs, especially white cedar, have historically been used as fence posts for a now resurgent Central New York hops market, which has arisen to supply the growing microbrew movement. The use of cedar posts for hops farms, fencing, and rustic furniture is a niche industry that directly impacts northern white cedar swamps in eastern service areas. Indeed, if one reviews tax map parcels of large forested wetland communities surrounded by agriculture in some of the eastern Service Areas they are often broken up into small, narrow tracts due to the historic need by farmers

for fence posts. ~~We~~ TWT considers all privately-owned forestlands susceptible to logging unless they are under a conservation easement. ~~We~~ TWT suggests these lands should be considered meeting the "under demonstrable threat" criteria for consideration for protection activities.

A third factor impacting wetlands is flash and sustained flooding, which is accentuated in steeper catchment basins. Complex topography in small watersheds concentrates infrastructure and development into the relatively narrow and flattened stream corridors, resulting in flooding that erodes streambanks and road ditches. Post-flooding maintenance operations are usually poorly planned and ~~although they tend to impact streams,~~ can ~~also~~ impact both streams and nearby wetlands. Climate change ~~will become~~ is an important factor accentuating flooding and potential wetland degradation. Weather events at the extremes (large volume rainfall events and longer drought periods) are becoming more common. Analyses by the National Oceanic and Atmospheric Association, and other top weather institutions have documented increased frequency of severe weather events (e.g., flooding, drought and high temperatures) such that risk designations regarding the classic 100 year storm may no longer be relevant as storms of such magnitude may become far more frequent with ongoing climate change (e.g., Easterling et al. 2000, DeGaetano 2009). Smaller wetlands created by beavers within floodplains often conflict with human habitation (e.g., plugging road, ditch culverts). These conflicts usually result in the extraction of the beavers and the loss of the wetlands they built.

6.3 How ILFP will offset wetland loss

The ILF Program will use mitigation funds to re-establish, establish, rehabilitate, preserve, and enhance wetlands based on the watershed analyses and strategies described within this instrument. Within each service area properties will be located that provide appropriate opportunities for these activities in priority locations. To the degree possible, sites with the potential for high quality re-establishment, establishment, rehabilitation, preservation and/or enhancement will be purchased in each service area before they are needed so that the site will be secured and design/construction can be initiated quickly. Other sites will be put on a confidential waiting list with a landowner agreement that the site is available if certain conditions are met at the time of purchase.

Sites with a potential for connecting to larger wetlands or other natural resource areas and sites that have adequate hydrological resources and that can be protected in the long term are priorities. Headwater areas are another priority as they have great potential not only for wetlands, but also for

small intermittent streams that are important source water areas for the entire watershed. Riparian wetlands will also be a priority as they provide for wildlife corridors and also buffer the stream system. Although land cover in most service areas have high percentages of forest cover, most is second growth on lands that were greatly impacted in the past. Efforts will be made to re-establish forested wetlands by re-establishing the pit and mound microtopography that was eliminated when the forest was removed and soils farmed. This will best be accomplished at the "edge" of an intact-forested wetland, expanding the existing site. Enhancement of an existing forested wetland is also a possibility, but it must be done with great care to ensure functions and values are not lost. Microtopography provides fine scale habitat diversity within wetland environments, which contributes to biological diversity (e.g., Huenneke and Sharitz 1986, Raney et al. 2014); re-establishing or establishing ephemeral wetlands within forest communities will help provide this added diversity.

Agricultural lands are another priority for re-establishment sites because historically they held wetland acres that were subsequently drained. Farmland has been naturally reverting to wetlands because agricultural operations have slowed; adding mitigation acres alongside these wetlands maximizes the total footprint of a project (i.e., the purchase of a parcel with existing wetlands and then re-establish or establish wetlands adjacent to those existing wetlands).

6.4 Historic resource loss

NYS DEC has estimated that half of New York State's historic wetlands have been lost (Huffman and Associates 2000). This loss largely appears to be a result of clear-cutting forests and conversion to agriculture. NY is the home of the drain tile first used in 1835 and in common use by 1850, with over 75,000 miles of clay tile laid by 1900 (Biebighauser 2007). Drain tiles efficiently eliminated wetland areas and their hydric soils and these tiles often function after the site has reverted to forest (Biebighauser 2007).

More recently (1980s and 1990s) total wetland acres increased by an estimated 3,000 acres but these were "open water" wetlands (NYS DEC Bureau of Habitat), while during that same period palustrine scrub shrub (PSS) swamps declined by about 5,000 acres and palustrine emergent marsh (PEM) declined by 16,000 acres (NYDEC 2005). The two photographs below from the Seeley Creek watershed depict the land use changes that are ubiquitous throughout all the service areas.

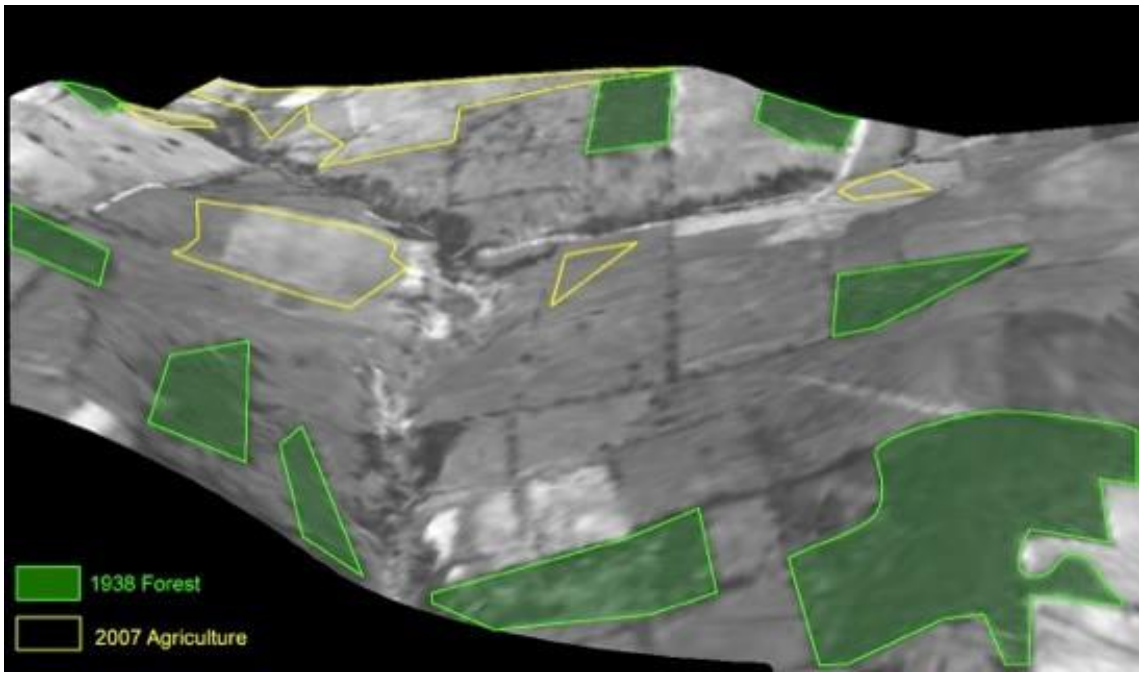

Figure 4. 1938 Aerial Photo Comparison of Agriculture and Forest Cover

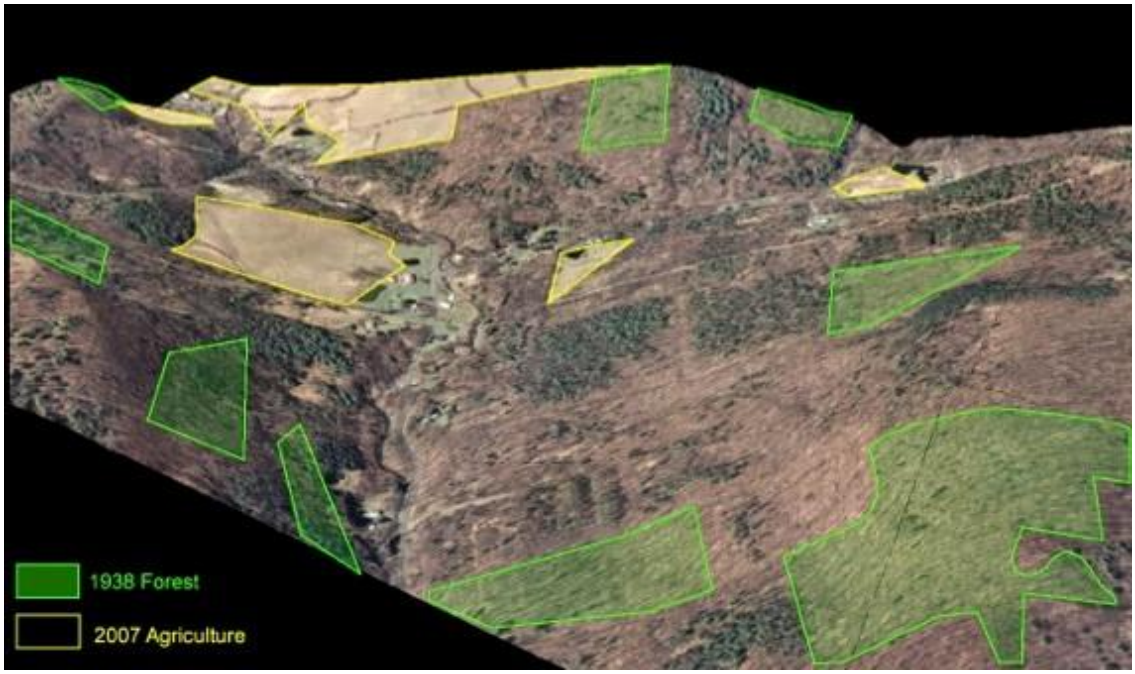

Figure 5. 2007 Aerial Photo Comparison of Agriculture and Forest Cover

6.5 Current aquatic resources

Table 2 summarizes wetland acreage in all service areas. In the past forests were cleared for agriculture, resulting in lower quality second growth forest, but also lower quality wetlands that re-established themselves. With less microtopography variation and many species extirpated or reduced only those more aggressive in reoccupying sites have become common. We believe that

"older growth forests", that is those forested areas found in 1938 aerial photos, will more likely harbor rarer species as they provided a refuge from agricultural conversion. An example is in Schuyler County, where the only Jefferson Salamander observation reported to NYS Heritage came from an oak forest woodlot depicted on a 1938 photo, with multiple vernal pools and pit and mound topography that indicated it was never plowed.

Table 2. A summary of wetland types in each TWT ILFP service area.

HUA	Name	NWI Acres	Total Wetlands %	PEM %	PFO %	PSS %	River %	Pond %	Lake %
02050101	Unadilla/Susquehanna	73,985	5.8	25.5	32.8	19.4	2.4	7.9	12.0
02050102	Tioughnioga/Chenango	46,325	4.5	17.8	37.0	21.7	6.0	6.2	11.3
02050103	Cayuta/Catatonk/Owego	15,077	2.6	15.9	24.6	18.3	21.5	15.5	4.1
02050104	Canisteo	6,374	1.4	17.8	24.2	8.3	28.3	17.5	3.9
02050105	Cohocton/Chemung	19,766	3.0	19.0	27.0	20.3	12.4	9.5	11.7
02020004	Mohawk	88,782	5.4	13.9	40.2	15.0	1.4	6.6	22.8
02020005	Schoharie	10,346	2.6	20.4	33.7	13.5	2.6	17.6	11.8
02020005	Schoharie - NYC	4,197	2.1	15.8	16.5	10.9	8.3	15.5	32.8
02040101	Upper Delaware	8,042	2.8	11.9	16.0	8.0	25.7	15.7	22.8
02040101	Upper Delaware - NYC	8,585	2.9	14.4	4.9	5.8	5.5	12.6	56.8
04130002	Lower Genesee	61,652	9.0	15.5	54.2	9.9	3.3	4.0	13.2
04130003	Upper Genesee	33,173	3.9	39.4	28.3	12.5	3.1	8.9	7.8
04140201	Finger Lakes	267,403	12.1	8.3	31.5	5.7	1.6	2.3	50.6
04140202	Oneida	130,786	13.6	4.2	45.9	4.1	0.7	2.8	42.3
04140203	Oswego	13,238	14.3	4.8	60.8	9.6	0.6	3.2	21.0
02020003	Hudson-Hoosic	76,906	7.1	12.7	33.8	13.3	7.4	4.3	18.2

6.6 Aquatic goals, including general amounts, types, and locations

The overall goal of this In Lieu Fee Program is to increase the acreage, quality, diversity and functionality of wetland community types and the numbers and biodiversity of species otherwise lost to development. The ILFP goals described below cover all service areas due to their similarity

in past land use, topography and potential impacts. Mitigation Plans prepared for each site will outline more specific goals for those sites.

General Amounts

- To address historical losses and the potential for increased wetland impact from gas field development and related infrastructure in the Marcellus, Utica or other shale layers, and other projects. We estimate 5 to 10 acres per year for the first decade of development in the Susquehanna Basin Headwaters and Adjacent Basins service areas.
- To distribute sites within each 8-digit HU Service Area to increase diversity, local connectivity, maximize restoration and target high quality sites for protection and as a base for expanding into larger wetland complexes
- To ensure long-term site sustainability and wetland functionality through a combination of wetland and uplands. Larger sites of 10 to 100 acres or more, adjacent to already protected lands, especially wetlands, would provide additional assurance of sustainability.

General Types

- To re-establish/establish/rehabilitate/enhance microtopography (pit and mound-type landscape) lost to historic land clearing activities, such as pothole construction within forested areas to add hydrology and topography, but not within existing forested wetlands and not to conflict with other existing important habitats.
- To eliminate effects of drain tiles and redevelop hydric soils.
- To enhance/rehabilitate diversity in existing wetlands that have been degraded due to encroachment by invasive plants, such as reed canary grass (*Phalaris arundinacea*), and keep invasive species from overwhelming the re-established diversity in the long-term.
- To select land parcels including high quality uplands to maximize wetland functionality.
- To select parcels with historically intact forests (based on the 1930's aerial photos) for re-establishment/establishment of adjacent wetlands and to increase habitat connectivity for rare species still populating these refugia.
- To target functions lost from the impacted wetland, but also add other functions/services in that wetland type to replace historical losses and to address watershed/service area priorities.
- To re-establish/establish wetlands that support habitats or species that may have been historically reduced or decreasing, such as emergent wetlands for breeding marsh birds (i.e., American bittern, pied-billed grebe); ephemeral headwaters wetlands for amphibians (i.e. mole

salamanders, wood frogs); wetlands along ridge tops for migratory bats and scrub shrub wetlands for songbirds and American woodcock.

- To use the NYS Heritage community types and attributes as guides for mitigation projects.
- To incorporate wetland projects in river floodplains.
- To add a climate change design component to potentially "buffer" weather extremes.
- To provide corridors for plant and animal migration and movements.
- To provide additional habitats for listed and other species of special concern.

General Locations

- To locate parcels in, adjacent to or near rare or high-quality communities (e.g., cedar swamps, hemlock/hardwood peat swamps, fens, and bogs), especially those not adequately preserved.
- To select locations in those areas where long-term sustainability of high-quality wetland sites (already existing and those to be re-established, established, rehabilitated, preserved and/or enhanced under this Program) are most likely.
- To select locations that add to the development of a sustainable ecology across the watershed consisting of large natural resource/wetland hubs connected by wetland and riparian habitat corridors.

6.7 Prioritization strategy - screening to locate general areas and sites

This ILFP will screen each Service Area to locate and nominate sites for inclusion in the Program. Areas of interest within sub-watersheds, wetland corridors or wetland areas will be located based on information gleaned from:

- Computer "quality assessments" using Maxent modeling of wetland locations to determine important landscape factors and ranking of all known wetlands and potential restoration sites at various watershed scales (Appendix C);
- A search for landscapes with "suitable soils" for wetlands;
- A review of other comprehensive analyses; and
- A review of expert opinions.

To some degree this screening activity will overlap, which is a benefit as the more times a location comes up on the "screen" the more likely it is a high priority opportunity. It is also imperative that multiple areas be targeted as an important objective of this ILF Program is to be

able to secure a site in a high priority location when it becomes available. This timing can be measured many times in days and at most months.

6.7.1 A computer "quality assessment" using Maxent of important landscape factors ranking all known wetlands and potential restoration sites

The State University of New York College of Environmental Sciences and Forestry (SUNY ESF) in partnerships with Upper Susquehanna Coalition analyzed sites that show promise for the re-establishment, establishment, rehabilitation, preservation, and enhancement of wetlands and have a high potential for promoting functionality and biodiversity for the Susquehanna River Basin and adjacent watersheds. This approach used the "Maxent" computer model was first demonstrated for the Upper Susquehanna River Basin and published in the Journal of Wetlands (Hunter et al. 2012). The model examined the landscape setting and environmental attributes (e.g., soil classes, slope, elevation, wetness) of existing wetlands and rare wetland communities to predict additional locations where wetlands (and their types) previously and currently exist (Godwin et al. 2002, Bedford and Godwin 2003, Amon et al. 2005). Effectively the "Maxent" modeling approach predicts where wetlands should occur had they not been impacted by human use (Philips et al. 2006, Hunter et al. 2012). Appendix C provides an in-depth explanation of this analysis. The Hunter et al. (2012) approach was extended to adjacent watersheds with only significant deviations in methodology being the addition of targeting for additional rare wetland types that were not present in the Susquehanna River Basin, and an improvement of spatial resolution.

6.7.2 A review of other comprehensive analyses

A review of analyses and reports was conducted to inform and guide the development of the ILFP. Examples are shown in the Table 3. The reports and publications included:

- Conservation Focus Areas of the Upper Susquehanna Watershed. 2012. Finger Lakes Land Trust. 43p. (http://www.fllt.org/linkfiles/uppersusqreport.pdf)
- Burger, M.F. and J.M. Liner. 2005. Important Bird areas of New York, Habitats Worth Protecting. 2005. BookMasters Press. Second Edition. 352p.
- Eallonardo, A.S., Jr., Leopold D.J. (2014) Inland salt marshes of the Northeastern United States: Stress disturbance and compositional stability. Wetlands 34:155-166.
- Hunter, E.A., Raney, P.A., Gibbs, J.P., and Leopold, D.J. (2012) Improving wetland mitigation
- through community distribution modeling and a patch based ranking scheme. Wetlands. 32:841-850.
- NYSDEC. 2005. Comprehensive Wildlife Conservation Strategy for New York-

Susquehanna Basin pages 467-501. (http://www.dec.ny.gov/docs/wildlife_pdf/susquehannatxt.pdf)
- NYNHP (2013) Rare species and community occurrences, Biodiversity Databases, Element Occurrence Record Digital Data Set. New York Natural Heritage Program, Albany, NY.
- NYSDEC. 2009. New York Open Space Conservation Plan. New York Department of Environmental Conservation. Albany. 240p (http://www.dec.ny.gov/lands/47990.html)
- Raney, P.A., Identifying potential refugia from climate change in wetlands (2014) Ph.D. Dissertation. SUNY-ESF, Syracuse, New York.
- Raney, P.A., Fridley, J.D., and Leopold, D.J. (2014) Characterizing microclimate and plant community variation in wetlands. Wetlands. 34, 43-53.
- Scanga S.E., Leopold D.J. (2010) Population vigor of a rare, wetland, understory herb in relation to light and hydrology. Journal of The Torrey Botanical Society. 137:297–311.
- Scanga S.E., Leopold D.J. (2012) Managing wetland plant populations: lessons learned in Europe may apply to North American fens. Biological Conservation 148:69–78.
- Upper Susquehanna Coalition (2013) GIS wetland conservation targeting tools developed following methodology of Hunter et al. (2012) with assistance from SUNY-ESF. Supported by EPA WPDG to USC.
- USFWS 2012. New York and Long Island Field Offices Strategic Plan FY 2012. New York. 625p. (http://www.fws.gov/northeast/nyfo/Full%20report%202012%20Web.pdf)
- Weatherbee, P.B. and Crow, G.E., 1992. Natural plant communities of Berkshire County, Massachusetts. *Rhodora*, pp.171-2
- Wiegand, K.M., Eames, A.J. (1925) The flora of the Cayuga Lake basin, New York. Vascular Plants. Cornell University, Ithaca, NY.

8 Digit HU	Name	Targeted Natural Areas	References
02050101	Unadilla/Susquehanna	Unadilla River Floodplain Clapper Lake Mud Lake Mud Pond (Jordanville) Jordanville Swamp	Hunter et al. 2012 NYNHP 2013
02050102	Tioughnioga/Chenango	Pharsalia Woods Long Pond Ninemile Swamp Morrisville Swamp	NYSDEC 2005 Burger and Liner 2005 Hunter et al. 2012 NYNHP 2013
02050103	Cayuta/Catatonk/Owego	Connecticut Hill Emerald Necklace Michigan Hollow Swamp/Spencer Lake/Spencer Marsh complex	Burger and Liner 2005 NYSDEC 2009 FLLT 2012 Tompkins County files
02050104	Canisteo	Canisteo Headwaters	NYSDEC 2009

02050105	Cohocton/Chemung	Cohocton Headwaters	Edinger et al. 2002
02020004	Mohawk	Deansboro Swamp Yule Corners Rd Swamp Canning Factory Rd Fen	USC 2013 Raney 2014
02020005	Schoharie	West Creek Headwaters West Kill/Mill Creek and Tribs	NYSDEC 2009 USC 2013
02020005	Schoharie - NYC	Schoharie Reservoir & Schoharie Creek and their Tribs	NYSDEC 2005 USC 2013
02040101	Upper Delaware	Basket Creek & Oquaga Creek and their Tribs	NYSDEC 2005 USC 2013
02040101	Upper Delaware - NYC	Trout Creek and Tribs	NYSDEC 2005 USC 2013
04130002	Lower Genesee	Honeoye Inlet Honeoye Creek Wetlands Richmond Conesus Wetlands Hemlock Canadice Outlet	NYNHP 2013 USC2013
04130003	Upper Genesee	Black Creek Swamp Hemlock Canadice Wayland Area Wetlands	NYNHP 2013 USC 2013
04140201	Finger Lakes	Junius Ponds Seneca Army Depot Fall Creek Fens Cortland Marl Pools Saline Wetlands	Wiegand and Eames 1925 NYNHP 2013 Raney 2014 Eallonardo & Leopold 2014
04140202	Oneida	Nelson Swamp White Lake Swamp Cicero Swamp Peterboro Swamp Fenner Swamp	Scanga & Leopold 2010 & 2012 NYNHP 2013 Raney et al. 2014
04140203	Oswego	Ox Creek Swamp Bowens Corners Muck Farm	USC 2013
02020003	Hudson-Hoosic	Young's Bog Preserve. Inland poor fen and spruce-tamarack bog	https://www.renstrust.org/explore/preserves/public/14-mud-lake-preserve-shuba-preserve

6.7.3 A review of expert opinions

Development and implementation of the ILFP includes input from local, state, regional, and federal scientific experts and input from natural resources groups such as the Upper Susquehanna Conservation Alliance, Finger Lakes Land Trust, Otsego Land Trust, The Nat

Conservancy, and NY Audubon. Expansion into the Hudson Hoosic SA will provide new potential partners who have knowledgeable professional staff, including Hudsonia, Inc., the Rensselaer Land Trust, Rensselaer Plateau Alliance, Berkshire Community Land Trust, Agricultural Stewardship Association (a land trust for Washington and Rensselaer counties), Hoosic River Watershed Association and Wilton Wildlife Preserve and Park). Some contacts have resulted in potential partnering on specific sites.

6.8 Site specific ranking and quality assessment of potential sites

Once geographical regions are identified as priorities within each Service Area, we will evaluate parcels for potential mitigation sites to purchase. A "parcel" is defined as the tax parcel being purchased and a "site" being that portion of the parcel that is the mitigation area. Sites on parcels for sale and those of significant interest for future acquisition will be ranked. We may discuss with a landowner the potential for purchase for certain high-ranking sites.

The Maxent computer analysis (see Section 6.7.1) and site visits will determine the quality of parcels nominated for further evaluation. The IRT will make specific site-by-site determinations for inclusion into the ILFP based on all information provided and use the specific success criteria approved by the IRT in that site's mitigation plan to determine if a mitigation project has been successful. An additional quality assessment tool being developed by the Corps will be used when it becomes available.

6.9 Criteria for selecting specific mitigation sites

Each of the following factors will be considered during the site selection process; they are displayed not in priority order, but in an attempt to group similar traits together. Some factors may overlap with the previous screening exercises such as presence of endangered species, thus providing additional support for that priority level. However other criteria will help to determine the sites defensibility, long-term viability and higher value over other sites.

1. Suitable soils (i.e., hydric soils, soils conducive to wetlands, site suitable for inducing hydric soils).
2. Hydrology and water quality on site and in the water source is adequate for long-term sustainability.
3. High quality upland component[1] on the parcel or in close enough proximity to maximize

wetland functionality.

4. Conducive to microtopography reestablishment (pit and mound type landscape), especially in forested wetlands.
5. Site can add to local wetland habitat connectivity.
6. Site is within or adjacent to a large wetland or potential wetland areas or corridors.
7. Parcels are sufficiently large (could be 10 + acres, but more likely in the 100-acre range) to buffer outside influences.
8. Parcel adjacent to or near preserved lands.
9. Sites adjacent to, near or within rare communities (i.e., fens and bogs [2]) or NYS DEC Class I Wetlands[3], especially those not adequately preserved.[4]
10. Parcels with historically intact forests that potentially or are known to support rare species; endangered species will be addressed separately and thoroughly following state and federal guidelines.
11. Wetlands that support habitats or species that may be historically reduced or decreasing.
12. The site has the possibility of addressing climate change (i.e., can buffer or survive weather changes).
13. Presence of invasive species at the site or in close proximity.
14. Parcel cost within the credit cost structure established for the Service Area.

[1]a high quality upland is one with attributes that would provide habitat for the non-wetland life history stages, such as mature forest, pit and mound topography, shrubs for nesting, deep topsoil layer, diverse plant community

[2]the classic kettlehole bog is the only wetland type specifically named as a DEC Class 1 wetland and because of its rarity any bog that is found not fully protected will be a priority:

"Classic kettlehole bogs are wetlands which are at least 75 meters (approximately 246 feet) in diameter within a closed drainage basin, having a minimal or no surface inlet or outlet. These bogs have complete or virtually complete concentric zones of differing vegetative cover types. The innermost zone of the bog is open water that is of pH 5.00 or lower and is typically anoxic and dark brown. Surrounding this is a floating mat of sphagnum mosses, liverwort, and shrubby heath plants; this mat is surrounded in turn by coniferous swamp above deep deposits primarily of partly decayed sphagnum mosses.

Wetlands of this type are very rare, as are many of the life form within them, and therefore they contribute to the ecological, geological, and aesthetic diversity of the state. This in turn provides educational and scientific research benefits."

[3]Other DEC Class I Wetlands include those that:
a.is resident habitat of an endangered or threatened animal species;
b.contains an endangered or threatened plant species; or
c.s supports an animal species in abundance or diversity unusual for the state or for the major region of the state in which it is found.

[4]*Wetlands that are regulated may not be adequately protected from degradation because selective logging, agricultural ditching, vehicular traffic and other activities are still allowed without restriction.*

6.10 How mitigation site are selected and developed

Most potential sites will be initially located through computer analyses, with others nominated by partner organizations. The parcels of interest are overlaid with a tax map parcel to

determine ownership boundaries and finally a contact with the owner is made to determine willingness to sell. All major real estate Internet sites are tracked to locate parcels on TWT list that may come up for sale.

For sites expected to move through the mitigation process the sponsor will obtain an option to buy after it has been sufficiently vetted. Vetting includes sites visits to determine mitigation potential, invasive species problems, potential for environmental hazards, hydrological issues and other related matters.

Each site is developed following its site specific, IRT approved mitigation plan. The plan includes an adaptive management approach to ensure weather conditions, equipment problems, soil anomalies and other such issues are addressed during the construction process.

A Mitigation Plan for each ILF site will be submitted for IRT review and approval and public comment. This plan will have the major elements required by 33CFR 332.4 that will specifically describe the nominated site. These elements are:

1. Objectives
2. Site selection
3. Site protection instrument
4. Baseline information, including a review for potential endangered species on the site
5. Determination of credits
6. Credit release schedule
7. Mitigation work plan
8. Maintenance plan
9. Performance standards
10. Monitoring requirements
11. Long-term management plan, including financial arrangements
12. Adaptive management plan, including addressing invasive species control
13. Financial assurances

6.11 Strategy ensuring preservation addresses impacted wetlands

Preservation objective: The objective of the preservation strategy is to select sites to ensure preservation of the highest and best functions, values and wetland acres.

Preservation criteria: The criteria in Section 6.12 will also be used for the preservation strategy.

Additional information on rare or high-quality communities (e.g., cedar swamps, hemlock/hardwood peat swamps, fens, and bogs), endangered species and species of special concern (Section 6.9) will be included. Preservation parcels with re-establishment potential "on- site" will also be an important consideration.

Preservation strategy: TWT, with the help of SUNY ESF's computer analysis described in section 6.7.1, has compiled an extensive list of unique fens and bogs as well as other high quality wetland communities that have unique functions, rare species, or other quantifiable qualities. The analysis would review the continuum of community types, some of which are described by Edinger et al. 2002, targeting the top 20% in the patch rankings. Rare wetland types such as bogs or fens will be priorities to ensure the highest quality sites are selected and to potentially address climate change. Research at SUNY-ESF is demonstrating that groundwater-supported wetland ecosystems (e.g., fens) not only support many boreal species at their southern range margins in New York State, but these areas are also buffered from changes in regional climate due to their steady flow of cold groundwater during the growing season (Raney 2014, Raney et al. 2014).

TWT will periodically update the list of potential sites, including nominations from local experts. The same list and strategy will also be used for selecting "assurance acres" to meet financial obligations. Using "assurance wetlands" as the major preservation component may be the most productive venue because it would provide for substantial acreages of preserved wetlands while still addressing the "no net loss" of wetlands that the mitigation acres must directly address.

Addressing temporal aspects of impacts: Preservation is based on the need to document a stressor that may impinge on the functions, values and acreage of a particular wetland. We suggest that there are two types of stressors that should be addressed, those that are "immediate" and most commonly observed (i.e., new housing developments, airport expansions or gas field development); and those that are "gradual cumulative impacts" that especially stress high quality, diverse wetlands and their fauna.

Gradual impacts resulting from continual long-term activities that accumulate and degrade wetlands are important wetland stressors. For example where the protection of a high quality wetland by the owner is not a priority or even a consideration the land can be easily impacted by many “seemingly” uneventful activities such as farming or recreation (e.g., ATV traffic). The

concept of preservation to eliminate likely stressors ~~is in harmony~~ aligns with the Corp's requirements that there be easements on mitigation lands that are already fully protected to ensure preservation "in perpetuity". We will use that same conservative approach and review all high-quality, biodiverse, and rare habitats that are not under some type of conservation control and make the case to the IRT that those parcels may be in jeopardy of impacts and available for inclusion into the preservation component of the Program.

Indeed Brooks et al. (2005) makes a strong case to have a program that includes protecting against the loss of wetland functions. He argues that not preserving existing high-quality wetlands leads over time to a homogeneity of wetlands in a region as subtle stressors will slowly degrade high quality wetlands unless they are under a preservation envelope.

Preserved versus Regulated wetlands: Preserved wetlands are those owned by organizations or agencies whose mission is long-term resource protection. Regulated wetlands, in NY's case wetlands greater than 12.4 acres (http://www.dec.ny.gov/permits/6279.htm), provide protection from impacts that require a permit, but are still vulnerable to gradual impacts from exempt activities, including:

1. "Normal agricultural practices, except filling, clear cutting of trees or construction of non-agricultural structures." This would include drainage ditches and tile lines that attempt to dry out an agricultural field but also can reduce an adjacent wetland's hydrology. Farmers can also stress or eliminate certain wetland wildlife species by clearing natural upland areas necessary to complete their annual life cycle (i.e., overwintering, egg laying, feeding). Trees can legally be cut within a wetland to reduce shading on the adjacent crop field or as a source of fence posts. Runoff from the unabated use of fertilizers, pesticides, and herbicides in many farming operations also degrade wetland quality over time and are not addressed by regulated wetlands.
2. "The harvesting of natural products and recreational activities (fishing, hunting, trapping, hiking, swimming, picnicking, or firewood collection)". Private landowners can greatly impact wetlands through tree cutting, log removal and combined with heavy ATV use trails and roads can divert water flows as well as directly impact both vegetation and wildlife.
3. "Continuance of lawfully existing land uses"; and
4. "Selective cutting of trees and harvesting of fuel wood (not clear cutting)." Loggers can still substantially harvest trees from regulated wetlands. In Service Areas 01 and 02 of the Upper

Susquehanna River Basin, cutting of northern white cedar for furniture and posts is a niche industry that appears to be a substantive threat to white cedar swamps.

Purchase strategy: Because priority parcels only rarely come up for sale, there will be great vigilance applied to find and acquire parcels when an opportunity arises. This will include a swift and confidential request to the IRT for approval of a preservation site to be included into the ILFP. We may submit for a preliminary review before a parcel becomes available or ~~at least~~ early in the negotiation phase. ~~In order~~ To add further functional value to the preservation strategy, the key preservation purchases will act as an "anchor property" to be expanded with additional wetland types (through re-establishment or establishment) and uplands to ensure there is biological diversity not only in species but also in functionality (i.e., nesting or overwintering habitat available).

6.12 Public and private involvement, coordination with federal, state, and local aquatic agencies

The USC supports TWT's efforts to ensure public and private involvement through its USC Wetland Team that provides outreach to farmers, small watershed groups, community groups, private citizens, academics and government agencies. There is also a shared services memorandum of agreement (MOA) between TWT and USC that further solidifies this relationship. The MOA provides for sharing staff and equipment of projects of mutual interest. This MOA will facilitate the USC's work for TWT within this instrument.

TWT and USC have already developed a working relationship with federal, state, and local agencies that deal with wetland issues and will continue to do so, incorporating the ILFP into this mix. TWT Board provides a direct link with academia because board membership includes Dr. Donald Leopold and Dr. James Gibbs, SUNY ESF. The USC Wetland Team Leader and TWT Chair also work with Binghamton University (wetland and water quality), Ithaca College (salamander radio tracking) and SUNY Oneonta (stream rehabilitation and wetland restoration). The USC Wetland Scientist, an active participant with TWT's ILF program, studied microclimates of wetlands of high conservation value in New York State for his Ph.D., which he received from SUNY-ESF in 2014. TWT Chair, USC's Wetland Scientist, and several Board members actively participate in the Upper Susquehanna Conservation Alliance (USCA) and the Lake Plains/Prairie Peninsula bog turtle recovery unit meetings, which are led by the U.S. Fish and

Wildlife Service; they include a variety of agencies and NGOs who may offer valuable information on sites, mitigation techniques, and recovery strategies for rare species. TWT will support academic research through grants outside of the ILFP to develop further information and academic involvement in the mitigation process.

TWT already works closely with local land trusts such as The Finger Lakes Land Trust (TWT Chair is on the FLLT Land Committee), the Otsego Land Trust, and the Chemung Valley Conservancy (TWT Chair is on the CVC Board). Private landowners and energy companies may also be a source for potential mitigation sites.

At this time, although NY State is a member of the IRT it may not become a signatory of this Instrument. Current NYS freshwater wetland regulations limit the use of ILF for Article 24 wetlands. Thus, it remains for future modifications of this Instrument to address potential mitigation of wetlands regulated by NY State under Article 24 because at present that option is not available.

6.13 Long term protection and management strategies by the sponsor

TWT's long-term protection and management strategy is to own the sites as fee simple property. Every property in the program will be supported by an endowment investment that will provide long-term funding for future management actions. TWT, being a 501c(3) nonprofit will own the properties, tax exempt under section 420-a of the NY Real Property Tax Law.

Additional information under **Section 4. Default and Closure Provisions** describes the process of transferring the parcels to other land stewards such as NYS DEC should that issue arise. Should a site be developed that has the potential for a land steward other than TWT, then at that time TWT will propose to the IRT a specific approach (perpetual ownership, endowment, other issues) for approval that would be incorporated in the Site's mitigation plan.

6.14 Periodic evaluation

An annual review and report will ensure that goals and priorities are still valid. The review would include the following topics:

1. A copy of the reports required and submitted as part of the ILFP accounting as described in **Section 5. Financial and Credit Accounting Reporting Protocols**.
2. A review of research conducted by TWT, SUNY ESF, BU and other academic partners with regard to wetland communities, wetland diversity, rare species, wetland siting and other related

topics. This review will be used to develop an updated/enhanced/expanded ILF Compensation Planning Framework for review and approval by the IRT.

3. A review of the potential mitigation needs for each Service Area as gas development in NY is better defined.

Section 7. Advance Credits

Mitigation credits will be identified as Advance Credits or Released Credits. Advance Credits are made available before the ILF mitigation plans have been written or implemented and are allocated by service area (Table 4). Released Credits are generated from mitigation projects when performance measures and milestones have been achieved. These Released Credits are first used to retire any Advance Credits that have been sold within the same service area. If there are no advance credits outstanding, then Released Credits can be sold directly to permittees. Once previously sold Advance Credits have been fulfilled, an equal number of Advance Credits may be re-allocated to the sponsor for sale consistent with the Instrument. The number of Advance Credits available to the Sponsor at any given time to sell to permittees in a given service area is equal to the number of Advance Credits specified in the Instrument in Table 4, minus any that have already been sold but not yet fulfilled through released credits from mitigation sites.

The number of advance credits was determined based on several assumptions:

- Marcellus shale development impacts (largely pipelines from PA) would be greatest in the eastern three Susquehanna Service Areas and particularly in Service Area 2050101.
- Enough credits need to be available to accommodate projects other than gas development.
- Each mitigation site is closely planned, monitored and approved by the IRT; having a liberal amount of advance credits does not provide any less assurances for success as they will be developed over time and the IRT always has the ability to reduce the credit number.
- To the extent possible ILF sites will be developed as soon as is possible using TWT internal funds, if necessary, to ensure a minimal time lag. This concept was initiated in the Unadilla/Susquehanna Service Area.

Table 4. Advance Credits by Service Area.

Service Area Name (Area Hydrological Unit)	8-digit HUA	Size (acres)	Number of Advance	Cost for one credit
Unadilla/Susquehanna	02050101	1,286,275	56	**$91,580.00 (5% reduction in price for credit sales over 15 to one permittee)**
Tioughnioga/Chenango	02050102	1,027,924	24	
Cayuta/Catatonk/Owego	02050103	578,368	24	
Canisteo	02050104	455,957	10	
Cohocton/Chemung	02050105	659,586	14	
Mohawk	02020004	1,631,397	20	**$98,022.00 (5% reduction in price for credit sales over 15 to one permittee)**
Schoharie	02020005	391,852	20	
Schoharie - NYC	02020005	201,563	5	
Upper Delaware	02040101	283,289	6	
Upper Delaware -NYC	02040101	291,376	14	
Lower Genesee	04130002	683,224	8	
Upper Genesee	04130003	851,375	10	
Finger Lakes	04140201	2,213,707	18	
Oneida	04140202	957,947	20	
Oswego	04140203	92,822	6	
Hudson-Hoosic	02020003	822,202	10	**125,500 (5% reduction in price for credit sales over 15 to one permittee)**

The number of Advance Credits was determined based on the potential need for credits, being highest in the eastern service areas due a slighter greater population, the thicker Marcellus shale layers and the pending 30-inch Constitution Pipeline being planned for 2015 in the Unadilla/Susquehanna Service area. The USC is the major TWT partner who will implement some sites, working on about 5 sites in any one year. A total of 25 acres of wetlands per year is well within the capacity of the partners. The USC in the past two years has initiated or implemented four mitigation projects. It has reestablished/established and partnered in the implementation of 887 acres of voluntary wetland projects in the basin (USC Wetland database, Tioga SWCD, Owego).

7.1 Insuring ILF sustainability

TWT shall complete land acquisition and initial physical and biological improvements by the third full growing season after the sale of Advance Credits in compliance with 33CFR 332.8. The reason for this requirement is to reduce temporal loss of wetland functions on the Program's mitigation sites and this is why Mitigation Banks are the preferred mitigation type as they generally

mitigate before the impact. Indeed, as a result of climate change and associated increases in precipitation intensity the impacts of temporal wetland loss may be magnified in terms of their contribution to increased flooding severity and degradation of property (DeGaetano 2009).

If TWT fails to meet these deadlines, the district engineer must either make a determination that more time is needed to plan and implement an ILF project or, if doing so would not be in the public interest, direct TWT to disburse funds from the ILF Program "program account" to another mitigation provider to provide alternative compensatory mitigation to fulfill those compensation obligations.

TWT has developed several alternative compensatory mitigation approaches to address this time lag issue. Some have been incorporated into the Program's compensatory planning framework and others are proposals for the district engineer to consider to ensure timely implementation should the 3-year deadline become a looming issue that may not be met. To reduce or eliminate the time lag problem TWT has several approaches:

a) TWT focuses on developing sizeable ILF sites that provide for a larger number of credits before they are needed.

b) TWT begins the site selection process before credits are sold using TWT internal funding. TWT is using its own limited "rolling funding source" where it purchases and begins collecting information necessary for developing a mitigation plan for the site, then is reimbursed once credits are sold. The funds are then reinvested to develop another site. This is the ideal paradigm as wetlands are developed ahead of impacts and small credit sales that would otherwise be difficult to offset, due to limited funding availability, are no longer an issue. TWT fully realizes that there is no guarantee that the site will be approved by the IRT, but if it closely follows its scientific approach it believes this risk is worth the chance to reduce or eliminate the time lag issue inherently built into an ILF Program.

c) TWT may request district engineer approval that if there are sufficient funds available in a Service Area after excess credits have been generated in that Service Area those funds be temporally (or permanently) used to supplement an adjacent Service Area's site acquisition funds in order to establish ILF site(s) in adjacent Service Areas where only a small number of advanced credits have been sold. This approach would facilitate the mitigation of impacts in the same service area as impacts, even when those impacts are small in nature. The funding would be repaid as future credits are sold. This approach is a close to the original intent of the legislation.

As is in all cases the district engineer would approve the specifics of such a transaction. TWT will develop a request after year two where a small credit sale has occurred further to reduce the temporal lag in wetland functions.

Section 8. Fee Calculations

The cost of one credit was based on the analysis of developing 8 potential mitigation credits on a hypothetical 80 acres parcel, which we considered to be a realistic credit number and parcel size, with past ILF experience informing the parcel size and credit number could range from 10 to 160 acres and credits 5 to 40, respectively. TWT used a mix of cost considerations for establishing various mitigation types (re-establishment, establishment, rehabilitation, enhancement, and preservation) and had three wetland staff biologists develop independent estimates for comparisons and averaging. As additional service areas were added, TWT factored in costs difference due to location. Land prices, professional services charge rates, cost of travel, and accommodations are important variables TWT considered based on past knowledge and advice from staff and TWT Board members who live and work in the various service areas. The final credit price was developed with the underlying objective that the credit price was consistent with full cost accounting, where under reasonable expectations funds raised from a particular site's credit sales would cover the complete "build out" of the site, including final closure. The categories and costs listed in Table 5 are considered to be a consistent and comprehensive estimate.

Table 5. Details for developing the price of one mitigation credit. **CONFIDENTIAL**
Estimate is based on an assumed purchase of 80 acres that holds 8 credits worth of potential mitigation of any kind (re-establishment, establishment, rehabilitation, preservation and enhancement). Differences reflect regional costs.

Credit Component	Sub-component description	02050101-5	02020004,5 02040101 04130002,3 04140201,2,3	02020003
Land acquisition	Parcel(s) cost boundary survey closing costs/legal fees land acquisition/search	32,000	34,000	48,835
Project planning and design*	watershed planning wetland mitigation plan permits (SWPPP) SHPO Wetland delineation, VIBI	6,250	7,300	8500
Construction*	site layout construction equipment and labor erosion control planting	8,125	9,309	14,000
Plants and other materials*	plants and seeds erosion control supplies signs water well/data logger (2) herbicide applications	7,150	7,150	8500
Monitoring, based on 10 years and the resulting adaptive management activities*	annual monitoring surveys report writing	4,500	4,500	5000
	re-grading replanting erosion control	2,000	2,000	2200
Long-term management and protection	Stewardship long-term investment	10,000	10,000	10,000
	Conservation easement held by others	1,500	1,500	1,500
Contingency costs*	funds for unexpected occurrences	1,250	1,250	2,500
Program administration (15%)	tracking credits bookkeeping for ILF payroll audit/accounting office/supplies TWT/IRT negotiations	13,737	14,703	18,825
Financial assurances for TWT	Bond or equivalent	5,855	6,310	8140
TOTAL		91,580	98,022	125,500

Table 5. Details for developing the price of one mitigation credit.
Estimate is based on an assumed purchase of 80 acres that holds 8 credits worth of potential mitigation of any kind (re-establishment, establishment, rehabilitation, preservation and enhancement). Differences reflect regional costs.

Credit Component	Sub-component description	HUA 02050101-5	HUA 02020004,5 02040101 04130002,3 04140201,2,3	HUA 02020003
Land acquisition	Parcel(s) cost boundary survey closing costs/legal fees land acquisition/search			
Project planning and design*	watershed planning wetland mitigation plan permits (SWPPP) SHPO Wetland delineation, VIBI			
Construction*	site layout construction equipment and labor erosion control planting			
Plants and other materials*	plants and seeds erosion control supplies signs water well/data logger (2) herbicide applications			
Monitoring, based on 10 years and the resulting adaptive management activities*	annual monitoring surveys report writing			
	re-grading replanting erosion control			
Long-term management and protection	Stewardship long-term investment			
	Conservation easement held by others			
Contingency costs*	funds for unexpected occurrences			
Program administration (15%)	tracking credits bookkeeping for ILF payroll audit/accounting office/supplies TWT/IRT negotiations			
Financial assurances for TWT	Bond or equivalent			
TOTAL		91,580	98,022	125,500

Section 9. Credit Assurances Methodology

In an effort to more efficiently use mitigation funds TWT has developed an alternative assurance methodology referred to herein as the three-pronged approach. The three-pronged approach will provide ***sufficient credit replacement*** in the event of a default while adhering to the overall mission of the Wetland Trust to restore, conserve, and protect wetland biota, functions, and values. This three-pronged approach may be used as assurance for advance credits sold from a mitigation site, or the sponsor may, alternatively, propose traditional financial assurances for the entire site. Both options are designed to ensure a high level of confidence that the Program's "compensatory mitigation" will be successful. The preferred option will be selected on a case-by-case basis and submitted to the IRT for consideration during the mitigation plan approval process.

The three-pronged "alternative assurance" approach centers on the acquisition by TWT of "secondary" mitigation ***parcel***(s) for each "primary" mitigation parcel proposed by TWT and approved by the Corps and IRT. The secondary ***parcel***(s) will be sufficient in nature and size to be able to offset ***all of TWT's mitigation obligations*** of a primary parcel should the primary parcel fail or the program otherwise defaults on its mitigation obligations. Such potential offset provided by the secondary ***parcel(s)*** would be through ***preservation, rehabilitation and enhancement combined with sufficient establishment/reestablishment*** acres to achieve no net loss of wetland function and acreage in the service area. The secondary ***parcel(s)*** will be protected in perpetuity regardless of whether they are ever needed to offset failure or default on the primary parcel. However, the ***restoration*** activities on secondary ***parcel(s)*** (i.e., establishment, reestablishment, rehabilitation and enhancement) would be required to occur only if needed to fulfill mitigation obligations assumed by TWT should obligations at the primary parcel go unfulfilled. Restoration activities (rehabilitation/enhancement and establishment/reestablishment) at secondary mitigation parcels would be considered available for use continually in each Service Area compared with preservation acres that would be permanently set aside for assurance, which would be "one and done". The secondary acres set aside for restoration may be restored and sold for mitigation credits (at which time they would become a primary mitigation area, with an appropriate mitigation plan written) as long as additional acres are set aside, if needed. All assurance credits would be developed within the same service area as the wetland credits they insure and there will always be sufficient assurance credits available to offset all outstanding advance credits that have been sold. These credits can also be made available in the case where eminent domain reduces already released credits.

All assurance wetlands will be mapped using an approved jurisdictional determination and filed by TWT with USACE at the time of entering assurance ***parcel(s)*** into the ILF program. This information will be used as a baseline for calculating wetland credits should the secondary assurance ***parcel(s)*** be called on in the event that a) a default on the primary parcel, or b) the assurance ***parcel(s)*** become a primary mitigation site.

The assurance credits will be developed using all three prongs of a three-pronged approach:

9.1First prong: preservation of quality wetland acres

The core of the wetland assurance credits is based on the purchase and preservation of high quality wetlands owned in title and fee by The Wetland Trust and set aside explicitly for this purpose. These wetlands would:

- be initially purchased by a third party or TWT using private, non-federal, non-state or other non-governmental funds in each service area until funds from advance credit sales are available to reimburse said entities;
- funds used to initiate the program are exclusive of all state and federal pass through natural resource improvement dollars and will include no federal or state funds;
- credits generated by the secondary parcel will be determined by the IRT on a case-by-case basis following the same guidelines as used for primary parcels in Table 6;
- be protected by a conservation easement similar to the easement developed for a primary mitigation site and subject to approval by the Corps; and
- preservation acres would only be used once for assurance.

9.2Second prong: commitment by the USC to provide ***establishment/re-establishment*** on primary or secondary mitigation parcels in the event of site or program default to ensure no net loss of wetlands

A second layer of assurance is established by a commitment to construct by the Upper Susquehanna Coalition and its administrator, Tioga County SWCD* should TWT default (See signed Resolutions in Appendix E). More specifically:

- wetlands to be re-established, established, rehabilitated, and/or enhanced could be located either on parcels specifically purchased for assurance or within a primary parcel (although all restoration activities would generate assurance credits, only re-establishment and establishment

would count toward the no net loss requirement as they are the techniques that actually increase wetland acres)

- Sufficient acreage would be established/re-established to ensure that no net loss of wetlands in each service area occurred due to the operation of this instrument. The amount of acres needed in the event of program default would be the difference between the "Authorized impacts by acre and type" in the table "Reporting - Accounting by Permit Number" in Appendix B and the total acres re-established or established wetlands at the time of default, based on the total credits released from all site specific mitigation plans in that Service Area. Once that loss is covered, outstanding wetland credit assurances can be fulfilled using all mitigation types (establishment, re-establishment, enhancement, rehabilitation or preservation), with the allowable credit amount determined by the Corps on a site-by-site review.

9.3Third prong: Set aside funds to assist the USC in completing tasks described in 9.2

To provide a third layer of assurance, all advance credits sold will reserve 20% of required project completion costs (Project planning and design, plants and other materials, monitoring or adaptive management, contingency costs, and program administration in Table 5) in a separate account (named Financial Assurances for TWT) held and administered by TWT. These funds will be:

- transferred to the USC's administrative lead, Tioga County SWCD, or an alternative entity approved by the District Engineer(s), in the event of a TWT default or site failure and used to support efforts in 9.2 under the approval of the District Engineer; or
- used by TWT in the service area where funds were generated once sufficient sites have been developed that cover all advance credits and there have been two consecutive years where the ILF site(s) intended to fulfill the advance credits sold have met all success criteria as defined in their mitigation plans. The financial assurance determination to release any amount of funds is at the discretion of the District Engineer(s) in consultation with the IRT.

The Upper Susquehanna Coalition (USC) of Soil and Water Conservation Districts works under a Memorandum of Understanding (MOU) signed by each County District that is within the Susquehanna River Basin in NY as well the NY State Department of Agriculture and Markets. The authority to make this Understanding is found under NY Soil and Water Conservation Districts Law, as Amended Through the Laws of 2004 as of November 17, 2004, The law states "AN ACT establishing the State Soil and Water Conservation Committee, and creating Soil and Water Conservation Districts, constituting chapter nine-b of the consolidated laws: **§ 10 Cooperation between districts - The directors of any two or more districts organized under the provisions of this chapter may cooperate with one another in the exercise of any or all powers conferred in this chapter."*

The MOU further assigns and directs the Tioga Soil and Water Conservation District, 183 Corporate Drive, Owego, NY 13827 to be the administrator the USC. Tioga SWCD also owns the construction equipment and employs technical staff who make up the USC Wetland Team.

Section 10. Credit Calculations

The ILFP will generate credits based on the net increase in benefits to aquatic resources at sites that meets or exceeds its Mitigation Plan success criteria. The IRT will determine credit ratios based on Table 6 during the final review of each site's Mitigation Plan, including:

- determination of an adequate buffer of at least 50 meters, where credit production may be reduced;
- modified by a sliding scale of quality based on the assessment of functions and services on a site-by-site basis; and
- the IRT using its assessment tool, when it becomes available.

Table 6. Credit Schedule for Developing One Mitigation Credit, Valid for All Service Areas.

Credits	Proposed Ratio
Wetland Re-establishment: Acres to generate 1 credit.	Up to 1:1
Wetland Establishment: Acres to generate 1 credit.	Up to 1:1
Wetland Rehabilitation or Enhancement: Acres to generate 1 credit.	3:1 to 10:1
Wetland Preservation: Acres to generate 1 credit	10:1 to 20:1
Upland Buffer Preservation: Acres to generate 1 credit	15:1
Upland Buffer Re-establishment or establishment: Acres to generate 1 credit	4:1 to 15:1

Section 11. Program Accounting Information

11.1Provide an acceptable FDIC program account

The ILFP Account will have a separate checking account for each service area established by TWT at a bank that is a member of the Federal Deposit Insurance Corporation (FDIC). Each will be named "Susquehanna Basin Headwaters and Adjacent Basins In-Lieu Fee Instrument, Service Area X ~~1,2,3,4, 5,6,7,8,9,10,11, 12, 13, 14, or 15~~" where X represents a service area number from 1 through 15. Each ILF site will have a separate budget within the account, with sufficient specificity to track cost items (i.e., property purchase, construction, plant materials, etc.), as shown below. These checking account(s) will be separate and different from other TWT accounts.

Once a project is implemented the budget will stay open to track the long-term items such as monitoring, adaptive management, and financial assurances and will not be closed until all of the credits that are available from that site are released. Each credit or portion of a credit sold to support the site will have its original funds dispersed based on Table 6 and tracked by a Project Budget for that ILFP Site as shown below. Funds remaining once the District Engineer has released all credits at a site will remain in the service area account for continued program development and dispersed, with Corps approval, for additional tasks depicted in one or more of the project component categories described Table 6. Any and all interest and other funds accruing in the account will be used to provide compensatory mitigation for impacts to aquatic resources in the same service area from which the credits were sold.

11.2Financial accounting

Reporting requirements for financial reporting are described in **Section 5. Financial and Credit Accounting Reporting Protocols**. The ILF Program account will track funds accepted from permittees separately from those accepted from other entities and for other purposes (i.e., fees arising out of an enforcement action, such as supplemental environmental projects). The program account will be established after this instrument is approved and before any fees are accepted.

If the Corps determines that The Wetland Trust is failing to provide compensatory mitigation by the third full growing season after the first advance credit is secured, the Corps may direct the funds to be turned over to other mitigation providers. Additional information on failure to fulfill the terms of the instrument is discussed in **Section 4. Program Default and Closure Provisions**.

The Corps has the authority to audit the program account records at any time.

Funds paid into the ILF Program account may only be used for the direct replacement and management of aquatic resources. This means the selection, design, acquisition (i.e., appraisals, surveys, abstracts, filing fees, title insurance, etc.), implementation, and management (of the entire project parcel and the mitigation site within) of in-lieu fee compensatory mitigation projects. This may include fees associated with securing a permit for conducting mitigation activities, activities related to the restoration, enhancement, creation and preservation of aquatic resources, maintenance and monitoring of project parcels and the mitigation sites they contain.

Fifteen percent of all fees paid into the ILF Program will be set aside used for administrative costs. Such costs include bank charges associated with the establishment and operation of the program, staff time for carrying out program responsibilities, expenses for day to day management of the program, such as ILP reporting to the Corps, bookkeeping, audits, mailing expenses, printing, office supplies, computer hardware or software, training, travel, and hiring private contractors, and office space.

11.3 Credit accounting

The Wetland Trust shall establish and maintain an annual report ledger that tracks the production of released credits for its ILF Program and for each individual in-lieu fee project. Reporting requirements for the annual report ledger are described in **Section 5. Financial and Credit Accounting Reporting Protocols** and Appendix B. On the income side, TWT shall track the fees and all other income received, the source of the income (i.e., state or local permitted impact, state or local resolution of violations, etc.), and any interest earned by the program account. The ledgers shall also include a list of all the permits for which in-lieu fee program funds were accepted, including the appropriate Corps permit number, the service area in which the specific authorized impacts are located, the amount (acreage) of authorized impacts, the aquatic resource type impacted by Cowardin class, the amount of compensatory mitigation required, the amount paid to the in-lieu fee program for each of the authorized impacts, and the date the funds were received from the permittee. TWT shall establish and maintain a report ledger for the ILF Program that will track all program disbursements/ expenditures and the nature of the disbursement (i.e., costs of land acquisition, planning, construction, monitoring, maintenance, contingencies, adaptive

management, and administration).

TWT will also track funds by cost category. The ledger (Appendix B) shall also include, for each project, the permit numbers for which the in-lieu site is being used to offset compensatory mitigation requirements, the service area in which the project is located, the amount of compensation being provided by method (i.e., re-establishment, establishment, rehabilitation, preservation and enhancement), the aquatic resource type(s) represented (e.g., Cowardin class, forested/non forested, vernal pools), the amount of compensatory mitigation being provided in acres and the number of credits certified by the IRT. The annual report ledger shall also include a balance of advance credits and released credits at the end of the report period for each service area.

Section 12. ILF Project Site Closure Specifications

A specific mitigation will be closed after meeting requirements of its site-specific mitigation plan, including:

- all applicable performance measures have been achieved;
- all available credits for that site have been sold, debited or otherwise been extinguished;
- the Sponsor has prepared a Long-Term Management and Maintenance Plan, that has been approved by the IRT;
- the Sponsor has prepared and submitted to the IRT and the appropriate locality a GIS shapefile or similar exhibit depicting the location and extent of project site contained within the ILF Program;
- the Sponsor has either: (i) assumed responsibilities for accomplishing the Long-Term Management and Maintenance Plan, in which case the Sponsor will fulfill the role of Long-Term Manager, or (ii) has assigned those responsibilities to another Long-Term Manager;
- the stewardship endowment has been funded and its contents have been transferred to the Long-Term Manager, if it is not the Sponsor
- the Sponsor has complied with all other terms of the Instrument.

Upon ILF closure, no further credit transfer may occur and the period of long-term ownership and preservation will commence. The IRT will issue a written certification of satisfaction to the Sponsor

and to the escrow agent (if there is one) who is holding any assurance "bonding" deposits. Thereafter any remaining funds will be released to the Sponsor for use in that Service Area on any and all tasks that are sanctioned under this Instrument.

Section 13. Transfer of Long-Term Management Responsibilities

The long-term manager for each mitigation site will be identified at the time that the site is proposed to the IRT. TWT fully intends to be the fee simple owner and long-term manager of all mitigation properties. However, should TWT choose to transfer the responsibilities for long-term management to another long-term steward TWT it must first seek Corps approval in writing. The Corps must also be given the option of being a signatory to any contract or other arrangement assigning the rights and delegating the responsibilities to the steward.

Transfer of long-term stewardship responsibilities for any site shall not occur until after performance standards have been achieved and all Released Credits have been sold. Once long-term management has been transferred to a land stewardship entity, said party is thereby responsible for meeting any and all long-term management responsibilities outlined in the project-specific mitigation plan.

If a transfer occurs, TWT shall transfer long-term management responsibilities to a "land stewardship entity, such as a public agency or non-governmental organization." The most likely entities to receive long-term stewardship responsibilities in the event of a transfer are the NYS DEC, the Finger Lakes Land Trust, other local land trusts, the USC or one of the 16 County Soil and Water Conservation Districts USC members that cover the region. Until such time as long-term management responsibilities are transferred to another party, TWT will be considered responsible for all long- term management of the mitigation project. If long-term stewardship responsibilities are transferred to another land stewardship entity, TWT shall also transfer the long-term management funds for that account or otherwise arrange for disbursements from such an account to be accessible to the land steward.

Section 14. Financial Arrangements for Long-Term Management

Financial arrangements will be specified in each site's mitigation plan. TWT fully intends to be the fee simple owner and long-term manager of all mitigation properties. All long-term management funds will be deposited in a separate account from the project implementation account and will be clearly named "Long Term Management Account". This section will include an outline of anticipated long-term expenses, and the method by which TWT will provide funding in perpetuity for those expenses, and the timeline for establishing those assurance funds. Assurance options including a traditional stewardship endowment in a secure investment, but may include other assurance methods, only as approved by the DE acting in consultation with the IRT.

Section 15. Signatures

James Cristoto — Chair — 2 Sept 2015
The Wetland Trust — Title — Date

for Diane C. Kozlowski — Chief, Regulatory Br. — 6 Oct 2015
District Engineer, USACE LRB District — Title — Date

for Christopher J. Gallery — Acting Chief, Regulatory Branch — OCT 30 2015
District Engineer, USACE NAN District — Title — Date

US Fish and Wildlife Service — Title — Date

US Environmental Protection Agency Region 2 — Title — Date

NY State Department of Environmental Conservation — Title — Date

Jeffrey C. Parker — chair — 9/8/15
Upper Susquehanna Coalition — Title — Date

Dale N. Weston — chair — 9/16/15
Tioga County Soil and Water Conservation District — Title — Date

Section 15. Signatures:

Program sponsor	Title	Date
District Engineer, USACE Engineers LRB District	Title	Date
District Engineer, USACE Engineers NAN District	Title	Date
US Fish and Wildlife Service	Title	Date
US Environmental Protection Agency Region 2	Title	Date
NY State Department of Environmental Conservation	Title	Date
Upper Susquehanna Coalition	Title	Date

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Appendix A: Susquehanna Basin Headwaters and Adjacent Basins In-Lieu Fee Program: Credit Transaction Form

Credit Transaction Form
TWT Service Area: _____

Project Name:
US Army Corps Permit Number:

Permittee:
name:
address:
telephone:
fax:
email:

Impacted 8 digit HU:
Acres impacted:
Resource type impacted:

Number of Credits purchased:

Date:

By:

Title:

_____
The Wetland Trust

Sponsor: The Wetland Trust, 4729 State Route 414, Burdett, NY 14818, phone/fax 607-546-2528
www.thewetlandtrust.org

Appendix B: Susquehanna Basin Headwaters and Adjacent Basins In-Lieu Fee Program: Annual Program Report

Annual Program Report

1 January through 31 December _____

Annual Reporting Table 1

Reporting - General							
Service Area	Income Received	Disbursements	Interest Earned	Advanced Credits Available[1]	Advanced Credits Sold	Advanced Credits Fulfilled	Released Credits Remaining
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
Total							

[1]Explain any changes in credit availability such as change in the number of credits developed at a specific ILF site.

Annual Reporting Table 2

Reporting - Accounting by Expenditure Category For Each Service Area (SA)																
Expenditure	SA 1	SA 2	SA 3	SA 4	SA 5	SA 6	SA 7	SA 8	SA 9	SA 10	SA 11	SA 12	SA 13	SA 14	SA 15	Program Total
Land acquisition																
Planning/design																
Construction																
Plants and other materials																
Monitoring and adaptive management																
Long-term management and protection																
Contingencies																
Financial assurances																
Administration																
Total																

Annual Reporting Table 3

Reporting - Accounting by Permit Number					
USACE Permit Number	Service Area[1]	Authorized Impacts by Acre and Type[2]	Compensatory Mitigation by Credit[3]	Amount Paid	Date Funds Received

[1] if Impact is not in the same Service Area as Compensation, make note
[2]PEM, PSS, PFO or Other, describe (e.g., fen, bog)
[3] an In-Lieu Fee Credit always equals an acre in this program

Annual Reporting Table 4

Project Budget for each ILFP Site			
Service Area:			
Project Site name and number:			
Income: (list by permit number, date and total funds deposited)			
Project Component	Expense	Budget	Balance
Land acquisition			
Project plan and design			
Construction			
Plants and other materials			
Labor			
Monitoring, based on the number of years planned			
Remediation/adaptive management and contingency costs			
Program administration			
Long-term management and preservation: stewardship endowment			
Financial assurances			
Third party easement			
TOTAL			

Annual Reporting Table 5

Service Area *X*, *Site Name* - Assurance Credits Qualifications and Credits Generated Checklist							
Assurance Site	Owned Fee Simple by TWT (demark X when complete)	US ACE Site Visit (date)	Pre-JD Approved (date)	CE Filed (date)	Site Design and Assurance Credits Approved (date)	Total Assurance Credits	Reestablishment /establishment acres available in Assurance Credit total to address no net loss
Site example	x	*05/15/2014*	*06/25/2014*	*09/25/2014*	*09/20/2014*	*0.467*	*0.1*
					Total Assurance Credits Available	*0.467*	*0.1*
Total outstanding credits sold: must be equal to or less than Total Assurance Credits Available - blue cell above.							0.0
Total wetland acres impacted and mitigated by this Site: from Table 3, **Reporting – Accounting by Permit Number**, column 3, "Authorized impacts by acre and type." This number must be equal or less than green cell above.							0.0

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www.thewetlandtrust.org

Appendix C: Computer modeling protocols for site selection in the Susquehanna Basin Headwaters and Adjacent Basins

A) Executive Summary:

We have implemented a comprehensive site selection protocol that remotely identifies and sets wetland mitigation priorities within the Susquehanna Basin Headwaters and Adjacent Basins. A more technical account of our mitigation site identification tools and their performance was published in the peer-reviewed Journal *Wetlands* as described in Hunter et al. (2012). Here we provide an overview of the methodology, but encourage readers interested in reviewing a detailed assessment of the procedure's performance to review Hunter et al. (2012). These tools help find sites in areas with the best potential to support high quality wetlands for establishment, reestablishment, rehabilitation, enhancement, and/or preservation. They complement and focus the more informative field assessments on the best potential mitigation sites, thus improving their quality compared to those found in the more traditional approaches.

Our site selection approach has three main components:

1) identify and map wetland occurrences and community types (extant and previously impacted) using geo-statistical modeling and available data describing wetland locations;
2) augment databases from step 1 with other available datasets describing wetland quality (e.g., presence of rare and endangered species and communities, site assessments); and
3) rank wetlands (extant and drained) from step 2 according to the best available information related to wetland quality and function.

Using extensive validation measures, our approach outperforms existing computer selection methods for detection of areas suitable for mitigation, and does so for all ILF Program service areas. This approach identifies biologically rare communities (e.g., inland salt marsh, bogs, poor, medium, rich, and marl fens) that either provide, or could provide refuge for rare and underrepresented species – an endeavor that furthers organizational objectives for many governmental agencies in our focal region (e.g., US Fish and Wildlife, NYS-Dept. of Environmental Conservation). In the following sections, we describe the general methods utilized for the modeling procedure, and provide an overview of the "patch" ranking system for targeting restoration and protection of large landscapes containing rare communities with high capacity to support biodiversity. Using the procedures described below to develop this database, we will target the top 20% highest ranked priorities in the Susquehanna Basin Headwaters and Adjacent Basins for establishment, reestablishment, rehabilitation, enhancement and/or preservation. The overall goal of this approach is to: identify priority locations for wetland restoration activities that improve watershed functioning, habitat connectivity, and biodiversity value. ***We note that this ranking system was explicitly designed to be flexible and to meet watershed specific functional and biological needs. The approach may be updated over time as better site-level information becomes available, or altered with different criteria better meet certain objectives.***

B) The need for improved site selection protocol

Compensatory mitigation frameworks many times lack the scientific rigor required to develop biologically sound watershed-level restoration plans required to identify mitigation priorities. Particularly the identification of focal areas for mitigation has been haphazard, often relying on a combination of parcels that are for sale at the time of mitigation need and an ensuing review of soils

maps and aerial photographs. This approach fails to identify and prioritize mitigation projects that maximize hydrological functionality and biodiversity conservation because it does not consider the entire watershed. To overcome these limitations, we collaborated with researchers at SUNY-ESF, to implement an improved site selection protocol that remotely identifies and sets comprehensive wetland mitigation priorities within many basins in New York and northern Pennsylvania.

C) Model Development and Validation

We used GIS layers in the program Maxent (maximum-entropy modeling) to systematically identify features of interest (previously drained wetland areas and rare community types) for protection and restoration efforts. It was chosen due to its superior prediction capabilities compared to other approaches (Elith et al. 2006). We used seven background environmental variables: elevation, slope, aspect, geology (rock types), topographic wetness index, vegetation height, and soil type to predict locations for features of interest (Table 1). SSURGO soils were reclassified into general soil classes more useful for prediction as described in Hunter et al. (2012) and Raney (2014), provided in Table 2. Together, these variables are used to train the model to find additional "features of interest" such as poorly drained forested wetlands or rare, rich fen wetland communities (Figure 1). Occurrence records to model rare communities were taken from acidic designations in existing National Wetlands Inventory and data from the New York Natural Heritage Program element occurrence database (bogs, poor fens, medium fens, rich fens, marl fens, and inland salt marsh) (NYNHP 2013).

We combined features identified by validated models with known wetland occurrences from NWI to create a comprehensive database of potential mitigation sites, hereafter "patches". Using this database we developed a flexible "patch" ranking system that can be utilized to meet a range of wetland mitigation goals depending on specific needs in a given watershed. This large database can be updated over time as more site-level information becomes available.

Model output produced goodness-of-fit statistics, and models were validated using the correct classification rate for known wetland areas. The rationale for statistical model validation using known wetlands to test model precision and accuracy is as follows: the same underlying environmental conditions that produced extant wetlands also produced the original wetlands that are now drained (e.g., geology, low slopes, hydric soils), thus as a comprehensive statistical model validation measure, modeled "wet" areas should include extant wetlands (here, National Wetlands Inventory) if the procedure is viable. This type of remote statistical model validation is common in the peer reviewed scientific literature, and allows for more robust "Verification" than would be feasible based on field visitation alone. Dozens of predicted sites have been visited by Upper Susquehanna Coalition staff, and generally conform to wetland areas or impacted wetlands.

For comparison with the Maxent modeling procedure, we also created a *hydric soils, low slope model*, which we called the "*Expert Model*". The expert model was designed to mimic the search procedure wetland planners use to select mitigation sites: *typically planners sift through hydric soils and topographic maps to identify areas with appropriate soils and hydrology for wetland restoration.* Expert model patches were created using areas with low slopes (< 1%) and soils high in organic content (muck, silt loam, and loam), which largely represent designated hydric soils (NRCS 2010) for the area.

Maxent outperformed the expert model in a test using an independent sample of known wetlands, predicting wetland locations with a 91% correct classification rate versus 62% for the expert

model. Furthermore, compared to simple aerial photo interpretation, site visitation, and NWI comparison, Maxent could consistently and clearly locate quality sites. We demonstrate this ability for mitigation site selection in Figures 2A, B, C, and D. Furthermore, this procedure allowed us to perform a thorough analysis of our ILF Program region.

Table 1 Source of environmental variables used in Maxent analyses. All datum units were converted to UTM. (Table reproduced with Permission from Raney 2014).

Variable	Source	Scale or Resolution	Original Datum	Original Units
Elevation (DEM)	National Elevation Dataset (Gesch 2007)	30 m^2	NAD 83	Meters
Slope	Calculated from DEM in ArcGIS	30 m^2	NAD 83	Percent
Bedrock Types	USGS (Nicholson et al. 2006, updated from Fisher 1970)	1:2,500,000	WGS 84	Categorical
Aspect	Calculated from DEM in ArcGIS	30 m^2	NAD 83	Degrees
Vegetation Height	National Biomass and Carbon Dataset for the Year 2000 (Kellendorfer et al. 2004)	30 m^2	NAD 83	Meters
Soils	SSURGO (NRCS 2010)	Various, typically 1:24,000	NAD 83	Meters
Topographic Wetness Index	Derived following (Beven and Kirkby 1979)	30 m^2	NAD 83	Index

Table 2 Description of soil categories used to model rare wetland community locations and poorly drained areas in the USRB and adjacent watersheds. Each row contains an individual soil classification. Data were reclassified following techniques described by Hunter et al. (2012), and is described in further detail by Raney (2014).

Soil Classes
Alluvial
Boulders
Clay
Cobbly loam
Dam
Gravelly sand & loam
Loams: loam, sandy loam, silty loam
Marl
Marl pits
Marsh
Muck: muck, mucky silt loam, mucky peat
Peat
Poorly drained
Rock outcrop
Salt dumps
Sand beach
Sandy gravelly loam
Silty clay loam, silty clay
Steep
Stony
Rocky loams: Stony silt loam, shaly silt loam, stony loam
Urban: rubble-land, made land, quarries
Water

Acknowledgements: Elizabeth A. Hunter performed the initial model development for the Upper Susquehanna River Basin (USRB) and she contributed Figure 1. Dr. Patrick A. Raney contributed several data layers and modeled the USRB and adjacent watersheds as a single region. We thank Drs. James. P. Gibbs and Donald J. Leopold for their contributions to an earlier portion of this work.

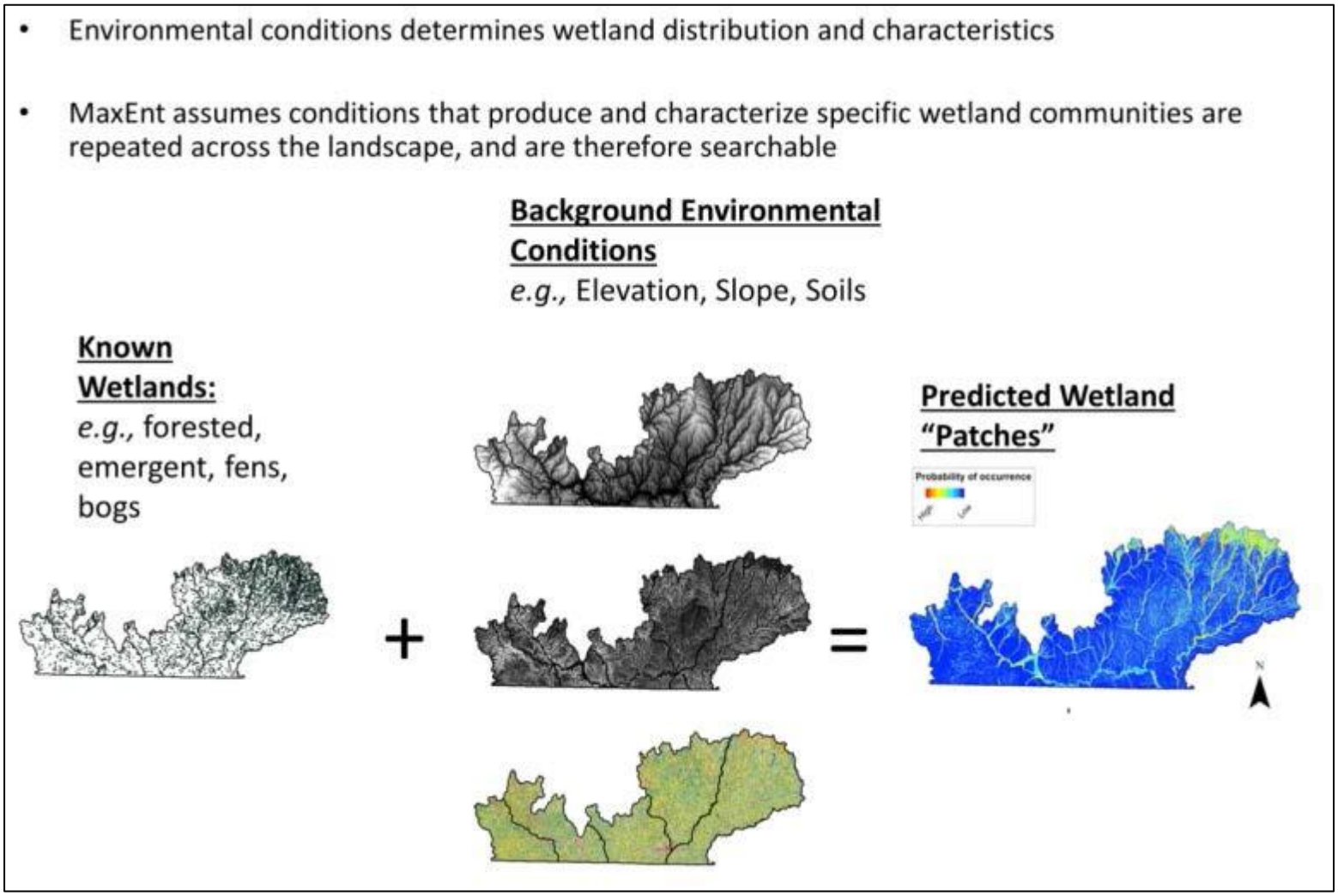


Figure 1: Description of how spatial modeling works when using Maxent, and other models types.

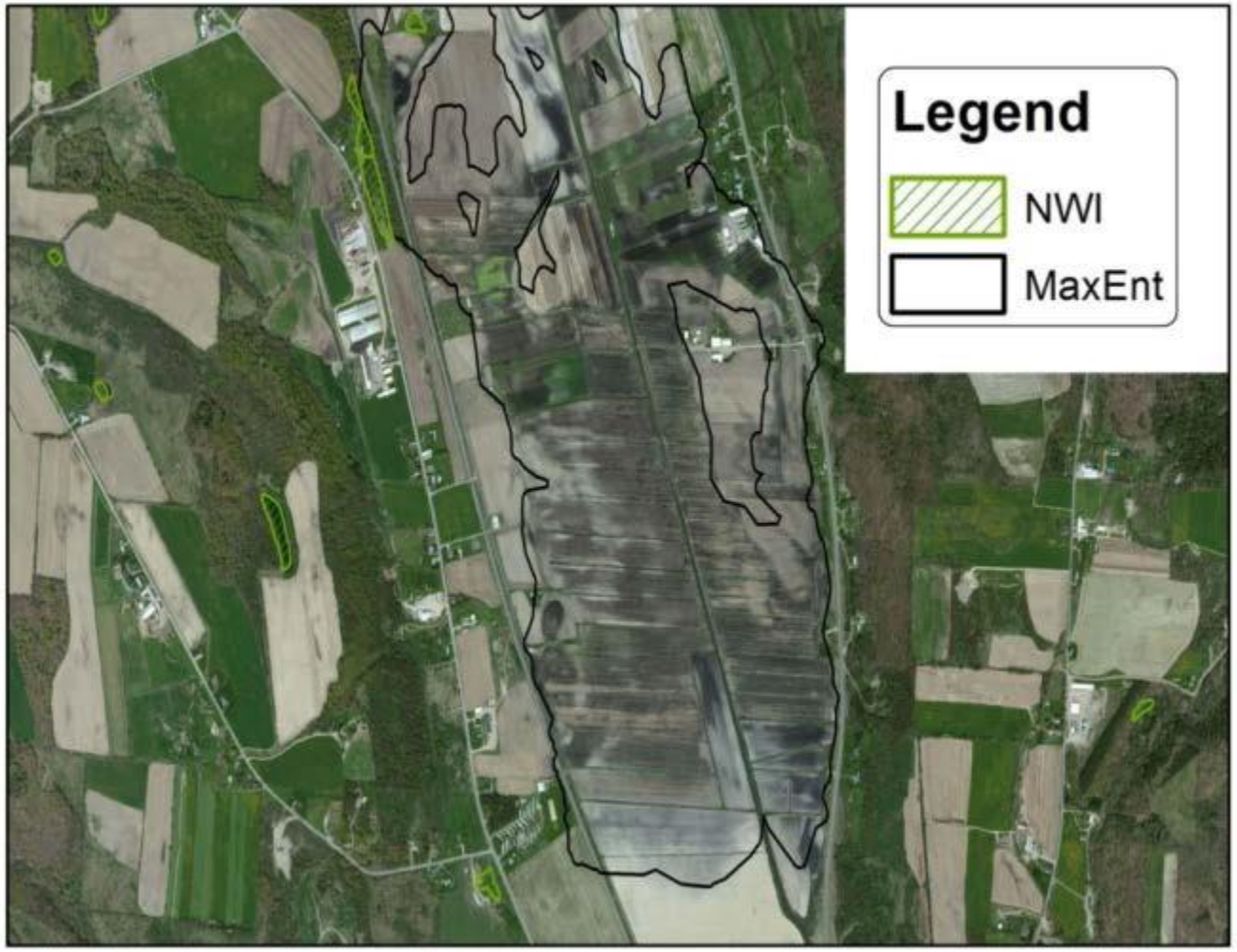


Figure 2-A: Maxent (black outline) clearly identifies more area than NWI (dashed green). Example includes a large drained muckland with visible ditching.

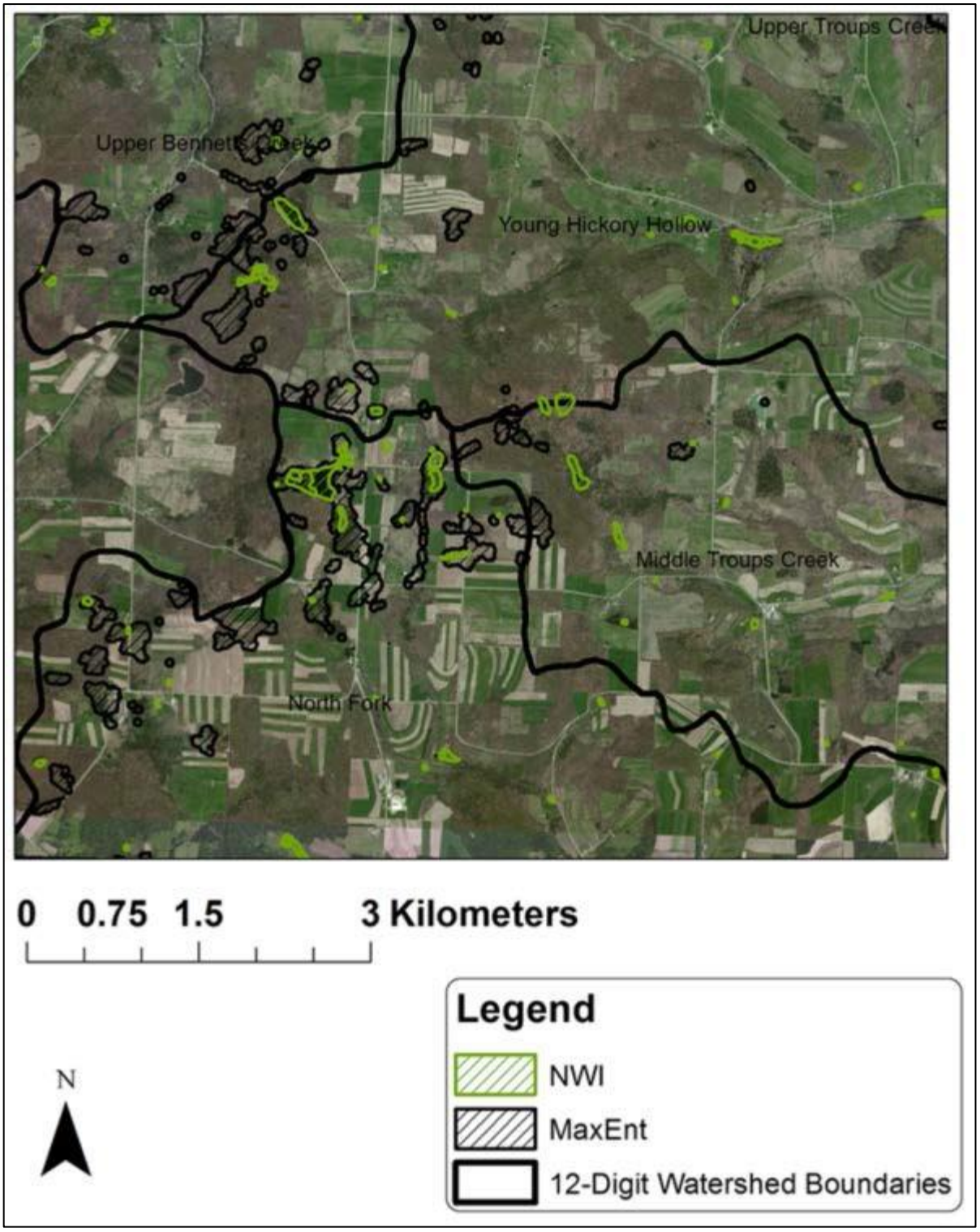


Figure 2-B: Maxent identifies restoration targets in areas lacking many wetlands.

Figure 2-C: Maxent identifies rare communities. Here a medium fen historically supporting rare species is shown.

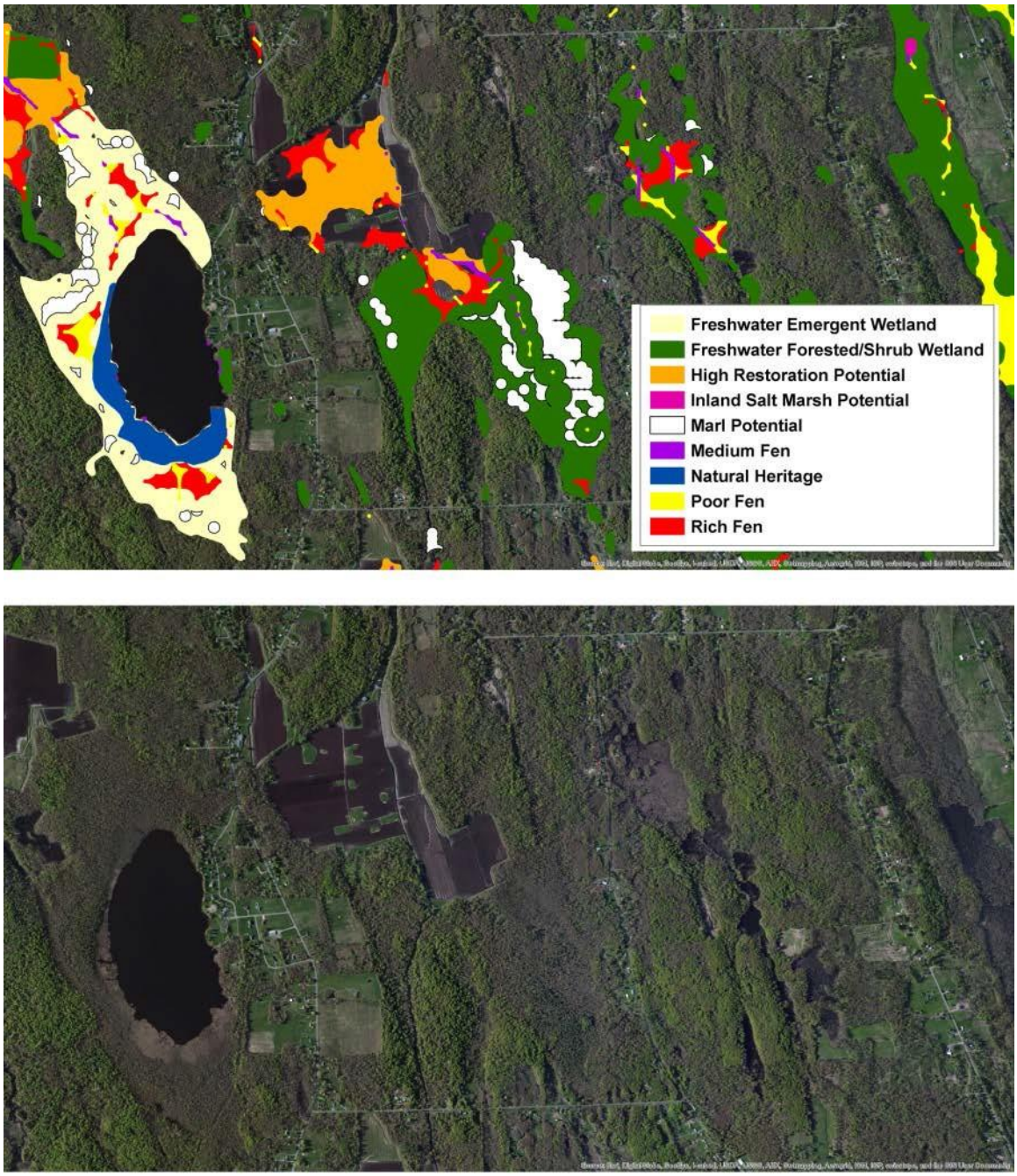


Figure 2-D: Maxent identifies rare communities for protection and adjacent areas suitable for reestablishment, rehabilitation, and enhancement. Here, Silver Lake bog (a medium fen) is shown with nearby mucklands offering excellent reestablishment opportunities. This region has been a previous target for conservation acquisition. Maxent models identified potential for marl and inland salt marsh in this vicinity – two of New York States rarest ecological communities. Areas in orange show locations identified by a model focusing on the identification of human impacted wetlands.

D) Ranking Procedure for Potential Mitigation Sites

For the purpose of prioritizing potential mitigation areas, we combined model outputs with NWI wetland occurrences and Natural Heritage community occurrence records to produce comprehensive coverages of wetland resources for the region. This approach effectively augmented NWI databases with wetland occurrences omitted by NWI, previously drained wetlands, and rare community designations (inland salt marsh, bogs, poor, medium, rich, and marl fens). This approach advantageously allowed for potential mitigation areas to be systematically compared and ranked in terms of potential to support biodiversity and watershed functioning using simple parameters with strong ecological underpinnings.

Our ranking approach is tailored to the varying needs in specific watersheds, and will be modified through time as more information becomes available, or as priorities shift. Below we provide an overview of our patch ranking, which favors a combination of establishment, reestablishment, rehabilitation, enhancement, and/or preservation of large areas with a diversity of wetland communities under a variety of cover types (emergent, scrub-shrub, forested wetlands). These quantitative patch ranking can be tailored to meet project and watershed specific goals and comprehensively identify the best places to work to meet certain objectives.

Patches were ranked according to the following criteria:

- normalized wetland area (A)
- normalized wetland complex area (B)
- designation as significant natural community(C), and
- presence of endangered species (D)

These criteria were chosen due to their direct connection to biodiversity and ecological functioning (e.g., MacArthur and Wilson 1963, Edinger et al. 2002). Variables were normalized and divided by respective maximum values to produce indices on 0-1 scales for summation. Normalization accounted for differences in maximum wetland size by service area. *Rare communities received a *C* value of 0.75 (all other wetlands received 0). The following formula was used for patch ranking:

$$= A+B+C+D/ \text{Max}(A+B+C+D)$$

**As modeling focused on hydrogeologic settings (unique soil conditions) fens in this scheme encompassed a variety of successional stages (from emergent to scrub shrub to forested), therefore not biasing mitigation towards a single successional type. Plant ecologists are increasingly expressing wetland communities in terms of source hydrology, and are less focused on the form of vegetation (forested vs. emergent) thus North American wetlands with mineral rich groundwater discharge are referred to as fens regardless of presence of a tree canopy cover (Bedford and Godwin 2003).*

E) Potential Mitigation Site Ranking Procedure Results

To test the efficacy of the patch based ranking, we calculated the average ranking for all patches, and for the seventy New York Natural Heritage Program wetland occurrences falling within the entire ILF Program region (NYNHP 2013). On a scale of

0 to 1 all patches averaged 0.31 (± 0.30 SD) while Heritage sites were averaged 0.74 (± 0.38 SD), a dramatic difference (Figure 3). Eighty-six percent of the NYNHP sites larger than ten acres in size ranked in the top 20% of sites over the entire ILF Program region, indicating this method possesses the ability to identify biologically important sites, see also (Hunter et al. 2012). Sites in the upper 20% of sites also included those with endangered species, large wetlands >200 acres, rare community types, and related reestablishment opportunities.

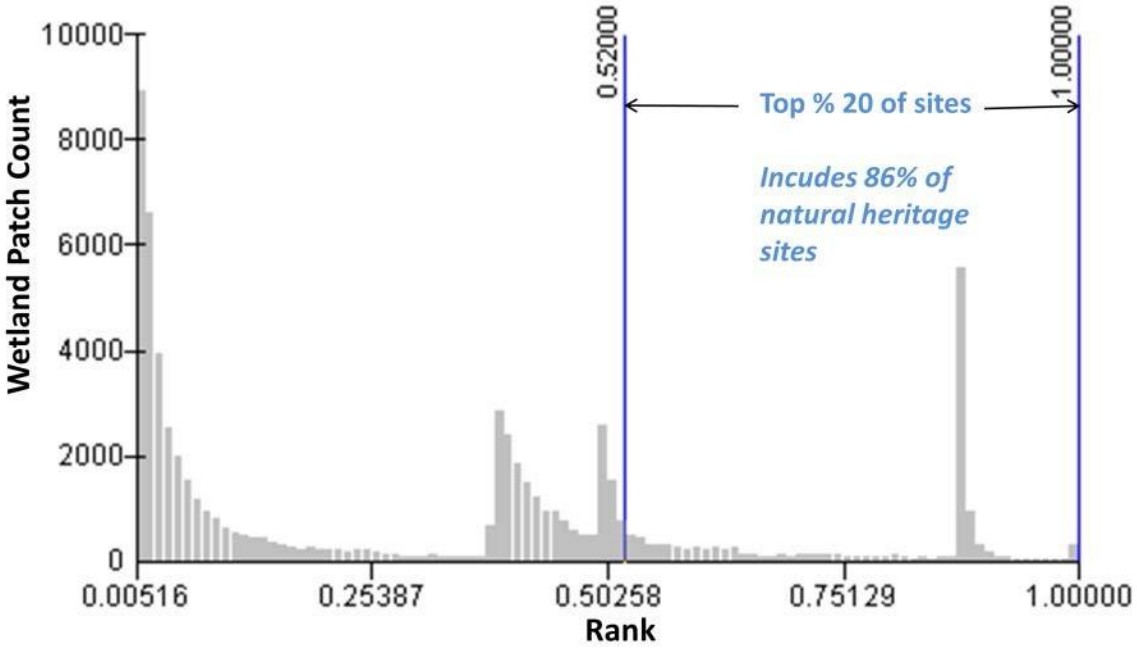
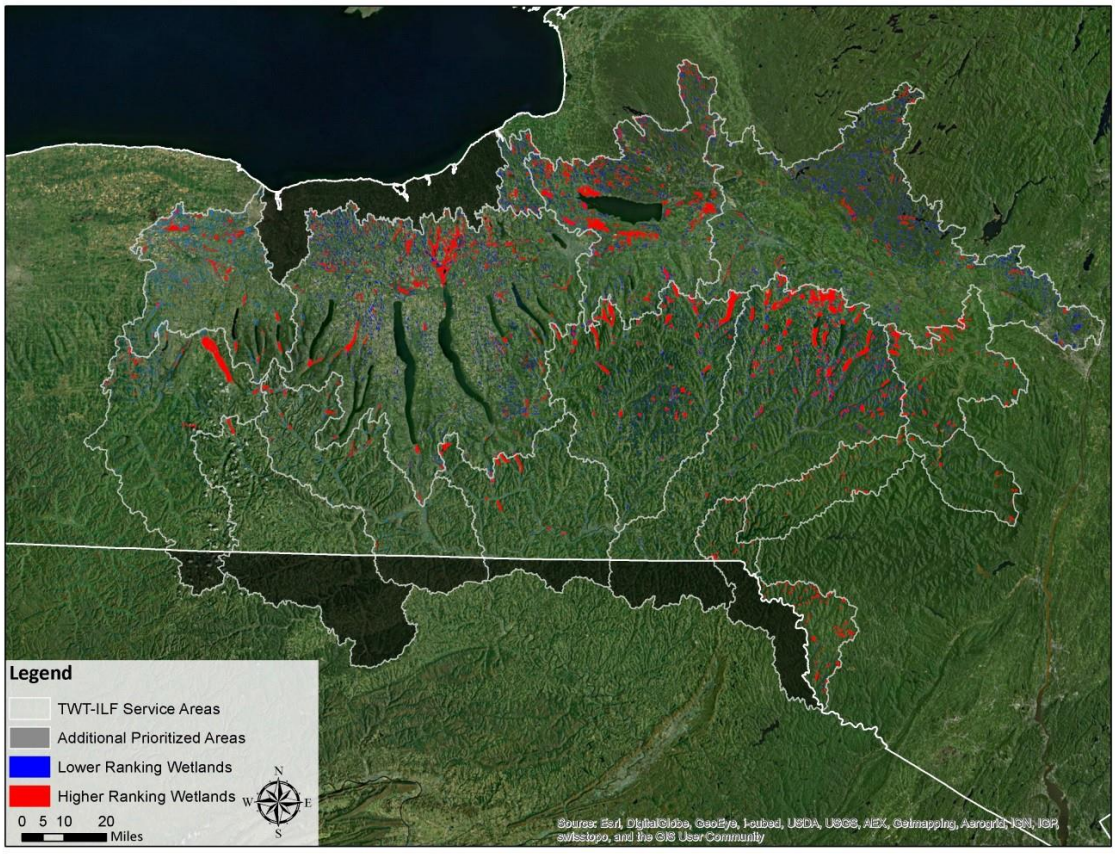


Figure 3: Histogram of patch ranks for the Susquehanna Basin Headwaters and Adjacent Basins (N=68,547).

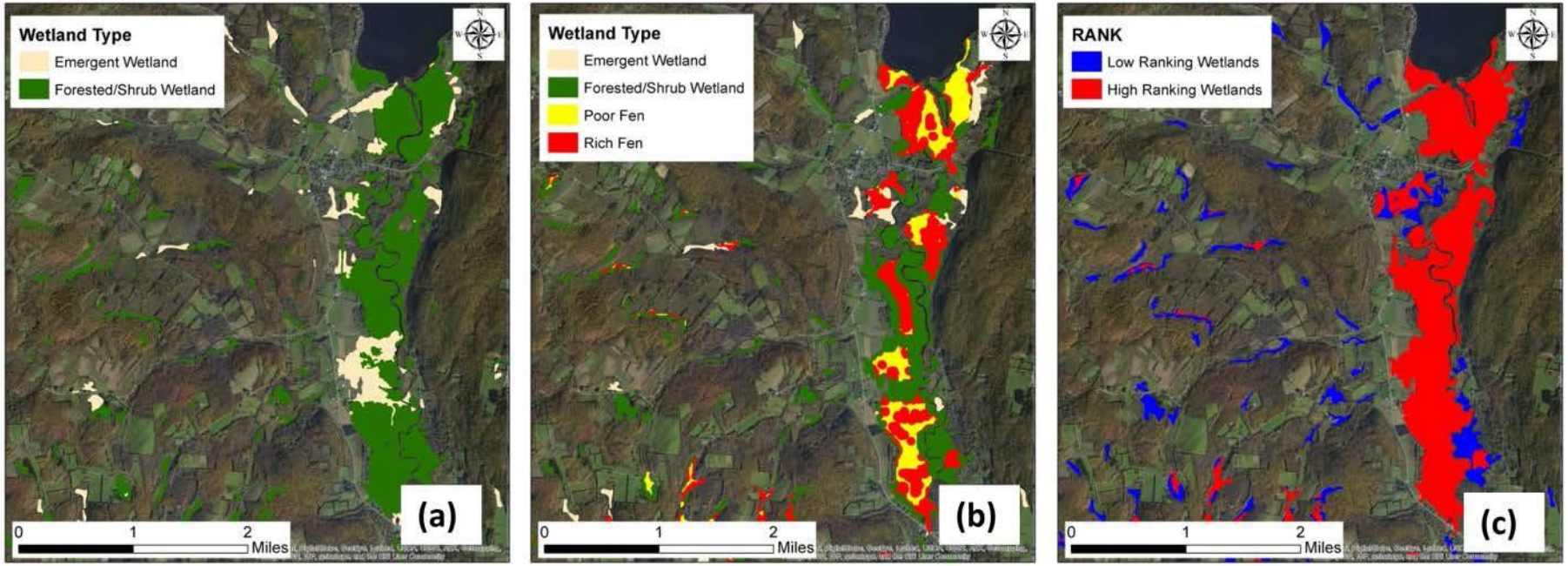
F) Mapping: Upper Susquehanna River and Adjacent Basins Priority Mitigation Areas

In this section, we provide overview maps of our target areas for the Susquehanna Basin Headwaters and Adjacent Basins including highlighting differences between TWT databases and National Wetlands Inventory (NWI). We provide examples of potential sites within individual service areas (8-Digit HUAs). Maps depict the top 20% of potential mitigation sites within that Service Area and examples of specific sites for the ILF program.

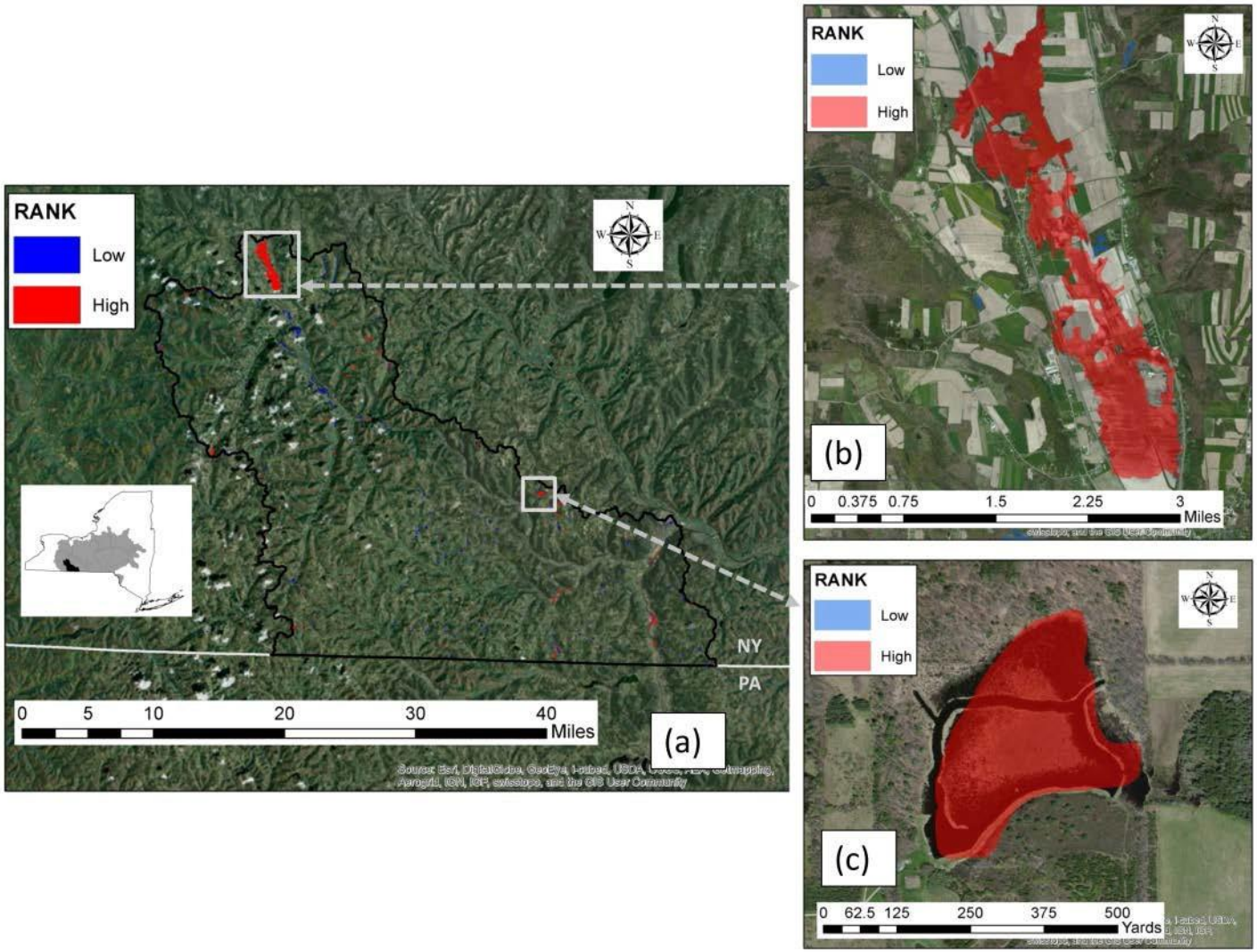
Potential Mitigation Targets in the Upper Susquehanna River Basin and Adjacent Basins In Lieu Fee Program.



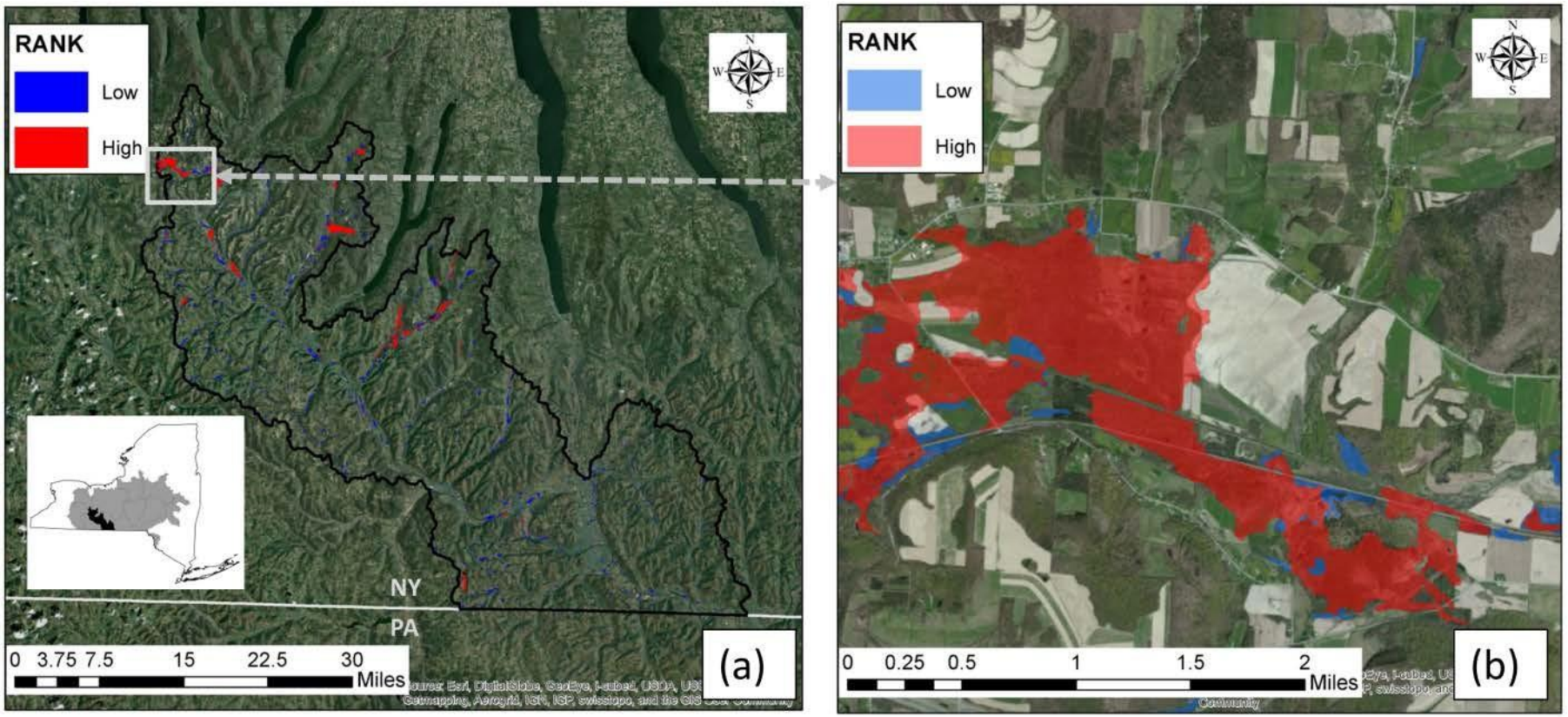
Areas in black have also been prioritized but fall outside of scope of The Wetland Trust's In Lieu Fee Program. Red areas are the top 20% of wetlands for the overall region. Note that priorities within individual service areas are specific to that service area.



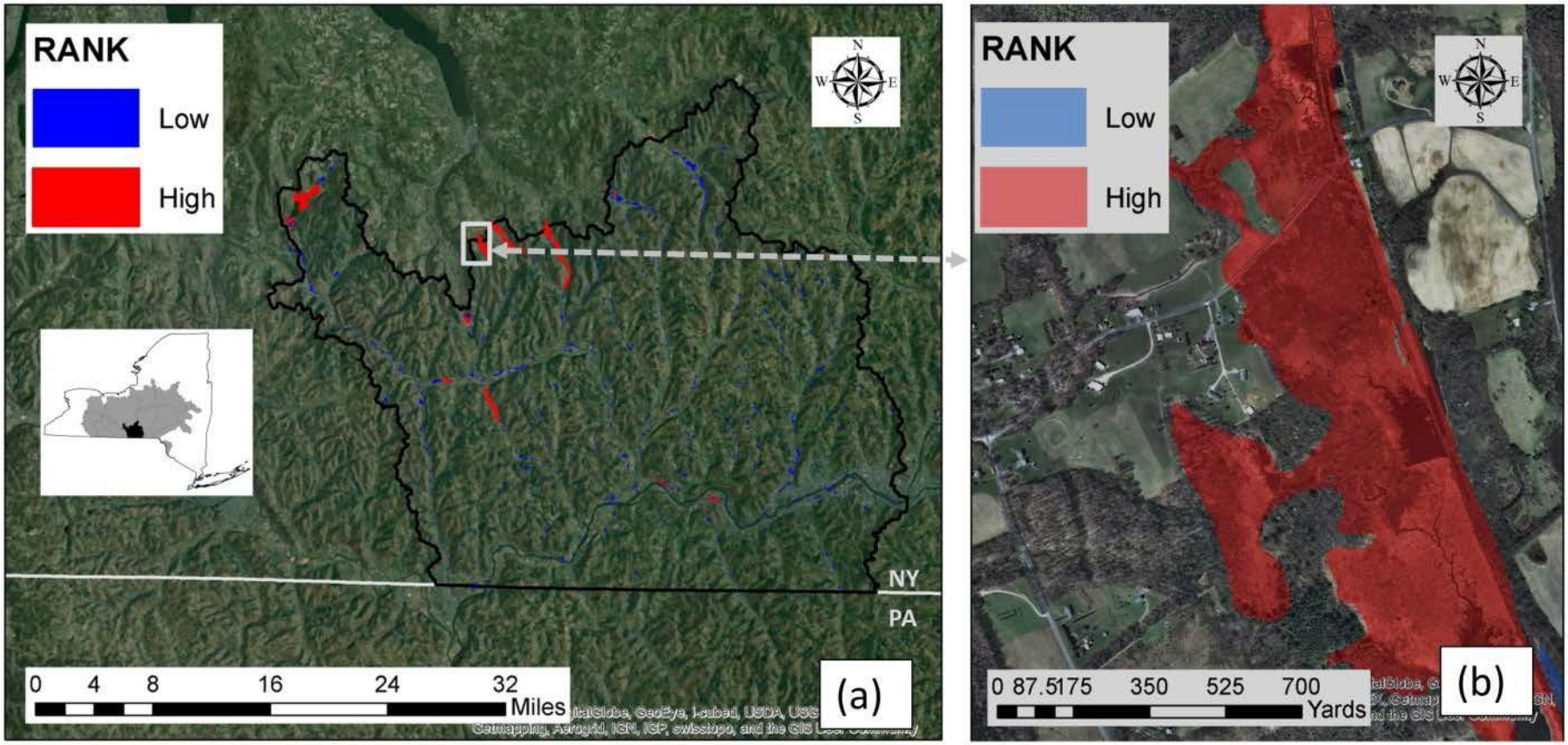
Example of differences between NWI ecological communities (**a**) and, those identified by the Maxent Models (**b**) shown in (**c**) is an example of the wetland complex symbolized by the ranking procedure. Rare community types were given higher weighting, as are larger wetlands including a range of types (e.g., forested, emergent). Oaks Creek Swamp (shown) lies to the south of and Canadarago Lake in the Unadilla/Susquehanna 8-digit HUA in the Upper Susquehanna River Basin. In 2014 TWT established a 101.23 acre preserve within the larger wetland complex within the highly ranking wetland areas. This added to existing conservation holdings (Oswego Co. Land Trust) in this high conservation priority area. The wetlands acquired by TWT include populations of Nodding Trillium (*Trillium cernuum*), an S3 species in NY (identified by Upper Susquehanna Coalition biologists in 2014). A pair of nesting bald eagles were also observed nearby in 2014.



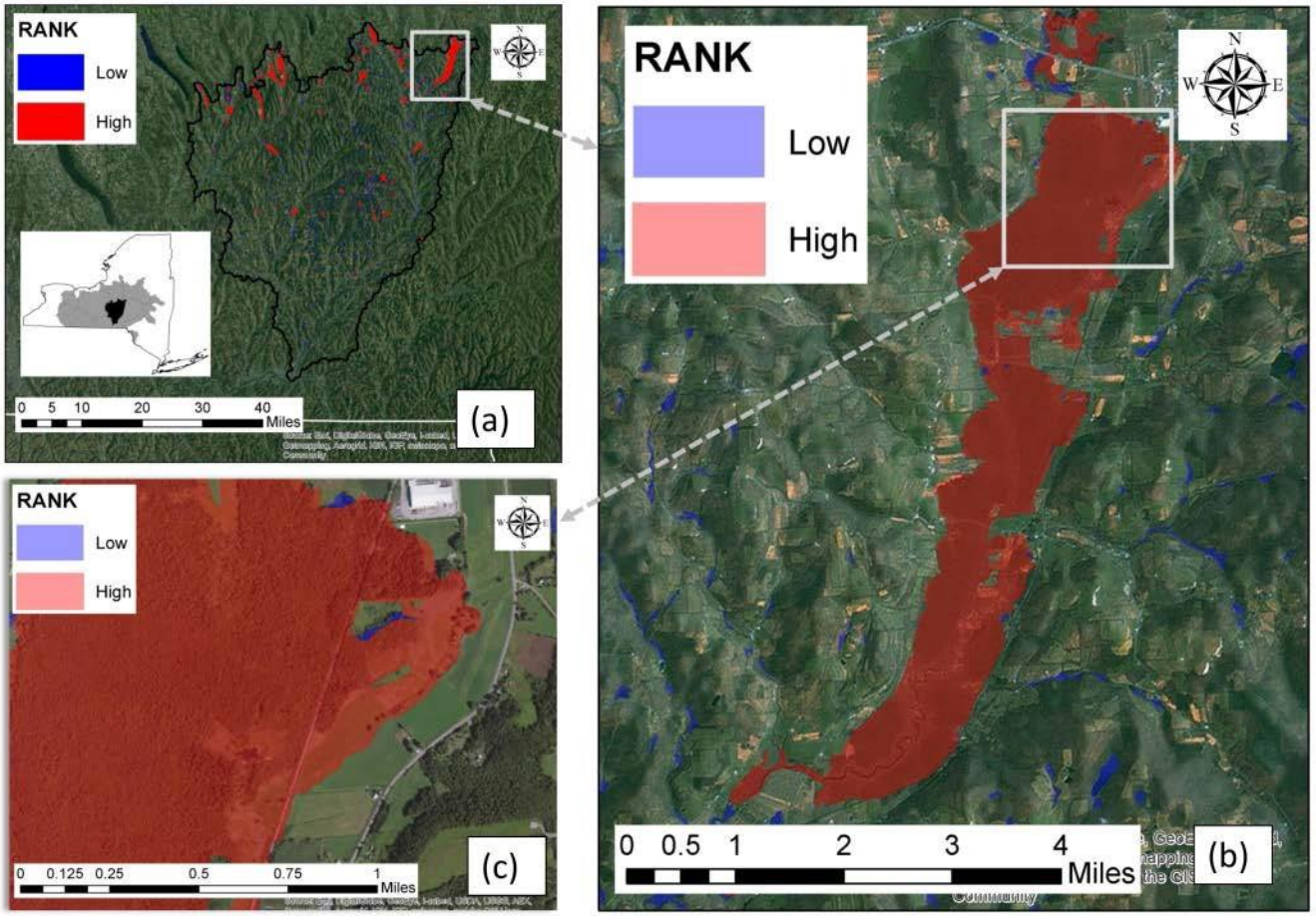
Canisteo Service Area:
(a) NY - portion of 8-digit HUA in ILF Service Area **(b)** shows a highly ranking area with excellent wetland reestablishment potential and a large block of remnant wetlands to the north **(c)** shows a floating bog mat (poor fen) likely to support rare species near Addison, New York. The site appears to have been managed for bass fishing by cutting boat lanes into the floating vegetation mat.



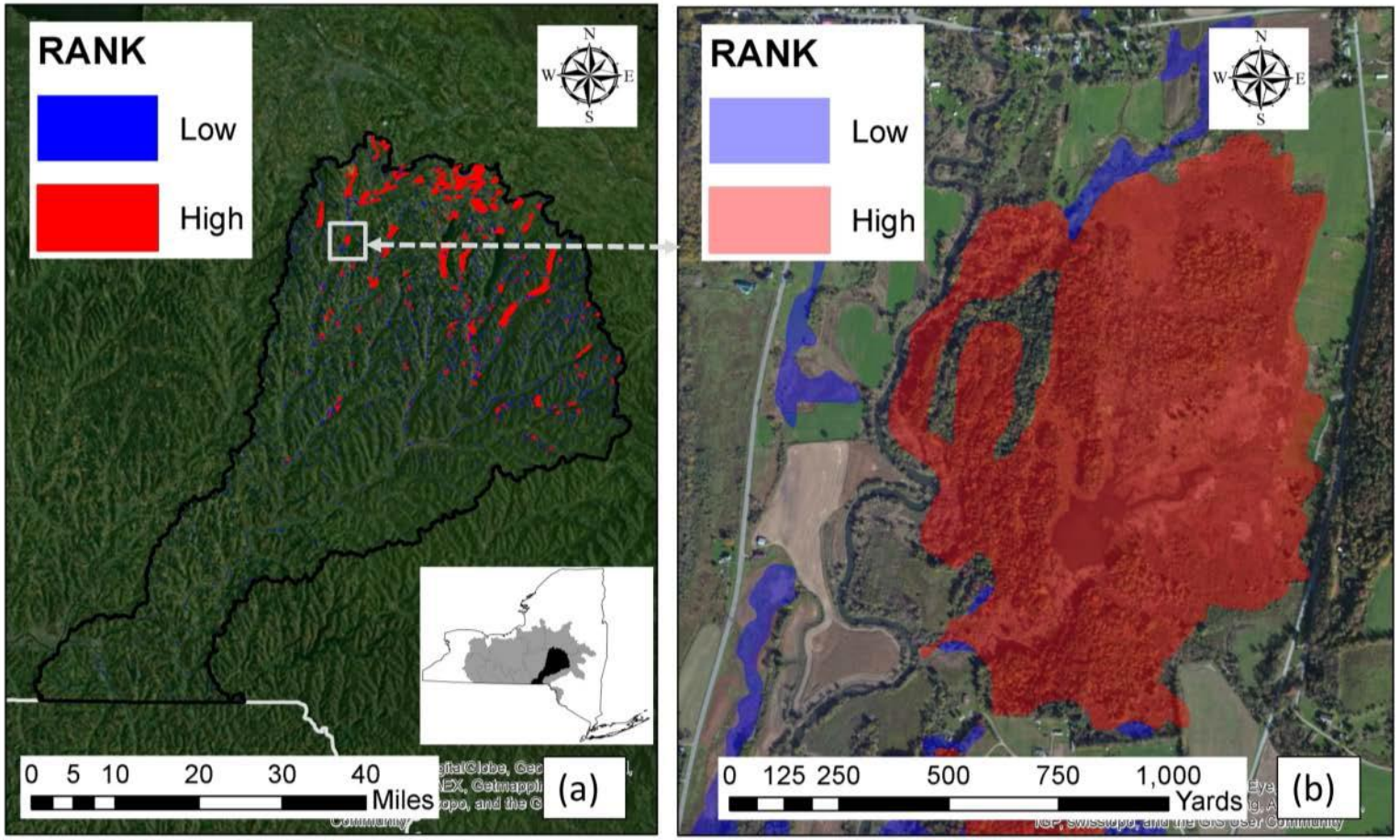
Cohocton/Chemung Service Area: (a) NY - portion of 8-digit HUA in ILF Service Area **(b)** shows a highly ranking area in Wayland, NY with excellent wetland reestablishment potential in and surrounding areas shown in red; TWT has existing conservation holdings in the wetland complex shown; a dwarf shrub bog is known to the east of this wetland complex.



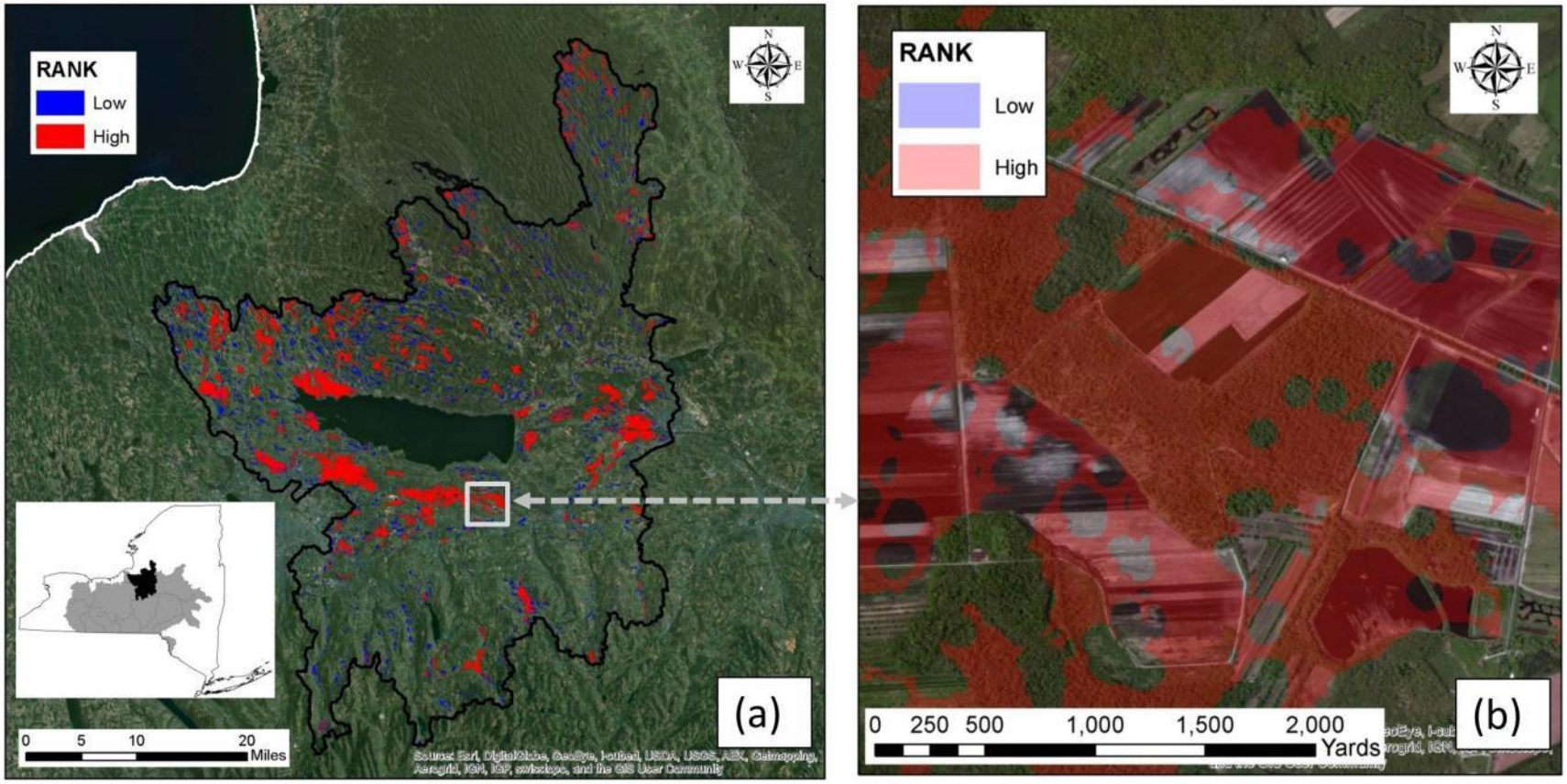
Cayuta/Catatonk/Owego Service Area: (a) NY - portion of 8-digit HUA in ILF Service Area **(b)** shows a highly ranking area with wetland reestablishment potential.



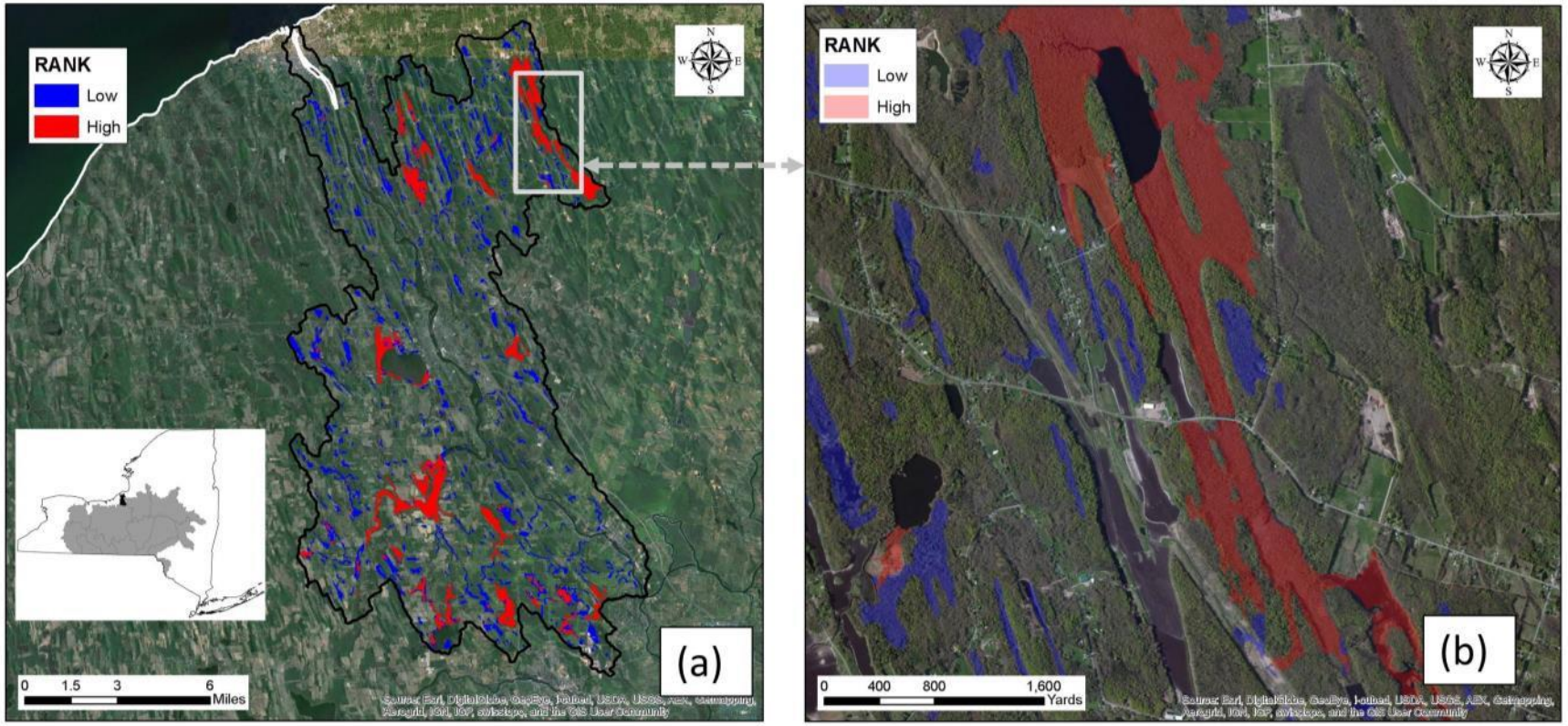
Tioughnioga/Chenango River Service Area: (a) Entire 8-digit HUA **(b)** shows a highly ranking area with excellent wetland protection and reestablishment opportunities **(c)** shows areas suitable for wetland reestablishment. Spreading globeflower (*Trollius laxus*) was historically known from the site. TWT ownership includes northern white cedar swamps, floodplain forest, open rich graminoid fens as well as forested upland buffers. Bald eagles have been observed at this site on several occasions.



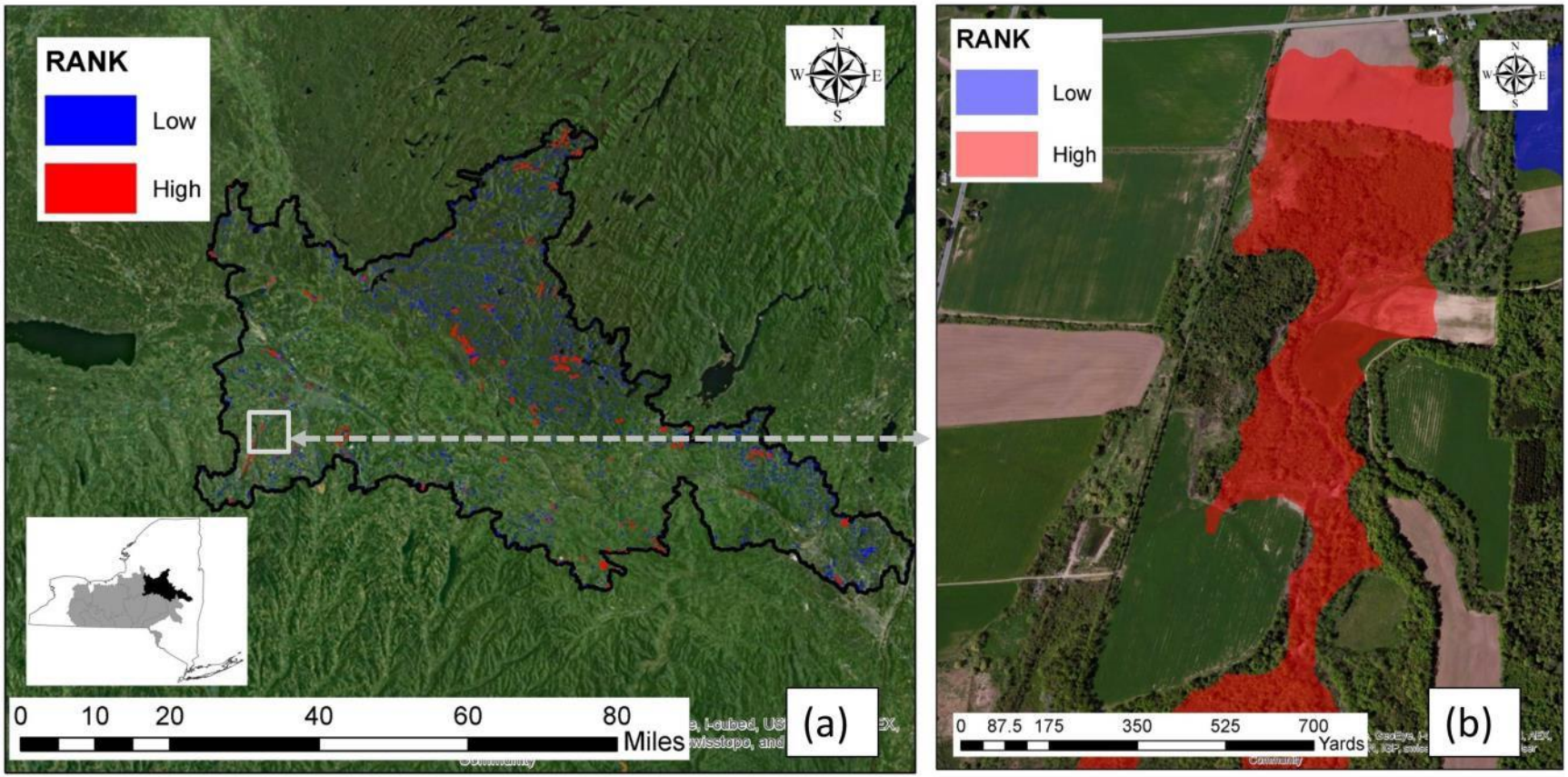
Unadilla/Susquehanna Service Area: **(a)** NY - portion of 8-digit HUA in ILF Service Area **(b)** shows a priority preservation, enhancement, and reestablishment area along the Unadilla River (Unadilla-Susquehanna 8-digit HUA) where TWT has established ownership of multiple parcels. Additional parcels are located downstream where a larger reestablishment project is underway. Notable species observed at TWT sites include Bald Eagles, pink lady's slipper orchids, meadow spikemoss (*Selaginella apoda*), *Trillium* spp., and northern pale green orchid (*Platanthera flava*). Pearly mussels have also been documented in the Unadilla River.



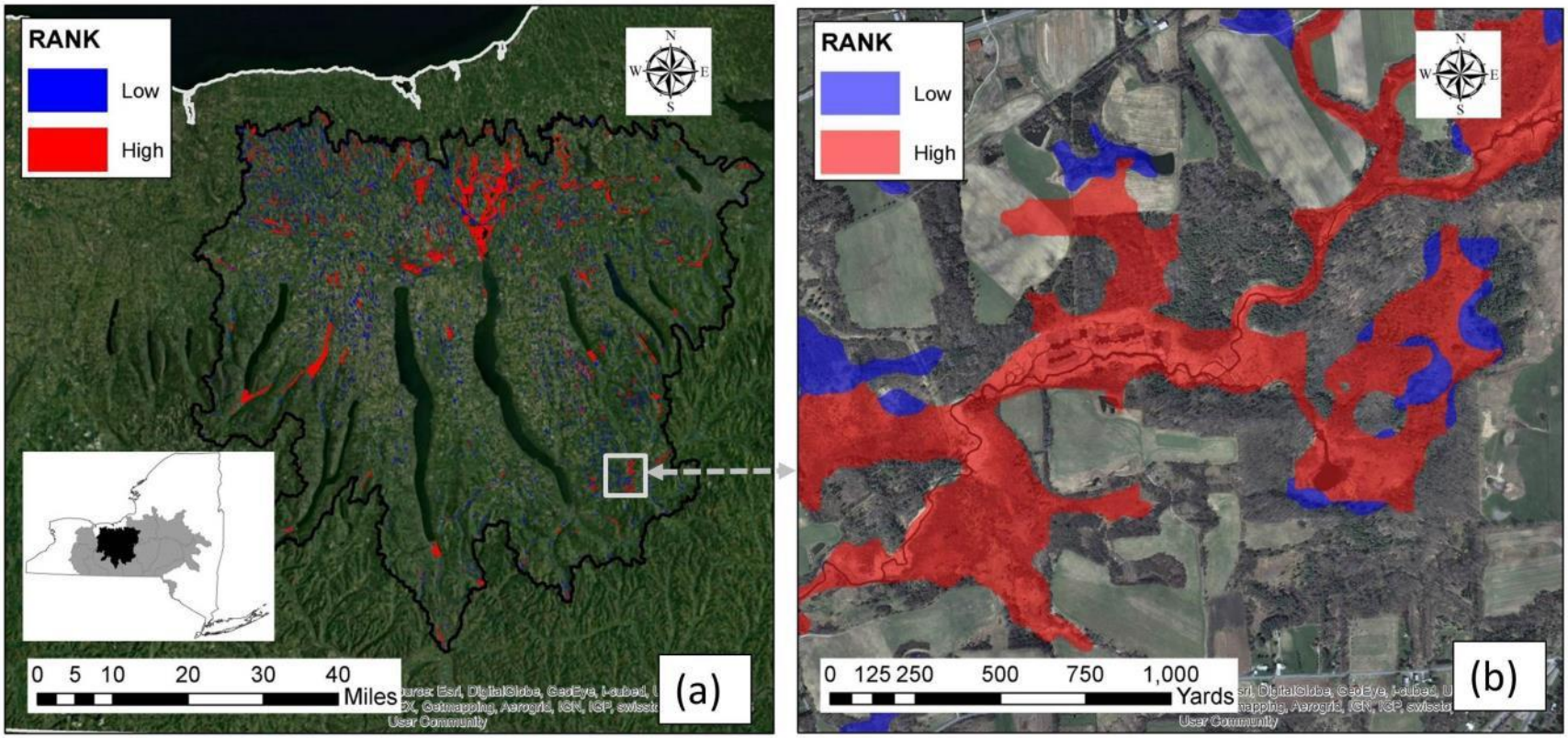
Oneida Service Area: (a) Entire 8-digit HUA **(b)** shows a highly ranking area with excellent wetland reestablishment potential; several opportunities exist within this service area for muckland restoration. Several species of greatest conservation need are historically associated with the drained medium fens found throughout much of the service area. TWT and Upper Susquehanna Coalition have taken steps to identify propagule sources as well as nurseries that could provide a means to reestablish rare plant species in such settings. Relative to other 8-digit HUA's this watershed boasts some of the regionally more important remaining wetlands including sites supporting species listed on the endangered species list.



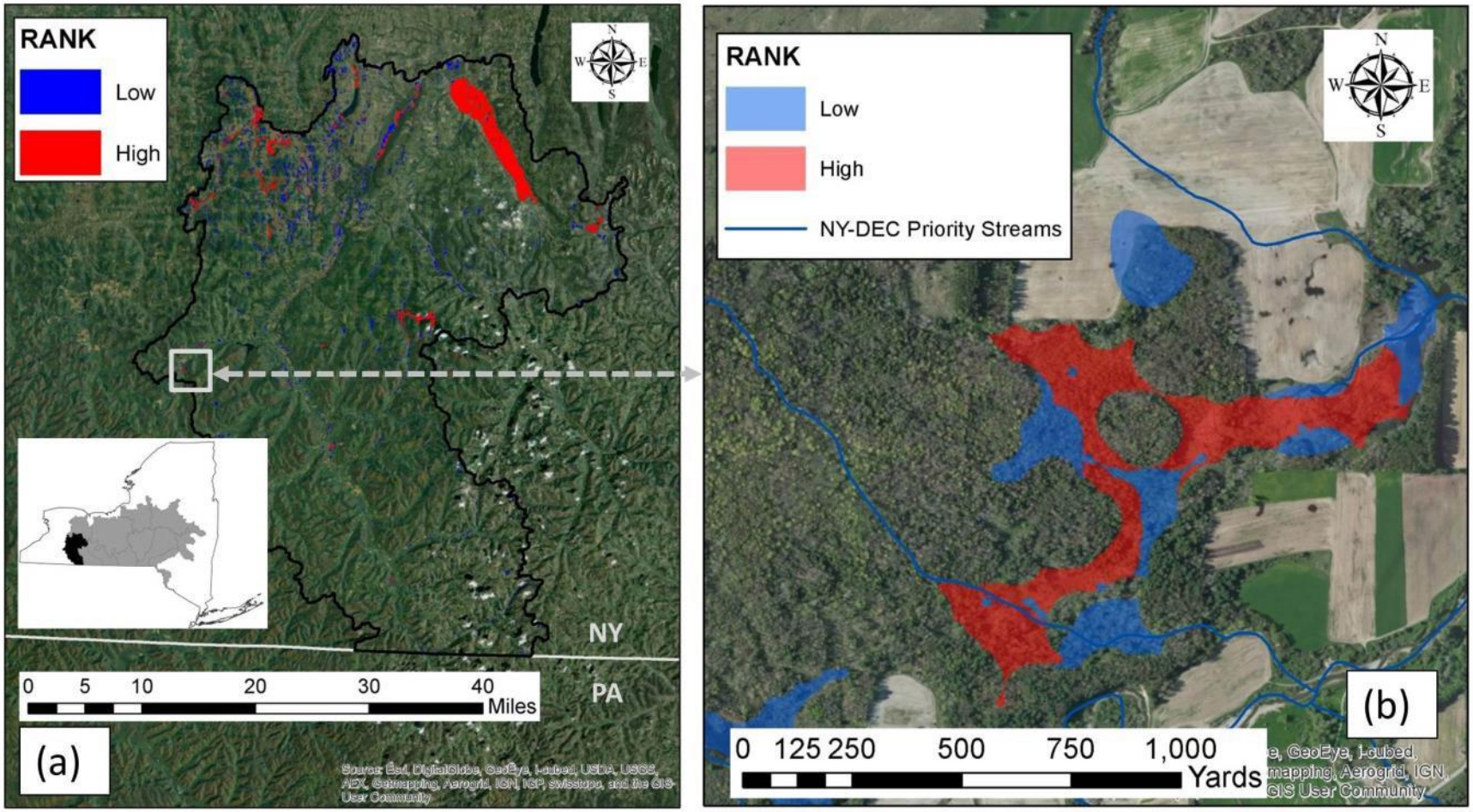
Oswego Service Area: (a) Entire 8-digit HUA **(b)** shows a highly ranking wetland complex with medium fen and forested wetland communities. Surrounding dark areas are previously drained mucklands that may offer additional wetland reestablishment opportunities. Several species of greatest conservation need are historically associated with the drained medium fens found throughout much of the service area.



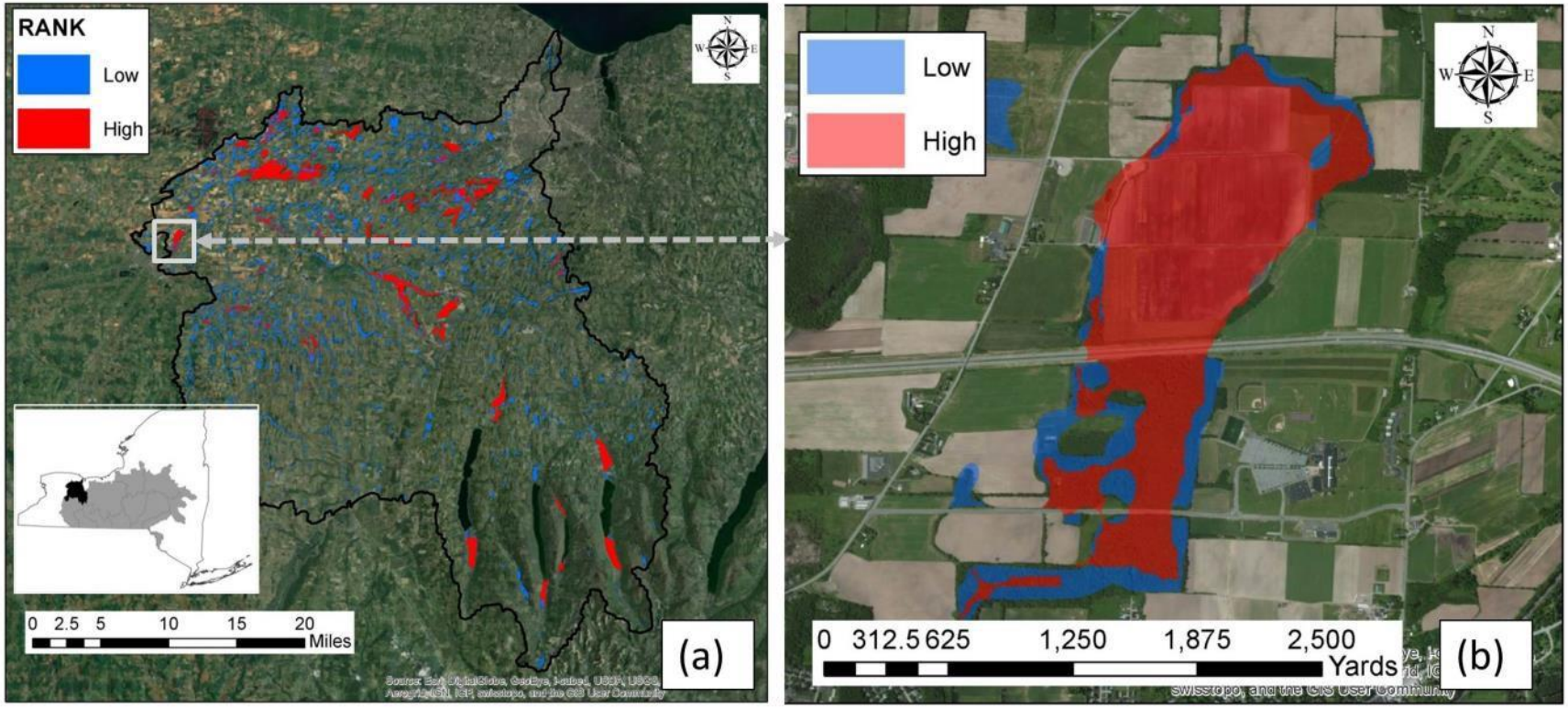
Mohawk Service Area: (a) Entire 8-digit HUA **(b)** shows a highly ranking area with excellent wetland reestablishment potential along Oriskany Creek. Oriskany Creek is known as an excellent trout fishing stream. Potential mitigation areas extend into the Adirondack Park Region where projects may contribute to furthering protection of a very large wilderness area.



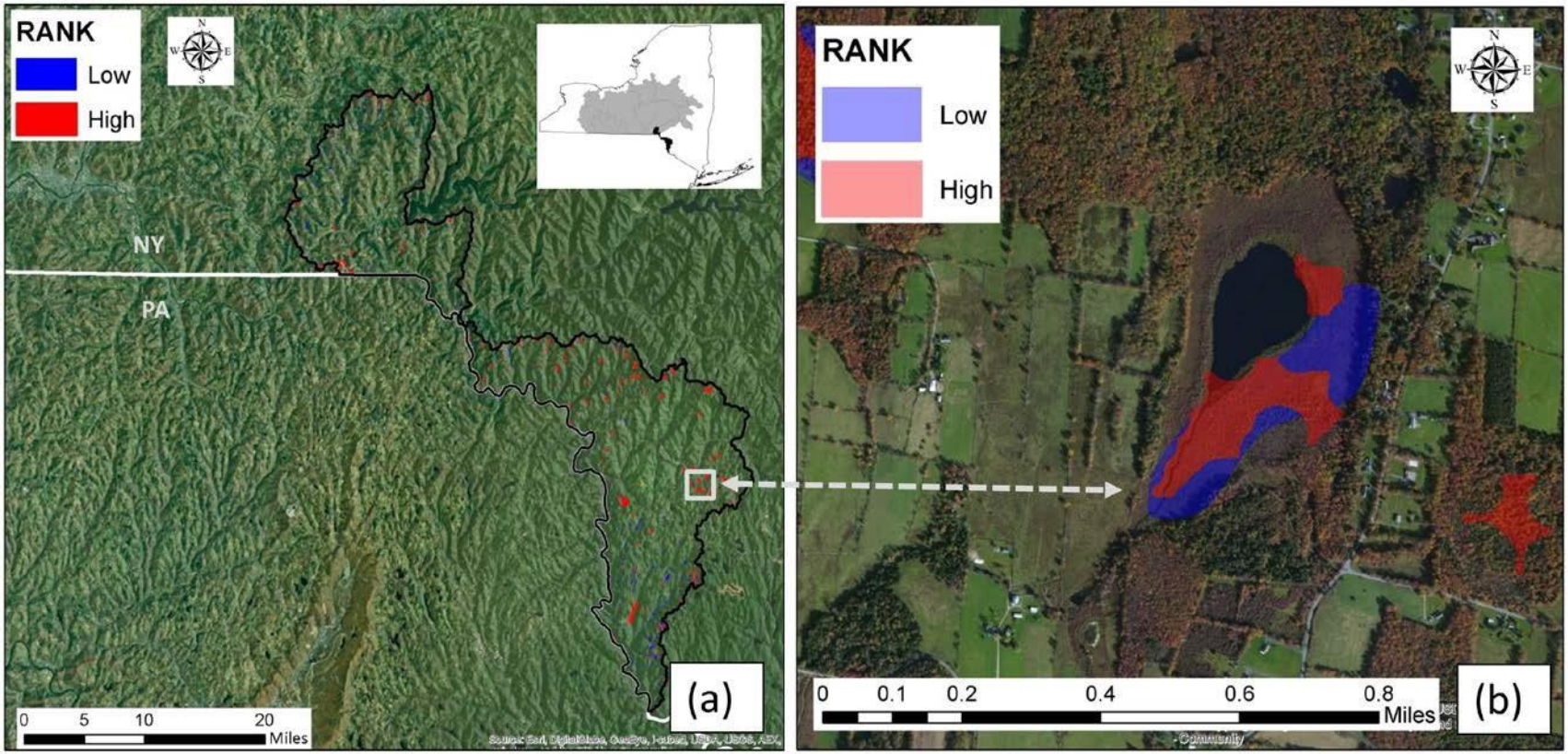
Finger Lakes Service Area: (a) Entire 8-digit HUA **(b)** shows a highly ranking area with excellent wetland reestablishment potential and a high density of known fens of high biological quality along Fall Creek. Several sites visited by USC staff support rare species such as Schweinitz's sedge (*Carex schweinitzii*), spreading globeflower (*Trollius laxus*), and a large diversity of orchid species.



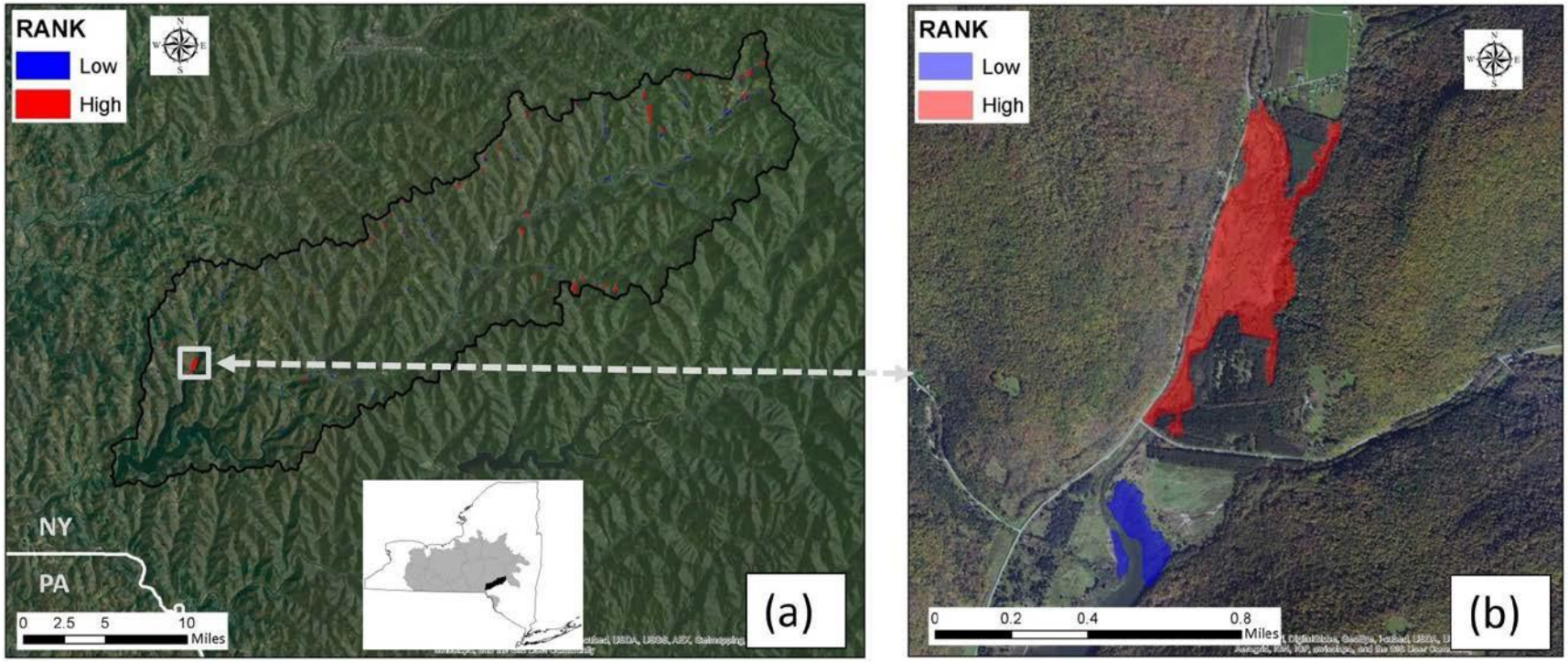
Upper Genesee Service Area: (a) Entire 8-digit HUA **(b)** shows a highly ranking area with excellent wetland reestablishment potential adjacent to DEC priority streams (Caneadea Creek and tribs). Adjacent agricultural fields also appear to offer wetland reestablishment opportunities as well.



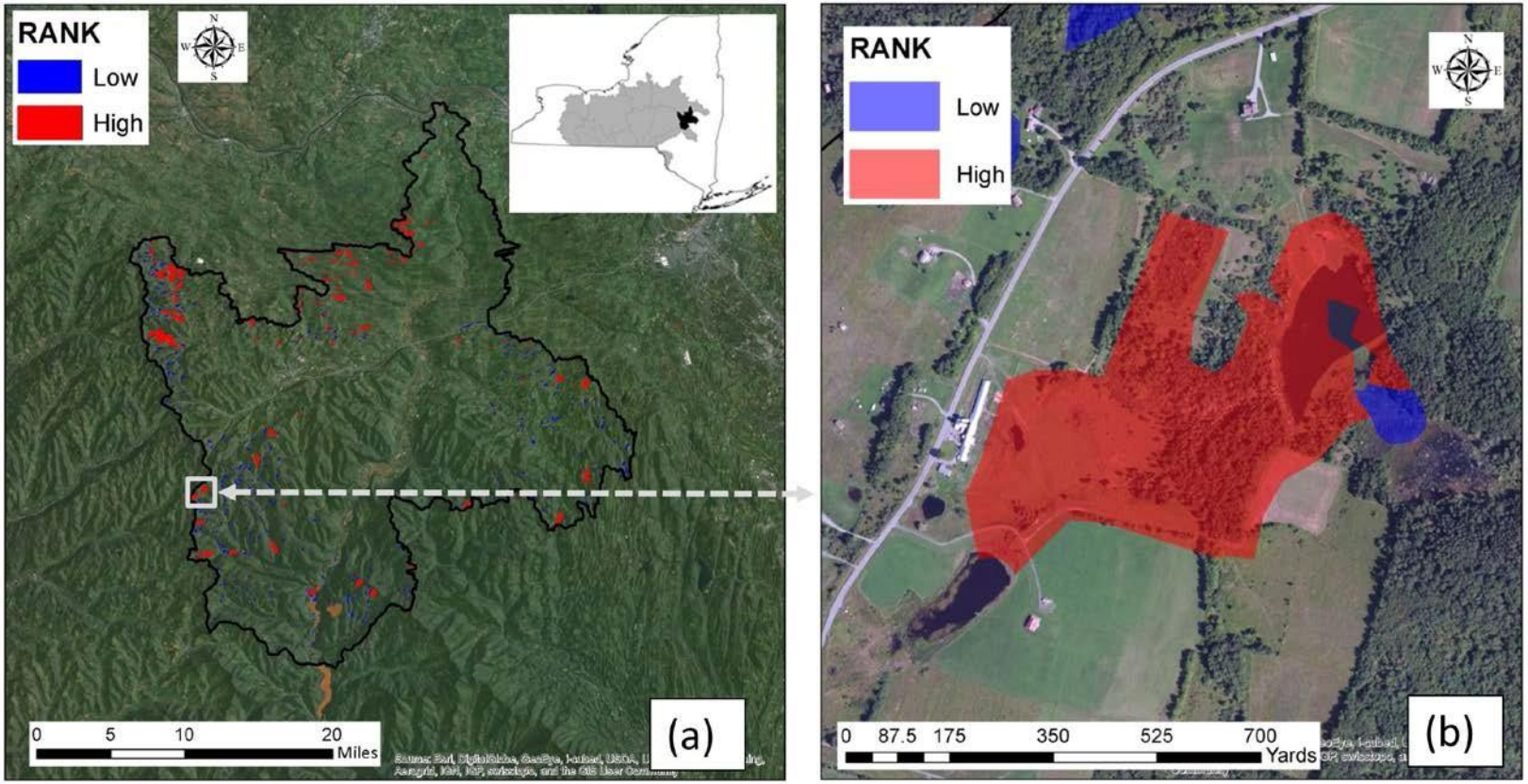
Lower Genesee Service Area: (a) Entire 8-digit HUA **(b)** shows a highly ranking area with excellent wetland preservation potential in a wetland with drained muckland to the north, and remnant wetland to the south. Other targets in the watershed include rich fens and northern white cedar swamps supporting large numbers of rare species.



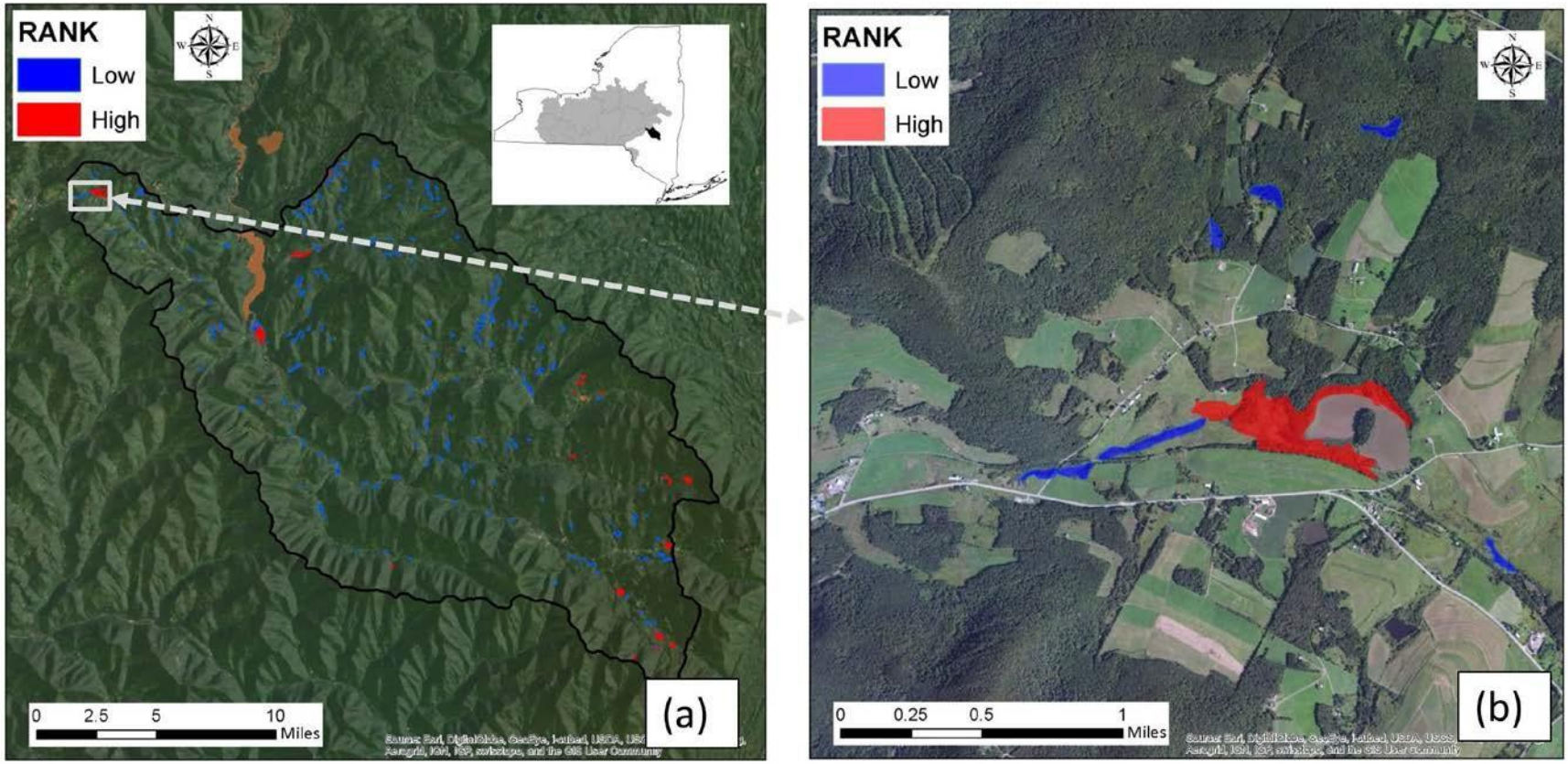
Upper Delaware Service Area: (a) Upper Delaware 8-digit HUA excluding NYC portion **(b)** shows a highly ranking area.



Upper Delaware NYC Service Area: (a) NYC portion of Upper Delaware 8-digit HUA **(b)** shows a highly ranking area along Trout Creek's, lower and minor tributaries. Trout Creek is a DEC priority stream. Additional restoration opportunities appear along much of Trout Creek.



Schoharie Service Area: (a) Schoharie 8-digit HUA excluding NYC portion **(b)** shows a highly ranking area with wetland reestablishment potential.



Schoharie NYC Service Area: (a) NYC portions of the Schoharie 8-digit HUA **(b)** shows a highly ranking area lying along minor tributaries to the Schoharie Reservoir.

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Appendix D: Resolution by the Upper Susquehanna Coalition (USC), 25 April 2014, Bi-monthly Meeting, Public Safety Building, Owego, NY 13827, page 1 of 2

Whereas the Upper Susquehanna Coalition of County Soil and Water Conservation Districts, under a memorandum of understanding signed by all members as well as New York State, works on watershed issues within NY's Susquehanna River watershed, and

Whereas the USC has a Memorandum of Agreement with The Wetland Trust (TWT) to share staff and equipment for benefits to both parties, and

Whereas the USC is knowledgeable about all aspects of wetland mitigation and specifically has re-established wetlands in the past for mitigation, following exact Corps criteria as described in Federal Register Volume 73, Number 70, 33CFR 332.4, and

Whereas the USC believes no net loss of wetlands in its Basin is an important objective, and

Whereas the USC originally approved, by resolution, the services described below for the original In-Lieu Fee Program Instrument on 11 January 2013,

Now Therefore Be It Resolved the USC will commit to provide construction services (: Construction services include initial design and land manipulation during initial design and construction at the site, plants and planting, site monitoring and adaptive measures to ensure the site meets its success criteria) to re-establish or establish wetlands for TWT to meet its financial assurance requirements as described in TWT's Susquehanna Basin Headwaters and Adjacent Basins In-Lieu Fee Program Instrument, and

Be It Further Resolved the USC will request the USC Chair to sign the Instrument to ensure its commitment to provide these services, with the commitment binding on each and every USC member that has signed this resolution, which will attached to said Instrument. Adopted, 25 April 2014 by a vote of 9 for and 0 against. Signatures and counties:

by	title	county	date
			10/24/14
	Manager	Cortland	10/24/14
			10/24/14
			10/24/14
		Chenango	12/17/2014
			12/17/2014
		Chemung	
		ONEIDA	

by	title	county	date
Scott H Soroy	Executive Director	Allegany	3/10/15
Gerald L. Smith	Manager	Herkimer	4/13/15
Jon A. Cox	District Mgr.	Schuyler	4/29/15

by tit.le county date

by title county date

by title county date