

The Role of In Lieu Fee Programs in Providing Off-Site Compensatory Mitigation

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I. Introduction

Environmental credit markets provide parties facing on-site regulatory requirements with third party, off-site regulatory compliance options. In concept environmental credit markets can offer both the regulated party and the regulators additional compliance options that can lower the cost of compliance and/or improve environmental outcomes of compliance actions. Third party credit providers have incentives to make investments that improve environmental conditions (quantified as a credit) if these improvements can be made at a cost lower than what the regulated party must pay to comply with the requirements. Third party credit providers with expertise in both restoration science and regulatory compliance systems can lower costs by constructing larger scale environmental improvement projects that lower unit credit costs (economies of scale) and lower administrative/regulatory approval costs. The flexibility to search and select investments off-site of the permitted activity also means that credit providers may also be able to (depending on program design and incentives) target environmental enhancement projects that improve the chances for environmentally successful outcomes and provide the most environmental improvement per investment projects.

In practice, environmental credit programs have confronted a number of implementation issues that limit the achievement of these potential benefits (Shabman, Stephenson and Shobe 2002; Shabman and Scodari 2004; Stephenson and Shabman 2011; Shortle 2013). Two general challenges involve uncertain and limited credit demand and high transaction (administrative) costs associated with the production and sale of credits. Environmental credit market demand is driven both by market conditions (amount of economic activity driving impacts) and regulatory conditions that can limit the use of offsite credit opportunities. Regulatory programs frequently require permitted parties to first minimize to permitted impact and thus credit demand. In addition, regulatory programs are confronted with the challenging of spatially, temporally, and functionally matching permitted regulated impacts and credit-generating improvements, called environmental equivalency. Environmental credit trading programs typically limit the geographic range of off-site compliance options and require off-site improvements be made congruent or in advance of the permitted impact (no “temporal losses”). Regulatory programs also typically require that the functional improvement match/replace the permitted (diminished) impacts. While essential, ensuring such equivalency and ensuring compliance can also increase the costs of producing and selling credits for the third party credit providers.

In some circumstances, in lieu fee programs may be designed and used to accelerate offsite compliance options in situations where regulatory and market conditions align to limit commercial credit investments. In lieu fee (ILF) programs allow an organization to accept payment (fee) from a regulated party to offset permitted impacts. In accepting the fee, the ILF organization also accepts responsibility for meeting the regulatory obligation. While in lieu fee programs typically create a lag between impact and environmental offset (“temporal loss”), in lieu fee programs may be able to address market and regulatory uncertainties that act as a barrier to other off-site mitigation options. If this is the case, in lieu fee programs may serve as

a stimulus and test platform to provide off-site compensatory mitigation when other compliance alternatives are infeasible.

The goal of this report is to examine the evolving role of ILF programs in one of the most mature environmental credit trading programs in the United States – wetland and stream mitigation credits. This analysis will investigate how limited demand conditions impact the ability of commercial credit providers to make investments in wetland credit projects in advance of permitted impacts and to what extent ILF programs can provide regulatory compliance under these conditions. In addition, this report will investigate how ILF programs operate under new federal regulatory rules that explicitly direct regulatory authorities to use ILF programs in situations where commercial credit alternatives are limited. Case studies of state ILF programs in Georgia and Virginia are used to provide a detailed examination of how ILF programs operate in this regulatory environment.

Wetland and Stream Credit Trading Under the U.S. Clean Water Act

The Corps of Engineers, in cooperation with other federal and state agencies, administers a number of permit programs that govern the discharge of fill material into waters of the United States under section 404 of the Clean Water Act.¹ Under these permit programs, individuals wishing to disturb or fill jurisdictional wetlands must obtain an individual or general permit from the Corps. As a condition of obtaining a permit, permittees must demonstrate that all practicable steps are undertaken to first avoid, and then minimize, all wetland and stream impacts. For those impacts that are unavoidable, the Corps also requires permittees to provide “compensatory” mitigation to offset the loss in wetland acreage and function. Compensatory mitigation can be provided by creating, restoring, enhancing, or preserving wetlands/stream function either on-site or off-site of the permitted activity. Regulatory authorities have also given clear preference for compensatory mitigation that matches the impacted (lost) wetland/stream (“in-kind” mitigation).

The permittee can meet the regulatory requirements by directly producing the compensatory mitigation offset, called permittee-responsible mitigation (either on-site and off-site of the permitted impact). Historically, regulatory authorities preferred that compensatory mitigation occur on-site of the permitted activity (thus the regulatory preferences was for “in-kind” and “on-site” mitigation. Strict preference for onsite-mitigation, however, has been criticized as generating small scale, costly, and ecologically ineffective replacement of lost wetland functions (NRC 2001).

As an alternative to permittee responsible mitigation, Corps permitting programs allow the permittee to pay a third party to provide the compensatory mitigation (generally off-site of the permitted impact). Third party compensatory mitigation providers create, restore, or enhance wetlands/streams in exchange for receiving transferable mitigation credits from regulatory agencies. These mitigation credits can be sold to permittees to meet compensatory mitigation

¹ The Corps also evaluates permits under other authorities including Sections 9 and 10 of the River and Harbors Act, but the large majority of permits compensatory mitigation is imposed under section 404 permits (Vanderbilt, Martin and Olson 2015)

requirements. The Corps has regularly approved the development and sale of wetland mitigation credits since the 1990s.

Compensatory mitigation credits have historically been provided by either off-site single user banks (permittee constructs consolidated off-site compensatory mitigation projects to offset multiple impacts), commercial mitigation credit banks or in lieu fee (ILF) programs. The two typical types of third party mitigation credit providers, commercial banks and ILF programs, generally differ by the source of capital and by organizational management. Commercial mitigation banks are operated by private firms who must secure the funding for constructing the mitigation project.² Typically, commercial mitigation banks secure the land, develop plans, and secure regulatory approval before credits are awarded and allowed to be sold. Commercial banks must also secure financial assurances (performance bonds, letters of credit, etc.) before credits can be sold from the mitigation bank. Financial assurances provide regulatory authorities with instruments to manage the risks that a compensatory mitigation project will fail to achieve its restoration objectives. With a credit sale, the legal responsibility to provide compensatory mitigation is transferred from the permittee to the credit provider.

In contrast, ILF programs historically have been operated by nonprofit organizations or government agencies.³ The primary source of financing for ILF programs comes from fees paid by the permittee. The payment of fees fulfills the permittees' regulatory obligation and transfers the obligation to the ILF program. The ILF program collects and holds fees in an account until sufficient fees are collected to begin a compensatory mitigation project. Like commercial mitigation banks, ILF programs can consolidate multiple small impacts into larger, more ecologically valuable projects. However, under ILF programs there is a temporal lag between impact (& payment of fee) and compensatory mitigation.

Regulatory authorities have used ILF programs as a compensatory mitigation option since the beginning of the program, and since the beginning, in lieu fee programs have been subject of a number of criticisms. Critics argue that ILF programs have limited incentives to produce "timely, successful mitigation" (Corps and EPA 2008, p. 19599). ILF programs already allow temporal loss to the ecosystem by waiting to collect sufficient fees before initiating compensation, thus undermining the national goal of "no net-loss" (Gutrich and Hitzhusen 2004). Some investigations reported instances of long delays in providing compensatory mitigation and incomplete wetland accounting that failed to tightly link fee revenue to timely completion of mitigation projects (ELI 2002, GAO 2001, Shabman and Scodari 2004). Given the nature of the characteristics of ILF revenue streams, ILF programs also face the risk that collected fee revenue would be insufficient to construct a sufficient offsetting amount of wetland mitigation. If fees were insufficient to fully offset permitted losses, then regulators may have few options to resolve the deficit. The private compensatory banking industry also voices concerns that ILF program compensatory mitigation costs are not reflected in ILF fees

² In some cases, nonprofit and governmental organizations may also supply credits in advance of impacts with the intention to generate positive net returns. For this reason, the more general term "commercial", rather than "private", is used to describe these banks

³ The 2008 mitigation rule now limits ILF program administration to only NGOs and governmental organizations.

(ex. not charging for overhead costs or not including land costs for projects built on public land), effectively subsidizing permitted impacts (ELI 2002; GAO 2001; Corps and EPA 2008).

In 2008, the Corps and the Environmental Protection Agency (EPA) approved new compensatory mitigation rules (33 CFR Part 332 and 40 CFR Part 230 subpart J) that significantly altered how compensatory mitigation is provided. The rule establishes two key regulatory preferences. In an historical policy shift, the new rules express a clear preference for consolidated off-site mitigation over on-site mitigation. The change in policy preference is consistent with findings that consolidating numerous small wetland/stream impacts into larger compensatory mitigation sites improve ecological functioning and chances for mitigation success (NRC 2001). As a consequence, permit-responsible mitigation is assigned a lower regulatory preference than mitigation provided by commercial mitigation banks and ILF programs (generally see 33 CFR 332.3 (b)). The rule, however, leaves the “avoid and minimize” requirement unchanged.

Second, the rule establishes a regulatory preference for mitigation in advance of impact. A key objective of the rule is to better manage the risk associated with providing compensatory mitigation and such risk is reduced with mitigation in advance of impact (some measures of mitigation success achieved prior to selling credits). Thus, the rule places priority for commercial mitigation credits over ILF advanced credits (33 CFR 332.3 (b)). The Corps permitting authorities, however, are also given discretion on for Corps permitting authorities in deciding when other mitigation alternatives (ILF advanced credits or permittee responsible mitigation) may be preferable to commercial bank credits. In particular, the Corps regulatory authorities are directed to also consider the location and the specific aquatic resource functions in deciding the appropriate compensatory option for a permitted impact.

During the development of the 2008 rule, many commentators called for phasing out of in lieu fee programs (Corps and EPA 2008), citing the reasons noted above. The Corps and EPA, however, retained ILF programs as a compensatory mitigation alternative in large part to provide mitigation when commercial banks and permittee-responsible mitigation is impractical (Corps and EPA 2008). ILF programs have been justified as an acceptable offsite compensatory mitigation option on a number of grounds. For instance, wetland and stream compensatory mitigation markets are often characterized by limited or “thin” demand (Shabman and Scodari 2004, Scodari and Shabman 1995). The demand for mitigation credits may be limited due to the lack of development activity that requires 404 permits, strict adherence to regulatory preference for avoidance of impacts, and the limited spatial market areas. Given the high up-front costs associated with producing credits, if credit sales opportunities are too limited or uncertain, commercial mitigation bankers may find it too costly and risky to invest in the development and construction of commercial banks (Shabman, Stephenson and Scodari 1998). In such situations, ILF may, in fact, allow the use of offsite options in situations where they would otherwise not exist.

The 2008 mitigation rule responded to critics of ILF programs and permittee responsible mitigation by establishing more uniform or “equivalent” standards across all compensatory mitigation options. In effect this meant that ILF programs and permittee responsible mitigation

must meet the more rigorous requirements typical of third party commercial credit providers. The rule requires ILF programs to now use the same mitigation bank approval process and provide similar financial assurances as commercial banks. In addition, ILF programs must demonstrate the use of full cost accounting when establishing advance credit fees. The rule also clarifies that only nonprofit organization or government agencies can operate an ILF program. The rule authorizes ILF programs to sell “advance credits”. Advance credits are credits sold to permittees prior to an approved mitigation plan or project. The rule requires that the number of total allowable advance credits that can be sold within a geographic area (service area) be defined in the ILF enabling instrument. The rule also limits the temporal lag between fee payment and compensatory offset by requiring ILF programs begin compensatory projects within the “third full growing season” (33 CFR 332.8 (n)). As ILF program begin to complete successful compensatory mitigation projects, the Corps issues “released credits” and these credits must be used to fulfill advanced credit sales. The ILF program may sell any remaining (unused) released credits.

The 2008 rule provides an opportunity to examine the evolving role ILF programs play in securing off-site third party mitigation in a regulatory program with clear preferences for advanced offsite mitigation. Specifically, this report has two goals. First, this analysis will examine the extent to which limited demand might impact investments by commercial mitigation banks. Commercial mitigation banks must be able to earn a return on investment commensurate with the investment risk before credits will be supplied. A financial simulation model is used to illustrate the investment incentives for commercial credit suppliers with thin credit demand.

Second, this report aims to examine how advanced credits and ILF programs are being used to provide off-site compensatory mitigation under the 2008 rule. While ILF advance credits offer new mitigation opportunities in areas underserved by commercial bankers, the mitigation rule places the burden on Corps permit administrators to enforce the preference for commercial mitigation credits over advance credits. Research at the Institute for Water Resources (IWR 2015, 85) has noted that some stakeholders charge that these regulatory preferences are not being followed. If true, then the presence of an ILF program would dampen the supply of commercial mitigation in advance of impacts. On the other hand, if regulatory preferences are being followed, then ILF programs will be tasked to provide offsite third party compensatory mitigation in areas unfavorable (“impractical”) to commercial investment. The analysis seeks to understand under what conditions are regulators approve advanced mitigation credit sales.

After advance credits are issued, ILF programs face equivalent requirements and standards for all compensatory mitigation projects. ILF programs selling advanced credits will need to fulfill the regulatory obligation within three years. Yet the rule already anticipates that ILF programs will be asked to provide offsite compensatory mitigation in areas that commercial investors find financially or ecologically challenging, presenting possible challenges to ILF programs to provide the required mitigation (U.S. Army Corps of Engineers 2006). This analysis will also investigate the experience of ILF programs to provide timely and successful mitigation in the context of this regulatory setting.

For the second objective, case studies are conducted of two ILF programs. Virginia and Georgia are selected as case study sites because ILF programs have been established in areas also well-served by commercial mitigation banks (IWR 2015). The ILF program service areas also include area that relatively few off-site third-party mitigation alternatives, offering opportunities to investigate program operation in areas with different credit market conditions.

II. Financial Simulation:

The compensatory mitigation rule places an emphasis on advance mitigation by commercial third party credit providers. Yet, commercial bankers require an adequate rate of return on investment to provide compensatory mitigation in advance of impacts. The supply of third party compensatory mitigation can be influenced by a variety of factor including the availability of suitable mitigation sites and cost. Another key element in the compensatory mitigation investment is credit demand. The price and quantity of credits that can be sold depends on overall development pressure (construction activities that generate potential impacts), the regulatory program that requires compensatory mitigation (sequencing), and the nature of the landscape that might be impacted. If there is insufficient credit demand, commercial banks will be not supply credits, thus providing a need for alternative compensatory mitigation options such as ILFs.

A commercial mitigation bank financial simulation model was developed to investigate the extent to which commercial mitigation banks can meet financial objectives under different credit demand situations. Following Shabman et al (1998), the simulation model estimates the internal rate of return and net present value of a compensatory mitigation project. Model inputs include preconstruction design and regulatory approval costs, construction costs, land costs, post-construction monitoring and maintenance, financial assurance cost, transaction costs, and long term maintenance and catastrophic fund costs. Cost data was derived from the literature and personal interviews (King and Bohlen 1994; Shabman et al 1998; IWR 2016).

We use the simulation model to estimate the rate of return to a variety of hypothetical, but realistic, wetland credit projects. Internal rates of return on investment is calculated under different assumptions concerning 1) the annual potential credits that could be sold each year, 2) wetland credit prices, and 3) wetland project size (acres).

Compensatory Mitigation Project Illustration

This analysis models a hypothetical wetland restoration project typical of the mid-Atlantic region. The initial restoration project area is assumed to be 50 acres of wetlands. Given the type of wetland project, one credit is generated per acre of restoration. The total size of the parcel where the wetland restoration site occurs is assumed to be 1.5 times the size of the restoration site. In the simulation, land is secured through a permanent conservation easement.

We assume the commercial bank requires 2 years to gain regulatory approval and includes time to identify and design the restoration project and then move the proposed project through the IRT process. Initial design and approval costs are assumed to be \$150,000. Construction (grading and initial planting) occurs in the third year. This project monitors and maintains the project for 8 years, upon which time the project is assumed to achieved all performance requirements and all potential credits are released. Construction costs are assumed to a nonlinear function of project size (King and Bohlen 1994). Key model assumptions are summarized in Table 1.

Table 1: Cost Assumptions for Wetland Financial Simulation

Description/Activities	Cost Assumption	When incurred
Pre-construction: site selection, site design, permitting	Minimum \$75,000/project plus \$1,500/ac	Years 1 and 2
Land acquisition/easement costs	\$400/acre	Year 1
Construction Costs	$30,706 * (\text{Acres}^{-0.396}) * (\text{2014\$ Price Conversion})$	Year 3
Post construction monitoring and maintenance	\$2000/yr minimum, plus \$120/ac/yr.	Years 4 through 9
Financial assurance: initial credit release	Letter of credit, 3% for 15% of value of initial credit release, plus collateral	Years 3 and 4
Maintenance fund	Deposit 8% of credit sales in maintenance fund, 10% returned following year	Years 4 through 9
Long-term management fund	2% of initial credit sales deposited into trust fund	Upon sale of a credit

Total potential wetland credit demand is assumed to range for 1 to 8 credits per year. Total *potential* wetland credit sales represent the maximum number of credits that the wetland project can sell in a year. In the simulation, the *actual* number of credits sold is equal to the potential credit demand only if sufficient released credits are available. Following typical credit release patterns in Virginia, 15% of total potential credits (ex 7.5 credits for a 50-acre site) is released upon bank approval and posting of financial assurances (year 3). Another 10% of potential credits are released after construction (year 4). This illustration assumes that after initial release of credits, additional credits are released uniformly each year as annual performance metrics are met. All credits from the project are released after the end of the 8-year monitoring period. If potential credit sales exceed released credits available to the bank, then actual sales equal the credits available for sale for that year.

Wetland credit prices are assumed to range between \$40,000 and \$60,000 per credit. While commercial wetland credit prices are not publicly available or disclosed, these fall within the range of advance credit prices published by the Virginia Aquatic Resources Trust Fund. Given the risky nature of the investment, a 20% rate of return is used as a target rate for a commercial credit venture (Shabman et al 1998).

Limited credit demand stretches credit sales further into the future and imposes a time opportunity cost on a commercial credit project. Given the assumptions above, the simulated rates of return for a 50-acre wetland restoration project is shown in Table 2. Generally, credit sales of 3 wetland credits per year will not achieve the target rate of return for any of the wetland credit prices. Credit prices would need to reach \$135,000/credit to enable this commercial wetland project to achieve a 20% rate of return given sales of 2 credits per year. At lower credit prices (\$40,000/credit), even high credit sales will be insufficient to achieve the target rate of return (see Table 2).

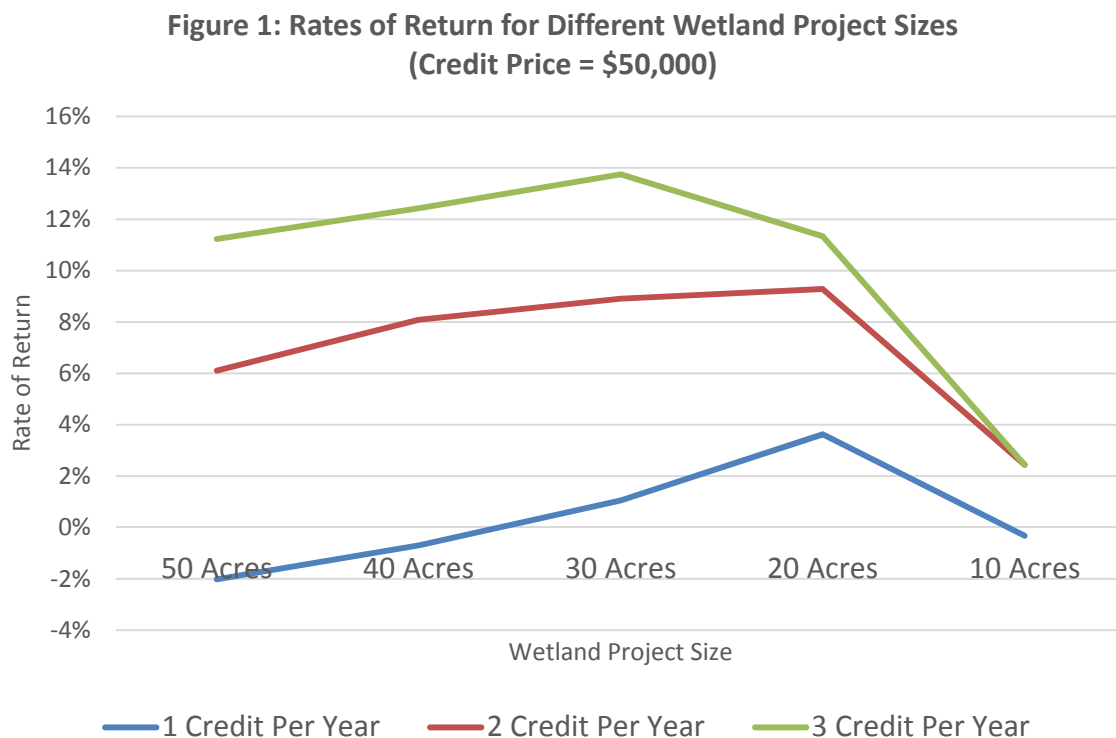
Table 2: Internal Rates of Return for 50 Acre Compensatory Wetland Mitigation Site Under Different Credit Demand Conditions

# Potential Credit Sales per year	Nontidal Wetland Credit Price		
	\$40,000	\$50,000	\$60,000
1	-3.8%	-2.0%	-0.5%
2	3.6%	6.1%	8.3%
3	7.7%	11.2%	14.3%
4	10.5%	15.3%	19.5%
5	13.4%	19.5%	24.9%
6	15.6%	22.8%	29.4%
7	16.2%	23.7%	30.6%
8	16.4%	24.1%	31.1%

The simulation results show that a commercial venture would not make an investment in 50-acre compensatory wetland restoration project with limited credit sales. Commercial wetland bankers, however, may have other means to meet the compensatory mitigation needs of permittees in these limited demand situations. For instance, compensatory wetland projects may be scaled down to better match credit demand conditions. Reducing the size of the project would reduce the upfront construction costs and allow the banker to sell a greater proportion of credits earlier in the project. Such a strategy, however, has trade-offs. As the size of a wetland project diminishes, the per acre construction costs increase (King and Bohlen 1994). In addition, some costs, such as regulatory approval costs, may be relatively insensitive to project scale since the IRT review process is the same regardless of project size. Thus, there are limits to how much costs can be reduced by reducing the project size.⁴

⁴ See Table 1 for model assumptions about how pre and post construction costs are assumed to vary with respect to project size.

To investigate the potential of project scaling to meet financial objectives in limited demand conditions (1 to 3 credit sales/yr), rates of return are estimated for different project sizes (ranging from 10 to 50 acres). The results are shown in Figure 1. The results suggest there are limits to the extent to which commercial mitigation bankers can increase rates of return in limited demand situations by reducing restoration project size. In the hypothetical case examined here, project rates of return peak for mitigation projects in the 20 to 30-acre size range. Reducing project size lower than 20 acres, however, reduces rates of return for all credit demand scenarios. Note, however, given the cost and project type assumed here, no project size alternatives is sufficient to generate a target 20% rate of return on investment.



The simulation model results demonstrate that under realistic cost and mitigation requirement settings how modest credit demand can limit investment to produce commercial wetland mitigation credits. The 2008 rule anticipates that ILF programs will serve the offsite compensatory mitigation needs of permittees and the regulatory program when no other third party compensatory mitigation credit alternatives are available. The next section of this reports investigates the extent to ILF programs provide compensatory mitigation services in areas without offsite alternatives.

III. ILF Program Implementation

In lieu fee programs have been a common feature of the wetland/stream compensatory mitigation program since the 1990s. By 2005, the Environmental Law Institute reported 46 approved and active in lieu fee programs in the United States. The 2008 mitigation rule that established new mitigation requirements prompted several existing ILF programs not to seek reauthorization. The 2008 rule, however, appears to have also stimulated the development of new ILF programs. Currently, 51 approved and operational ILF programs exist in the United States, 28 of which were established after 2008.⁵

In lieu fee programs, however, historically have represented a relatively small share of total compensatory mitigation in the United States. Prior to 2008, the majority of compensatory mitigation was undertaken near the permitted impact by the permittee (on-site permittee responsible mitigation). Since the 2008 mitigation rule was implemented, use of third party (mitigation banks and ILF programs) appears to be increasing, particularly for small permitted impacts (IWR 2015). In 2014, nearly two-thirds of all authorized impacts (number of permitted impacts) that required compensatory mitigation used third party mitigation. In lieu fee programs make up a smaller share than commercial mitigation banks (approximately 10% of all third party mitigation). However, as a share of total mitigation acres or linear feet, the majority of compensatory mitigation is still undertaken by the permittee (either on-site or off-site), suggesting that compensatory mitigation for larger permitted impacts are met by the permittee (IWR 2015).

As stated by their program instruments, most of the ILF programs established after 2008 state that their primary goal is to meet regulatory preferences by providing offsite compensatory mitigation. Many of the ILF programs established after 2008 are regional or state-wide in scope (blue area below). These service areas of these new ILF programs cover approximately 545 thousand square miles (blue area in map below). A significant portion of the service areas of the post 2008 ILF programs serve areas without an existing mitigation bank (see map). In these areas, ILF programs are the only off-site third party provider of compensatory mitigation.⁶

Of particular interest for this report are regions served by both forms of third party compensatory mitigation providers. In these areas, regulatory authorities have multiple offsite-compensatory mitigation options and while the 2008 rule gives preference for compensatory mitigation established in advance of impacts, the rule does grant discretion to Corps district to make case-by-case determinations on the most appropriate mitigation (ecological preference).

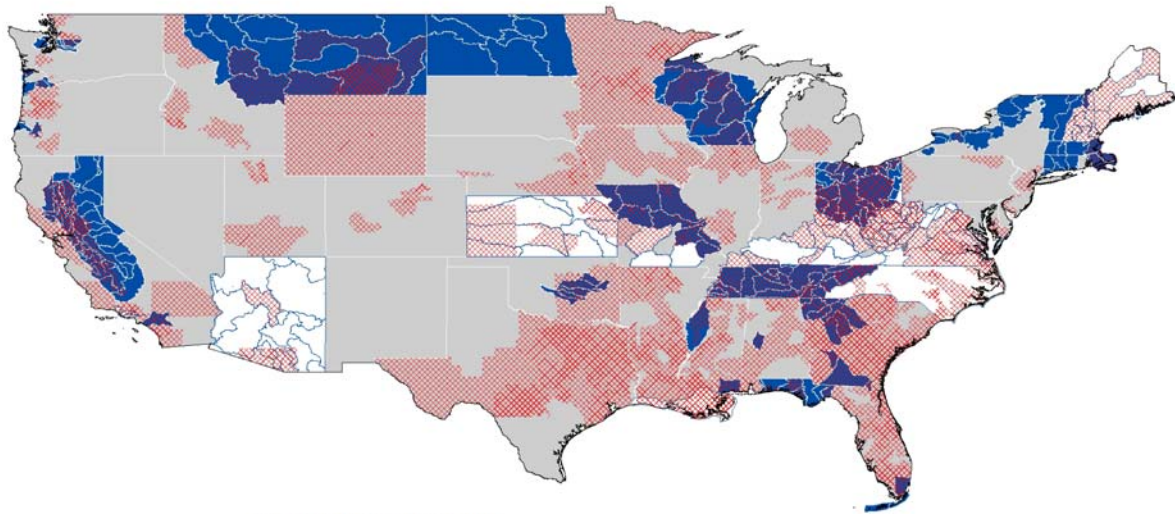
Virginia and Georgia were selected for detailed case study investigations to more closely examine how ILF programs are used to provide off-site compensatory mitigation and how ILF programs operate to meet their compensatory mitigation obligations. The analysis uses

⁵ Data from RIBITS and Steve Martin, IWR.

⁶ Limited credit demand may be an important contributor to the lack of commercial credit production in these areas.

multiple sources of evidence to examine these issues. Information on ILF and commercial bank wetland and stream credit transactions was obtained from the Corps banking and in-lieu fee program database, RIBITS. Other technical documents (guidance, bank and program instruments) were obtained from RIBITS and the Corps' Norfolk and Savannah Districts. Historical program documents, current ILF program instruments, existing evaluative literature, and personal interviews of ILF administrators and regulatory staff were conducted and used to identify trends and gain more comprehensive understanding of observed behavior and activities.

Service Areas of Third-Party Mitigation Providers (2015, contiguous U.S.)



Service Areas Depicted

- Third Party Mitigation Service Areas (sans Single-Client User Banks and ILF bank sites)
- ILF Program Service Areas (Programs established Post-2008)
- ILF Program Service Areas (Programs established Pre-2008)

Virginia Aquatic Resource Trust Fund (VARTF)

The VARTF was established in 1995 by memorandum of understanding between the Nature Conservancy and the Corps of Engineers. The Nature Conservancy has operated the program since its inception and has been the primary ILF program within the state.⁷ The VARTF also operates in a state with one of the most active wetland/stream credit trading programs in the nation (IWR 2015). According to the VARTF program manager, the VARTF current and historical focus is to provide compensatory mitigation to areas underserved by commercial mitigation banks (Johnson 2016).

In July 2011, the Nature Conservancy and the Corps finalized a revised ILF program instrument that meets the requirements of the 2008 mitigation rule. The instrument defines 14 service areas that generally correspond to major watershed boundaries (see Figure 2). The service areas typically contain multiple 8-digit HUC watersheds and are generally larger than service areas of the commercial mitigation banks. ILF project specific service areas, however, may be further limited by the permitting agencies (VARTF 2011). Virginia state law limits wetland and stream mitigation bank service areas to be within or adjacent to the “fourth order subbasin”, which approximates the HUC-8 classification (see § 62.1-44.15:23A).⁸ The VARTF serves all areas of the state except the Big Sandy service area in far southwestern Virginia.⁹ Total allowable advance credit sales are specified for nontidal wetlands, tidal wetlands, and streams in each of the remaining service areas. The expressed goal of the VARTF is to compensate for smaller impacts and the VARTF retains discretion to reject ILF payments based on impacts greater than 3 wetland acres or 2,000 linear feet of streams (VARTF 2011).

The Norfolk District of the U.S. Army Corps of Engineers oversees the VARTF. Although no district level guidance has been published, Corps regulatory staff is expected to require permittees to buy released credits before authorizing an advance credit purchase (Richardson 2016). The permittee is required to demonstrate that no existing credits are available to compensate for the impact. If released credits are available, permit staff will not approve an advance credit purchase even if released credits are more expensive. The Norfolk District, however, treats ILF release credits (credits produced in excess of advance credit obligations) as

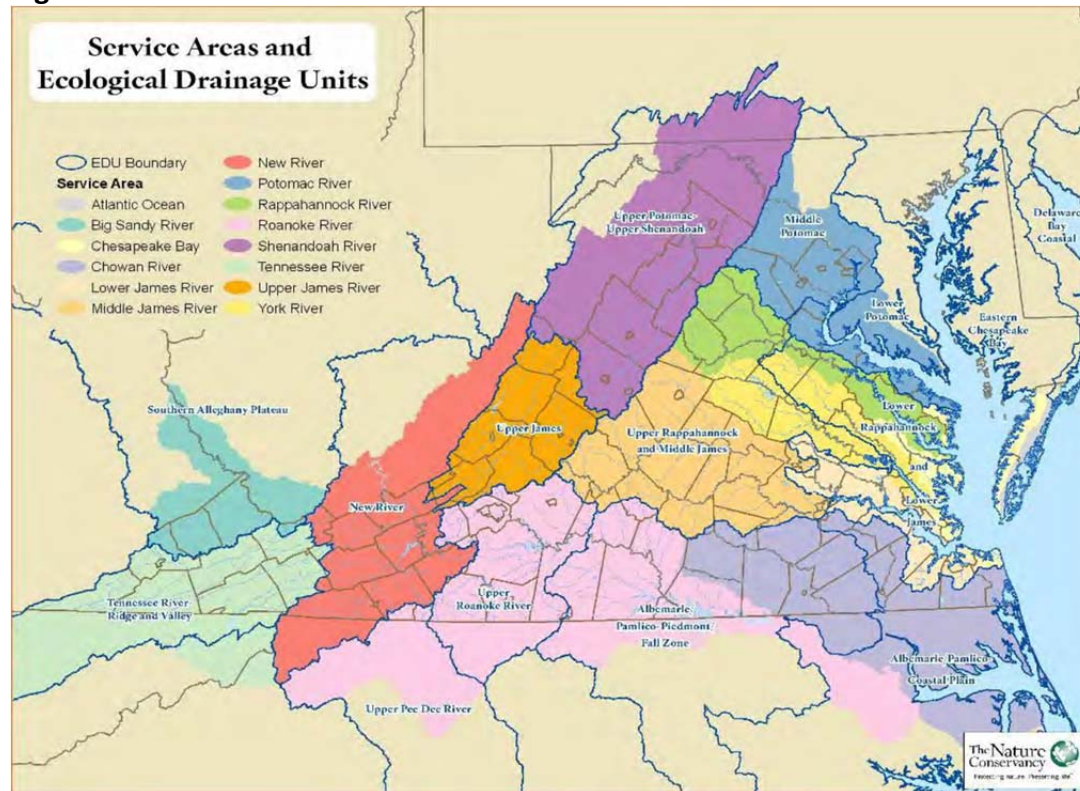
⁷ One other ILF program, the Living River Restoration Trust, has been approved in Virginia. This ILF program was initially approved in 2004 and serves a small watershed (Elizabeth River) in southeastern Virginia (ELI 2006). Two other in lieu fee programs are under review, the Department of Environmental Quality Wetland and Stream Replacement Fund and the Southwest Virginia In Lieu Fee Program.

⁸ For a summary of the changes in watershed boundary classifications, see <http://www.dcr.virginia.gov/soil-and-water/hu>.

⁹ The Nature Conservancy elected not offer advanced credits in the Big Sandy due to the challenges of locating and gaining approval for appropriate mitigation sites in the region. The region is largely forested and impacted by coal mining. The land and mineral rights in the region complicate securing mitigation sites.

the same as released commercial bank credits. Prior to 2008, the Corps generally gave preference to commercial bank credits over released ILF credits (Johnson 2016). In addition, the Norfolk District does not require any mitigation adjustment (trading ratio or additional fee) to offset temporal lags between impact and compensatory mitigation.

Figure 2: VARTF Service Areas



Source: VARTF 2011. Note: the Big Sandy is the only drainage area not served by VARTF.

Advance Credit Sales in Virginia

Since the approval of the VARTF ILF instrument in July 2011 (and through 2015), the VARTF received payments for 111 permitted impacts (advanced credit transactions).¹⁰ Almost three quarters of all advance credit transactions involved wetland impacts (74%). Over this period, approximately 26.5 nontidal wetland and 15,098 advance stream credits were issued (see Table 1).¹¹ Only 0.76 advanced credits (16 permitted impacts) for tidal wetland were sold and were scattered over 7 service areas. Advance credits tend to be concentrated in a relatively small

¹⁰ An advanced credit transaction is defined as any impact that required mitigation to offset either a wetland, stream, or tidal wetland impact. In some cases, a permittee and operating under single permit would have multiple advance credit purchases for multiple impacts under a single permit. These are recorded as separate "transactions"

¹¹ These totals compensate for approximately 20.3 acres of wetland impacts and 17,050 linear feet of stream impact.

number of service areas. Over 70% of all wetland advance credits were issued in just 4 service areas: Atlantic Ocean (seaside of the eastern shore), Chowan, Roanoke, and New River service areas. For streams, 83% of all advanced credits were located in the western portion of the state: New River, Roanoke, Tennessee, and Shenandoah service areas (see Table 3). In Virginia advance credits offset small impacts. The average size of the impact for an advanced credit sale was about a quarter of an acre for wetlands and 600 linear feet for streams.

Table 3: VARTF Total Advanced Credit Sales (2011-2015)

Service Area	Stream	Wetland	Wetland Tidal
Atlantic Ocean	0	4.69	0.182
Chesapeake Bay	312	0.93	0.174
Chowan	195	4.995	0.06
Lower James	1,690	0	0.006
Middle James	0	0	0
New River	4,615	4.949	0
Potomac	0	0	0.298
Rappahannock	306	0	0.036
Roanoke	3,410	4.79	0
Shenandoah	2,036	1.78	0
Tennessee	2,534	2.282	0
Upper James	0	2.05	0
York	0	0.05	0.0022
Total	15,098	26.516	0.758

Overall, in lieu fee programs represent a small and declining share of all third party wetland (nontidal) credit transactions in Virginia (see Figure 3).¹² VARTF advanced credit sales, 26.5 credits, comprised 3.1% of all third party wetland credit transactions between 2011 and 2015. During the same period, commercial banks sold 859 wetland credits. Note that the majority of all VARTF wetland credit sales during the 2011-2015 period were advance credit sales. VARTF may also sell “released” credits. In lieu fee programs sold an additional 10 released credits during 2011-2015. The total portion of total wetland credit sales from ILF programs [VARTF] (advanced and released credits) after the 2008 rule (2009-2015) was less than 4%. Prior to the 2008 rule (2000-2008), in lieu fee programs (overwhelmingly VARTF) represented 11% of all third party off-site credit transactions.

Off-site compensatory mitigation for stream impacts has a more recent regulatory history than wetland compensatory mitigation. Offsite stream compensatory mitigation did not start occurring until 2002 in Virginia and the total amount of compensatory mitigation for stream

¹² A third party credit transaction is defined as a credit sale that results in the transfer of compensatory mitigation responsibility from permittee to another entity. Data was derived from RIBITS.

impacts remained small until 2006 (see Figure 4). Between 2011 and 2015, commercial banks sold an average of 41,200 stream credit annually. Advanced credits from the VARTF averaged around 3,000 per year, representing a little less than 6% of all stream credit sales during the period.

Figure 3: Third Party Wetland Credit Sales, Virginia

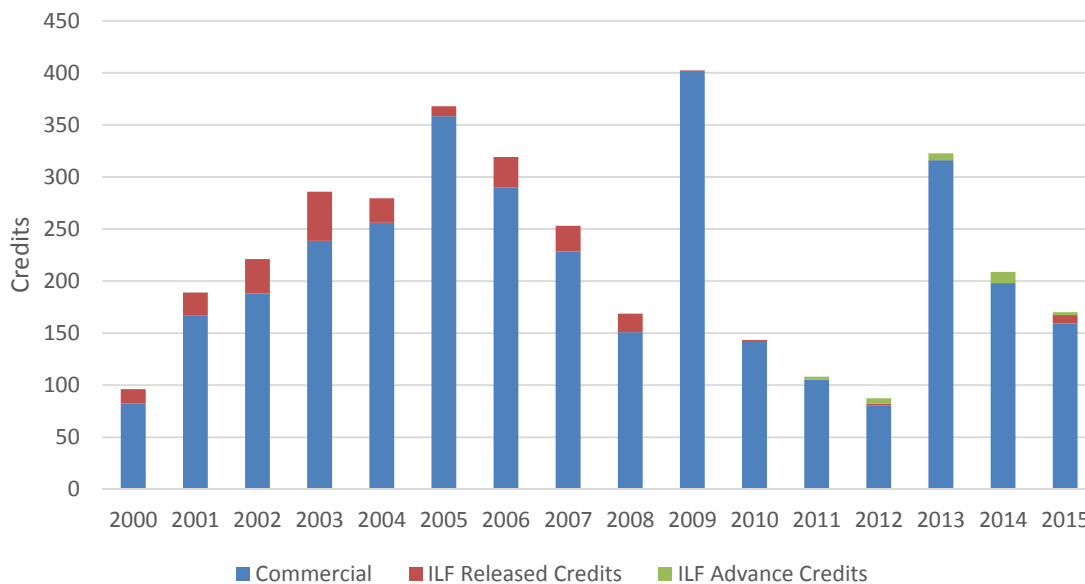
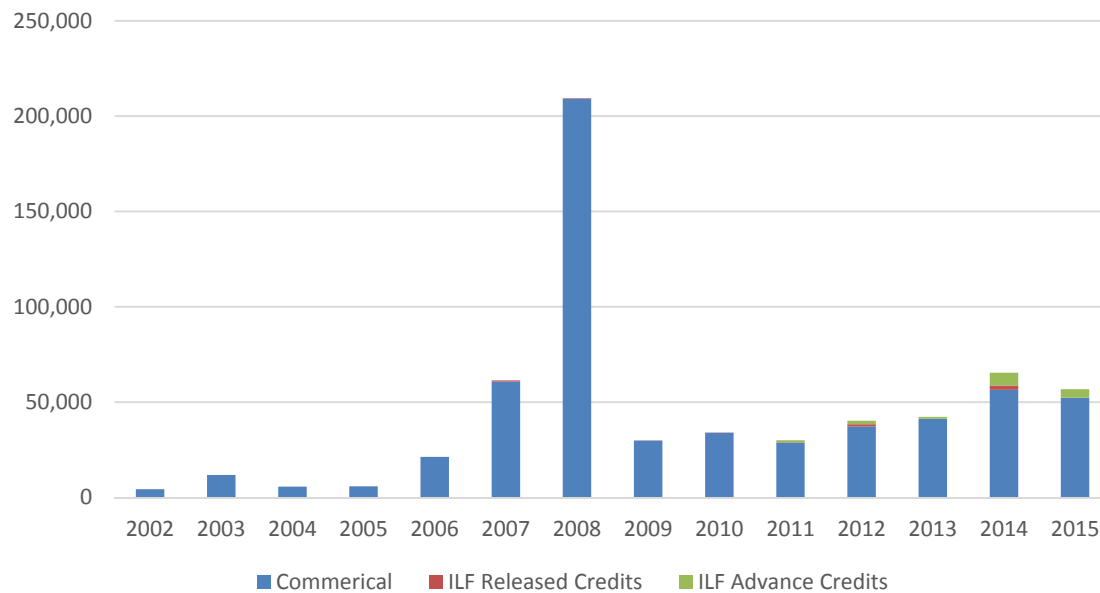


Figure 4: Third Party Stream Credit Sales, Virginia



Like advance credit sales, the distribution of commercial wetland and stream mitigation credits sales exhibits regional variation across the state and tend to be clustered in specific watersheds.

While each commercial mitigation bank has its own service area, the location of the commercial mitigation bank sites was grouped according to the broader ILF service areas. Total credit sales of the commercial wetland mitigation banks between 2011 and 2015 is shown in Table 4. Nearly 90% of commercial wetland credit sales occurred in just 4 watersheds: Chowan, Lower and Middle James, and the Potomac. These generally serve the urban areas in the eastern coastal areas of Richmond, Northern Virginia, and Norfolk regions. Similarly, 80% of commercial stream credit sales originate in the Potomac, Middle James, and Roanoke watersheds.

Table 4: Commercial Credit Sales 2011-2015, Virginia

Service Area	Stream Credits		Wetland Credits	
	# of Credits	%	# of Credits	%
Atlantic Ocean	0	0%	0.0	0%
Chesapeake Bay	0	0%	33.7	4%
Chowan	4,147	2%	265.1	30%
Lower James	0	0%	232.4	26%
Middle James	51,792	25%	152.5	17%
New River	0	0%	0.0	0%
Potomac	115,680	56%	139.7	16%
Rappahannock	11,583	6%	27.1	3%
Roanoke	18,661	9%	8.5	1%
Shenandoah	0	0%	0.0	0%
Tennessee	0	0%	0.0	0%
Upper James	600	0%	0.0	0%
York	3,689	2%	34.8	4%
Total	206,152	100%	893.8	100%

The spatial distribution of commercial wetland mitigation credits provides evidence that ILF advance credits are located in areas with relatively little commercial compensatory mitigation investments in Virginia. Table 5 compares the distribution of VARTF advance credit sales (2011-2015) against the total production of commercial wetland and stream credit in Virginia since 2000.¹³ Approximately half of all advanced credit sales (49% for stream credits and 52% of wetland credits) occur in major watersheds that have never produced a commercial mitigation credit (e.g. any third party mitigation in advance of impacts) (see red text in Table 5). In addition, the data provides additional evidence of adherence to the mitigation hierarchy in the 2008 mitigation rule. For instance, 86% of the commercial stream mitigation credits were produced in regions that did not produce any advance credit sales. Nearly 60% of commercial wetland credits were produced in ILF service areas that had no advance nontidal wetland credit sales (see blue text in Table 5).

¹³ Within RIBITS, the Corps labels these as released credits.

Table 5: Advance Credit Sales and Total Commercial Credit Production, Virginia

Service Area	Stream Credits		Wetland (Nontidal) Credits	
	ILF Advance Credit Sales	Commercial Bank Credit Production	ILF Advance Credit Sales	Commercial Bank Credit Production
Atlantic Ocean	0	0	4.68	0.00
Chesapeake Bay	312	0	0.93	52.44
Chowan	195	24,163	4.99	1,939.28
Lower James	1690	6,155	0.00	1,175.33
Middle James	0	153,875	0.00	492.48
New River	4615	0	4.95	0.00
Potomac	0	460,748	0.00	987.06
Rappahannock	306	22,266	0.00	110.90
Roanoke	3410	47,081	4.79	76.20
Shenandoah	2036	9,056	1.78	59.42
Tennessee	2534	0	2.28	0.00
Upper James	0	5,586	2.05	0.00
York	0	66,092	0.05	300.39
Total	15,098	795,022	26.52	5193.5

The data in Table 5, however, underestimates the extent to which the VARTF provides compensatory mitigation options to areas without off-site third party mitigation alternatives. As noted above, commercial bank service areas may cover only a portion of the regions defined above. Second, commercial banks credits may not be available to permittees because either the bank may have sold out of all available credits at the time of impact (advance credit sale) or the bank may be holding available credits for another buyer. To provide a more comprehensive understanding of the pattern of VARTF advance credit sales, the total number of commercial banks and bank credits that served the HUC-8 impact watershed was identified for each advance credit transaction using the RIBITS database.¹⁴

This analysis confirms that 96.5% and 97.1% of wetland (nontidal) and stream advance credits respectively occurred in situations when no commercial credits were available to the permittee. In many cases, the commercial banks served only a portion of the VARTF service area and the permitted impacts occurred in the underserved areas (ex. in the Roanoke service areas). The remaining cases involved commercial banks being temporarily sold out at the time the permittee needed compensatory mitigation. In most of these cases, the issuance of advance credits was temporary since new releases of commercial credits were approved after the

¹⁴ Advance credit transactions were initially sorted using GIS overlays of HUC-8s. In cases where banks served only a portion of a HUC-8, transactions were verified manually using service areas identified in RIBITS. In some cases, the latitude and longitude of the impact was obtained from other permit databases to identify private credit availability.

advance credit sale. For the unconfirmed cases (3.5 and 2.9% of advance credits), commercial credits could have been listed as available on RIBITS but the commercial bank was holding remaining credits for another permittee (thus unavailable to others). This evidence further indicates that the regulatory officials in Virginia closely adhere to the mitigation preference hierarchy laid out in the 2008 rule.

Meeting Compensatory Mitigation Obligations by the VARTF

During the course of the history of the VARTF, the Nature Conservancy has conducted over 100 compensatory mitigation projects under the VARTF (ELI 2016). The Nature Conservancy maintains a staff with restoration expertise that oversees the identification and implementation of mitigation projects.¹⁵ The Nature Conservancy utilizes a network of partners that can help them identify sites and projects (Johnson 2016). While not standard practice, the Nature Conservancy maintains the option to purchase commercial bank credits from existing banks within the service area (VARTF 2011).¹⁶ To meet assumed compensatory mitigation obligations in the Roanoke, the VARTF issued a request for proposals for stream mitigation credits. (Johnson 2016; ELI 2016). The end result of that effort was the direct purchase of 2,500 released stream credits from an existing mitigation bank (ELI 2016).

In March 2016, the Environmental Law Institute released a five year audit of the VARTF. ELI evaluated VARTF against numerous requirements of the ILF program including compliance with the comprehensive planning framework, content of mitigation plans and projects, financial assurances, credit accounting and tracking, and compliance with advance credit requirements. ELI found that the Nature Conservancy met nearly all of the regulatory standards laid out in the 2008 mitigation rule.

ELI found, however, that the VARTF was not able to meet the three-year advance credit obligation in many instances. Based on ELI's interpretation of the "three full growing seasons", any advance credit sales occurring prior to March 2013 would need offsetting by the end of 2015. ELI identified 5 service areas where the 3-year time limit had not been met: Atlantic Ocean (tidal and nontidal wetlands); Chesapeake Bay (tidal and nontidal wetlands), Lower James (stream), New River (wetlands) and the Tennessee (stream). To meet these obligations, the Nature Conservancy has initiated and received initial approval for 10 projects (ELI 2016) since 2011. Of the 10, site development plan has been submitted for four projects. Only one project development project has been approved for construction.

VARTF staff note that the time requirements to gain mitigation project approval through the regulatory process (Interagency Review Team or IRT process) contributes to these lags. The Nature Conservancy staff report that gaining approval to proceed with construction of a mitigation project is taking approximately three years (Johnson 2016). Under ideal conditions,

¹⁵ Project design work, however, is contracted out.

¹⁶ The VARTF program instrument authorizes such flexibility when cumulative impacts from advance credits are small (defined as 3 acres of wetland impacts and 2,000 linear feet of stream impacts in a given year).

approval of a potential mitigation site could take approximately 7 to 9 months (U.S. Army Corps of Engineers 2009). The three-year approval reported by VARTF does not appear due to deficiencies with VARTF proposals. Private bankers report similar approval times in Virginia. Thus, even after the first advance credit sale in any watershed, the VARTF still could not meet the mitigation time requirement of advance credits in the 2008 rule.

Recently, the Virginia Department of Environmental Quality also conducted a recent evaluation of the VARTFs plans to meet compensatory mitigation obligations (VDEQ 2016). The VDEQ compared VARTFs outstanding compensatory obligations (including those assumed prior to the 2011 VARTF instrument) against current projects and submitted proposals for mitigation projects). VDEQ concluded that existing mitigation obligations will still be unmet in many service areas and across wetland, tidal wetlands, and streams mitigation obligations (VDEQ's results are reproduced in Table 6). The VDEQ requested the Nature Conservancy focus particular attention on the Atlantic Ocean and Big Sandy service areas.¹⁷ For VARTF service areas and impacts where no projects are currently being proposed and where mitigation liabilities exceed three years, the VADEQ has encouraged VARTF to issue RFPs for mitigation credits and projects.

Table 6: Projected Remaining Mitigation Obligations, VARTF*

	Stream Credits	Wetland Credits	Tidal Wetland Credits
Atlantic Ocean	--	1.06	1.19
Big Sandy	647 (plus 1,972 If**)	0.11	--
Chesapeake Bay	--	--	--
Chowan	751	--	0.07
Lower James	--	--	--
Middle James	258	--	--
New River	1,102	5.04	--
Potomac	2,697	--	0.41
Rappahannock	1,721	--	0.04
Roanoke	--	4.64	--
Shenandoah	--	0.21	--
Tennessee	--	0.46	--
Upper James	--	0.53	--
York	5	--	--

*Table reproduced with slight editorial modifications from VDEQ letter to Nature Conservancy, dated July 14, 2016.

** Pre-USM Stream

¹⁷ Note the Big Sandy mitigation liabilities predate the 2011 instrument and in some cases are quite old. The VARTF has had several past attempts to meet these obligations but have been confronted with a variety of challenges in finding acceptable projects.

The purchase of released credits seems like a viable option for VARTF to meet remaining outstanding obligations in a few areas (for example Middle James and Potomac service areas). Note, however, that the areas and impacts where mitigation liabilities remain are in areas generally underserved or have never been served by commercial banks (example tidal wetlands and wetlands in the western portions of the state, and the upper Chowan). In addition, the VARTF has sold a small number of advance credits and mitigation obligations in several service areas, including wetland in the western service areas and tidal wetland impacts (see Table 6). In such cases, the VARTF may confront issues of not hold enough cumulative impact to construct an effective mitigation projects. A Corps district official stated that providing viable compensatory mitigation projects in these situations will be challenging. Representatives of the VARTF, however, feel that they will be capable of locating viable smaller compensatory mitigation projects.

Georgia Land Trust In Lieu Fee Program (GLTILF)

The Georgia Land Trust In Lieu Fee (GLTILF) program was established November 2013. The nonprofit Georgia Land Trust operates the GLTILF program within the Corps' Savannah District. Prior to 2008, Georgia was served by another ILF program, the Georgia Wetland and Stream Trust Fund operated by the Georgia Land Trust Service Center. The original ILF program sponsor elected not to reauthorize the program under the 2008 rule.

The GLTILF appears to be one of the few ILF programs designed explicitly to accommodate the compensatory mitigation preference hierarchy. The program goals for most ILF programs are broadly defined in the ILF program instrument to provide off-site mitigation options for permittees. These ILF programs do not directly address the role of commercial mitigation banks in the preference hierarchy. In contrast, the GLTILF program instrument states that goal of the program is to provide compensatory mitigation needs in areas underserved by commercial banks. Specifically,

“Georgia currently has an extensive commercial mitigation banking system. However, there are watersheds and credit types that are underserved or in low supply where the option for in lieu fee payments may be more likely. The GLTILF program would generally be considered as a mitigation option in these circumstances.” (p.4)

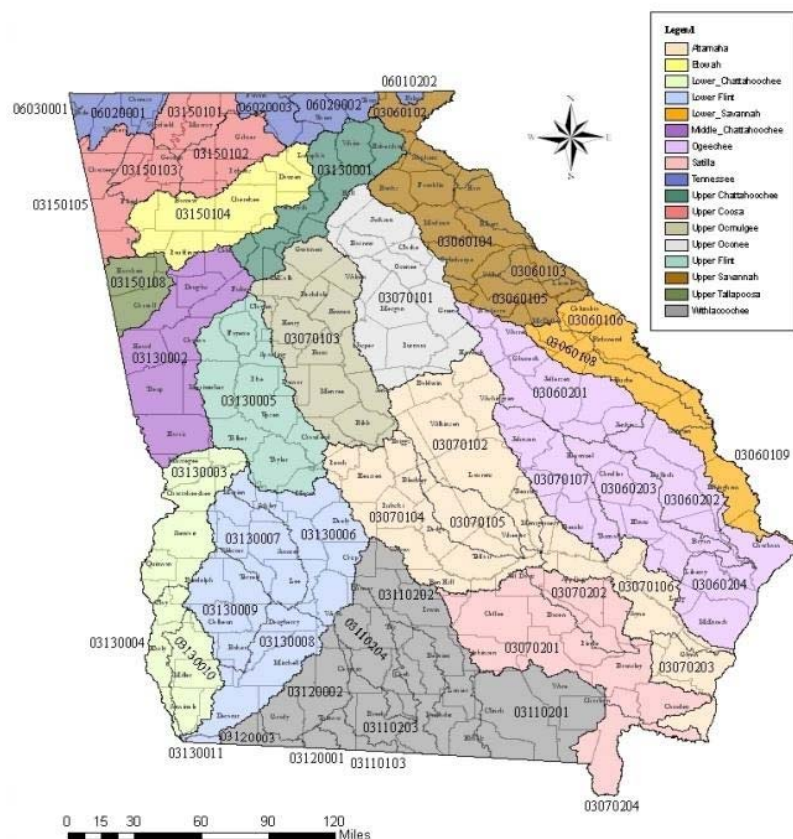
Low mitigation credit supply may be due either due lack of bank credits or large impacts that exceed available commercial credit demand (GLTILF 2013, 8-9).

Georgia defines 17 primary service areas in which a permittee may secure offsite compensatory mitigation (see Figure 5). Primary service areas generally include multiple HUC-8 level watersheds, although some service areas correspond to a single HUC-8. In Georgia, the 17 service areas generally apply equally to both commercial mitigation banks and the ILF program. The Savannah Corps District issued guidelines for permittees evaluating commercial mitigation bank options (US Army Corps of Engineers 2009).¹⁸ In general permittees with small impacts

¹⁸ The guidelines do not cover in lieu fee purchases.

(general permits) may secure compensatory mitigation within a service area, while permittees with larger impacts must first seek compensatory mitigation within the HUC-8 of the impact (US Army Corps of Engineers 2009). If no credits are located within the primary service area, guidelines then direct permittees to identify existing bank credits within “secondary service” areas. A commercial bank’s secondary service areas are typically defined as watersheds at are adjacent to the primary service area. If no commercial bank credits are available within the primary or secondary service area, the permit applicant can acquire advance credits from the GLTILF (Robertson 2016). Regulators implement this off-site compensatory hierarchy without regard to the credit price to the permittee (Robertson 2016).

Figure 5: Wetland and Stream Mitigation Service Areas in Georgia



Source: Georgia Land Trust

The GLTILF provides offsite compensatory mitigation for wetland and stream impacts. The GLTILF does not compensate for tidal wetlands or saltwater marshes impacts. While the GLTILF is authorized to serve the entire state, the Corps helps identify the underserved areas based on trend analysis and allocates advanced credits for stream and/or wetland impacts in those service areas. To date, advance credits have been approved in 10 of the 17 service areas (see

Table 7). In general, stream advance credits are located in the southern service areas (Withlacoochee, Satilla, and Lower Flint service areas), while wetland advance credits are located in the mountain and piedmont regions in the north.

Table 7: Advanced Credits Issued in Georgia (2014-2015)

Service Area	Wetland	Stream
Etowah	120	0
Lower Flint	0	5000
Satilla	0	5000
Tennessee	24	854
Upper Chattahoochee	14	0
Upper Coosa	359	0
Upper Ocmulgee	15	0
Upper Oconee	15	0
Upper Savannah	55	0
Withlacoochee	0	19190
<i>Altamaha</i>	<i>0</i>	<i>0</i>
<i>Lower Chattahoochee</i>	<i>0</i>	<i>0</i>
<i>Lower Savannah</i>	<i>0</i>	<i>0</i>
<i>Middle Chattahoochee</i>	<i>0</i>	<i>0</i>
<i>Ogeechee</i>	<i>0</i>	<i>0</i>
<i>Upper Flint</i>	<i>0</i>	<i>0</i>
<i>Upper Tallapoosa</i>	<i>0</i>	<i>0</i>
Totals	602	30,044

The GLTILF uses a two tier advance credit fees schedule. For small wetland and stream impacts, an advanced credit fees are posted for each service area. The GLTILF uses the collected fees from multiple impacts to purchase commercial bank credits as these credits become available (GLT 2013, 34). For larger impacts, the GLTILF may elect to establish project specific fee prices. As described by GLTILF (2013, 34):

This discretionary method will allow GLT-ILF to remain cost-competitive with permittee-responsible mitigation for larger impact credit needs, and creates a streamlined process for permittee's with larger impacts in service areas without sufficient commercial mitigation bank credits.

In addition, a temporal loss fee of 5% of total advance credit sales will be assessed all ILF fee payments. The loss fees will be held by GLTILF and used for mitigation use (GLTILF 2013, 35).

The GLTILF intends to fulfill advance credit obligations primarily through a competitive bid process that requests restoration proposals based on watershed objectives and priorities (GLTILF 2013, 22). The GLTILF procurement is to issue request for proposals for mitigation projects in areas where advance credits have been issued. The GLT selects proposals based on

watershed criteria and expectations of project success (Robertson 2016). The selected project sponsors will be responsible for design, constructing and monitoring the mitigation project. The Georgia Land Trust elected to solicit mitigation projects through RFP processes because the GLT is not staffed with sufficient in house restoration expertise.

The GLTILF program instrument also makes contingencies in case it proves challenging to secure compensatory mitigation within three years of an advance credit sale through the preferred design-build bid process (Robertson 2016; GLTILF 2013, 36). GLTILF may elect to purchase existing commercial bank credits, first within the primary service and then consider buying or securing credits from a secondary service area (Robertson 2016). The ILF instrument also allows for discretionary deferment (extension of the 3 years) or securing credits through the use of preservation credits.

Advance Credit Sales in Georgia

During 2014 and 2015, the GLTILF program received fees for 97.7 advanced wetland credits and 19,177 advanced stream credits (see Table 8). These credits covered 27 separate permitted impacts (advanced credit transactions), with the majority of the advance credit transactions involving wetlands (21 permitted impacts, or 77% of the total). The 97.7 advanced wetland credits issued cover approximately 37 acres of permanent wetland impacts and 5,698 linear feet of stream impacts. All stream advance credits occurred in two southern service areas, the Lower Flint and the Withlacoochee. Recently the GLTILF requested and received permission to expand the number of authorized advance credit authorizations in the Withlacoochee because of a two large permitted impacts. For wetlands, 83% of all wetland advance credits occurred in the northern service areas (piedmont & mountain region) of Upper Coosa, Upper Savannah, and Upper Oconee. The GLTILF provided advance credits for 7 different permitted impacts in the Etowah, the most of any service area. Most advance credits were issued in 2015.

Table 8: Advanced Credits Sales in Georgia (2014-2015)

	Wetland	Stream
Etowah	7.4	
Lower Flint		4,201.1
Satilla		0
Tennessee	1.9	0
Upper Chattahoochee	0	
Upper Coosa	46.3	
Upper Ocmulgee	7.2	
Upper Oconee	9.7	
Upper Savannah	25.2	
Withlacoochee		14,976.1
Totals	97.7	19,177.2

Blanks indicate no advance credits issued

Similar to Virginia, advance wetland credit sales represent a small fraction of all third party credit sales in Georgia (See Figures 6 and 7). The GLTILF wetland advance credit sales represents 3% of all third party compensatory mitigation credit transactions in 2014 and 2015 (advance credit sales were 5.6% in 2015). For stream compensatory mitigation, advance credit sales represented 4% of total third party credit sales across 2014 and 2015. These recent patterns do not represent a significant deviation from the past. Although Georgia had another approved in lieu fee program operating prior to the 2008 mitigation rule, this program represented an even smaller share of total third party mitigation credit sales. While not shown in the Figures, offsite compensatory mitigation in general (third party bank sales plus single client off-site banks)) is dominated by commercial mitigation banks in Georgia, historically accounting for 85 and 95% of total wetland and stream mitigation transfers (withdrawals) in Georgia since 1998.

Figure 6: Third Party Wetland (nontidal) Credit Sales, Georgia

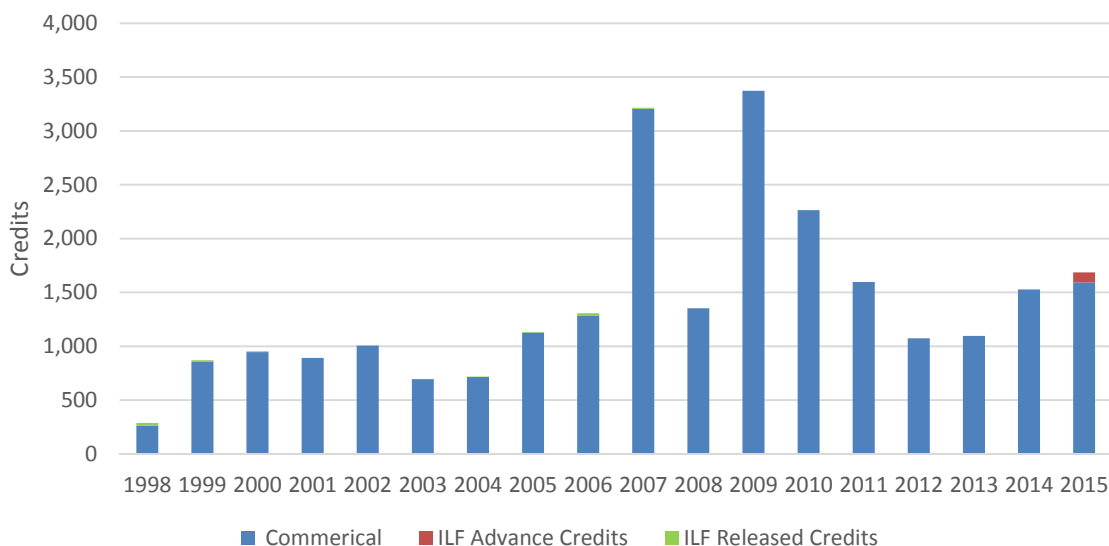
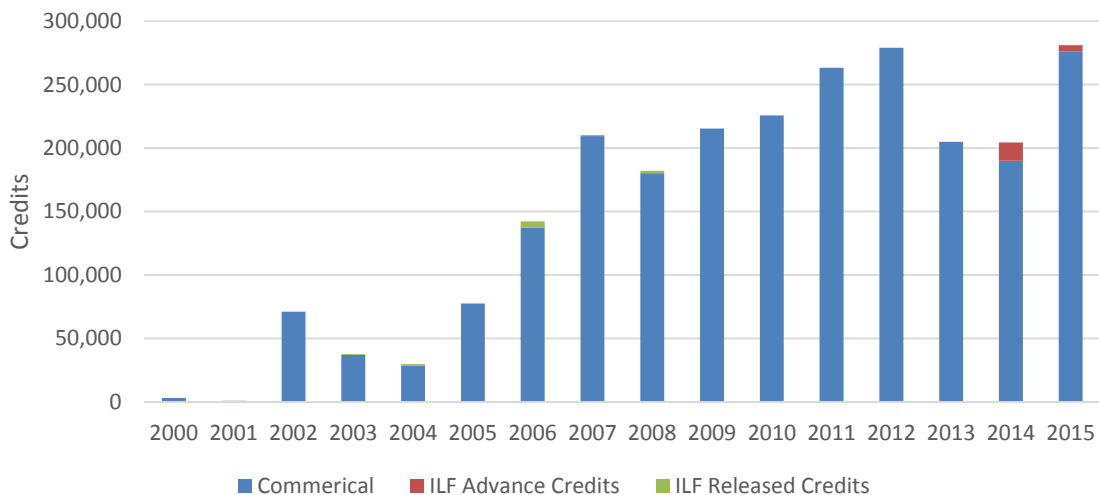


Figure 7: Third Party Stream Credit Sales, Georgia



Similar to Virginia, advance credit sales tend to be concentrated in areas with limited commercial bank sales and production (see Table X). For instance, 99.4% and 94.6% of all total historical stream and wetland credit production has been located in areas without any advance credit sales (blue text in Table X). For wetland, service areas with the lowest historical commercial credit production also had the highest frequency of advance credit sales (Upper Savannah, Upper Coosa). For streams, the Lower Flint service area never produced any commercial credits, but had 4,201 advance credit transactions. However, many service areas with advance credit sales in 2014 and 2015 also registered private commercial banks transactions (black text in Table 9). For wetlands, the Etowah, Upper Coosa, Upper Ocmulgee, Upper Oconee, and Upper Savannah accounted for the vast majority of advance credit sales (95.8 credits), but had one and a half times as many commercial wetland credit sales.

Table 9: ILF Advance Credit Sales and Commercial Bank Sales and Production, Georgia

Service Area	Wetlands			Stream		
	ILF Advance Credit Sales (2014- 15)	Commercial Bank Credits Sold (2014-15)	Total Commercial Bank Credit Production (1992- 2015)	ILF Advance Credit Sales (2014- 15)	Commercial Bank Credits Sold (2014-15)	Total Commercial Bank Credit Production (1996- 2015)
Etowah	7.4	24.6	376.6		120,233	480,626
Lower Flint		0.0	153.5	4,201	0	0
Satilla		315.1	4,214.6	0	112	1,383
Tennessee	1.9	0.0	0.0	0	0	26,229
Upper Chattahoochee	0.0	11.9	76.6		66,188	475,582
Upper Coosa	46.3	3.2	122.0		21,987	392,845
Upper Ocmulgee	7.2	37.1	1,105.9		22,202	575,208
Upper Oconee	9.7	56.3	479.8		22,455	492,901
Upper Savannah	25.2	30.2	87.7		35,825	256,035
Withlacoochee	0.0	1,159.3	7,630.5	14,976	6,647	29,409
<i>Altamaha</i>		473.0	7,662.1		29,101	716,130
<i>Lower Chattahoochee</i>		20.2	1,013.3		8,830	283,827
<i>Lower Savannah</i>		308.8	2,282.0		20,877	125,290
<i>Middle Chattahoochee</i>		66.4	858.6		57,939	739,369
<i>Ogeechee</i>		416.7	5,702.8		10,972	50,101
<i>Upper Flint</i>		193.9	7,361.7		42,771	367,606
<i>Upper Tallapoosa</i>		0.0	0.0		0	0
Total	97.7	3,116.4	39,127.7	19,177	466,139	5,012,543

Detailed level analysis of individual advance credit transaction was undertaken to estimate the extent to GLTILF provided permittees off-site mitigation options when no commercial credit

option existed. Within the service areas with commercial banking activity during the 2014-2015 (black text in the table above), credit availability was assessed at the time of the advance credit transaction. In all but a few transactions, it was confirmed that no commercial credits were available at the date of the advance credit transactions in either the primary or secondary service areas. In one example, one stream bank has been approved in the Withlacoochee service areas, but this bank did not have sufficient number of released credits available to cover permittee mitigation needs at the time of the advance credit sale. For wetlands, all wetland advance credits sales, with one exception (Upper Ocmulgee), were confirmed to have occurred at a time when no released credits were available. In the unconfirmed cases, the commercial credits may have been listed as available on the official registry, but were unavailable for other reasons (e.g. private banker holding credits for another client). Thus, 100% of stream credits and 93% of wetland credit sales in Georgia was confirmed to occur in situations without off-site third party credit alternatives.

Meeting Compensatory Mitigation Obligations by the GLTILF

Since most advance credits have been issued in the past 18 months, the GLTILF has yet to accumulate extensive experience in fulfilling their advance credit obligations. However, the GLTILF program has a number of approaches in meeting the compensatory requirements. In December 2014, GLTILF issued an RFP for stream mitigation projects in the Withlacoochee service area (the location of the majority of GLTILF advance credits). The project, if fully implemented and successful, would generate approximately 30,000 stream credits. The process to gain approval for this project took approximately 14 months (Robertson 2016). The GLT also purchased existing wetland credits from a commercial mitigation bank to fulfill all the advance credit obligations in the Etowah service area in December 2015. The commercial credits were released after the sale of advance credits. The GLTILF compensatory obligations in the Etowah were relatively small compared other service areas.

In anticipating future challenges, one GLTILF administrator noted that restrictions on ILF programs might make meeting regulatory requirements difficult in some situations (Robertson 2016). In particular the 3-year compensatory mitigation requirement for advance credits will be challenging in areas with no commercial bank credits in primary and secondary service areas and in areas with small amount of advance credit sales. Limited number of advance credit sales may make it difficult to identify and implement economically and ecologically viable compensatory mitigation projects. No explicit policy currently exists in Georgia on how to address those situations. One possible solution would be to allow more preservation-based mitigation in these thin demand areas (Robertson 2016).

The GLTILF program management is facilitated by good working relationships with the private mitigation banking industry. The GLTILF program structure relies on commercial bank and consultants to implement mitigation projects. The GLTILF also uses price and cost data provided by private mitigation bankers to establish and revise the fee schedule. The GLTILF program recently revised wetland advance credit prices within the last year to align with the prices and

costs emerging from the commercial credit market (Robertson 2016). Many mitigation bankers cooperate because they perceive no disincentives to share data and advice with the GLTILF.

Comparison of ILF Programs in Virginia and Georgia

The GLTILF and the VARTF both reflect similar use and patterns of advance credit sales. In both states, advance credits and in lieu fee programs provide a very small portion of third party compensatory mitigation services. With few exceptions and consistent with the preferences outlined in the 2008 rule, advance credit sales are largely confined to areas where no other credit options are available. These two case study areas provide little evidence to support the notion that advance credit compete with commercial bank alternatives. In addition, Virginia and Georgia experience also suggests there is little evidence to suggest that ILFs dampen or diminish the spread of commercial banks in areas being served by ILF credits.

Thus, Georgia and Virginia ILF programs are expanding offsite compensatory mitigation to areas otherwise unserved by commercial banks, as anticipated in the 2008 rule. The financial simulation results further support the findings that commercial banks will not invest in areas with the level of credit sales observed in areas served by ILF programs. However, serving these areas does present unique challenges to ILF programs. The 2008 rule “levels the playing field” between commercial banks and ILF programs. The only substantial concession granted to ILF programs in meeting compensatory mitigation needs in these underserved areas is a 3-year delay between impact and compensation. While this requirement helps prevent the delay of compensatory mitigation, the case studies suggest the requirement can also be problematic for several reasons: 1) mitigation bank approval times may take up to three years, and 2) more time may be required to accumulate enough impacts to construct viable compensatory mitigation projects. More work is needed to investigate the extent to which these issues pose challenges for other ILF programs.

The VARTF has experienced challenges in providing compensatory mitigation within the three year regulatory timeframe. The GLTILF has not been operating long enough to form a track record. The length of the IRT mitigation project review and approval process represents an important challenge for VARTF. It is not unusual for mitigation projects to take 2 to 3 years to get approved in Virginia, one to 2 years longer than what the GLTILF reports. Both programs face challenges in some service areas to accumulate sufficient amounts of advance credits to construct viable compensatory mitigation. In Virginia the average tidal wetland advance credit sale is 1/20th of an acre and total accumulated mitigation obligations are less than a quarter of an acre. In such situations, program administrators are faced with the trade-off of trying to develop small compensatory mitigation projects or postponing compensatory mitigation.

A number of options exist for meeting compensatory mitigation obligations in situations with small total impacts. Some suggest that bidding for full service projects or purchase of existing credits may help (Richardson; Rutlin 2016). For instance, both Virginia and Georgia ILF programs have met credit demand when there were temporary shortages of commercial credits. In those situations, purchasing commercial credits as they become available is a

feasible alternative. This option maybe less feasible when commercial banks have found it financially unviable to provide credits in a particular service area (perhaps due to high approval costs and diseconomies of scale). Other suggestions would rely on full service bid programs, but would encourage participants to build larger projects and retain the surplus credits to meet any future credit demand. If ILF programs contracted out the compensatory mitigation, then the commercial banker could retain the remaining credits. This would financially compensate the mitigation provider for some or all of the high upfront costs and reduce some demand side risk.¹⁹

Other options would require regulatory flexibility in what is accepted as compensatory mitigation, including deviating from temporal and/or spatial conditions. For example, regulatory officials may grant a request to defer the 3 year requirement. Regulatory officials may also expand conditions on what is considered acceptable compensatory mitigation, including broader consideration of project type (sponsoring more preservation projects) or larger service areas. In general these options can be granted on a case-by-case basis by the IRT (VARTF 2011) and has been granted to regulatory agencies within the 2008 rule.

The VARTF and GLTILF utilized different approaches to securing compensatory mitigation. Both ILF programs are operated by nonprofit organizations with strong restoration and preservation objectives. The GLTILF program, however, relies on the mitigation industry to help fulfill its compensatory obligations. The GLTILF primary means to secure compensatory mitigation is through full service delivery bidding systems. The VARTF primarily oversees its own mitigation projects. The GLTILF also establishes fees to a large degree based on prices and costs within the commercial banking sector. GLTILF procurement and pricing system encourages cooperation with commercial mitigation banks. In Virginia, many in commercial banks view VARTF as a competitive threat and have supported legislative efforts to scale back the VARTF program (VMBA).

¹⁹ Robertson (2016) and Richardson (2016).

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