



# IN-LIEU FEE MITIGATION: REVIEW OF PROGRAM INSTRUMENTS AND IMPLEMENTATION ACROSS THE COUNTRY

*Environmental Law Institute and  
The Institute for Biodiversity Law and Policy, Stetson University College of Law*

JUNE 2019



STETSON LAW

# In-Lieu Fee Mitigation: Review of Program Instruments and Implementation Across the Country

July 2019



Cover Photo: Meadow Creek, VA, The Nature Conservancy

*Acknowledgements.* This review of in-lieu fee compensatory mitigation programs was produced by the Environmental Law Institute (ELI) and the Institute for Biodiversity Law and Policy at Stetson University College of Law. ELI Staff contributing to this study include Rebecca Kihlslinger, Christina Libre, and Kathryn R. Ma. Stetson University College of Law staff contributing include Erin Okuno and Royal Gardner, as well as student research assistants Katherine Pratt and Vanessa Moore. Funding was provided by the U.S. Environmental Protection Agency (EPA) through a Wetland Program Development Grant. An Advisory Committee, including Karen Johnson, Steve Martin, Ann Redmond, Megan Webb, and Joy Zedler, as well as about 30 of the in-lieu fee programs interviewed, reviewed a draft of this report. The contents of this report do not necessarily represent the views of the U.S. EPA, and no official endorsement of the report or its findings should be inferred. Any errors or omissions are solely the responsibility of ELI and the Institute for Biodiversity Law and Policy at Stetson University College of Law.

Citation: Kihlslinger, R., Libre, C., Ma, K.R., Okuno, E., & Gardner, R.C. (2019). *In-Lieu Fee Mitigation: Review of Program Instruments and Implementation Across the Country*. Environmental Law Institute, Washington, DC.

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## Introduction

Nationwide, in-lieu fee (ILF) programs provide a significant percentage of the compensatory mitigation available to offset permitted impacts to aquatic resources. According to Hough and Harrington (2019), ILF programs accounted for approximately 17% of compensatory mitigation in 2017.<sup>1</sup>

Like mitigation banks, ILF mitigation is referred to as third-party mitigation because the responsibility for implementing compensation projects as well as the liability for ensuring that projects meet performance standards is transferred to a separate provider than the permittee. In general, ILF—like mitigation banking—involves the restoration and protection of larger, more ecologically valuable parcels and entails more thorough scientific and technical analysis and planning than do permittee-responsible mitigation projects. As such, compensatory mitigation projects carried out under well-designed ILF programs should yield ecologically sustainable mitigation projects that improve the protection and restoration of watersheds and aquatic ecosystems.

The 2008 Rule of the Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (the Corps) governing compensatory mitigation for impacts to wetlands, streams, and other aquatic resources authorized by Clean Water Act section 404 permits and other Department of the Army permits (2008 Rule) defines an ILF program as:

a program involving the restoration, establishment, enhancement, and/or preservation of aquatic resources through funds paid to a governmental or non-profit natural resources management entity to satisfy compensatory mitigation requirements for DA permits. Similar to a mitigation bank, an in-lieu fee program sells compensatory mitigation credits to permittees whose obligation to provide compensatory mitigation is then transferred to the in-lieu program sponsor. However, the rules governing the operation and use of in-lieu fee programs are somewhat different from the rules governing operation and use of mitigation banks. The operation and use of an in-lieu fee program are governed by an in-lieu fee program instrument.<sup>2</sup>

ILF programs operate under a program instrument developed in coordination with the Corps and the Interagency Review Team (IRT). Unlike mitigation banks, ILF programs may begin to sell credits in advance of securing a compensation site or conducting any mitigation activities. The number of these “advance credits” is defined in the program instrument. Thus, ILF programs do not require the significant amount of up-front funding necessary to secure a site and develop a

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<sup>1</sup> See also Institute for Water Resources (2015), at 11 (reporting that between 2010–2014, for permits requiring mitigation under the 2008 Compensatory Mitigation Rule, 11% used ILF program credits).

<sup>2</sup> 33 C.F.R. § 332.2 (2018).

mitigation plan in advance of selling credits. ILF programs are restricted to sponsorship by government agencies and nonprofit conservation organizations.

**Box 1: Basic Characteristics of ILF Programs (Adapted from ELI's In-Lieu Fee Mitigation: Model Instrument Language and Resources.**

<https://www.eli.org/sites/default/files/eli-pubs/d19-15.pdf>

There are six basic characteristics of ILF Programs, including:

- In-lieu fee program instrument
- Review by interagency review team
- Geographic service area(s)
- Compensation planning framework
- In-lieu fee program account
- Allocation of advance credits

An ILF program instrument is “the legal document for the establishment, operation, and use of an in-lieu fee program.” 33 C.F.R. § 332.2.

An Interagency Review Team (IRT) is “an interagency group of federal, tribal, state, and/or local regulatory and resource agency representatives that reviews documentation for, and advises the district engineer on, the establishment and management of a mitigation bank or an in-lieu fee program.” 33 C.F.R. § 332.2.

A service area is “the geographic area within which impacts can be mitigated at a specific mitigation bank or an in-lieu fee program, as designated in its instrument.” 33 C.F.R. § 332.2 It is also defined as “the watershed, ecoregion, physiographic province and/or other geographic area within which the... in-lieu fee program is authorized to provide compensatory mitigation required by DA permits.” 33 C.F.R. § 332.8(d)(6)(ii)(A).

A compensation planning framework is a plan, included in the ILF program instrument, that is used “to select, secure, and implement aquatic resource restoration, establishment, enhancement, and/or preservation activities.” The framework must “support a watershed approach to compensatory mitigation,” and all of the compensation projects proposed by the in-lieu fee program must be consistent with the approved framework. 33 C.F.R. §§ 332.2, 332.8(c)(1).

An ILF program account is an account established by the program sponsor to track the fees accepted and disbursed. The account must track funds accepted from permittees separately from those accepted from other entities and for other purposes (e.g., fees arising out of an enforcement action, “such as supplemental environmental projects”). 33 C.F.R. §§ 332.2, 332.8(i).

Advance credits are “any credits of an approved in-lieu fee program that are available for sale prior to being fulfilled in accordance with an approved mitigation project plan. Advance credit sales require an approved in-lieu fee program instrument that meets all applicable requirements including a specific allocation of advance credits, by service area where applicable. The instrument must also contain a schedule for fulfillment of advance credit sales.” 33 C.F.R. § 332.2.

In many respects, ILF programs are subject to similar requirements as mitigation banks (e.g., program instrument, review by IRT, geographic service areas, etc.). However, ILF programs are also required to complete several additional planning requirements before their programs can be approved and they can start accepting fees (see Box 1, above). For example, ILF programs must include a “Compensation Planning Framework.” The compensation planning framework is used to “select, secure, and implement aquatic resource restoration, establishment, enhancement, and/or preservation activities.”<sup>3</sup>

In addition, a mitigation plan and a thorough review and approval by the IRT are required for each individual ILF project conducted with fees collected through selling credits. Each individual ILF project site must also be protected with appropriate real estate instruments and have dedicated long-term management funding in place.

### Purpose of the Report

Eleven years have passed since the release of the 2008 Rule. As of October 2018, 59 in-lieu fee (ILF) programs had been approved to operate under the updated regulation (see Figure 1).<sup>4</sup> Programs are located across the country and range in size and the number and type of projects conducted.



**FIGURE 1: IN-LIEU FEE SERVICE AREAS (EXCLUDING ALASKA) – SOURCE: U.S. ARMY CORPS OF ENGINEERS**

This comprehensive report outlines the range of practice in ILF mitigation and describes innovative approaches across the country. The aim of this report is to support the development of effective mitigation programs by enhancing the capacity of state/local/tribal governments and others to develop or oversee ILF programs. Our goals are to:

- Provide a means for the transfer of knowledge among programs;

<sup>3</sup> 33 C.F.R. § 332.2.

<sup>4</sup> Fifty-eight programs are currently operating as of October 2018. The Conservation Fund Alaska ILF Program was terminated in 2017.

- Increase participation among state, tribal, and local governments in leading and overseeing ILF programs; and
- Improve protection and restoration of watersheds and aquatic ecosystems across the country.

## Methods

To produce this report, we reviewed and analyzed program instruments and procedures (through internet search and document review) and examined program implementation (through phone interviews and other outreach avenues) to assess the range of practice and identify some of the innovative approaches in ILF mitigation across the country. We worked with an Advisory Committee to identify the topic areas of particular interest for programs and finalize the target components for review. The Advisory Committee also reviewed a draft of this report. About 30 of the programs we interviewed for this report also reviewed a draft of this report.

We reviewed and analyzed program instruments (including the compensation planning frameworks and any available amendments or modifications) for all ILF programs that were listed as approved on the Regulatory In-lieu Fee and Bank Information Tracking System (RIBITS) as of December 2017 (see Appendix 1).<sup>5</sup> We primarily used RIBITS to access publicly available program instruments and in a few instances accessed documents on ILF program websites or requested documents directly from program coordinators/administrators.

After consulting with our Advisory Committee, we identified five specific components of program instruments to review in detail,<sup>6</sup> including watershed approach, service areas, prioritization strategies, stakeholder involvement, and audits. Using the 2008 Rule, ELI publications, and other documents as guides (see references cited), we evaluated whether and how each program instrument addresses regulatory requirements and sought to identify trends across programs and make recommendations to inform new and established programs across the country.

We also conducted standardized phone interviews with program administrators/operators from 41 approved ILF programs to assess the range of procedures and activities across the country (Table 1). We asked questions about ILF compensation (e.g., number of projects completed or underway, acres of compensation provided, range of project costs and fees), program procedures (e.g., fee schedules and methods for updating fees to reflect actual experience, long-term management approaches and financing, watershed approach planning, etc.), and program administration (e.g., interactions with the IRT in program and project development and implementation, interactions with other ILF programs and mitigation banks in overlapping service areas, etc.). See Appendix 2 for our interview template.

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<sup>5</sup> For those programs that were approved as of December 2017, we also reviewed any program instrument modifications or amendments that were available on RIBITS as of June 2018.

<sup>6</sup> We previously reviewed ILF program instruments for methodology for future credits and fees, ILF program account descriptions, and advance credit allocation and draft fee schedules.

## Structure of the Report

What follows is a broad survey of trends and lessons learned with regards to how program sponsors are executing ILF compensatory mitigation. The sections are organized by topic area. Topics include:

- Program Administration
- Watershed Approach
- Service Areas
- Credits
- Fees
- Mitigation Projects
- Financial Assurances
- Project Monitoring
- Long-Term Management
- Data Management
- Audits

The sections on the watershed approach, project prioritization, and audits are based primarily on instrument and document review. The sections on service areas and stakeholder involvement were informed by both the document review as well as interviews. The remaining sections are primarily based on the results of the interviews we conducted with program staff. In some cases, we went back to primary documents (e.g., program instruments and websites) so that we could include model language or examples.

The final section in the report identifies future research needs as identified by our program interviews. Many programs expressed a need for more information on a variety of topics. We tried to include information in this report that will aim to address some of these requests. In other cases, more research, program development, or capacity building may be needed.

In some cases, we have cited or included language from program instruments. The list of program instruments reviewed is included as Appendix 1 at the end of the report.

**Table 1: Interviewed ILF Programs. ILF programs represent a diversity of program sponsors and operate in more than 25 states.**

<b>Program Name</b>	<b>State</b>	<b>Sponsor</b>	<b>Year Approved Under 2008 Rule</b>
Arizona Game and Fish Department ILF Mitigation Program	AZ	Arizona Game and Fish Department	2013
California State Coastal Conservancy - Calleguas Creek ILF Program	CA	California State Coastal Conservancy	2014
Coachella Valley ILF Program	CA	Coachella Valley Conservation Commission	2014
Connecticut ILF Program	CT	National Audubon Society of Connecticut	2013
Ducks Unlimited New York ILF Program	NY	Ducks Unlimited	2012
Ducks Unlimited Vermont ILF Program	VT	Ducks Unlimited	2011
Everglades National Park ILF Program	FL	National Park Service	2015
Georgia-Alabama Land Trust	GA	Georgia-Alabama Land Trust	2013
Great Land Trust	AK	Great Land Trust	2011
Hood Canal Coordinating Council	WA	Hood Canal Coordinating Council	2012
Kentucky Department of Fish and Wildlife Resources ILF Program	KY	Kentucky Department of Fish and Wildlife	2011 (covering all but 9 of the state's 120 counties); 2018 (modified to cover all counties)
Keys Restoration Fund	FL	Keys Restoration Fund	2013
King County Mitigation Reserves Program	WA	King County	2012
Land Trust for the Mississippi Coastal Plain	MS	Land Trust for the Mississippi Coastal Plain	2011
Living River Restoration Trust (Elizabeth River Project)	VA	Living River Restoration Trust	2009 (pre-2008 Rule) and 2018 (post-2008 Rule)
Louisiana Department of Natural Resources ILF Program	LA	Louisiana Department of Natural Resources, Office of Coastal Management	2014

<b>Table 1 (continued): Interviewed ILF Programs.</b>			
Maine Natural Resource Conservation Program	ME	The Nature Conservancy and ME Department of Environmental Protection	2011
Massachusetts Department of Fish and Game ILF Program	MA	Massachusetts Department of Fish and Game	2014
Montana Aquatic Resources Services ILF Program (MARS)	MT	Montana Aquatic Resources Services	2013
Mountains Restoration Trust ILF Program	CA	Mountains Restoration Trust	2013
National Fish and Wildlife Foundation Sacramento District California ILF Program	CA	National Fish and Wildlife Foundation	2014
New Hampshire Aquatic Resource Mitigation Fund	NH	New Hampshire Department of Environmental Services	2012
North Carolina Division of Mitigation Services	NC	North Carolina Department of Environmental Quality	2010
North Dakota Ducks Unlimited ILF	ND	Ducks Unlimited	2014
Northern Kentucky University ILF Program	KY	Northern Kentucky University	2012
Northwest Florida Water Management District	FL	Northwest Florida Water Management District	2015
Pierce County ILF Program	WA	Pierce County	2015
Quil Ceda Village	WA	Borough of Quil Ceda Village, Tulalip Tribes	2013
Riverside-Corona Resource Conservation District ILF Program	CA	Riverside-Corona Resource Conservation District	2012
South Dakota Ducks Unlimited ILF	SD	Ducks Unlimited	2016
Southeast Alaska Land Trust	AK	Southeast Alaska Land Trust	2011
Southeast Alaska Mitigation Fund	AK	Southeast Alaska Watershed Coalition	2017
Stream + Wetlands Foundation ILF Program	OH	Stream + Wetlands Foundation	2014
Tennessee Stream Mitigation Program	TN	Tennessee Wildlife Resources Foundation	2013

The Nature Conservancy's Ohio Stream and Wetland ILF Program	OH	The Nature Conservancy	2014
The Nature Conservancy's Virginia Aquatic Resources Trust Fund	VA	The Nature Conservancy	2011
The Wetland Trust	NY	The Wetland Trust	2013
Tucson Audubon Society ILF Program	AZ	Audubon Society of Arizona	2015
Ventura River Watershed ILF Mitigation Program	CA	Ojai Valley Land Conservancy	2013
West Virginia ILF Stream and Wetland Mitigation Program	WV	West Virginia Department of Environmental Protection	2013
Wisconsin Wetland Conservation Trust ILF Program	WI	Wisconsin Wetland Conservation Trust	2014

## Program Administration

As of October 2018, there are 58 currently approved ILF programs.<sup>7</sup> The programs represent a diversity of program sponsors, cover a range of geographies, and provide a variety of credit types, including wetland, stream, and vernal pool, among others.

### Program Sponsors

Among the ILF programs approved for operation, approximately 56% (32) are administered by non-profit entities, often land trusts or wetland conservation organizations. These include both local groups and the regional branches of national organizations, like Ducks Unlimited or The Nature Conservancy (TNC). The other approximately 44% (26) are administered by public agencies, including state departments of fish and game, natural resources, or environmental protection; local water management districts; and tribal and county governments. Though 25 of these ILF programs were operating prior to the release of the 2008 Rule, the past decade has also seen the inception of many new programs. In some cases, these programs have been established to fill an unmet need for mitigation options. The Northwest Florida Water Management District, for example, established an ILF program to provide mitigation options to the Florida Department of Transportation in accordance with Florida Statutes.<sup>8</sup> The Quil Ceda Village ILF program was established in anticipation of development within the bounds of the Quil Ceda business park.

<sup>7</sup> The Conservation Fund's Alaska ILF Program was terminated in 2017.

<sup>8</sup> Fla. Stat. § 373.4137.

## Staff

Administering ILF compensatory mitigation requires the contribution of varied areas of expertise, including ecology, hydrology, biology, and engineering, as well as administration, marketing/public outreach, accounting, and law. Moreover, staff of ILF programs are typically adept at liaising among and collaborating with a wide range of community and regulatory stakeholders (see section on Partnerships with Stakeholders and Other Practitioners).

Among the programs interviewed, the vast majority employ one to five full-time equivalents (FTEs). A small number of programs employ six or more FTEs. Among these, the Riverside-Corona Resource Conservation District ILF Program and the Kentucky Department of Fish and Wildlife Resources ILF Program told us they have 11 employees. The North Carolina Division of Mitigation Services employs 31 individuals and funds legal, stewardship, and intern staff.

Core staff activities include outreach, project development, contracting, permitting, budgeting and accounting, and preparing program reports. Many programs also have engineers, restoration ecologists, wetlands scientists, and/or field crew on staff.

In some cases, employees work only part-time with the ILF program. Because programs are typically sponsored by organizations or public entities that execute various other programs and services, staff often split their time between these functions.

Some ILF programs—often state agencies—have in-house capacity to cover all elements of program work, including the entire life cycle of a project (design to construction to monitoring), as well as activities like credit accounting and reporting. Most programs, however, contract out at least some component of their work. This most frequently includes surveying sites, engineering and designing projects, removing invasive species, or operating heavy machinery during construction. The Nature Conservancy's Virginia Aquatic Resources Trust Fund, for example, contracts out the removal of invasive species for some projects. Likewise, the West Virginia ILF Stream and Wetland Mitigation Program utilizes third-party consultants for engineering and design of projects. Further, at least nine of the programs we interviewed operate request for proposal (RFP) processes to identify at least some mitigation projects conducted under the program's instrument. Under these programs, applicants propose projects in response to program specifications (e.g., programs may specify a geographic location or resource type as priority for funding). Successful proposals often serve as, or are modified to serve as, mitigation plans that are submitted to the IRT for approval. Selected applicants generally implement the projects and are often responsible for ensuring that projects meet identified performance standards.<sup>9</sup>

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<sup>9</sup> The programs that reported using RFPs to identify/select projects are North Carolina Division of Mitigation Services, The Nature Conservancy's Virginia Aquatic Resources Trust Fund, Wisconsin Wetland Conservation Trust ILF Program, Georgia-Alabama Land Trust, Maine Natural Resource Conservation Program, New Hampshire Aquatic Resource Mitigation Fund, Connecticut ILF Program, and Tennessee Stream Mitigation Program. There are some programs that use RFPs for other parts of the project implementation (e.g., restoration work or monitoring).

Some programs told us that they hire interns or volunteers on a seasonal or sporadic basis to assist with outreach, project identification, and administrative tasks, as well as to lend unique skills. The ILF program sponsored by the Massachusetts Department of Fish and Game, for example, hosted a graduate student intern who built a GIS-based planning tool for the Department as part of her master's program. Likewise, a PhD student assisted the Coachella Valley ILF Program with developing its instrument for approval under the 2008 Rule.

## Partnerships with Stakeholders and Other Practitioners

Stakeholder involvement often is an integral part—both formal and informal—of environmental restoration and conservation planning and processes. The 2008 Rule requires that the compensation planning framework in an ILF program instrument include “[a] description of any public and private stakeholder involvement in plan development and implementation, including, where appropriate, coordination with federal, state, tribal and local aquatic resource management and regulatory authorities[.]”<sup>10</sup> Stakeholder participation may occur in various ways and at different times and involve a wide variety of groups and individuals.

Involving stakeholders in ILF program development and implementation may strengthen program performance and thus improve the ecological benefits associated with the program. It also may contribute to the program's transparency and accountability and allow for consideration and possibly incorporation of relevant stakeholders' goals and/or priorities for the area's aquatic resources. Effective stakeholder engagement may help to avoid potential future conflicts or resistance to the program and its projects. Additionally, it can lead to meaningful coordination with other conservation programs or efforts, which in some cases may allow for leveraging of funding and resources. Stakeholders may provide beneficial knowledge and expertise, and sometimes they add “boots on the ground” for the ILF program.

Some program instruments include relatively basic provisions about stakeholder involvement,<sup>11</sup> and three of the instruments reviewed do not appear to include any information at all, perhaps because stakeholder involvement was not really contemplated for those programs, because the programs' initiation was already well known locally, and/or because the information may have been unintentionally omitted from the instrument. On the other end of the spectrum, several program instruments contain extensive, detailed provisions about stakeholders.<sup>12</sup> Most of the program instruments reviewed have one section that addresses stakeholder involvement, but a couple program instruments have a general section on stakeholder involvement, as well as more specific information about stakeholder involvement in the compensation planning

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<sup>10</sup> 33 C.F.R. § 332.8(c)(2)(viii).

<sup>11</sup> Examples of program instruments with more basic stakeholder involvement provisions include the Arizona Game and Fish Department ILF Mitigation Program and the Everglades National Park ILF Program.

<sup>12</sup> Examples of some of the more detailed stakeholder involvement provisions in terms of the number and variety of identified stakeholders may be found in the program instrument for the Montana Aquatic Resources Services ILF Program (in terms of the number and variety of identified stakeholders) and the Southeast Alaska Mitigation Fund (in terms of overall description and specifically identifying partners' expertise).

framework for each service area.<sup>13</sup> The length and level of detail of the stakeholder involvement provisions in the program instruments reviewed vary widely regarding the types of actual or potential stakeholders identified, when they may be involved, what their roles may be, and how the program plans to engage with them.

### Types of Stakeholders

Although the 2008 Rule does not define the term, others define stakeholders as “the people and organizations who are involved in or affected by an action or policy and can be directly or indirectly included in the decision making process.”<sup>14</sup> Similarly, the EPA defines a stakeholder as “a person (or group) who is responsible for making or implementing a management action, who will be significantly affected by the action, or who can aid or prevent its implementation.”<sup>15</sup> The stakeholders identified in the ILF program instruments reviewed include current and preexisting stakeholders who are already involved with the sponsor or the program’s development in some way, as well as potential stakeholders who could be involved in the future. In general, the program instruments reviewed include stakeholders from both the public and private sectors. Broadly, the types of stakeholders identified include regulatory authorities (e.g., the Corps), resource agencies (e.g., EPA, USFWS, and state counterparts), tribes and tribal agencies, municipalities, natural resource conservation districts, environmental non-governmental organizations (national organizations and regional or local chapters and groups), watershed groups, chambers of commerce, professional organizations, farmers, other landowners, and academics, among many others. Usually, but not always, the identified stakeholders have some environmental, restoration, and/or conservation interest, focus, or connection. See Box 2 for a non-exhaustive list of the types of stakeholders identified in the program instruments reviewed.

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<sup>13</sup> An example of the latter approach may be found in the Montana Aquatic Resources Services ILF Program, which includes some information about stakeholder involvement in the program instrument and then provides more specific lists of stakeholders in each subsequently approved compensation planning framework for each service area. At least one program instrument (King County Mitigation Reserves Program) also anticipates that the sponsor will provide a stakeholder involvement plan as part of future final mitigation plans.

<sup>14</sup> Vogler et al. (2017).

<sup>15</sup> United States Environmental Protection Agency (2013).

**Box 2: Examples of stakeholders identified in the program instruments reviewed. Program sponsors should consider whether they may be able to identify and engage with any of these types of stakeholders.**

- Federal agencies
  - DOD
  - EPA
  - NASA
  - NOAA/NMFS
  - NPS
  - NRCS
  - NRDP
  - Power administrations
  - U.S. Bureau of Reclamation
  - U.S. Federal Highway Administration
  - U.S. Navy
  - USACE
  - USBLM
  - USDA Farm Service Agency
  - USFS
  - USFWS
  - USGS
- National Forests and Marine Sanctuaries
- Air Force bases
- State and local agencies (environmental, transportation, agriculture, wildlife, historic, energy, forest, parks, recreation, resource, conservation, coastal management, etc.)
- Tribes and tribal departments
- IRT
- Municipalities, counties, boroughs
- Regional, county, and state planning and land use offices/commissions
- Metro/rural planning organizations
- County cooperative extension offices
- Regional councils of government
- Soil and water/natural resource conservation or management districts
- Forest and park associations/councils
- NGOs (local, regional, national)
  - American Bird Conservancy
  - American Prairie Foundation
  - Audubon
  - Ducks Unlimited
  - Environmental Defense Fund
  - National Wildlife Federation
  - Pheasants Forever, Inc.
  - Southern Environmental Law Center
  - The Conservation Fund
  - The Trust for Public Land
  - TNC
  - Trout Unlimited
  - World Wildlife Fund
  - Other NGOs (including smaller regional or local NGOs)
- Land trusts
- Watershed committees/programs/groups
- Water user groups/associations
- Species recovery units
- Restoration/conservation cooperatives
- Coalitions
- Landowners
- Public/citizens
- Industry
- Forestry and logging corporations
- Road and bridge workers
- Community businesses
- Chambers of commerce
- Farmers and agricultural associations
- Energy companies and public utilities
- Likely credit users (developers, infrastructure and utility agencies, etc.)
- Real estate professionals/organizations
- Attorneys
- Academics, scientists, students, and researchers
- Universities/colleges/high schools
- Environmental information centers/education programs
- Engineers
- Natural resource conservation/management/planning experts
- Consultants/consulting groups
- Specific people and affiliations
- Mitigation banks
- Civic and other organizations

Stakeholders range from large groups or entities to smaller groups and individuals. A couple of program instruments even list specific individuals by name and provide their contact information. Though not necessarily required, a few program instruments also provide additional information about certain stakeholder groups, briefly describing the group's purpose and history, what the group does, when the group meets, or other details about the group.

## Timing of Stakeholder Involvement and Roles

The ways in which stakeholders may be involved in the ILF programs reviewed differ in terms of the stages at which they may be involved, the duration/extent of their involvement, and what their roles may be. The programs involve stakeholders during initial program development, project selection and design, project implementation, program and project assessment and monitoring, and/or long-term stewardship. Some stakeholders' involvement may be limited in duration (e.g., providing public comments during notice and comment proceedings), while other stakeholders may be involved for much longer periods of time (e.g., implementing a specific project or acting as the long-term steward for a site).

The program instruments reviewed provide for a wide variety of actual and potential roles for stakeholders. Box 3 provides a non-exhaustive list of the roles identified in the program instruments reviewed. Some stakeholders may provide input on program development and implementation, including information about their goals/objectives and priorities for the program. They also might help to develop or update or revise plans, guidance documents, assessments, or methods. Sometimes, programs directly involve stakeholders in the identification, evaluation, selection, and prioritization of mitigation sites. Stakeholders also may submit project proposals and/or participate during project implementation. Additionally, stakeholders may evaluate and/or monitor project performance, and often, they can be an important part of long-term management and protection (e.g., by acting as the long-term steward or conservation easement holder). Stakeholders also may promote better cooperation and coordination, including by sharing or leveraging funding, knowledge, expertise, contacts, data, and other resources.

## Engaging with Stakeholders

Some of the program instruments reviewed also describe the various ways in which the program has already engaged or could engage with the identified stakeholders. For example, stakeholder engagement could be included as part of a program's marketing and promotional activities and materials, as well as through webpages, social media, and newsletters. Stakeholder engagement also may occur through meetings, surveys, phone, and email. If the ILF program uses a competitive award approach or grant approach to project solicitation/selection, stakeholders may submit proposals and be part of subsequent project implementation. A few program instruments also suggest that the sponsors will engage with stakeholders through presentations, at conferences, at exhibitor booths, at educational events, or through tours of project sites.

## Implementation

The extent of actual stakeholder involvement by existing ILF programs is unclear, but our interviews suggested that at least some programs include active stakeholder participation. Some programs have worked or are working with stakeholders on preparing the program instrument, construction, implementation, monitoring, expanding existing projects, joint funding, sharing knowledge, and raising awareness about the program's goals.

Multiple programs indicated that they work with stakeholders on project identification/site selection, and many noted that they hire contractors or consultants to do specific work that the programs cannot perform in house. A few program sponsors/administrators also explained that the programs conduct outreach activities with potential restoration partners or have meetings with stakeholders to share information and troubleshoot. ILF programs expressed that their networks might, for example, alert them to emerging issues at work sites or help them identify new sites and projects. Still others reported that nurturing these relationships warmed local landowners and community groups to the goals of compensatory mitigation and their programs, building mutual trust and understanding.

## Observations and Suggestions

Often, it should be sufficient for the program instrument to provide a single strategy for stakeholder involvement that applies to the ILF program as a whole. If, however, a program expects to involve different stakeholders or use different strategies for stakeholder involvement depending on the particular service area or project, it may be beneficial to provide additional tailored stakeholder involvement provisions for each service area or in future mitigation plans for specific projects.

When identifying stakeholders, it is important to consider a broad range of stakeholders. The sponsor should draw from preexisting stakeholder relationships and consider potential new stakeholders as well (Box 2 may serve as a starting point for consideration). Program sponsors should be creative. It may be useful to think beyond more traditional ILF program stakeholders (such as resource agencies, landowners, and environmental NGOs) to determine whether it might be appropriate and feasible to include less obvious (or less commonly identified) stakeholders from industry, academia, or even a mitigation bank, among others.<sup>16</sup> A stakeholder analysis may be useful to help identify the range of relevant interests, people, and groups that could be involved. The references listed at the end of the report include references that provide useful information about identifying stakeholders and conducting a stakeholder analysis. Program sponsors also should think about the many (or in some cases, necessarily limited) ways and the various stages in which the program might involve relevant stakeholders. Of course, the public may provide feedback through required public notice and comment procedures, but it is recommended that stakeholder engagement go beyond such procedures if

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<sup>16</sup> While it may be helpful in limited circumstances to document individuals by name, in most instances, it should be sufficient to identify groups or people somewhat more generally/generically, especially because turnover or changes may occur, and the individuals identified by name might not actually be stakeholders any longer.

feasible and include other types of formal and informal interactions with stakeholders when appropriate. Additionally, sponsors should try to estimate the likely duration of involvement for the various stakeholders.

**Box 3: Examples of stakeholder involvement/roles identified in the program instruments reviewed. Program sponsors should consider whether they may be able to involve stakeholders in any of these ways.**

- Existing MOUs/MOAs
- Participate at the beginning of watershed planning process
- Previously developed watershed restoration/action plan
- Previously prepared planning and guidance documents/methodologies
- Assist with ecoregional assessments
- Create and/or update watershed plans
- Develop conservation objectives/vision
- Identify threats
- Share goals/concerns for community and resources
- Develop program, program instrument, and/or CPF
- Develop mitigation plans
- Identify, evaluate, and prioritize mitigation opportunities/potential projects/sites/suitable lands
- Assist with the development of assessment methods and coordinate with ongoing efforts regarding assessment methods
- Adapt service areas/watershed priorities
- Provide information on mitigation techniques and recovery strategies for rare species
- Contribute to project selection criteria
- Participate in project planning processes and implementation
- Submit project proposals
- Evaluate projects
- Assess project performance
- Provide input on forms (ILF program, reporting, evaluation)
- Develop and implement monitoring programs
- Participate in long-term management and protection
- Hold easements
- Expand contiguous habitat
- Contribute technical and financial assistance
- Share staff, equipment, data, contacts, local knowledge, and other resources
- Complete tasks in the field
- Provide on-the-ground expertise/understanding (historical land cover trends, site feasibility, ecological characteristics, expected development pressures, recent local developments, conditions, situations, and opportunities, planning efforts, etc.)
- Identify other stakeholders
- Promote landowner support/cooperation
- Coordinate with ongoing inventory and monitoring efforts
- Ensure consistency and synergy with local/regional mitigation and restoration priorities
- Attend meetings
- Provide public comment
- Act as members of advisory group/committee
- Assist with permit requests and reports
- Engage in project-by-project discussions
- Review data and remediation approaches
- Review documents
- Build professional relationships
- Participate in public use of the projects
- Own lands on which projects are implemented

Sponsors also should consider the variety of roles that stakeholders might play given a program's needs and resources (see Box 3). Obviously, exactly how and when stakeholders participate will vary depending on the ILF program. Some programs have the resources, expertise, and staff to do most of the ILF program and site work in house, and if that is the case, there inherently may be fewer roles for stakeholders. Other programs, however, may outsource more of the program and site work, which may provide more opportunities to involve stakeholders. Certain stakeholders may participate in multiple ways, while other stakeholders may need to have more limited or narrowly focused roles. It often is appropriate to include non-technical stakeholders, but for certain roles, such as site identification or prioritization, including non-technical stakeholders might actually "dilute the scientific basis of site selection."<sup>17</sup>

No matter how many stakeholders are or may be involved or what their roles may be, if the program expects to involve stakeholders, engagement should be meaningful and, when appropriate, sustained. Sometimes, engagement may be more limited due to resource limitations (e.g., time, labor, or funding), but sponsors should still determine how stakeholders could be engaged in relatively resource-efficient ways. See the list of references cited at the end of the report for references that discuss a variety of ways to engage with stakeholders.

## Budget

ILF annual program expenditures vary widely among programs. Only 14 program operators were able to provide an estimate of their annual budget for program expenditures (including both project and administrative costs). Of those programs, annual program expenditures ranged from around \$150,000 to as much as \$55 million.

This variation seems to be related to a variety of factors, including size/scope of the program and program administrator (non-profit versus government). However, it is difficult to draw any clear trends from the information we were able to collect. Many of the program operators from newer programs were not able to provide annual budget numbers as they are just beginning to sell credits and initiate projects. Several of these programs mentioned that they expect their annual budgets to grow over time.

Most programs told us that annual project expenditures vary considerably from year to year based on project costs. However, several programs we interviewed reported that their project and administrative budgets are relatively stable when tracked out over many years. Program operators told us that project costs vary with the number of active projects in any given year. The number of active projects can in turn vary with other factors such as the weather, which can hinder restoration efforts and delay project implementation.

The size of program budgets is ultimately tied to income from credit sales, as more credit sales generally lead to more or larger projects and larger budgets. As with program budgets, income from credit sales also varies widely among programs and over time for individual programs. For example, several programs reported that the number of credits sold is highly correlated with

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<sup>17</sup> Environmental Law Institute & The Nature Conservancy (2014).

the pace of development in their service area(s). The Land Trust for the Mississippi Coastal Plain ILF program, for example, remarked that credit sales have slowed in the time that has elapsed since Hurricane Katrina and the BP oil spill, as the building market has slowed.

Other programs told us the rate of credit sales changed with turnover in regulatory staff and amount of compensatory mitigation required in their service areas. We also heard that changes in the availability of other compensation options (e.g., mitigation bank credit availability) may impact the number of permittees approaching an ILF program to purchase credits.

## Administrative Fees

The 2008 Rule states that credit fees must be based on full cost accounting (see more in the section on fees below) and include, as appropriate, costs to administer the program. Almost all ILF programs interviewed incorporate a percentage of credit fees for administrative costs into their fee calculations. Of those programs collecting an administrative fee, programs reported taking an administrative fee of between 5 and 20% on top of other program costs (see Table 2). Where reported in dollar amounts, program operators told us that administrative budgets tended to range from low tens of thousands to around \$200,000 annually.

A select few ILF programs reported taking a very small fee or no fee at all for administrative costs. One program sponsor explained that, in response to slow credit sales, it has stopped including a percentage in its fees for administrative costs as a temporary measure to lower prices. Though the lower credit prices encouraged customers and, in turn, helped the program gather sufficient funds to conduct projects, this measure is likely not sustainable over the long term. One program told us that any administrative funds that remain from those collected in years with high credits sales are saved for years when credit sales are lower and may not be sufficient to cover costs.

Several programs told us that there is some confusion about the types of activities that can be funded with administrative funds. In general, interpretations of which activities may be deemed “administrative” generally fall into two categories. Some programs draw on administrative funds to cover only expenses that are explicitly disconnected from any specific project. This might include costs related to managing credit sale transactions, preparing annual reports, accounting, program meetings, and day-to-day management. These programs would use project-specific funds—sometimes called “restricted funds”—to cover time spent on site selection, development of concept plans, and initial project approval. Other programs, however, interpret the use of project funds to be limited to time spent working on projects that have been at least initially approved (e.g., programs would not use these funds for scouting and developing projects, and in some cases even for developing mitigation plans). These programs say they use administrative funds from the program account for site selection and initial plan development.

<b>Program Name</b>	<b>Administrative Fee</b>
Ducks Unlimited New York ILF Program	15%
Ducks Unlimited Vermont ILF Program	15%
Everglades National Park ILF Program	11%
Georgia-Alabama Land Trust	5%
Kentucky Department of Fish and Wildlife Resources ILF Program	20% maximum adjustable fee
Keys Restoration Fund	17.50%
Land Trust for the Mississippi Coastal Plain	0% (3% for first two years of the program)
Living River Restoration Trust (Elizabeth River Project)	15%
Maine Natural Resource Conservation Program	15% (7.95% to program administrator (TNC), with 7.05% added in 2016 to cover costs for Maine DEP)
Massachusetts Department of Fish and Game ILF Program	17.50%
Montana Aquatic Resources Services ILF Program (MARS)	20%
Mountains Restoration Trust ILF Program	8-9% adjustable fee
New Hampshire Aquatic Resource Mitigation Fund	20%
National Fish and Wildlife Foundation Sacramento District California ILF Program	15-20% (with minimum of \$10,000)
North Dakota Ducks Unlimited ILF	15%
Northern Kentucky University ILF Program	5%
Quil Ceda Village	10%
Riverside-Corona Resource Conservation District ILF Program	15% maximum
South Dakota Ducks Unlimited ILF	15%
Southeast Alaska Land Trust	6%
Southeast Alaska Mitigation Fund	15%
Stream + Wetlands Foundation ILF Program	15%
Tennessee Stream Mitigation Program	6-8% adjustable fee
Tucson Audubon Society ILF Program	15%
Ventura River Watershed ILF Mitigation Program	10%

## Watershed Approach

A key feature of the 2008 Rule is its emphasis on using a watershed approach in the selection of compensatory mitigation sites, which was endorsed by the National Research Council (2001). The objective of the watershed approach is to improve the siting (positioning), quantity, and

quality of wetlands and other aquatic resources by shifting away from a reactive, case-by-case consideration of impacts and offsets. Ideally, a watershed approach should expand the informational and analytical bases of compensatory mitigation site selection.

The 2008 Rule contemplates some flexibility with respect to the watershed approach. The agencies define watershed approach to mean “an analytical process for making compensatory mitigation decisions that support the sustainability or improvement of aquatic resources in a watershed.”<sup>18</sup> Importantly, a watershed approach considers how problems and threats affect a particular watershed’s functioning and how proposed compensatory mitigation actions will address those issues. The expected ecological outcomes of a watershed approach are one justification for the mitigation hierarchy, in which mitigation banks and ILF mitigation are preferred over permittee-responsible mitigation.<sup>19</sup>

Under a watershed approach, permitted impacts and associated compensatory mitigation should occur in the same watershed. That, however, leads to the question: what is a watershed for purposes of compensatory mitigation?

By itself, the term watershed is not scale-specific and could “rang[e] in size from less than a small field to almost a third of the North American continent.” (National Academy of Sciences 1999, at 37). The 2008 Rule defines watershed generally: “a land area that drains to a common waterway, such as a stream, lake, estuary, wetland, or ultimately the ocean.”<sup>20</sup> In the context of compensatory mitigation site selection, the appropriate scale of the watershed is left to the Corps’ judgment.

The preamble to the 2008 Rule notes that the “appropriate watershed scale . . . will vary by geographic region, as well by the particular aquatic resources under consideration.” Compensatory Mitigation for Losses of Aquatic Resources, 73 Fed. Reg. 19594, 19599 (April 10, 2008). In discussing the watershed approach, the 2008 Rule provides general guidance with respect to watershed scale:

The size of watershed addressed using a watershed approach should not be larger than is appropriate to ensure that the aquatic resources provided through compensation activities will effectively compensate for adverse environmental impacts resulting from activities authorized by DA [Department of the Army]

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<sup>18</sup> 33 C.F.R. § 332.2.

<sup>19</sup> As explained in the 2008 Rule, “[i]n many cases, the environmentally preferable compensatory mitigation may be provided through mitigation banks or in-lieu fee programs because they usually involve consolidating compensatory mitigation projects where ecologically appropriate, consolidating resources, providing financial planning and scientific expertise (which often is not practical for permittee-responsible compensatory mitigation projects), reducing temporal losses of functions, and reducing uncertainty over project success.” 33 C.F.R. § 332.3(a)(1). The Rule further explains that mitigation banks and in-lieu fee programs “typically involve larger, more ecologically valuable parcels, and more rigorous scientific and technical analysis, planning and implementation than permittee-responsible mitigation.” 33 C.F.R. § 332.3(b)(2), (3). Regarding in-lieu fee programs, the Rule notes that “[t]hey also devote significant resources to identifying and addressing high-priority resource needs on a watershed scale, as reflected in their compensation planning framework.” 33 C.F.R. § 332.3(b)(3).

<sup>20</sup> 33 C.F.R. § 332.2.

permits. The district engineer should consider relevant environmental factors and appropriate locally developed standards and criteria when determining the appropriate watershed scale in guiding compensation activities.<sup>21</sup>

Often, the Corps relies on hydrologic units delineated by the U.S. Geological Survey (such as 8-digit hydrologic unit codes, also known as “HUCs”) for watershed purposes.<sup>22</sup> The service area for each ILF program must include “a watershed-based rationale” justifying its delineation.<sup>23</sup>

In some cases where watershed boundaries do not exist—such as marine areas—a watershed approach is not required. Instead, the 2008 Rule states that “an appropriate spatial scale should be used to replace lost functions and services within the same ecological system (e.g., reef complex, littoral drift cell).”<sup>24</sup>

## Elements of a Watershed Approach

In a previous study, ELI and The Nature Conservancy (2014) identified five key elements of a watershed approach:

### Element 1: Identify watershed needs

- Existing plans, reports, or analyses
- Analysis of historical loss of aquatic resources in the watershed
- Analysis of current condition of aquatic resources in the watershed
- Analysis of trends and future threats within the watershed
- Stakeholder input

### Element 2: Identify desired outcomes

### Element 3: Identify potential sites

- Identify areas with appropriate hydrology and soils
- Determine potential for persistence of sites

### Element 4: Assess the potential of sites to sustainably meet watershed needs

- Function and condition assessments

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<sup>21</sup> 33 C.F.R. § 323.3(c)(4).

<sup>22</sup> A unique hydrologic unit code (HUC) is used to identify each hydrologic unit. HUCs, which “consist[] of two to twelve digits based on . . . six levels of classification,” provide a standardized framework for hydrologic data. It is important to note, however, that “most hydrologic units are not true topographic watersheds.” (Griffith et al. 1999; Natural Resources Conservation Service 2007).

<sup>23</sup> 33 C.F.R. § 332.8(c)(2)(ii), § 332.8(d)(6)(ii)(A).

<sup>24</sup> 33 C.F.R. § 332.3(c)(2)(v).

- Ecosystem service assessments
- Wildlife and habitat assessments

#### Element 5: Prioritize sites, areas, and desired outcomes

- Identify priority hydrologic units
- Prioritize sites

For ILF programs, the compensation planning framework represents the way that programs carry out the watershed approach.

### Regulatory Parameters: Compensation Planning Framework

When developing the 2008 Rule, the EPA and the Corps initially considered phasing out the use of ILF programs entirely. Ultimately, the agencies retained ILF programs as an option because, in the agencies' view, a properly structured ILF program could support a watershed-based approach to compensatory mitigation. Consequently, the agencies added to the final rule the requirement for ILF programs to develop a compensation planning framework.

The 2008 Rule provides that the compensation planning framework must contain the following ten items:

- Service area with watershed-based rationale
- Description of threats (and how ILF program will help offset impacts associated with those threats)
- Analysis of historic aquatic resource loss in service area
- Analysis of current state (supported by field documentation)
- Statement of aquatic resource goals and objectives for each service area
- Prioritization strategy for selecting compensatory mitigation projects
- Explanation of use of preservation
- Description of public and private stakeholder involvement and coordination with regulatory and resource agencies
- Description of long-term protection and management strategies
- Strategy for evaluation and reporting<sup>25</sup>

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<sup>25</sup> 33 C.F.R. § 332.8(c)(2).

Table 3 maps the required elements of a compensation planning framework with the elements of a watershed approach.

<b>Table 3: Elements of a watershed approach and corresponding compensation planning framework elements. For ILF Programs, the compensation planning framework represents the way that programs are carrying out the watershed approach.</b>					
<i>Elements of a watershed approach (ELI &amp; TNC)</i>					
	<b>Identify watershed needs</b>	<b>Identify desired outcomes</b>	<b>Identify potential sites</b>	<b>Assess the potential of sites to sustainably meet watershed needs</b>	<b>Prioritize sites, areas, and desired outcomes</b>
<i>Required elements of a compensation planning framework</i>	Description of service area (based on watershed rationale)	Statement of aquatic resource goals and objectives for service area	Prioritization strategy for selecting compensatory mitigation projects	Prioritization strategy for selecting compensatory mitigation projects	Prioritization strategy for selecting compensatory mitigation projects
	Description of threats in service area			Explanation of use of preservation	Strategy for evaluation and reporting
	Analysis of historic resource loss in service area			Description of long-term protection and management strategies	
	Analysis of current state of service area				
	Description of public and private stakeholder involvement	Description of public and private stakeholder involvement	Description of public and private stakeholder involvement	Description of public and private stakeholder involvement	Description of public and private stakeholder involvement

### The Watershed Approach in Practice

The 2014 ELI and TNC report noted that watershed approaches occur over a spectrum, ranging from watershed-informed decisions to watershed analyses (with non-prescribed outcomes) to watershed plans (with prescribed outcomes). When identifying watershed needs, ILF programs rely on a range of sources of information, such as ecoregional assessments, planning tools and models, GIS and other datasets, lists of impaired waters, existing watershed and restoration plans, etc.

While the 2008 Rule requires ILF programs to use a watershed approach, the programs do not necessarily need to develop a formal watershed plan. Although the agencies state that “it would always be preferable to have an appropriate watershed plan,” they recognize that in light of limited time and resources, a “structured consideration of watershed needs” can lead to improvements in compensatory mitigation site selection.<sup>26</sup> Figure 2 describes the watershed approach spectrum in more detail.

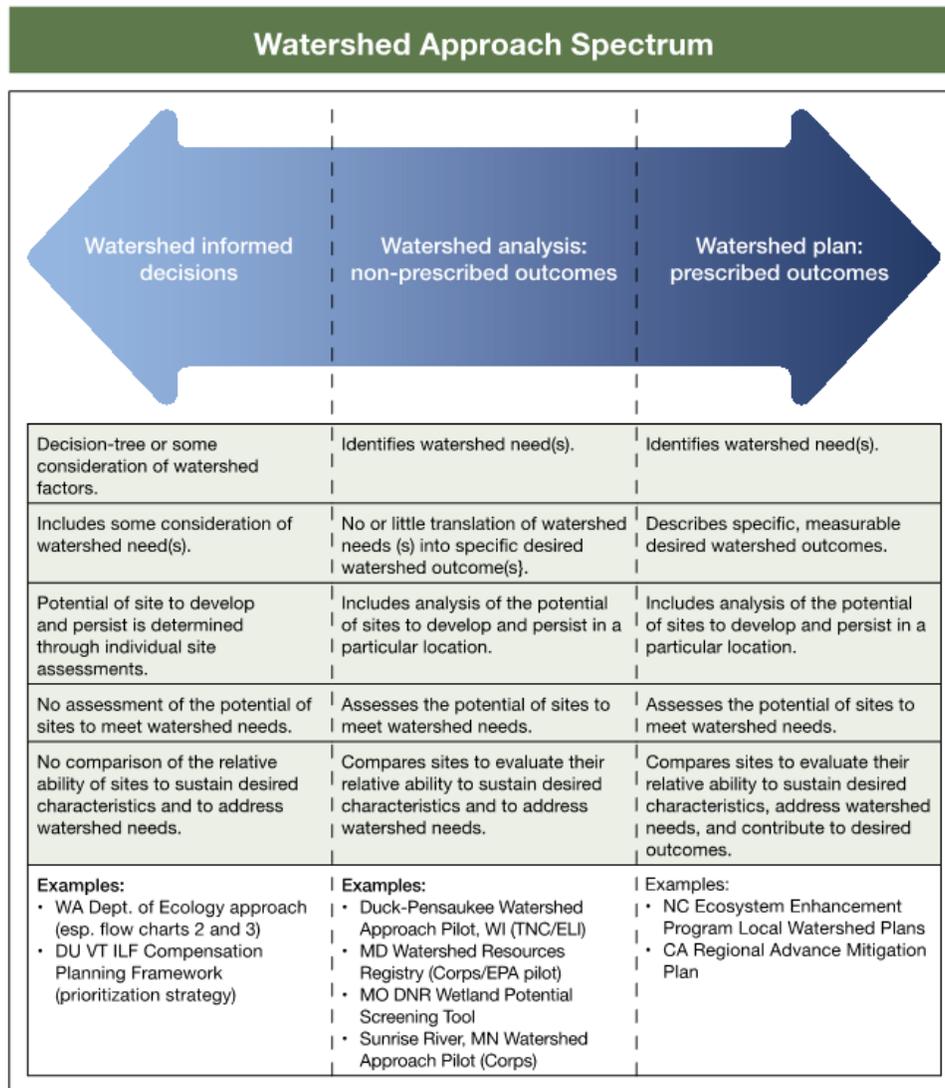
While these are not strict categories, approaches that are more rigorous and specific flow to the right of the continuum. Examples of some of the more rigorous approaches include the North Carolina Division of Mitigation Services ILF program (NCDMS), the Quil Ceda Village ILF program, and the King County Mitigation Reserves Program, among others.

It is important to note that an ILF program with a specific watershed plan may not translate to an active program with numerous sites. Many other factors, including the geographic scope and the demand for credits within the service area, come into play. For example, while both the NCDMS and the Quil Ceda Village ILF program can be viewed as having watershed plans, the statewide NCDMS is managing more than 550 compensatory mitigation sites (according to RIBITS), while the more localized Quil Ceda program (which is a much newer and smaller program) currently has none.

In our review of ILF program instruments, we found that the compensation planning frameworks of most programs fell within the spectrum. Some programs, however, had relatively bare-boned compensation planning frameworks. For example, although the Louisiana Department of Natural Resources ILF Program states that it “will attempt” to identify strategically significant mitigation projects through “an intensive review process,” details about the process are lacking in its compensation planning framework. In practice, the program reports that it works closely with the Louisiana Coastal Protection and Restoration Authority to select projects. The West Virginia ILF Stream and Wetland Mitigation Program’s compensation planning framework also is quite general. The state is divided into 32 service areas based on 8-digit HUCs, yet there is no discussion of threats, historic loss, or current state at the individual service area level. The prioritization strategy is largely a list of broad factors to be considered. Such compensation planning frameworks stand in contrast to more comprehensive analyses in other programs.

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<sup>26</sup> 73 Fed. Reg. 19594, 19599; 33 C.F.R. § 332.3(c)(1).



**FIGURE 2: ELI AND TNC'S WATERSHED APPROACH SPECTRUM. SOURCE: ELI & TNC (2014).**

Below we highlight several examples of ILF programs with more rigorous compensation planning frameworks.<sup>27</sup>

<sup>27</sup> The programs highlighted are not meant to provide an exhaustive list of all of the programs with relatively rigorous compensation planning frameworks. Just because a program is not listed does not necessarily mean there are any deficiencies in its compensation planning framework. The programs highlighted are meant to be representative examples of some of the different watershed approaches. All program instruments and related documents for these examples were accessed through RIBITS.

## Case Studies

### ***Advance credits based on a roster of sites versus released credits based on “pre-capitalized” sites***

#### **King County Mitigation Reserves Program (approved in 2012) and Pierce County ILF Program (approved in 2015), Washington**

In King County, two county organizations are primarily responsible for the ILF program: the Department of Natural Resources and Parks, which has watershed expertise and experience with aquatic enhancement and restoration projects, and the Department of Development and Environmental Services, which works with permit applicants. In Pierce County, the Public Works Surface Water Management Division is the ILF program administrator.

The compensation planning frameworks for these county-run programs contain thorough, detailed discussions about watershed-based service areas, the historic loss, current state, and threats to aquatic resources within each service area, and the goals and objectives for each service area. They incorporate information from a broad array of reports, analyses, and planning documents that consider species (especially salmon), water quality, flood management, and other watershed-specific characteristics.

The compensation planning frameworks are organized in a similar fashion, as the King County framework offered a template for Pierce County. The Pierce County compensation planning framework provides a table of contents linked to the 2008 Rule’s requirements:

33 CFR Part 332 Section	Summary Description of Federal Rule Requirement	Relevant Section(s) of this Instrument
§332.8(c)(1)	Compensation Planning Framework purpose; need for watershed approach	Appendix I: Watershed Approach to Mitigation
§332.8(c)(2)(i)	Service area descriptions	Appendix J, Sections 1.0 and 2.0 and Exhibits 1 to 3 (maps)
§332.8(c)(2)(ii)	Threats to aquatic resources <sup>10</sup>	Threats subsections in Appendix J, Sections 1.0 and 2.0
§332.8(c)(2)(iii)	Analysis of historic losses of aquatic resources	Historic Losses subsections in Appendix J, Sections 1.0 and 2.0
§332.8(c)(2)(iv)	Current aquatic resource conditions	Physical Description and Current Conditions subsections in Appendix J, Sections 1.0 and 2.0
§332.8(c)(2)(v)	Aquatic resources goals and objectives for each service area	Aquatic Resource Goals and Objectives subsections in Appendix J, Sections 1.0 and 2.0
§332.8(c)(2)(vi)	Prioritization strategy for implementing mitigation	Appendix K and Appendix L
§332.8(c)(2)(vii)	Preservation objectives	Appendix I, Section 3.0

§332.8(c)(2)(viii)	Description of public and private stakeholder involvement	Appendix K, Section 1.0
§332.8(c)(2)(ix)	Long-term protection and management strategies	Appendix Q
§332.8(c)(2)(x)	Program evaluation and reporting	Appendix O and Appendix V
§332.8(c)(2)(xi)	Other compensation planning information as required by the Corps and/or Ecology	Will address in amendments to this Instrument as necessary

Both programs use the same type of functional credits (habitat, hydrologic, and water quality) and rely on the same tools and analyses for the selection of compensatory mitigation sites. As noted in the program instrument for the King County Mitigation Reserves Program, an important guide for site selection is *Selecting Wetland Mitigation Sites Using a Watershed Approach* (Hruby et al. 2009), an interagency document that “provides specific recommendations on how to apply a watershed approach when selecting sites and in choosing between on-site and off-site mitigation in western Washington.”

In Washington, the Department of Ecology has divided the state into 62 watershed resource inventory areas (WRIAs), which the two counties rely on in their compensation planning frameworks. King County’s program has seven service areas—five WRIAs with two divided into sub-watersheds—ranging in size from 132 to 667 square miles. Pierce County’s program has two service areas based on WRIAs. One is 180 square miles with five sub-basins, while the larger is 768 square miles with six basins.

A significant difference between the two programs is their approaches with respect to the timing of site selection and project implementation. King County has developed a roster of potential mitigation sites; more than 420 parcels have been identified in six of its seven service areas. Although the compensation planning framework contemplates that private, tribal, and other non-county owned lands can be included in the roster, initially all the sites are county-owned. King County’s request for advance credits was based on the roster of sites, along with a service area’s size, location, and development pressures.

In contrast, Pierce County intends to rely more on released credits, rather than on advance credits. Prior to the collection of any credit fees, it is conducting compensatory mitigation work, which it terms “pre-capitalization,” on two sites with the use of county and state funds. The goal is to reduce the temporal lag between impact and mitigation by using credits generated from these pre-capitalized sites, operating more akin to a mitigation bank. A roster of additional sites, based on a checklist of desired characteristics for each sub-basin, will be developed later.

Both compensation planning frameworks discuss the reporting requirements on individual projects and financial matters, but both also include a provision to track overall program performance. In particular, the counties will examine whether the credit fees cover the costs of the compensatory mitigation, whether the program is operating in a timely and efficient manner, and whether the overall ecological functions are being enhanced or degraded within a service area or sub-basin. Pierce County also expects to consider trends toward a reduction (or increase) in particular wetland functions and whether any imbalance is aligned with watershed goals.



Elliott Bridge Reach Mitigation Project, located on Cedar River. Source: King County (2017).

## Case Studies

### ***Grounding statewide compensation planning frameworks in a sponsor's strategic conservation framework***

#### **Virginia Aquatic Resources Trust Fund (most recent instrument approved in 2011) and TNC's Ohio Stream and Wetland In-lieu Fee Mitigation Program (approved in 2014)**

The Nature Conservancy (TNC) sponsors two statewide ILF programs in Virginia and Ohio. While the Virginia Aquatic Resources Trust Fund program falls entirely within the Corps' Norfolk District, the Ohio Stream and Wetland In-lieu Fee Mitigation Program cuts across three Corps Districts (Buffalo, Huntington, and Pittsburgh). Both ILF programs incorporate TNC's Conservation by Design strategy.

As described in the compensation planning framework for the Ohio Stream and Wetland In-lieu Fee Mitigation Program, TNC's Conservation by Design is "a collaborative, science-based conservation approach and a common set of analytical methods to identify the biodiversity that needs to be conserved, decide where and how to conserve it and measure effectiveness of those efforts." As such, the program instruments state that this methodology satisfies the 2008 Rule's requirements and guides the process for the selection of compensatory mitigation sites.



*Conservation by Design* adaptive management framework.

TNC's approach relies on ecoregional assessments. In Virginia, TNC aquatic ecologists developed ecological drainage units (EDUs), which have distinct assemblages and habitats, within each freshwater ecoregion. The Virginia program's 13 service areas are aggregations of 8-digit HUCs, which generally correspond with the EDUs, and range from 323 square miles to 6,687 square miles. TNC assessed the current state of EDUs with a GIS analysis and expert workshops to identify a portfolio of areas for priority conservation. It developed and used specific prioritization schemes to determine which areas to include in the various freshwater and terrestrial ecoregional portfolios.

Similarly, in Ohio, TNC uses ecoregional assessments to identify conservation priorities in the 43 primary service areas (which range in size from 26 square miles to 3,196 square miles). The primary service areas are based on 8-digit HUCs. In the compensation planning framework, TNC considers the relevant Landscape Development Index and Permitted Impacts Map and the Aquatic Life Use Score

Map to help identify priority conservation areas for each service area. Ohio's Total Maximum Daily Load (TMDL) plans and any existing watershed plans also play an important role in setting goals and objectives.

One significant difference between the two programs is the timing of and approach to selecting the compensatory mitigation projects. In the Virginia program, which has operated since 1995, compensatory mitigation is provided through a number of approaches, including in-house work, RFPs, or purchase of mitigation bank credits. The Virginia program has sold advance credits, and at this point, it has released credits available in some of its service areas. In contrast, the much younger Ohio program currently relies on the more common approach of advance credits. Once advance credits are sold, TNC then issues an RFP for a compensatory mitigation project in the relevant service area in Ohio.

## Case Studies

### *Dovetailing with a stakeholder-developed watershed action plan*

#### **Living River Restoration Trust ILF Program (most recent instrument approved in 2018), Virginia**

The Living River Restoration Trust, a non-profit organization, has been the sponsor for an ILF program that focuses on the Elizabeth River watershed (approximately 200 square miles and an 8-digit HUC) in southern Virginia since 2004.

A key feature of the 2018 compensation planning framework is its linkage to the Elizabeth River Watershed Action Plan. The Watershed Action Plan is a ten-year plan developed through consultation with almost 150 stakeholders, including scientists, business leaders, government officials, academics, and citizens—as well as the Living River Restoration Trust. The most recent iteration of the Watershed Action Plan was published in 2016.

The most significant threat to the Elizabeth River, as noted in both the Watershed Action Plan and the compensation planning framework, is contaminated sediment, primarily Polycyclic Aromatic Hydrocarbons (PAHs) from former wood treatment plants. As the compensation planning framework notes, “[s]ome of the highest concentrations of toxics on the Chesapeake Bay are located in hotspot areas throughout the Elizabeth River.” Both the Watershed Action Plan and the compensation planning framework emphasize the Living River Restoration Trust’s previous work in rehabilitating contaminated sediments at Money Point.

The Watershed Action Plan identifies five mutually reinforcing general actions with accompanying short- and long-term goals. It also discusses specific recommended steps and focus areas. For example, a general action of continuing to make progress on cleaning up contaminated sediment (“Keep the goo going!”) has a goal of reducing cancer in an indicator fish, the mummichog, to background levels by 2025. One of the recommended steps is remediation of contaminated sediment hotspots at sites, such as Paradise Creek, by Living River Restoration Trust. In turn, the compensation planning framework specifically discusses mitigation plans for Paradise Creek.

The compensation planning framework also notes that the Watershed Action Plan calls for oyster reef and wetland restoration and protection. The compensation planning framework emphasizes that, in this context, the sponsor will give priority consideration to sites that the Watershed Action Plan has identified for potential restoration. If a site is chosen that the Watershed Action Plan does not specifically reference, the site nevertheless must “support the goals and objectives of the Watershed Action Plan.”

## Case Studies

### *Developing a compensation planning framework without a typical watershed approach*

#### **Keys Restoration Fund In-Lieu Fee Mitigation Program (approved in 2013), Florida**

The Keys Restoration Fund (KRF) In-Lieu Fee Mitigation Program is sponsored by the non-profit organization Coastal Resources Group, Inc. The KRF program took over some of the remaining responsibilities and previously identified projects of the former Keys Environmental Restoration Fund program, including two wetland restoration projects and two seagrass restoration projects. The KRF program instrument is unusual in that it does not follow a traditional watershed approach. The compensation planning framework uses a landscape approach and specifically notes that “[u]se of the typical, well defined watershed approach in setting service areas . . . is not appropriate for the [program].”

Described in the program instrument as a “unique situation,” the KRF program has two service areas that encompass islands and submerged lands in the Florida Keys National Marine Sanctuary. The service areas cover around two-thirds of the sanctuary, including federal and state waters; they do not extend into the mainland in Monroe County. The service areas are the Lower Keys Project Area and the Upper Keys Project Area, which are divided at approximately the middle of the Seven Mile Bridge.

The service areas include all of two 12-digit HUCs (Lower Keys and Upper Keys) and part of a third 12-digit HUC (Biscayne Bay). Some islands that are formally part of the Upper Keys HUC are included in the Lower Keys Project Area because they are more similar to the Lower Keys, and the portion of the Biscayne Bay HUC is included in the program’s Upper Keys Project Area. The boundaries for the service areas were determined based on a variety of factors, including size, geology, elevation, precipitation, tidal circulation patterns, plant communities, distribution of threatened and endangered species, boating impacts, development patterns, human population density, and anticipated impacts to wetland and submerged habitats. The program’s goal is to maintain projects in both service areas at all times.

The program was approved to sell advance credits (determined using Florida’s Uniform Mitigation Assessment Method) for tidal wetlands (mangrove and salt marsh), non-tidal (freshwater) wetlands, and seagrass. The compensation planning framework describes the threats to the aquatic resources in the Keys and analyzes the historical loss and current conditions of the area’s aquatic resources. It also discusses the program’s aquatic resource goals and objectives, which generally include the restoration, enhancement, and preservation of seagrass and hard-bottom habitats and mangrove and transitional wetlands in both service areas, as well as non-tidal (freshwater) wetlands in the Lower Keys Project Area.

The former program compiled a list of potential restoration projects in the Keys, and the KRF program instrument contemplates that the sponsor will use the list for the initial identification of future potential projects. Although not focused on the watershed in a traditional sense, the KRF program’s prioritization strategy for site selection and implementation includes consideration of many factors, such as habitat connectivity, likelihood of achieving anticipated ecological benefits, sustainability, and “potential to address multiple functions and services such as improvement of fish and wildlife habitat, support for rare species, water quality maintenance and improvement, resilience to sea level rise and climate change, and recreation or education values.”

## Service Areas

A fundamental aspect of an ILF program is the program's service area. The service area is the geographic area in which an ILF program may provide compensatory mitigation for permitted impacts to aquatic resources.<sup>28</sup> A service area may be a particular watershed, or it may be an "ecoregion, physiographic province, and/or other geographic area," and an ILF program may have a single service area or multiple service areas.<sup>29</sup> The size of a service area may vary and is an important consideration for a program; the 2008 Rule explains that "[t]he service area must be appropriately sized to ensure that the aquatic resources provided will effectively compensate for adverse environmental impacts across the entire service area."<sup>30</sup> An 8-digit hydrologic unit code (HUC) or smaller watershed may be an appropriate size for a service area in an urban area, whereas a 6-digit HUC or several adjoining 8-digit HUCs may be an appropriate size in a rural area.<sup>31</sup> Any applicable local standards and criteria also are supposed to be considered, and the program may consider economic viability when determining the service area's size.<sup>32</sup>

The importance of appropriately defining a program's service area cannot be overstated. In many ways, the service area helps drive the ecological and economic performance of the ILF program. A key point is that impacts and offsets must be within the same service area. Properly sizing the service area helps to ensure that the program can provide adequate compensation for permitted impacts, assuming that trade-offs among varied functions can be adequately estimated. It also may affect the demand for credits from the program and help determine the program's feasibility.

The 2008 Rule requires that the ILF program's compensation planning framework include "[t]he geographic service area(s), including a watershed-based rationale for the delineation of each service area[.]"<sup>33</sup> The program instruments reviewed had vastly different numbers of service areas per program, sizes of the service areas, definitions of boundaries, inclusion of primary or secondary (or even tertiary) service areas, distances between the impact location and the offset, types of aquatic resource(s), and the watershed-based rationales for the service areas.

### Number and Size of Service Areas

An ILF program may have one service area (Figure 3) or multiple service areas (Figure 4) (see Table 4 for an idea of the range of service areas reported by ILF programs we interviewed). In the program instruments we reviewed, we found that programs ranged from 1 to 43 service areas.<sup>34</sup> Most programs have ten or fewer service areas per program; only around one-fifth of the program instruments reviewed provided for more than ten service areas per program.

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<sup>28</sup> 33 C.F.R. § 332.2; 33 C.F.R. § 332.8(d)(6)(ii)(A).

<sup>29</sup> 33 C.F.R. § 332.8(d)(6)(ii)(A).

<sup>30</sup> *Id.*

<sup>31</sup> *Id.*

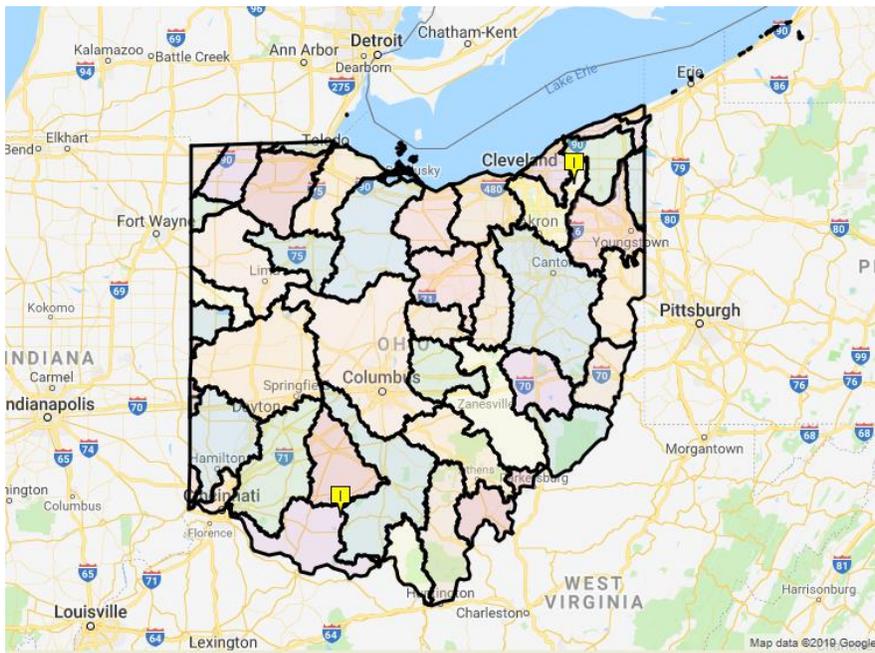
<sup>32</sup> *Id.*

<sup>33</sup> 33 C.F.R. § 332.8(c)(2)(i).

<sup>34</sup> The Nature Conservancy's Ohio Stream and Wetland ILF Program.



**FIGURE 3: LIVING RIVER RESTORATION TRUST (ELIZABETH RIVER PROJECT) ILF PROGRAM SERVICE AREA.**  
**SOURCE: REGULATORY IN-LIEU FEE AND BANK INFORMATION TRACKING SYSTEM (2019).**



**FIGURE 4: THE NATURE CONSERVANCY'S OHIO STREAM AND WETLAND ILF PROGRAM SERVICE AREAS.**  
**SOURCE: REGULATORY IN-LIEU FEE AND BANK INFORMATION TRACKING SYSTEM (2019).**

<b>Program Name</b>	<b>Service Areas</b>
Arizona Game and Fish Department ILF Mitigation Program	10
Ducks Unlimited New York ILF Program	11
Ducks Unlimited Vermont ILF Program	4
Great Land Trust	2
Keys Restoration Fund	2
Living River Restoration Trust (Elizabeth River Project)	1
Louisiana Department of Natural Resources ILF Program	2
Maine Natural Resource Conservation Program	7
Montana Aquatic Resources Services ILF Program (MARS)	16
Mountains Restoration Trust ILF Program	1
National Fish and Wildlife Foundation Sacramento District California ILF Program	17 aquatic resource; 12 vernal pool
Northern Kentucky University ILF Program	1
Northwest Florida Water Management District	7
Quil Ceda Village	1
Southeast Alaska Land Trust	1
Stream + Wetlands Foundation ILF Program	13 stream; 4 wetland
The Nature Conservancy's Ohio Stream and Wetland ILF Program	43
West Virginia ILF Stream and Wetland Mitigation Program	32
Wisconsin Wetland Conservation Trust ILF Program	12

The geographic coverage of service areas varies widely across programs. An individual service area may cover a single watershed or may cover multiple watersheds. A service area also may cover a specific portion of a state, such as the Northern Kentucky University ILF Program, which covers the nine northernmost counties in Kentucky, and the Southeast Alaska Land Trust ILF program, which has a service area consisting of eleven 8-digit HUCs that focuses on Southeast Alaska. Some programs have a single service area that focuses on a particular watershed (e.g., the Ventura River Watershed ILF Mitigation Program), while other programs have multiple service areas that cover an entire state (e.g., the Arizona Game and Fish Department ILF Mitigation Program and the Connecticut ILF Program). The program with the overall largest service area coverage is the Montana Aquatic Resources Services ILF Program (MARS), which has 16 service areas that cover the entire state of Montana.

During interviews, some programs expressed challenges related to the size of their service areas. Some programs, usually those with numerous small service areas, explained that it can be difficult to gather enough funds in certain service areas to meet the three-year growing season timeframe for initial progress required by the Rule. When the Maine Natural Resource Conservation Program was first approved, for example, it sub-divided the state into 19 service areas. Development—and hence, permitted impacts—tend to be concentrated in southern Maine, though. In the more southern service areas, the program was able to gather funds and implement meaningful projects within the Rule’s three-year timeframe without significant difficulty. It had a more difficult time doing so in more northern service areas, however, because in those areas, fewer in-lieu fees were being paid. To address this challenge, the program worked with its IRT to consolidate the 19 sub-regions into 7 that would allow the program to collect enough funds to support project development in all service areas. Likewise, the New Hampshire Aquatic Resource Mitigation Fund ILF program consolidated its 16 watershed areas into 9 after a similar experience.

## Delineation/Definition of Service Area Boundaries

There are numerous ways to define the boundaries of a program’s service area(s), and the program instruments reviewed employ a wide variety of methods. Some programs focus primarily on one unit or method to delineate the boundaries, while other programs use a combination of multiple units or methods. Most programs use a predetermined hydrological or ecological unit to help define the service area boundaries. These units include, *inter alia*, U.S. Geological Survey hydrologic unit codes (HUCs), ecoregions, ecological drainage units, watershed resource inventory areas (WRIAs), and watershed districts. Programs also may incorporate political boundaries (e.g., county, parish, tribal) into the service area delineation; this may be due to jurisdictional considerations or because the service area boundaries do not neatly coincide with certain physical features. Although less common, a service area may even extend across multiple Corps districts (e.g., Ducks Unlimited New York ILF Program and Missouri Conservation Heritage Foundation In Lieu Fee Mitigation Program) or across state lines (e.g., Ducks Unlimited Vermont ILF Program).

Several programs use state-determined units to help define the boundaries of the service area. For example, some of the ILF programs in Washington use WRIAs, which delineate the state’s major watersheds. In Montana, the MARS ILF program’s service areas are based on watershed districts delineated by the Montana Department of Transportation. Another example comes from the Connecticut ILF Program, which uses major river and coastal drainage basins as defined by the Connecticut Department of Energy & Environmental Protection. Programs also sometimes use state guidance documents to help determine the service area boundaries. The North Dakota Ducks Unlimited ILF program and the Georgia-Alabama Land Trust program rely, in part, on state-specific guidance documents to help set the service area boundaries for their programs.

Many of the program instruments reviewed use HUCs to define service area(s). Some service areas encompass a single HUC, and others include multiple HUCs. The service area may include

all of a given HUC, or it may include portions of one or multiple HUCs. Multiple HUC levels are used, including 4-, 6-, 8-, 10-, and 12-digit HUCs, depending on the program, whether the area is rural or urban, and other considerations. Using one 8-digit HUC or a combination of 8-digit HUCs appears to be most common method to delineate service areas among the instruments reviewed.

## Primary and Secondary Service Areas

Most of the program instruments reviewed provide for only primary service areas and do not contemplate that the program will use secondary service areas. A few programs, however, include secondary service areas (and one program also has a tertiary service area), for use in limited circumstances. The Stream + Wetlands Foundation (Wetland) ILF Program includes two service areas, each defined by an 8-digit HUC, and secondary service areas that consist of the remainder of the 6-digit HUC watershed for each primary service area. The Nature Conservancy's Ohio Stream and Wetland ILF Program also includes 8-digit HUCs as its primary service areas and 6-digit HUCs as secondary service areas. Other programs with secondary service areas include the Ventura River Watershed ILF Mitigation Program, the West Virginia ILF Stream and Wetland Mitigation Program, and the Coachella Valley ILF Program. The Tucson Audubon Society ILF Program even includes the entire state as a tertiary service area, which may be used when authorized by the Corps on a case-by-case basis.

The program instruments sometimes describe the rationale for including the secondary service areas. For example, one program instrument explains that the secondary service areas are included because there are small average amounts of permitted impacts in the secondary service areas and because those watersheds lack mitigation banks or other ILF programs. The program instruments also sometimes identify the specific limited circumstances in which the program may use the secondary service areas. Examples include situations in which there are not any reasonable mitigation opportunities in watersheds that are closer to the impact, the sponsor finds an exceptional mitigation option located outside the primary service area, or the sponsor has acquired insufficient funds in the primary service area to conduct a sustainable, ecologically meaningful project within a certain period of time after the first credit sale in the primary service area.

## Types of Aquatic Resources

A couple of ILF programs define different service areas for different types of aquatic resources. The Hood Canal Coordinating Council program has three freshwater service areas and one marine/nearshore service area. The freshwater service areas include "freshwater wetlands, lakes/ponds, and non-tidally influenced rivers/streams and their adjacent floodplains and riparian areas," and the marine/nearshore service area covers the "marine riparian zone . . . , the adjacent intertidal and subtidal zones including sub-estuaries and beaches, tidally influenced portions of streams, and estuarine wetlands."<sup>35</sup> The National Fish and Wildlife Foundation Sacramento District California ILF Program has 17 aquatic resource service areas for

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<sup>35</sup> Hood Canal Coordinating Council. (2012). *Hood Canal Coordinating Council In-Lieu Fee Program Instrument Technical Appendices and Compensation Planning Framework*.

wetlands (excluding vernal pools) and other aquatic resources (such as endangered or threatened anadromous fish) based on river systems and 12 vernal pool service areas based on vernal pool regions identified in a USFWS recovery plan.

## Watershed-based Rationale

As noted above, a program's compensation planning framework is supposed to include a watershed-based rationale for the service area(s).<sup>36</sup> The level of detail varies in the program instruments regarding the watershed-based rationale for the delineation of the service areas. A few of the program instruments reviewed do not provide much rationale for the delineation of the service area. Most of the program instruments reviewed, however, provide at least some explanation, and several are quite extensive and detailed. At least one program (the Tennessee Wildlife Federation Wetland In Lieu Fee Program (TN Mitigation Fund)) even includes additional information about the rationale for each particular service area in the compensation planning framework. Examples of detailed service area rationales included in program instruments are listed in Box 4 and excerpted in Appendix 3. Many of the program instruments reviewed reference certain sources that the sponsor consulted to inform the service area decision-making process. The program instruments may refer to federal, state, and local laws or guidance documents as part of the service area rationale as well. Stakeholder input also sometimes informs the delineation.

### Box 4: Examples of detailed service area rationales.

The program instruments for the following programs provide examples of relatively thorough, detailed service area rationales:

- **Ducks Unlimited, Inc.—Vermont In-Lieu Fee Program**
- **Everglades National Park ILF Program**
- **National Fish and Wildlife Foundation Sacramento District California ILF Program**
- **Tennessee Wildlife Federation Wetland In Lieu Fee Program (TN Mitigation Fund)**
- **Terra Foundation ILF Program**
- **The Watershed Land Trust In Lieu Fee Mitigation Program**

Excerpts of the service area rationales for the above programs are provided in Appendix 3.

Review of the program instruments revealed an expansive, varied list of rationales for the delineation of service areas, which makes sense given the differences among the programs. Broadly, the rationales provided address various hydrological, ecological, conservation, economic, geopolitical, and other considerations. These include considerations about watershed boundaries, resources, and objectives; aquatic resource conditions, types, communities, functions, services, connectivity, impacts, and threats; proximity between permitted impacts and mitigation projects; the sponsor's and others' conservation goals and existing conservation efforts; historical and projected impacts, demand, development, and

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<sup>36</sup> 33 C.F.R. § 332.8(c)(2)(i).

population trends; availability of mitigation banks or other ILF programs; financial viability; political and jurisdictional subdivisions; and a variety of other factors. Many programs note generally that their selected service areas are at an appropriate scale to ensure that the sponsors can implement good, high quality projects in a realistic amount of time and that the projects will effectively compensate for permitted impacts. This is consistent with what the 2008 Rule says about sizing service areas.<sup>37</sup>

The boundaries selected for the service areas in the program instruments reviewed are almost always due largely to consideration of the physical and ecological characteristics of the watershed or area. Programs also often explain that the chosen service areas are consistent with the existing conservation efforts, strategies, or plans (e.g., watershed plans) of other agencies, entities, or people. The sponsor's particular focus, its preexisting conservation efforts, or its familiarity with an area may play an important role in defining the service area boundaries as well, and not surprisingly, the sponsor's jurisdictional boundary may affect the delineation. Additionally, the rationale for some service areas is based, at least in part, on the impact history in the area and the projected or likely future impacts, which will affect regulatory demand and consequently the economic viability of the program.

Several program instruments note that the programs plan to minimize the distance between the permitted impacts and the compensatory mitigation site, and they set service area boundaries to facilitate this goal. Programs may use larger service areas for rural areas, however, to provide greater flexibility and offer a greater array of potential projects. Sometimes, smaller service areas are not feasible because it likely would not be possible to find enough viable mitigation projects or collect enough funds to implement good projects in the area. Land acquisition also may be a challenge if a service area is too small, and as noted in one program instrument, if the service areas are too small, the projects might end up resembling permittee-responsible mitigation.

## Observations and Suggestions

The size, number, and delineation of service areas should be well reasoned, ecologically sound, economically viable, and administratively feasible. Programs should select service areas by thoroughly evaluating a variety of factors, including relevant watershed, hydrological, ecological, economic, political, and other factors. The factors described throughout this section may provide a good starting point.

The sponsor's programmatic focus and jurisdictional and political boundaries obviously will help to define or limit a program's service area(s) in the first place. In terms of the number and size of the service area(s), a single or smaller service area may be appropriate for programs whose sponsors focus on a particular watershed or more limited geographic area, type of aquatic resource, or species. Conversely, larger programs with numerous service areas may be appropriate for sponsors with a larger regional or statewide focus or jurisdiction. The urban or rural nature of the area may influence the size of a service area as well. Programs also should

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<sup>37</sup> 33 C.F.R. § 332.8(d)(6)(ii)(A).

consider whether the number of service areas will be manageable from an administrative standpoint. Importantly, if a program has more than one service area, it must account for impacts by service area.<sup>38</sup>

When deciding which unit or method (or combination of units or methods) to use to help delineate the boundaries of the service area(s), programs should determine whether any state laws or guidance documents may apply (see, e.g., North Dakota Ducks Unlimited ILF program, Georgia-Alabama Land Trust). Other times, however, programs may be able to choose from among a variety of units or methods. HUCs are the most common unit used among the program instruments reviewed, but other units or methods (e.g., ecoregions) may be appropriate.

Program sponsors also should evaluate the economic viability of the proposed service area(s). Historical and projected development trends and past and likely future credit demand are important factors to consider. ILF program sponsors should determine how the proposed service area(s) might overlap with, or be affected by, existing mitigation banks or other ILF programs. In addition, considering whether the service area is consistent with other existing conservation efforts, programs, or strategies may allow the ILF program to leverage funding and/or other resources. This also could strengthen existing efforts or contribute to watershed and other plans, which may lead to greater ecological benefits.

Typically, secondary (or tertiary) service areas probably will not be necessary, and as explained above, most programs do not use them. However, at least one program reported that it routinely gets requests for credit sales for impacts outside of its service area due to limited compensation options in the region. Secondary service areas may be appropriate in limited circumstances to provide additional flexibility, but sponsors first should consider whether secondary service areas will still provide for ecologically sound mitigation. If a program decides to include secondary service areas, it should explain the reasons for doing so in the program instrument.

Programs should thoroughly explain the watershed-based rationale for the service area(s). This contributes to the transparency and accountability of the program and provides a documented record of the service area rationale in case staff or programmatic changes later occur. Furthermore, existing programs should continually evaluate whether the program's selected service area(s) is appropriate and modify or amend the program instrument to add, remove, or adjust service areas as needed. Indeed, a few programs (e.g., the Ducks Unlimited, Inc.—Vermont ILF Program, the Riverside-Corona Resource Conservation District ILF Program, and the Ventura River Watershed ILF Mitigation Program) have done so, sometimes through multiple amendments.

## Credits

ILF programs offer a range of credit types (e.g., wetland, stream, vernal pool, aquatic resource, etc.) to offset permitted impacts to aquatic resources. The 2008 Rule defines a credit as “a unit

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<sup>38</sup> 33 C.F.R. § 332.8(d)(6)(ii)(A).

of measure (e.g., a functional or areal measure or other suitable metric) representing the accrual or attainment of aquatic functions at a compensatory mitigation site. The measure of aquatic functions is based on the resources restored, established, enhanced, or preserved.”<sup>39</sup> The Rule allows ILF programs to sell two types of credits: advance and released. The Rule allows each ILF program to sell a limited (i.e., capped) number of “advance credits” in each service area in order to fund the development and implementation of compensation projects within that service area. As funded ILF projects are implemented, credits are released as milestones specified by a credit release schedule in the approved mitigation plan are achieved, with a final credit release upon project completion (e.g., performance standards are met). As projects produce these “released credits,” advance credits are fulfilled or satisfied (i.e., sold advance credits are tied to credits released from projects that have met performance standards) and are then available again for sale. Released credits are available for sale to permittees once “any advance credits that have already been provided within the project service area” are fulfilled.<sup>40</sup>

## Advance Credits

The 2008 Rule defines advance credits as “any credits of an approved in-lieu fee program that are available for sale prior to being fulfilled in accordance with an approved mitigation project plan. Advance credit sales require an approved in-lieu fee program instrument that meets all applicable requirements including a specific allocation of advance credits, by service area where applicable. The instrument must also contain a schedule for fulfillment of advance credit sales.”<sup>41</sup>

The number of advance credits available in each service area is determined by the district engineer and the IRT in collaboration with the program, and the number is described in the program instrument. The 2008 Rule states that the “number of advance credits will be based on the following considerations: (i) The compensation planning framework; (ii) The sponsor’s past performance for implementing aquatic resource restoration, establishment, enhancement, and/or preservation activities in the proposed service area or other areas; and (iii) The projected financing necessary to begin planning and implementation of in-lieu fee projects.”<sup>42</sup> Several program administrators told us that the number of advance credits is the result of a negotiation between the program and the IRT in the development of the instrument. As such, the number and type of advance credits vary by program.

Where noted, most programs reported that the number of advance credits is determined, at least in part, by an analysis of the potential credit market or mitigation need in the service area. For example, the Quil Ceda Village ILF program calculated the number of advance credits in each service area based on a ten-year baseline of development before the credit release, an analysis of how much development could actually still be completed in the service area, and an

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<sup>39</sup> 33 C.F.R. § 332.2.

<sup>40</sup> 33 C.F.R. § 332.8(n)(3).

<sup>41</sup> 33 C.F.R. § 332.2.

<sup>42</sup> 33 C.F.R. § 332.8(n)(1).

estimation of the number of credits that could be generated by potential projects (done using Washington State's credit/debit calculator).

The Wisconsin Wetland Conservation Trust ILF Program outlines a three-step process for determining advance credits in its instrument. The first step was to estimate the average annual permitted impacts, based on five full years of Corps permitting data. The next step was to determine an "Advance Credit Basis" based on the five-year annual average of permanent permitted wetland impacts and the anticipated quantity of required compensatory mitigation using ratio standards established in the 2013 Wisconsin Mitigation Guidelines. The guidelines include a statutory minimum acreage mitigation ratio of 1.2:1 (credit: impact). The guidelines also require a .25 credit increase to account for temporal loss of aquatic functions. The resulting mitigation ratio used to establish wetland credits is 1.45:1. The Advance Credit Basis was then calculated by multiplying the annual average by the anticipated mitigation ratio by three years (based on the requirement in the Rule that compensatory mitigation projects commence within the first three growing seasons after selling the first advance credit in the service area). The final step was then to compare the Advance Credit Basis against a number of considerations, including:

- Overall size and urbanization of the SA, with the larger more urbanized ones generally resulting in more advanced credits to reflect potential for increased permit activity and associated compensatory mitigation credit needs;
- Current availability of wetland mitigation bank credits in each SA, with those containing few or no active banks or those with smaller availability of bank credits resulting in an increase of Advanced Credits;
- Current permit impacts and the associated compensatory mitigation credits needs with those SA's that have increased permit activity or larger proposed projects resulting in an increase of Advanced Credits;
- Anticipated permitted impacts in SA's that are foreseen to be higher than the past 5 year annual average due to industries including, but not limited to, metallic and non-metallic mining that may result in substantial compensatory mitigation needs justifying an increase of Advanced Credits.<sup>43</sup>

Finally, a minimum of 30 advance credits was established for those service areas where the three-step process described above resulted in a very low number of advance credits.<sup>44</sup>

Several program administrators told us that the market-based data used to determine advance credits sometimes did not match up well with the actual credit market. For example, some programs have had to request additional advance credits in their service areas in order to keep up with demand.

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<sup>43</sup> Wisconsin Wetland Conservation Trust ILF Program. (2014). *WI Wetland Conservation Trust (In-Lieu Fee Mitigation Program) Instrument*.

<sup>44</sup> *Id.*

Some programs are using other data to determine the number of advance credits in each service area. One program told us that the number of advance credits was not a market-based decision, but rather based on annual budget and staff capacity.

Programs also vary in the types of advance credits that they offer. The credits allotted to the Keys Restoration Fund and the Massachusetts Department of Fish and Game ILF Program illustrate these differences. Upon approval of its instrument, the Keys Restoration Fund program, for example, received advance credits specific to aquatic resource type in each of its two service areas. In its Upper Keys Project Area, the program was allowed six Tidal Wetlands and four Seagrass Advance Credits. In its Lower Keys Project Area, the program was allowed six Tidal Wetlands, two Non-tidal Wetlands, and four Seagrass Advance Credits. The Massachusetts program, on the other hand, was allotted advance credits by aquatic resources denominated in acreage and in linear feet in each of its four service areas. In the Quabbin/Worcester Plateau service area, for example, the ILF program received 52 advance credits for aquatic resources denominated in acres and 2,500 for aquatic resources denominated in linear feet (e.g., shoreline of rivers, streams, and ocean). In its Coastal service area, it received 130 advance acreage credits and 162,819 advance linear feet credits.

## Released Credits

As mentioned above, released credits are those associated with an approved mitigation plan and that are determined by the IRT to be available for fulfillment of advance credits or sale to permittees as project milestones in the credit release schedule are achieved. Released credits are available for ILF programs to sell to permittees when advance credits are fulfilled in the service area. Like mitigation bank credits, released credits generated above and beyond advance credit obligations are created prior to impacts and thus the sale of release credits reduces the risk of temporal loss of aquatic resource functions that may be associated with advance credits.

Among the programs we interviewed, about half have—or will soon have—released credits available for sale in at least some service areas from completed compensation projects. Some programs, like the Northwest Florida Water Management District program, Everglades National Park ILF Program, and Land Trust for the Mississippi Coastal Plain program, have only released credits. In many cases, ILF programs with released credits were either programs that had been in operation prior to the 2008 Rule and thus had existing projects completed or in progress prior to finalizing their program instrument or new programs that had completed projects prior to signing their program instrument. However, several programs established after the 2008 Rule now have released credits from completed projects.

## Types of Credits Generated by Projects

Most programs generate a range of aquatic credits (see Table 5). Certain programs, however, offer only one type of credit. For example, the Northern Kentucky University ILF Program provides only stream credits, and the Wisconsin Wetland Conservation Trust ILF Program provides only wetland credits.

Some programs offer credits based on more specific resource types. The National Fish and Wildlife Foundation Sacramento District California ILF Program, for example, provides Aquatic Resource Credits and Vernal Pool Credits. The program's Vernal Pool Credits may be used to offset impacts to seasonal depression wetlands, while its Aquatic Resource Credits may be used to offset permitted impacts to "wetlands (excluding vernal pools), other Waters of the U.S., and Waters of the State, and other aquatic resources including threatened or endangered anadromous fish."<sup>45</sup> Likewise, the Northwest Florida Water Management District program offers four different types of credits denoting different wetland types: Estuarine Emergent, Palustrine Emergent, Palustrine Scrub/Shrub, and Palustrine Forested.

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<sup>45</sup> National Fish and Wildlife Foundation Sacramento District California ILF Program. (2014). *Sacramento District California In-Lieu Fee Enabling Instrument*.

<b>Table 5: Credit types offered by interviewed ILF programs. Information collected from program interviews and credit ledgers found on RIBITS.</b>	
<b>Program Name</b>	<b>Credits Offered</b>
Arizona Game and Fish Department ILF Mitigation Program	Riparian, Wetland
Coachella Valley ILF Program	Wetland, Stream
Connecticut ILF Program	Emergent wetlands, Scrub-shrub wetlands, Forested wetlands, Open water, Submerged aquatic vegetation, Stream, Mudflat, Upland
Ducks Unlimited New York ILF Program	Wetland, Stream
Ducks Unlimited Vermont ILF Program	Wetland
Everglades National Park ILF Program	Wetland (Palustrine Emergent)
Georgia-Alabama Land Trust	Wetland, Stream
Great Land Trust	Slope/Flat/Palustrine, Riverine, Tidal/Marine Estuarine, REV (Relative Ecological Value as determined using the Anchorage Credit-Debit Methodology)
Hood Canal Coordinating Council	Wetlands (Habitat, Hydrology, Water Quality, Marine/Nearshore)
Kentucky Department of Fish and Wildlife Resources ILF Program	Wetland, Stream
Keys Restoration Fund	Tidal wetlands (mangrove and salt marsh), Non-tidal (Freshwater) wetland, Seagrass
King County Mitigation Reserves Program	Wetlands (Habitat, Hydrology, Water Quality); wetland buffers; and stream, aquatic area, and their buffers (on a case-by-case basis)
Land Trust for the Mississippi Coastal Plain	Wetland (Bottomland Hardwood, Wet Pine Flats)
Living River Restoration Trust (Elizabeth River Project)	Tidal Wetland, Tidal River Bottom, Tidal Oyster Reef
Louisiana Department of Natural Resources ILF Program	Wetland: Fresh/Intermediate/Brackish/Saline Marsh
Maine Natural Resource Conservation Program	Palustrine Emergent, Palustrine Scrub Shrub, Palustrine Forested, Preservation Uplands, Riverine, Vernal Pool, Vernal Pool Critical Terrestrial Habitat, Estuarine/Marine Intertidal, Estuarine Subtidal, Palustrine Unconsolidated Bottom, Stream

**Table 5 (continued): Credit types offered by interviewed ILF programs.**

Massachusetts Department of Fish and Game ILF Program	Wetland, Stream
Montana Aquatic Resources Services ILF Program (MARS)	Stream, Wetland (Palustrine Emergent/Palustrine Scrub Shrub), Prairie Pothole (isolated/depressional)
Mountains Restoration Trust ILF Program	Wetland (Palustrine Emergent Enhancement), Stream/Riverine (Enhancement, Preservation, Re-establishment, Rehabilitation)
New Hampshire Aquatic Resource Mitigation Fund	Emergent wetlands, Scrub-shrub wetlands, Forested wetlands, Open water, Submerged aquatic vegetation, Stream, Mudflat, Upland, Buffer, Vernal pool, Vernal Pool Critical Habitat
National Fish and Wildlife Foundation Sacramento District California ILF Program	Vernal Pool, Aquatic Resource
North Carolina Division of Mitigation Services	Stream (Warm, Cool, and Cold Water), Wetland, Riparian buffer, Nutrient offset, Coastal Marsh
North Dakota Ducks Unlimited ILF	Stream, Wetland, Prairie Pothole
Northern Kentucky University ILF Program	Stream
Northwest Florida Water Management District	Estuarine Intertidal Emergent, Palustrine emergent, Palustrine scrub/shrub, Palustrine forested
Pierce County ILF Program	Wetlands (Habitat, Hydrology, Water Quality)
Quil Ceda Village	Wetland, Wetland Buffer, Aquatic area (non-wetland), Aquatic Area Buffer, Stream
Riverside-Corona Resource Conservation District ILF Program	Riverine (Rehabilitation, Enhancement), Ephemeral/Intermittent Stream, Wetland
South Dakota Ducks Unlimited ILF	Wetland
Southeast Alaska Land Trust	Wetland
Southeast Alaska Mitigation Fund	Stream, Wetland
Stream + Wetlands Foundation ILF Program	Stream, Wetland
Tennessee Stream Mitigation Program	Stream
The Nature Conservancy's Virginia Aquatic Resources Trust Fund	Non-tidal wetland, Tidal, Stream
The Nature Conservancy's Ohio Stream and Wetland ILF Program	Stream, Wetland
The Wetland Trust	Wetland, Buffer
Tucson Audubon Society ILF Program	Stream, Wetland
Ventura River Watershed ILF Mitigation Program	Palustrine, Riverine
West Virginia ILF Stream and Wetland Mitigation Program	Stream, Wetland

<b>Table 5 (continued): Credit types offered by interviewed ILF programs.</b>	
Wisconsin Wetland Conservation Trust ILF Program	Wetland

## Methods of Calculating Number of Credits

Program operators told us that ILF credits are generally determined either by (1) methodologies based primarily on ratios of acreage or linear feet restored/enhanced/preserved/established (modified by various factors) or (2) methodologies that incorporate functional/conditional assessments (see Table 6).

### Mitigation Ratios

In many cases, ILF project credits are determined using ratios of acreage or linear feet of compensation at the project site. In most situations, ratios vary based on the type of resource restored/enhanced/preserved/established, the quality or rarity of the resource, and the mitigation method (restoration, establishment, enhancement, and preservation), among other factors, including temporal loss/lag for advance credits or functions and services provided by the project.

For The Wetland Trust program in New York State, credits are determined by the IRT based on a schedule included in the instrument (Figure 5) as informed by “determination of an adequate buffer of at least 50 meters, where credit production may be reduced; modified by sliding scale of quality based on the assessment of functions and services on a site-by-site basis; and the IRT using the best available assessment tools.”<sup>46</sup>

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

**FIGURE 5: THE WETLAND TRUST MITIGATION RATIOS. SOURCE: SUSQUEHANNA BASIN HEADWATERS AND ADJACENT BASINS IN-LIEU FEE PROGRAM INSTRUMENT**

Similarly, the Maine Natural Resource Conservation Program refers to the recommended ratios (see Figure 6) included in the 2010 guidance from the New England District Mitigation Guidance. The program’s instrument states, “Where there are ranges, the Corps will determine

<sup>46</sup> The Wetland Trust. (2015). *Susquehanna Basin Headwaters and Adjacent Basins In-Lieu Fee Program Instrument*.

the appropriate ratio for a specific project based on the functional benefits of the project.”<sup>47</sup> In fact, the District’s guidance states that the ratios are “to serve as a starting point for developing adequate compensatory mitigation” but that “there continues to be flexibility on a project-by-project basis in order to achieve the most appropriate mitigation for a specific project and, based on the facts of a particular situation, permit decisions may result in different requirements than the ratios set forth in this document.”<sup>48</sup> The guidance goes on to list a number of factors that will be considered in developing project-specific compensation, including the functions provided by the project, the method of compensatory mitigation, temporal losses, distance between impact site and compensation site, and watershed considerations, among other factors.

Resource	Restoration 1 (re-establishment)	Creation (establishment)	Enhancement (rehabilitation)	Preservation (protection/management)
Emergent Wetlands (ac)	2:1	2:1 to 3:1	3:1 to 10:1	15:1
Scrub-shrub Wetlands (ac)	2:1	2:1 to 3:1	3:1 to 10:1	15:1
Forested Wetlands (ac)	2:1 to 3:1	3:1 to 4:1	5:1 to 10:1	15:1
Open Water (ac)	1:1	1:1	project specific	project specific
Submerged Aquatic Veg.(ac)	5:1	project specific	project specific	N/A
Streams <sup>6</sup> (lf)	2:1	N/A	3:1 to 5:1	10:1 to 15:1
Mudflat (ac)	2:1 to 3:1	2:1 to 3:1	project specific	project specific
Upland <sup>10</sup> (ac)	10:1	N/A	project specific	15:1

FIGURE 6: MAINE NATURAL RESOURCE CONSERVATION PROGRAM MITIGATION RATIOS. SOURCE: STATE OF MAINE - IN LIEU FEE PROGRAM INSTRUMENT, TABLE 2

### Assessment Methodologies

The 2008 Rule states that, “in cases where appropriate functional or condition assessment methods or other suitable metrics are available, these methods should be used where practicable to determine how much compensatory mitigation is required. If a functional or condition assessment or other suitable metric is not used, a minimum one-to-one acreage or linear foot compensation ratio must be used.”<sup>49</sup> Just under half of the ILF programs we interviewed reported integrating functional or conditional assessment methodologies into credit calculations.

<sup>47</sup> Maine Natural Resource Conservation Program. (2011). *State of Maine - In Lieu Fee Program Instrument*.

<sup>48</sup> *New England District Compensatory Mitigation Guidance*, [https://elr.info/sites/default/files/doi-consent-decrees/united\\_states\\_v.\\_fkt\\_resort\\_mgmt.\\_llc\\_p2.pdf](https://elr.info/sites/default/files/doi-consent-decrees/united_states_v._fkt_resort_mgmt._llc_p2.pdf).

<sup>49</sup> 33 C.F.R. § 332.3(f)(1).

The Everglades National Park ILF Program and other Florida ILF providers use the Uniform Mitigation Assessment Method,<sup>50</sup> which was created in fulfillment of a mandate in state statute. The Florida Department of Environmental Protection (DEP) explains that the UMAM tool:

provides a standardized procedure for assessing the ecological functions provided by wetlands and other surface waters, the amount that those functions are reduced by a proposed impact, and the amount of mitigation necessary to offset that loss . . . . The UMAM evaluates functions through consideration of an ecological community's current condition, hydrologic connection, uniqueness, location, fish and wildlife utilization, time lag and mitigation risk.<sup>51</sup>

UMAM is designed to evaluate any type of impact and compensation project, including restoration, enhancement, creation, and preservation. The assessment involves two main parts: a qualitative description and a quantification of the assessment area. During the latter phase, sites are evaluated and scored in three categories, with a high score indicating minimal impairment. These categories include Location and Landscape Support, Water Environment (this category includes rapid inference of hydrologic alteration and an assessment of water quality), and Community Structure (this category looks specifically at habitat and vegetation).<sup>52</sup>

ILF programs in Washington State use the Credit-Debit Method, developed by the Washington Department of Ecology (Hruby 2012). The Credit-Debit Method looks at three major categories of wetland ecological functions: (1) hydrology, (2) improvement of water quality, and (3) habitat and maintenance of food webs. The assessment tool then scores these functions on a few metrics: (1) the potential of a site to provide each aforementioned function, (2) the potential for the landscape to maintain each function at the site scale, and (3) the value each function offers to society. These ratings are then transformed into "acre-points," which are used to calculate credits and debits.

Other functional assessment methods are used by programs across the country. Various programs in California use the California Rapid Assessment Method (CRAM)<sup>53</sup> to assess wetlands, and CRAM scores may be used as an input in credit determination. The Army Corps of Engineers New Orleans District uses the Louisiana Wetlands Rapid Assessment Method (LRAM), which replaced the Modified Charleston Method in 2016. Other programs, like the Ducks Unlimited South Dakota ILF, use the Hydrogeomorphic (HGM) Approach developed by the Corps.

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<sup>50</sup> *The Uniform Mitigation Assessment Method (UMAM)*, <https://www.flrules.org/gateway/ChapterHome.asp?Chapter=62-345>.

<sup>51</sup> Florida Department of Environmental Protection, *The Uniform Mitigation Assessment Method (UMAM)*, <https://floridadep.gov/water/submerged-lands-environmental-resources-coordination/content/uniform-mitigation-assessment>.

<sup>52</sup> *Uniform Mitigation Assessment Method Training Manual*, [http://sfrc.ufl.edu/ecohydrology/UMAM\\_Training\\_Manual\\_ppt.pdf](http://sfrc.ufl.edu/ecohydrology/UMAM_Training_Manual_ppt.pdf).

<sup>53</sup> *California Rapid Assessment Method (CRAM)*, <https://www.cramwetlands.org/>.

Certain programs may use condition assessment methods to evaluate selected credits, usually those specific to certain resource types. The Nature Conservancy's Virginia Aquatic Resources Trust Fund (VARTF), for example, uses the Unified Stream Methodology,<sup>54</sup> available in the Norfolk District of the Corps, for evaluation of stream impacts and improvements. For its wetland credits, VARTF uses mitigation ratios. The West Virginia ILF Stream and Wetland Mitigation Program uses the West Virginia Stream and Wetland Valuation Metric, another condition-based approach. The North Carolina Division of Mitigation Services uses the North Carolina Wetland Assessment Methodology<sup>55</sup> and the North Carolina Stream Assessment Methodology, which are also condition-based methodologies.

The aforementioned functional and conditional assessment methods are established at a state or regional scale and may be available to multiple ILF programs. Other sponsors that do not have tools available in their regions may elect to establish their own functional assessment methodologies. For example, the Southeast Alaska Mitigation Fund collaborated with outside partners to develop a function-based credit calculation methodology. The program collaborated with a host of partners, including the IRT, the Southeast Alaska Land Trust, The Nature Conservancy's Virginia Aquatic Resources Trust Fund, Herrera LLC, Sitka Hydro Science LLC, Paul Adamus, and CH2M Hill to develop a process for calculating wetland (Wetland Credit-Debit Method - WCDM) and stream (Stream Credit-Debit Method – SCDM) credits. The WCDM is based on the *Wetland Ecological Services Protocol for Alaska-Southeast Version 2*,<sup>56</sup> and the SCDM is primarily based on *A Function-Based Framework for Stream Assessment and Restoration Projects*.<sup>57</sup> As described in the instrument, the credit calculations are based on the difference between ecological functions at the site following the mitigation action (projected conditions) and the existing site conditions. The method then applies the factors of time lag, risk, and areal/linear extent.

Various programs, like the MARS ILF program in Montana, hope to transition away from credit ratios toward using a functional assessment methodology in the future. MARS uses the Montana Wetland Assessment Method (MWAM) to determine credit-based equivalents for mitigation, but this method could also be used for a functional-unit based approach to mitigation. However, as assessment methodologies are integrated into crediting, ILF programs report a number of challenges. For example, a program in Florida reported that, although UMAM is used to determine the number of credits available at a compensation site, permittees pay based on acreage ratios of their impacts. This can reduce the correlation between impacts and compensation and/or lead to insufficient funds for compensation projects. Further, some

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<sup>54</sup> *Unified Stream Methodology (USM)*, <http://www.nao.usace.army.mil/Missions/Regulatory/Unified-Stream-Methodology/>.

<sup>55</sup> *North Carolina Wetland Assessment Methodology (NCWAM)*, <https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-quality-program-development/ncwam-manual>.

<sup>56</sup> Adamus, P. (2015). *Wetland Ecological Services Protocol for Alaska-Southeast Version 2*, [https://www.researchgate.net/publication/323990885\\_Manual\\_for\\_Wetland\\_Ecosystem\\_Services\\_Protocol\\_for\\_Southeast\\_Alaska\\_WESPAK-SE](https://www.researchgate.net/publication/323990885_Manual_for_Wetland_Ecosystem_Services_Protocol_for_Southeast_Alaska_WESPAK-SE).

<sup>57</sup> Harman, W., Starr, R., Carter, M., Tweedy, K., Clemmons, M., Suggs, K., & Miller, C. (2012). *A Function-Based Framework for Stream Assessment and Restoration Projects*. US Environmental Protection Agency, Office of Wetlands, Oceans, and Watersheds, Washington, DC, EPA 843-K-12-006.

programs are frustrated by the length of time it takes to complete some assessments, leading to delays in project approvals and credit releases. Other programs are concerned integrating assessment methodologies could raise credit prices and, perhaps, change project design.

<b>Table 6: Methods interviewed ILF programs are using to determine credits.</b>		
<b>Program</b>	<b>Restoration/Resource Type</b>	<b>Method of Determination: Functional Assessment or Ratios of Acreage/Feet</b>
Coachella Valley ILF Program	All	CRAM
Ducks Unlimited New York ILF Program	Rehabilitation & Enhancement	3:1 to 10:1
	Wetland Establishment & Re-establishment	Up to 1:1
	Aquatic Preservation	10:1 to 20:1
	Upland Buffer Preservation	15:1
	Upland Buffer Restoration	4:1 to 15:1
Great Land Trust	All	Anchorage Debit Credit Methodology
Hood Canal Coordinating Council	All	Credit-Debit Method
Kentucky Department of Fish and Wildlife Resources ILF Program	Big Sandy River, Upper Kentucky River, Upper Licking River & Upper Cumberland River Service Areas Streams	Eastern Kentucky Stream Assessment Protocol
	Lower Kentucky River, Lower Licking River, Lower Cumberland River, Green & Tradewater River, Salt River, Jackson Purchase and Northern Kentucky Service Areas Streams	Central Kentucky Assessment Protocol
	All Wetlands	Central Kentucky Assessment Protocol
Keys Restoration Fund	All	Florida UMAM
King County Mitigation Reserves Program	All	Credit-Debit Method

**Table 6 (continued): Methods interviewed ILF programs are using to determine credits.**

Living River Restoration Trust (Elizabeth River Project)	Tidal Wetlands	1:1
	Tidal River Bottom	0.25:1 to 1:1
	Tidal Oyster Reef	1:1
Louisiana Department of Natural Resources ILF Program	All	The LDNR uses the Wetland Value Assessment Model to assess wetland impacts. The Army Corps of Engineers New Orleans District uses the Louisiana Wetlands Rapid Assessment Method (LRAM).
Montana Aquatic Resources Services ILF Program (MARS)	Wetland Re-establishment	1.5:1
	Wetland Rehabilitation or Creation	2:1
	Wetland Enhancement or Preservation	4:1
	Upland Buffer	5:1
	Stream	Montana Stream Mitigation Procedure
Mountains Restoration Trust ILF Program	All	CRAM or other functional assessment method
National Fish and Wildlife Foundation Sacramento District California ILF Program	All	CRAM or other functional assessment method
Pierce County ILF Program	All	Credit-Debit Method
Riverside-Corona Resource Conservation District ILF Program	All	CRAM
South Dakota Ducks Unlimited ILF	All	Prairie Pothole HGM mechanism
Southeast Alaska Land Trust	Wetlands	Wetland Ecosystem Services Protocol for Southeast Alaska (WESPAK-SE)
	Non-wetland shore segments	Nearshore Assessment Tool for Southeast Alaska (NATAK-SE)
Southeast Alaska Mitigation Fund	Wetlands & Streams	Credit-Debit Method
Stream + Wetlands Foundation ILF Program	Minimal function, minimal habitat wetlands	1.5:1
	Isolated minimal function, minimal habitat wetlands	2:1

	Non-forested moderate function, moderate habitat wetlands	2:1
	Forested moderate function, moderate habitat wetlands	2.5:1
	Non-forested superior function, superior habitat wetlands	2.5:1
	Forested superior function, superior habitat wetlands	3:1
The Nature Conservancy's Virginia Aquatic Resources Trust Fund	Wetland Restoration or Creation	1:1
	Wetland Enhancement	3:1 to 5:1
	Wetland Preservation	10:1
	Upland Buffer Restoration	15:1
	Upland Preservation	20:1
The Wetland Trust	Wetland Establishment or Reestablishment	Up to 1:1
	Wetland Rehabilitation or Enhancement	3:1 to 10:1
	Wetland Preservation	10:1 to 20:1
	Upland Buffer Preservation	15:1
	Upland Buffer Establishment or Reestablishment	4:1 to 15:1
West Virginia ILF Stream and Wetland Mitigation Program	Wetlands & Streams	West Virginia Stream and Wetland Valuation Metric
	Wetlands	Spatial Analysis of Presence of Hydric Soils
	Streams	Rapid Bioassessment Protocols
Wisconsin Wetland Conservation Trust ILF Program	Baseline	1.45:1
	Out-of-kind	+ 0.25:1
	Out of service area	+ 0.25:1

## Credit Market

### Customers

ILF programs sell credits to a wide array of permittees. Far and away, ILF programs reported that the most common purchasers of credits are departments of transportation (DOTs). Nearly every program interviewed for this study reported that some or most of its sales went to transportation agencies, often state-level DOTs, for projects like the construction of a highway.

Many programs across the country also reported selling credits to offset impacts due to residential and commercial development, utilities projects, oil and gas exploration and transport, and the construction of railroads, airports, and schools. On a more regional basis, some programs reported credit purchases for mining impacts. This included programs in states in the Appalachian region, like West Virginia and Ohio, as well as Montana, Arizona, Wisconsin, and Alaska. Some ILF programs, like that of the Riverside-Corona Resource Conservation District, also reported selling credits to flood-control districts as part of storm water management efforts.

## Competition

ILF programs reported varying levels of competition for credit sales from other providers of compensatory mitigation: mitigation banks, other ILF programs, and permittee-responsible mitigation. Existence of competition depends, of course, upon the coverage and feasibility of alternate mitigation options in the ILF's service area(s).

Several programs reported significant, sustained competition for credit sales from mitigation banks. ILF programs in states like West Virginia, Virginia, Wisconsin, and Alaska told us that nearby banks were selling credits in their service area(s).<sup>58</sup> Several of these states have robust and well-organized banking communities in comparison with other parts of the country.

Programs also reported that credit sales are influenced by how strictly the Corps district is approaching the hierarchy of mitigation options outlined in the 2008 Rule. The Rule gives explicit preference to mitigation bank credits over other forms of compensation (including ILF advance credits) when appropriate bank credits are available. However, the Rule does indicate that the considerations that are used to justify the preference for bank credits "may also be used to override this preference," for example, where "an in-lieu fee program has released credits available from a specific approved in lieu fee project."<sup>59</sup> As with mitigation bank credits, ILF released credits are associated with "an approved instrument," "are not released for debiting until specific milestones . . . are achieved," and require "site identification in advance, project-specific planning, and significant investment of financial resources"<sup>60</sup> and thus also reduce risk and uncertainty of temporal loss of resource functions and services and that mitigation will be unsuccessful.

Most programs reported that the districts are adhering closely to the hierarchy stated in the Rule, giving preference to mitigation bank credits over other forms of compensation, including, in some cases, ILF released credits. Certain states also have institutionalized thorough and strict adherence to the hierarchy prioritizing banks. For example, North Carolina law requires private entities to purchase credits when credits are available from private mitigation banks within the designated hydrologic unit code (HUC) first before utilizing the Division of Mitigation Services.<sup>61</sup>

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<sup>58</sup> For a detailed analysis of activity in Virginia, see: Stephenson, K., & Tutko, B. (2018). The role of In-Lieu Fee programs in wetland/stream credit trading: Illustrations from Virginia and Georgia. *Wetlands*, 3, 1211-1221.

<sup>59</sup> 33 C.F.R. § 332.3(b)(2).

<sup>60</sup> *Id.*

<sup>61</sup> N.C. Gen. Stat. § 143-214.11.

The Nature Conservancy's Virginia Aquatic Resources Trust Fund noted a similarly strict enforcement of the hierarchy in Virginia. Virginia Administrative Code states that compensatory mitigation options shall be considered on a case-by-case basis, but that mitigation bank credits should be considered first, followed by ILF credits, and then permittee-responsible options, buffers, and preservation projects.<sup>62</sup> The program expressed that it does not sell credits when there are private bank credits available. Similarly, the Northwest Florida Water Management District program provides mitigation options to the Florida Department of Transportation only when use of a private mitigation bank is not feasible. This also is pursuant to requirements in section 373.4137, Florida Statutes.

A handful of programs mentioned they were cognizant of the potential for duplication from other ILF providers whose service areas overlapped with their own. Some of those programs report sharing and receiving technical knowledge to most effectively plan and execute mitigation work, including consultation with the Corps. The ILF programs sponsored by both the Great Land Trust and the Tucson Audubon Society, for example, communicate with other programs in their regions.

A small number of ILF programs reported that some or most of their competition was from permittee-responsible mitigation. These programs included the Hood Canal Coordinating Council, the Connecticut ILF Program, The Nature Conservancy's Ohio Stream and Wetland ILF Program, and the Tennessee Stream Mitigation Program.

Many programs reported that they generally do not have significant competition for credit sales. In many cases, this was due to the fact that alternate mitigation options—credits from private banks and other ILF programs or feasible permittee-responsible mitigation—did not exist within the program's service area(s).

Even where there is competition, most programs still reported that it is not an impeding factor in their work. In some cases, this was because an ILF program was the only provider of specific types of credits. The Georgia-Alabama Land Trust program, for example, reported that, while banks in Georgia have plentiful stream credits to offer, they have few wetlands credits. The ILF program fills that niche. Likewise, the Louisiana Department of Natural Resources ILF Program provides fresh, intermediate, brackish, and saline marsh credits. Permittees are required to purchase credits from the ILF when there are no banks available in the hydrologic basin of impact or if there are impacts to a small acreage. For example, the New Orleans District requires permit applicants to purchase no smaller than 0.1 acre of credits from a mitigation bank. In order to prevent an applicant from over mitigating, since the ILF credits are sold in hundredths of an acre, LDNR will allow permittees to purchase credits from the ILF for smaller impacts (less than 0.1 acre) instead of requiring a mitigation bank credit purchase. In North Carolina, bank credit supply in most HUCs is not meeting demand. NCDMS provides a secondary option for permittees to meet mitigation credit needs within the HUC.

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<sup>62</sup> 9 Va. Admin. Code § 25-210-116(C)(2).

Furthermore, in other cases, demand for credits overall is simply high enough that there are sufficient customers to patronize all mitigation providers. The King County Mitigation Reserves Program in Washington State noted that development of large infrastructure projects, like railroads, has augmented demand for credits from all providers. The Everglades National Park ILF Program reported that regional residential and commercial development and impacts from transportation projects have generated such demand that the program sells out of credits almost immediately after notifying the public of their availability.

## Fees

### Range of Fees Charged by Programs

ILF programs determine the credit fees. The 2008 Rule requires that ILF providers determine their schedule of fees for credits using a “full cost accounting approach”—that is, one that proactively anticipates and accounts for all costs associated with executing ILF mitigation.<sup>63</sup> Costs per credit thus vary widely among programs and sometimes among credit types offered by a program (see Table 7). Many programs have developed fees for each service area covered by the program.

<b>Program</b>	<b>Fee Category</b>	<b>Pricing Per Unit</b>
Coachella Valley ILF Program	Restoration/Rehabilitation	\$224,500.00/acre
	Enhancement	\$187,450.00/acre
	Buffer	\$144,900.00/acre
Connecticut ILF Program	Housatonic River	\$7.56/sq. ft.
	Southwest Coastal	\$9.12/sq. ft.
	Southcentral Coastal	\$7.45/sq. ft.
	Connecticut River	\$10.11/sq. ft.
	Thames River	\$10.80/sq. ft.
	Thames River North of I-95 and Southeast Coastal	\$7.97/sq. ft.

<sup>63</sup> 33 C.F.R. § 332.8(o)(5)(ii).

**Table 7 (continued): Fees charged by ILF programs based on interviews, information posted on program websites, and instrument review.**

Ducks Unlimited New York ILF Program	Black River, Conewango-Pennsylvania River, Lower Genesee River, Oneida Lake, Oswego River, Seneca-Finger Lakes Region, or Eastern and Western St. Lawrence River	\$98,022.00/CR
	Buffalo-Eighteen Mile Creek or Niagara River	\$125,000.00/CR
	Irondequoit-Ninemile Creek	\$105,000.00/CR
Ducks Unlimited Vermont ILF Program	Connecticut River	\$2.53/sq. ft.
	St. Francois	\$2.57/sq. ft.
	Richelieu	\$3.02/sq. ft.
	Upper Hudson	\$2.97/sq. ft.
Everglades National Park ILF Program	Federal UMAM	\$69,000.00/CR
	State Acre	\$12,759.61/CR
Georgia-Alabama Land Trust	Upper Savannah, Upper Coosa, Etowah, and Tennessee Wetlands	\$44,000.00/CR
	Upper Chattahoochee Wetlands	\$55,000.00/CR
	Upper Oconee and Upper Ocmulgee Wetlands	\$49,500.00/CR
	Withlacoochee Streams	\$104.50/CR
	Tennessee and Lower Flint: Middle Flint/Lake Blackshear Streams	\$121.00/CR
	Satilla: St Mary's River Non-Tidal Streams	\$88.00/CR
Keys Restoration Fund	Non-Tidal (freshwater) Wetlands	\$217,800.00/CR
	Seagrasses	\$1,089,000.00/CR
King County Mitigation Reserves Program	Credit-Debit Method, case-by-case	\$44-50,000.00/CR
	Non-tidal influence aquatic resource	\$430-500,000.00/CR, by acre
Living River Restoration Trust (Elizabeth River Project)	Tidal River Bottom Restoration	\$370,000.00/CR
	Tidal River Bottom Rehabilitation	\$370,000.00/CR
	Tidal Wetland	\$740,000.00/CR
	Tidal Oyster Reef	\$254,740.00/CR

**Table 7 (continued): Fees charged by ILF programs based on interviews, information posted on program websites, and instrument review.**

Maine Natural Resource Conservation Program	Calculator for all	Varies; Developed through ME DEP Fact Sheet (Fees range from \$2.92 – 4.08/sq. ft. before application of multipliers)
Massachusetts Department of Fish and Game ILF Program	Berkshire/Taconic Service Area	Wetland - \$13.68/sq. ft. (1 wetland credit (1 acre) costs \$595,900.80)
		Stream - \$100.00/linear ft (1 credit costs \$300.00) [\$ /linear foot x 3 components (left bank, right bank, channel)]
	Connecticut River	Wetland - \$13.70/sq. ft.
		Stream - \$100.00/linear ft
	Quabbin/Worcester	Wetland - \$13.73/sq. ft.
		Stream - \$100.00/linear ft
	Coastal	Wetland - \$14.26/sq. ft. (1 wetland credit (1 acre) costs \$621,165.60)
		Stream - \$200.00/linear ft (1 credit costs \$600.00) [\$ /linear foot x 3 components (left bank, right bank, channel)]
Montana Aquatic Resources Services ILF Program (MARS)	Calculator	Varies; Prices calculated using one of several formulas. One formula takes into account the costs of a pre-approved project. Other formulas consider typical wetland/stream restoration costs where a project has not already been approved. Formulas consider costs associated with restoration, administrative costs for program, and contingency and long-term management costs.
Mountains Restoration Trust ILF Program	All	\$250,000.00/CR

**Table 7 (continued): Fees charged by ILF programs based on interviews, information posted on program websites, and instrument review.**

New Hampshire Aquatic Resource Mitigation Fund	Calculator for all	Varies; Calculator takes into account area impacted, land acquisition and construction costs, and program administrative costs.
North Carolina Division of Mitigation Services	Statewide Standard (SS) Stream	\$507.32/CR
	SS Freshwater Wetlands	\$60,187.45/CR
	SS Coastal Wetlands	\$560,000.00/CR
	SS Riparian Buffer	\$0.97/CR
	Catawba Wetlands	\$104,447.63/CR
	Little Tennessee Wetlands	\$106,598.74/CR
	Roanoke Wetlands	\$91,055.65/CR
	Yadkin Wetlands	\$91,984.41/CR
	Cape Fear: Randleman and Jordan Lake Lower New Hope Riparian Buffer	\$4.38/CR
	Catawba Riparian Buffer	\$1.87/CR
	Neuse Riparian Buffer	\$1.52/CR
	Neuse Basin Nitrogen Offset	\$13.37/lb.
	Neuse Outside Falls Lake Watershed Nitrogen Offset	\$21.86/lb.
	Neuse Falls Lake Watershed Nitrogen Offset	\$10.52/lb.
	Neuse Falls Lake Watershed Phosphorus Offset	\$187.56/lb.
	Tar-Pamlico Basin Nitrogen Offset	\$8.28/lb.
	Tar-Pamlico Basin Phosphorus Offset	\$117.96/lb.
	Jorden Lake Watershed Nitrogen Offset	\$132.00/lb.
	Jorden Lake Watershed Phosphorus Offset	\$343.93/lb.
North Dakota Ducks Unlimited ILF	All	\$50,000.00/acre
Northern Kentucky University ILF Program	Stream	\$300.00/CR
Pierce County ILF Program	Chambers/Clover Creek Watershed	\$40,000.00/CR
	Nisqually Watershed	\$30,000.00/CR

**Table 7 (continued): Fees charged by ILF programs based on interviews, information posted on program websites, and instrument review.**

Riverside-Corona Resource Conservation District ILF Program	Rehabilitation	\$265,000.00/acre
	Enhancement	\$230,000.00/acre
	Buffer	\$185,00.00/acre
Southeast Alaska Mitigation Fund	Wetland	\$20-60,000.00/CR
	Stream	\$500-10,000.00/CR
Stream + Wetlands Foundation ILF Program	Wetland	\$45,000.00/acre
	Stream	\$230.00/linear ft.
The Nature Conservancy's Ohio Stream and Wetland ILF Program	Upper Ohio-Wheeling and Raccoon-Symmes Creeks Streams	\$240.00/ft.
	Upper Ohio, Upper Ohio-Shade, Hocking River, and Wills Creek Streams	\$245.00/ft.
	St. Joseph River, Upper Maumee, Tiffin River, and Little Miami River Streams	\$255.00/ft.
	Upper Scioto River and Lower Great Miami Streams	\$260.00/ft.
	Conneaut, Shenango River, Little Muskingum River, and Muskingum River Streams	\$265.00/ft.
	Huron-Vermilion, Grand River, and Tuscarawas River Streams	\$275.00/ft.
	Upper Great Miami and Ohio Brush-Whiteoak Streams	\$285.00/ft.
	Ottawa, Raisin River, St. Mary's River, Auglaize River, Black-Rocky Rivers, Mahoning River, Mohican River, Walhonding, Licking River, Lower Scioto, Paint Creek, and Mississinewa River Streams	\$315.00/ft.
	Sandusky Streams	\$320.00/ft.
	Lower Maumee Streams	\$340.00/ft.
	Upper Wabash Streams	\$370.00/ft.
	Blanchard River and Cedar-Portage River Streams	\$380.00/ft.
	Cuyahoga River and Chagrin-Ashtablu Streams	\$420.00/ft.

**Table 7 (continued): Fees charged by ILF programs based on interviews, information posted on program websites, and instrument review.**

	Whitewater River and Middle Ohio-Laughery Streams	\$440.00/ft.
	Upper Scioto River Wetlands	\$45,000.00/acre
	St. Joseph River, Upper Maumee, Tiffin River, Ottawa, Raisin River, and Lower Maumee Wetlands	\$48,000.00/acre
	Tuscarawas River Wetlands	\$49,000.00/acre
	Raccoon-Symmes Creeks, Upper Ohio, Upper Ohio-Shade, Hocking River, Wills Creek, Conneaut, Shenango River, Little Muskingum River, Muskingum River, Little Scioto-Tygarts, Grand River, Auglaize River, Mahoning River, and Cedar-Portage River Wetlands	\$51,000.00/acre
	Upper Ohio-Wheeling, Upper Great Miami, Paint Creek, and Sandusky Wetlands	\$52,000.00/acre
	Upper Wabash and Blanchard River Wetlands	\$55,000.00/acre
	Little Miami River, Lower Great Miami, Huron-Vermillion, Ohio Brush-Whiteoak, Lower Scioto, and Mississinewa River Wetlands	\$56,000.00/acre
	St. Mary's River, Black-Rocky Rivers, Mohican River, Walhonding, and Licking River Wetlands	\$58,000.00/acre
	Cuyahoga River and Chagrin-Ashtabula Wetlands	\$66,000.00/acre
	Whitewater River and Middle Ohio-Laughery Wetlands	\$71,000.00/acre
	Upper Ohio, Upper Ohio-Shade, Hocking River, and Wills Creek Streams	\$245.00/ft.
The Nature Conservancy's Virginia Aquatic Resources Trust Fund	Atlantic Ocean, Potomac, Chesapeake Bay, Upper James, or Roanoke Non-Tidal Wetlands (NTW)	\$100,000.00/acre
	Atlantic Ocean, Rappahannock, or Lower James Tidal Wetlands (TW)	\$500,000.00/acre

**Table 7 (continued): Fees charged by ILF programs based on interviews, information posted on program websites, and instrument review.**

	Atlantic Ocean, York, Chesapeake Bay, Upper James, Chowan, New River, or Tennessee Streams	\$400.00/CR
	Shenandoah NTW	\$85,000.00/acre
	Shenandoah, Rappahannock, Middle James, Lower James, or Roanoke Streams	\$500.00/CR
	Potomac TW	\$600,000.00/acre
	Potomac Streams	\$700.00/CR
	Rappahannock NTW	\$70,000.00/acre
	York NTW	\$65,000.00/acre
	York TW	\$400,000.00/acre
	Chesapeake Bay TW	\$450,000.00/acre
	Middle James NTW	\$55,000.00/acre
	Lower James NTW	\$50,000.00/acre
	Chowan NTW	\$40,000.00/acre
	Chowan TW	\$550,000.00/acre
	New River or Tennessee TW	\$75,000.00/acre
Tucson Audubon Society ILF Program	All	\$85,000.00/CR

## Full Cost Accounting

The 2008 Rule does not prescribe a fully comprehensive list of costs for each program to consider when determining fees. The language in the Rule does, however, provide the following items for consideration under a full cost accounting approach:

Costs must be based on full cost accounting, and include, as appropriate, expenses such as land acquisition, project planning and design, construction, plant materials, labor, legal fees, monitoring, and remediation or adaptive management activities, as well as administration of the in-lieu fee program.<sup>64</sup>

The regulation also requires that programs proactively account for other possible costs:

The cost per unit credit must also consider contingency costs appropriate to the stage of project planning, including uncertainties in construction and real estate expenses. The cost per unit of credit must also consider the resources necessary for the long-term management and protection of the in-lieu fee project. In

<sup>64</sup> 33 C.F.R. § 332.8(n)(5)(ii).

addition, the cost per unit credit must include financial assurances that are necessary to ensure successful completion of in-lieu fee projects.<sup>65</sup>

### How Programs Are Implementing Full Cost Accounting in Practice

Programs consider a range of costs to determine credit prices. We frequently heard that land costs are the primary input in fee calculations. Programs also reported that costs associated with project design, construction, administration, contingency fees, and long-term management, among other factors are included in the calculation. Often programs told us that administration, contingency, and long-term management costs are added as percentages of credit fees, while other costs may be treated as line items in the cost calculation. Other programs include line items for temporal lag (for advance credits) and inflation.

Programs use a range of data to determine credit prices. Some programs told us they base fees off of previous projects. Other programs are comprehensively gathering and analyzing data from a variety of sources, including land appraisals, analyses of regional construction costs, spatial analyses of regional contributing factors, mineral rights, and analyses of the credit market, among others. For example, the Southeast Alaska Mitigation Fund conducted a review of all the restoration projects completed in Southeast Alaska to determine project costs for full cost accounting. Another factor that may influence the fee is economy of scale, especially in terms of long-term management (LTM) costs. For example, one program told us that LTM costs can be distributed across a larger area, therefore reducing the cost of LTM per credit and thus total credit cost.

### How Programs Are Determining Fees

Generally, programs either develop fixed fees (or fee ranges) for credits in a given service area or resource type or use calculators or formulas to determine fees when credits are sold. Most programs told us they are calculating fixed fees per service area.

#### Fixed Fees

The Quil Ceda Village ILF program mitigation fees are composed of two components: a credit fee and a land fee. The credit fee was determined by summing the average project cost per acre of wetland restoration (calculated by comparing an estimated per credit cost using the King County Mitigation Cost Worksheet and real project costs calculated based on real costs of projects conducted by the Tribe), a contingency fee, administrative costs, monitoring and maintenance, and long-term monitoring and maintenance costs.<sup>66</sup> The land fee is “used exclusively for purchase of properties to replace those impacted under permit authorizations.”<sup>67</sup> The land fee is based on an analysis of average cost of recent natural lands acquisitions in the service area. The final cost per credit assumes 3% inflation projected over three years of project implementation.

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<sup>65</sup> *Id.*

<sup>66</sup> Quil Ceda Village. (2013). *Quil Ceda Village In-Lieu Fee Program: In-Lieu Fee Instrument*.

<sup>67</sup> *Id.*

The Nature Conservancy’s Ohio Stream and Wetland ILF Program considers a wide range of factors in determining fees. Accounting categories include administration, property acquisition, pre-construction design, construction, monitoring and maintenance, stewardship endowment, and program contingency. Figure 7 lists the components in each category and descriptions of costs per category (either fixed cost, percentage of fee, or placeholder for calculation). The program then gathers information on implementation costs, other contributing factors (related to policies (credit methodology, performances standards, state regulatory buffer widths, and state regulatory monitoring period), geography (stream and hydric soils density, mineral rights, property values), and market factors (permitting history, credit sale projections, service area size)) to determine costs using a project cost/revenue spreadsheet.

	Administration	Property Acquisition	Pre-Construction Design	Construction	Monitoring and Maintenance	Stewardship Endowment	Program Contingency
<b>Components</b>	<ul style="list-style-type: none"> <li>• Strategic planning</li> <li>• Watershed planning</li> <li>• Quality assurance</li> <li>• Research and development</li> <li>• Adaptive management</li> <li>• Contract management</li> <li>• Account management, budgeting and accounting</li> <li>• Reporting to regulators and stakeholders</li> <li>• Database management</li> <li>• Site identification</li> <li>• Concept plan development</li> </ul>	<ul style="list-style-type: none"> <li>• Purchase land or conservation easement</li> <li>• Land survey</li> <li>• Legal fees for title search, title recording, etc.</li> <li>• Environmental assessment</li> <li>• Baseline documentation report</li> <li>• If needed - subordination of mineral rights or risk analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Administer RFP</li> <li>• Feasibility analysis</li> <li>• Watershed assessment</li> <li>• Reach analysis</li> <li>• Reference analysis</li> <li>• Topographic study</li> <li>• Floodplain management study</li> <li>• Final design</li> <li>• Mitigation plan</li> <li>• Permitting</li> <li>• Cultural resource assessment</li> <li>• Endangered species avoidance and/or mitigation</li> </ul>	<ul style="list-style-type: none"> <li>• Administer RFP</li> <li>• Supervision of construction</li> <li>• Mobilization of equipment and personnel</li> <li>• Earthwork (clearing, and topsoil stockpile, excavation, cut and fill, grading, installation of structures, erosion /water control)</li> <li>• Revegetation</li> <li>• Invasive species control</li> <li>• As-built documents, record drawings</li> <li>• Financial Assurances &amp; Project contingency (10% construction costs)</li> </ul>	<ul style="list-style-type: none"> <li>• 10 years of monitoring</li> <li>• Maintenance of stream and wetland structures, boundaries, riparian vegetation, repairs</li> </ul>	<ul style="list-style-type: none"> <li>• Determined by the size of the property, the type of Site Protection Instrument, the specific long-term management needs, the stewardship needs of the owner/holder of the Site Protection Instrument, annual cost estimates to meet the various needs, inflationary adjustments, and other contingencies</li> </ul>	<ul style="list-style-type: none"> <li>• Used to fund unanticipated program or project expenses</li> <li>• Or to implement supplemental or advance mitigation projects</li> </ul>
<b>Cost</b>	8-15% of credit cost	County specific land costs + legal fees	~20% of Construction Costs	Determined by the project specific amounts of restoration, enhancement, and preservation	Monitoring ~\$15k/year + project specific invasive species control needs	20% of purchase price + project specific long-term management needs	5% of credit cost

**FIGURE 7: FULL COST ACCOUNTING CATEGORIES CONSIDERED BY THE NATURE CONSERVANCY’S OHIO STREAM AND WETLAND ILF PROGRAM WHEN DETERMINING FEES. SOURCE: PROGRAM SPONSOR.**

### Formulas/Calculators

Several programs use formulas to calculate credit costs for each credit sale. The National Fish and Wildlife Foundation Sacramento District California ILF Program uses a table-based formula to calculate fees. The fees are composed of three components: a Base Price for ILF Project development, implementation, and long-term management and monitoring; a Contingency Amount for contingencies; and an Administrative Fee Amount for general administration of the

program.<sup>68</sup> Credit prices are then based on the number of credits purchased per resource type according to the tables below (see Figure 8). The program instrument states that the price schedule was developed through financial modeling based on research and experience. As indicated in the table, a bulk-price discount may be given for larger credit purchases, but the program reserves the option to not offer the discount.

**Table 1. Aquatic Resource Credits**

A	B	C	D	E	F
No. of Credits Purchased	Unit Price Per Credit	Base Price (\$) (# Credits x B)	Contingency Amount (\$)	Administrative Fee Amount (\$)	Total Price (\$) (C + D + E)
0.01 – 0.50	\$150,000		(0.30 x C)	\$10,000	
0.51 – 1.00	\$150,000		(0.25 x C)	(0.15 x C)	
1.01 – 5.00	\$150,000		(0.20 x C)	(0.15 x C)	
5.01 – 10.00	\$125,000*		(0.15 x C)	(0.17 x C)	
10.01 +	\$100,000*		(0.10 x C)	(0.20 x C)	

\*Bulk-price discount to be applied *if applicable* for a particular Advance Credit Transfer

**Table 2. Vernal Pool Credits**

A	B	C	D	E	F
No. of Credits Purchased	Unit Price Per Credit	Base Price (\$) (# Credits x B)	Contingency Amount (\$)	Administrative Fee Amount (\$)	Total Price (\$) (C + D + E)
0.01 – 0.25	\$265,000		(0.30 x C)	\$10,000	
0.26 – 0.50	\$265,000		(0.30 x C)	(0.15 x C)	
0.51 – 1.00	\$265,000		(0.30 x C)	(0.15 x C)	
1.01 – 3.00	\$265,000		(0.20 x C)	(0.15 x C)	
3.01 – 5.00	\$220,000*		(0.15 x C)	(0.16 x C)	
5.01 +	\$175,000*		(0.10 x C)	(0.20 x C)	

\*Bulk-price discount to be applied *if applicable* for a particular Advance Credit Transfer

**FIGURE 8: TABLE-BASED FORMULA USED BY THE NATIONAL FISH AND WILDLIFE FOUNDATION SACRAMENTO DISTRICT CALIFORNIA ILF PROGRAM TO DETERMINE CREDIT PRICE. SOURCE: PROGRAM INFORMATION: EXHIBIT F – PROGRAM ACCOUNT**

The Maine Natural Resource Conservation Program uses a resource-dependent formula. The program determines a base rate that is calculated using estimates of regional construction and monitoring costs plus county unimproved land cost. Once the base rate is determined, the program applies resource multipliers. The resource multiplier is an “adjustment factor that reflects the significance of specific resources and the Department’s resource compensation ratio outlined in the Wetlands and Waterbodies Protection Rules, Chapter 310 and the Significant Wildlife Habitat Rules, Chapter 355.”<sup>69</sup> The resource multipliers include:

<sup>68</sup> National Fish and Wildlife Foundation Sacramento District California ILF Program. (2014). *Sacramento District California In-Lieu Fee Enabling Instrument*.

<sup>69</sup> *Maine Department of Environmental Protection Fact Sheet – In Lieu Fee Compensation Program*, [https://www.maine.gov/dep/land/nrpa/ILF\\_and\\_NRCP/index.html](https://www.maine.gov/dep/land/nrpa/ILF_and_NRCP/index.html).

- 2:1 for projects  $\geq$  20,000 square feet;
- 2:1 for areas of special significance (e.g., peatlands dominated by shrubs, sedges, and sphagnum moss; coastal wetlands; great ponds; and others).

Fees are then calculated via a resource-specific formula. For example, the formula for wetlands is:

Wetland compensation fee = (Direct wetland impact/sq. ft. x (natural resource enhancement & restoration cost/sq. ft. + avg. assessed land valuation/sq. ft.)) x (resource multiplier)

Additional fees are then added for impacts to uplands that affect aquatic organisms (e.g., vernal pool species). For example, the formula for the vernal pool compensation fee is:

Vernal pool compensation fee = (Direct wetland impacts within the Significant Vernal Pool habitat/sq. ft. x (natural resource enhancement & restoration cost/sq. ft. + avg. assessed land valuation/sq. ft.)) x (resource multiplier of 2) + (Direct non-wetland impacts within the Significant Vernal Pool habitat/sq. ft. x avg. assessed land valuation/sq. ft.)

The Oregon DSL program uses a payment calculator to determine fees when ILF project costs are not known (project has not yet been conducted) at the time of payment.<sup>70</sup> The formula is:

Payment = [A + R + RMV + LT]  $\div$  mm; where

- A = Administrative costs (10% of R, RMV and LT)
- R = Restoration costs. The sum of all anticipated costs (e.g., engineering, construction, planning and seven years of monitoring and maintenance) based on a biennial survey of regional project data.
- RMV = Real Market Value of the impact area (total cost and acreage of the tax lot). Land value is discounted based on a combination of zoning, tax lot size and improvements.
- LT = Long Term management costs (30% of the restoration costs)
- mm = mitigation multiplier. The mm is the number of credits typically generated per unit area of mitigation conducted. The program assumes 2 acres of mitigation for every one acre of impact so mm = 0.5.

The New Hampshire Aquatic Resource Mitigation Fund allows users to calculate fees using an online calculator. Fees are based on construction cost (adjusted yearly with rate of inflation), land acquisition costs (adjusted locally assessed values to estimate 100% market value), and an administrative cost. To determine payment amount, users start by inputting square feet of impact and town land value (based on table of town values included in the calculator). The impact amount is converted to acres and then adjusted according to a required mitigation ratio

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<sup>70</sup> Oregon Department of State Lands ILF Program, *Payment Calculator for In-Lieu Fee Programs*, [https://www.oregon.gov/dsl/WW/Documents/DSLpaymentCalculatorforMitigation\\_11032016.xlsx](https://www.oregon.gov/dsl/WW/Documents/DSLpaymentCalculatorforMitigation_11032016.xlsx).

based on resource type (forested wetlands = 1.5:1; tidal wetlands = 3:1; all other areas = 1.5:1). Wetland construction and land acquisition (based on town land values) costs are then calculated based on the adjusted construction acreage. An administrative fee is added to the total construction and land cost to yield the total payment. The calculator is available on the program's website at <https://www.des.nh.gov/organization/divisions/water/wetlands/wmp/> (see Figure 9). The program also has a calculator for determining stream payments.

For at least one program, fees are set in state statute. The Northwest Florida Water Management District reported that fees are defined by Florida statute but are adjusted annually based on land costs.

2018 VALUES									
TOWN	Equalized Value per Acre	<b>NHDES AQUATIC RESOURCE MITIGATION FUND WETLAND PAYMENT CALCULATION</b> <b>***INSERT AMOUNTS IN YELLOW CELLS***</b>							
ACWORTH	1309.0								
ALBANY	802.0								
ALEXANDRIA	2121.0								
ALLENSTOWN	5594.0								
ALSTEAD	2084.0	<b>1 Convert square feet of impact to acres:</b>		<b>INSERT SQ FT OF IMPACT</b>		Square feet of impact		54678.00	
ALTON	17543.0							43560.00	
AMHERST	24675.0					Acres of impact =		1.2552	
ANDOVER	3591.0								
ANTRIM	3170.0								
ASHLAND	10756.0								
ATKINSON	32795.0	<b>2 Determine acreage of wetland construction:</b>							
AUBURN	17829.0			Forested wetlands:				1.8829	
BARNSTEAD	5998.0			Tidal wetlands:				3.7657	
BARRINGTON	10193.0			All other areas:				1.8829	
BARTLETT	4447.0								
BATH	1497.0								
BEAN'S GRANT	365.0	<b>3 Wetland construction cost:</b>							
BEAN'S PURCHASE	365.0			Forested wetlands:				\$167,969.82	
BEDFORD	32795.0			Tidal Wetlands:				\$335,939.64	
BELMONT	9643.0			All other areas:				\$167,969.82	
BENNINGTON	3181.0								
BENTON	365.0	<b>4 Land acquisition cost (See land value table):</b>							
BERLIN	710.0	<b>INSERT LAND VALUE FROM TABLE WHICH APPEARS TO THE LEFT. (Insert the amount do not copy and paste.)</b>		Town land value:				1309	
BETHLEHEM	879.0			Forested wetlands:				\$2,464.65	
BOSCAWEN	4596.0			Tidal wetlands:				\$4,929.30	
BOW	16350.0			All other areas:				\$2,464.65	
BRADFORD	3113.0								
BRENTWOOD	16035.0								
BRIDGEWATER	11471.0	<b>5 Construction + land costs:</b>							
BRISTOL	10367.0			Forested wetland:				\$170,434.47	
BROOKFIELD	2199.0			Tidal wetlands:				\$340,868.94	
BROOKLINE	13892.0			All other areas:				\$170,434.47	
CAMBRIDGE	365.0								
CAMPTON	3479.0	<b>6 NHDES Administrative cost:</b>							
CANAAN	3689.0			Forested wetlands:				\$34,086.89	
CANDIA	7429.0			Tidal wetlands:				\$68,173.79	
CANTERBURY	3161.0			All other areas:				\$34,086.89	
CARROLL	2348.0								
CENTER HARBOR	22943.0	<b>***** TOTAL ARM PAYMENT*****</b>							
CHANDLER'S PURCHASE	365.0			Forested wetlands:				\$204,521.36	
CHARLESTOWN	2173.0			Tidal wetlands:				\$409,042.73	
CHATHAM	445.0			All other areas:				\$204,521.36	
CHESTER	10343.0								
CHESTERFIELD	6653.0								

FIGURE 9: CALCULATOR USED BY NEW HAMPSHIRE AQUATIC RESOURCE MITIGATION FUND TO DETERMINE FEES. SOURCE: AQUATIC RESOURCES MITIGATION FUND CALCULATOR

## Information Gaps and Other Constraints on Effective Full Cost Accounting

One of the most frequently cited obstacles to implementing full cost accounting is the pressure on programs to keep fees artificially low in order to keep pace with competition from other providers or to sell credits in slow markets. One provider, for example, has stopped including administrative costs in its fees—meaning that the program staff do not currently have a reliable pool from which to draw their salaries for their work on the program. For some, keeping fees low is not a voluntary measure, but a mandate. Updating the New Hampshire Aquatic Resource Mitigation Fund fee, for example, would require a legislative change.

Many interviewed programs reported, however, that scheduled fees are generally sufficient to cover project and administrative costs and that they have a process for regularly evaluating and adjusting (if necessary) fees. Yet, many—if not most—active ILF programs expressed a desire for further information or direction on how best to implement full cost accounting.

Programs suggested that they often lack information on the factors that should be included in full cost accounting, as well as how to estimate the cost of each factor. Programs indicated that it is difficult to evaluate the nuances of their local economy, geography, weather, regulatory and permitting landscape, or other factors. Programs also described having difficulty in accessing critical historical data on factors ranging from land values or pace of development to weather and climate change. Programs expressed that they have learned from practice to consider factors like temporal lag and inflation that they had not immediately considered when first structuring fees.

Some programs have sought to fill in information gaps by working with partners to conduct studies or analyses of the local compensation market or other factors. For example, when initially mapping out appropriate fee prices, the Southeast Alaska Mitigation Fund contracted out to have a full review done of all the restoration projects conducted in Southeast Alaska. This provided the program a comprehensive view of the considerations and costs relevant to projects conducted in the region. This historic data provided the backbone of their accounting process. Other programs have conducted similar analyses.

Having accountants or individuals with accounting expertise on staff is a clear advantage for full cost accounting. Some programs have sought out the assistance and review of other supporters, like sponsor organization board members.

## Adjusting Fees

Each program adheres to a slightly different timeline and process for evaluating and amending its fees. Some programs noted that cumbersome processes discourage them from adjusting prices as frequently as may be desirable. Others reported that they have standard practices in place for regularly—often annually—evaluating whether fees collected are enough to cover project and administrative costs. Programs that have flexibility to update their fees without lengthy approval or amending processes may be better equipped to update their fees as needed.

## Frequency of Evaluation

Most programs evaluate the adequacy of their fees quarterly or annually. Some programs noted that their evaluation timeline is set by their instrument. For example, The Nature Conservancy's Ohio Stream and Wetland ILF Program instrument states, "The Sponsor will evaluate credit fees on an annual basis. Fees may be adjusted as deemed necessary to reflect the full cost accounting and the fee adjustments will not constitute a modification of the Instrument."<sup>71</sup> Other programs stated that fee evaluation is conducted as a larger annual audit conducted by their parent organization. Select programs indicated that their timeline for evaluation is designated in state statute. The North Carolina Division of Mitigation Services, for example, told us it is required by state code to conduct an annual review of fees, culminating in a once-annual adjustment of rates.

A few programs mentioned that they evaluate their fees less frequently than once per year or that they have yet to evaluate their fees since their program was approved under the 2008 Rule.

## Process of Adjustment

Many programs reported that they have or will soon update fees to keep up with program costs. Some sponsors have significant independence and authority over decisions to change fees. Others, however, may be required to consult with—or at least notify—their sponsor organization's board members, IRT representatives, or Corps Liaisons. The Montana Aquatic Resources Services ILF Program, for instance, need only notify parent organization board members. A few are required to go through legislative channels if they would like to update fees, as their schedule or calculator may be codified in statute. This is the case for the New Hampshire Aquatic Resource Mitigation Fund.

Programs varied in their approach to adjusting fees when necessary. Some programs told us that their process includes a rigorous and comprehensive accounting for all actual component expenses and comparison to revenue gained through fees. Some programs have developed and are regularly using financial planning models that allow them to project varied costs out over many years (e.g., Everglades National Park ILF Program). Others described a process that is less rigorous (e.g., simply raising the fee by a set percentage). However, program staff told us that, even if this results in sufficient fees, it can leave staff without critical insights into how costs might change over time or how they might most effectively allocate or spend funds in the present.

There are drawbacks and benefits to both flexible and more rigid processes for evaluating and updating fees. The structure provided by a more rigid process—be that in timeline or in required engagement with different stakeholders—may ensure that a program is more intimately aware of its financial status or may have a larger pool of expertise to draw upon when needed. A more flexible process, however, may allow a proactive program to more efficiently respond to needs as they arise. Several programs noted that the rigidity or extensive

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<sup>71</sup> The Nature Conservancy's Ohio Stream and Wetland ILF Program. (2014). *The Nature Conservancy's Ohio Stream and Wetland In-Lieu Fee Mitigation Program Instrument*.

requirements of their process for updating fees drew down slim resources and consumed time that was in short supply.

### Accessibility of Fee Information to the Public

The 2008 Rule requires that a draft fee schedule be included in the program instrument.<sup>72</sup> Instruments are publicly available on the Corps' RIBITS website.<sup>73</sup> Most interviewed programs provide some information about their mitigation fee schedule on their website—the most public- and customer-facing platform a program typically maintains. Some programs post their price per credit, while others post a price calculator or details about the formula they use for calculating fees.

A smaller, but not insignificant, group of providers does not make information about their fees available through their website or other public fora. The programs that specified that they do not share these details expressed that this was for one of two reasons: (1) they update their prices frequently or (2) they keep this information somewhat more private due to competition with other providers. Several programs do not post information about their fees online, but they will provide information to those who specifically request it.

### Observations and Suggestions

Programs are approaching full cost accounting in a variety of ways. Regardless of whether the program decides to develop fixed fees or use formulas/calculators to determine costs when credits are sold, it is important to have a good understanding of the factors that need to be included in full cost accounting, be able to estimate the costs of each factor using the best available information, have a process for evaluating the sufficiency of fees, and have a process for adjusting fees as necessary to ensure project costs are covered.

As illustrated above, some programs (such as The Nature Conservancy's Ohio Stream and Wetland ILF Program) have invested significant time identifying the individual components to consider when calculating fees. Broad categories to be included in fee determination should generally include: administration; land cost/property acquisition fees; project design; construction costs; monitoring and maintenance costs; long-term management costs; and project/program contingency. These broad categories can then be broken down into components. For example, property acquisition costs may include land costs, survey fees, legal fees, and baseline documentation costs, among other considerations. Several programs also use existing models or calculators to break down and estimate LTM costs (see Long-Term Management section).

Many programs reported challenges in estimating costs for each factor. Gathering the appropriate data may necessarily involve conducting studies or analyses—either in house or with partners. For example, the Quil Ceda Village ILF program determines part of its fee by first calculating an estimated per credit cost using the King County Mitigation Cost Worksheet and then calculating a real per credit cost based on previously conducted projects. The averages of

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<sup>72</sup> 33 C.F.R. § 332.8(d)(6)(iv)(B).

<sup>73</sup> RIBITS, <https://ribits.usace.army.mil>.

two figures are then summed to get the “credit fee” portion of the credit cost. Several other programs conducted some kind of study of previous project costs to inform that portion of the fee calculation.

Once fees are calculated, it is crucial that programs have a process in place to regularly evaluate the sufficiency of fees and adjust fees as necessary. Program sponsors should at least annually evaluate how project implementation costs align with fees collected in the service area. This could be done as part of the annual reporting process and should be done in such a way as to determine how costs might change over time and to inform full cost accounting and fee calculation in the future (e.g., how actual construction costs in a given service area compare with budgeted costs). This type of analysis applies whether a program uses a fixed fee or formula/calculator approach. Formula/calculator inputs should be evaluated regularly and adjusted as necessary.

## Mitigation Projects

All ILF projects conducted by an approved ILF program are considered modifications to the ILF program instrument and are subject to the same review and approval process as was the instrument itself. All projects must have a separate mitigation plan and must be consistent with the approved compensation planning framework.<sup>74</sup>

The number and type of projects that each ILF program conducts vary widely. The youngest ILF programs have yet to initiate the selection or approval processes for their first projects, while the most established have already approved, implemented, or completed upwards of many hundreds of projects (Table 8).

Most programs told us that their projects are primarily restoration or at least include a restoration component. However, preservation projects are common in some regions of the country. Interviews with program sponsors revealed that preservation projects tend to be more common in northeast states and Alaska. Programs in New Hampshire, Maine, and Massachusetts all reported that preservation projects make up a significant portion of their budget.

<b>Table 8: Number of projects approved, pending, and completed reported by interviewed ILF programs.</b>	
<b>Program Name</b>	<b>Number of Projects</b>
Arizona Game and Fish Department ILF Mitigation Program	2 in construction; 4 pending; 3 complete (2 still in monitoring)
Connecticut ILF Program	17 approved, of which 5 pending in progress and 12 are completed

<sup>74</sup> 33 C.F.R. §§ 332.8(j)(1), (c)(1).

<b>Table 8 (continued): Number of projects approved, pending, and completed reported by interviewed ILF programs.</b>	
Ducks Unlimited New York ILF Program	8 in approval process; 1 constructed
Ducks Unlimited Vermont ILF Program	1 constructed; 2 in planning
Everglades National Park ILF Program	1 approved (phased work with credit sales)
Georgia-Alabama Land Trust	3 approved; 2 in planning/approval process
Great Land Trust	18 approved (4 approved under the current instrument)
Hood Canal Coordinating Council	5 projects (1 approved mitigation plan; 1 pending; 3 in development)
Kentucky Department of Fish and Wildlife Resources ILF Program	25 completed (in long-term management); 15 in post-construction monitoring; 24 in design
Keys Restoration Fund	1 in approval process; 2 in permitting; 1 constructed
King County Mitigation Reserves Program	6 approved (3 of those implemented; 0 complete)
Land Trust for the Mississippi Coastal Plain	3 approved projects
Living River Restoration Trust (Elizabeth River Project)	1 complete; a few others in planning
Louisiana Department of Natural Resources ILF Program	1 active project (under the current instrument)
Maine Natural Resource Conservation Program	85 approved or active (60 completed, 17 in monitoring, and 8 in progress; of the total, 20 are restoration/enhancement, 14 are preservation with restoration/enhancement, and the rest are preservation)
Massachusetts Department of Fish and Game ILF Program	1 implemented with monitoring; 3 in approval process; 4 in planning/pre-approval stage [ <i>note: Prior to 2014, the Massachusetts Division of Marine Fisheries sponsored an ILF program, now expired and incorporated in current MA Department of Fish and Game ILF Program. 3 pre-2014 projects complete; 1 in construction phase</i> ]
Montana Aquatic Resources Services ILF Program (MARS)	5 in preliminary planning; 4 complete
New Hampshire Aquatic Resource Mitigation Fund	80 approved; 72 complete
National Fish and Wildlife Foundation Sacramento District California ILF Program	9 submitted for approval from IRT
North Carolina Division of Mitigation Services	700+ approved (active or complete)
North Dakota Ducks Unlimited ILF	1 in approval process; 5 approved
Northwest Florida Water Management District	7 approved sites: 3 active/early work; 4 in monitoring

<b>Table 8 (continued): Number of projects approved, pending, and completed reported by interviewed ILF programs.</b>	
South Dakota Ducks Unlimited ILF	1 approved
Southeast Alaska Land Trust	24
Southeast Alaska Mitigation Fund	0
Stream + Wetlands Foundation ILF Program	8 projects in review and approval process
The Nature Conservancy's Ohio Stream and Wetland ILF Program	8 in approval process
The Nature Conservancy's Virginia Aquatic Resources Trust Fund	125 approved
Ventura River Watershed ILF Mitigation Program	2 approved
West Virginia Stream and Wetland Mitigation Program	11 planning; 3 approved (construction started); 6 in monitoring
Wisconsin Wetland Conservation Trust ILF Program	8 in development

## Structure of Project Implementation

Programs provide compensation for permitted impacts in a number of ways. These categories include:

- Design-build
- Design-bid-build
- Requests for Proposals (RFPs)
- Alternative Mitigation (e.g., purchase of bank credits)

For a relatively small number of programs, all program operations—from administration to design to restoration to monitoring to outreach—are for the most part accomplished in house. These programs often have staff that have design, surveying, field work, monitoring, administration, and marketing expertise, among other skills. The programs are able to accomplish most of the project work themselves, although they may contract out for large, heavy-duty work or other discrete tasks. In some cases, these programs draw from their larger parent organizations (either private organizations or public agencies) for some of these functions.

Other programs generally contract out parts of the operation—often site selection, engineering, design, and construction. Several programs told us that program staff may be responsible for administration, project selection, and reporting, but much of the engineering and construction are contracted out.

Another set of programs run RFP processes through which compensation projects are selected. Often projects selected through RFPs are full-delivery mitigation. In other words, applicants propose sites, design projects, and implement the compensation project. In some cases, applicants are also responsible for project success (through contract provisions). Projects

selected through an RFP process must still go through the same review and approval process as all other ILF projects.

The above are general categories, and programs may not fall neatly into just one of the categories. For example, some programs, like The Nature Conservancy's Virginia Aquatic Resources Trust Fund (VARTF), that generally design and implement projects in house will occasionally issue an RFP for a given project or service area. Other programs may purchase bank credits to meet their mitigation obligations. Some programs like the Georgia-Alabama Land Trust program do so fairly routinely. VARTF, Stream + Wetlands Foundation ILF Program, and National Fish and Wildlife Foundation Sacramento District California ILF Program have all done so to ensure program compliance with the three-year growing season timeframe.

## How Projects Are Identified and Prioritized

ILF program instruments must include “[a] prioritization strategy for selecting and implementing compensatory mitigation activities” as part of the compensation planning framework.<sup>75</sup> While the 2008 Rule does not offer specific guidance regarding prioritization strategies for ILF programs, it does describe the factors that the Corps must consider for site selection generally, which include:

- (i) Hydrological conditions, soil characteristics, and other physical and chemical characteristics;
- (ii) Watershed-scale features, such as aquatic habitat diversity, habitat connectivity, and other landscape scale functions;
- (iii) The size and location of the compensatory mitigation site relative to hydrologic sources (including the availability of water rights) and other ecological features;
- (iv) Compatibility with adjacent land uses and watershed management plans;
- (v) Reasonably foreseeable effects the compensatory mitigation project will have on ecologically important aquatic or terrestrial resources (e.g., shallow sub-tidal habitat, mature forests), cultural sites, or habitat for federally- or state-listed threatened and endangered species; and
- (vi) Other relevant factors including, but not limited to, development trends, anticipated land use changes, habitat status and trends, the relative locations of the impact and mitigation sites in the stream network, local or regional goals for the restoration or protection of particular habitat types or functions (e.g., re-establishment of habitat corridors or habitat for species of concern), water

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<sup>75</sup> 33 C.F.R. § 332.8(c)(2)(vi).

quality goals, floodplain management goals, and the relative potential for chemical contamination of the aquatic resources.<sup>76</sup>

Additionally, as part of the overall watershed approach, “[p]lanning efforts should identify and prioritize aquatic resource restoration, establishment, and enhancement activities, and preservation of existing aquatic resources that are important for maintaining or improving ecological functions of the watershed.”<sup>77</sup> The 2008 Rule further notes that “[t]he identification and prioritization of resource needs should be as specific as possible, to enhance the usefulness of the [watershed] approach in determining compensatory mitigation requirements.”<sup>78</sup>

Our interviews and review of program instruments found that ILF programs employ a wide range of prioritization strategies for mitigation selection and implementation. Many programs provide specific, tailored strategies in their instruments. A few program instruments, however, provide relatively basic or minimal information for this component of the compensation planning framework.<sup>79</sup>

### Priorities Based on a Single Strategy versus Multiple Tailored Strategies

Most of the program instruments reviewed describe a single overall prioritization strategy for selecting and implementing mitigation projects. Several program instruments go a step further and also include prioritization strategies for each service area. For example, the Montana Aquatic Resources Services ILF Program instrument notes that “Montana’s diverse landscapes and watersheds do not lend themselves to a single, statewide prioritization strategy,”<sup>80</sup> and it instead sets out a framework for prioritization that includes six criteria that generally will be used to evaluate potential projects. The program then provides a tailored prioritization strategy in the compensation planning framework for each service area. Building on the general criteria from the prioritization framework, each individual prioritization strategy includes fairly specific details for that service area. The Terra Foundation ILF program instrument also provides a prioritization strategy for each service area; for the most part, the criteria listed in the strategies are similar across the program’s service areas, but each strategy describes which specific activities will be priorities in a given service area. Another example of this approach may be found in the program instrument for the Kentucky Department of Fish and Wildlife

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<sup>76</sup> 33 C.F.R. § 332.3(d)(1).

<sup>77</sup> 33 C.F.R. § 332.3(c)(2)(iv).

<sup>78</sup> *Id.*

<sup>79</sup> For example, the description of the prioritization strategy for the La Paz County Endangered Species Fund 290 ILF Program consists of only the following sentence: “Prioritization for selecting and implementing Compensatory Mitigation will be: 1) Enhancing or Restoring aquatic resources through projects or actions that provide direct benefits to the listed fish species or their habitats, 2) Enhancing or Restoring aquatic resources through projects or actions that provide future benefits to the listed fish species or their habitats, or 3) Enhancing or Restoring aquatic resources through projects or actions that increase understanding of needs or facilitate quantification of Program benefits.” Examples of other relatively basic or general prioritization strategies may be found in the program instruments for the Arizona Game and Fish Department ILF Mitigation Program, the Stream + Wetlands Foundation (Stream) In-Lieu Fee Program, and the Louisiana Department of Natural Resources ILF Program.

<sup>80</sup> Montana Aquatic Resources Services ILF Program (MARS). (2013). *Montana Statewide In-Lieu Fee Mitigation Program Instrument*.

Resources ILF Program, which includes statewide project priorities as well as prioritization strategies for each service area. Similarly, the Wisconsin Wetland Conservation Trust ILF Program’s prioritization strategy explains that projects initially will be evaluated against listed core requirements and then will be further prioritized and selected according to the prioritization strategy, goals, and objectives provided for each service area.

A few programs also provide tailored prioritization strategies for different types of aquatic resources. For example, the Hood Canal Coordinating Council program instrument includes specific strategies for marine/nearshore service areas and for freshwater service areas. The National Fish and Wildlife Foundation Sacramento District California ILF Program instrument includes different prioritization strategies for each aquatic resource service area and for each vernal pool service area.

### Priorities Based on Mitigation Actions

Programs prioritize mitigation activities (i.e., establishment, enhancement, restoration, and preservation) in different ways. The strategies in many program instruments allow for establishment, enhancement, restoration, and/or preservation actions. Some programs, however, give less weight to preservation opportunities, while other programs focus primarily on preservation (see section on Mitigation Projects above). The Connecticut ILF Program uses weighted criteria as part of its process to rank proposals, and the program instrument explains that preservation-only projects will not fully meet one of the weighted criteria in the strategy. Similarly, the instrument for the Maine Natural Resource Conservation Program notes that “projects must include a restoration or enhancement component in addition to permanent preservation”<sup>81</sup> in order to fully meet one of its weighted prioritization criteria. On the other hand, the Great Land Trust program in Alaska and the Southeast Alaska Land Trust program focus more on preservation actions.

### Priorities Based on Rankings, Weighted Criteria, and/or Decision Support Tools

#### Rankings

Some programs include a strategy for future identification or ranking of sites or areas, while other programs have already identified priority areas, regions, watersheds, resources, sites, and/or activities as part of the prioritization strategy. Some of the program instruments reviewed explain that the sponsor will rely on screenings or rankings that have already been completed either for the ILF program specifically or for other purposes, such as existing watershed or conservation plans. These previous screenings or rankings will be used to help inform the prioritization strategy. For example, the Oregon Department of State Lands Statewide ILF program determined initial priority watersheds based on information from a variety of sources, including watershed assessments and action plans. The Living River Restoration Trust program instrument explains that it will first evaluate sites identified in the Elizabeth River Watershed Action Plan and will prioritize sediment and oyster projects based on the aquatic resources that were identified in the plan. The Quil Ceda Village ILF program

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<sup>81</sup> Maine Natural Resource Conservation Program. (2011). *State of Maine - In Lieu Fee Program Instrument*.

instrument provides an ordered list of priority restoration activities, which were identified in part based on priorities listed in the Quilceda/Allen Watershed Management Plan. Another example is the Keys Restoration Fund program, which will identify potential projects initially using a list of over 100 potential restoration sites in the Keys that were identified in 2010.

#### Weighted Criteria

A few programs have developed weighted criteria as part of their prioritization strategies. Each criterion usually has multiple sub-criteria or factors as well. Examples with weighted criteria include the Connecticut ILF Program, the Georgia-Alabama Land Trust program, and the Maine Natural Resource Conservation Program. The criteria and relative weights for the Connecticut ILF Program are as follows: potential to meet program goals (30%); landscape context (20%); project readiness/feasibility (20%); project sponsor capability (15%); cost effectiveness (10%); other benefits (5%). The Georgia-Alabama Land Trust criteria and relative weights are as follows: watershed context (30%); potential to provide restoration, enhancement, preservation, or creation of aquatic resource(s) that will be conserved in perpetuity (20%); cost effectiveness (20%); project feasibility (20%); partner capacity (5%); other benefits (5%). The weighted criteria (as amended) for the Maine Natural Resource Conservation Program are as follows: potential to meet program goals (35%); landscape context (20%); project readiness/feasibility (30%); cost effectiveness (10%); other benefits (5%). The program instruments for these three programs provide many additional details and considerations for each criterion. A few program instruments also include evaluation keys that will be used to prioritize sites/projects based on specific points. Examples of evaluation keys are included in Appendix 4.

#### Decision Support Tools

Programs also sometimes rely on existing or newly developed decision support models or tools to aid in the prioritization and selection of compensatory mitigation projects/sites. For example, the Ducks Unlimited Mississippi Delta program instrument notes that the sponsor will use two existing decision support systems that were developed by conservation planners in the area to help prioritize sites; the systems include a Wetland Restoration Suitability Index and a Forest Breeding Bird Decision Support Model. The instrument explains that the highest priority sites will be those that rank as medium to high priority on both models. Other Ducks Unlimited programs (including the Ducks Unlimited New York ILF Program, the North Dakota Ducks Unlimited ILF program, and the South Dakota Ducks Unlimited ILF program) combine numerous data layers to create decision tools that will be used as part of the programs' prioritization strategies. The Northwest Florida Water Management District program also uses spatial layering tools, such as GIS, to help prioritize sites, and The Wetland Trust uses "[a] computer

‘quality assessment’ using Maxent of important landscape factors”<sup>82</sup> in conjunction with reviews of other comprehensive analyses and expert opinions to help identify potential sites.

### Priorities Informed by External Support

Some programs rely on advisory committees and experts to provide input during project/site prioritization and selection. The Connecticut ILF Program has a project advisory committee comprised of six permanent and three rotating members that will evaluate (using prioritization criteria) and recommend project proposals received through the program’s RFPs. Similarly, the Maine Natural Resource Conservation Program has a review committee that ranks project proposals using prioritization criteria and sends recommendations to the IRT, which makes the final decisions. The Hood Canal Coordinating Council uses a group of experts to screen, prioritize, and develop a site roster, and an ecologist then performs limited site reconnaissance. The King County Mitigation Reserves Program uses a credit allocation team, which consists of a group of staff experts, to select sites from the program’s list of roster sites (which is included as an exhibit to the compensation planning framework). The Great Land Trust also has an advisory committee.

While some programs perform all or most of the work on mitigation projects in house, many programs contract out restoration work or other tasks, with some using a competitive award approach and issuing RFPs for compensatory mitigation projects that will be implemented by others outside the program. Some of the program instruments that contemplate a competitive award approach include the Connecticut ILF Program, the Georgia-Alabama Land Trust program, the Maine Natural Resource Conservation Program, and the New Hampshire Aquatic Resource Mitigation Fund program, among others. A few programs use a combination of approaches depending on the circumstances. For example, the Wisconsin Wetland Conservation Trust ILF Program instrument explains that the sponsor will identify projects through either an RFP process or an internal process, with preference given to using an RFP process.

### Factors/Criteria Considered

With respect to the factors or criteria considered in the prioritization strategy, the details vary widely across programs, but the program instruments reviewed usually incorporate some or all of the 2008 Rule’s site selection factors, which are listed above.<sup>83</sup> Some criteria also are program-specific, such as resilience to climate change and sea level rise, removal of particular invasive species, ability to meet specific regional goals, special considerations for urban wetlands, protection of scenic viewsheds, or projects that are within the program sponsor’s area(s) of expertise. Examples of prioritization strategies from three ILF programs are summarized in Box 5 and provided in full in Appendices 5, 6, and 7. In general, programs consider “[h]ydrological conditions, soil characteristics, and other physical and chemical

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<sup>82</sup> The Wetland Trust. (2015). *Susquehanna Basin Headwaters and Adjacent Basins In-Lieu Fee Program Instrument*.

<sup>83</sup> 33 C.F.R. § 332.3(d)(1).

characteristics,”<sup>84</sup> as well as watershed needs and the watershed context and features. They usually consider the resource type(s) and scarcity; some prioritize high-value or rare aquatic resources, and some seek representative conservation of resources. Programs may prioritize or focus exclusively on particular types of aquatic resources, such as certain types of streams or wetlands. Programs also sometimes prioritize projects that will attenuate floods, improve or sustain water quality, or use or restore the native plant community or natural hydrology and processes. They typically consider whether the potential site contains, supports, or benefits (or could potentially do so) sensitive, rare, or listed plants, animals, or habitat as well.

The programs’ prioritization strategies usually consider the surrounding landscape setting or ecological or landscape connectivity. Some may strive for projects that include buffers, are compatible with the surrounding landscape, reduce fragmentation, or support aquatic habitat diversity. Many prioritize projects that are on or adjacent to public or private conservation lands. Some program sponsors prioritize or require that projects be located on sponsor-owned or sponsor-managed land. The location and size of the site are also important, and programs generally seek to prioritize or select projects that are near the permitted impact(s).

Naturally, sponsors often build in their own mission, goals, priorities, expertise, and standards as part of their approach to site prioritization and selection. Programs also consider stakeholder input and involvement when prioritizing, selecting, and implementing compensatory mitigation projects. Prioritization criteria sometimes include the capacity or qualifications of potential project partners or applicants, as well as whether willing landowners or adequate partnership interest exists. For more information about working with project partners and other stakeholders, see the Partnerships with Stakeholders and Other Practitioners section of this report.

Project urgency and likelihood of success are other criteria that are frequently included in ILF program prioritization strategies. When evaluating project urgency, sponsors may consider the likelihood of potential negative impacts or threats, as well as land use, development, and conversion trends, and they may try to prioritize projects that are in areas in most need. Additionally, they consider the extent to which the project will replace or improve lost functions and services, typically focusing on areas that have the highest potential.

Most programs also consider the project’s technical and financial feasibility and sustainability. Sponsors may try to determine the likelihood of meeting the proposed schedule, and they may analyze the project/site’s “readiness” or the practicability of the project. The sustainability of a project is also an important consideration (e.g., sites in urban areas may require more active maintenance and monitoring to ensure sustainability over time). Whether a site is or may be permanently protected is another important factor, and programs sometimes note that the threat of vandalism or invasive species should be low.

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<sup>84</sup> 33 C.F.R. § 332.3(d)(1).

Financial considerations are also frequently included in the programs' prioritization strategies. This may include the resources required and available, cost effectiveness of the project, possible fund leveraging (e.g., the availability of matching funds), long-term stewardship/management funding mechanisms, and cost savings (e.g., flood control). A few programs explicitly include consideration of whether there are mitigation banks in the area as part of their prioritization strategy as well.

The programs' prioritization strategies often evaluate whether the project supports or complements existing watershed, local, state, or regional goals, plans, priorities, or initiatives, such as water quality goals, watershed plans, species recovery plans, TMDL actions, or conservation strategies or plans. Programs also may consider other benefits that the project might provide, such as job creation, economic activity, recreational opportunities, or scenic enhancement. Finally, although an inherent requirement or consideration for all ILF programs, some program instruments specifically note that projects must comply with applicable federal, state, and local regulations, policy, or guidance (including the 2008 Rule, of course).

#### **Box 5: Examples of prioritization strategies.**

According to its program instrument, the Oregon Department of State Lands Fee In Lieu Program established initial priority watersheds. The medium- and high-priority watersheds in the state were determined by evaluating past mitigation needs, future mitigation needs, the lack of private mitigation banks to meet credit demand, and availability of funds. Potential mitigation projects will be evaluated according to the following criteria: likelihood of success; multiple objectives; supports regional conservation initiatives and is compatible with the surrounding landscape; capacity of the applicant and the project team; fund leveraging and project costs; and long-term management. The program instrument also includes detailed profiles of the priority watersheds, which identify priority habitats, areas, actions, and/or wetland ecological systems. Additional details about the process and the criteria are available in Appendix 5.

The prioritization strategy for the Ventura River Watershed ILF Program uses a set of land protection priority criteria and a set of aquatic resource priority criteria. The land protection priority criteria include: protection and enhancement of environmental values; contribution towards sustainable use of ground and surface water in the Ojai Valley, including use of water in a way that supports the other conservation criteria; provision of nature-based recreation and education opportunities; and protection of scenic viewsheds. The aquatic resource priority criteria include: proximity to existing high-quality sites; surrounding land use; intact adjacent upland areas; intact natural hydrology or the potential to restore the natural processes of the system; ability to restore natural hydrology in riparian systems; promote structural diversity and volume of the understory; restore the width of the riparian corridors and floodplains; and ability to fulfill multiple goals. The instrument also identifies three conservation priority areas within the program's service area, which were selected based on the identified priority criteria. A candidate site also is presented in the prioritization strategy section. For more information about the criteria, priority areas, and candidate site, see Appendix 6.

The program instrument for the Georgia-Alabama Land Trust ILF Program explains that the sponsor will select projects based on a competitive award approach, evaluating proposals using weighted prioritization criteria. The instrument also notes that the sponsor "will promote use and development of GIS-based model or similar mitigation management methodology siting models that take into account data relevant to a watershed approach and provide a relative scoring of a proposed mitigation site." (Georgia-Alabama Land Trust ILF Program, Instrument) Two examples of such models are described in the prioritization strategy. As noted above (in the

Weighted Criteria subsection), the prioritization criteria include: watershed context (30%); potential to provide restoration, enhancement, preservation, or creation of aquatic resource(s) that will be conserved in perpetuity (20%); cost effectiveness (20%); project feasibility (20%); partner capacity (5%); other benefits (5%). Further details about the overall strategy, including the criteria and models, are available in Appendix 7.

## Observations and Suggestions

In general, it is recommended that program sponsors prepare thorough, tailored prioritization strategies for their compensation planning frameworks. They must consider how the prioritization strategy will contribute to the program's goals and the overall watershed approach. If a program has multiple service areas or different service areas for different types of aquatic resources, the sponsor should determine whether a single overall prioritization strategy will be adequate or whether it might need the flexibility provided by using a framework prioritization strategy in conjunction with a tailored prioritization strategy for each service area. The latter approach may allow for more location-specific goals or priorities to be included.

Program sponsors also should decide whether they might use a competitive award approach or conduct all of the work themselves. This largely will depend on a sponsor's capacity and resources and goals. It is also important to consider whether the program might benefit from having an advisory committee to help screen and/or rank potential projects or project proposals, or how it might include stakeholder input. Sponsors also should try to determine whether existing screenings or rankings could be used and whether any existing decision support tools or models (e.g., from other programs or plans) may be helpful. Sponsors should figure out if any relevant local, regional, state, federal, or tribal goals, plans, initiatives, or strategies may exist, such as watershed plans, water quality goals, or species conservation plans. Of course, sponsors also must determine how applicable local, state, federal, or tribal regulations, policies, or guidance may impact the way in which the program selects and implements projects.

Although each ILF program is unique, program sponsors should review other program instruments to see if they might be able to build off another program's strategy or use another program's resources, evaluation keys, or other documents to inform their own program's strategy. This type of review also may provide a better idea of the numerous criteria that might be appropriate for a program to consider for project selection and implementation. See Box 5 (and Appendices 5, 6, and 7) for some examples of prioritization strategies. Most programs include several broad criteria for consideration and more detailed sub-criteria or factors. The 2008 Rule's site selection factors also provide a good starting place to determine which criteria to include in the prioritization strategy.

Importantly, a few of the program instruments reviewed note that the prioritization strategy may be updated or revised as necessary, and it is recommended that programs regularly review their prioritization strategies to determine if changes might be necessary. Technological,

ecological, programmatic, regulatory, or other changes might occur, and programs should be flexible and adapt their prioritization frameworks as needed.

## Project Review and Approval

As mentioned above, the process for review and approval of an ILF project is the same required for the development of a mitigation bank or of the ILF program instrument itself,<sup>85</sup> including the following steps:

1. Optional (but Recommended) Preliminary Review of Draft Prospectus
2. Submission and Review of Prospectus, including 30-day public comment period
3. Initial Evaluation
4. Submission and Review of Draft Instrument
5. Submission and Review of Final Instrument
6. Final Decision (Approved/Not Approved)

### The Steps

The project review and approval process generally follow the steps outlined in the Rule. Many, but not all, programs detail a project approval process in their instruments. Although most programs we interviewed described a multi-step project approval process, there is some variation in the terminology used, the formality of each step, and the timing of public notice. Most of the programs we interviewed report that, in general, the project approval proceeds as follows:

1. **Pre-Application Consultation:** Many programs report some kind of pre-application consultation with the Corps and/or IRT. Many programs describe this as informal. Some programs reported that these early meetings include site visits or that the program may present multiple possible projects to the IRT at this stage. Some programs reported having regular ongoing meetings with the Corps and that these may serve as pre-application consultation.
2. **Initial Submittal (i.e., the Prospectus):** The next step (as reported by a number of programs) involves developing and submitting an initial document for approval. Several programs referred to this document as a prospectus, mirroring the language in the 2008 Rule. Other programs describe submitting a preliminary document for review but call it something else (e.g., proposal, package of information, summary, site approval, conceptual/concept plan, initial report, preliminary project plan, conceptual mitigation plan, site selection plan, request for instrument modification, initial submission, etc.). The level of detail required by the Corps at this stage varied among programs. Some described a less formal process (a “fatal flaw” analysis, according to one program) where the program provides the minimum information for the Corps/IRT to be confident that the program could go forward with plan development. Other programs described submitting a comprehensive and detailed prospectus or having to complete functional/conditional assessments for initial submittals. Sometimes initial submittals include other documentation to aid the Corps/IRT’s evaluation. For example, the West

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<sup>85</sup> 33 C.F.R. § 332.8(d).

Virginia ILF Stream and Wetland Mitigation Program reported that it often includes a “good faith letter of intent” from a landowner that provides some assurances that the landowner is willing to work on the project and is aware of the project details.

3. **Initial Approval:** Most programs describe receiving some kind of initial approval before moving forward with the full project development process (e.g., development of the mitigation plan). Some referred to this approval as an “initial evaluation letter,” mirroring the terminology in the 2008 Rule. Many programs describe receiving an initial release of funds for the development of the mitigation plan at this point.
4. **Draft Mitigation Plan:** After initial approval, programs then develop and submit a mitigation plan (also called site development plan, development plan, compensation site plan, site instrument, instrument amendment) for review. Several programs reported that the public comment period happens during this stage, although a few programs told us that the public comment period may occur earlier in the process. The 2008 Rule indicates that the Corps will provide public notice within 30 days of the receipt of a complete prospectus. 33 C.F.R. § 332.8(d)(3).
5. **Final Mitigation Plan:** Many programs describe a period of back and forth discussions with the Corps and IRT as they develop a final mitigation plan. The final mitigation plan is then submitted prior to final approval.
6. **Final Approval:** Programs then noted receiving approval before moving forward.

Several programs have formally outlined a multi-step process that goes into specific detail for each step. For example, The Nature Conservancy’s Virginia Aquatic Resources Trust Fund outlines eight steps in the project approval process. Of those, six require input and review by the Corps or the public (see Figure 10).



**FIGURE 10: THE NATURE CONSERVANCY’S VIRGINIA AQUATIC RESOURCES TRUST FUND PROJECT DEVELOPMENT PROCESS INCLUDES A NUMBER OF STEPS THAT EACH REQUIRE INPUT AND REVIEW BY THE CORPS/IRT OR THE PUBLIC (SEE YELLOW STARS). SOURCE: PROGRAM SPONSOR.**

The Montana Aquatic Resources Services ILF Program instrument details a nine-step, three-phase ILF Program Modification Process in the program instrument. The first phase (four steps) describes the steps involved in the review of the Proposed Site Plan, the second phase (two steps) describes the review of the mitigation plan, and the third phase (three steps) describes the review and approval of the final Mitigation Site Plan (see Figure 11).<sup>86</sup>

The Kentucky Department of Fish and Wildlife Resources ILF Program projects are approved under a Corps Letter of Permission (LOP) process. The LOP issued by the Louisville, Nashville, Memphis, and Huntington Districts:

authorizes all activities performed in association with the enhancement, rehabilitation, establishment, re-establishment, maintenance, and repair of compensatory mitigation projects associated with a Corps approved Mitigation Bank (Bank) or In-Lieu Fee (ILF) Instrument, including dredging, temporary and

<sup>86</sup> Note, Montana Aquatic Resources Services ILF Program is currently working with the IRT to update this process. The new timeline will illustrate the relationship between the major project phases (Operational, Establishment, LTM) with nested timelines, the timing of short-term financial assurances and long-term management funds relative to those phases, and the project milestones that are associated with the start and end dates of those phases.

permanent work, structures, discharges of dredged or fill material into “waters of the U.S.,” the removal of structures, and the removal of fill.<sup>87</sup>

The LOP thus serves as the individual permit for the project. The LOP lays out step-by-step implementation and application procedures and includes a timeline (see Figure 12). According to the program, the LOP project approval time—including about 6 months for state 401 Water Quality Certification—can be around 345 days if things go smoothly. However, if a few of the steps take a week or two longer than scheduled, the process can last more than a year.



**Exhibit F: 9-Step ILF Program Modification Process**

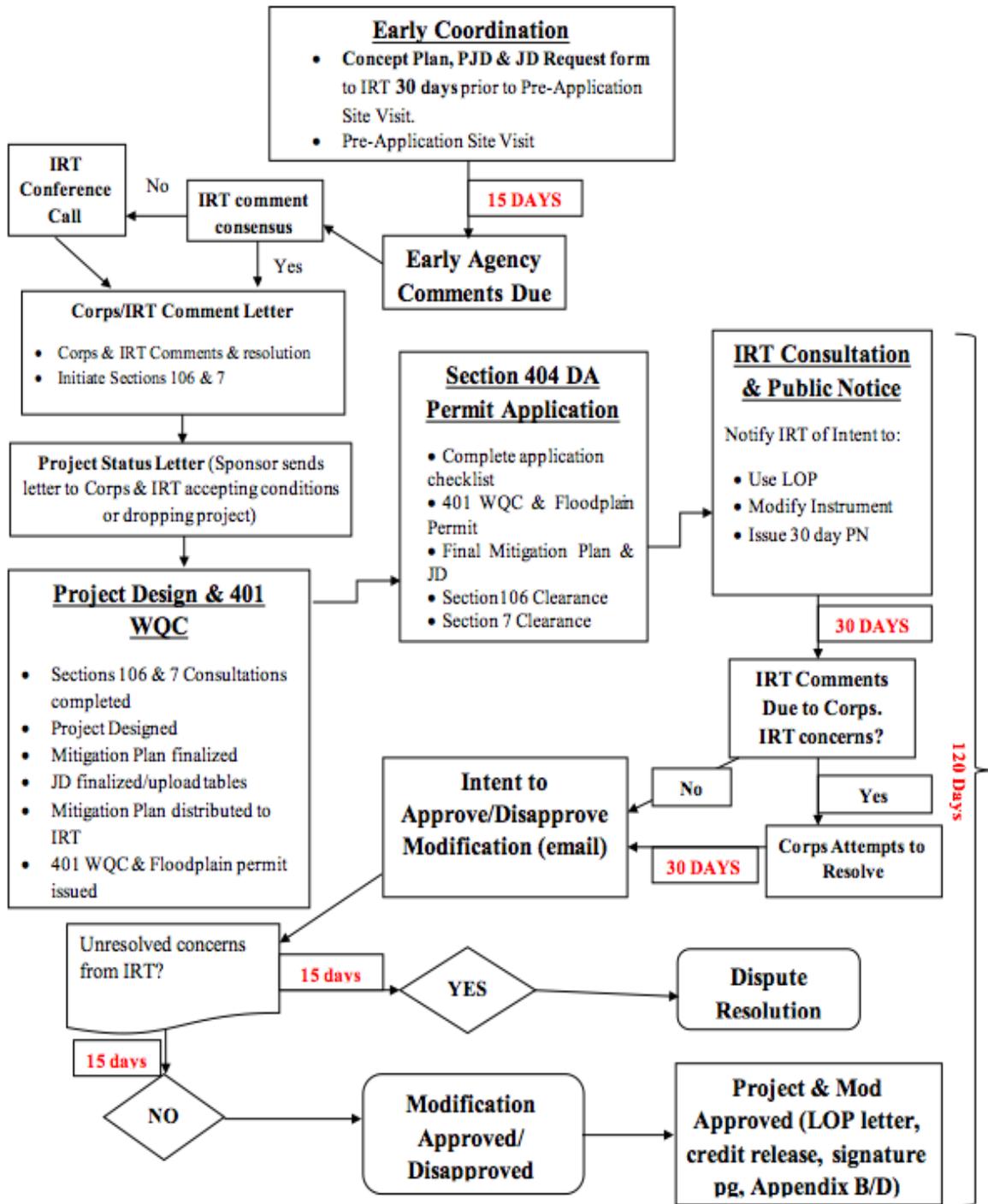
<b>ADMINISTRATION (4000)</b>		
PHASE I	<b>Step 1</b>	<b>Phase I: MARS will submit a Proposed Site Plan</b> Corps determines if Proposed Site Plan is complete. Corps will communicate with MARS regarding need to provide additional material if necessary. Once Proposed Site Plan is considered complete, Corps will notify MARS when Public Notice has been sent out.
	<b>Step 2</b>	<b>Public Notice (30 days)</b> - Corps accepts comments from IRT and public during this period.
	<b>Step 3</b>	Following the 30-day comment period, Corps will provide MARS and IRT copies of all comments submitted by the public and the IRT.
	<b>Step 4</b>	MARS will submit a document to the Corps that describes their intent to respond to the public and IRT comments. The Corps will review this document and if acceptable, will send an Evaluation Letter notifying MARS to proceed with the Draft Mitigation Site Plan. Comments received during Phase I will be incorporated into the Draft Mitigation Site Plan.
<b>MITIGATION (5000 Codes)</b>		
PHASE II	<b>Step 5</b>	<b>Phase II: Draft Mitigation Site Plan</b> Based on comments received from the public, IRT, and the Corps, MARS will submit a Draft Mitigation Site Plan to the Corps. The Corps will work with MARS until there is enough information to be considered complete. Once complete, the Corps will submit the Draft Mitigation Site Plan to the IRT for review (30 days).
	<b>Step 6</b>	Following the comment period, the Corps will discuss any comments with appropriate agencies and MARS. The Corps will make the final decision if there are disputes on issues. Within 90 days of receipt of the complete Draft Mitigation Site Plan, the Corps must notify MARS of the status of the IRT review.
	<b>Phase III: Final Mitigation Site Plan</b>	
PHASE III	<b>Step 7</b>	MARS will prepare a Final Mitigation Site Plan based on comments received during the Draft Mitigation Site Plan review. The Corps will make one final review to make sure all issues submitted have been addressed.
	<b>Step 8</b>	The Corps will notify the IRT members of intent to approve/not approve the Final Mitigation Site Plan. IRT will have time to initiate the dispute resolution process (30 days) or concur.
	<b>Step 9</b>	Signatures - if no one initiates dispute resolution then the Chair will recommend that State Program Manager sign the Final Mitigation Site Plan. The Final Mitigation Site Plan becomes active after the State Program Manager signs.

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**FIGURE 11: THE MONTANA AQUATIC RESOURCES SERVICES ILF PROGRAM PROJECT APPROVAL PROCESS. SOURCE: PROGRAM SPONSOR**

<sup>87</sup> U.S. Army Corps of Engineers Public Notice LRL-2010-323-pgj, <https://www.lrl.usace.army.mil/Portals/64/docs/regulatory/publicnotices/LRL-2010-323%20pnpics.pdf>.

## LOP Implementation Process



Revised: February 2017

FIGURE 12: THE USACE LETTER OF PERMISSION (LOP) PROCESS ISSUED BY THE LOUISVILLE, NASHVILLE, MEMPHIS, AND HUNTINGTON DISTRICTS. SOURCE: U.S. ARMY CORPS OF ENGINEERS PUBLIC NOTICE LRL-2010-323-PGJ

A number of factors might influence the project approval process, including the ways in which the program approaches project development (design-build, design-bid-build, requests for proposals, etc.), the way site selection is structured, the types of projects, and the District's/IRT's approach to project approval.

The project approval process for at least nine programs that use an RFP process to select projects generally follows the above steps. In several cases, programs reported that selected project applications submitted by the RFP respondents serve as the prospectus or initial submission to the Corps/IRT, and the approval process proceeds as described above. Other programs have developed formal and comprehensive review processes that are used to evaluate and select projects submitted under an RFP. These programs may submit more developed mitigation plans for initial review by the Corps/IRT.

For some programs, built-in project advisory committees are integral to the review process. For example, the New Hampshire Aquatic Resource Mitigation Fund (ARM Fund) established two review committees: the Site Selection Committee (SSC) and the Wetlands Council. The ARM Fund has established a three-step process:

- Pre-proposal: Applicants submit a pre-proposal to the Site Selection Committee (SSC). The SSC provides feedback, and eligible projects are invited to be submitted as full applications.
- Full application: Full applications are evaluated by the New Hampshire Department of Environmental Services Mitigation Coordinator for eligibility and provided to the Corps for public notice and to the New Hampshire Department of Historic Resources for review and comment. Full applications are ranked by the SSC according to site selection criteria, and projects are selected for full or partial funding.
- Approval process: Selected projects are then forwarded to the second review committee (the Wetlands Council) and to the Corps/IRT for approval.

Another factor that may influence the project approval process is the way site selection is structured and the types of projects that are selected. As described above, some programs have identified specific projects or sites in their instrument. For example, the Everglades National Park ILF Program has an exclusive focus on one 6,300-acre site. The program is working to remove anthropogenically derived soil down to the bedrock and then monitoring to track natural succession and colonization. The program has completed restoration on 5,128 acres so far. They have completed a mitigation plan for the entire area, and they complete each section of work as credits are sold. According to the program, this arrangement resulted mostly because the agencies/Corps understood that there was low risk involved with the project.

In another example, the Louisiana Department of Natural Resources ILF Program works with other state agencies to select projects. The ILF program selects projects from the list of projects that the Coastal Protection and Restoration Authority (CPRA) (the state entity in charge of ensuring comprehensive coastal protection) has identified. The program identifies the best opportunities from this list and then packages them into a report to submit to the IRT. They

meet with the IRT as often as they have potential projects (much more than once annually). The IRT provides feedback on the potential projects, and the program revises and provides more information as needed. The revised report is then formally submitted to the Corps. The Corps sends it to IRT for comment. Then the program provides any necessary feedback/revision and waits for approval. Approval requires both verbal approval and a written letter.

The project approval process also varies among Corps districts. The ILF programs in the Los Angeles District, for example, all detail the same approval process in their instruments. The process generally follows the project approval language and timeline in the 2008 Rule. We did not observe similar patterns in other districts.

### Permitting

Many programs begin the permitting process (when permitting is required) during the draft mitigation plan review stage. Other programs wait for final approval from the Corps/IRT before they start the permitting process. The LOP issued by the Louisville, Nashville, Memphis, and Huntington Districts described above provides another possible mechanism for permit approval. The LOP serves as the individual permit for ILF and bank projects within the districts. In any case, many programs reported that the permitting process can add significant time to the overall length of the approval process, especially for restoration projects or sites that may have endangered species.

### Funding the Project Approval Process

Many programs indicated that development of the mitigation plan requires significant resources. Several programs reported that the district/IRT will release funds for mitigation plan development after approval of the initial document (i.e., prospectus). Most programs approve the final project budget with the mitigation plan, and programs are then able to use funds to develop the project. Several programs reported using administrative funds for initial site selection and development of the preliminary project plan or prospectus.

### Time to Approval and the Three-Year Timeframe

Programs reported a lot of variation in the time it takes to receive approval for a project. The quickest reported approval process was about nine months. On the other hand, several programs reported that project approval can take up to three years or more. Other programs reported review and approval times of 1 year, 16 months, 1.5 years, and 2 years. The timing varied depending on the type of project, the program's project approval process, and whether endangered species review was required. As described above, there are a lot of factors that can affect the length of time it takes to complete the review and approval process, including back and forth with the agencies during review, lengthy scheduling of site visits, permitting, and certain requirements for documentation or assessment, among others.

The 2008 Rule states, "Land acquisition and initial physical and biological improvements must be completed by the third full growing season after the first advance credit in that service area

is secured by a permittee, unless the district engineer determines that more or less time is needed to plan and implement an in-lieu fee project.”<sup>88</sup> The three-year growing season requirement has proven challenging for many ILF programs.

Most of the programs we interviewed have not missed the three-year deadline required in the 2008 Rule in any of their service areas. At least 16 of the 41 programs that we interviewed told us they are having little or no trouble meeting the three-year requirement. About half of these programs pre-identify project sites or potential sites in their program instruments or conduct projects in advance and thus are not selling advance credits. Several other programs in this group select projects on land owned or managed by program sponsors, use RFP processes for project selection, or select projects identified in state plans. The remaining programs identify and select projects using a prioritization process detailed in their compensation planning framework and were generally not conducting projects in advance of selling credits.

About ten programs told us that they have not yet missed the three-year deadline in any service area, but that they may (or will likely) have to negotiate an extension in the future for one or more service areas. A few of these programs use RFP processes for project selection, and at least one of these programs had previously identified sites for future projects. Many of these programs told us that they will work with the Corps on an extension or will buy available bank credits to fulfill advance credit liabilities in non-compliant service areas.

Nine programs reported that they have missed the deadline in at least one service area or for a given resource type. Most of these programs reported that they are working with or have worked with the Corps and IRT on an extension that will allow them to come into compliance. As mentioned above, several programs, including the Nature Conservancy’s Virginia Aquatic Resources Trust Fund, Stream + Wetlands Foundation ILF Program, and National Fish and Wildlife Foundation Sacramento District California ILF Program, have had to implement alternative mitigation (e.g., purchase mitigation bank credits) to meet mitigation obligations and come into compliance.

We heard a number of reasons for the delays in project development. One often-cited reason for delays was lengthy project review and approval timelines. Some programs told us that very long review time or delays in setting up site visits extended the approval timeline of a given project, leading to service areas going out of compliance. Other programs suggested other reasons for delays, including lengthy assessment protocols or difficulty in finding willing landowners.

Another factor that is often overlooked is that the duration of the three-year growing season time period can vary significantly, depending on when the credit sale date occurs relative to the start of the current growing season. Depending on when a credit sale is completed (i.e., immediately before the first full growing season starts versus during the growing season), an ILF

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<sup>88</sup> 33 C.F.R. § 332.8(n)(4).

sponsor may have as few as 29 months or as many as 40 months to complete the initial physical and biological improvements by the end of the third full growing season.

The other major reason for missing the three-year timeframe is inability to sell enough credits in a service area to conduct an appropriate project. Some programs sold a small number of credits in a service area but then were not able to collect enough additional funds to conduct a project. A few programs were thus forced to submit proposals for extremely small projects or come up with other creative projects to ensure they stayed in compliance (including buying bank credits).

All of the programs that told us they have gone out of compliance described how they are working with the agencies to come back into compliance. Most said they have submitted/received formal request for extensions. Two programs told us they are facing watershed/service area closures due to lack of compliance. In fact, the Tennessee Stream Mitigation Program was recently required to close seven of its ten service areas in an effort to come back into compliance. The program is currently being audited by independent auditors.

A few programs have put processes into place to help ensure compliance. For example, the Arizona Game and Fish Department ILF Mitigation Program told us that they do not sell advance credits until they have a defined project with realized costs for initial capital restoration costs and long-term endowment establishment.

The National Fish and Wildlife Foundation Sacramento District California ILF Program outlined a process for working with the IRT on how to proceed if the program is nearing the three-year growing season deadline. Exhibit E of the program instrument details the general process of ILF project site selection (see Box 6) that includes how to proceed if the deadline will be exceeded “which may include, but not be limited to the following; continuing to wait a specified period of time as determined by the IRT, merge funds with another Service Area or purchase bank credits.”

**Box 6: National Fish and Wildlife Foundation Sacramento District California ILF Program  
Instrument Exhibit E – ILF Project Development Process.**

**General Process for ILF Project Site Selection**

1. On an on-going basis, Program Sponsor will calculate the amount of collected funds for each Service Area.
2. A minimum of fifty thousand dollars (\$50,000) (threshold) within a Service Area will trigger the Program Sponsor to consider in consultation with the IRT whether minimum threshold funding is available in the Service Area to warrant ILF Project development consideration. If sufficient funding for ILF Project development does not exist, proceed to step 9.
3. If sufficient funding is present, Program Sponsor will conduct an evaluation of critical needs within the Service Area and an evaluation of the existence of potential ILF Project opportunities and/or ILF Project partners through a request for proposals process and/or other outreach.
4. In addition to 3) above, Program Sponsor will determine if there is a mitigation bank in the Service Area with applicable available credits.
5. Program Sponsor will evaluate and compare potential ILF Project proposals, including the purchase of any applicable available mitigation bank credits, using the Project Evaluation Criteria worksheet (Exhibit E). The worksheet references the requirements of the 2008 Mitigation Rule, and specifically uses the first three requirements that are applicable at the ILF Project prospectus stage as a screen to determine whether an ILF Project proposal should be considered and evaluated. The worksheet is intended as a tool to aid the Program Sponsor and IRT in evaluating and comparing proposed ILF Projects for funding consideration, but is not the only consideration.
6. Program Sponsor will present to the IRT for the IRT's consideration the highest priority ILF Project(s) that Program Sponsor determines to be feasible and practicable, and that can be implemented with available funds. The presentation will be in the form of an Initial Project Prospectus (as described in further detail below), including an estimated budget for each such proposed ILF Project(s), which Program Sponsor will submit to the IRT along with the Project Evaluation Criteria worksheet described above.
  - a) As soon as possible, and no later than fifteen (15) days from receipt of the Initial Project Prospectus(es), each IRT Member will notify the USACE and Program Sponsor in writing whether it will participate or abstain from participating on the IRT with respect to consideration of each proposed ILF Project.
  - b) As soon as possible, and no later than fifteen (15) days from receipt of the complete Initial Project Prospectus(es), the USACE will issue a public notice of the Initial Project Prospectus(es) providing a thirty (30) day public comment period. If required or otherwise desired, other IRT Members participating on the IRT with respect to consideration of the Initial Project Prospectus(es) may also issue a public notice of the Initial Project Prospectus(es) providing a public comment period. To the extent possible, the USACE and such other IRT Members shall coordinate such public notices and public comment periods to run concurrently.
  - c) If the proposed ILF Project would provide benefits to special status, threatened, or endangered species, the appropriate state or federal fish and wildlife agencies that are not otherwise on the IRT (i.e., USFWS and CDFW) may be requested by the IRT and Program Sponsor to participate in the IRT discussions regarding the proposed ILF Project.

7. Approval of Initial Project Prospectus(es). Within thirty (30) days of the close of the applicable public comment period(s), the IRT shall consider the Initial Project Prospectus(es), supporting information, and any public comments received regarding the proposed project(s), and provide to Program Sponsor its written approval or denial of the Initial Project Prospectus(es). Alternatively, the IRT may provide Program Sponsor with comments regarding the Initial Project Prospectus(es) that Program Sponsor may address in revisions to the Initial Project Prospectus(es) and resubmit to the IRT for its written approval or denial.
8. If an Initial Project Prospectus is approved, then as of the date of such approval the Program Sponsor may access and expend funds in the applicable Service Area-specific Sub-Account to pay for the ILF Project Development Plan, in accordance with the estimated budget for the Project Development Plan as set forth in the approved Initial Project Prospectus. If in the course of the Project Development Plan process, the Program Sponsor discovers that the expenditures will exceed the budget, the Program Sponsor will notify the IRT in writing and propose a budget augmentation for the IRT's consideration and written approval. The expenditure of such funds is intended to allow the Program Sponsor to develop and finalize, based on the foundation of the Initial Project Prospectus, a formal Project Development Plan for the applicable ILF Project.
9. Once finalized, the Project Development Plan will be submitted to the IRT as a formal request for a modification to the Instrument in accordance with the ILF Project approval process set forth below.
10. If sufficient funding is not available for ILF Project development, the Program Sponsor will wait to determine if sufficient funding has been reached for ILF Project development. If funding is sufficient after waiting an additional period of time not to exceed twenty-four (24) months total after first funds collected in the Service Area, proceed with steps 3 through 8. If funding is not sufficient by the end of the 24-month period, proceed to step 9.
11. Consult with the IRT as to how to proceed, which may include, but not be limited to the following: continue to wait a specified period of time as determined by the IRT; merge funds with another Service Area; or, purchase mitigation bank credits.

## Financial Assurances

The 2008 Rule requires that the mitigation plan include “a description of financial assurances that will be provided and how they are sufficient to ensure a high level of confidence that the compensatory mitigation project will be successfully completed, in accordance with its performance standards.”<sup>89</sup> Financial assurances serve to “indemnify the public” against any losses that might occur if the mitigation provider does not perform its compensatory mitigation obligations.<sup>90</sup>

Financial assurances are generally “phased out once the compensatory mitigation project has been determined by the district engineer to be successful in accordance with its performance

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<sup>89</sup> 33 C.F.R. § 332.4(c)(13).

<sup>90</sup> U.S. Army Corps of Engineers, Institute for Water Resources (2016).

standards.”<sup>91</sup> After this point, the long-term monitoring and management phase begins, and mitigation providers are required to ensure that funds are available for legal protection and long-term management of mitigation project sites. However, these funds are separate from the financial assurances required to ensure that the mitigation project meets its performance standards.

The 2008 Rule lists a number of appropriate types of financial assurances, including “performance bonds, escrow accounts, casualty insurance, letters of credit, legislative appropriations for government sponsored projects, or other appropriate instruments, subject to the approval of the district engineer.”<sup>92</sup> The Rule also states that financial assurances may not be required in “cases where an alternate mechanism is available to ensure a high level of confidence that the compensatory mitigation will be provided and maintained (e.g., a formal, documented commitment from a government agency or public authority).”<sup>93</sup> The amount of the financial assurance is determined by the Corps and the project sponsor and “must be based on the size and complexity of the compensatory mitigation project, the degree of completion of the project at the time of project approval, the likelihood of success, the past performance of the project sponsor, and any other factors the district engineer deems appropriate,” including the cost of providing replacement mitigation.<sup>94</sup> This rationale must be documented in the administrative record for the permit or the program instrument.

ILF programs generally approach financial assurances in one of three ways:

1. Providing assurance of financial backing from the government entity (for programs sponsored by public agencies);
2. Establishing a programmatic and/or project contingency fund (e.g., through a line item in the project budget and/or a percentage of credit sales going to a contingency fund);  
or
3. A traditional financial assurance (e.g., bond, letter of credit, insurance).

Programs administered by public agencies told us that they are not generally required to post financial assurances. Per the 2008 Rule, as stated above, financial assurances may not be required where a government entity provides a formal commitment to assure project success.

Many programs use programmatic and project-based contingency funds as financial assurances. For example, the Hood Canal Coordinating Council program sets aside 14.7% of credit sales into a contingency account that serves as financial assurance for its projects. Similarly, the National Fish and Wildlife Foundation Sacramento District California ILF Program sets aside a percentage of credit sales into a contingency account to address contingencies in the program and projects, as well as to provide a component of financial assurance for projects (in addition to project-

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<sup>91</sup> 33 C.F.R. § 332.3(n)(4).

<sup>92</sup> 33 C.F.R. § 332.3(n)(2).

<sup>93</sup> 33 C.F.R. § 332.3(n)(1).

<sup>94</sup> 33 C.F.R. § 332.3(n)(2).

related financial assurances such as contractor bonds and letters of credit). The percentage ranges from 10 to 30% depending on the number of credits purchased.

Several programs told us they have a line item in the project budget for contingency, as well as a percentage of sales that goes to a contingency fund. The Kentucky Department of Fish and Wildlife Resources ILF Program told us that each contract has 10–20% contingency on design and construction plus warranties and retainer percentage, and performance bonds to ensure adequate completion of projects. There is also a programmatic level contingency in the Reserve Fund, which functions as a financial assurance in two ways: (1) additional projects (credits) can be funded with Reserve, thereby making up for any shortfalls in service area advance credit sale obligations, and (2) Reserve can be used to correct deficiencies/maintenance of projects.

The Nature Conservancy's Ohio Stream and Wetland ILF Program has three levels of financial assurances, including:

1. Programmatic contingency fund of 5% of credit sales
2. Project-specific contingency fund of 5% of project construction costs
3. Performance bonds/insurances required from construction firms contracted to do the work.

A few programs use other vehicles. For example, the Land Trust for the Mississippi Coastal Plain told us the program uses bonds. The amount of bond is determined by the Corps, and the program is allowed to reduce the bond by a percentage of the budget that has been used for restoration. In other words, whenever it has credits released, the program reviews the budget and sends these figures to the bond company to jointly re-evaluate. The Coachella Valley ILF Program told us that it has insurance on the land through a joint powers commission.

Another level of financial assurances happens at the level of the contract with the construction firm. The Georgia-Alabama Land Trust mostly uses a letter of credit, but it also accepts a construction bond, insurance policy, etc. The Keys Restoration Fund requires that contractors be insured for major construction projects, and, as mentioned above, The Nature Conservancy's Ohio Stream and Wetland ILF Program requires performance bonds or insurance from construction firms contracted to do the mitigation work.

Some of the programs that use RFPs to select projects do not require financial assurances from the project applicants, but they make it clear that the applicants are liable for project completion. The Maine Natural Resource Conservation Program told us that project applicants are expected to cover any additional costs to ensure the project meets performance standards. The Connecticut ILF Program has a similar process.

## Project Monitoring

The 2008 Rule requires that every project be monitored once implementation is complete. Monitoring is required to “determine if the project is meeting its performance standards, and to determine if measures are necessary to ensure that the compensatory mitigation project is

accomplishing its objectives.”<sup>95</sup> The mitigation plan must include a description of the project monitoring requirements, “including the parameters to be monitored, the length of the monitoring period, the party responsible for conducting the monitoring, the frequency for submitting monitoring reports to the district engineer, and the party responsible for submitting those monitoring reports to the district engineer.”<sup>96</sup>

## Monitoring Plan

The 2008 Rule does not prescribe what should be required in a monitoring plan. Instead, the Rule states that “the content and level of detail for those monitoring reports must be commensurate with the scale and scope of the compensatory mitigation project, as well as the compensatory mitigation project type,”<sup>97</sup> leaving discretion to the mitigation sponsor and the IRT. The Corps Regulatory Guidance Letter 08-03 provides guidance on minimum monitoring requirements for mitigation projects, including the required minimum content for monitoring reports.<sup>98</sup> Some states or Corps districts have other guidance documents (e.g., U.S. Army Corps of Engineers South Pacific Division Regional Compensatory Mitigation and Monitoring Guidelines<sup>99</sup> and the Wisconsin Department of Natural Resources Guidelines for Wetland Compensatory Mitigation in Wisconsin<sup>100</sup>). These guidelines are influential in the development of monitoring plans. Other programs told us that their district has no specific monitoring guidance.

Broadly, monitoring requirements are site specific and vary by project. Wetland monitoring metrics include those related to vegetation (e.g., percent cover, diversity, density), invasive species, geomorphology, soils, hydrology, and wildlife. Several programs use assessment methodologies for monitoring. For example, several programs from California use CRAM during the monitoring period to assess condition of projects relative to their performance standards (which are also sometimes based on CRAM). The Riverside-Corona Resource Conservation District ILF Program, for example, told us that all monitoring metrics are based on CRAM, including vegetation cover and species composition, among others. The Keys Restoration Fund reported using UMAM for monitoring, and the Northern Kentucky University ILF Program suggested that the Stream Functions Pyramid may inform monitoring requirements for its projects.

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<sup>95</sup> 33 C.F.R. § 332.6(1).

<sup>96</sup> *Id.*

<sup>97</sup> *Id.*

<sup>98</sup> U.S. Army Corps of Engineers RGL 08-03, <http://www.nap.usace.army.mil/Portals/39/docs/regulatory/rgls/rgl08-03.pdf>.

<sup>99</sup> U.S. Army Corps of Engineers South Pacific Division Regional Compensatory Mitigation and Monitoring Guidelines, <http://www.spd.usace.army.mil/Portals/13/docs/regulatory/mitigation/MitMon.pdf>.

<sup>100</sup> Wisconsin Department of Natural Resources Guidelines for Wetland Compensatory Mitigation in Wisconsin, <https://dnr.wi.gov/topic/Wetlands/documents/mitigation/WetlandCompensatoryMitigationGuidelines.pdf>.

## Performance Standards

Performance standards are used to assess whether a project is achieving its objectives. They are established as a reference so that a “project can be objectively evaluated to determine if it is developing into the desired resource type, providing the expected functions, and attaining any other applicable metrics (e.g., acres).”<sup>101</sup> Certain general principles underlie the development of performance standards: they must be based on qualities that are “objective and verifiable,” and they must be based on “the best available science that can be measured or assessed in a practicable manner.”<sup>102</sup>

The 2008 Rule provides further details on what these standards may look like:

Performance standards may be based on variables or measures of functional capacity described in functional assessment methodologies, measurements of hydrology or other aquatic resource characteristics, and/or comparisons to reference aquatic resources of similar type and landscape position. The use of reference aquatic resources to establish performance standards will help ensure that those performance standards are reasonably achievable, by reflecting the range of variability exhibited by the regional class of aquatic resources as a result of natural processes and anthropogenic disturbances. Performance standards based on measurements of hydrology should take into consideration the hydrologic variability exhibited by reference aquatic resources, especially wetlands.<sup>103</sup>

Programs reported that performance standards vary from project to project, depending on resource type, ecological context, and so forth. Metrics are most commonly related to hydrology, habitat features, plant survival, species composition, etc. Most programs told us that monitoring criteria are linked to performance standards.

As suggested above, several programs reported that assessment methods and/or reference resources are used to develop performance standards. Programs in California, for example, told us that CRAM is used to determine appropriate indicators of performance, and as described above, the methodology is also used during monitoring to ensure projects are meeting performance standards. Likewise, the Everglades National Park ILF Program uses UMAM, the Montana Aquatic Resources Services ILF Program uses MWAM, and the South Dakota Ducks Unlimited ILF uses HGM. These assessment methods are discussed in greater detail in the Credits section above. Programs like the Keys Restoration Fund and Massachusetts Department of Fish and Game ILF Program use reference sites or resources to develop appropriate performance standards.

Beyond these tools, some programs highlighted that their resources for developing performance standards include formal guidance from their Corps district, IRT, or state agencies.

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<sup>101</sup> 33 C.F.R. § 332.5(a).

<sup>102</sup> 33 C.F.R. § 332.5(b).

<sup>103</sup> 33 C.F.R. § 332.5.

The Nature Conservancy’s Ohio Stream and Wetland ILF Program, for instance, refers to guidance documents from the IRT that outline performance standards for streams and for wetlands. The Wisconsin Wetland Conservation Trust ILF Program refers to guidance from the Wisconsin Department of Natural Resources, as well as the Corps.

## Monitoring Period

The 2008 Rule requires that the mitigation plan specify a monitoring period that is sufficient to demonstrate that the project has met performance standards, and that this period may be no fewer than five years.<sup>104</sup> It specifies that there are some cases in which the monitoring period is required to be longer, as when the project involves aquatic resources that have slower development rates, like bogs or forested wetlands. The 2008 Rule also provides that the district engineer may revise the monitoring period—reducing it upon determination that performance standards have been met or extending it if the project is not on track to meet its objectives within the original timeline.

In practice, most of the programs that we interviewed said that they typically monitor for five to ten years (see Table 9). For some programs, like the Connecticut ILF Program, the length of monitoring time is unique to each project and is specified in each mitigation plan. A handful of programs, including The Nature Conservancy’s Ohio Stream and Wetland ILF Program and the Pierce County ILF Program are required to monitor for at least ten years.

Some programs reported that they monitor sites every year or several times per year. Others, however, remarked that they conduct monitoring for only some of the years of the full monitoring period. The Nature Conservancy’s Virginia Aquatic Resources Trust Fund monitors six out of the ten years of monitoring it performs.

<b>Program Name</b>	<b>Duration of Monitoring (length of time subject to change in circumstances of adaptive management)</b>
Arizona Game and Fish Department ILF Mitigation Program	Minimum 5 years
Coachella Valley ILF Program	Minimum 5 years
Connecticut ILF Program	Minimum 5 years
Ducks Unlimited New York ILF Program	Minimum 5 years

<sup>104</sup> 33 C.F.R. § 332.6(2)(b).

<b>Table 9 (continued): Monitoring duration for interviewed ILF programs.</b>	
Ducks Unlimited Vermont ILF Program	Minimum 5 years
Georgia-Alabama Land Trust	Minimum 5 years
Great Land Trust	Minimum 5 years
Everglades National Park ILF Program	Minimum 5 years
Hood Canal Coordinating Council	Minimum 5 years
Kentucky Department of Fish and Wildlife Resources ILF Program	Minimum 5 years
Keys Restoration Fund	Minimum 5 years
King County Mitigation Reserves Program	Minimum 5 years; projects are typically 7–10 years
Land Trust for the Mississippi Coastal Plain	Minimum 5 years
Living River Restoration Trust (Elizabeth River Project)	Minimum 5 years
Louisiana Department of Natural Resources ILF Program	LDNR must maintain the project for 20 years
Maine Natural Resource Conservation Program	Minimum 5 years
Massachusetts Department of Fish and Game ILF Program	Minimum 5 years
Montana Aquatic Resources Services ILF Program (MARS)	Minimum 5 years
Mountains Restoration Trust ILF Program	Minimum 5 years
New Hampshire Aquatic Resource Mitigation Fund	Minimum 5 years
National Fish and Wildlife Foundation Sacramento District California ILF Program	Minimum 5 years
North Carolina Division of Mitigation Services	7 years on stream and wetlands projects; 5 years on buffer and nutrient projects
North Dakota Ducks Unlimited ILF	Minimum 5 years
Northern Kentucky University ILF Program	Minimum 5 years
Northwest Florida Water Management District	Minimum 5 years
Pierce County ILF Program	10 years on all projects
Quil Ceda Village	Minimum 5 years
Riverside-Corona Resource Conservation District ILF Program	Minimum 5 years
South Dakota Ducks Unlimited ILF	Minimum 5 years
Southeast Alaska Land Trust	Minimum 5 years
Southeast Alaska Mitigation Fund	Minimum 5 years
Stream + Wetlands Foundation ILF Program	Minimum 5 years for non-forested wetland restoration/creation; 10 years for forested wetland restoration/creation
Tennessee Stream Mitigation Program	Minimum 5 years

<b>Table 9 (continued): Monitoring duration for interviewed ILF programs.</b>	
The Nature Conservancy’s Ohio Stream and Wetland ILF Program	10 years on all projects
The Nature Conservancy’s Virginia Aquatic Resources Trust Fund	10 years on all projects
The Wetland Trust	10 years on all projects
Tucson Audubon Society ILF Program	Minimum 5 years
Ventura River Watershed ILF Mitigation Program	Minimum 5 years
West Virginia Stream and Wetland Mitigation Program	Minimum 5 years
Wisconsin Wetland Conservation Trust ILF Program	Typically 5-10 years

## Reporting on Monitoring

All programs are required to produce reports on their assessments of projects. Per the 2008 Rule, the district engineer has significant authority over the contents of monitoring reports. The Rule establishes that the district engineer “must determine the information to be included in monitoring reports. This information must be sufficient for the district engineer to determine how the compensatory mitigation project is progressing towards meeting its performance standards.”<sup>105</sup>

Reports may include qualitative or quantitative indications of the functions provided by a compensatory mitigation site. Qualitative and quantitative data may come from functional, condition, or other assessments. Additionally, the Rule does not require any specific forms of documentation be included, but it does allow that reports may include “plans (such as as-built plans), maps, and photographs to illustrate site conditions.”<sup>106</sup>

The content and nature of monitoring reports is somewhat variable from program to program. The King County Mitigation Reserves Program, for example, noted that much of the information provided in its report is quantitative in nature. The report includes tables and photo documentation, as required by the IRT.

Programs generally include some detail about monitoring reports in their program instruments. For example, in Montana, the MARS program describes what will be included in a report:

In general, MARS will provide annual monitoring reports for each project to the Corps and IRT in conjunction with annual credit reporting by March 31 of each year following the growing season (June 15 – August 31) until all performance

<sup>105</sup> 33 C.F.R. § 332.6(c).

<sup>106</sup> 33 C.F.R. § 332.6.

standards have been achieved and associated credits released. Each report will be submitted in electronic format, and will contain the following:

1. Plans, maps, and/or photographs adequate to illustrate site conditions;
2. A narrative summarizing the condition of individual ILF projects;
3. Monitoring results with comparison to performance standards, and;
4. Recommendations for adaptive management at the site.<sup>107</sup>

The Connecticut ILF Program instrument states:

The details of the report shall be project-specific and identify specific parameters for monitoring, including a project overview, specific permit requirements, a summary of mitigation goals, the standards of success to achieve mitigation goals and/or measures needed to attain those standards, an assessment of how well the site is meeting these performance standards, before and after photographs, and any charts or figures which can facilitate displaying this information. The reports shall also describe needed remedial actions, visual estimates of plant cover, presence of invasive species, wildlife using the area and comment on plant health and vigor.<sup>108</sup>

Most interviewed programs specified that they submit monitoring reports every year. As described above, the MARS program noted that its report is due by March 31 each year. The North Carolina Division of Mitigation Services noted that its annual reports are due by April 1 to the IRT. Other programs submit reports on different schedules. The Wisconsin Wetland Conservation Trust ILF Program submits five or six reports across its five to ten years of monitoring, while the Ducks Unlimited New York ILF Program submits reports every two years. The Nature Conservancy's Virginia Aquatic Resources Trust Fund monitors six out of the ten years of monitoring it performs. They specified that monitoring reports are due on years 1, 2, 3, 5, 7, and 10, as specified by Virginia state code. The King County Mitigation Reserves Program conducts formal monitoring in years 1, 3, 5, 7, and 10. It conducts some degree of less formal monitoring all other years.

## Adaptive Management

Monitoring serves to measure progress towards achieving performance standards and also to identify any challenges that may need to be addressed through adaptive management measures. The 2008 Rule defines adaptive management as

a management strategy that anticipates likely challenges associated with compensatory mitigation projects and provides for the implementation of

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<sup>107</sup> Montana Aquatic Resources Services ILF Program (MARS). (2013). *Montana Statewide In-Lieu Fee Mitigation Program Instrument*.

<sup>108</sup> Connecticut ILF Program. (2013). *Final Instrument for the Audubon Connecticut In-Lieu Fee Program*.

actions to address those challenges, as well as unforeseen changes to those projects. It requires consideration of the risk, uncertainty, and dynamic nature of compensatory mitigation projects and guides modification of those projects to optimize performance. It includes the selection of appropriate measures that will ensure that the aquatic resource functions are provided and involves analysis of monitoring results to identify potential problems of a compensatory mitigation project and the identification and implementation of measures to rectify those problems.<sup>109</sup>

Most of the programs we interviewed reported that adaptive management language was included in the instrument and/or in individual mitigation or monitoring plans. For example, Appendix P of the Pierce County ILF Program's instrument describes Adaptive Management and Contingencies Planning. The appendix identifies the sections of the 2008 Rule that provide guidance on adaptive management of mitigation projects and states that each mitigation plan will include an adaptive management plan. A few programs told us that adaptive management provisions are included in RFPs and/or contracts to project applicants or contractors. The North Carolina Division of Mitigation Services, for example, told us its RFP states that contractors must deliver credits in order to receive payment. This includes taking adaptive management measures to ensure specified outcomes. Adaptive management must be documented in monitoring reports so that regulatory agencies know what happened.

Many programs told us they set aside a percentage of the credit costs for contingency funds that may be used for adaptive management (as described in the Financial Assurances section above). Contingency percentages ranged from 5% to 20% of credit prices. A few programs told us that they had to take adaptive actions on individual projects.

Several programs mentioned challenges presented by extreme weather events. In the past several years, various ILF programs have experienced the impacts of severe storms and flooding, wildfire, or other natural disasters. These programs include the Ventura River Watershed ILF Mitigation Program, which experienced significant damage to resources during the Thomas Fire in autumn of 2017. The sponsor described the damages as amounting to approximately "6 years and \$1 million worth of work." The program has now initiated a claim for Force Majeure with its IRT. The program is asking for formal concurrence from the IRT so that the project can be officially closed and the program can then find other funds to repair the project. The project site is located on land owned by the sponsor, and the sponsor is committed to restoring the site.

Likewise, the Keys Restoration Fund program described damage to a project after Hurricane Irma in 2017, and the Land Trust for the Mississippi Coastal Plain experienced the destructive impacts of Hurricane Katrina in 2005.

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<sup>109</sup> 33 C.F.R. § 332.2.

## Long-Term Management

Long-term management (LTM) is everything that happens after the performance standards for a site are met and the agencies have signed off on a site, signaling the end of the establishment and operational phases and the beginning of the LTM phase. LTM ensures that the restoration or other compensation efforts continue to provide desired functions after the active phase of the mitigation project is over and may involve management, maintenance, and monitoring obligations.

The 2008 Rule recognizes the importance of LTM, requiring that the mitigation plan include a LTM plan that describes “how the compensatory mitigation project will be managed after performance standards have been achieved to ensure the long-term sustainability of the resource, including long-term financing mechanisms and the party responsible for long-term management.”<sup>110</sup> The Rule further requires that the compensation planning framework include “[a] description of the long-term protection and management strategies for activities conducted by the in-lieu fee program sponsor.”<sup>111</sup>

The 2008 Rule states that “compensatory mitigation projects shall be designed, to the maximum extent practicable, to be self-sustaining once performance standards have been achieved.”<sup>112</sup> Several programs echoed this objective, suggesting that designing self-sustaining projects will help to minimize LTM activities and costs and ensure long-term sustainability. For example, the Georgia-Alabama Land Trust’s instrument states, “Wherever possible, Mitigation Sites will be designed to be self-sustaining.”<sup>113</sup> However, ILF programs vary in how they approach LTM and how they finance it.

### The Long-Term Management Plan

#### Timing

As required by the 2008 Rule, most programs told us that a version of the LTM plan is included in the draft mitigation plan submitted for project approval.<sup>114</sup> However, many programs told us that the LTM plan is substantially developed or revised as the project nears completion and moves toward the LTM phase. This allows the program to make any changes necessary to reflect as-built conditions. Several programs told us that the submission of the final LTM plan is required for the final release of credits and before the project can move into the LTM phase. For example, the King County Mitigation Reserves Program and the Quil Ceda Village ILF program reported that the final credit release for projects is based on submitting the final LTM plan to the IRT.

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<sup>110</sup> 33 C.F.R. § 332.4(c)(11).

<sup>111</sup> 33 C.F.R. § 332.8(c)(2).

<sup>112</sup> 33 C.F.R. § 332.7(b).

<sup>113</sup> Georgia-Alabama Land Trust. (2013). *Georgia Land Trust In-Lieu Fee Program: Program Instrument*.

<sup>114</sup> 33 C.F.R. § 332.4(c)(11).

In a few cases, programs told us that no LTM plan is required for certain types of projects. For example, the Maine Natural Resource Conservation Program explained that no LTM plan is required for barrier removal projects, where there is no surrounding conserved land to manage.

### Content of the LTM Plan

The 2008 Rule requires that the LTM plan include:

- The parties responsible for long-term management and maintenance
- The long-term management and maintenance needs
- The party responsible for long-term ownership
- A description of the annual costs for carrying out long-term management activities
- The funding mechanism that will be used to meet those costs<sup>115</sup>

In addition, ILF Programs must also:

- Include “the legal mechanisms and the party responsible for long-term management and protection” of the site, and
- “address the financial arrangements and timing of any necessary transfer of long-term management funds to the steward.”<sup>116</sup>

Most programs told us that LTM plans are tailored to the needs of individual project sites. However, as programs increase the number of projects completed, some are looking to develop standard or program-wide management plans. For example, the Quil Ceda Village ILF program is looking into developing a management plan for all of its projects on which individual project plans will be based. The program’s instrument already lays out a fairly comprehensive description of LTM requirements. The instrument goes into some detail about what will be included in each mitigation project’s Long-Term Management and Maintenance Plan (LTMM Plan), including basic site information and management goals; general management considerations (including allowed and prohibited uses, fencing and signage, buffers, and trespass); long-term monitoring activities (including establishing permanent transects); and long-term maintenance activities (see Quil Ceda Village Appendices and CPF).

Some programs reported that they work with project partners to develop the LTM plan. Sometimes the compensation site’s landowner may be involved in developing the plan. For example, the MARS Program worked with a land trust to develop the management plan. And several of the programs that run RFPs told us that the applicant or landowner will develop the LTM plan.

### Long-Term Management Responsibilities

LTM roles can include easement holder, fee title holder, and long-term manager (or entity carrying out monitoring and maintenance). For example, the ILF program may retain fee title

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<sup>115</sup> 33 C.F.R. § 332.7(d)(2).

<sup>116</sup> 33 C.F.R. § 332.8(u)(1-3).

ownership of the site and carry out LTM and maintenance obligations, while a separate entity, such as a land trust, may hold the easement and carry out easement monitoring and defense. Or the mitigation provider may hold fee title but engage another entity to conduct the LTM. Programs told us that they are taking on the range of these activities. Some programs are accepting most of the management duties; others are primarily working with partners or project sponsors. Many programs are working with other organizations to hold easements on the project sites.

A number of programs are taking on at least some of the management duties, including both public agencies and private non-profits (including several land trust sponsors). For example, the Hood Canal Coordinating Council cannot own or hold title to property (due to its legal structure); thus, titles for its compensation sites are held by local land trusts who do easement encroachment work. The program, however, retains some of the LTM responsibility for issues like invasive species or trash/garbage removal. The division of responsibilities will vary somewhat by site. Several of the public ILF programs partner with sister agencies with significant land management expertise on LTM or will be responsible for LTM themselves where appropriate.

Most programs reported that they are partnering with other organizations or agencies to take on LTM. The Louisiana Department of Natural Resources (LA DNR) ILF Program partners with a sister agency, the Coastal Protection and Restoration Authority (CPRA), on project identification, and responsibility for LTM stays with LA DNR when restoration is complete. The Quil Ceda Village ILF program plans to collaborate with other agencies and contractors on LTM. The Tulalip Tribes Community Development Department or the Northwest Indian Fisheries Commission will hold the conservation easement and will conduct easement monitoring on their project sites. The Program will contract out monitoring and maintenance and LTM reporting.

The Stream + Wetlands Foundation ILF Program is working with local NGOs to manage sites over the long term. The program identifies who will do this early in the development of the project. As mentioned above, many of the programs that run RFPs as part of their site selection process work with the project applicants to develop LTM plans. The applicants or the landowners are then often responsible for LTM. The Maine Natural Resource Conservation Program's instrument, for example, requires that the project sponsor or whoever is holding the land (for sites where the land is purchased) create a LTM plan and serve as long-term manager. The Program has a template for this.

Some of the newer programs are still figuring out what they will do as they do not yet have projects that are ready to move to the long-term management phase. They are exploring options and potential partners.

## Calculating LTM Costs

Under the 2008 Rule, mitigation providers are required to provide sufficient funding to meet the LTM needs of the site. As stated above, the LTM plan for the site must include long-term

financing mechanisms and any “provisions necessary for long-term financing must be addressed in the original permit or instrument.”<sup>117</sup>

Most programs told us they are setting aside funds for LTM. A few programs told us they are partnering with agencies on LTM for some projects, and in some cases the partner agency will handle the costs for LTM. For example, the Keys Restoration Fund reported that for its projects on state lands, the state budgets its own funds for LTM.

Most programs told us that LTM is factored into credit prices and that often there is a line item in the project budget for LTM. However, programs varied in how they determine the LTM funds available for projects. There are generally three ways that programs told us that they are determining the amount of funds set aside for LTM: a calculator, case-by-case, or a percentage of credit price (see Table 10).

- **Calculator:** Some programs calculate costs using either spreadsheet calculators (such as the one developed by The Nature Conservancy<sup>118</sup>) or computerized database methodologies (such as the Property Analysis Record (PAR) developed by the Center for Natural Lands Management<sup>119</sup>). These funding formulas and cost calculators are used to calculate the principal amount of the long-term funding mechanism necessary for perpetual stewardship or management of mitigation sites.

Some programs have developed their own calculator. For example, NCDMS hands over its compensation sites to a stewardship group for LTM management. The stewardship group has developed a model to calculate LTM costs. The model looks at what is necessary to ensure that the boundaries of the compensation site are protected in perpetuity (using aerials, drone, etc.). The group then tells NCDMS what the LTM costs will be, and those are then approved by the IRT and factored into credit prices.

Other programs use calculators developed by other groups. The Nature Conservancy’s (TNC) Ohio Stream and Wetlands ILF Program use a calculator developed by TNC. TNC’s calculator “is intended to provide a standard method for estimating and evaluating long-term protection, administration and management funding needs of conservation and restoration properties, including those provided through compensatory mitigation.”<sup>120</sup>

Other programs—especially those in California—use the Property Analysis Record (PAR).

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<sup>117</sup> 33 C.F.R. § 332.7(d)(2).

<sup>118</sup> *The Nature Conservancy Calculator*,

<https://www.conservationgateway.org/ConservationPlanning/ToolsData/Pages/stewardshipcalculator.aspx>.

<sup>119</sup> *Property Analysis Record (PAR)*, <https://www.cnlm.org/par/>.

<sup>120</sup> *The Nature Conservancy Stewardship Calculator and Handbook*,

<https://www.conservationgateway.org/ConservationPlanning/ToolsData/Pages/stewardshipcalculator.aspx>.

The PAR is a computerized database methodology that is effective in helping land managers calculate the costs of land management for a specific project. The PAR helps analyze the characteristics and needs of the property from which management requirements and costs are derived. It helps pinpoint management tasks, estimate the costs associated with these tasks, and determine administrative costs. The PAR generates a report on the full cost estimate for managing a property, which can provide your land trust with a well-substantiated basis for justifying your long-term funding needs.<sup>121</sup>

The Tucson Audubon Society ILF Program, Mountains Restoration Trust ILF Program, and Riverside-Corona Resource Conservation District ILF Program all reported using PAR to aid in determining LTM costs.

- **Case-by-case based on experience:** Some programs estimate the amount of LTM funding necessary for a given project based on analyses of previous projects or past experience or by consulting neighboring program procedures.

For some programs, project partners help to determine the proposed LTM costs. For example, many of the programs that use an RFP process to identify sites have the applicant include the LTM cost in their budget proposal. The Connecticut ILF Program requires the conservation entity/property owner to pay for LTM out of its own budget. The application submitted under the RFP includes a breakdown of costs.

- **Percentage of Credit Price:** Some ILF programs set aside a portion of credit sales for LTM expenses. Most of these programs told us that these percentages are based on average LTM costs or experience of nearby programs.

For example, the King County Mitigation Reserves Program sets aside 5% of each sale for the LTM account by service area. An additional 10% of the credit sale also goes to contingency. The program can use some of these funds for LTM if needed. The interest earned on these accounts rolls back into the LTM fund. Other programs set aside from 5% (Pierce County ILF Program, Quil Ceda Village ILF program) up to 17% (MARS) or even 18% (West Virginia In Lieu Fee Stream and Wetland Mitigation Program) of credit fees for LTM.

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<sup>121</sup> Environmental Law Institute & Land Trust Alliance (2012).

Calculator or model	North Carolina Division of Mitigation Services (Stewardship Group developed model); Southeast Alaska Land Trust (Excel spreadsheet); Everglades National Park ILF Program (model); The Nature Conservancy's Ohio Stream and Wetland ILF Program (TNC calculator); Tucson Audubon Society ILF Program (PAR); Mountains Restoration Trust ILF Program (PAR but may move to TNC); Riverside-Corona Resource Conservation District ILF Program (used PAR plus experience); Coachella Valley ILF Program (based on Riverside-Corona); North Dakota Ducks Unlimited ILF; South Dakota Ducks Unlimited ILF
Case-by-case based on experience	Land Trust for Mississippi Coastal Plain; Arizona Game and Fish Department ILF Program (study of previous projects and years of experience); Pierce County ILF Program (based on experience of other programs); Georgia-Alabama Land Trust (work with project applicants, significant in-house expertise); Stream + Wetlands Foundation ILF Program; Louisiana Department of Natural Resources ILF Program (case-by-case basis, works with state agency partner)
Percentage	Living River Restoration Trust (Elizabeth River Project) (based on construction costs); Hood Canal Coordinating Council (14.7% of credit price in contingency that can be used for LTM); MARS (17% of credit price); King County Mitigation Reserves Program (5%, and additional 10% goes to contingency, which could be used for LTM); Ventura River Watershed ILF Mitigation Program (\$10,000 per acre of credit cost); Kentucky Department of Fish and Wildlife Resources ILF Program (10%); West Virginia ILF Stream and Wetland Mitigation Program (18%); Quil Ceda Village (5% of fees)

## Observations and Suggestions

LTM plans are the mechanism for ensuring that compensation projects continue to provide desired functions over the long term. The 2008 Rule does not include detailed guidance on the development of LTM plans, leaving a lot of discretion to the plan drafters. ELI and The Land Trust Alliance's 2012 report *Wetlands and Stream Mitigation: A Handbook for Land Trusts* provides technical guides on site protection instruments, LTM plans, and LTM financing mechanisms that may be informative in the development of LTM plans and the calculation of LTM costs.<sup>122</sup> We include some key recommendations here.

### LTM Plans

Several Corps districts have LTM plan templates or provide some more specific information. In a review of the plans, we identified nine sections common to models or actual plans. These include:

1. Introduction to and purpose of the plan

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<sup>122</sup> *Id.*

2. Party responsible for long-term management
3. Party responsible for site ownership
4. Background conditions and the baseline
5. Description of the site
6. Management and monitoring goals, objectives, tasks
7. Administrative matters, such as reporting, transfer, replacement, amendment, and notice
8. Funding and task prioritization
9. Other sections (including more detailed information on the long-term manager, explanation of broader biological principles informing management goals and tasks, local, state, and federal laws that may impact management, contingencies—natural hazards that may affect the site, equipment or supplies that may be needed for management, possibilities for expanding the protected area, other programmatic objectives—like public education or research on site, or impact or relationship of other compatible uses—like hunting)

Some of these sections, such as background conditions and the baseline, description of the site, the management and monitoring section, and the funding section will be the most technical and time consuming. Thoroughly evaluating possible management activities (including synthesizing and studying monitoring data to develop any necessary mid-course corrections), for example, is important for helping to ensure long-term sustainability of the site. LTM tasks can include:

- Habitat management (e.g., species monitoring and inventories)
- Fire management (e.g., prescribed burns)
- Invasive species control (e.g., weed and pest—unwanted plants and animals—control)
- Hydrology (e.g., management of any structural water control mechanisms on site)
- Educational activities
- Public recreation or access
- Volunteer training
- Demonstration areas

The clearer the management tasks in the LTM plan, the easier it will be to develop a solid long-term financing plan. Clear language can also help to ensure that LTM responsibilities are predictable and will help increase the likelihood that the long-term manager will not be expected to carry out tasks not anticipated at the time that the LTM plan was crafted or be subject to liability for perceived failures to effectively implement the plan. However, as conditions may change over the long term, it is important to consider including some flexibility in the LTM plan and including contingency funds in the calculation of LTM costs. Highly specific language in the LMT plan may make it more difficult to address changing site conditions, such as the appearance of a new invasive species, that were not anticipated when the LTM plan was written. Balancing this tension between plan specificity and flexibility may require a significant investment of time, as well as the input of expert advice.

## Calculating LTM Costs

LTM funds must be sufficient to ensure that the LTM needs identified in the LTM plan are covered over the long term. There are a number of steps that may go into calculating long-term funding needed, including:

- Identify the range of duties, activities, and other responsibilities that need to be considered when calculating annual stewardship costs
- Calculate the annual stewardship costs
- Calculate the enforcement costs
- Calculate the principal amount of the long-term financing mechanism<sup>123</sup>

There are many costs that should be considered in the determination of LTM costs, including:

- Baseline documentation (some land trusts include this item as an acquisition cost)
- Annual monitoring and stewardship responsibilities
- Enforcement to address easement violations
- Labor costs for easement monitoring
- Labor costs for establishing and maintaining landowner relationships
- Consultants
- Office overhead
- Travel and mileage
- Supplies and equipment (e.g., cameras, image processing, GPS units, fireproof file cabinets, copying and mailing, etc.)
- Storage and records management (e.g., direct costs, labor costs, administrative support)
- Legal costs (i.e., ready access to an attorney when questions arise about easement interpretation, compliance issues, process, and other points of law)
- Insurance costs
- Marking and maintaining boundaries
- Paying taxes
- Overseeing leases and other arrangements
- Protecting the important conservation attributes of the property
- Capital expenses and replacement costs (e.g., replacement, repair, or maintenance of brochures, trailhead or road barriers, equipment purchase and maintenance, signs and registration boxes, boundary signs/brushing out boundaries, bridges and walkways, and buildings and other structures)
- Resource inventories
- Contingency (funds should be set aside to account for unforeseen costs that result from property ownership)
- Others

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<sup>123</sup> *Id.*

The Nature Conservancy’s Stewardship Calculator and the Property Analysis Record are available tools that may be used to guide an ILF program (or LTM plan drafter) through the LTM planning process. Several ILF programs are using these tools.

## Data Management

Managing an ILF program requires managing many different types of data. The 2008 Rule, for example, requires that the sponsor “establish and maintain an annual report ledger . . . as well as individual ledgers that track the production of released credits for each in-lieu fee project.”<sup>124</sup> The Rule goes on to require that the sponsor “compile an annual ledger report showing the beginning and ending balance of available credits and permitted impacts for each resource type, all additions and subtractions of credits, and any other changes in credit availability.”<sup>125</sup> In addition to information on the sale, fulfillment, and release of credits, program sponsors also track information on finances, permitting and construction timelines, monitoring, archives of monitoring data that are fully described and documented for future users, communications with key stakeholders, and so on. The breadth and depth of the data that sponsors must adeptly manage is significant. As such, sponsors turn to a variety of platforms to organize the different information.

### Financial Data and Credit-Debit Ledgers

For financial and credit-debit information, most programs turn to ubiquitous and easily customizable platforms like Microsoft’s Excel and Access or Intuit’s QuickBooks to track the inflow and outflow of credits and of funding. Some interviewees mentioned that these programs may feel a bit unwieldy over time, however. Some programs, particularly those sponsored by government agencies or large non-profits, mentioned that they use financial management software customized for their organization or their state or county. The California State Coastal Conservancy Calleguas Creek ILF Program, for instance, uses FI\$Cal, the financial management platform used by the State of California. Likewise, Ducks Unlimited programs use organization-specific software.

### Managing Project Timelines and Communications

Another significant source of information that requires close tracking is that of the timelines associated with permitting; construction; monitoring of construction efforts; engaging with stakeholders like the Corps, IRT, or landowners; etc. Given that sponsors may manage different projects concurrently, it is often imperative that they have a straightforward system in place for managing overlapping and complex processes. Various interviewed programs mentioned that they use spreadsheets like those in Excel to manage the data. Others, like the North Dakota Ducks Unlimited ILF program, noted that they create and progressively update flowcharts mapping the stages or checkpoints they can expect.

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<sup>124</sup> 33 C.F.R. § 332.8(p)(2).

<sup>125</sup> 33 C.F.R. § 332.8(q)(1).

## Monitoring Data

A few programs reported that they track data on items like vegetation, geomorphology, and more in Excel or in mapping and visualization platforms like ArcGIS, a geographic information system (GIS) platform, and GeoJot. These programs allow users to layer different types of data into visualizations so that they can be spatially analyzed. The Great Land Trust program in Alaska, for example, uses GeoJot (a subscription service that allows users to upload datasets and photos taken on mobile devices to a visualization platform) to manage its monitoring data. Programs also told us that they upload monitoring reports to the RIBITS site. For some programs, use of this web platform constitutes the extent of their management of monitoring data.

## Observations and Suggestions

Data management is a critical component of ILF program management. Some of the programs we interviewed reported feeling very comfortable and confident in their data management. Others expressed a desire to improve their data management. Of those programs, several mentioned a desire for more customized, ILF-specific platforms for data management. Some of these programs have proactively determined to build their own management systems, like the North Carolina Division of Mitigation Services.

For other programs, it is not the platforms available to them that present an obstacle, but their staff's lack of capacity or expertise with data management. Some programs, like the New Hampshire Aquatic Resource Mitigation Fund, are considering hiring external contractors to assist where they feel they do not have sufficient in-house capacity.

In general, some desired properties that will improve the completeness and longevity of data management systems include accessibility, integration, stability, and quality control.

## Audits

Each ILF program must have a program account, which “may only be used for the selection, design, acquisition, implementation, and management of in-lieu fee compensatory mitigation projects, except for a small percentage . . . that can be used for administrative costs.”<sup>126</sup> A program sponsor must receive written authorization from the Corps before making disbursements from the account, and the sponsor is required to provide annual reports on the program account to the Corps and the IRT.<sup>127</sup> The 2008 Rule further provides that the Corps may audit an ILF program account: “The district engineer may audit the records pertaining to the program account. All books, accounts, reports, files, and other records relating to the in-lieu fee program account shall be available at reasonable times for inspection and audit by the district engineer.”<sup>128</sup> This is important to ensure that all funds are being used appropriately and are properly tracked and accounted for within the program.

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<sup>126</sup> 33 C.F.R. § 332.8(i)(1).

<sup>127</sup> 33 C.F.R. § 332.8(i)(2)–(3).

<sup>128</sup> 33 C.F.R. § 332.8(i)(4).

Although an important aspect of ILF programs, several programs have no information about audits or record review in their program instruments, and of the program instruments that include audit provisions, many are not very specific or detailed. Most of the program instruments reviewed do, however, at least acknowledge that the Corps may review or audit the program account records. Past that, the programs' audit provisions vary widely regarding who performs the audit (other than the Corps, of course), when and how often the program account is audited, what type of notice is required before an audit, and importantly, who bears the cost of an audit.

## Auditing Entity

The program instruments reviewed identify various entities that may perform an audit. Most note that the Corps may review or audit the program account, which reflects that the Corps has the right to conduct account audits under the 2008 Rule.<sup>129</sup> Some also note that the IRT, program sponsor, and/or program administrator may perform an audit. Several instruments provide that the audit will be completed by an independent auditing entity. For example, The Nature Conservancy's Virginia Aquatic Resources Trust Fund program instrument and the Georgia-Alabama Land Trust program instrument contemplate independent audits. A few programs, such as the Hood Canal Coordinating Council, include provisions that allow the state or a state environmental agency to audit the program account.

## Frequency and Timing

The frequency with which an audit may occur varies among the programs reviewed. Some allow an audit "at any time." Many programs describe when they may be audited in general—and somewhat vague—terms, such as "from time to time," "periodically," or at a "frequency deemed appropriate." Others are more specific and provide for an audit annually or every five years. One program has a set document retention period and states that the audit may occur during that period. A couple of programs also mention the time at which the audit may occur, specifying that the records will be made available during normal business hours or at reasonable times.

## Notice

The length and form of notice required also vary among the audit provisions for the program instruments reviewed. Many programs require 14 days' notice, and one program even requires a 30-day notice. Others allow an audit upon request or with reasonable prior notice. The provisions in many program instruments often specify that the notice must be in writing.

## Cost

A significant detail that is missing from most of the program instruments reviewed is information about who will bear the cost of the audit, which does not appear to be addressed directly in the 2008 Rule. Only a few programs explicitly identify who will pay for the audit—

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<sup>129</sup> *Id.*

either the sponsor (as a program expense) or the party requesting the audit (e.g., the Corps). A couple of instruments note more generally that the sponsor will provide an annual independent audit, which may imply that the sponsor would be responsible for the cost. It seems unlikely that the Corps or another agency will regularly have the funds or resources available to audit an ILF program account, so it is recommended that the sponsor factor in the cost of audits up front as a program expense. In this way, an audit can be a meaningful exercise that may actually occur and not simply something that is allowed but is largely precluded due to a lack of agency funds or resources.

## Implementation/Practice

Our interviews revealed that most programs have internal audits, sometimes as part of an overall organizational audit (if the ILF program is part of a larger non-profit, for example), and some undergo independent audits. For some programs, this is consistent with what is contemplated in their program instruments. For example, the Living River Restoration Trust Instrument provides that “[t]he parties shall endeavor to cause [an] independent audit to occur prior to the expiration of the Instrument,”<sup>130</sup> and the program is independently audited annually, with the audit sent to the Corps as part of the annual report. The program instrument for the National Fish and Wildlife Foundation Sacramento District California ILF Program notes that the sponsor’s compliance with generally accepted accounting principles will be audited on an ongoing basis as part of the sponsor’s annual independent financial audit (and includes the costs of such audits in the administrative fee). The Nature Conservancy’s Virginia Aquatic Resources Trust Fund instrument provides for an independent audit of the entire program every five years, and the Environmental Law Institute performed such an independent programmatic audit in 2016 (the program’s financial accounts were also audited by an independent financial auditor in 2016) (see Box 7). Although not always mentioned in their program instruments, many programs indicated that they perform annual internal audits of the program account. State-sponsored ILF programs like Kentucky Department of Fish and Wildlife Resources ILF Program and North Carolina Division of Mitigation Services are also subject to state requirements for fiscal audits.

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<sup>130</sup> Living River Restoration Trust (Elizabeth River Project). (2018). *Living River Restoration Trust Program Instrument*.

## Box 7: Programmatic Audit.

In 2016, ELI conducted the first (to our knowledge) programmatic audit of an ILF program (the Virginia Aquatic Resources Trust Fund). In the course of this audit, ELI examined records provided by the program and program records maintained by the Corps in RIBITS. In addition to documents pertaining directly to specific mitigation projects, ELI examined the program credit ledger spreadsheet; the budget spreadsheet; the agreed standard operating procedures (SOP); standard letters used in implementing the program; internal databases used by the program to manage and track the status of projects; and the program annual reports. ELI considered internal controls related to the performance and documentation of required elements and performed tests of the operation of these controls by matching documentation to the stated activities subject to the audit. In accordance with ELI's program audit agreement with the Conservancy as approved by the IRT, ELI reviewed the program's documentation of performance of the following material requirements:

- Conformation of mitigation project service areas to applicable regulations and standards;
- Compliance with the approved compensation planning framework;
- Documented approval of mitigation project sites;
- Site development plans including all required elements;
- Content of monitoring plans;
- Long-term management and maintenance plan;
- Adaptive management plan;
- Financial assurances;
- Recorded land protection documents;
- Documentation of credit costs;
- Maintenance of credit tracking system;
- Accurate tracking of credits using the system;
- Compliance with advance credit requirements;
- Satisfaction of required reporting protocols.

After a comprehensive review, ELI produced a final audit report finding the program demonstrated substantial compliance with all but one of the required program elements reviewed. The audit informed the reauthorization of the program, and the program undertook actions to fulfill outstanding mitigation obligations and reexamined current practices. A financial audit of the ILF program was conducted concurrently with ELI's programmatic audit, so ELI did not review the financial records of the program, as distinct from the mitigation credit ledger and documents associated with tracking and accounting for performance of mitigation obligations.

**Note:** A March 2018 letter from the Corps to the program sponsor of the Tennessee Stream Mitigation program indicated that the Corps will be working with the program sponsor to conduct a programmatic and financial audit of the program, at federal expense. This audit was completed in spring 2019.

## Observations and Suggestions

The current dearth of information about audits in many of the program instruments is not surprising, given that the 2008 Rule authorizes the Corps to conduct audits but does not require any specific language or information about audits to be included in the ILF program instruments. Due to the importance and utility of an audit, however, and because of the associated costs and time commitment for an audit (especially for an independent audit), it is suggested that sponsors include more details in their program instruments than what has typically been included in many instruments.

While an audit provision need not be particularly lengthy, including more detailed information in the program instrument may alleviate potential confusion or conflicts later. Program sponsors should consider including information about who (other than the Corps) may perform the audit or review, how frequently it may occur, what form of notice is required, how far in advance notice must be given, and importantly, who will pay for the audit. As noted above, it is recommended that the cost be included as a program expense to allow for a meaningful opportunity for an audit to occur. Importantly, an audit is not or should not be merely a fiscal audit (of ILF program fund management) but also should include an audit of programmatic operations.

We also suggest that ILF programs set up good data management systems as this may help put the programs in a better position for future audits (for more information, see the Data Management section of this report). A couple of program instruments also explain how confidential information will be treated for purposes of record review or audits. If a sponsor anticipates that it will treat certain types of information or documents as confidential, the sponsor may want to describe briefly what will be done with such information (i.e., if and how it may be shared) during an audit. It also may be worth noting where and when the audit should occur (e.g., during normal business hours at the sponsor's office or at the independent auditing entity's office).

Although not entirely comprehensive, examples of program instruments that already contain relatively more detailed/specific information regarding audits than most instruments include, among others, The Nature Conservancy's Virginia Aquatic Resources Trust Fund and the National Fish and Wildlife Foundation Sacramento District California ILF Program. The relevant provisions in the Virginia Aquatic Resources Trust Fund program instrument state, in part:

The Conservancy shall hold any funds collected pursuant to this Agreement in the Account, which shall be an interest-bearing account in a federally-insured financial institution . . . . The Conservancy shall account for the funds so held in accordance with generally accepted accounting principles, and the Account shall be subject to audit by the Corps and DEQ from time to time, as determined by the Corps and DEQ, at the expense of the party requesting such audit. Notwithstanding the foregoing, the Program shall be audited once each five years by an independent auditor, the cost of which shall be an administrative

expense of the Program. The parties shall endeavor to cause such independent audit to occur prior to the expiration of the Agreement. . . .

\* \* \*

The Corps and DEQ may review Account records with 14 days written notice. When so requested by the IRT, the Conservancy shall provide all books, accounts, reports, files, and other records relating to the Account.<sup>131</sup>

The instrument for the National Fish and Wildlife Foundation Sacramento District California ILF Program provides, in part:

In addition, the Program Sponsor applies generally accepted accounting principles (“GAAP”) to all of its financial accounts, which will include the ILF Program Account. . . . The Program Sponsor’s conformance with GAAP will thus be audited on an ongoing basis as part of the Program Sponsor’s annual independent financial audit.

\* \* \*

Upon request, the Program Sponsor shall also provide to any requesting IRT Member copies of its audited financial statements for any completed fiscal year. The IRT may inspect and review Program Account records by giving 30 days advance written notice to the Program Sponsor. When so requested, the Program Sponsor shall make available for inspection all books, accounts, reports, files, and other records relating to the Program Account.

\* \* \*

A percentage of each Advance Credit Transfer will be assessed and collected by the Program Sponsor as an administrative fee for the general administration of the Program, which includes tasks associated with the planning and operation of the overall ILF Program, which may be performed by the Program Sponsor or by third parties under professional services contracts. These activities may focus on the overall ILF Program or may be associated with activities related to undifferentiated ILF Projects. They include, without limitation, the following: . . . Internal and External Audits . . .<sup>132</sup>

## Conclusion

ILF programs have implemented hundreds of compensatory mitigation projects across the country. Many more projects are pending or in the planning stages. And new programs continue to come online to provide additional compensation options for permittees. Program sponsors—together with the Corps, IRT members, and stakeholders—have developed various ways to administer their programs and comply with regulatory requirements as they navigate a range of credit markets, geographic and climatic contexts, and regulatory and political climates. Our report shows that programs vary in the resources they serve, the way

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<sup>131</sup> The Nature Conservancy’s Virginia Aquatic Resources Trust Fund. (2011). *Virginia Aquatic Resources Trust Fund Program Instrument*.

<sup>132</sup> National Fish and Wildlife Foundation Sacramento District California ILF Program. (2014). *Sacramento District California In-Lieu Fee Enabling Instrument*.

they delineate service areas, the way they calculate credits, how they evaluate projects for selection, which aspects of program work are covered in house versus by a contractor, and so forth.

Through our research, we have identified a number of common challenges faced by ILF programs and have uncovered some strategies for achieving objectives. These include, though may not be limited to, the following.

## Common Challenges and Information Needs

Sponsors frequently cited the 2008 Rule's requirement that mitigation projects commence within the first three growing seasons after selling the first advance credit in the service area as one of the more challenging elements of administering an ILF program. Though many ILF programs approved under the 2008 Rule have been able to meet this requirement, many remarked that doing so has been somewhat challenging. Those programs that described meeting the three-year growing season timeframe as a challenge typically cited the following as sources of difficulty:

- Small or infrequent credit sales that make it difficult to gather sufficient funds to execute a meaningful project
- Difficulty finding landowners willing to sell properties or donate conservation easements for projects
- Lengthy and/or cumbersome project approval and permitting processes
- 

As was mentioned above, however, programs are working with the Corps and the IRT to negotiate extensions or alternative forms of mitigation (e.g., purchasing mitigation bank credits).

Programs also expressed a need for further guidance regarding certain technical elements of program administration. Included among these information needs were the topics of financial accounting and budgeting, long-term management, and data management.

Many programs would like further information on which expenses they should take into consideration when determining fees and how to estimate costs for these line items. Though almost all sponsors expressed that they are able to cover program needs with their current accounting and budgeting, many did remark that they would feel more comfortable that their credit pricing would adequately cover all of their expenses if they had more comprehensive guidelines in place.

We also heard from many programs that they would benefit from more guidance on long-term management. As more projects approved under the 2008 Rule move into the long-term management phase, more programs are seeking to better understand their long-term management responsibilities (e.g., whether they will be required to manage invasive species for many years to come). Programs also are still working to figure out how to accurately estimate long-term management costs and whether or not the funds set aside will be sufficient over the

long term. We do not have any good data to determine whether or not the long-term management funds set aside are sufficient to fund management activities over the long term. This will be an increasingly important question as more ILF projects are completed.

Programs expressed interest in receiving more detailed guidance on how to prepare for, respond to, and recover from significant natural events that may have damaged ILF projects. They also desired further clarification on the degree of responsibility they, as the sponsor, should expect for the costs and burdens of remediation in these situations. Some programs placed these concerns in the context of climate change and an increasing likelihood of similar extreme events. Some future important questions about adaptive management of ILF projects include: who reviews the monitoring data on projects and decides that adjustment are needed and who funds additional monitoring if adaptive management is necessary.

Many programs also stated that they wished they had better systems in place and tools at their disposal to manage the different types of data relevant to ILF administration. These data include, but are certainly not limited to, credit transactions, finances, project timelines, impacts, etc. As we explored in the above section on data management, however, it should be noted that some programs have been able to effectively leverage tools and technologies that make the task of managing information easier.

## Strategies for Effective Implementation of ILF Mitigation

Some of the most effective programs are those that have forged strong partnerships, developing and tending relationships with local landowners, community associations and interest groups, regulatory partners, and other stakeholders. Developing strong working relationships and open lines of communication allows programs to predict and address challenges early on, identify beneficial opportunities, and gain the trust of community members.

Programs can also benefit greatly from sharing knowledge with other ILF providers. Although each ILF program is unique, program sponsors should review other program instruments to see if they might be able to build off another program's strategy or use another program's resources, evaluation keys, or other documents to inform their own program's strategy. Several programs told us that convening regularly with other programs is extremely helpful for answering questions and improving program operation. At least one program told us that mentorship from another program was important for program development. The relatively young Southeast Alaska Mitigation Fund was the beneficiary of the Coda Global Fellows Program of The Nature Conservancy. The program provided resources for the Mitigation Fund to host a staff member from The Nature Conservancy's Virginia Aquatic Resources Trust Fund to assist with the initial development of the program. These types of mentorships and knowledge-sharing relationships offer a space to troubleshoot challenges and share effective solutions. They also equip sponsors to better identify the questions they should be asking and needs to anticipate at each stage of implementation. To that end, ILF programs have established an In-Lieu Fee Communications Group. The Group allows programs across the country to discuss current challenges, post new developments, and share strategies.

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## Appendix 1: ILF Instruments Reviewed by Stetson

- Arizona Game and Fish Department ILF Mitigation Program, *In-Lieu Fee Enabling Instrument: Arizona Game and Fish Department In-Lieu Fee Program* (2013)
- California State Coastal Conservancy - Calleguas Creek ILF Program, *In-Lieu Fee Enabling Instrument: Calleguas Creek Watershed In-Lieu Fee Program* (2014)
- Coachella Valley ILF Program, *In-Lieu Fee Enabling Instrument: Coachella Valley In-Lieu Fee Program* (2014)
- Connecticut ILF Program, *Final Instrument for the Audubon Connecticut In-Lieu Fee Program* (2013)
- Ducks Unlimited New York ILF Program, *Ducks Unlimited – New York In-Lieu Fee Program Final Instrument* (2012)
- Ducks Unlimited Mississippi Delta, *Ducks Unlimited, Inc. Mississippi Delta In-Lieu Fee Program Instrument*
- Ducks Unlimited Vermont ILF Program, *Ducks Unlimited, Inc. - Vermont In-lieu Fee Program* (2011)
- Everglades National Park ILF Program, *In-Lieu-Fee Program Instrument For The Everglades National Park In-Lieu-Fee Program* (2015)
- Georgia-Alabama Land Trust, *Georgia Land Trust In-Lieu Fee Program: Program Instrument* (2013)
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- Massachusetts Department of Fish and Game ILF Program, *Commonwealth of Massachusetts Final In-Lieu Fee Program Instrument* (2014)
- Missouri Conservation Heritage Foundation In Lieu Fee Mitigation Program, *In-Lieu Fee Instrument for the Missouri Conservation Heritage Foundation Stream Stewardship Trust Fund* (2013)
- Montana Aquatic Resources Services ILF Program (MARS), *Montana Statewide In-Lieu Fee Mitigation Program Instrument* (2013)
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- National Fish and Wildlife Foundation Sacramento District California ILF Program, *Sacramento District California In-Lieu Fee Enabling Instrument* (2014)
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- West Virginia ILF Stream and Wetland Mitigation Program, *West Virginia In Lieu Fee Stream and Wetland Mitigation Program Instrument* (2013)

## Appendix 2: Interview Template

### **Part 1: Program Information**

1. How many employees and what types of positions does your program have?
  - a. Does your program have other outside support?
2. What is your budget and source of funding?
  - a. Do you leverage outside sources of funding?
3. What is the strength of your customer base/competition?

### **Part 2: Site Selection and Project Approval:**

4. How do you determine service area boundary?
  - a. How do you establish number and type of credits in a given service area?
5. How do you select mitigation sites?
  - a. What guidance is used and/or factors are considered in your decision to select a site?
  - b. How do you define and incorporate the watershed approach?
    - i. What challenges have you faced in using this approach?
    - ii. Do some impact types not fit this approach?
  - c. Do you consider climate change impacts?
6. How do you select/develop mitigation projects?
  - a. What challenges to you face in using this approach?
7. What is your process for getting a project approved?
  - a. Is this documented in your instrument or other formal agreement with IRT or program SOP?
  - b. What information/documents are required by the IRT to facilitate approval?
  - c. Describe your level/mode of communication with IRT?
  - d. What challenges do you face in this process?
8. How many projects have been approved, implemented, completed?
  - a. Approximately how long does it take to complete a project?
  - b. Have any projected failed or struggled to yield credits?
9. What outside entities or stakeholders do you consult with on project development or implementation?
  - a. What have been benefits/challenges in the process?
10. How successful have you been in meeting the requirements of advanced credits?
  - a. How do you address any delays?

### **Part 3: Financing and Planning:**

11. Is your fee schedule publically available?
  - a. Have you evaluated whether the fees are covering costs in practice?
  - b. What is your process to updated fees if necessary?
  - c. What challenges do you face in this process?
  - d. How do you demonstrate full-cost accounting?
  
12. How do you determine funding for long-term management (LTM)?
  - a. Is LTM endowment periodically reviewed for sustainability based on LTM needs?
  
13. What factors do you use to calculate financial assurances?
  - a. What specific cost categories and contingencies do you plan for?
  - b. Do you plan for remedial action for failed performance standards?
  
14. What is the process for obtaining spending authorizations?
  - a. What information is required?
  - b. How many requests are made to implement a project?
  - c. How many requests are made annually?
  
15. How do you ensure that implementation funds are being used as originally planned on the ground?
  - a. Do you compare appropriated funds to the actual spending of those funds?
  
16. How are your financial accounts structured?
  - a. How do you handle interest received from program funds?
  - b. How are you able to invest program funds?
  
17. At what point do you develop long-term management plan?
  - a. Are consultants used for development of long-term management plan?

### **Part 4: Monitoring and Performance Standards:**

18. What information do you monitor and how often is it collected?
  - a. What does the IRT require in terms of monitoring?
  
19. What criteria are used to evaluate performance?
  - a. Are performance standards tied to monitoring requirements?
  - b. How do you address and/or fund deficiencies?
  - c. How do you plan for funding and remedial action?
  
20. What adaptive management techniques or strategies do you use?
  - a. How do you address land development pressures over time?

### **Part 5: Data Management and Program Audits**

21. What data do you track?
  - a. What is your data management system?

- b. What is required in the annual report?
22. What has been your experience with program audits?
- a. What is your process for informing regulators of problems?
  - b. Would you be able to address ongoing performance in a post-success determination compliance audit?

**Final Questions**

23. What questions do you have for other ILF programs?
- a. What best practices or helpful tips might you have for other ILF programs in regard to any of the topics discussed in this interview?

## Appendix 3: Service Area Rationale Excerpts from Program Instruments

### *Ducks Unlimited Vermont ILF Program*

#### **Element I: Geographic service areas and delineation**

According to Mitsch and Gosselink (2007) and Vermont DEC Water Quality Division, Vermont has lost over 35% of its original 341,000 acres of wetland habitat. Aquatic resource habitats in Vermont include lacustrine (lake), fluvial (streams and rivers), floodplains forests, shores, and marsh systems. The palustrine wetlands consist of peatlands, forested, shrub-scrub, and marshes. Lacustrine habitats include open water, aquatic beds, with over 23,400 acres of unclassified near-shore wetlands associated with Lake Champlain. Finally, riverine wetlands cover about 174 acres within the state. Unfortunately, data on historic wetland loss at the watershed level is lacking for Vermont (Ralph Tuner, Head the National Wetlands Inventory, R5 - Northeast Region, U.S. Fish and Wildlife Service, personal communication). Therefore, selection of mitigation service areas will focus on enhancing and restoring the current palustrine, lacustrine, riverine aquatic resources and associated upland buffers, and early-succession habitat.

The DU-VT ILF Program geographic service areas were selected based on several criteria: a watershed approach, existing planning efforts in VT, and internal DU planning efforts. Vermont DEC has a Watershed Initiative which provides guidelines for protecting high quality river basins and restoring habitats and other important impaired water resources. The watershed and associated river basins share common zoogeographic history, physiographic, and climatic characteristics, thus, have distinct assemblages of freshwater habitats. The Vermont DEC river management goal is to support and implement channel assessment and management practices that recognize waterbodies' natural functions and values. Riparian (riverbank) areas can serve as corridors for numerous wildlife species, and also assist with reduction of sediments, provide organic inputs, and regulate water chemistry. Therefore, riparian areas are also a conservation target because they provide protection from headwaters and downstream receiving waters, and improve water quality. The Vermont Natural Heritage Program, Wildlife Action Plan, and TNC priority conservation areas goals and objectives are also included **when selecting services areas. The DEC identified 17 major river basins and associated watersheds for conservation (Figure 1)**

**DU's service area stratification mirrors the DEC's current watershed conservation efforts and serves as a framework for a watershed approach to prioritizing restoration, establishment, enhancement, and preservation of aquatic resources and associated upland buffers. DU has identified four major river basins to function as service areas for Vermont's DU-VT ILF Program. These four river basins include: (1) Connecticut (Upper – HUC 010801 and Lower –HUC 010802), (2) St. Francois (HUC 011100), (3) Richelieu (HUC 020100), and (4) Upper Hudson (HUC 020200; Figure 1). Using sound science, targeted mitigation projects within the watersheds will enable project design to achieve effective compensation, maximum benefits to the watershed, and improve project success and sustainability.**

The service areas were also chosen because the scale is appropriate to ensure the projects selected will effectively compensate for adverse environmental impacts across the entire service area and enable financially sound delivery of the program (smaller service areas are not financially viable due to impact history). Service areas may include more than one project depending on the number of impacts permitted and the subsequent number of required compensatory mitigation acres. DU will provide compensatory mitigation for permitted impacts within the same geographic service area in which the impact occurred; unless the district engineer has agreed to an exemption. Individual projects will be proposed for specific service areas in project-specific mitigation plans. DU will use a landscape perspective within service areas to identify types and locations of DU-VT ILF Program projects and subsequently design projects to maximize the watershed benefit and offset impacts to aquatic resources and their associated upland buffers caused by permitted activities.

In addition to the scientific databases developed and available to DU, and discussed in the introduction, the following factors will also be considered when targeting specific mitigation projects within each service area:

- Focus areas from the Wildlife Action Plan
- Heritage data for rare plants and communities
- Key information from non-profits and land trusts (TNC, VT Land Trust, VT Audubon, VT Natural Resources Council, etc.)
- Past mitigation needs in the watershed based on historical impacts
- Future needs for mitigation in the watershed based on projected growth and development
- Aquatic resource and associated upland buffers conservation needs and opportunity
- Lack of private mitigation banks suitable to meet the demand for mitigation in the service area
- Partner/Stakeholder input, target locations for state, federal, and NGO agencies to increase contiguous habitat.
- Relationship to other protected lands

## **Everglades National Park ILF Program**

### **Element 1: Watershed and Eco-Region based rationale for the delineation of the Mitigation Service Area 332.8(d)(6)(ii)(A).**

The Mitigation Service Area (MSA) was developed in accordance with 332.8(d)(6)(ii)(A) which states that 1) “The service area must be appropriately sized to ensure that the aquatic resources provided will effectively compensate for adverse environmental impacts across the entire service area”; 2) “Delineation of the service area must also consider any locally-developed standards and criteria that may be applicable”, and; 3) “The economic viability of the mitigation bank may also be considered in determining the size of the service area.” The MSA is in accordance with these points and are addressed below.

The MSA for the ENP ILF Program will encompass most of Miami-Dade, and a portion of Broward, the northern limit of the MSA is bounded by the Interstate 75/Interstate 595 complex (Figure 2, Appendix B). The MSA is based on the Everglades Watershed and two south Florida Eco-Regions (level III Ecoregions). The MSA encompasses a total of approximately 1,503,940 acres. The MSA does not include any saline or tidally influenced wetlands. Similarly, it does not include barrier islands as it is difficult to establish a hydrological connection. Each ILF Mitigation Project will have a project specific service area approved by the Corps.

#### **Everglades Watershed**

The Everglades Watershed is expansive and larger than the MSA for the ENP ILF Program. The Everglades Watershed encompasses the Everglades ecosystem including the Kissimmee River watershed and other smaller watersheds north of Lake Okeechobee that ultimately supply water to the Everglades Ecosystem, and ultimately ends in Florida Bay

The Everglades Watershed has been altered from historic pre-drainage flows but still has hydrologic connectivity across the system. The Everglades Watershed is characterized by low-lying, relatively flat terrain with pronounced wet and dry seasons. During the longer wet season eighty per cent of the rain in this region falls between May and December and the average rainfall is sixty inches per year. The soils consist of relatively thin layers of poorly drained marls and mucks over the porous limestone bedrock. The fluctuation in surface water levels between the wet and dry season play an important role in the existence of the marsh. Water levels are at their highest in the summer and gradually begin to recede as winter approaches. In general, the

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wetland basins can have a hydroperiod of one to twelve months though standing water is not usually present by midwinter. Many of the species that inhabit a marsh have evolved to require this water fluctuation for their survival. The marshes are often dominated by only a few species such as saw grass (*Cladium jamaicense*) or Muhly (*Muhlenbergia capillaries*), but the variety can be quite large.

A joint effort by the state and federal government called the Comprehensive Everglades Restoration Plan (CERP) seeks to reverse these alterations and restore the watershed to near historic conditions. CERP restoration efforts aside, the Everglades Watershed as it is today supports the basis for the ENP ILF Program MSA. There is a clear watershed nexus between the location of any current or future ENP ILF Program project and unavoidable wetland loss within the MSA that is permitted by the Corps.

### **Ecoregions**

The MSA for the ENP ILF Program conforms to the boundaries of the level III Everglades and Miami Ridge/Atlantic Coastal System eco-regions. Ecoregions are defined as regions of relative homogeneity in ecological systems; they depict areas within which the mosaic of ecosystem components (biotic and abiotic as well as terrestrial and aquatic) is different than adjacent areas in a holistic sense. Geographic phenomena such as soils, vegetation, climate, geology, land cover, and physiology that are associated with spatial differences in the quantity and quality of ecosystem components are relatively similar within each ecoregion.

ENP as a whole is in the Southern Florida Coastal Plain Ecoregion (SFCP). The SFCP is comprised of 4 level III sub-regions. However, ENP ILF Program projects will be located only within the Miami-Dade County portion of ENP. Miami-Dade County is comprised of only two sub-regions of the SFCP; the Everglades and the Miami Ridge Ecoregions. The HID mitigation project, as an example, falls within both of these eco-regions. Therefore the MSA for the ENP ILF Program should only be comprised of these two sub-regions of the SFCP. This rationale establishes a clear eco-region nexus between the location of any current or future ENP ILF Program project and unavoidable wetland loss within the MSA that is permitted by the Corps.

### **Additional Rationale for the MSA**

The biological and hydrological resources of the freshwater herbaceous wetlands within the MSA, are similar to the biological and hydrologic resources being restored in the ENP Program Area. Using the HID as an example, the restored habitats within the HID adequately provide compensatory mitigation for wetlands that are adversely impacted within its MSA. The HID has been suitable as an offsite mitigation area for unavoidable impacts to freshwater herbaceous wetlands in Miami-Dade County since 1996.

The economic viability of the ENP ILF Program was taken into account when the MSA was established. Many areas within the MSA are likely to experience additional growth in years to come. Major infrastructure that occurs within MSA includes, but is not limited to portions of Tamiami Trail, Interstate 75, the Florida Turnpike, and a number of State and local roads and highways. Future expansion of transportation infrastructure and associated wetland impacts within the MSA would be adequately offset by ENP ILF Program projects like the HID.

**Exhibit B**  
**Service Area Narrative**

The ILF Program Area is defined as the jurisdictional limits of the U.S. Army Corps of Engineers Sacramento District within California. The ILF Program offers two credit types: Aquatic Resource Credits and Vernal Pool Credits. Aquatic Resource Credits for permitted Impacts to wetlands (excluding vernal pools), other Waters of the U.S., Waters of the State, and other aquatic resources including threatened or endangered anadromous fish, are available in Aquatic Resource Service Areas. These service areas are delineated by the watersheds which contain portions or the entirety of distinct rivers systems, spanning the headwaters to the floodplains. Vernal Pool Credits for permitted Impacts to vernal pools are available in Vernal Pool Service Areas. Vernal pool wetlands are geographically and functionally distinct from other wetland types in the ILF Program Area, and as such as have service areas based on the vernal pool regions as accepted by USACE, U.S. Fish and Wildlife Service, and California Department of Fish and Wildlife.

**Aquatic Resource Service Areas**

The Program establishes Aquatic Resource Service Areas to promote the comprehensive watershed approach to evaluation of wetland losses, pressures, and restoration objectives endorsed by the 2008 Rule. This approach incorporates aspects of habitat functions, species utilization, water quantity and quality, and connectivity within a contiguous integrated unit. As such, it promotes the ecologically coherent assessment of stresses and restoration potentials across a spectrum of wetlands functions, services, and landscape position. In addition, because the Program will provide compensation in locations underserved by mitigation banks often due to lower levels of permit activity, the Aquatic Resource Service Areas will allow small amounts of in-lieu fees to be generated across larger areas and aggregated into amounts sufficient to develop meaningful ILF Projects to address critical or priority needs.

A typical planning level watershed in the Sacramento District is defined by the eight-digit hydrologic unit codes (HUCs). However, a review of USACE permit data from 2007 through 2012 reflects that an 8-digit watershed area is not large enough to consolidate sufficient funds for adequate programmatic planning across all landscapes of the Program Area. Therefore, the Program looks to the next larger logical geographical units which are based on major river systems. As an example, the Feather River Aquatic Resource Service Area consists of the Feather River and tributaries, including the North Fork, Middle Fork, South Fork, and contributing streams; this area encompasses four eight-digit (HUCs). The Aquatic Resource Service Areas are listed in **Table 1** and depicted in **Figure 1**, along with the 8-digit HUCs they encompass. Detailed maps of each Service Area are provided in the Compensation Planning Framework (**Exhibit D of the Instrument**).

Some river drainages that are relatively narrow have been combined with ecologically similar adjacent river basins in order to increase the potential that adequate funds could accrue for viable compensation projects (e.g., the Chowchilla River has been included in San Joaquin River Service Area). Even with the use of larger river systems to define service areas, some of the Aquatic Resource Service Areas are likely to have very few impacts requiring compensation and funding thresholds for implementation of an ILF Project may be challenging.

### **Vernal Pool Service Areas**

Vernal Pool Service Areas are based on the vernal pool regions identified in the USFWS Vernal Pool Recovery Plan that occur within the Sacramento District (**Figure 2**). Detailed maps of each Service Area are provided in the Compensation Planning Framework (**Exhibit D of the Instrument**). The vernal pool regions are geographic areas that encompass unique communities of vernal pool species, based on land formations, soils, hydrology, and other distinctive physical features. The vernal pool recovery units within the ILF Program Area are listed below:

1. Carrizo (partially within the ILF Program Area)
2. Central Coast (partially within the ILF Program Area)
3. Lake-Napa (partially within the ILF Program Area)
4. Livermore (partially within the ILF Program Area)
5. Modoc (partially within the ILF Program Area)
6. Northeastern Sacramento Valley
7. Northwestern Sacramento Valley
8. San Joaquin Valley
9. Solano-Colusa (partially within the ILF Program Area)
10. Southeastern Sacramento Valley
11. Southern Sierra Foothills
12. All Other Vernal Pool Areas (Vernal Pool landscapes not within a vernal pool region)

Some of the Vernal Pool Service Areas that are partially within the ILF Program Area are small; the Carrizo and Central Coast service area are examples. These small service areas are likely to have very few permitted impacts requiring compensatory mitigation. The All Other Areas Service Area addresses the fact that there are vernal pool resources located outside of the Vernal Pool Regions identified in the USFWS Vernal Pool Recovery Plan. Compensatory mitigation for impacts occurring in this All Other Vernal Pool Areas Service Area should generally occur within the Vernal Pool Region closest to the location of the impact.

## **Tennessee Wildlife Federation Wetland In Lieu Fee Program (TN Mitigation Fund)**

### **V. PROPOSED SERVICE AREAS**

The Program will operate throughout the state of Tennessee, with specific information related to service areas set forth as follows. The geographic service areas for the Program will be defined at various scales based upon a watershed approach. In urban areas, a U.S. Geological Survey 8-digit hydrologic unit code (HUC) watershed or a smaller watershed will be used. In rural areas, several contiguous 8-digit HUCs or a 6-digit HUC watershed will allow greater flexibility to provide functional compensatory mitigation within a given ecoregion and still provide compensation for resource losses at a watershed scale, as appropriate (**Figure 1**). This approach allows for special provisions for areas such as the Mill Creek Watershed in Davidson and Williamson Counties, which is a HUC-10 with a separate Service Area and provides compensatory mitigation on a watershed basis.

The Program will provide compensatory mitigation for permitted impacts within the same geographic service area in which the impacts occur unless the district engineer, in consultation with the IRT, has agreed to an exemption. The service areas were selected because TWF has concluded that the scale is appropriate to ensure that the projects selected will be able to effectively compensate for adverse environmental impacts across the entire service area. These service areas will also allow the Program to focus efforts in areas with the most need, by combining watersheds with relatively fewer impacts and existing wetlands, or those that have historically been covered within the service area of approved mitigation banks.

The Program will not accept fees from a permittee in service areas in which the Program has been unable to identify appropriate mitigation project sites for prior accepted payments. Individual projects will be proposed for specific service areas in project-specific mitigation plans.

Rationale for Service Area selection is further discussed within the Compensation Planning Framework.

1. Conasauga River Service Area

**A. Geographic Service Area**

The Conasauga watershed is part of the Coosa-Tallapoosa system, originating just north of the Tennessee-Georgia border, and extending into central north Georgia, before crossing the Georgia-Alabama state line into north Alabama, and continuing across central and south Alabama before terminating in Mobile Bay. The service area will be that portion of the Coosa-Tallapoosa River watershed that is within Tennessee, which is limited to the HUC 12 Conasauga River Watershed (**Figure 5**). The Conasauga River begins in southeast Tennessee and drains an area of 727 square miles (124 square miles in Tennessee) (**Table 6**). The system flows through Polk and Bradley counties in Tennessee and Fannin, Whitfield, Gilmer, Gordon, Murray, Walker and Catoosa counties in Georgia.

This service area was selected because this is the only portion of the 8–digit or 6-digit HUC that is within the state of Tennessee. Despite its small size and lack of prior permitted impacts, five advance credits are requested in service area due to the prevalence of hydric soils (%4.88 of the land area is covered by soils identified as hydric), especially in the flat, low-lying valleys.

2. Barren River Service Area

**A. Geographic Service Area**

The Barren River is part of the Green River Watershed. The Green River watershed is considered the most biologically diverse and rich branch of the Ohio River system. Approximately 1,350 square miles, the watershed is predominantly in central Kentucky; and includes the upper Green River watershed, its tributaries, and the Mammoth Cave National Park. The service area will be that portion of the Green River watershed that is within Tennessee, which is limited to the HUC 12 Barren River Watershed (**Figure 8**). The Barren River Watershed is approximately 1,661 square miles with distribution in Kentucky and Tennessee (432 mi<sup>2</sup> in Tennessee) and includes parts of Clay, Macon and Sumner Counties in Middle Tennessee (**Table 7**). The watershed has 563.2 stream miles and 45 lake acres in Tennessee. Twelve rare plant and animal species have been documented in the watershed, including seven rare fish species and one rare snail species.

This area is underlain by karst geology. Sinkholes, springs, disappearing streams and caves characterize karst topography. In karst areas, the ground water flows through solution-enlarged channels, bedding planes and microfractures within the rock. The characteristic landforms of karst regions are: closed depressions of various size and arrangement; disrupted surface drainage; and caves and underground drainage systems.

This service area was selected because this is the only portion of the 8–digit or 6-digit HUC that is within the state of Tennessee. Despite its small size and lack of many prior permitted impacts, five advance credits are requested in service area as the minimum number of advance credits requested per service area.

3. Upper Cumberland River Service Area

**A. Geographic Service Area**

The Upper Cumberland River Watershed is approximately 9,924 square miles (5,526 in Tennessee) and includes six HUC-8 watershed and parts of twenty-eight Tennessee counties (**Figure 11**).

This service area was selected because this is the 6-digit HUC. This region of the state has relatively low prevalence of hydric soils, with only %1.28 of all soils categorized as hydric. The relative rate of impact acres in this service area is still very low, and having some larger service areas with relatively low rates of impacts will allow the Program to devote watershed planning efforts to those service areas with the greatest needs and the greatest amounts of impacts. 10 advance credits are being requested in the service area due to its size and the amount of historic impact.

[\*Note: The rationales for the program's other service areas may be found in the compensation planning framework.]

### III. SERVICE AREAS

#### A. Overall Approach for Service Area Definition

The In-Lieu Fee Program shall be established with the purpose of providing compensatory mitigation for impacts to the waters of the U.S., including wetlands, within the State of Oklahoma. Impacts to waters of the U.S., including wetlands, mitigated through this program will be administered within distinct service areas based on the drainage area boundaries within the state. This will help to ensure this In-Lieu Fee Program's compliance with the watershed approach to compensatory mitigation defined in the April 10, 2008 Final Mitigation Rule issued by the Corps and the EPA.

In order to ensure that in-lieu fee compensatory mitigation sites will be located as close as is practicable to the source of impacts, the service area boundaries are based on Hydrologic Unit Code (HUC) boundaries with 6-digit HUC service areas for rural areas and 8-digit HUC service areas for areas that contain all or part of an urban area. Impacts to waters of the U.S. must be mitigated within the same service area unless otherwise approved on a case by case basis by the Corps in consultation with the IRT as discussed in Section II.I. This will result in 30 separate service areas within the state

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grouped according to the watershed in which they reside. A watershed is defined as a 4-digit HUC watershed within Oklahoma with the combination of the Upper Cimarron and Cimarron 4-digit HUCs into one watershed because of the small size of the Upper Cimarron HUC within Oklahoma. Figure 1 shows the service area boundaries within Oklahoma. Please note that this In-Lieu Fee Program cannot locate in-lieu fee project sites on tribal lands without being requested to by the tribe in cooperation with the Corps. As a result, while tribal lands are included in this in-lieu fee program on a case by case basis, they are not shown in any service area figures because of the anticipated improbability of siting projects on tribal lands.

As a result of this approach, the Oklahoma City metropolitan area within Oklahoma and Cleveland Counties is covered by six different service areas. Consequently, multiple in-lieu fee project sites will eventually surround the Oklahoma City metropolitan area as opposed to one or two very large in-lieu fee project sites that serve the whole region. Similarly, the Tulsa metropolitan area contained within Tulsa, Creek, Rogers and Wagoner Counties would be split among three service areas based on 8-digit HUC watersheds. Likewise, the City of Lawton would be covered by two separate 8-digit HUC service areas within the same watershed. Figure 2 shows the service area for an example impact site in southern Oklahoma County.

The Sponsor took great care balancing the desire to minimize the distance between impact and mitigation sites with the necessity of establishing service area boundaries of sufficient size to make centralized mitigation viable. As part of this process, several different watershed sizes were considered as the basis for service areas. The Sponsor considered 10-digit HUC service area boundaries but these were found to be impracticable because an average 10-digit HUC is only the size of one third or one half of a county. The exact total number of 10-digit HUC service areas in Oklahoma was not able to be determined, but with 77 counties in Oklahoma and an assumed average of 2.5 10-digit watersheds per county there would be more than 190 throughout the state. This small service area size would make an in-lieu fee program infeasible because of the impossibility of acquiring and restoring parcels of land in the most urbanized areas where most impacts will likely occur. Additionally, the number of project sites would increase dramatically and most of the sites would need to be smaller in size as a result of the lesser amount of credit sales per watershed. That would make land acquisition impractical in many instances. With more numerous and smaller project sites as described, in practice an In-Lieu Fee program based on 10-digit HUC service area boundaries would more closely resemble permittee-responsible off-site mitigation which would not provide the ecological benefits, administrative efficiency and ease of compliance monitoring associated with larger centralized mitigation parcels. The Sponsor also considered using 12-digit HUC service areas for service area boundaries but these were also determined to be impracticable for the same reasons as the 10-digit HUCs were. This is because these service areas were very small, with each county containing approximately fifteen to twenty-five 12-digit HUC service areas. Additional information about the individual service areas is contained within Section VII (Compensation Planning Framework).

Because mitigation banks are the preferred method of compensatory mitigation over in-lieu fee project sites, in-lieu fee advance credits will not be allowed to be sold under this agreement within a service area that contains an approved and constructed mitigation bank in good standing, unless specifically approved by the Corps. However, in-lieu fee released credits will be able to be sold to permittees even if a constructed mitigation bank in good standing is present in the same service area. This is because both forms of mitigation represent on-the-ground mitigation completed ahead of future impacts. The Corps will determine which in-lieu fee project sites are eligible to sell credits to permittees in need of compensatory mitigation on a case by case basis. Decisions authorizing the use of credits from an in-lieu fee project site for authorized impacts outside the in-lieu fee project site's designated geographic service area will be made by the Corps on a case-by-case basis in accordance with applicable requirements.

*B. Initial Active Service Areas*

Rather than immediately operating a statewide program, when this instrument is approved the In-Lieu Fee Program will be authorized to operate within the initial active service areas that are listed in this subsection. These initial active service areas are the areas of Oklahoma that are anticipated to have the highest future mitigation need. The initial active service areas include the following service areas: Canadian B, Canadian C, Beaver/North Canadian D, Beaver/North Canadian E, Lower Arkansas A, and Lower Arkansas B. These service areas encompass most of the Oklahoma City and Tulsa metropolitan areas. This In-Lieu Fee Program will not be authorized to operate in any other service areas unless and until the Sponsor is provided written approval to do so by the Corps and IRT. The approval of additional service areas would be at the discretion of the Corps, in consultation with the IRT, and would be based upon the Sponsor's adequate fulfillment of the requirements of the Program Instrument within the initial approved service areas. Specifically, the Sponsor will be able to request the approval of additional service areas no sooner than five years after the date of approval of this Program Instrument which will provide enough time to allow for a meaningful amount of advance credit sales and for a number of in-lieu fee project sites to have been constructed. These in-lieu fee project sites will likely provide some initial monitoring data by that point as well. After that point, the Corps and IRT can approve the expansion of this In-Lieu Fee Program into additional service areas if the In-Lieu Fee Program has remained in good standing with no default proceedings or other significant indication of a systemic problem with the In-Lieu Fee Program.

## ***The Watershed Land Trust In Lieu Fee Mitigation Program***

### **3.0 GEOGRAPHIC SERVICE AREAS**

The WLT ILF program will serve the entire state of Kansas. The Kansas City District USACE and the Kansas IRT determined that the U.S. Geological Survey hydrologic unit codes (HUC) are the appropriate basis to develop service area boundaries (SA). To evaluate appropriate SAs for Kansas, the WLT consulted the following resources:

- Kansas Fish & Game Commission. 1981. Stream and River Evaluation Map of Kansas. Published by the U.S. Fish & Wildlife Service, Office of Biological Services, Denver, CO.
- Hawkes, C.L., D.L. Miller, and W.G. Layher. 1986. Fish Ecoregions of Kansas: Stream Fish Assemblage Patterns and Associated Environmental Correlates. *Environmental Biology of Fishes* 17(4):267-279.
- Kansas Department of Wildlife, Parks, and Tourism f/k/a Kansas Department of Wildlife, Parks and Tourism (Hereinafter referred to as KDWP). 2006. Stream Monitoring and Assessment Program: Sub-Watershed Report. Environmental Services Section, Pratt, Kansas.
- Missouri Resource Assessment Partnership (MoRAP). 2006. Using GIS and an Aquatic Ecological Classification System to Classify and Map Distinct Riverine Ecosystems Throughout EPA Region 7. University of Missouri, Columbia, MO.
- Kansas Water Office. 2007. Regional Basins: HUC 6. Map. Topeka, KS.

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As watershed boundaries and identified ecoregions are key factors determining the structure, function, and biological character of aquatic systems, the WLT considered large scale geographic patterns as the initial criteria for SA delineation. Kansas regional watershed boundaries (HUC 2) vary from north to south while ecoregion boundaries (EPA Level III) vary from east to west. To maintain consistency with the watershed approach required by the Final Rule, the WLT used the HUC 2 divisions as the first cut between SAs. The first cut yields two SAs: Missouri basin (HUC 10) and Arkansas-White-Red basin (HUC 11).

To refine SA delineation, the WLT searched for clear patterns from fish ecoregion, ecological drainage unit (EDU), and HUC 6 boundaries within both HUC 2 basins. While EDU boundaries in western Kansas are surprisingly large—relative to eastern Kansas EDUs—they are very consistent with fish ecoregions identified by Hawkes et al (1986). However, eastern Kansas EDUs are more consistent with the HUC 6 boundaries. As the IRT clearly expressed concern with the large EDUs, the WLT focused on HUC 6 boundaries as the second criteria for SA delineation. This second cut yields 12 SAs, seven in 2-digit HUC 10 and five in 2-digit HUC 11.

To further refine the 12 SAs, the WLT evaluated established Aquatic Ecosystem Types (AES) within the HUC 6 boundaries. MoRAP (2006) generated AES boundaries from data on soil texture, soil depth, infiltration, bedrock geology, relief, and groundwater contributions to identify and map groups of hydrologic units that are relatively similar with regards to these landscape properties that ultimately control in stream habitat conditions and functional processes. From this evaluation the WLT reduced SAs to 10 by combining multiple HUC 6 basins. The Neosho, Verdigris, and Walnut Rivers and Grouse Creek were combined into one SA while the Kansas, Big Blue, and Lower Missouri-Blackwater were combined into a single SA.

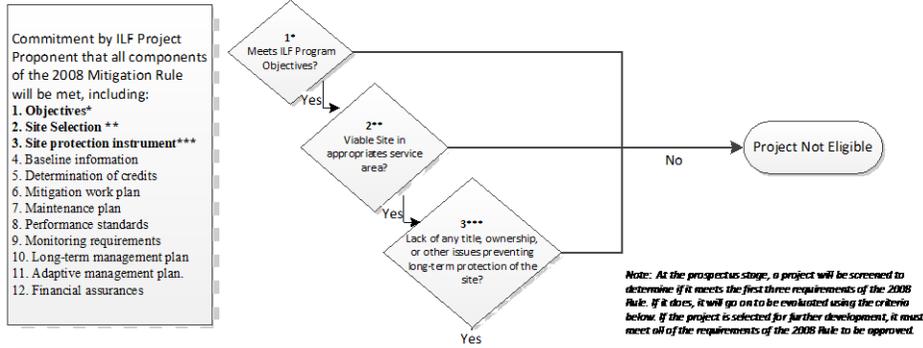
Final refinement of the SAs included the review of KDWPT stream monitoring data (1,117 surveys from 1994 through 2004) to test the validity of combining multiple HUC 6 basins. The WLT evaluated and compared fish species collected in each HUC 6 within the combined SAs. Similarity of fish communities in the Kansas-Big Blue-Lower Missouri HUCs supported this combination as one SA. However, fish community differences—26 species found in the Neosho River basin but not in the Verdigris, Walnut, or Grouse—require the Neosho HUC 6 to stand alone as a separate SA. Fish communities of the Verdigris-Walnut-Grouse SA are similar having a high species overlap and these three basins remain combined. The 11 proposed SAs for the WLT ILF program are listed in Table 1 and shown in Figure 1.

# Appendix 4: Examples of Evaluation Keys

From National Fish and Wildlife Foundation Sacramento District California ILF Program Instrument:

## Project Evaluation Criteria

**Eligibility Criteria**  
*Eligible Projects at the Prospectus Stage Must Meet the Three Initial Criteria*



**Evaluation Criteria**  
*Eligible Projects will be Evaluated and Compared using the Following Criteria*  
*(Circle the appropriate criteria in each category and place the corresponding score in the column to the right)*

	LOW 1	MEDIUM 2	HIGH 3	Score 1-3
Degree to which project addresses Service Area priorities	No priorities met, but meets other goals	One SA priority met	More than one SA priority met	_____
Potential for re-establishment or rehabilitation of wetlands	Enhancement	Rehabilitation	Re-establishment	_____
Use of natural processes in restoring ecological function – biological, physical, hydrologic	No natural process used to achieve ecological lift	1 – 2 ecological components improved using natural processes	All 3 ecological components improved using natural processes	_____
Extent of connectivity with other protected lands	Isolated	Within planned connectivity corridor or biological core area	Immediately adjacent to protected lands	_____
Extent of buffer	Buffer less than 50 feet in width	Buffer between 50 and 100 feet	Buffer more than 100 feet	_____
Experience of proponent	Has never done a mitigation project	Has done one successful mitigation project	Has done multiple successful mitigation projects	_____
Cost effectiveness	Per acre cost more than fee collection rate	Per acre cost equal to fee collection rate	Per acre cost less than fee collection rate	_____
Credits generated	Equal to minimum needed	More than minimum needed	Equal to or more than minimum needed & could create additional types of credits (e.g., USFWS or CDFW species credits)	_____
TOTAL				_____

**From Ducks Unlimited Vermont ILF Program Instrument:**

**Key 1-1. Site selection key for potential mitigation projects**

*Points in right hand column (i.e., steps 3-14) are used for ranking wetlands (i.e., step 16).*

Steps:

- 1) Listed by HUC8, collect data regarding mitigation requirements based on permits issued by USACE [i.e., total acres of each wetland impact type (PEM, PSS and/or PFO) and wetland functions and values that must be replaced]; continue to 2.
- 2) Identify service area with the wetland impact. Mitigation sites should be in the same service area as impact site;\* continue to 3.

*\*If no site can be identified in same service area, contact USACE and IRT for approval to work outside service area, then proceed to 3.*

- 3) Does the watershed have priority conservation areas as identified by federal, state, or NGO agencies (e.g., TNC priority landscapes, DEC conservation areas)?\*\*
  - a) if Yes, proceed to 5 using the identified priority areas. .....POINTS = 1
  - b) if No, proceed to 4

*\*\*Show preference for mitigation projects in priority areas.*

- 4) Can co-ordination efforts with stakeholders locate potential properties within the watershed (i.e., NRCS's Wetlands Reserve Program lands, real-estate lands, federal or state lands)?
  - a) if Yes, proceed to 5 using identified sites. ....POINTS = 1
  - b) if No, proceed to 5.....POINTS = 0
- 5) Map National Wetland Inventory Data, State wetlands, priority conservation areas, Vermont TNC natural areas, and agricultural lands layer and identify site(s).
  - i) Is the entire site classified as a wetland?
    - a) if Yes, proceed to 5 (ii) .....POINTS = 0
    - b) if No, proceed to 5 (iii).....POINTS = 1
  - ii) Does the site include preservation or is it already preserved?
    - a) if Yes, proceed to 5 (iii) .....POINTS = 1
    - b) if No, remove site from consideration and return to 4
  - iii) Are there adjacent wetlands to the property?
    - a) if Yes, proceed to 5 (iv). .....POINTS = 1
    - b) if No, proceed to 5 (iv).....POINTS = 0

- iv) Are there adjacent protected conservation lands?
  - a) If Yes, proceed to 6 .....POINTS = 1
  - b) If No, proceed to 6.....POINTS = 0
  
- 6) Map hydric soils using data layers (e.g., NRCS Web Soil Surveys).  
Are there soils on the property that would support the wetland restoration?
  - a) if Yes, proceed to 7. ....POINTS = 1
  - b) if No, remove site from consideration.
  
- 7) Will the mitigation site expand or improve State, federal or NGO priority conservation areas in Vermont?
  - a) If Yes, proceed to 8 .....POINTS = 2
  - b) If No, Proceed to 8 .....POINTS = 0
  
- 8) i) Is the mitigation site in the same 8-digit Hydrologic Unit Code (HUC) as the impact site?
  - a) if Yes, proceed to 9 ..... POINTS = 2
  - b) if No, proceed to 8 (ii).....POINTS = 0  
 ii) Is the site in the same 6-digit HUC as the impact site?
  - a) If Yes, proceed to 9 .....POINTS = 1
  - b) If No, proceed to 9.....POINTS = 0
  
- 9) Contact landowner. Will the landowner be willing to allow DU to complete a wetland mitigation project on their property and grant a conservation easement to DU or other appropriate easement holder?
  - a) if Yes, proceed to 10. ....POINTS = 1
  - b) if No, remove site from consideration, return to 4.
  
- 10) Perform a site visit and ground-truth the property (with landowner permission), and evaluate property characteristics and record detailed site description, then continue to 11.
  
- 11) Will the site support the proposed wetland acres for the mitigation project?
  - a) if 50-100% of total acres, proceed to 12. ....POINTS = 2
  - b) if 26-49% of total acres, proceed to 12. ....POINTS = 1
  - c) if 1-25% of total acres, proceed to 12 .....POINTS = 0

\*\*\*Sites can be combined to meet acres requirements for mitigation projects

- 12) Are there logistical or environmental constraints that would jeopardize successful wetland mitigation?
  - a) eliminate site from consideration.
  - b) if No, proceed to 13 .....POINTS = 2

- 13) Coordinate with Federal and State agencies (i.e., USFWS, Vermont Fish and Wildlife Department).
  - i) Does the site have state or federal threatened or endangered (E&T) species whose habitat and/or range overlap the site?
    - a) if Yes, proceed to 13 (ii).....POINTS = 1
    - b) if No, proceed to 13 (ii) .....POINTS = 0
  - ii) Does the site support a wildlife species addressed in the Vermont Wildlife Action Plan?
    - a) if Yes, then proceed to 13(iii).....POINTS = 1
    - b) if No, then proceed to 13(iii) .....POINTS = 0
  - iii) Does the site support one or more exemplary wetland natural communities as defined by the Vermont Non-Game Natural Heritage Program?
    - a) If Yes, proceed to 13(iv) .....POINTS = 1
    - b) If No, proceed to 13 (iv).....POINTS = 0
  - iv) Will any wetland mitigation negatively impact Vermont's E&T species or species of greatest concern listed in the Wildlife Action Plan?
    - a) if Yes, remove site from consideration.
    - b) if No, proceed to 14.
- 14) Coordinate with State agencies (e.g., Vermont Fish and Wildlife Department). Can the wetland mitigation assist with current conservation strategies or goals (i.e., Vermont's Wildlife Action Plan, Vermont's nongame and natural heritage program)?
  - a) if Yes, work with agencies to improve the wetland mitigation plan, then proceed to 15 .....POINTS = 1
  - b) if No, proceed to 15.....POINTS = 0
- 15) Repeat 3-14 until  $\square$  5 potential sites have been identified with ranks, then continue to 16.
- 16) Rank sites base on point values (in right margin 3-14), then continue to 17.
- 17) Provide list to New England District Corps of Engineers for review, comment, and approval by IRT. A narrative, locus, and concept plan will be included for each site. A site visit by the IRT will generally be held. Continue to 18.
- 18) Begin the DU-VT ILF Program mitigation project.

## Appendix E Site Prioritization Key

Potential OWF ILFP mitigation project sites will be identified based upon input received from watershed coordinators, Soil and Water Conservation Districts, other watershed-based groups/NGO's, permit applicants, communities, counties, ecological consultants, and other state and federal resource agencies. Potential sites will be evaluated and ranked using the following key in order to identify the site(s) with the highest potential for mitigation success. Final site selection will be made in close consultation with the IRT.

1. Select ILF project service area. Review compensation planning framework to identify watershed water resource restoration, enhancement, establishment, or preservation priorities
2. **Site Analysis:** Once identified, site(s) will be examined using publically available data (including but not limited to: historic aerals, National Wetland Inventory, Ohio Wetland Inventory, National Land Cover Database, USEPA WATERS, and County Soil Surveys) to determine the suitability of the site to support a successful wetland mitigation project. Sites will be scored based upon the following criteria or by alternative assessment methods as appropriate.
  - a. Is the entire site mapped as a wetland?
    - i. Yes Score = 0
    - ii. No Score = 1
  - b. Are there adjacent wetlands in close proximity to the site?
    - i. Yes Score = 1
    - ii. No Score = 0
  - c. Are there adjacent preserves, parks, or conservation lands?
    - i. Yes Score = 1
    - ii. No Score = 0
  - d. Is the site underlain by a predominance of hydric soils, or non-hydric soils with hydric inclusions?
    - i. Yes Score = 1
    - ii. No Remove site from consideration
  - e. Does the site receive a significant portion of its hydrology from a nearby stream, river, or other waterbody?
    - i. Yes Score = 1
    - ii. No Score = 0
3. **Site Procurement:** OWF will examine if the landowner (for privately owned parcels) or land manager/resource agency (for publically owned parcels) is interested in supporting a wetland mitigation project on the property. If so, OWF will determine if it is possible to a) secure the site by purchasing the property, b) protect the mitigation area by placing a conservation easement on the site, or 3) partner with the agency to act as a long-term management entity.
  - i. Yes Score = 1
  - ii. No Remove site from consideration

4. **Site visit.** OWF will conduct a site visit to examine the parcel in greater detail to determine the potential success of wetland mitigation projects on the site.
  - a. Does the site acreage allow for adequate quantities of mitigation for the proposed mitigation project?
    - i. Yes, site exceeds required acreage Score = 2
    - ii. Yes, site meets required acreage Score = 1
    - iii. No Remove site from consideration
  - b. Does the site have logistical or environmental issues that would jeopardize the success of the mitigation project?
    - i. Yes Score = 0
    - ii. No Score = 1
  - c. Will the site provide potential habitat for a federal or state threatened or endangered species?
    - i. Yes Score = 1
    - ii. No Score = 0
  - d. Will the site help to buffer a high quality natural area (Category 3 wetlands, riparian corridors, streams/rivers, etc.) through improvements in water quality or physical protection?
    - i. Yes Score = 1
    - ii. No Score = 0
5. Rank site(s).
6. Consult with IRT for preliminary review of highest ranked site(s). Schedule site visit(s) as needed.

## Appendix 5: Prioritization Strategy for Oregon Department of State Lands In-Lieu Fee Program.

### A. Statewide Priorities

Over time, DSL hopes to have mitigation projects around Oregon that will provide appropriate compensatory mitigation for impacts to waters of the U.S. and waters of the state. Priority watersheds of the state are determined by the following:

- Past mitigation needs in the watershed based on historical permitted impacts;
- Future need for mitigation in the watershed based on projected growth and development trends;
- Lack of private mitigation banks to meet the demand for credits in the service area; and
- Availability of funds in the third-field hydrologic unit watersheds of the state.

Evaluation areas are fourth-field sub-basins (HUC4) west of the Cascade Mountains and as third-field basins (HUC3) east of the Cascades. Fund availability was evaluated by HUC3 because the Wetland Mitigation Bank Revolving Fund (WMBRF) is documented at this scale.

Based on an evaluation of current information, DSL has established initial priority watersheds in the state (Table 1, Figure 1). Additional watersheds may be added as information changes or becomes available. Service areas may or may not follow HUC3 or HUC4 boundaries. The service area for each mitigation project will be described in its mitigation plan and will be based on criteria outlined therein.

**Table 1. Priority watersheds in the state by HUC3 and HUC4.**

<b>Basin 1 – North Coast</b>	<b>Basin 5--Deschutes</b>
Lower Columbia	
Necanicum	<b>Basin 15—Rogue</b>
Wilson-Trask-Nestucca	Middle Rogue
<b>Basin 2B—Mid-Willamette</b>	<b>Basin 16—Umpqua</b>
Molalla-Pudding	South Umpqua
<b>Basin 2C—Lower Willamette</b>	<b>Basin 17—South Coast</b>
Clackamas	Coos
Lower Willamette	
Tualatin	

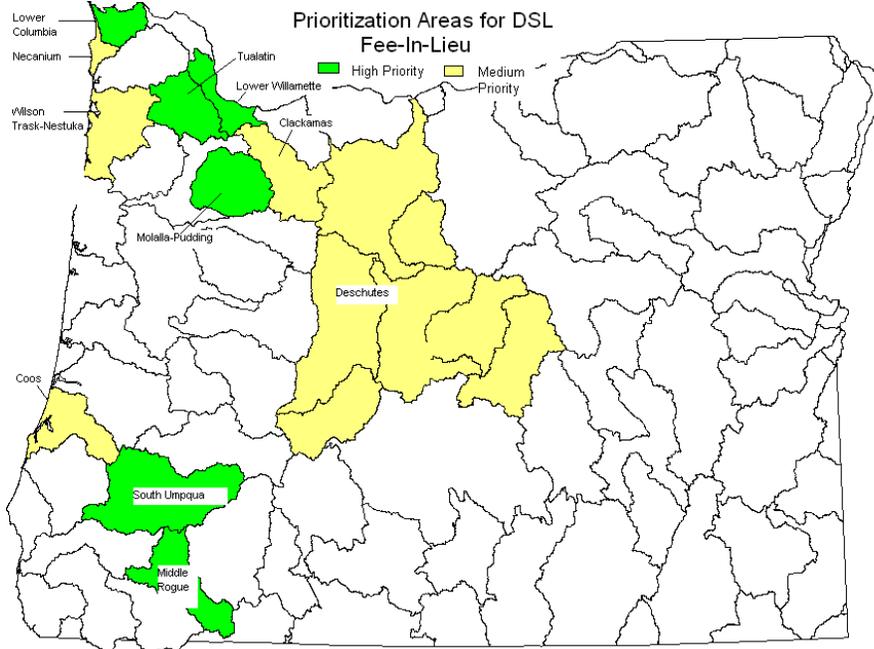


Figure 1. Priority watersheds for the establishment of mitigation projects.

**B. Criteria for Selection of Mitigation Projects**

Each potential mitigation project will be evaluated for its ability to provide appropriate compensatory mitigation for impacts to the waters of the U.S. based on the following criteria:

- **Likelihood of success:** Funded projects must demonstrate a high likelihood of success through a sound wetland restoration, creation and/or enhancement concept. The water source for the site should be reliable. Threats from invasive species or vandalism should be low or manageable. The project will be evaluated for its ability to result in successful and sustainable net gain of wetland acreage and/or function, with limited maintenance. Restoration projects will receive priority due to the higher lift in function that can be achieved, and the higher success rate of these types of projects.
- **Multiple objectives:** The project will be evaluated for its ability to address multiple functions and services such as improvement of fish and wildlife habitat, support for rare species, flood attenuation, water quality improvement, and recreation or education values. The project should target native plant community diversity and natural processes. Greater functional gains will be given more preference.
- **Supports regional conservation initiatives and is compatible with the surrounding landscape:** Projects should be located where they pose minimal conflicts with adjacent land uses and where they meet regional conservation priorities, address limiting factors identified in watershed assessments, provide habitat corridors, and/or add to the effectiveness of nearby protected natural areas.
- **Capacity of the applicant and the project team:** The applicant must demonstrate that they have sufficient capacity and expertise to manage the project. The project team must have the necessary expertise and capacity to carry out pre-implementation planning, restoration construction, follow-up monitoring and remediation of project problems.
- **Fund leveraging and project costs:** Collaborative funding from multiple sources is encouraged, but not necessary. The project budget should identify all sources of funding and in-kind services, and itemized list of components to be funded including planning, implementation, monitoring and accounting. Projects with a high wetland functional gain per dollar will be given preference.
- **Long-term management:** Suitable projects must have a plan for long-term management and stewardship. Long-term stewardship could be provided by a non-profit conservation organization, local government or other interested constituency.

### **C. Priority Watershed Profiles**

The capacity of a project to address appropriate functions and services will be evaluated based on the historic, existing and future aquatic resource conditions for each priority watershed. This information was compiled at the basin scale from the Oregon Watershed Enhancement Board's Acquisition Priorities, Oregon Department of Fish and Wildlife summer water flow restoration priority maps, and ODFW's Oregon Conservation Strategy. Within selected basins, watershed information was compiled from watershed assessments and action plans, restoration prioritization summaries prepared for OWEB, DSL's internal database, and other sources as documented. Maps are credited to the USDA-NRCS 8-digit Hydrologic Unit Profiles.

[\*Note: The watershed profiles may be found in the program's compensation planning framework.]

## Appendix 6: Prioritization Strategy for Ventura River Watershed ILF Mitigation Program.

### **6) Prioritized Mitigation Projects**

#### **a) Land Protection Priority Criteria**

Lands acquired and restored in the past and future were and will be selected based on (1) the extent to which they possess or have the potential to contribute to the goals and objectives described above, (2) opportunity, including willing landowners and partner interest including funding, and (3) momentum. With regard to momentum, the “conservation whole” is always greater than the sum of the parts, and new conservation projects contiguous to and building on old projects almost always offer a much greater benefit on a per acre basis than isolated projects in new areas.

OVLC has utilized a consistent, time-tested set of land protection, aka conservation criteria, over the years. As developed by OVLC’s Land Committee and summarized by David Lavender in a white paper entitled, “Conservation Plan for the Ojai Valley – Commitment to the Future”, the basic conservation criteria utilized by OVLC and its Land Committee are and will remain as follows:

- (1) Protection and enhancement of environmental values (see Section 6b below for more specific criteria related to aquatic resource prioritization).
  - (2a) Native wildlife habitats, with special emphasis on preserving:
    - Areas that support a diversity of habitats in close proximity;
    - Areas that enhance core habitat; and
    - Areas that contribute to habitat connectivity.
  - (2b) Sensitive, threatened, and endangered species and communities.
  - (2c) Areas with high restoration potential.
  
- (2) Contribution towards sustainable use of ground and surface water in the Ojai Valley, including use of water in a way that supports the other conservation criteria.
  
- (3) Provision of nature-based recreation and education opportunities.
  - (4a) nature-based outdoor recreation opportunities;
  - (4b) regional trail corridors or non-motorized trail connections between neighborhoods and natural areas; and
  - (4c) environmental and cultural education experiences for school children and adults. Examples include areas ideally suited for short interpretive trails, universal trails (handicap-accessible), and field trips.
  
- (4) Protection of scenic viewsheds.
  - (1a) open space lands that serve as a scenic gateway to Valley communities;
  - (1b) key ridgeline, valley, and canyon viewsheds as seen from public highways, roads, and trails; and
  - (1c) lands that offer important visual relief and contrast to surrounding developed areas; that possess outstanding visual variety or unique landscape features; and pastoral settings that help define the community's rural character.

#### **b) Aquatic Resource Priority Criteria**

The following criteria have been and will continue to be used to select those aquatic resources that can be restored most successfully on lands protected or targeted by OVLC or its partner organizations, and methods for restoring self-sustaining, functioning habitats.

- (1) Proximity to existing high-quality sites. As described above OVLC advocates that new conservation projects contiguous to and building on old projects almost always offer a much greater benefit on a per acre basis than isolated projects in new areas. Additionally, projects in close proximity to high quality lands already protected such as Los Padres National Forest are prioritized.
  
- (2) Surrounding land use. Land use of properties near a project area influence hydrology, plant establishment and wildlife use *within* a project area, and surrounding land use needs to be compatible with restoration goals of each project site.
  
- (3) Intact adjacent upland areas. As the buffer area between wetland and terrestrial habitats, grass, shrub and woodland habitats adjacent to riparian zones provide benefits for both wetland associated and terrestrial species. First, they provide migratory stopover grounds, foraging

habitat, flood refugia and dispersal corridors for wetland-associated amphibians, reptiles, birds and mammals. They also support species that primarily utilize upland habitats.

(4) Intact natural hydrology or the potential to restore the natural processes of the system. Restoration of these areas can be completed more quickly and inexpensively than areas that require earthwork to create or re-create hydrology that sustains native plant communities and associated habitat types.

(5) Ability to restore natural hydrology in riparian systems. Restoring natural hydrology allows for establishment of self-sustaining vegetation communities which creates quality habitat indefinitely. Plants establish more quickly and inexpensively.

(6) Promote structural diversity and volume of the understory. Introducing a diversity of native trees and shrubs and aquatic plants will create a vegetation mosaic with greater stature, denser cover and increased canopy layering. This more heterogeneous habitat will provide cover and nesting opportunities for more diverse wildlife.

(7) Restore the width of the riparian corridors and floodplains. Increasing riparian corridor and floodplain width to historic margins when possible allows for more natural hydraulics and channel migration. These in turn allow for more natural channel geometry, sediment transport and plant succession. Wider corridors also provide more habitat and larger buffer zones between quality habitat and possibly non-compatible surrounding land use.

(8) Ability to fulfill multiple goals. Wetland restoration that also promotes such things as groundwater infiltration, improved water quality, or stormwater attenuation is more cost effective and provides greater benefits to the community.

### **c) Conservation Priority Areas**

Within the ILFP Service Area, three conservation priority areas (Appendix D) will be targeted for acquisition and restoration of aquatic resources. These priority areas were selected based on OVLC's Land and Aquatic Resource Prioritization Criteria, opportunity, and momentum.

(1) The Ventura River Corridor - The Ventura River Corridor extends across the 100-year floodplain and offers the greatest concentration of resource values of any area in the Ojai Valley. The collection of available aquatic resources, wildlife linkages, and threatened and endangered species habitat as well as opportunities to improve water quality and quantity along the Ventura River are unsurpassed in the ILFP Service Area. In this priority area, OVLC will seek to permanently protect – restoring as necessary – all land in the floodplain of the Ventura River and its major tributaries, and adjacent land as appropriate, in order to permanently secure the aquatic resources this land offers. This priority area encompasses 2,833 acres with an estimated 10-20% that needs some degree of restoration.

(2) The San Antonio Creek Corridor - Similar to the Ventura River Corridor, the San Antonio Creek Corridor provides excellent habitat values and is a significant wildlife migration corridor in the Ojai Valley. Although San Antonio Creek is a tributary of the

Ventura River and therefore technically part of priority area #1, because of the outstanding resource values and prominence in the community of this corridor, OVLC is explicitly naming this as a priority area in itself. In this priority area, OVLC will seek to permanently protect, restoring as necessary, all the land in the 100-year floodplain of San Antonio Creek, and adjacent land as appropriate, to permanently safeguard habitat, views, and recreational opportunities as they become available. This priority area covers 1,095 acres with an estimated 10-20% that requires some degree of restoration.

- (3) Signature Landscapes - “Signature Landscapes” is not a discrete geographical area but instead is a collection of lands which share the commonality of being identified on the short list of the Ojai Valley’s most special places. While this conservation priority area spans 4,678 acres, the majority of these were selected based on criteria other than aquatic resources thus it is unlikely ILFP funds will be used to preserve or restore a very high percentage of these acres. Valuable aquatic resources such as vernal wetlands and freshwater marshes that lie outside of the Ventura River and San Antonio Creek Corridors were intentionally covered by “Signature Landscapes” thus some ILFP mitigation projects have already and will continue to occur in locations within this priority area as designated below:
- (a) Ojai Meadows Preserve. The OVLC will complete the restoration of the meadow to its former state as a functioning wetland system, and expand the geographical extent of this project as appropriate.
  - (b) Riparian corridors along Lion and Reeves Creeks.
  - (c) Other high value ecological areas such as the Happy Valley vernal wetlands.

#### **d) Candidate Sites**

##### **(1) Ojai Meadows Wetland Restoration Project**

The 57-acre site is located 0.7 mi east of the Ventura River and 12 mi upstream of the Pacific Ocean (Appendices B and D). The project area was once bottomland fed by a drainage network where stormwater converged on its way to the Ventura River. It supported more than 20 acres of various types of wetlands including freshwater marsh, riparian forests, emergent wetlands and vernal wetlands. Over the decades changes in adjacent land use, sedimentation, dumping of soil in the historic wetland and over 100 years of intense farming and grazing pressure has altered and the natural hydrology and habitats that were once found on the property.

In 2004, the *Ojai Meadows Habitat Restoration and Flood Control Plan* (Condor 2004) was completed with the goals of 1) restoring historic wetlands and associated habitats on 23.6 acres (Fig. 1) and 2) reducing flooding in areas surrounding the preserve. To help alleviate flooding on Highway 33, stormwater runoff from adjacent Nordhoff High School was diverted in 2004 from the storm drain system to the project site. In 2005, weed control and planting in un-graded areas began. In 2007-2008, the project site was re-graded to return the landform and hydrology to that which would support a variety of wetland types. With the restoration of hydrology at the project site, it became possible to restore native wetland vegetation to all areas.

Grading has denuded most of the project site to bare soil. Weeding and planting were initiated in graded areas in February 2008. OVLC worked with Coastal Restoration Consultants, Inc (CRC)

to create the *Restoration Plan for the Ojai Meadows Preserve* in 2008 which includes a planting plan that will result in appropriately-zoned self-sustaining vegetation types on the 23.6-acre project site. Species lists include common, structurally important species as well as rare and locally extirpated species that we will seek to re-introduce to the area. Seed is collected from OVLC's 1,417-acre Ventura River Preserve and grown in an on-site nursery, or is purchased from nearby seed companies. The OVLC maintains a professional landscaping staff for project installation as well as volunteer groups to control invasive non-native plants and establish target native vegetation communities.

Since 2005 about 100,000 plants have been installed on 12 acres in both graded and un-graded areas. The remaining acreage is undergoing weed control treatments and will be ready to plant in Dec 2010.

Two monitoring methods are used to characterize changes in vegetation in restoration areas. Annual quantitative surveys will estimate percent cover, stature, and species richness from random transects with one-meter square quadrats placed every five meters along each transect. An annual functional assessment of restored areas will use the California Rapid Assessment Method. Results of monitoring efforts will be communicated to the Corps in the annual report.

Current wetland restoration opportunities are primarily for vernal wetlands in small sections of the project site that have soils conducive to wetland establishment.

## Appendix 7: Prioritization Strategy for Georgia-Alabama Land Trust.

### **Prioritization Strategy for Selecting and Implementing Compensatory Mitigation Activities**

The GLT-ILF Program will have a state-wide service area encompassing multiple PSAs. Specific discussion of site selection will be included in any site-specific Mitigation Plan.

All site-specific Mitigation Plans must be compliant with the Rule. In addition to being consistent with the most-current SOP, all site-specific Mitigation Plans must contain either perennial or a combination of perennial and intermittent streams and/or

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wetlands and buffers, except in the limited circumstances of establishment or certain types of restoration.

The preference in the GLT-ILF Program will be for inclusion of both sides of any stream within a Mitigation Site. However, if a site is adjacent to the main stem of a tributary stream, then it may be considered for one side only. Subject to the approval of the DE and IRT, funds may include payment for upland property, to the extent permitted by SOP and guidance buffer limits, where the upland provides wildlife corridors necessary for the ecological functioning of the aquatic resource and where those resources are essential to maintain the ecological viability of the adjoining aquatic resources.

Mitigation Plans will be selected using a competitive award approach based on periodic requests for proposals of site specific mitigation plans by PSA. Prior to submittal of a Mitigation Plan, a letter of intent or draft prospectus designed to provide information for GLT, the DE, and the IRT is submitted to evaluate if a project meets the eligibility requirements. Periodically, mitigation projects will be selected for submission of a Mitigation Plan based on this competitive approach. Projects will be evaluated using prioritization criteria and weighting.

GLT-ILF will promote use and development of GIS-based model or similar mitigation management methodology siting models that take into account data relevant to a watershed approach and provide a relative scoring of a proposed mitigation site. These methodologies should provide objective, comprehensive, and consistent approaches within each service area to the evaluation of a potential site. Examples of such models, though not an exhaustive list, include the following:

1. The siting tool and stakeholder involvement of the The Nature Conservancy's Etowah Mitigation Pilot Project

The Etowah Watershed, located in Northwest Georgia on the north side of the Atlanta Metro Area, is one of the most biologically rich temperate river systems in the world. Some of the fastest-growing counties in the United States are in the Etowah, causing rapid development and water supply pressure on the watershed. The Nature Conservancy and Environmental Law Institute developed a stakeholder-driven watershed approach for prioritizing future mitigation sites to maximize the conservation of ecosystem function throughout the Etowah. The pilot project, which is intended to be replicable in other similar watersheds, uses a straightforward analysis of existing datasets to prioritize sites for Preservation or Restoration. Stakeholders identified the key system functions and needs, which were subsequently used to drive the analysis. Nutrient removal and the system's ability to support a diverse aquatic biota were identified as the key ecological functions for the analysis. Increasing stormwater filtration, limiting development impacts on biodiversity and restoring water quality were the top three needs identified.

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The Preservation analysis focuses on identifying areas that are currently in the best ecological condition and are currently supporting system function and would result in significant impacts if converted to other land uses. The Restoration analysis identifies a set of sites with a low level of degradation which, if restored, could support system function over the long term based on surrounding current and future land use. Each analysis identified high priority areas at the NHDPlus catchment level by equally weighting the proportion of impervious surface, presence of dams, reservoirs, and impaired waters, width of riparian buffers, size of forested areas, projected future development, and distance from currently protected areas. The Preservation analysis also included the total number of road crossings and diversity of aquatic species, while the Restoration analysis included presence of secondary road crossings. Given the impact of even low levels of impervious surface area to the effectiveness of stream and wetland restoration projects, the Restoration analysis included only catchments that contain less than 5% impervious surfaces and greater than 50% forested cover. The results of the analyses are the identification of high priority sites for Preservation or Restoration under the mitigation framework that will improve the quantity, quality, and functions of aquatic resources throughout the Etowah Watershed over the long term. This information provides a screening tool for mitigation bankers and the agencies tasked with approving mitigation credits to ensure that future banks will meet the requirements of the 2008 Compensatory Mitigation Rule.

The approach developed by the Etowah Pilot Mitigation Project was designed to be replicable in other watersheds. The stakeholders in each watershed should be convened to identify the key ecological functions and needs for restoration. A similar analysis should be conducted to identify sites at the catchment level based on a simple analysis of existing datasets that can provide a reasonable watershed-level identification of sites where mitigation bankers and stakeholders can be assured contributions to watershed function will be maintained or restored under the mitigation framework. Site-level assessment should still be a key step in Mitigation Plan approval, but for those making investments in mitigation sites within a watershed, the existence of a stakeholder-vetted, robust analysis of widely-available data sets can significantly reduce risk and uncertainty in the site-approval process.

2. A siting model defining data layers with scaled or relative importance within a service area. The importance of each layer may be gauged through stakeholder input, technical assistance, research, existing conservation programs and policies, direction of the IRT, among other sources. Data layers to consider consolidating in the GIS watershed analysis tool could include: existing stream and wetland features with large buffers, NWI wetland layers,

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USGS water layers, EPD-classified or otherwise classified impaired streams, proximity to conservation lands, density of land cover types relevant to the analysis (forested, open agricultural, impervious), existence and proximity of "high priority habitat" or landscape features identified in the CWCS, and locations of avoidance areas like airport zones, open water bodies, etc.

In addition, Mitigation Plan proposals will include evaluation of a proposed site against the six factors in 332.3(d)(1) of Rule. The six factors in the Rule are to be addressed within the weighted categories of the selection and implementation prioritization factors. While certain overlap exists among the categories, the following division of factors is meant to provide a consistent and transparent evaluation methodology to determine the priority and likely success of proposed Mitigation Plans:

### *Initial Review Criteria for Site Specific Mitigation Projects and RFP Review*

The review criteria are part of a method for evaluating projects before presentation to the IRT. It does not supplant or infringe on the DE and IRT approval authority or structure of the Rule. Rather, it is meant to be an initial screening of projects for suitability and comparison between projects for ranking and feedback purposes between project proponents.

**30% Watershed Context.** Location of the proposed site as it relates to GIS modeling of significant data layers described above. This factor can include the following sub-factors: presence and proximity to CWCS features; size and location of the compensatory mitigation site relative to hydrologic sources and other ecological features; proximity to conservation lands; development trends and anticipated land use patterns over a twenty year period; potential for chemical contamination of the aquatic resources; contribution to water quality improvement within the watershed, including proximity to 303(d)-listed or other impaired aquatic resources; ability to combine the site with other conservation programs; and habitat status and trends, TES species occurrences, or other foreseeable impacts of the proposed site on natural resources of interest, all of which may be captured or supported by GIS modeling and location scoring of the site.

**20% Potential to provide restoration, enhancement, preservation, or creation of aquatic resource(s) that will be conserved in perpetuity.** This factor includes examination of the following sub-factors: self-sustainability and likelihood of success; credit-value of the site as determined using the formula and worksheets set forth in the most current SOP; hydrological conditions, soil characteristics, and other physical and chemical characteristics; functional lift on the site; the degree of replacement for the impacted resources of the PSA; the relative locations of the impact and mitigation sites in the watershed; threat of degradation of a preservation area over a twenty year

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time horizon; adequacy of upland buffers to protect resource integrity; and connectivity and compatibility within the landscape and watershed to other conservation areas as identified on the Georgia Land Use Trends, other landscape level functions, habitat connectivity, and relevant scoring under the GIS model.

**20% Cost Effectiveness.** This factor is a consideration of the number of mitigation credits-worth of required payments from permittees, by resource kind (as defined by District SOP), that were collected in the funds to be used in the proposed project budget, and the credits generated by the proposed project. The credit generated by the proposed site at the cost proposed should meet or exceed the number of credits-worth of required payments from permittees for the given resource-kind in the PSA. Excess credit generation may be banked within the program as mitigation for other permittee-payments. This factor should also consider the temporal-delay since the time of the permitted impact that generated the funding to be used by the proposed project.

This factor should also consider the availability of supporting funds (to the extent permitted by the Rule) to complete the project and/or achieve other conservation efforts (such as Species-banking, Section 7 requirements, other USFWS programs, or additional land conservation programs). There may be project scenarios where an aquatic resource mitigation site may also have aspects that are suitable for mitigating impacts to listed species or may have upland components that could be preserved through additional programs. Credit and debit tracking, including RIBITS, and separation of funds will ensure that funds for other purposes are not used in the creation of mitigation credit on a site, but increasing the ecological benefit and leverage of mitigation funds by bringing them together alongside other funding sources to achieve a greater conservation result.

**20% Feasibility of Project.** This factor considers the extent of project readiness, simplicity of the technical approach relative to the ecological lift, likelihood of self-sufficiency and success, and project cost. The following sub-factors are considered: soundness of the conceptual plan and resource conservation understanding; likelihood of achieving anticipated functional lift within the proposed or required schedules; risk of adverse impacts (encroachment, flooding, intrusion, invasive species, habitat loss, etc.); feasible maintenance, monitoring, and stewardship planning given funding, project complexity, and using Corps-approved methodologies for determining financial assurances including relevant worksheets; landowner willingness to participate; and urgency of project as a factor of both combination with other conservation effort or pending option agreement, and also threats of other uses to the site.

**5% Partner Capacity.** This factor is an assessment of the construction, performance monitoring, adaptive management, and long-term site protection elements of the project given the parties involved. The sub-factors include: a long-

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term site protection instrument held by a responsible state or federal agency, or conservation organization; qualifications and experience of environmental consultants or other relevant agent in the design, performance, and management of the project; quality and completeness of the proposal; and adequacy of financial assurance and long-term maintenance funding (if any) based on SOP.

**5% Other Benefits.** This factor allows the project partner to include additional benefits not captured by the other areas but important to the prioritization of the project and can include: extent of participation by additional agencies, landowners, organizational partners, and jobs supported by the project; enhancement to scenic or recreational values; and enhancement to other programs of local and regional importance.

