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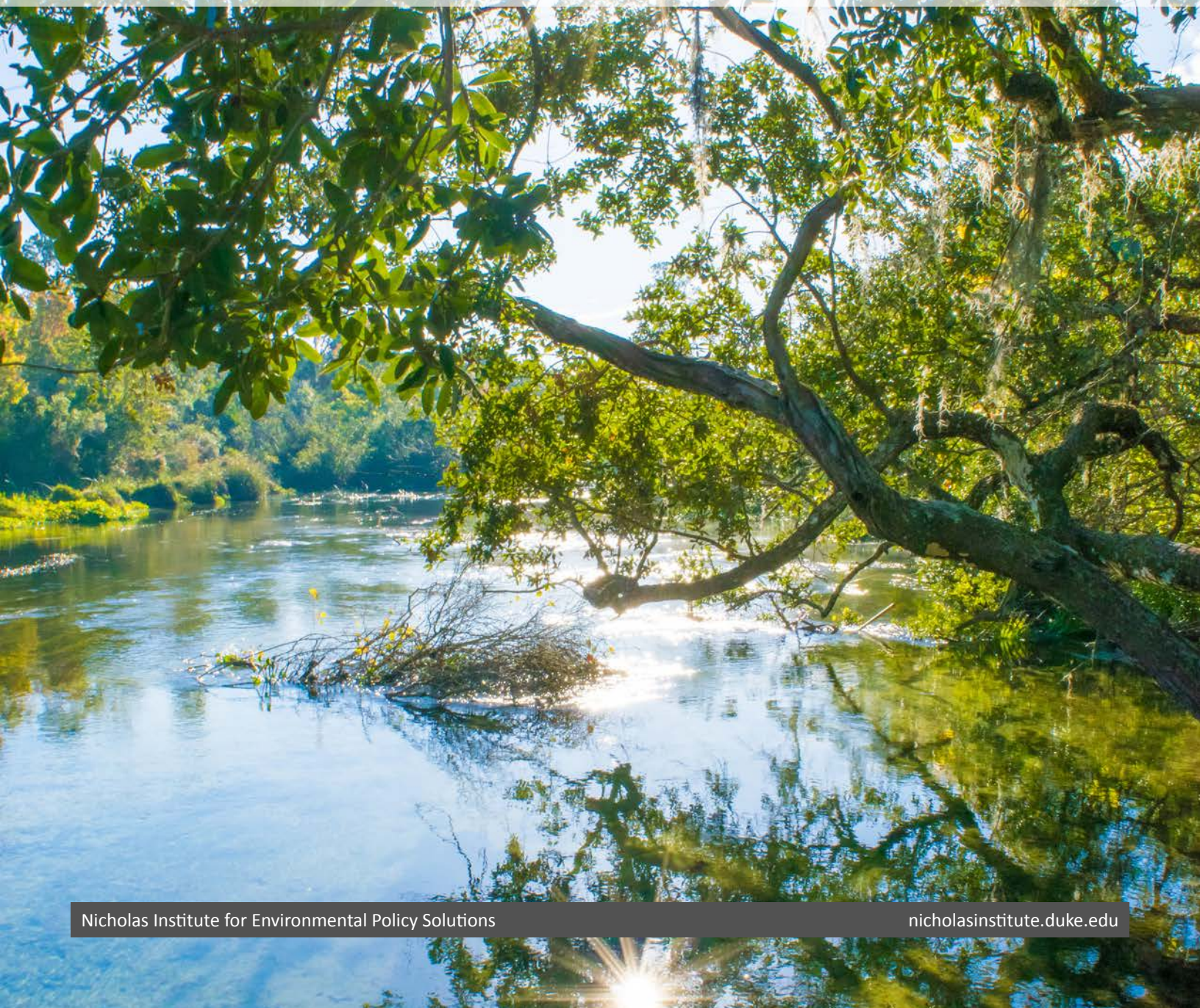
The Financial and Environmental Risks of In Lieu Fee Programs for Compensatory Mitigation

Martin W. Doyle



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Author Affiliation
Nicholas Institute for Environmental Policy Solutions, Duke University, martin.doyle@duke.edu

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EXECUTIVE SUMMARY

This is a review of a sample of In Lieu Fee (ILF) Programs through an analysis of general incentives created by the ILF Program model, and through drawing on a small sample of ILF Programs as case studies. This review focuses on the incentives created by ILF Programs as a mechanism of compensatory mitigation; while other forms of compensatory mitigation—permittee-responsible mitigation and mitigation banking—are not without their problems, there are intrinsic financial and environmental risks that are unique to ILF Programs.

This review is not comprehensive; rather it draws attention to common shortcomings and flaws of ILF programs and notes necessary safeguards based on three Clean Water Act (CWA) ILF Programs and one Endangered Species Act (ESA) ILF Program. The negative characteristics of ILF programs observed in the case studies here may be outliers, single occurrences, or they may be systemic. Some of the characteristics, however, are emergent and systemic because of the incentives that are created through the ILF Program model. Safeguards are needed by regulatory agency rule-making to govern ILF Programs generally. Indeed, many early problems associated with CWA ILF Programs were addressed through the 2008 Mitigation Rule. While the experiences here demonstrate that the 2008 Rule has in fact addressed some challenges of implementing ILF Programs through adaptive management of ILF Programs over the past decade, other experiences documented here demonstrate that because of local-level discretionary decision-making, some problems have persisted, along with problems not addressed in the 2008 Rule.

The insights gained from this limited review also demonstrate the need for a systematic review of ILF Programs across the U.S., particularly (a) consistency of CWA ILF Programs since the implementation of the 2008 Mitigation Rule, and (b) emerging ESA ILF Programs and their divergence from best practice principles present in the 2008 Mitigation Rule.

Key Findings

- Many ILF Programs can set their fees too low.
- ILF Program record-keeping is not transparent.
- Regulators use discretion to exercise flexibility in their oversight of ILF Programs.
- It is unclear who is liable for ILF Program failure.
- ILF Programs create a situation similar to a moral hazard—ILF Programs take on potentially excessive risk because the program itself may not have to absorb the costs of their decisions.
- It is unclear if many problems with ILF Programs are the exception or the rule because there has not been a critical, systematic review of ILF Programs for CWA compliance since the 2008 Mitigation Rule, and no systematic review of ILF Programs for ESA compliance.

Recommendations

- **Because of the temporal lag alone, ILF Programs should be a last resort as a mechanism for compensatory mitigation**. When temporal lags are allowed to occur, the environment loses. This lag also creates an uneven playing field for mitigation/conservation banks vis-à-vis ILF Programs. The primary way to avoid this is for explicit preference to be granted to mitigation banks or credits already generated: if bank credits are available, then permittees should be expected and/or required to purchase those credits rather than use credits advanced to an ILF Program. This hierarchy is codified in the 2008 Mitigation Rule for CWA mitigation, and should continue to be enforced. A similar hierarchy should be ensured for ESA mitigation.
- **ILF Programs should have fee schedules for advance credits that change regularly, and should include risk-based multipliers to ensure that sufficient revenue is available to meet the associated credit liability**. Prior to the 2008 Mitigation Rule, there was a consistent tendency for ILF Programs to under-charge for credits, and this problem has persisted in at least some CWA ILF programs; the problem also exists in ESA programs. If anything, ILF Programs should be estimating on the high side, i.e., should be overestimating credit prices rather than underestimating. Pricing of advanced credits should include a mechanism that accounts for the increase in mitigation costs between when fees are collected and when the project is actually implemented.
- **ILF Programs should disclose their credit liabilities in realistic and worst-case financial terms**. ILF Programs have often had impenetrable reporting, obscuring their condition to the broader public or to ILF Program umbrella organizations. The public has the right to know what liabilities their government agencies are taking on, and sponsoring organizations need to know their total financial obligations of subsidiary units. ILF Programs should report their liabilities in a way that includes estimates of financial liabilities based on realistic and worst-case possible credit price scenarios.
- **Regulatory agencies should require all existing ILF Programs to perform a credit and financial liability audit.** Current ILF Programs are disparate and uncoordinated, and so it is unclear across entire regulatory programs (e.g., CWA and ESA) how much credit liability and associated financial liability currently exists. Because of the accumulated poor reporting, it is unclear what scale of financial liability exists across the United States for this regulatory approach. The existing ILF Programs should be required to provide annual summary financial metrics in a simplified format to all sponsoring and umbrella organizations, as well as to relevant regulatory agencies. The auditing and reporting approach, including the funding mechanism, developed by the VARTF provides a best practice example by requiring an independent audit every 5 years, and for that audit to be paid for with funds from the ILF Program account. This audit could increase transparency by including program operations, timing of project development, and implementation schedules.
- **Regulatory agencies should more strictly apply the agreements, and should articulate potential penalties for lack of programmatic compliance.** All ILF Programs examined here were out of compliance with certain aspects of their agreements at some point in their history (including currently for two of them), most typically temporal requirements. Yet regulatory agencies did not penalize program sponsors. Penalties or consequences could

include requirement of alternative compensatory mitigation, application of temporal lag multipliers to crediting, suspension of program operations in affected service areas, and program termination. The lack of penalties has created a moral hazard wherein the primary losers are the environment and umbrella organizations who are likely unaware of the associated risks under their sponsorship.

- **Regulatory agencies and umbrella organizations should clarify and specify their liabilities and responsibilities under the assumption that ILF Programs could fail.** When combined with lack of transparency, and lack of clarity of existing financial liabilities of some ILF Programs, it is realistic to suspect that many umbrella organizations (e.g., TNC) are unaware of their total potential risk exposure via ILF Programs. Each ILF Program should clearly articulate to its regulatory agency and its umbrella organization (a) what would happen should the ILF Program become financial insolvent, (b) who would bear the costs of the existing credit liability. Sponsoring umbrella organizations should be required to annually communicate to regulatory agencies that they are aware of their existing and projected financial liabilities, and demonstrate financial assurances to fulfill those liabilities. Existing ILF Program agreements should be supplemented with this information.
- **Regulatory agencies should initiate a systematic review of ILF Programs.** This review is based on a limited number of cases in comparison with the number of ILF Programs that have been approved. In particular, many concerns with ILF Programs were noted and addressed in the 2008 Mitigation Rule (for CWA mitigation), but it is not clear if the rule was sufficient and effective. A systematic review would be needed to clarify whether there are in fact systemic, emergent problems with ILF Programs nationwide, whether for CWA or ESA compliance.

COMPENSATORY MITIGATION UNDER THE CLEAN WATER ACT AND ENDANGERED SPECIES ACT

What is compensatory mitigation?

Compensatory mitigation is a method for achieving environmental regulatory compliance while also allowing permitted impacts to occur. Compensatory mitigation is generally contained within the "mitigation sequence," which is first to avoid impacts, second to minimize unavoidable impacts, and then to compensate for those impacts which cannot be avoided. That is, compensatory mitigation is envisioned to be the last resort for resource protection and intended for offsetting unavoidable damages. Those unavoidable damages are offset by improving habitats or ecosystems elsewhere via preservation, enhancement, or restoration. Compensatory mitigation is often referred to as simply "mitigation."

The primary participants in compensatory mitigation are the permittee, the regulator, and mitigation provider. The regulator is any federal or state agency that is the grantor of a permit for a specific type of regulated action or impact. For instance, impacts to aquatic resources such as streams and wetlands are regulated by the Clean Water Act (CWA), which is co-administered by the U.S. Army Corps of Engineers (USACE; the Corps) (lead agency) and the Environmental Protection Agency (EPA). In this case, the regulator could refer to the Corps. In the case of impacts to listed species and/or designed critical habitats which fall under the protection of the Endangered Species Act (ESA), the regulator would refer to the U.S. Fish and Wildlife Service (FWS) or NOAA Fisheries.

The other key participant in compensatory mitigation is the permittee, often also referred to as the project sponsor. This is a person or organization that has proposed a project to the regulator and must receive a permit in order to proceed with the project. As part of the permit application, the regulator will ensure that the proposed project has avoided and minimized any impacts, and will then condition the permit for the proposed impacts by requiring some compensation for the unavoidable damages. Importantly, the permittee can be a private entity (e.g., land developer; property owner), an agency such as a state department of transportation, or any other entity that, through its activities, impacts regulated resources.

Typically compensatory mitigation is evaluated and inventoried in terms of "credits" or "mitigation units," which are often measured (and inventoried) in terms of derivations of area or length.[1] For instance, impact to 50 acres of wetland or species habitat might be inventoried as 50 mitigation debits; the permittee would need to compensate through the provision of 50 mitigation credits elsewhere. Indeed, many mitigation programs require trading ratios (e.g., 2:1, or 2 units of compensation for 1 unit of impact) which may be used to reflect condition of the impacted and compensation resources, temporal lag between impacts and compensation, etc. (for CWA see 33 CFR 332.3(f)(2) and (3)). Through this approach, a mitigation program can help ensure no net loss of area and ecological functions since compensation methods (e.g., restoration vs. enhancement) differ in their ability to offset impacts to lost area and lost ecological functions. In many parts of the country, use of more sophisticated science-based methodologies for quantifying debits at impacts sites and potential credits at compensatory mitigation sites has replaced reliance on area- or length-based trading rations.

It is important to note that the motivating factor behind compensatory mitigation is permitting and regulatory compliance. While mitigation programs are often described as environmental markets, they are in reality regulatory markets. The permittee is not typically interested in purchasing mitigation credits unless those credits fulfill their need for regulatory compliance. Thus, mitigation programs are only effective in so much as regulatory agencies and personnel are engaged in monitoring and, if necessary, enforcing their end results. The essential element in any compensatory mitigation program is the decision-making and implementation by the relevant regulatory agency or agencies.

Aquatic Resources: Wetlands and Streams

Impacts to aquatic resources are regulated under section 404 of the CWA. Any project which proposes to impact regulated aquatic resources—wetlands, streams, and a variety of features which fall under the definition of "Waters of the United States"—must be first permitted by the Corps and EPA; this practice and associated policies and industry is typically described as "wetland mitigation" (although stream mitigation is an increasingly prevalent practice now in about 25 states).

[1] Credits may be derived from physical attributes of a project such as area or length, but are often not measured in terms of area or length. They represent an accrual of function or condition. Area or length may be used as a surrogate measure of functional change.

Compensatory mitigation shows the evolution of policy and practice over several decades at the federal and state levels of government.[2] While arising out of fairly informal guidance documents, memoranda, and individual projects, mitigation of aquatic resources has become a significant private mitigation industry (i.e., entrepreneurs involved in enhancement or restoration of wetlands, streams, and other systems) with a commensurate amount of policy innovation at the state and federal level. Indeed, because much of the decision-making for permit granting occurs at the state or district office of the Corps of Engineers, there has been (and continues to be) a federalism-type of approach to wetlands mitigation: each state or district often experiments with mitigation based on the particulars of their region and experiences, with different approaches being adopted.[3] This led in the 2000s to a wide variety of approaches, which was consolidated in 2008 at the national scale in a federal rule (typically referred to as the 2008 Mitigation Rule). This set of regulations was instrumental in the wetland mitigation industry and in the regulatory community by establishing standards for a variety of aspects of wetlands mitigation (e.g., permitting timelines, as well as monitoring, reporting, and financial assurance requirements).[4] It is important to note that while the 2008 Mitigation Rule set goals and standards nationwide, much of the specific and project-relevant decision-making is left to the discretion of the district-level agency personnel.

Species Habitat under ESA

Like impacts to aquatic resources, impacts to species listed as threatened or endangered are regulated by the federal government and some state governments. Under the ESA, actions which may cause potential impacts to listed species or their habitats may be permitted, but the permit may contain conditions requiring mitigation measures ("species mitigation"). Section 9 of the ESA prohibits the "take" of listed endangered species, defined broadly by the FWS to include impacts to habitat that result in significant habitat modification or degradation that actually kills or injures wildlife by "significantly impairing essential behavioral patterns including breeding, feeding, or sheltering."

The ESA provides an exception to the prohibition on take when the FWS authorizes a conditional permit issued under Section 10 of the ESA. To obtain a permit, an applicant must submit to the FWS (for terrestrial and freshwater species) or NOAA Fisheries (for marine species) a habitat conservation plan that minimizes and mitigates the impact of the take "to the maximum extent practicable." Species mitigation is routinely included in habitat conservation plans (HCPs). Species mitigation includes habitat preservation and/or restoration in areas known to be occupied by, or potentially suitable for, the species that will be impacted by the permitted activity.[5]

Unlike mitigation under the CWA, species mitigation is not governed by a uniform set of requirements. Rather, the FWS and NOAA Fisheries evaluate species mitigation proposals on a case-by-case basis, based on the best available science and information provided by the permit applicant about the "practicability" of mitigation options. The result can be disparate mitigation requirements for different permittees, even for the same species in the same geographic area.

Mechanisms for Mitigation: In Lieu Fee, Banking, and Permittee-Responsible

In Lieu Fee Programs

In Lieu Fee Programs (ILF Programs) are a mechanism for accomplishing compensatory mitigation. ILF Programs allow an organization (the ILF sponsor) to accept a pre-defined fee for specific impact types from a permittee and provide the necessary compensatory mitigation for that permittee, often at a later date. ILF Programs must be sponsored by a government (e.g., state agency) or a nonprofit organization (e.g., The Nature Conservancy, TNC); private companies or individuals are not allowed to act as an ILF Program sponsor. ILF Programs exist for compensatory mitigation of CWA and ESA related compliance (see below).

ILF Programs must exist through some formal agreement between the sponsoring organization and the relevant regulatory agencies. This agreement can be in one of several forms: for instance, a Memorandum of Understanding or Agreement

[2] A particularly useful review of the initiation and early evolution of compensatory mitigation is Hough, P., and M.M. Robertson, 2009. "Mitigation Under Section 404: Where It Comes From, What It Means." Wetlands Ecology and Management 17: 15–33.
[3] Doyle, M.W., R. Lave, M.M. Robertson and J. Ferguson, 2013. "River Federalism." Annals of the Association of American Geographers 103: 290–298.
[4] 33 CFR Parts 325 and 332, Department of Defense and Environmental Protection Agency, Compensatory Mitigation for Losses of Aquatic Resources, Final Rule, April 10, 2008.
[5] For species banking generally, see Bonnie, R. 1999. "Endangered Species Mitigation Banking: Promoting Recovery through Habitat Conservation Planning under the Endangered Species Act." Science of the Total Environment 240: 11–19.

(MOU or MOA); an ILF Instrument; or under the ESA, as a part of a conditional permit such as a CCAA or Habitat Conservation Plan (HCP). In whatever form, this is a key aspect, as it allows most ILF Programs to accept fees in advance of providing the actual mitigation to offset the habitat-damaging impacts. To accomplish this, most ILF Programs receive an allocation of "advance credits" from the relevant regulatory agencies[6] (i.e., the amount of credits that the ILF Program can sell prior to implementation of actual compensatory mitigation projects). These advance credits can be thought of as a loan of mitigation credits from the regulatory agency to the ILF Program; the ILF program can accept fees from permittees up to this limit, allowing it to effectively sell loaned credits. While there are important differences between a true "loan" of credits and the treatment of advance credits, in many ways, advance credits can be best conceived as a loan of mitigation liability.[7] These loaned credits also typically include constraints as to what geographic area or region they can be applied (i.e., "geographic service areas" or "service territories"). For example, the Corps of Engineers may approve the availability to an ILF Program 3,500 stream credits for use in a specific watershed. The ILF Program then can accept fees from permittees who are impacting streams within that watershed up to the amount of credits issued by the Corps. The ILF Program must therefore set the fees to generate revenue; this fee-based revenue will then be used to finance the mitigation projects required to compensate for the impacts that permittees engage. Importantly, when an ILF Program sponsor accepts fees from permittees (i.e., sells loaned/advanced credits), this creates a *credit liability* for the program; the program sponsor is now obligated to fulfill the requirements of compensatory mitigation, while the permittee has no further responsibility for resource impacts.

Part of the formal instrument between the regulatory agencies and the ILF Program sponsor includes the terms over which the ILF Program will fulfill their obligations. The regulatory agencies will have specific types of activities or projects that will count toward compensating for the mitigation obligation taken on through the loaned credits. The agreement will also include the temporal terms; for instance, how many years does an ILF Program have to fulfill their compensatory mitigation requirements once a loaned credit has been sold (i.e., fees have been accepted)? In addition, some agreements have included a specific fee schedule for the ILF Program and the frequency with which it can be adjusted; that is, in some cases the actual agreement creating the ILF Program has included the price of the credits themselves or the mechanism used to calculate the cost of credits to a permit applicant (described more below).

Some ILF Programs restrict the types of permittees who can use the program or the conditions under which the ILF Program can be used. For instance, ILF Programs may only be available for use by government agency-related impacts: an ILF Program specifically intended to compensate for road-building by a department of transportation or one tied to a county government and its associated construction activities. In addition, some ILF Programs may be limited based on other types of mitigation that are available; for example, if a mitigation bank (see below) or other form of already-developed mitigation is available, then loaned credits via an ILF Program may not be allowed to be used.

There are several key characteristics of the ILF concept that are independent of any specific ILF Program or sponsors.

- **First, by design, ILF Programs create the potential of a temporal lag between impact and compensation**; this is often referred to as a "temporal loss." If an ILF Program has three years from the time at which a fee is accepted to the time that their project must be constructed, then there is, at minimum, a three-year temporal loss of environmental function that is legal and likely (unless the project sponsor implements the project sooner). In reality, this will be even greater because of the time needed for many types of restoration to actually reach some level of functionality. In some cases, ILF Programs have been able to use fees to finance projects larger than what are needed for their immediate credit liability; in these cases, the program can generate excess credits and can reduce or even eliminate temporal loss of future projects. They have effectively created a bank of credits (and are comparable to a mitigation bank, see below).
- **Second, the regulatory agency must agree to an advance of credits** or allow the program to have some sort of waiver period at the outset so that the program can collect fees that earn the needed revenue at the outset of

[6] Some programs do not receive advance credit releases, e.g., Everglades National Park ILF, Northwest Florida WMD, and Coastal Mississippi Land Trust.

[7] Regulatory agencies do not agree with describing advance credits as loaned credits because the term "loan" implies that the credits belong in some way to the regulatory agencies. Rather, advance credits belong to the ILF Program, and in order to secure those credits the ILF Program must develop a planning level tool to identify what types of projects would be developed. The ILF Program has to make a case for the amount and type of advance credits that would be available.

the program. Thus, a central aspect of the ILF approach to mitigation is the regulatory agency approving the use of advance credits by the ILF Program; this requires the regulatory agency to a priori assess the viability of the program to fulfill the potential credit liability it will assume. Moreover, it should require some mechanism by which the regulatory agency can hold the ILF Program accountable if the credit liability is not fulfilled according to their formal agreement.

- **Third, an ILF Program must price their credits prior to actual mitigation projects**. That is, any ILF Program must forecast what the costs of mitigation projects will be in the future and set their prices accordingly. Because of the relative novelty and site-specificity of environmental restoration, this presents significant challenges and a source of substantial uncertainty; that is, it is quite difficult to project and forecast what the actual prices of mitigation might be in the future given the relative infancy of the restoration industry writ large. In addition, some ILF Programs have fees set by rule-making (described below), which subjects the fees to significant political influence and associated lobbying by regulated interest groups.
- **Finally, an ILF Program—which can be a state agency—assumes all risk and liability for compensatory mitigation without the ability to adjust their prices for fees already accepted**. When a permittee pays a fee, all liability is transferred to the ILF Program sponsors. Thus, any changes to regulatory requirements of compensatory mitigation, any increases in costs—land, materials, construction, technological—must be addressed by the ILF Program sponsor rather than by the permittee, and this must be done after fees have already been accepted, i.e., after possible revenue generation. That is, *the ILF Program accepts all of the regulatory and market risk without the ability to reassess permittees to accommodate for these changes*. Because of regulations on ILF Programs, this means that government agencies and NGOs are absorbing regulatory and market risk associated with compensatory mitigation.

Mitigation Banks and Conservation Banks

There are many differences between ILF Programs and the banking alternative, typically referred to as "mitigation banks" for aquatic resources mitigation and "conservation banks" for ESA species mitigation (both referred to herein typically as "mitigation banks"). In contrast to an ILF Program, *mitigation banks develop a mitigation project in advance of an impact permit being issued.* The general model of mitigation banking is for an entrepreneur to propose a mitigation project (preservation, enhancement, restoration) to the regulatory agencies. The project will have a specific location, actions, and plan for what types of impacts the credits from that bank can compensate. Moreover, based on the specific requirements, the mitigation bank will be required to monitor the project for some period of time (e.g., five years) and meet specific success criteria during those five years. Thus, an entire mitigation bank can require a minimum of six years, and more likely ten years or more to proceed from initial agreement with regulatory agencies to full project completion. However, the entire project need not be completed for credits to be sold; as part of the initiation agreement between mitigation bankers and regulatory agencies—encapsulated in the Mitigation Banking Instrument—the regulatory agencies will typically allow the bank to sell credits as different benchmarks are met along the way. For instance, if a bank is generating 100 mitigation credits in total, the regulator may allow the bank to sell 15% of the credits after the bank instrument is approved by regulators, and another 15% once the project is constructed, then releasing a portion of the remainder of the credits each year as monitoring indicates that the project is meeting various success criteria. The bank therefore does not need to wait until the end of the entire monitoring period to generate any revenue; rather, it can often generate some limited revenue at some times during and after construction. That said, the bulk of the revenue for a mitigation bank will come during the monitoring period as post-project success criteria are met.[8]

Mitigation banks are often entrepreneurial (i.e., commercial), although they need not be. Government agencies and nonprofit organizations can also sponsor and develop mitigation banks rather than, or in addition to, ILF Programs. The credits generated from these banks can be used to compensate for their own impacts, or to generate additional revenue (the former makes them similar to a Permittee Responsible Mitigation approach; see below). This is an important facet of mitigation credits in general: they are fully fungible unless the sponsoring organization constrains them. For instance, the credits from a mitigation bank can be sold to offset private or public sector impacts; indeed, ILF Programs can, and often times do, purchase credits from private mitigation banks. Vice versa, ILF Programs, once they have fulfilled the

[8] For review of credit release schedules and their effect on revenue generation during the process of mitigation banking see BenDor, T.K., J.A. Riggsbee, and M.W. Doyle. 2011. "Risk and Markets for Ecosystem Services." Environmental Science and Technology 45: 10322–10330.

credit liabilities, can sell their excess credits on the broader mitigation credit market by treating their projects similar to a mitigation bank (if excess credits exist).[9]

Despite these similarities, there are several key distinctions between a mitigation bank and an ILF Program.

- **First, a mitigation bank is a site-specific enterprise, wherein the regulator must review and approve specific design, construction, and monitoring plans associated with a particular site**. A mitigation bank must be established—site approved, permanently protected and restoration fully funded financially—prior to selling any credits. This is a critical feature of mitigation banks: the restoration work is begun, if not partially completed, in advance of impacts being permitted associated with that mitigation. This not only reduces the potential for ecological temporal loss, but it also increases the likelihood of successful offsets and equivalence of functions, i.e., no net loss. Conversely, site-specific, project-level information is not required for an ILF Program to be approved.
- **Second, a regulatory agency is not allowed to advance/loan credits to a mitigation bank** (i.e., banks cannot receive advance credits). Rather, and quite the opposite, a mitigation bank can only sell credits once they have been approved for sale by the regulatory agencies, referred to as "released credits." Releasing credits is contingent on the mitigation project meeting clearly articulated success criteria, whether construction benchmarks or ecological recovery benchmarks.
- **Third, the price of credits sold from a mitigation bank is set by the banker, who must generate sufficient revenue from their sale to recoup actual construction costs and operational costs for their organization, including profits**.[10] Bank-derived prices will thus bear some reflection of the market value of mitigation credits. This is in contrast to the fees set by ILF Programs which must be set by some combination of information and speculative expectations. Any mitigation bank will be unable to sell credits at a sustained loss, and thus, the *price of credits from a mitigation bank will be determined by the actual cost of credit production and some profit margin*.
- **Fourth, a mitigation bank assumes all risks associated with mitigation, including the risk associated with production of credits prior to impacts**. If a mitigation project fails, the mitigation banker fails financially, and the only ecological loss is, at most, those credits released as per the credit release schedule. Mitigation bankers also take on considerable financial risk, as they must not only finance the project (e.g., engineering designs; land acquisition; legal preparation; construction), but they must also provide financial assurances for the project.[11] Thus, even if a project fails, there is a financial backstop to eventually offset any environmental liability associated with a failed mitigation project.
- **Fifth, the mitigation banker bears liability of performance**. If a mitigation bank fails, there is limited associated ecological damage (i.e., limited to temporal loss), as financial assurances are available to successfully complete the projects in cases of banker default.

Permittee-Responsible Mitigation

The third form of wetland mitigation is referred to as permittee-responsible mitigation (PRM). As the name suggests, this form of mitigation is perhaps most simple in that the mitigation is performed by the permittee for a specific permit. In the earliest iterations of mitigation, PRM was often performed by organizations not well-suited to ecosystem restoration and were usually sited on or adjacent to property being impacted. Thus, these projects were frequently small in scale, subject to direct development pressure (e.g., polluted runoff, sedimentation, etc.) and designed/managed by inexperienced sponsors. From this earlier experience, PRM became the least preferred mitigation mechanism, as it did not offer the convenience of consolidation and large ecological scale as is the case with mitigation banks and ILF sites. Indeed, in the 2008 Mitigation Rule, based on experience with regulating wetland mitigation, the Corps of Engineers and the EPA stated a preference for mitigation banks over ILF Programs, and a preference for both mitigation banks and ILF Programs over PRM (33 CFR

[9] For a review of how ILF Programs intersection with mitigation banks see Doyle, M.W., and T.K. BenDor. 2011. "Evolving Law and Policy For Freshwater Ecosystem Service Markets." William and Mary Environmental Law and Policy Review 36: 153–191.

[10] There are a number of single-user banks, such as those sponsored by federal, state, or local government agencies; these make up about 25% of the currently approved mitigation banks.

[11] As a percentage of total project costs, financial assurances are not necessarily significant. However, these financial instruments often tie up capital/assets on balance sheets of mitigation banks while outstanding. So in effect, financial assurances can limit a bank's ability to pursue additional projects until they complete existing banks.

Part 332.3 (b)). It is worth noting that the practice of PRM has changed dramatically in the past few years, making PRM more comparable in approach and scale to mitigation banking in that projects are now typically quite large and done in advance of impacts. This topic merits a systematic review of recent experiences.

Role of Regulatory Agencies

While this present review focuses on ILF Programs, it is important to note that the eventual environmental success or failure of any compensatory mitigation project or program will be determined more by the regulatory agencies than by those implementing the mitigation work, whether a mitigation banker or an ILF Program. Under a compensatory mitigation program, after a transaction, the permittee bears no risk (excluding PRM). When a permittee purchases credits from a mitigation banker or pays a fee to an ILF program, the transaction results in all regulatory compliance liability being transferred from the permittee to the banker or ILF program sponsor. Thus, if there is project or program failure, the permittee is not liable. Because of this feature of compensatory mitigation, the permittee does not have an interest in the quality or condition of a mitigation project: the goal of a permittee is regulatory compliance, and thus, the quality of a mitigation credit (from a permittee perspective) is its ability to fulfill regulatory requirements, not in its ability to increase ecological condition, improve resources, or enhance species viability. Further, while mitigation bank and ILF Program sponsors typically have environmental motivation, their central task is to meet the success criteria established by regulatory agencies which determine the conditions of successful (i.e., permitted/released) compensatory mitigation projects. Their goal is to ensure credits are released for sale, which means meeting the associated regulatory requirements. *The characteristics of mitigation projects (i.e., restored or enhanced ecosystems) is thus determined by regulatory agencies and their personnel, not by mitigation bankers or ILF program sponsors through quality-maximizing incentives as might characterize other types of market transactions.* It is important to note that mitigation project sponsors (whether ILF Program or mitigation bankers) have extensive discussions with regulatory agencies over most aspects of the project, including what types of actions will be accomplished for ecosystem restoration, thus leading to a partnership in developing the project implementation plan and requirements. Nevertheless, the regulatory agencies (e.g., Corps for CWA; FWS/NOAA for ESA) have final determination for which impacts require permits, and they determine which restoration projects are sufficient to offset those impacts.[12]

ILF Programs, Benefits, Risks, and Recent Rule-Making

ILF Programs are not new to the compensatory mitigation industry, having developed in the early 1990s according to a recent review of the database used by federal agencies to track mitigation (RIBITS; recognizing that this database is often incomplete with many program descriptions in flux).[13] This database also suggests the development and utilization of CWA ILF Programs is increasing, especially since the issuance of 2008 Mitigation Rule. Within ESA mitigation, the proposal and establishments of ILF Programs is also increasing. The range-wide plan used for lesser prairie chicken (WAFWA, described below) is an ILF Program, and the Environmental Defense Fund has proposed the use of their Habitat Exchange for at least three species, which will also operate as an ILF Program.[14] It appears ILF Programs are being increasingly proposed, approved, and presumably used by permittees although there is considerable variation in the specific instruments used by ILF Programs.

ILF Programs can be beneficial in compensatory mitigation when appropriately used. Advocates for ILF Programs note that they allow compensatory mitigation to move into geographic areas where mitigation banks are unlikely to invest, presumably due to limited long-term credit demand. ILF Programs may also be a mechanism of developing new types of offsets; for example, initial stream mitigation (as opposed to wetland mitigation) was driven by ILF Programs rather than mitigation bankers. However, there are also inherent risks associated with ILF Programs that are not readily apparent—risks that can be controlled if properly treated in ILF Instruments, but may not be controlled in practice. These are discussed in detail below.

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[12] Doyle, M.W., J. Singh, R. Lave, and M.M. Robertson. 2015. "The Morphology of Stream Restored for Market and Nonmarket Purposes: Insights from a Mixed Natural-Social Science Approach." Water Resources Research doi:10.1002/2015WR017030.

[13] Accessed October 3, 2018

[14] EDF's Habitat Exchange is an ILF Program with a modification that limits temporal loss to a certain extent by pairing impacts with offset sites through a reverse auction process. It is not as comprehensive of an advance mitigation program as conservation banking.

It is important to note that there have been focused efforts by regulatory agencies to improve the practice and policy of compensatory mitigation, including the use of ILF Programs. Most notably, in 2008, the Corps of Engineers and EPA released the 2008 Mitigation Rule. There were a large number of reforms in the 2008 Mitigation Rule specific to ILF Programs. In fact, based on practical experience administering mitigation markets, the USACE and EPA excluded ILF Programs entirely as a potential source of mitigation in the first version of the 2008 Mitigation Rule which was sent out for public comments and review. However, numerous public comments were submitted that compelled the USACE and EPA to include ILF Programs in the Rule's final version. While the final 2008 Rule included ILF Programs, it did so subject to a preference structure for mitigation mechanisms that assigned a priority to mitigation banks over ILF Programs. Many commentators on the proposed 2008 Mitigation Rule recommended keeping ILF as a mechanism of mitigation, but with reforms, which included:[15]

- Limits on who can be an ILF Program sponsor
- Advance planning requirements
- Cap on advance credits
- Full-cost accounting for credit pricing
- District Engineer approval for fee schedule for advance credits
- Financial accounting requirements
- Provisions to address timing of projects
- Similar administrative and ecological standards as mitigation banks
- Same public and Interagency Review Team (IRT) review process as mitigation banks

While the 2008 Mitigation Rule was an important policy development in providing some specific standards for the establishment and operation of ILF Programs, there are risks not directly or adequately addressed by these existing regulations; these are the subject of much of the review below. In addition, and as problematic, there are risks that any federal rule will not be implemented for specific projects as intended. Like much rule-making by federal agencies, significant discretion is left to the local level (e.g., field offices of the Corps). This means that while the 2008 Mitigation Rule set out to specifically address shortcomings of ILF Programs, the actual implementation and discretionary decision-making could undermine some of the intent of the rule.

Such risks are not unique to CWA markets: ILF Programs for ESA compliance—which do not have regulations equivalent to the 2008 Mitigation Rule—exhibit similar risks. In both CWA and ESA markets, potential risks need to be well understood in order to prevent ILF Program failures which can be both financial and ecological. This study reviews some of the more readily apparent examples of ILF Program failures that have emerged across multiple CWA and ESA markets. These findings are intended to compile some lessons learned, which are used to develop specific recommendations to control/alleviate ILF programmatic hazards.

OBSERVED AND INHERENT CHARACTERISTICS OF ILF PROGRAMS

ILF programs are not uniform—they vary considerably between regions, states, and purposes. Even within one specific program, they can vary over time, as many have evolved, and continue to evolve. Thus, it is impossible to characterize all ILF Programs with any single blanket descriptions.

It is possible, however, and useful to consider the *potentially inherent characteristics and consequences* of ILF Programs—those that could exist through the basic incentives and structures of any ILF Programs. These are important to understand because they may emerge unless a specific and explicit set of constraining policies or rules are set in place, and thus, it is important to articulate the necessity of such rules and practices. Some of these negative characteristics can be observed to have occurred in specific programs or to be occurring currently. While they may be outliers, or even single occurrences,

[15] Based on personal communication with Palmer Hough, EPA Wetlands Division, communication November, 2018.

they are important to document and identify because they represent potentially emergent properties of ILF Programs. That is, characteristics of ILF Programs in the past may represent a tendency of ILF Programs in general; while they may not be systemic, they may not be outliers either.

Here, the general characteristics of a small sample of ILF Programs are reviewed within the context of four specific ILF Programs: three associated with CWA compliance and one with ESA compliance. These characteristics are reviewed below through a synthesis of these programs, while the specific programs themselves are described in greater detail in the Appendixes. The review here is admittedly anecdotal and based on a limited number of case studies relative to the number of ILF Programs that have been approved and in operation. The intention is to raise issues that are known to exist, or to have existed with ILF Programs, and thus identify what types of problems need to be examined on an individual ILF Program review basis, as well as the types of problems which would be important to review in a systematic, nationwide analysis in the future. The review here is not comprehensive; the findings of this limited review do support the need for a comprehensive review.

Some ILF Programs Have Set Their Fees Too Low

One of the key structural flaws of the ILF model in concept and practice is the potential for fees to be set too low and thus create financial and ecological deficits. Most simply, fees need to be set to cover the full costs of providing mitigation (the 2008 Mitigation Rule required full-cost accounting for ILF Programs). While some programs have developed fee schedules to address this issue, other programs have struggled to price credits appropriately.[16] Fees might be set too low for a number of reasons, but generally, they can be inadequate for the costs of mitigation at the time and/or fees can fail to account for increase in mitigation costs between the time that they are paid and when projects are actually undertaken and completed.

Because the fees are taken in prior to the project being implemented (often several years before), it can be difficult for an ILF Program to accurately assess what full costs might realistically be. In addition to this, some ILF Programs have fees that are set by a rule-making process, or at least programmatic designs, which constrain the prices or the rate at which prices can be raised. For example, the current WAFWA ESA ILF Program only allows fees to increase by a set percentage per year. Likewise, the Tennessee Stream Mitigation Program (TSMP) had fees initially set as part of its forming agreement with regulatory agencies, and the North Carolina ILF Program had its fees set, initially (pre-2008), via rule-making. When fee prices are set by rule-making or are to be codified in some manner (as is done in the WAFWA program), the programs are subject to intense lobbying from a variety of sources including other state agencies as well as influential private industries, who are large users of the ILF Program. Thus, there is considerable pressure to either underestimate or even suppress fees, and once they are set, to not adjust them quickly enough to reflect real costs of mitigation. Even if there is a requirement for fees to reflect full-costs of mitigation, those personnel actually running the program can find it difficult to fully understand the actual cost of mitigation delivery, what the business structure of the industry they are regulating entails, and the broader drivers of mitigation costs (e.g., land acquisition costs). This can result in a surprisingly hollow, qualitative debate on what the fee structure *should be* to achieve the programs goals rather than detailed, hard analysis and rapidly responding reality-check of what fees actually *need to be*.

An example of how underpricing credits can lead to long-term financial difficulties is the Tennessee Stream Mitigation Program (TSMP). In 2002, the TSMP developed a fee of, at most, $200/linear foot of streams. Through the end of 2011, the program had a credit liability of 176,000 credits, of which 80% were in some stage of mitigation, and the other 20% were unmitigated. If $200/credit was an accurate estimate of the full-cost of delivering required mitigation, then the program had an existing credit liability, 9 years later, of over $7 million.[17] By 2016, the total credit liability was over 136,000 credits. With a fee (as of 2016) of $240/credit, the TSMP was liable for $32.8 million of mitigation work to be completed.[18] This assumes, however, that the program can provide mitigation at $240/credit. In adjacent North Carolina, the state ILF Program has set fees at over $500/credit for streams, reflecting what North Carolina has determined is the full-cost of stream mitigation. If North Carolina's estimates are realistic, then taking this range of cost estimates, the credit liability for the Tennessee ILF Program sits somewhere between $32.8 million and $69.3 million if they were to begin mitigation

[16] For programs that have developed fee schedules more appropriate and reflective of mitigation costs see King & Piece County (Washington), Riverside-Corona RDC (Southern California), New Hampshire ARM, and Maine NRCP.
[17] Tennessee Wildlife Resources Foundation, Inc., and Subsidiary, Consolidated Financial Statements, December 31, 2011, page 6.
[18] Tennessee Wildlife Resources Foundation, Inc., and Subsidiaries, Consolidated Financial Statements, December 31, 2016, page 8. Liabilities reported page 14.

immediately; the program currently has $18 million on hand.[19] Each year that no work is done, the costs associated with their credit liability will rise.

In addition, even if fees are set appropriately for a particular time, a delay in a particular project implementation will see the costs for mitigation inevitably rise. For example, if fees are set appropriately for a particular type of credit to provide full cost of projects in 2018, but the project is delayed for a year (not unusual), then the actual fee required would have needed to be increased to reflect the timing of the actual projects. This again leads to credit liability being underfunded.

Table 1. Mitigation completed compared to mitigation liabilities of the TSMP as of December 2016.

Service area	Credits actually fulfilled via completed mitigation ("Credits created")	Credits obligated to be created due to fees previously accepted ("Credits sold")	Remaining credit liability	Remaining financial liability @ $240/credit	Remaining financial liability @ $400/credit	Remaining financial liability @ $507/credit[a]
North Hatchie Obion	9,565	7,196	(2,369)	-	-	-
South Hatchie Obion	20,010	38,833	18,823	$4,517,520	$7,529,200	$9,549,284
Lower Tennessee	38,179	31,337	(6,842)	-	-	-
Mid. Tennessee Elk	3,363	16,136	12,773	$3,065,520	$5,109,200	$6,479,998
W. Lower Cumberland	35,068	47,023	11,955	$2,869,200	$4,782,000	$6,065,011
E. Lower Cumberland	-	29,035	29,035	$6,968,400	$1,614,000	$14,730,036
Upper Cumberland	5,891	33,209	27,318	$6,556,320	$10,927,200	$13,858,968
Mid.Tenn. Hiwassee	5,243	25,924	20,681	$4,963,440	$8,272,400	$10,491,885
Upper Tennessee	25,797	22,342	(3,455)	-	-	-
French Broad Holston	1,507	17,435	15,928	$3,822,720	$6,371,200	$8,080,593
Total	144,623	268,470	136,513[b]	$32,763,120[c]	$54,605,200[c]	$69,255,775[c]

[a] The value of $507.32 is the cost-based fee in 2018 for North Carolina, which has developed a rigorous method for quickly adjusting fees based on actual costs of mitigation provision. It is unclear if credits are fully equivalent between NC and TN, however; thus the prices may not be fully translatable.

[b] This value is not a simple sum of the column; the negative values in the column (i.e., excess credits) cannot necessarily be used to fulfill credit deficits in other service areas. This total value is thus the total of the positive values in the column.

[c] It is possible that the liabilities are less than this because additional revenue could be gleaned through marketing excess credits generated in North Hatchie Obion, South Hatchie Obion, and Upper Tennessee service areas. However, it is not clear that there is a market for these credits to ensure revenue generation.

More evolved and adaptive programs—those which have often had significant problems in the past—have developed methods by which they have increased their fees significantly and sought to ensure their ability to increase their fees based on geography and vary their fees frequently. The NC ILF Program, for example, after over a decade of experience in the problems associated with underfunded credit liabilities,[20] has developed a series of practices to better ensure sufficient revenue generation and accurate credit pricing. The NC ILF Program can currently charge a premium of up to 33% for some geographic areas, and has the ability to reset its rates quarterly.[21] Also, more fiscally conservative programs are more conservative in the liabilities that they take on, an approach adopted by the Virginia ILF Program (VARTF). In 2017, the VARTF had a liability of 34,103 stream credits, and $13.7M in their fund account, which is sufficient to procure credits for $400/credit. This is likely enough to meet their credit liability, although (as noted above) the NC ILF Program currently

[19] According to 2017 financial audit.

[20] Templeton, S.R., C.F. Dumas and W.T. Sessions. 2008. Estimation and Analysis of Expenses of Design-Bid-Build Projects for Stream Mitigation in North Carolina. Clemson University Department of Applied Economics and Statistics, Research Report RR 08-01, January.

[21] 15A NCAC 02R, North Carolina Division of Mitigation Services.

estimates that stream credits costs exceed $500/credit (recognizing that it is difficult to directly compare credit prices from one district to another due to differences in crediting methodology). Thus, while the VARTF is not in a credit liability condition as the TSMP, if North Carolina's cost estimates are somewhat translatable, then the VA ILF Program will have some financial shortfall for its existing credit liability.

An ILF Program with insufficient financial resources for its credit liability has to reduce costs or increase revenue to come back into compliance. Reducing costs can only be done by altering normal mitigation practices or reducing administrative overhead. For instance, an ILF Program may seek to make use of public lands for siting mitigation projects while private, commercial banks often make use of private land easements. While this may reduce costs for an ILF Project, it can influence or distort site selection: siting a project becomes finding free land rather than the best land. This is a topic that needs much more attention, i.e., whether mitigation on private lands is preferable to public lands, or vice versa. Regardless, it creates an alternative incentive for an in-debt ILF Program which will not necessarily be as prevalent for a financially robust ILF Program.

Alternatively, an ILF Program can balance their books by increasing revenues, which would require increasing fees on future permittees rather than those who have already purchased advanced credits. First, it is important to recognize that the increase in fees have to accomplish two functions: (a) they have to more accurately reflect the price of current mitigation, and (b) they have to make up the financial gap for already existing liabilities. That is, if financial liabilities exist, the fee adjustment will need to over-compensate for some period of time. (This problem is analyzed quantitatively in the Appendix.) But as problematic as they may be structurally, in order to make up their financial liability, ILF Programs have to continue to take in fees, which continue to represent more liabilities. They must continue to increase risk exposure to backstop existing liabilities (i.e., a moral hazard; see below). Quite bluntly, this creates a situation in which success of meeting the needs of initial and early permittees is accomplished by fees paid by later permittees.

Such fee miscalculations are further compounded in ILF Programs with caps regulating fee increases because the program may not be able to escalate revenue sufficiently to overcome initial price disparity. This problem is made particularly difficult to overcome if price escalation does not also include effects of inflation generally, and particularly on the input costs of mitigation (e.g., construction, land values, labor), which can increase faster than metrics of general inflation. If the price set by the ILF Program is less than the real price of credit production at some initial point in time, then the ILF Program will need to increase its fees at some rate greater than the rate of inflation. Based on a set of simple analyses (see Appendix 5; section 5.5 below), recovering sufficient revenue for an ILF Program to become financially viable can take over a decade of price escalation. Importantly, all the years in between are financial losses: an ILF Program with an initial revenue liability (i.e., prices initially set too low), *will be selling credits at a financial loss, for every credit sold, for a period of several years.*

In sum, the problem of underpricing credits by ILF Programs can create substantial financial liabilities for an ILF Program that can take years to correct. Further, many of these financial liabilities are difficult to identify initially and understand over time, and elements within ILF Program governing documents—such as limits on fee increases—may even preclude correction. It is unclear whether ILF Programs nationwide are more likely to genuinely price their credits accurately and conservatively, like Virginia and North Carolina, or to be in a condition of underfunded credit liability like Tennessee.

Record-keeping by ILF Programs Has Not Been Transparent

ILF Programs are difficult to understand because there are temporal and spatial particulars, and there are varying cash flows and liabilities that change over time and space. This means that understanding ILF Programs, and regulating them, requires great transparency of record-keeping to ensure that the programs are being implemented as designed, agreed upon, and intended. However, another problematic characteristic of ILF Programs is their potential for lack transparency in their record-keeping, leading to problems with external groups—including regulatory agencies—clearly understanding the true condition of the programs. For example, in 2016, the VA ILF Program hired an external organization to review its performance. This external review team had deep expertise in mitigation and ILF Programs, and even after significant investment of recreating the transactions of fees received and projects completed, the review team found that they "were unable on the basis of the documentation maintained by the VARTF to determine with precision whether any other ongoing mitigation projects satisfy the three-growing season timing requirement for these listed areas." That is, for a

particular aspect of this ILF Program, even contracted reviewers with deep expertise in mitigation were not able to sufficiently understand an ILF program's documentation.

The Virginia example provides two important lessons. First, the VARTF responded to this external review by revising their documentation, which now more clearly communicates their existing credit liability on a service area by service area basis.[22] The ILF Program adapted their management in response to external review, resulting in a far better overall program. Second, the approach taken by the VARTF should be viewed as a best practice for other programs; it is the only ILF Program instrument known to contain a specific requirement for an independent audit every five years, and for that audit to be paid for with funds from the ILF Program account.

Regulators themselves may find it difficult to understand what is reported to them from ILF Programs. For instance, the WAFWA ILF Program had developed a reporting mechanism that was opaque to its own users, and to the FWS. In commenting on its primary deliverable to the FWS in 2015, the Director of the FWS noted,

> *As you know, under the unique partnership set up by the [ILF Program], our ability to access information on participating landowners, enrolled participants, conservation and mitigation commitments, and other aspects of plan implementation is critical for the Service to carry out its independent oversight responsibilities of participants enrolled in the [ILF Program]. While WAFWA has made all this information available to us, the lack of a user-friendly interface that Service staff can navigate without technical assistance from WAFWA staff has been an impediment.*

The regulator in charge of oversight was unable to oversee the ILF Program without assistance from the program itself.[23]

Regulators' lack of understanding the details of an ILF Program was in part what created an escalation of problems for the North Carolina's ILF Program. In a review of transactions and associated records conducted during the mid-2000s, three academic researchers required more than a year to recreate and understand the records kept by the ILF Program. And it was only after significant investment of time that the actual practices of the program were made clear (i.e., that they altered the transactions through time; see description in section 3.3 below).

It is important to note that this potential for ILF Programs to lack transparency in reporting generates extraordinary problems, most notably financial liabilities. For example, while the reporting standards developed by VARTF are an important improvement, they still do not communicate an estimate of how their existing credit liability translates into financial liability. That is, the VARTF could combine their known credit liability with an estimate of credit production cost ranges, and in so doing clearly communicate their likely (and worse case) financial liabilities (similar to Table 1 above). Without this information, it is impossible for other organizations, such as umbrella organizations of the sponsor (e.g., TNC for the VARTF, state of NC for the NC ILF Program), to clearly estimate the financial viability or liability of the program.

To illustrate just how critical such financial transparency is, the Tennessee ILF Program (TSMP) provides annual financial audits in which they present their financial position, but this financial position is not made consistent with their credit position (i.e., liability). As such, in 2016, the program reported that it had $43,455 in financial liabilities, yet did not state in the same manner that it had at least $32 million in credit liabilities. By not translating the existing credit liabilities as financial liabilities, the reporting was not transparent in clearly communicating the actual financial condition of the program.[24] This stands in stark contrast to the most recent approach used by North Carolina's ILF Program which explicitly forecasts its revenue and liability based on a range of potential credit prices, and in so doing, is able to best convey to lawmakers the most appropriate prices and the implications of incorrectly pricing credits.[25] Indeed, this approach by NC's ILF Program should be considered a best practice for communicating realistic scenarios of revenue generation and need. Therefore, to improve record-keeping and program transparency, regulators and ILF Program sponsors should consider supplementing existing ILF Program reporting with the approach adopted by North Carolina's ILF Program in which it

[22] Environmental Law Institute, 2016. Program Audit of Virginia Aquatic Resources Trust Fund. See also Memo from Karen Johnson (The Nature Conservancy in Virginia), to US Army Corps of Engineers/DEQ/IRT Members, RE: VARTF Program Audit, dated May 11, 2016.
[23] Quote from letter from Dan Ashe (Director of FWS) to Ross Melinchuck (Deputy Director of Texas Parks and Wildlife Department), March 31, 2015.
[24] Tennessee Wildlife Resources Foundation, Inc., and Subsidiaries, Consolidated Financial Statements, December 31, 2016, page 8. Liabilities reported page 14.
[25] The analysis and set of figures that is exemplary in many ways is available at NC DEQ, Division of Mitigation Services, Fiscal Note for Proposed Amendments to 15A NCAC 02R.

explicitly forecasts its revenue and liability based on a range of potential credit pricing (in addition to adopting the external auditor approach adopted by VARTF; see above).

Regulators Have Adjusted the Rules for ILF Programs

By their design, ILF Programs are given a lower bar for compensatory mitigation than their counterparts. The availability of a credit loan is a key structural benefit for ILF Programs. Beyond this structural benefit, regulators have exercised flexibility for ILF Programs, sometimes in slight ways, and sometimes in significant ones. While regulators are granted discretion to exercise such flexibility, there are a number of issues that arise when such discretion is exercised frequently.

The most common way that rule application has been adjusted is when ILF Programs do not produce credits within the specified time period as part of their loan of credits from regulatory agencies, and in clear violation of their agreements with these agencies. For example, in the earliest iteration of North Carolina's ILF Program, which began in 1996–97, the program was required by regulators to institute mitigation within 12 months of accepting fees (and associated permit being issued to permittee for wetland impacts). Over a 5-year period, the ILF Program had accepted $58 million in fees, yet restored only 10 acres of wetlands, or 0.05% of its obligated amount. Of 22 projects required by regulators to be built by the summer of 2001, none had been initiated; the program had accepted fees and impacts to ecosystems had already occurred, but the program was not compliant with the rules governing it and in so doing was facilitating the ongoing ecological degradation it was intended to offset. After a significant re-vamping of the ILF Program from 2002–2005, the second iteration of the ILF Program continued to be unable to comply with its agreed-upon rules that it negotiated with regulators. As had occurred in the first iteration, the regulatory agency—the Corps of Engineers—adjusted its expectations of the ILF Program.[26]

These experiences with the North Carolina program were prior to the 2008 Mitigation. But a somewhat similar process unfolded more recently, and after the 2008 Mitigation Rule, with the Tennessee Stream Mitigation Program (TSMP). This ILF Program accepted fees for many years across several geographic service areas, but in several of these areas, the program was unable to provide the required compensatory mitigation within the time period to which they had agreed with the regulatory agencies. In addition, the program has had insufficient revenue to fulfill their credit liability (due to insufficient rates; see above). In 2016, (after several years of accepted fees for credit advances) the TSMP voluntarily suspended activities, and in 2018 the regulatory agencies concluded that the plan developed by the ILF Program "is not acceptable based on the extended temporal loss and uncertainty of when mitigation projects and associated stream mitigation credits will be produced." The regulatory agency also found continued accumulation of credit liabilities, including temporal loss exceeding 10 years in some of the service areas. Further, the regulatory agency noted that some areas would likely require over 20 years before credit liabilities would be met. For these reasons, the regulatory agency suspended the TSMP for many of the service areas, although allowed it to continue operating in others. It remains unclear whether penalties will be assessed on the ILF Program sponsor for this underperformance and violation of both its agreements with the Corps and with the 2008 Mitigation Rule; to date, no known assessments or penalties on the program sponsor have occurred.[27] While suspension of a program or termination of a program could be viewed as a consequence for program noncompliance, because ILF Programs work with advance/loaned credits, there is still an outstanding ecological need to fill the gap, which is why the lack of penalty is relevant (versus simply shutting down a program). This case of chronic extension of flexibility through regulatory agency discretion created a problem for which a solution is unclear.

[26] After initial failure of the WRP (first ILF Program iteration), the state and federal regulators established a second iteration (the EEP) which contained many additional provisions to ensure timely and consistent mitigation. Specifically, it explicitly constrained the use of preservation to compensate for impacts. The EEP was noncompliant with the MOA established rules by the end of 2005. In March, 2006, a coalition of environmental groups noted that the ILF Program was in violation of its agreement with the federal and state agencies (letter from Derb Carter, Southern Environmental Law Center, to Secretary of Environment Bill Ross, March 30, 2006), which noted, "Based on available information, it appears that EEP has not and will not meet these requirements of the MOA." This was confirmed by EEP personnel (presentation by NCEEP staff, May 1, 2006, Raleigh, NC) and by the Corps (letter from USACE Colonel John Pulliam to Derb Carter, April 10, 2006). However, the Corps responded, "Although we view any deficit with concern, we strongly feel that on a programmatic basis, EEP … [has] been successful in providing watershed based compensatory mitigation consistent with our program requirements and that these deficits, when they occur, are relatively short lived." In essence, the Corps provided the EEP the rationale and the backing to be non-compliant with the MOA between the EEP and the Corps.

[27] Letter from Gregg Williams and Tammy Turley, Nashville District of the Corps of Engineers to Joey Woodard, Tennessee Wildlife Resources Foundation, March 19, 2018, File No. LRN-2011-00711, Tennessee Stream Mitigation Program (TSMP). Quote taken from page 1 of letter.

Even well-run programs struggle to meet their credit liabilities during the agreed upon timeline. The Virginia Aquatic Resources Trust Fund (VARTF) has had similar experience, although on a more limited scale. Under the 2008 Mitigation Rule, VARTF (like all CWA ILF Programs) must complete land acquisition and "initial physical and biological improvements" by the third full growing season after the first loaned credit is sold in each service area, unless the Corps determines that more or less time is needed. A 2016 external review/audit of the VARTF found that the program had credit liability which had extended beyond the three-year timeline. The VARTF responded that they were aware and concerned about this issue, but project development was "taking longer than anticipated." The ILF Program was eventually required by the regulators to purchase credits from mitigation banks to fulfill mitigation obligations that exceeded three years. This is an example of how the Corps (as program regulator) used its discretion to first allow flexibility in program implementation, and then enforce an alternative approach to reach compliance and mitigation requirements. [28]

It is important to note that one reason for delays in the VARTF and other ILF Programs is delays in regulators reviewing and providing feedback on proposed projects. This raises the question of whether agencies can, or should, penalize an ILF Program for being in default if one of the reasons is the slow turnaround of the regulatory agencies. While this is true, the real loss in such cases is the environment, because advance credits have already been released to offset impacts—the delay by regulators only exacerbates the time between impacts and compensation.

These problems are also present in ESA ILF Programs. The WAFWA ILF Program administrators decided to use a scientifically arbitrary mix of permanent and temporary mitigation for their species habitat conservation requirements, with 25% being permanently restored and protected, and 75% being restored and protected for 10-years at a time. This approach was a central requirement and element of the agreement between this ILF Program and the FWS. From a species conservation perspective, the 25% annual permanent preservation portion is clearly imperative. Despite this critical element of species protection, the regulatory agency compromised its requirements, allowing the WAFWA ILF Program to provide only 10% as permanent conservation rather than the previously agreed upon 25%. At the date of this noncompliance, the WAFWA ILF Program requested that the program be granted a three-year extension to meet the requirement. The regulatory agency allowed the ILF Program an additional two years to come into compliance, a deadline that the ILF Program also failed to meet, thus remaining in violation of its agreement with the regulatory agency.[29]

These aforementioned examples are how regulatory agencies have utilized flexibility in timeline rules for ILF Programs. But there are other ways that ILF Programs have requested, and received, variances from regulatory agencies for how rules would apply. One of the central ways that this has happened across a variety of programs is for the regulatory agency to exert discretion of geographic rules; an initial requirement for mitigation to take place within specific geographic areas is relaxed, allowing a broader interpretation of the geographic service area (or territory) requirements. For instance, in the case of the WAFWA ILF Program (for ESA mitigation), the FWS allowed permanent conservation in one territory to count for all four of the program's territories.[30] A similar geographically flexible approach was used for regulating the North Carolina ILF Program, which was allowed to use mitigation projects outside the impact project's service area in > 20% of the transactions (pre-2008).[31]

Flexibility in rule implementation might also occur from sister agencies rather than direct regulatory agencies, and at times such sister agencies have been unwilling or unable to police their own ILF Programs. North Carolina's experience (prior to the 2008 Mitigation Rule) demonstrates the difficulty of interagency regulation. As mentioned above, in terms of temporal loss of streams and wetlands, the program was clearly noncompliant with the rules laid out in its founding

[28] Quote from pgs 30–31 in Environmental Law Institute, 2016. Program Audit of Virginia Aquatic Resources Trust Fund, April 29, 2016.
[29] The situation is actually more egregious when the timeline is specified. On March 29, 2015—two days before their deadline—the WAFWA ILF Program notified the USFWS Director (Dan Ashe): "This past week, we signed a contract for fee-title purchase of a property which we will close on within 90 days, effectively generating approximately 10% of our total offset need to date." That is, the ILF Program had not secured even less than half of their requirement (which was, in fact, 25%) until the week before the deadline. Letter from Ross Melinchuk (Deputy Executive Director, Texas Parks and Wildlife Department) to Dan Ashe (Director, USFWS), March 29, 2015. Response from Ashe to Melinchuck March 31, 2015.
[30] Letter from Ross Melinchuk (Deputy Executive Director, Texas Parks and Wildlife Department) to Dan Ashe (Director, USFWS), March 29, 2015. Response from Ashe to Melinchuck March 31, 2015.
[31] BenDor, T.K., J. Sholtes, and M.W. Doyle. 2009. "Landscape Characteristics of a Stream and Wetland Mitigation Banking Program." Ecological Applications 19: 2078–2092. It is worth noting that the preamble to the 2008 Mitigation Rule does allow the use of released credits (credits generated from ILF Projects) to be used occasionally to offset debits of advanced credits (see pages 19613 and 19659), provided the released credits are determined to be appropriate to offset the impacts associated with the previously debited advance credits. This is intended to occur in rare circumstances.

documents by itself and the state's primary environmental agency (the NC Department of Environmental and Natural Resources, NCDENR) in terms of temporal loss. And as noted by the 2008 external academic review, the program operated in a way that was inconsistent with its own self-imposed geographic service area constraint.[32] But beyond that, the quality of its work was criticized by nonregulatory organizations, including academics and environmental NGOs. In 2009, the NC ILF Program engaged in a transaction that was effectively "double dipping" of credits, which led to net environmental loss for water quality, and did so with the full knowledge of its sister regulatory agency (Division of Water Quality). In 2010, the Southern Environmental Law Center captured this lack of regulatory oversight of an ILF Program by its sister agencies: "Since its founding as WRP, the [state of North Carolina's] in-lieu fee program has not met mitigation performance standards defined in its governing documents, has relaxed those standards, and then failed to meet the relaxed standards."[33] The North Carolina ILF Program has adjusted its practices in many ways to not rely on such flexibility of rule-implementation, and thus illustrates how adaptation of programs can be necessary but effective in developing better managed programs. Other programs have not been as quick to adapt practices, however, and there have been troubling practices by ILF Program with regard to their ability, or willingness, to police themselves.[34]

It Is Unclear Who Is Liable or Responsible for ILF Program Failure

Many ILF Programs operate underneath umbrella organizations such as state agencies or NGOs (e.g., a Department of Natural Resources or Transportation; county government; TNC). These umbrella organizations may ultimately be responsible for the ILF programs in terms of governance and liability, but this responsibility is very unclear. This lack of clarity of responsibility has significant ramifications.

Because of the structure of ILF Programs, they are designed to operate in debt. In all cases, the availability of credit advances means that most programs will have some degree of credit liability. When combined with fees being set too low (see section 3.1 above), there is the real potential for ILF Programs to accumulate significant and grossly underfunded financial liabilities. If an ILF Program is mismanaged for a sustained period of time, or allowed to take on unrealistic amounts of credit liability, a relevant but surprisingly unasked question then is, what happens next?

When an ILF Program takes on significant credit liability and they do not have the finances to actually pay for the deficit, then two things can happen. First, the program will need to make up for the lack of finances by increasing the fees on future impacts. This effectively penalizes future permittees for the program subsidizing impacts in the past. Second, the program could be financially back-stopped by its umbrella organization or sponsor. The North Carolina and Virginia ILF Programs provide examples of best practices for other programs going forward. In the case of the North Carolina's ILF Program, the cosignatories of the MOU, which created the ILF Program, appear to be responsible for providing the necessary financial resources to ensure credit liabilities are fulfilled. The Secretary of NC DENR noted to the head of the regulatory agency, "If shortfalls are experienced because fees are insufficient, the Department is committed to covering costs to meet permit requirements that have been assumed by the program."[35] For the VARTF ILF Program, the program instrument specifies that The Nature Conservancy is responsible for backstopping: "In the event the Program is closed, the Conservancy is responsible for fulfilling any remaining mitigation obligations."[36]

The Tennessee program provides an example of the implications when responsibility is unclear. At present, the TSMP itself does not appear to have the resources to meet its mitigation liabilities. The founding MOA in 2003 indicates that if the TSMP is unable to fulfill its obligations, then the duties must be fulfilled by a state agency, specifically the Tennessee Wildlife Resources Agency (TWRA). In essence, the failure of this nonprofit ILF creates considerable financial and compliance liability for the state itself.[37] However, in the revised 2013 ILF Instrument, the statements regarding liability

[32] BenDor et al. 2009; pg. 2087; note 31 above.

[33] Letter from Derb Carter and Geoff Gisler, SELC to Todd Tugwell, Corps of Engineers, March 23, 2010, RE: Proposed Ecosystem Enhancement Program In-Lieu Fee Program Instrument.

[34] A particularly problematic example was perhaps a WAFWA treasurer also being employed by the FWS, and in this latter role being in a position to oversee the actions of WAFWA, as well as draw dual salaries for single activities; see Office of the Inspector General, 2016. Investigative Report of Failure to Disclose Employment at the U.S. Fish and Wildlife Service. Department of the Interior, June 7, 2016.

[35] Letter from Dee Freeman (Secretary of NC Department of Environment and Natural Resources) to Colonel Jefferson Ryscavage (District Engineer, Wilmington District, US Army Corps of Engineers), January 11, 2010.

[36] VARTF program instrument (Part IV Section F: Program Default and Closure Procedures).

[37] Page 9, Section 3.5(f): "If the Foundation LLC commits any act of malfeasance or other misuse of funds or if construction is not commenced on a project within 210 days of the Foundation LLC having received both the necessary funds and the approval of the SMRT, unless the SMRT grants

being passed to TWRA are not included; instead, more general language was included about the regulatory agency taking "appropriate enforcement action."[38] The revised instrument does include the statement that "in the event that the SMP is terminated, the Sponsor (TWRF)[39] is responsible for fulfilling any *remaining project obligations* including the successful completion of *ongoing* mitigation projects, relevant maintenance, monitoring and reporting" [emphasis added]. However, it is not clear whether or not TWRF is responsible for fulfilling remaining credit liabilities that have *not* been even initiated.

The case of liability is similarly unclear in the case of the WAFWA ILF Program. This program was created by a coalition of state agencies (e.g., Texas Parks and Wildlife Department and Oklahoma Department of Wildlife Conservation, among others), but is structured as a 501(c)(3), nonprofit organization. Its role as an ILF Program sponsor for Lesser Prairie Chicken mitigation is only one of its many roles.[40] While it is unclear what would happen if this specific ILF Program were to cease to operate for mitigation, it is likely that the umbrella organization (WAFWA) would be compelled to assume responsibility and financial liability. Moreover, it is not unreasonable to expect that the state departments that are part of WAFWA may, in the end, be obligated to provide some ultimate backstopping financial role.

ILF Programs Create a Moral Hazard

Some of the greatest systemic failures across various areas of society over the past few decades have been the result of policies which created the opportunity for moral hazards. Moral hazards occur when a person or organization increases their exposure to risk when insured, especially when they take on even more risk because someone else bears the costs of those risks. The financial collapse of 2008–2009 is a clear example of a moral hazard—banks took on excessive risk because they expected that the federal government would backstop their risk (they were right), meaning that these banks did not expect to have to bear the ultimate costs of their risky behavior. There are other examples including ubiquitous land development in floodplains in which the subsidized costs of flood insurance increase the development on floodplains, which is increased as the federal government provides disaster relief for those without any insurance. All of these are widely recognized systemic risks to society where individuals or organizations are not sufficiently avoiding risky behavior because of the presence of another entity that will bear the costs of the risk.

This same form of systemic risk exists for ILF Programs in two forms of potential program failure. First, an ILF Program could fail to produce or procure the necessary mitigation credits for which it has already accepted fees; this causes environmental failure and regulatory failure. Second, the program could fail financially by taking in insufficient fees to cover the credit liability; this causes financial failure. The moral hazard is created by the perception—and indeed the experience by some programs—that the ILF Program sponsors and their umbrella organizations will not, in the end, bear the *full costs* of program failure or even the partial costs of partial failure. Because regulators have developed a tendency to exercise discretionary flexibility (sometimes slightly; sometimes significantly), there is the realistic expectation that such flexibility and exercise of discretion in favor of the ILF Program will continue in the future. This means that ILF Programs may not bear full regulatory or environmental costs of the risks that they are taking on via the sale of advance credits, or at least expect not to bear the full costs; they have not had to bear the immediate or full costs of noncompliance in the past due to regulatory agencies granting extensions or exceptions for a variety of program failures.

In addition, because of the ability of ILF Programs to undercharge current permittees in the expectation that they will be able to bridge the financial gap through the future sale of loaned credits at (perhaps) a more realistic price, ILF Programs have been able to pass any existing financial liability onward to future generations of ILF permittees. Finally, and most systemically, there is, at best, a lack of clarity about the final bearer of financial risk should an ILF Program be completely suspended while carrying large, unfunded credit liability (e.g., Tennessee TSMP). It is realistic to expect that either the broadest sponsoring organization will have to absorb some portion of that liability, or perhaps more realistic, that the regulatory agencies will allow all, or some of the already permitted impacts to go unmitigated, therefore representing permanent losses to ecological resources.

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an extension, then TDEC may issue a Notice of Termination of the duties of the Foundation LLC under this MOA and serve it upon all parties to the SMRT. The Foundation LLC shall then immediately transfer the balance of the Trust Fund at that time to TWRA. Thereafter, until such time as the SMRT modifies this MOA, TWRA shall perform the duties of the Foundation LLC under this MOA."

[38] See section 6.3 at page 14 in Tennessee Stream Mitigation Program, In Lieu Fee Instrument, May 15, 2013.

[39] Tennessee Wildlife Resources Foundation (TWRF)

[40] The main mission involves the improvement of fish, wildlife, and game management within its 19-member state agencies through education, research, and conservation initiatives.

When all of these expectations of risk-shedding are combined, they create a realistic worst-case scenario. *The first worst case would be borne by the environment*: ILF Programs continue to request and receive credit advances, thus increasing their mitigation liability over time for the umbrella organization, which is often a government entity. The ILF Programs default on their mitigation credit liability, and federal regulators (out of deference to states) reduce the necessary mitigation requirements, significantly alter the rules of compliance, or create such a prolonged timeline for compliance so as to cause significant and irreversible environmental losses. *The second worst case would be borne by government entities or for national environmental organizations (e.g., TNC)*: ILF Programs default on their mitigation credit liability, but federal regulators demand mitigation liability be fulfilled in their entirety, thus requiring governments entities or NGOs to bear the costs of failed ILF Programs, often at costs far exceeding those expected because of unrealistic initial fee-setting coupled with escalating costs associated with deferred implementation (i.e., inflation and real estate appreciation).

RECOMMENDATIONS: CHARACTERISTICS NECESSARY FOR ILF SUCCESS

Based on this limited review of case studies of ILF Programs, a number of recommendations can be made for ways to avoid problems and limitations of ILF Programs going forward. Some of these recommendations are already reflected by changes implemented in already-effected rules (e.g., 2008 Mitigation Rule), but their implementation may not be consistent. Thus, these recommendations can be viewed as operational aspects which either need to be initiated or simply consistently implemented.

- **Because of the temporal lag alone, ILF Programs should be a last resort as a mechanism for compensatory mitigation**. When temporal lags are allowed to occur, the environment loses. This lag also creates an uneven playing field for mitigation/conservation banks vis-à-vis ILF Programs. The primary way to avoid this is for explicit preference to be granted to mitigation banks: if bank credits are available, then permittees should be expected and/or required to purchase those credits rather than use credits loaned to an ILF Program. This hierarchy is codified in the 2008 Mitigation Rule for CWA mitigation and should be enforced. Similar hierarchy should be ensured for ESA mitigation.
- **ILF Programs should have fee schedules for advance credits that change regularly and should include risk-based multipliers to ensure that sufficient revenue is available to meet the associated credit liability**. Prior to the 2008 Mitigation Rule, there was a consistent tendency for ILF Programs to undercharge for credits, and this problem has persisted in at least some CWA ILF programs and some ESA programs. If anything, ILF Programs should be estimating on the high side, i.e., should be overestimating credit prices rather than underestimating. Pricing of advance credits should include a mechanism that accounts for the increase in mitigation costs between when fees are collected and when the project is actually implemented.
- **ILF Programs should disclose their credit liabilities in realistic and worst-case financial terms**. ILF Programs have often had impenetrable reporting, obscuring their condition to the broader public or to ILF Program umbrella organizations. The public has the right to know what liabilities their government agencies are taking on, and sponsoring organizations need to know their total financial obligations of subsidiary units. ILF Programs should report their liabilities in a way that includes estimates of financial liabilities based on realistic and worst-case possible credit price scenarios.
- **Regulatory agencies should require all existing ILF Programs to perform a credit and financial liability audit.** Current ILF Programs are disparate and uncoordinated, and so it is unclear across entire regulatory programs (e.g., CWA and ESA) how much credit liability and associated financial liability currently exists. Because of the accumulated poor reporting, it is unclear what scale of financial liability exists across the United States for this regulatory approach. The existing ILF Programs should be required to provide annual summary financial metrics in a simplified format to all sponsoring and umbrella organizations, as well as to relevant regulatory agencies. The auditing and reporting approach, including the funding mechanism, developed by the VARTF provides a best practice example by requiring an independent audit every five years, and for that audit to be paid for with funds from the ILF Program account. This audit could increase transparency by including program operations, timing of project development, and implementation schedules.

- **Regulatory agencies should more strictly apply agreements and instruments, and should articulate potential penalties for lack of programmatic compliance.** All ILF Programs examined here were out of compliance with certain aspects of their agreements at some point in their history (including currently for two of them), most typically temporal requirements. Yet regulatory agencies did not penalize program sponsors. Penalties or consequences could include requirement of alternative compensatory mitigation, application of temporal lag multipliers to crediting, suspension of program operations in affected service areas, and program termination. The lack of penalties has created a moral hazard wherein the primary losers are the environment and umbrella organizations who may be unaware of the associated risks under their sponsorship.
- **Regulatory agencies and umbrella organizations should clarify and specify their liabilities and responsibilities under the assumption that ILF Programs could fail.** When a lack of transparency and a lack of clarity of existing financial liabilities of some ILF Programs are combined, it is realistic to suspect that many umbrella organizations (e.g., TNC) are unaware of their total potential risk exposure via ILF Programs. Each ILF Program should precisely articulate to its regulatory agency and its umbrella organization (a) what would happen should the ILF Program become financial insolvent, and (b) who would bear the costs of the existing credit liability. Sponsoring umbrella organizations should be required to annually communicate to regulatory agencies that they are aware of their existing and future financial liabilities, and demonstrate financial assurances to fulfill those liabilities. Existing ILF Program agreements should be supplemented with this information.
- **Regulatory agencies should initiate a systematic review of ILF Programs.** This review is based on a limited number of cases in comparison with the number of ILF Programs that have been approved. In particular, many concerns with ILF Programs were noted and addressed in the 2008 Mitigation Rule (for CWA mitigation), but it is not clear if the rule was sufficient and effective. A systematic review would be needed to clarify whether there are in fact systemic, emergent problems with ILF Programs nationwide.

APPENDIXES: PROGRAM DESCRIPTIONS AND ADDITIONAL ANALYSIS

Tennessee Stream Mitigation Program

Description

The TSMP was created in 2002 through an MOA with the Corps of Engineers.[41] That MOA recognized a fee of, at most, $200/foot. Through the end of 2011, the TSMP had 176,000 mitigation credit obligations, of which 80% were in some stage of implementation, and the other 20% were unmitigated; at $200/credit, this represented a liability of over $7 million.[42]

This reporting raises an important aspect of ILF programs: the lack of clarity on financial and mitigation liabilities. In their financial position statement, the TMSP does not record these unmitigated credits as a financial liability.[43] With such reporting, it is not possible for external organizations to clearly and quickly evaluate the success or failure of the program financially, nor to evaluate the liabilities being accrued.

In 2012, local media began noting the expenses and liabilities that were being taken on by the TSMP.[44] In 2013, TSMP adopted a new instrument to govern its ILF program. This new instrument included an important adjustment: it gave the TSMP the ability to adjust its fees at any time in order to reflect the actual programs costs, and it could do so by providing written notice to the USACE and the IRT; fee costs were initially established in the 2013 instrument at $240/credit.[45] By 2016, the situation had become much more problematic financially for the TSMP, although the transparency of the situation was not particularly clear through the reporting practices. The total credit liability had reached over 136,000, and with a fee (as of 2016) of only $240/credit. This created a significant credit liability for the mitigation work to be completed.[46] Nevertheless, their financial position statement recorded only $43,455 of liabilities. By not transparently communicating the real liabilities held by the program by way of unfulfilled mitigation, the auditing was not helpful to those who might externally evaluate the program's efficacy or efficiency, and its financial integrity.

In 2013 the instrument for the TSMP was revised in response to the 2008 Mitigation Rule. That new instrument allows for the increase in fees whenever needed; yet the TSMP did not increase rates from 2013 to 2015. In 2016, the TSMP voluntarily suspended activities, pointing to regulatory uncertainty as the primary cause.[47] In 2018 the Nashville District of the Corps reviewed the progress and associated plans of the TSMP and concluded that the credit production plan "is not acceptable based on the extended temporal loss and uncertainty of when mitigation projects and associated stream mitigation credits will be produced." The Corps also found continued accumulation of mitigation liabilities, including temporal loss exceeding 10 years in some of the service areas; that is, fees were accepted for impacts that had not been mitigated in over 10 years. Some service areas, the Corps noted, would likely require greater than 20 years for mitigation liabilities to be met. For these reasons, the Corps suspended the TSMP for many of the service areas, although allowed it to continue operating in others.[48]

Importantly, the liabilities remain, and they fall on the sponsoring organization to fulfill. At present, the TSMP does not have the resources to meet its mitigation liabilities. While the TSMP is a nonprofit foundation, it appears that the state remains, in the end, liable for this program's failure, although this is not entirely clear. The founding MOA in 2003 indicates that if the TSMP is unable to fulfill its obligations, then the duties must be fulfilled by a state agency, specifically the Tennessee Wildlife Resources Agency (TWRA). In essence, the failure of this nonprofit ILF creates considerable financial and compliance liability for the state itself.[49] However, in the revised 2013 ILF Instrument, the statements regarding liability

[41] TWRF, LLC "In Lieu Fee" Stream Mitigation Program Memorandum of Agreement, August 16, 2002.
[42] Tennessee Wildlife Resources Foundation, Inc., and Subsidiary, Consolidated Financial Statements, December 31, 2011, page 6.
[43] Tennessee Wildlife Resources Foundation, Inc., 2011, page 15.
[44] Humphrey, T. 2012. "Critics say 'wholesale auction' of Tennessee's stream quality afoot." Knoxville News Sentinel, February 19, 2012.
[45] Tennessee Stream Mitigation Program, In Lieu Fee Instrument, May 15, 2013. Fee determination described on pages 7-8.
[46] Tennessee Wildlife Resources Foundation, Inc., and Subsidiaries, Consolidated Financial Statements, December 31, 2016, page 8. Liabilities reported page 14.
[47] Open letter from Eric Chance, TNSMP Operations Manager, April 11, 2016, re: Credit Sales Suspension.
[48] Letter from Gregg Williams and Tammy Turley, Nashville District of the Corps of Engineers to Joey Woodard, Tennessee Wildlife Resources Foundation, March 19, 2018, File No. LRN-2011-00711, Tennessee Stream Mitigation Program (TSMP). Quote taken from page 1 of letter.
[49] Page 9, Section 3.5(f): "If the Foundation LLC commits any act of malfeasance or other misuse of funds or if construction is not commenced on a project within 210 days of the Foundation LLC having received both the necessary funds and the approval of the SMRT, unless the SMRT grants an extension, then TDEC may issue a Notice of Termination of the duties of the Foundation LLC under this MOA and serve it upon all parties to the SMRT. The Foundation LLC shall then immediately transfer the balance of the Trust Fund at that time to TWRA. Thereafter, until such time as the

being passed to TWRA are not included; instead, more general language included about the Corps District Engineer taking "appropriate enforcement action" is used.[50] The revised instrument does include the statement that "in the event that the SMP is terminated, the Sponsor (TWRF) is responsible for fulfilling any remaining project obligations including the successful completion of ongoing mitigation projects, relevant maintenance, monitoring and reporting" although whether or not TWRF is responsible for fulfilling remaining credit liabilities is not clear.

There were a number of things that went wrong with the TSMP. Most notably, the program did not collect sufficient fees to provide the financial resources to meet their credit liabilities and now some entity, presumably the state of Tennessee, is liable for generating credits sufficient to fulfill their existing liabilities. The TSMP could change fees at any time, and yet they still found themselves underwater in terms of liabilities and assets. This most likely indicates a lack of will for a state agency to set their fees appropriately or to change their fees sufficiently to meet economic realities. An additional problem that emerges from the Tennessee experience is the lack of clarity on assets and liabilities of ILF programs. It should be noted that no official TSMP documents state clearly the remaining credit liabilities, nor do they estimate the associated economic liabilities. Thus, any overseer not intimately familiar with the program's inner workings or typical credit prices can quickly or accurately assess the situation and the associated liabilities.

Key Findings

- The TSMP did not charge the actual price to achieve real, cost-recovering fees, preferring instead to provide below-cost mitigation, thus economically subsidizing stream-impacting development activities and insuring the fiscal demise of the program.
- Record-keeping from TSMP is unclear in communicating the existing liabilities of this state agency.
- The future of a suspended or even canceled program is unclear, particularly for who bears the considerable financial liability.
- The TSMP could change fees at any time, and yet they still found themselves underwater in terms of liabilities and assets. This most likely indicates a lack of will or ability of the sponsoring organization to set their fees appropriately or to change their fees sufficiently to meet economic realities.

Virginia Resources Trust Fund

Description

The Virginia Resources Trust Fund (VARTF) is an ILF program with The Nature Conservancy (TNC) playing the role of program sponsor (i.e., umbrella organization). VARTF was created in 1995 through an MOU between TNC and the Corps; stream mitigation did not begin in Virginia until 2002. Importantly, the goal of the VARTF was to provide compensatory mitigation to areas underserved by commercial mitigation banking. In 2011, TNC and the Corps developed a revised ILF instrument in compliance with the 2008 Mitigation Rule, but the instrument also included provisions so that the program continued to reduce competition with mitigation banks; for example, the VARTF instrument included the ability to reject ILF payments for large impacts (greater than three wetland acres or 2,000 linear feet) because such large impacts would likely generate sufficient demand for commercial mitigation banks. Additionally, the VARTF places significant emphasis in its project development plans to be as consistent as possible with the requirements and approaches used by commercial mitigation bankers, i.e., ensuring to the degree possible equivalence between methods of mitigation.[51]

In addition to the specifics of the ILF program, the local District of the Corps of Engineers—the Norfolk District—pushed the goals of the 2008 Mitigation Rule for mitigation bank preference: any permittee is required to demonstrate that no existing credits are available to compensate for the impact before the permittee is allowed to use the ILF program for compensation. The Norfolk District will not approve the purchase of an advance credit from an ILF even if released credits are more expensive; however, if the VARTF has released credits (i.e., approved credits from a completed projects), those are treated equally with credits produced from mitigation banks.

SMRT modifies this MOA, TWRA shall perform the duties of the Foundation LLC under this MOA."

[50] See section 6.3 at page 14 in Tennessee Stream Mitigation Program, In Lieu Fee Instrument, May 15, 2013.

[51] A thorough review of the VARTF is given by Stephenson, K., and B. Tutko. 2016. The Role of In Lieu Fee Programs in Providing Off-Site Compensatory Mitigation. Final Report for the Office of Environmental Markets, USDA, September, 2016.

The combination of these preferences and philosophical approaches to credits from the ILF Program as compared to those from mitigation banks created a far more efficient and effective system. Between 2011 and 2015, commercial banks sold an average of 41,200 stream credits annually while advance credits from VARTF averaged only around 2,000 per year, less than 6% of all stream credit sales.[52] While commercial mitigation banks were the prominent source of credits in urban/suburban areas with high credit demand, the VARTF was the primary source of credits in areas with relatively little commercial mitigation banking activity. On further analysis, they show that over 96% of advance credit sales occurred in situations in which no commercial mitigation bank credits were available to the permittee. That is, the combination of commercial mitigation banks and a constrained ILF program resulted in a robust commercial mitigation bank industry and a healthy ILF program which served, together, the needs of the permittees in the state.

Unlike the early years of the NC ILF Program (described below), the fees for advance credits under the VARTF program are able to be adjusted based on service area and each year. As of the end of 2017, the VARTF had a liability of 34,103 stream credits, and $13.7M in their fund account. So long as the program is able to procure credits for $400/credit, then they appear to be financially viable.

It is also worth noting that despite being apparently well run and well intended, the VARTF is not without shortcomings. Every five years this ILF program must go through an external, third party audit. In 2016, the VARTF contracted the Environmental Law Institute (ELI) to conduct the audit of 2011–2015 performance. While much of the program was in compliance, ELI found that several issues could be improved, and one was out of compliance. Under the 2008 Mitigation Rule, VARTF must complete land acquisition and "initial physical and biological improvements" by the third full growing season after the first advance credit is sold in each service area, unless the district engineer determines that more or less time is needed. The ELI review noted that "most of the advance credit liability taken on by the VARTF remains, and in some cases existing advance credit liability has extended beyond the three-year timeline established in the regulations." The ELI review team added, "We were unable on the basis of the documentation maintained by the VARTF to determine with precision whether any other ongoing mitigation projects satisfy the three-growing season timing requirement for these listed areas." That is, even contracted reviewers with deep expertise in mitigation were not able to sufficiently understand an ILF program's documentation.[53] The VARTF responded that they were "very concerned about this finding," but project development was "taking longer than anticipated."

Table A1. VARTF 2017 according to RIBITs.

	Credit liabilities	Proposed credits	Completed/ constructed credits	Released credits	Total credits	Released credit liability
NTW	492	58	364	702	1,123	210
TW	6	8	48	26	81	20
SUSM	48,363	57.014	5,722	14,260	79,996	(34,103)

Prior to the ELI review, it was difficult to clearly identify the credit liabilities of the VARTF. The financial reports did not include credit liabilities as financial liabilities or acknowledge in their financial reporting the existence of these potentially significant liabilities; this reporting is similar to the continued reporting habits of the TSMP (see above). Following the ELI review, the VARTF has adopted a reporting format that makes assessing credit liabilities clearer and explicitly calls out credit deficits as liabilities (e.g., Table 2 and Table 6 in 2017 Annual Report).[54] However, even in the revised reporting format, credit liabilities are not converted from credits to dollars; that is, there is not an acknowledgment that credit liabilities represent financial liabilities. This creates unnecessary opacity about the financial obligations and conditions of an ILF program.

Key Lessons

- VARTF adapted its approach to ILF Program implementation, particularly to coexist with mitigation banks and to

[52] Table 4 in Stephenson and Tutko, 2016, note 51.
[53] Page 30–31 in Environmental Law Institute, 2016. Program Audit of Virginia Aquatic Resources Trust Fund, April 29, 2016.
[54] Virginia Aquatic Resources Trust Fund Annual Report—2016. April 10, 2017.

increase transparency and record-keeping.

- Mitigation banks and ILF programs can coexist so long as ILF Programs do not misuse their structural and political advantages.
- ILF Programs should be designed as the option of last resort rather than the least-cost option.
- Ideally both options should operate under the same mitigation standards.
- ILF fees should be based on market-based pricing so that they can work with versus compete against the private sector mitigation banks.
- Even in a well-run ILF Program, there can be a lack of transparency for how information is conveyed to outsiders, including program sponsors.

North Carolina Wetlands & Streams ILF Program: WRP, EEP, and DMS

Description

Like VARTF, the ILF Program in North Carolina has been extremely adaptive over the past two decades, demonstrating the benefits of learning from mistakes from previous iterations of ILF Program implementation. The state government agency sponsored ILF Program in North Carolina has been one of the most studied ILF Programs in the U.S., often pointed to as exemplary. Almost every misstep that could be made in an ILF program was made at some point amidst the creation and management of the NC ILF Program, however, the program that now exists after significant adaptation and evolution is one that has many elements to be emulated in other ILF Programs. Renamed the Division of Mitigation Services (DMS), the current ILF Program has a long and tortured history, which is worth capturing in full to understand the decisions made by ILF Programs, and how these decisions lead to a series of unintentional results that are financially and environmentally problematic.

First Iteration: From 1996–2003

The ILF Program was created in 1996 as the Wetland Restoration Program and was cosponsored by the NC Department of Transportation and the NC Department of Environmental Natural Resources (NCDENR). This reflected the fact that the NC Department of Transportation (NCDOT) was the primary impactor of wetlands and had experienced project delays because of the lack of available compensatory mitigation. During these first years of its existence, the ILF Program set its fees artificially low, meaning that the fees it charged permittees were insufficient to cover the costs needed for mitigation. Any type of permittee could use the ILF Program—whether NC DOT or private developer—rather than purchasing credits from mitigation banks, and of course they did not do so because commercial mitigation bankers' costs were higher than the artificially low prices set by the ILF Program. This had the effect of undermining the commercial mitigation banking industry in the state; the private sector could not compete with a subsidized public sector providing the exact same services.[55]

Even with these artificially low, subsidized prices, the ILF Program was chronically missing deadlines while simultaneously spending their revenue (i.e., accepted fees) on personnel and administrative costs. The program promised the NC General Assembly that 22 restoration projects would be completed by 2001; in 2002 none of them had been started. By January of 2002, five years into its full operation, NC's ILF Program took in $58 million in fees, spent only $4.2 million, and produced only 11.7 acres of wetlands. Because the fees it took in were less than what was needed to actually accomplish mitigation requirements, the state's ILF Program was effectively in debt, holding considerable mitigation liability because of the program; importantly, mitigation liability is effectively financial liability, in this case for the state of North Carolina.

Critically, none of the regulatory agencies—whether state or federal—policed the situation. Instead, media had to play the role of regulatory police. A series of articles in local and state newspapers drew considerable attention to the program which regulators and legislators could no longer ignore. The ILF Program responded to the criticisms with a change in leadership and name; the Wetland Restoration Program was renamed the Ecosystem Enhancement Program, or EEP.[56]

[55] See Doyle and BenDor, 2011, note 9 above.

[56] The media attention is quite remarkable for such a wonkish issue. The primary coverage was in the Raleigh News & Observer: Shiffer. 2002. "Pay-and-pave system leaves wetlands behind." Raleigh News & Observer, page 1A, January 20, 2002; "Private companies struggle to compete with N.C. agency." page 12A. Editorial, "Mired on Wetlands." January 22, 2002. Local and regional newspapers from literally every corner of the state provided

Second Iteration: From 2003–2015

The revised ILF Program was more effective in some ways, but just as problematic in others. The EEP was more effective at providing mitigation in a timely manner, but there were still issues with the program in setting appropriate fees to cover real costs. The EEP was unable to adjust its fees without legislative rulemaking, and thus subject to political influence and lobbying. Despite changing at times, they remained too low compared to the real costs of mitigation. In addition, the EEP was providing mitigation for any interested permittees; this resulted in its being a source of competition for any nascent commercial mitigation banking industry; and because the EEPs fees were artificially low, this was competition on what could be considered an uneven playing field. The program continued to be given credit advances, and thus continued accepting fees and accumulating mitigation liabilities, all while collecting insufficient fees to conduct the work. This increased the financial liability and commensurate environmental losses.

The EEP sought to produce its own mitigation projects as a way to reduce costs and do what work it could with its limited fee (i.e., revenue) base; it began to contract with firms under "design-bid-build" contracts to produce projects rather than purchasing "full delivery" credits.[57] By 2006, the EEP employed 68 people, spanning functions from real estate and construction to science and monitoring.[58] Even with this large bureaucracy, or perhaps because of it, management of the program and decisions made by it indicated a decline of internal and external oversight. For instance, in 2009, the EEP was involved in a transaction that was described as "double dipping." The NC ILF Program was behind schedule and underfunded by the fees that it had been collecting. In an apparent effort to increase revenue with increased costs, the program double dipped by selling the same restoration site for multiple offset programs, once to mitigate federally regulated CWA impacts, and again to mitigate state regulated nutrient impacts.

There were several critical aspects of this event. The ability to do this type of transaction was only possible because of the opacity of record keeping; the transaction only came to light through investigative journalism rather than through transparent disclosure by the ILF Program or its sister agency.[59] While this transaction was considered legal by the ILF Program itself and sister agencies, when disclosed by the media and discovered by outside groups, it was considered on the verge of, if not outright, unethical. The outcry was so quick and so intense that the state put a moratorium on such transactions and brought in the state Program Evaluation Division (the state's version of GAO) to fully investigate.[60] And in their final assessment, the state Program Evaluation Division concluded that "the Division of Water Quality's decisions related to this controversy resulted in actual and potential future losses to the environmental integrity of the Neuse River basin."

In addition, the record-keeping and inventorying practices used by the EEP pushed the limits of regulatory interpretation and information opacity. In the end, the policing came from media, external academic researchers, and NGOs rather than oversight or regulatory agencies.[61]

Third Iteration: From 2015–present

The current iteration of the NC ILF Program represents considerable adaptive management of a program, along with adjustments in expectations by permittees and state agencies. In 2015, the program was renamed the Division of Mitigation Services (DMS). Some of their most significant changes have been to their fees and their approach. Their fee structure (i.e., prices for credits) is established quantitatively by a set of well-established analytical methodology. Through this approach, their fees have risen tremendously and now more accurately reflect the real cost of credits (e.g., currently $507 for a stream credit). In addition to this, the DMS relies heavily on mitigation bankers as a source of mitigation credits; this is in contrast to their tendency and preference a decade earlier of doing the restoration projects themselves. This has had the effect of

follow-up coverage, including the Greensboro News and Record (Page B7, January 31, 2002); Winston-Salem Journal (January 21, 2002); Charlotte Observer (2B, January 21, 2002); and the Wilmington Morning Star (2B, January 21, 2002) among others.

[57] The "full delivery" approach was not a ready option in part because the fees were set too low; thus, a mitigation credit provider (e.g., a commercial mitigation bank selling credits to an ILF Program) could not produce credits at the price that the EEPs fees supported.

[58] Based on review of NC EEP organizational charts included in annual reports.

[59] Kane, D. 2009. "EBX Is Paid Twice for Wetlands Work." Raleigh News & Observer, page 1A, 6A, December 8. Kane, D. 2009. "State Verifies It Paid Twice on Wetlands." Raleigh News & Observer, page 1B, 7B, December 18. The Raleigh News & Observer also ran a fairly damning editorial calling out the ILF Program for environmental negligence: "Swamp things," Editorial, Friday, December 18, 2009.

[60] North Carolina Program Evaluation Division. 2009. Department of Environment and Natural Resources Wetland Mitigation Credit Determinations. NC PED Report No. 2009-04.

[61] BenDor, T.K., J. Sholtes, and M.W. Doyle. 2009. "Landscape Characteristics of Stream and Wetland Mitigation Banking." Ecological Applications 19: 2078–2092.

increasing transparency of prices, bolstering the private banking industry, reducing the amount of internal staff needed within DMS, reducing temporal losses, and reducing DMS's project-level performance risks. Indeed, staff at the NC ILF Program has gone from 6 in 1999, to 68 in 2006, to 54 in 2011, and now only 30 in 2018.

Key Findings

- The NC ILF Program suffered from problems common to many ILF Programs: underpriced fees for credits, resulting in credit liability.
- Sister agencies within the state government were unwilling to police clearly environmental damaging trends or decisions.
- Media, NGOs, and academic researchers have had to play the role of constant watchdog over the program, often uncovering decisions that, when exposed, led to significant changes being imposed on the ILF Program.
- The program has adapted dramatically over the years, often through a series of trial and error, although triggered by media exposure rather than intentional program adjustment.
- The most recent iteration of the ILF Program demonstrates mechanisms that reduce financial liability for the program while increasing the role of private bankers, all while ensuring programmatic compliance.

WAFWA Lesser Prairie Chicken Range-Wide Plan

Description

The Lesser Prairie Chicken (LPC) has been on the USFWS' list of candidate species since 1998; that is, the species is not listed as threatened or endangered, but rather is considered a species that may be listed in the future given current trends. In 2011, USFWS proposed to list the species as endangered. In response, the Western Association of Fish and Wildlife Agencies (WAFWA)[62] formed an LPC Initiative, led by the five states the LPC's range covers, and formulated a voluntary, state-led conservation plan that aimed to reverse the decline of the species. The USFWS endorsed this range-wide plan (RWP) in October 2013. Subsequently in March 2014 the USFWS announced that it would list the bird as threatened, rather than endangered. USFWS also issued a "special rule" under the ESA that provided that farmers, ranchers, and energy companies could avoid liability for "take" under the ESA by participating in the RWP.

The WAFWA administers the mitigation program associated with a Candidate Conservation Agreement with Assurance (i.e., a permit; CCAA) covering oil and gas exploration and extraction activities across LPC occupied range. The RWP is an ILF Program, as it accepts predefined fees for specific impact types from CCAA participants and provides compensatory mitigation for all participants according to the terms of the RWP and its associated CCAA. By accepting fees from CCAA participants, WAFWA assumes all participants' mitigation liabilities—including siting, implementation, monitoring, reporting and performance. WAFWA provides annual reports to FWS detailing impact and offset quantities accumulated in a given year as well as across the operational life of the RWP and CCAA. In September 2015, in a lawsuit brought by the oil and gas industry a federal judge in Texas vacated the USFWS' threatened listing for the LPC and the special rule. Consequently, the LPC is not currently protected under the ESA, but the RWP remains in effect as a voluntary conservation initiative. In addition, there is a candidate conservation agreement with assurances in place for the oil and gas industry, which provides that operators that participate in the RWP are shielded from future liability under the ESA, should USFWS decide eventually to relist the species.

The RWP set impact fees for permittees, which cannot be increased by more than 3% annually before WAFWA conducts its scheduled adaptive management review after the fifth year of implementation (2019). Following that review, WAFWA can begin raising rates by an additional 4% annually, totaling a maximum of 7% fee increases per year thereafter. WAFWA has not increased rates to date, which is likely undermining their ability to meet the programmatic objectives. Impact fees were set at approximately $2,200 per acre of high-quality habitat. The RWP utilizes an offset to impact ratio of 2:1; thus, the $2,200 fee is assumed sufficient to generate two acres of high-quality habitat offsets. The RWP then uses these funds to develop offsets in a mixture 75% term (5- to 10-year contracts) and 25% permanent. The term mitigation is then renewed every 5 to 10 years in perpetuity (assumedly on different acres). The intended effect is to move large habitat blocks around

[62] WAFWA is an organization of the fish and wildlife departments of 19 western states and 5 Canadian provinces. WAFWA members work together on education, research, and conservation initiatives that are designed to improve fish, wildlife, and game management.

the range as LPC redistribute themselves in response to fragmentation and other environmental factors such as climate change.

Looking at permanent mitigation only, the RWP's fees assume a single acre of permanent conservation can be secured for $1,100 (half of $2,200). However, private conservation bankers have several FWS-approved LPC banks across the bird's range, and their prices are closer to $2,500/acre. Assuming that a conservation banker generates credits at the real cost + 20% profit, then the real cost of an acre of conservation would be ~$2,000/credit.[63] Thus, the WAFWA ILF Program appears to be underpricing mitigation with limited ability to correct its prices. This problem is further compounded by a marked decline in industry participation since the LPC was delisted by the federal courts.[64]

Another problem with WAFWA's administration of the RWP, which is common in ILF Programs, is difficult-to-discern record-keeping. WAFWA's reporting was opaque to its own users and the USFWS. In commenting on its primary deliverable to the USFWS in 2015, the Director of USFWS noted to WAFWA,

> *As you know, under the unique partnership set up by the [ILF Program], our ability to access information on participating landowners, enrolled participants, conservation and mitigation commitments, and other aspects of plan implementation is critical for the Service to carry out its independent oversight responsibilities of participants enrolled in the [ILF Program]. While WAFWA has made all this information available to us, the lack of a user-friendly interface that Service staff can navigate without technical assistance from WAFWA staff has been an impediment.*

That is, the regulator in charge of oversight was unable to oversee the ILF Program without assistance from the program itself.[65] This opaque structure was assumedly designed because of confidentiality concerns associated with landowners and industry participants who wanted to remain anonymous in fear of USFWS prosecution for LPC take. However, such intense attention to these confidentiality concerns clearly limited the USFWS's ability to determine if the RWP is complying with its own standards.

WAFWA, like several other ILF Program sponsors, has depended on the regulatory authorities (USFWS in this case) to relax compliance standards when they failed to meet explicit objectives within their own plan. Because of the needs of the species, mitigation for its habitat requires a mixture of habitat preservation types, with 25% being permanently protected, and 75% being protected for 5 to 10 years at a time. From a species conservation perspective, the 25% permanent preservation portion is clearly imperative. Despite this critical element of species protection, the USFWS compromised on the RWP's requirements, allowing the WAFWA to provide, by its agreed upon deadline, only 10% as permanent conservation rather than 25%. At the date of this non-compliance, the WAFWA ILF Program requested that the program be granted a three-year extension to meet the requirement. Moreover, this 10% was generated at a single property located in one of the RWP's four service areas. The regulatory agency allowed the ILF Program an additional two years to come into compliance, a deadline that the ILF Program also failed to meet. In addition, USFWS allowed that single property to

[63] It is surprisingly difficult to directly compare credits produced from the WAFWA ILF Program with those from conservation banks, as the FWS has allowed WAFWA to develop its own methodologies for inventorying which are inconsistent with FWS methods, and thus, with conservation bank methods (who must follow FWS methods). Further, the WAFWA data system is impenetrable to understand, as noted by the FWS itself. There is also a difference in the types of credits produced: conservation banks are required to protect mitigation sites using FWS-approved, permanent conservation easements (thus, conservation banks can only produce permanent conservation), while WAFWA ILF Program can produce permanent or temporary mitigation ("term mitigation"). I compared the permanent types of credits: see Table H-14. In the Shin Oak service area, the table cites a cost to impact one acre of CHAT 1 habitat as $2,229.05. As the RWP requires a 2:1 mitigation to impact ratio, this price is expected to provide two acres of high-quality habitat protection. Price of private conservation bank credits based on personal communication with conservation banker with multiple approved conservation banks with comparable credits (LPC Conservation, LLC, Wayne Walker, August 20, 2019). Conservation banks are required to protect mitigation sites using FWS-approved, permanent conservation easements. Thus, conservation banks can only produce permanent conservation, while WAFWA ILF Program can produce permanent or temporary mitigation ("term mitigation"). A 2016 analysis of regulating documents associated with WAFWA's RWP and those of FWS-approved conservation banks found glaring differences with respect to mitigation standards. Such differences, the analysis concluded, resulted in significant pricing advantages for WAFWA—effectively excluding private conservation banks and lowering conservation outcomes. In addition, the mitigation standard disparities had the practical effect of FWS disproportionately regulating bankers more than WAFWA, which essentially established a WAFWA-run monopoly for lesser prairie chicken mitigation. Riggsbee, J.A. 2016. "Range-Wide Plan and Conservation Banking Standards: An Analysis of Equivalency Among Lesser Prairie Chicken Mitigation Programs." White paper provided to DOI on March 16, 2016. Available upon request.

[64] Permian Basin Petroleum Ass'n v. Dep't of Interior, 127 F. Supp. 3d 700 (W.D. Tex. 2015).

[65] Quote from letter from Dan Ashe (Director of FWS) to Ross Melinchuck (Deputy Director of Texas Parks and Wildlife Department), March 31, 2015.

count towards the new relaxed standard of 10% in the other three service areas as well—thus, a second variance. Therefore, in this one decision, USFWS readily relaxed spatial and temporal compliance standards.

One final note regarding the RWP is the liable party dynamic. As noted above, this program was created by a coalition of state agencies (e.g., Texas Parks and Wildlife Department and Oklahoma Department of Wildlife Conservation, among others), but is structured as a 501(c)(3), nonprofit organization. Its role as an ILF Program sponsor for Lesser Prairie Chicken mitigation is only one of its roles. While it is unclear what would happen if this specific ILF Program were to cease to operate for mitigation, it is likely that the umbrella organization (WAFWA) would be compelled to assume responsibility and financial liability. Moreover, it is not unreasonable to expect that the state departments that are part of WAFWA may, in the end, be obligated to provide some ultimate backstopping financial role. Meaning the RWP is assuming liabilities that may in effect be backed by its member states' treasuries.

Key Findings

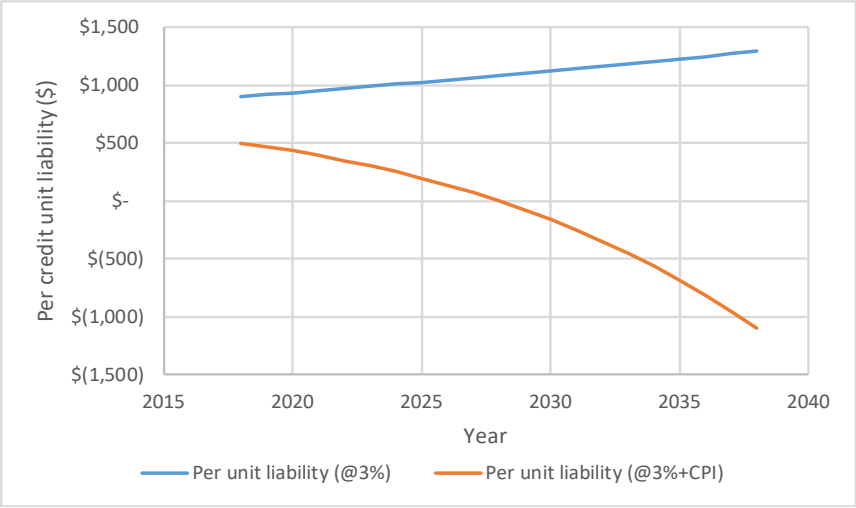
- The RWP appears to have set their fees too low to meet their objectives, which is compounded by an annual limit on fee increases (7% annual after the fifth year of implementation). With such constraints, it could take WAFWA 11 years to bring their costs in line with the market's actual costs. To date, WAFWA has not raised its rates.
- Record-keeping is (or at least initially was) too opaque for USFWS to conduct adequate compliance audits.
- USFWS bent key rules to accommodate WAFWA's inability to execute its plan. Rules regarding spatial and temporal standards associated with permanent mitigation were relaxed by USFWS in 2015. WAFWA is still not in full compliance with these rules three years later.
- WAFWA appears to be running a program with significant financial liabilities that have been assumed by WAFWA from industry (oil and gas permittees). In the event of default, the larger parent organization would appear to be liable for these liabilities, which it almost certainly cannot afford. It is therefore assumed that WAFWA's member states and their treasuries would bear the liability of providing all outstanding mitigation needs.

Economic Implications of Initial Prices Being Set Too Low

There are unrecognized implications of the prices for credits being set too low by ILF Programs, particularly when the prices cannot be aggressively adjusted to compensate for financial shortfalls. The WAFWA ILF Program, for example, can only increase fees after the fifth year of operations, once they complete the adaptive management review. After this, fees can only be increased by 3% to cover inflation and an additional 4% to cover deficiencies cited during the adaptive management review.[66] In this particular case, there is considerable disparity between WAFWA's fee (estimated at ~$1,100) for an acre of permanent conservation and the comparable price charged by private conservation banks (~$2,500) for an acre of permanent conservation. Assuming that a conservation banker generates credits at the real cost + 20% profit, then the real cost of an acre of conservation would be ~$2,000/credit. If the ILF Program sets the price initially at $1,100, then there is a per-credit unit liability of $900; that is, in year one, for each loaned credit that the ILF Program sells (i.e., each fee taken in), it is taking on a liability of $900.[67] If the ILF Program allows a 3% increase per year cap, and if inflation is estimated at the Consumer Price Index (~2.5%), then intuition says that the gap should be reduced over time, i.e., that the per-unit liability should decrease over time. However, this intuition is, in fact, wrong, and it reflects the importance of the initial starting price and the power of inflation. If the ILF Program increases their fee at 3% only while the real cost increases at 2.5%, then in year two, the real price of a credit has become $2,050 while the ILF price is only $1,133, creating a per-unit liability of $917. That is, the per-unit credit liability has increased in year two; and the per-unit liability increases over time instead of decreasing (blue line in Figure 1).[68] In this case of $2,000 vs $1,100, the ILF Program would have to increase their fee at a rate of at least 3.7% per year in order to begin closing the gap between the real price and the ILF price (i.e., to make the blue line flat).

[66] RWP, P. 196. Collectively, WAFWA can only raise rates by 7% annually, after the adaptive management process is initiated in Year-5 (2019).
[67] Clearly, the ILF Program could generate credits more creatively and more cheaply than the for-profit competitors, but it is unrealistic why such an assumption could or should be made, i.e., why the public sector is more efficient than the private sector at the same task.
[68] This is comparable to starting your retirement with $250,000 in year 1 versus $100,000. Because you compound year-on-year, the difference in starting point cannot be made up unless the lower starting value has a sufficiently higher per-year rate of return; thus, why people who start saving for retirement late in life have to take on riskier investments than those who start earlier.

Figure A1.



Note: The effect of difference in real credit price and assumed ILF credit price. Figure assumes real price is $2,000 and the ILF price is $1,100, and the ILF price is increased at 3%/year and the CPI is 2.5%/year. If credit price is increased at 3%+CPI, it still requires 10 years until the real and assessed prices are the same.[69]

Thus, *if the price set by the ILF Program is less than the real price of credit production, the ILF Program will need to increase its fees at some rate greater than the rate of inflation.* But balancing out takes time. If this particular example ILF Program inflated at 3% + inflation (assuming CPI is 2.5%), it will take 11 years until the ILF Price is the same as the real price of credit production (where the red line crosses the $0 axis in Figure A1). Importantly, all the years in between are financial losses; that is, an ILF Program with a $900/credit liability, even if increasing its fees at 3% + inflation, *will be selling credits at a financial loss, for every credit sold, for an entire decade.* In the WAFWA ILF Program example, the situation is even worse because the program requires waiting five years to adjust fees its fees, dramatically exacerbating financial liabilities accumulated.[70]

[69] This is based on a very simplified analysis to demonstrate the importance of starting price.

[70] This situation is actually even worse for the WAFWA ILF Program: because there has been a decline in the use of the ILF Program by industry, there are fewer credits to be sold and fees to be taken in. Thus, there is not as large of a potential revenue source in the future, meaning that the per credit fee will have to be even higher to have some semblance of financial viability.