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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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 thirteen 8 digit HUAs comprising the Susquehanna River headwater and adjacent watersheds in New York. It provides-for a "revolving fund" of 234 advance wetland mitigation credits spread across twelve service areas (we are combining the Oswego HUA with the Oneida HUA into one service area due to Oswego's small size) 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.

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 biological quality;
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. ~~use an assessment protocol to quantify functional values and guide restoration efforts;~~
7. develop a Corps required mitigation plan for each site that contains all elements listed in Federal Register Volume 73, Number 7033CFR 332.4; and

8. To further the TWT's core mission to restore, conserve and protect wetlands.

Section 1. Service Areas

This ILFP encompasses 11,599,769 acres covering 12 Service Areas, each being an 8-digit Hydrological Unit (HU) – depicted in Figure 1 and described in Table 1. The only exception is that we have combined 04140202 and 04140203 because of the small size of 04140203 and they both flow to Lake Ontario. The use of 8 Digit HU'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 (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.

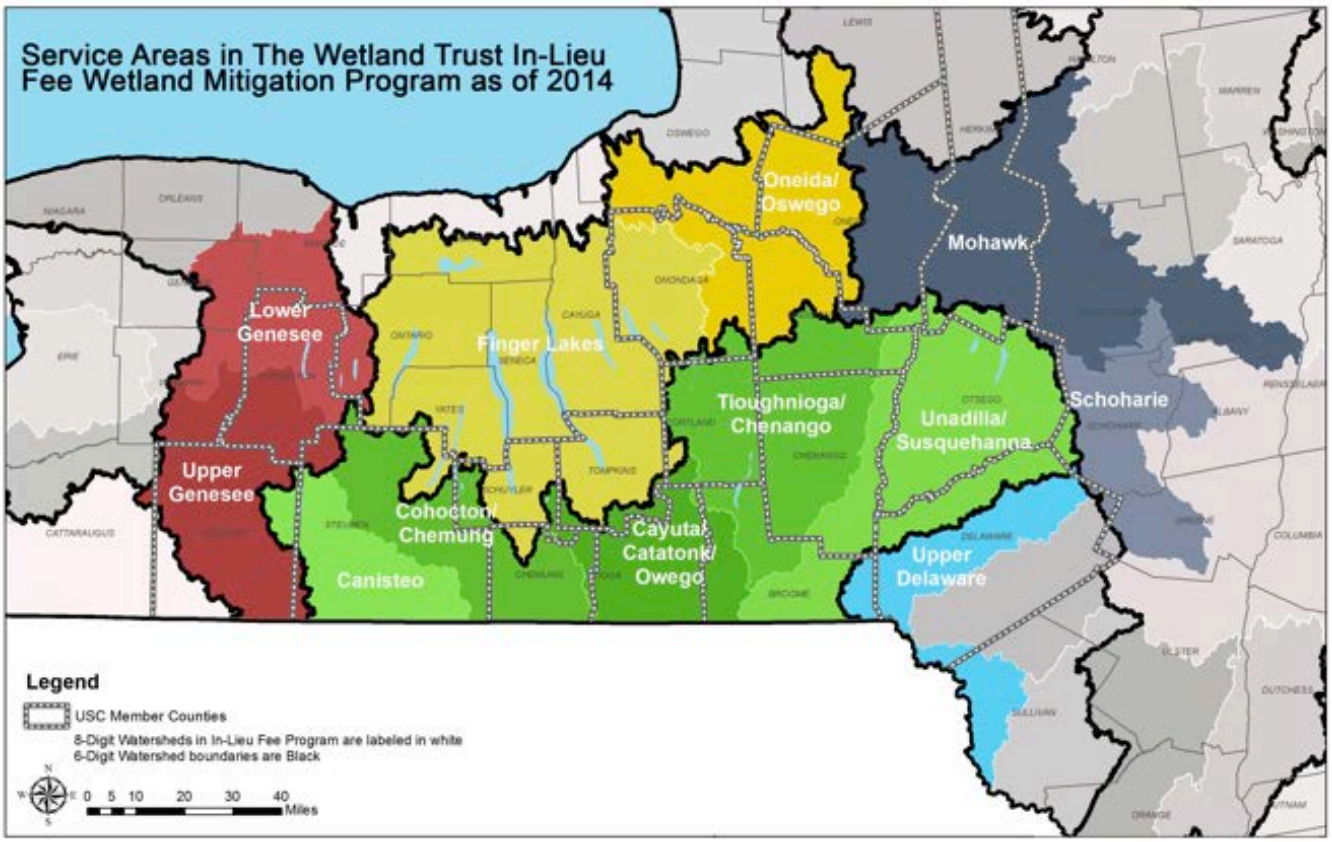


Figure 1. Service Areas in the Susquehanna Basin Headwaters and Adjacent Basins In-Lieu Fee Wetland Mitigation Program.

Table 1. Service Area Sizes 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	27.2
02050102	Tioughnioga/Chenango	1,027,924	46,523	4.5	69.2	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
04140202/3	Oneida/Oswego	1,050,746	144,024	13.7	40.2	25.3

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 12 service areas, and within each service area for each individual mitigation project that has its own mitigation plan. The Program Account and how it functions is 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 the 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 ~~(see **Section 10. Credit Calculations**)~~ 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
- an 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 the 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, and 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 to 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 15 January 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

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 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 12 geographic service areas each covering that portion of the 8-digit HU in New York State encompassing the headwaters of the Susquehanna River and adjacent basins. All 12 service areas are rural with similar land cover, composed of largely forest, agriculture and wetlands (total >70%). 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 two exceptions is the Lower Genesee, which still has extensive dairy operations and the Finger Lakes, which has a combination of vineyards and row crops. ~~However the two major basins (Chemung and Susquehanna) have characteristics unique to themselves. For example the three eastern service area's (01,02,03) wetland flora tend to have species (i.e., northern white cedar) and topographic features (karst) uncommon in the two western service areas (04,05). The service areas within each Chemung and Susquehanna sub basins are quite similar.~~

6.2 Threats

There are three major threats to habitat loss in the Basin: construction, logging and flooding. The first threat is related to new construction and development, especially linear developments such as pipelines, highway maintenance, construction, and to a lesser degree development of infrastructure, shopping malls, housing, and other similar projects. 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.

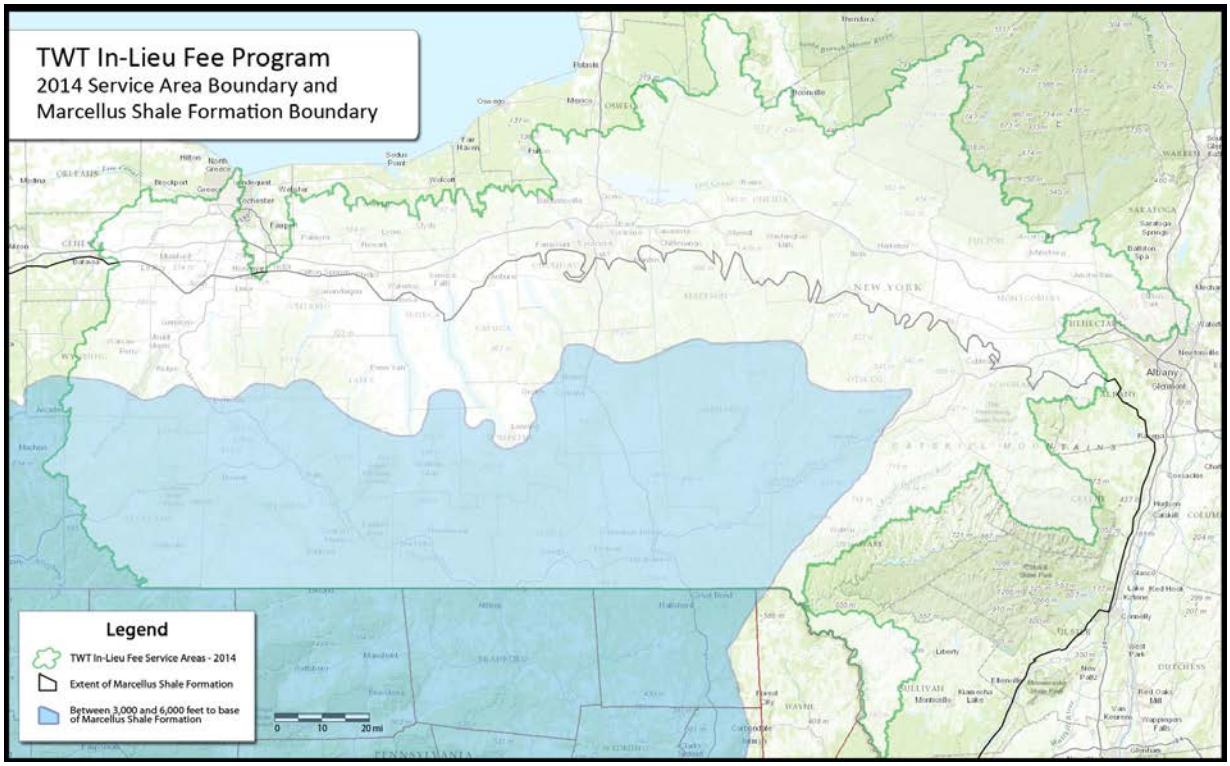


Figure 2. Area Most Likely Developed for Gas in the Marcellus Shale Layer

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 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. We expect gas development to occur much slower in NY due to the regulatory climate and price of natural gas. Be that as it may, NY holds a tremendous amount of gas resources and future development will probably occur at a slower but still extensive pace. Sufficient credits need to be available to meet gas development potential.

On 1 July 2011 the NYS DEC issued a revised Draft Supplemental Generic Environmental Impact Statement (DGEIS) on gas development. It suggested that gas drilling should be reduced or disallowed in large blocks of forest and grass habitats, on state lands and over certain aquifers. This approach will concentrate development at least in the early years near the PA border where the shale layers are thicker and there is access to the Millennium gas transmission pipeline. We estimate that 100 acres of impacts spread out over the first five years of development in NY is a reasonable assumption considering permitting probably will go slower in NY and 0.5 to 10 acres per permit is a reasonable assumption for the size of impact. The NYS DEC review and low natural gas prices will temporarily slow down the process, which may provide sufficient time to secure the surface rights on quality sites before the surface rights are sold or pipeline routes are approved. Most recently, in June 2012 there have been suggestions by the State that it will limit permits to deeper portions of the shale layer, which includes Steuben, Chemung, Tioga, Broome and Chenango counties. This selection will still result in impacts to a number of service areas.

An important aspect of the gas development is there will be a network of pads, roads and pipeline rights of way that can impact the entire "shale fairway" in the relatively near future. This development is not related to highways or centers of human habitation, but rather well pads and pipelines will be spread throughout the landscape. We request that the IRT take this into consideration when reviewing a Mitigation Plan that has a "preservation" component. We suggest properties within the Marcellus Shale Fairway, where development is allowed should be considered meeting the "under demonstrable threat" criteria for consideration for protection. Protection of wetland complexes and corridors should be a priority long before drilling begins, as the development can be rapid and overwhelming as has been shown in PA. All mitigation sites described and mapped in each individual mitigation plan will be clear of all surface mineral leases (e.g., TWT will own all surface rights). However eminent domain cannot be precluded, so accommodations will be made under financial assurances to address that issue should it arise.

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.

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 and there is continual pressure on the landscape for developing corn/hay fields on well-drained soils, even when the soil is not. 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.

Logging occurs extensively with little oversight or regulation; most loggers are small operations which are very hard 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) the 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 consider all privately owned forestlands susceptible to logging unless they are under a conservation easement.

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 flatter 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 nearby wetlands. Climate change will become 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), result not only in demise of beavers, but often in the unregulated loss of the wetlands they built through trapping efforts.

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., purchase 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.

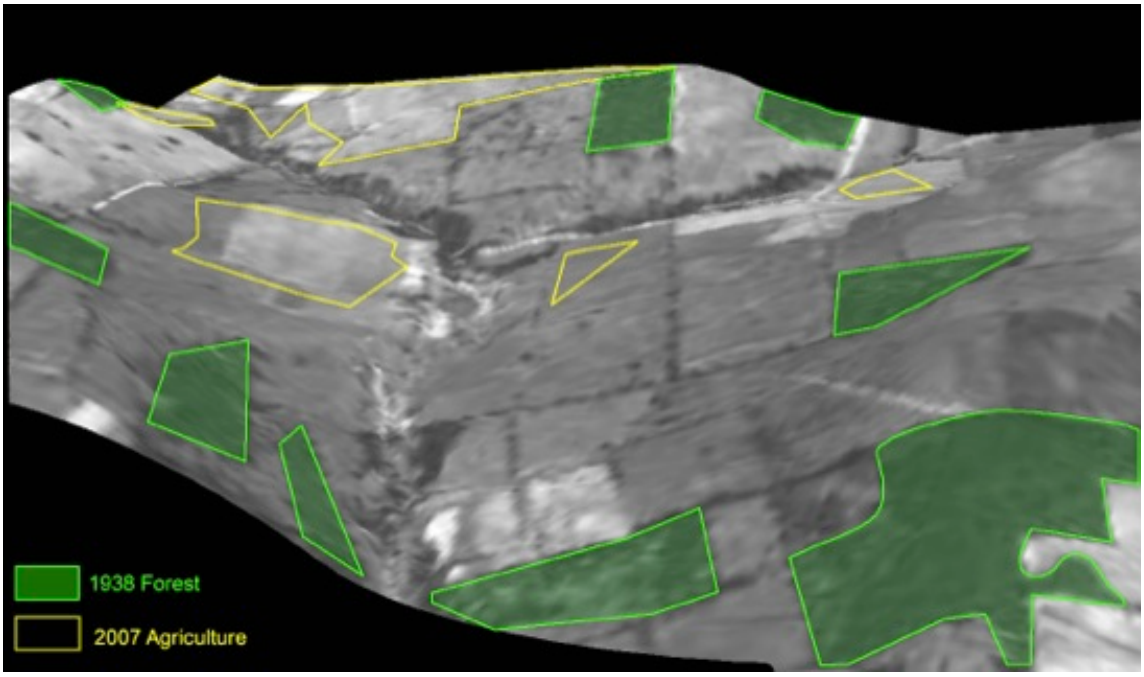


Figure 4. 1938 Aerial Photo Comparison of Agriculture and Forest Cover

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 1930 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. Existing Wetland Acreage by Service Area.

HU	Name	NWI Acres	Total Wetlands %	Percent of total wetland acres					
				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	46,523	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	14,543	2.5	19.1	28.8	12.7	4.3	17.0	17.9
02040101	Upper Delaware	16,627	2.9	13.2	10.3	6.8	15.3	14.1	40.4
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
04140202/3	Oneida/Oswego	144,024	13.7	4.3	47.3	4.6	0.7	2.8	40.3

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.

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. Sites of 10 to 100 acres or more, adjacent to already protected lands, especially wetlands, would provide additional survival assurance.

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.

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. Large regions 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 using important landscape factors and ranking of all known wetlands and potential restoration sites at region-wide and within watershed scales (Appendix C)
- A search for landscapes with "suitable soils" for wetlands
- A review of other comprehensive analyses
- A review of expert opinions

To some degree these screens 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.

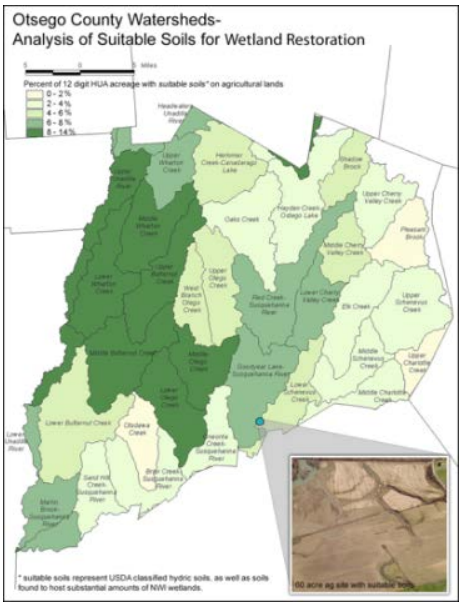
6.7.1 A computer "quality assessment" using Maxent of important landscape factors ranking all known wetlands and potential restoration sites

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 that have a high potential for promoting functionality and biodiversity for the Susquehanna River Basin and adjacent watersheds. This approach used the “Maxent” computer model and was first demonstrated for the Upper Susquehanna River Basin and was 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 search for landscapes with "suitable soils" for wetlands~~

~~NRCS maintains spatial data regarding the distribution of hydric soil classes, including locations suitable for wetland restoration (NRCS 2010). While these data are not without error, they provide an additional means of identifying sites suitable for wetland re-establishment, establishment, rehabilitation, preservation, and enhancement. Additionally, we quantified soil types lying under NWI wetlands and then identified the remainder of those same soil types that had no wetlands. We hypothesize that under the right conditions, with either hydrologic or~~

~~mechanical manipulation, these soils may provide suitable wetland restoration opportunities and combined with classic wetland soils (i.e., hydric) without wetlands, provide a screen for potential mitigation sites. Each potential site can be ranked by size of the suitable soil type footprint, location in the watershed (stream order and proximity to existing wetlands) and position in relation to agriculture (is it on active farmland?). An analysis of Otsego County located many sites including the 60 agricultural acres shown below which have great potential for wetland re-habilitation as well as stream buffering.~~



~~Figure 5. Sample Watershed-based Analysis for Otsego County~~

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)
- Wiegand, K.M., Eames, A.J. (1925) The flora of the Cayuga Lake basin, New York. Vascular Plants. Cornell University, Ithaca, NY.

Table 3. Examples of Important Natural Areas by Watershed.

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	NYSDEC 2009 FLLT 2012 Burger and Liner 2005 Tompkins County files
02050104	Canisteo	Canisteo Headwaters	NYSDEC 2009
02050105	Cohocton/Chemung	Cohocton Headwaters	Edinger et al. 2002

8 Digit HU	Name	Targeted Natural Areas	References
02020004	Mohawk	Deansboro Swamp Yule Corners Rd Swamp Canning Factory Rd Fen	USC 2013 Raney 2014
02020005	Schoharie	West Creek Headwaters Fly Creek Headwaters	NYSDEC2009 USC 2013
02040101	Upper Delaware	Oquaga Creek Headwaters 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 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 and Leopold 2014
04140202	Oneida	Nelson Swamp White Lake Swamp Cicero Swamp Peterboro Swamp Fenner Swamp	Scanga and Leopold 2010 & 2012 NYNHP 2013 Raney et al. 2014
04140203	Oswego	Ox Creek Swamp Bowens Corners Muck Farm	USC 2013

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, The Nature Conservancy, and NY Audubon.

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" 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.

~~Potential sites will be evaluated using SusRAM (Appendix D) to provide a general sense of "quality" and to ensure each site is reviewed comprehensively for the same parameters. It should also provide an estimate of the amount of "functional lift" a wetland mitigation project might provide after implementation efforts. It will also compliment~~ The maxent computer analysis (see Section 6.7.1) and site visits will ~~to~~ determine the quality of parcels nominated for preservation. ~~, especially for "assurance acres". SusRAM will not be used to measure success of a mitigation plan or whether a specific site is to be included in the ILF Program.~~ 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.

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.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 the 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.

6.11 ~~Preservation~~ 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: The 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 ~~(Figure 2)~~. 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.

Gradual, cumulative impacts resulting from continual long-term activities that accumulate and degrade wetlands are important wetland stressors. For example where the preservation 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 with the Corp's requirements that there be secondary easements on mitigation lands that are already fully protected to ensure preservation "in perpetuity". We will use that same conservative approach and review all very high quality biodiverse 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 a constant vigil 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 the TWT within this instrument.

The 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. The TWT Board provides a direct link with academia because board membership includes Dr. Donald Leopold and Dr. James Gibbs, SUNY ESF and Dr. Keith Porter, Cornell. The USC Watershed Coordinator and TWT Chair also work with Binghamton University (wetland and water quality), Ithaca College (salamander radio tracking), SUNY Oneonta, and Alfred University (stream rehabilitation and soon to be wetland restoration). Upper Susquehanna Coalition 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. The 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.

The 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

The 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. The 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 the TWT, then at that time at that time the 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. As credits are released, they will first be used to fulfill any Advance Credits that have already been sold within the service area before any released credits can be directly sold 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.

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

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

- Marcellus shale development would be greatest in the eastern three Susquehanna Service Areas

and greatest 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)		Size (acres)	Number of Advance Credits	Cost for one credit
Unadilla/Susquehanna	(02050101)	1,286,275	56 (1.0)	Base rate: $ 91,580; Adjust per service area by multiplying factor in parentheses ( ) in 3rd column (5% reduction on credit purchases over 5)
Tioughnioga/Chenango	(02050102)	1,027,924	24 (1.0)	
Cayuta/Catatonk/Owego	(02050103)	578,368	24 (1.0)	
Canisteo	(02050104)	455,957	10 (1.0)	
Cohocton/Chemung	(02050105)	659,586	14 (0.8)	
Mohawk	(02020004)	1,631,397	20 (1.0)	
Schoharie	(02020005)	593,414	10 (1.0)	
Upper Delaware	(02040101)	575,726	14 (1.0)	
Lower Genesee	(04130002)	683,224	8 (0.8)	
Upper Genesee	(04130003)	851,375	10 (0.8)	
Finger Lakes	(04140201)	2,213,707	18 (0.85)	
Oneida/Oswego	(04140202&3)	1,050,926	26 (0.8)	

~~TWT shall complete land acquisition and initial physical and biological improvements by the third full growing season after the sale of Advance Credits. 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 provide alternative compensatory mitigation to fulfill those compensation obligations.~~

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.

Indeed the USC in the past two years has initiated or implemented four mitigation project sites while restoring/establishing basic non-mitigation wetlands on over 500 acres of wetlands and wetland complexes in the basin.

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. 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 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 implements before credits are sold using TWT internal funding. TWT is using its own limited "rolling funding source" where it purchases and establishes a 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. Initiating this

approach needs no district engineer approval.

c) TWT may propose that credits from adjacent service areas be used to meet the unmet obligations when the "3-year implementation clock" is reached in a service area due to very few credits. Indeed this process has implied approval in the federal register as more than one 8 digit HUA can be used as a Service Area; thus ILF Program's with single 8 digit HUAs might be able to, in certain instances, request the district engineer temporarily "combine" two adjacent service areas to meet a specific need.

d) 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 that those funds be temporally 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 closer to the original intent of the legislation than alternate "b", which is the normal consideration. As is in all cases the district engineer would approve the specifics of the transaction.

In approaches b and c the TWT will develop a request after year two of a small credit sale to reduce the temporal lag in wetland functions.

Section 8. Fee Calculations

Fee calculations are based on a cost estimate (Table 6) that assumed the purchase of 80 acres that holds 8 credits worth of potential mitigation of any kind (re-establishment, establishment, rehabilitation, preservation and enhancement). This schedule is valid for all Service Areas, and is provided in Table 5.

Table 5. Details for Developing the Cost of One Mitigation Credit

Credit Component	Sub-component description	Charge per Credit All Service Areas
Land acquisition*	property (mitigation site and assurance acres purchase) boundary survey closing costs/legal fees land acquisition/search	
Project planning and design*	watershed planning wetland mitigation plan permits (SWPPP) SHPO	
Construction*	site layout construction equipment and labor erosion control planting	
Plants and other materials*	plants seeds erosion control supplies signs water well/data logger (2)	
Monitoring, based on 10 years and resulting the remediation or adaptive management activities*	annual monitoring surveys report writing re-grading replanting erosion control	
Long-term management and preservation	stewardship endowment deposit payment to second land steward	
Contingency costs*	funds for unexpected occurrences	
Program administration for duration of the credit (10 years)	tracking credits paying bills payroll audit/ accounting office/supplies	
Financial assurances for TWT * USC Commitment *	funding used to meet default during implementation and to rectify loss in case of condemnation to (re-) establish wetlands as part of assurance commitment	
TOTAL		$ 91,580

** See Section 9 for additional information*

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) 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.

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 a three-pronged approach:

9.1 First 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.

9.2 Second prong: commitment by the USC to provide ***establishment/re-establishment*** ~~activities~~ 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 the 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.

9.3 Third 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, program administration; see Table 6) in a separate account. 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; and
- released to the TWT to be used in the service area where it was generated once sufficient sites have been constructed 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 the best available assessment tools.

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

Credits	Proposed Ratio
Re-establishment: Acres to generate 1 credit.	Up to 1:1
Establishment: Acres to generate 1 credit.	Up to 1:1
Rehabilitation or Enhancement: Acres to generate 1 credit.	3:1 to 10:1
Preservation (wetland): Acres to generate 1 credit	10:1 to 20:1
Upland Preservation of a buffer: Acres to generate 1 credit	15:1
Upland Re-establishment or establishment of a buffer: Acres to generate 1 credit	4:1 to 15:1
Price per credit	$91,580

Section 11. Program Accounting Information

11.1 Provide 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 1,2,3,4, 5,6,7,8,9,10,11, or 12". 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.

11.2 Financial 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 and 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. The 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, the 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" or other descriptive title.

Section 15. Signatures

The Wetland Trust	Title	Date
District Engineer, USACE LRB District	Title	Date
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
Upper Susquehanna Coalition	Title	Date
Tioga County Soil and Water Conservation District	Title	Date

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