A COMPARISON OF COMPENSATION PLANNING FRAMEWORKS

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ELI assessed the compensation planning frameworks (CPFs) that are included in the final in-lieu fee (ILF) program instruments that have been approved under the terms of the 2008 Compensatory Mitigation Rule (the Rule)[1] as of September 2011. This assessment compares how these ILF programs structured the ten elements that the Rule required to be included in the CPFs and evaluates the information that was provided in support of each of these elements.

Ten Elements of a Compensation Planning Framework

The compensation planning framework must include the following ten elements (§332.8(c)):

1. The geographic service area(s), including a watershed based rationale for the delineation of each service area.
2. A description of the threats to aquatic resources in the service area(s), including how the in-lieu fee program will help offset impacts resulting from those threats.
3. An analysis of historic aquatic resource loss in the service area(s).
4. An analysis of current aquatic resource conditions in the service area(s), supported by field documentation.
5. A statement of aquatic resource goals and objectives for each service area, including a description of the general amounts, types and locations of aquatic resources the program will seek to provide.
6. A prioritization strategy for selecting and implementing compensatory mitigation activities.
7. An explanation of how any preservation objectives identified above satisfy the criteria for use of preservation.
8. A description of any public and private stakeholder involvement in plan development and implementation, including coordination with federal, state, tribal and local aquatic resource management and regulatory authorities.
9. A description of the long term protection and management strategies for activities conducted by the in-lieu fee program sponsor.
10. A strategy for periodic evaluation and reporting on the progress of the program in achieving the goals and objectives above, including a process for revising the planning framework as necessary.

Finally, the district engineer may request additional information to be included to ensure "effective compensation planning."

[1] Compensatory Mitigation for Losses of Aquatic Resources, 33 C.F.R. § 325, 332 (2008) [hereinafter Mitigation Rule].

Overall Structure of Compensation Planning Frameworks

Of the six approved instruments evaluated,[2] the CPFs for four programs – NCEEP, DU Vermont, TNC VARTF, and LTMCP Mississippi – were structured so that elements were directly addressed in the order that they are listed in the Rule. Of these four, however, only one (NCEEP) addressed all elements independently; DU Vermont aggregates elements 2-5 into a single section and TNC VARTF similarly aggregates elements 2-4 and 5-6. LTMCP does not address elements 2-4 in its CPF.

Approved In-Lieu Fee Programs (as of August 2011)

The Coastal Mississippi In-Lieu Fee Program
Sponsor: Land Trust for the Mississippi Coastal Plain (LTMCP Mississippi)[3]

The Mississippi Delta In-Lieu Fee Program
Sponsor: Ducks Unlimited, Inc. (DU Mississippi)[4]

The North Carolina Ecosystem Enhancement Program In-Lieu Fee Program
Sponsor: North Carolina Ecosystem Enhancement Program (NCEEP)[5]

The Oregon Department of State Lands Statewide Fee-in-Lieu Program
Sponsor: Oregon Department of State Lands (Oregon DSL)[6]

The Ducks Unlimited, Inc.-Vermont In-Lieu Fee Program
Sponsor: Ducks Unlimited, Inc. (DU Vermont)[7]

The Nature Conservancy Virginia Aquatic Resources Trust Fund In-Lieu Fee Program
Sponsor: The Nature Conservancy (TNC VARTF)[8]

Living River Restoration Trust*
Sponsor: Elizabeth River Project (VA)

* The Living River Restoration Trust did not develop a conventional instrument or CPF, precluding analysis of their CPF

The other two CPFs – Oregon DSL and DU Mississippi – did not use this format. Evaluation of these latter CPFs involved more interpretation, as an explicit connection is never made between the content of the CPFs and the particular elements listed in the Rule. For example, because DU Mississippi has no section designated for element two, which requires the provider to provide a description of threats to aquatic resources in the service area(s)[9], our analysis of how effectively this program satisfies this requirement is more a matter of interpretation than with the other CPFs.

In addition, rather than including all ten elements in their CPFs, some programs

[2] Virginia Living Resources did not develop a conventional instrument or CPF, precluding analysis of their CPF. See: Elizabeth River Project. 2008. "The River of the Future: A Watershed Action Plan." Portsmouth, VA: Elizabeth River Project. http://www.elizabethriver.org/The_Elizabeth_River/Action_Plans.aspx.
[3] Land Trust for the Mississippi Coastal Plain. "The Coastal Mississippi In-Lieu Fee Program." January 2010.
[4] Ducks Unlimited, Inc. "Mississippi Delta In-Lieu Fee Program Instrument." October 4, 2010.
[5] North Carolina Department of Environment and Natural Resources. "North Carolina Department of Environment and Natural Resources' Ecosystem Enhancement Program In-Lieu Fee Instrument." July 28, 2010.
[6] Oregon Department of State Lands. "Statewide Fee-in-Lieu Instrument." July 10, 2008.
[7] Ducks Unlimited. "Vermont In-lieu Fee Program." December 7, 2010.
[8] The Nature Conservancy of Virginia. "Virginia Aquatic Resources Trust Fund Instrument." July 15, 2011.
[9] Mitigation Rule, §332.8(c)(2)(ii).

defer addressing specific elements to individual site mitigation plans. For example, LTMCP Mississippi defers elements 2-5 to individual site mitigation plans. It defers elements 2-4 by reasoning that threats, historic losses, and current conditions for a site cannot be addressed prior to defining service areas in the individual mitigation plans.[10] It defers addressing element five by stating in its CPF that specific resource goals for each project can only be identified "[o]nce watershed conditions and mitigation needs are evaluated"[11] in project-specific mitigation plans.

	DU VT				DU MS				NC EEP				OR DSL				TNC VARTF				LTMCP MS			
	CPF Element																							
Manner of addressing CPF element	2	3	4	5	2	3	4	5	2	3	4	5	2	3	4	5	2	3	4	5	2	3	4	5
With required content for each individual proposed or finalized service area	X	X	X	X									X	X	X	X	X	X	X	X				
With required content for the ILF program's entire program area					X	X	X	X																
By describing methods for obtaining required content for each service area									X	X	X	X					X	X	X	X				
By describing methods for obtaining required content for each project																								X
By deferring to the mitigation plan																					X	X	X	X
By including required content on the program's website									X	X	X	X												

Table 1: Response types given for CPF elements 2-5 varied across instruments.

CPFs also varied significantly in terms of the descriptive and analytical information provided, particularly in their treatment of the elements 2-5 (Table 1). Some programs addressed elements 2-5 by providing the content requested by the Rule in their CPF document, while others described the methods that would be applied to generate the required information. For example, the CPFs for the NCEEP and TNC VARTF describe the process and methods they will use to satisfy three elements (2-4), but NCEEP does not provide that analysis in the CPF.

Element-by-element comparison

Element I: Geographic service areas, including a watershed-based rationale for the delineation of each service area.

- All six CPFs indicate the size of their final or proposed geographic service areas. DU Mississippi has two service areas; one service area is a 6-digit Hydrologic Unit Code (HUC-6) bounded by a Level III Omernik Ecoregion and the Vicksburg Corps district, and one service area is comprised of two HUC-8s within Mississippi and the Vicksburg district. DU Vermont indicates that their service areas are based on HUC-6s, while NCEEP indicates that all of its service areas will use the HUC-8. TNC

[10] Bowie, Laura. Personal Communication. June 15, 2011.
[11] Land Trust for the Mississippi Coastal Plain. "The Coastal Mississippi In-Lieu Fee Program." January 2010.

VARTF provides a map that overlays its service areas, which are aggregations of HUC-8s, with the ecological drainage units (EDUs) upon which these aggregations are based. Oregon DSL proposes that in general, HUC-8s be used as service areas west of the Cascade Mountains and HUC-6s be used east of the Cascade Mountains, although it defers final determination of service areas to a particular project's mitigation plan.[12] LTMCP Mississippi will use the "Proximity Factor Method"[13] to establish service areas for each individual mitigation plan; the CPF states that these service areas will be HUC-8 watersheds.[14] All of the approved ILFs' geographic service areas may be altered in certain circumstances noted in their CPF document or instrument (see below) or based on locally-developed guidance or standards.[15]

- Three of the six CPFs (DU Vermont, TNC VARTF, and LTMCP Mississippi) include ecological

Hydrologic Unit Codes

The U.S. Geological Survey divides the country up into "hydrologic units" that are nested within each other. Each hydrologic unit is assigned a 2-12 digit hydrologic unit code (HUC), depending on the level of classification (i.e., a 2-digit HUC is assigned a 2-digit number and a 12-digit HUC is assigned a 12-digit number). The more digits the HUC, the smaller the hydrologic unit.

For example, the country is divided into 22 two-digit HUCs, which average 177,560 square miles and generally encompass the drainage area of a major river, such as the Missouri region, or the combined drainage areas of a series of rivers, such as the Texas-Gulf region. The 8-digit HUC, or subbasin, is a fairly standard unit used for a variety of watershed-based analysis and regulatory decision-making. There are 2,267 eight-digit HUC subbasins in the country that each average 703 square miles in size.

Sources: Lists and maps of the hydrologic units are available from the USGS. A text-formatted list of hydrologic unit names and numbers is available in the original format (http://water.usgs.gov/GIS/huc_name.html) or in tab-delimited format (http://water.usgs.gov/GIS/huc_rdb.html). For more information on ordering maps, see: "Ordering U.S. Geological Survey Products," http://ask.usgs.gov/to_order.html.

[12] For example, in two ILF mitigation plans completed following the Oregon DSL's approval under the Rule, a HUC-8 was used for the program's Half Mile Lane site and an aggregation of coastal HUC-10s smaller than a HUC-8 was used for the program's Tamara Quays site. Oregon DSL used the aggregation of coastal HUC-10s for the Tamara Quays site based on the compensation site's location in a particular estuarine subbasin, the lack of demand in the eastern portion of Oregon's coastal HUC-8s, the small quantity of compensation credits offered by the site, and the lower importance of HUCs in coastal drainage areas. Hicks, Dana. Personal Communication. August 26, 2011.

[13] Mobile District. U.S. Army Corps of Engineers. "Proximity Factor Method." April 12, 2009. http://www.sam.usace.army.mil/rd/reg/PN/currentPNs/ProximityFactorMethod.pdf.

[14] Land Trust for the Mississippi Coastal Plain. "The Coastal Mississippi In-Lieu Fee Program." January 2010.

[15] For instance, the North Carolina Stream Mitigation Guidelines set additional geographic preferences for stream compensation (e.g., within one stream order of an impacted stream; as close to an impact site as possible; warm/cool/cold streams replaced in-kind; compensation in same physiographic province). See: Wilmington District, U.S. Army Corps of Engineers, Region IV, U.S. Environmental Protection Agency, North Carolina Division of Water Quality, Natural Resources Conservation Service, and North Carolina Wildlife Resources Commission. "Stream Mitigation Guidelines." April 2003. http://www.saw.usace.army.mil/wetlands/mitigation/stream_mitigation.html.

justifications for use of a particular service area size, and two CPFs (Oregon DSL and DU Vermont) include economic reasoning for selecting a particular service area size.

- **Ecological rationale:** DU Vermont, LTMCP Mississippi, and TNC VARTF use ecological rationales to justify their service areas. DU Vermont states that service areas are selected based on a "watershed approach, existing planning efforts in VT, and internal DU planning efforts."[16] The program builds upon existing Vermont planning efforts to support its service area size, including the Vermont Department of Environmental Conservation's Watershed Initiative and goals and objectives of the Vermont Natural Heritage Program, Vermont Wildlife Action Plan, and TNC Priority Conservation Areas. TNC VARTF explains that service areas are based on aggregations of HUC-8s that roughly correspond to ecological drainage units (EDUs) defined by TNC's aquatic biologists and hydrologists. LTMCP Mississippi notes that its service areas "are consistent with [the Mississippi Department of Environmental Quality's] basin coordination efforts as well as other resource conservation strategies in Mississippi."[17]
- **Economic rationale:** Oregon DSL and DU Vermont's service area justifications include economic rationales (i.e., expected future distribution of impacts). Oregon DSL uses data to support its selection of service areas. Within each priority HUC-8 or HUC-6 watershed, Oregon DSL cites county-level population data over the period from 2000 to 2007[18] and percent of total permitted wetland impact acreage by HGM and Cowardin class. Oregon DSL's instrument also notes that service area determinations for individual sites will consider the "expected amount and type of mitigation required in an area (demand) compared with the aquatic resources and amount of credits that are expected from a[n ILF] project, the availability of private mitigation banks in the area, [and] population and growth information."[19] DU Vermont adds of its choice of service areas, "The scale is appropriate to ensure the projects selected will effectively compensate for adverse environmental impacts…and enable financially sound delivery of the program."[20] Further, DU Vermont reports that "past mitigation needs in the watershed based on historical impacts; future needs for mitigation in the watershed based on projected growth and development; [and] lack of private

[16] Ducks Unlimited. "Vermont In-lieu Fee Program." December 7, 2010.
[17] Land Trust for the Mississippi Coastal Plain. "The Coastal Mississippi In-Lieu Fee Program." January 2010.
[18] Population Research Center. College of Urban and Public Affairs, Portland State University, Portland, Oregon. 2008.
[19] Oregon Department of State Lands. "Statewide Fee-in-Lieu Instrument." July 10, 2008.
[20] Ducks Unlimited. "Vermont In-lieu Fee Program." December 7, 2010.
DU Vermont's instrument also analyzes historical permitting data for the four years preceding the program in establishing advance credit levels for each of the four service areas. Advanced credits for each area "were determined based on the estimated credits needed to compensate for impacts permitted over the past four years," as determined by data from Ruth Ladd of the New England district of the Army Corps of Engineers. The program also notes that "[i]n service areas that have experienced relatively few impacts over the past four years, a minimum of 25 advanced credits are needed to finance the program." This analysis indicates that DU Vermont utilized past permitting data in its analysis of the service area sizes necessary for financial viability of the program.

mitigation banks suitable to meet the demand for mitigation in the service area"[21] will inform selection of compensation sites in each service area.

- **Service area flexibility:** Two programs (Oregon DSL and LTMCP Mississippi) preserve case-specific service area flexibility by deferring final determination of service areas to individual site mitigation plans. The other four instruments finalize service area sizes but maintain service area flexibility. For example, DU Vermont's CPF states that the program "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 exception."[22] Similar statements are included in the DU Mississippi, NCEEP, and TNC VARTF instruments or CPFs.
    - **Small impacts policy:** The NCEEP instrument institutes a small impacts policy, whereby the program may request that the district engineer and the Interagency Review Team (IRT) allow use of "credits from an adjacent [HUC-8] within the same river basin" when "the cumulative mitigation requirements in any given North Carolina State Government Fiscal Year are less than 1,000 linear feet of stream or 3 acres of wetlands."[23] Similarly, the TNC VARTF instrument states, "If, within any [HUC-8], the cumulative amount of impacts, for which the Program was utilized in any given year, are less than 2,000 linear feet of stream or three acres of wetlands, the Conservancy may submit a proposal to the IRT to satisfy the mitigation obligation liability through the use of Released Credits or Bank Credits from within the same river basin."[24] Small impacts policies may help to ameliorate concerns of inadequate credit demand in a particular service area.

Element II: A description of the threats to aquatic resources in the service area(s), including how the in-lieu fee program will help offset impacts resulting from those threats.

- **Description of aquatic resource threats:** Three of the six CPFs (Oregon DSL, DU Vermont, and TNC VARTF) describe specific threats to aquatic resources for some or all of their proposed or finalized service areas. DU Mississippi, on the other hand, describes threats across the geographic extent of their ILF. NCEEP does not detail specific service areas' aquatic resource threats in its CPF; instead, the program distributes data on problems and threats by river basin and HUC-8, and for certain local HUC-14s, on its website.[25] NCEEP annually updates the IRT and district engineer on its river basin and local watershed analyses. LTMCP

[21] Ducks Unlimited. "Vermont In-lieu Fee Program." December 7, 2010.
[22] Ducks Unlimited. "Vermont In-lieu Fee Program." December 7, 2010.
[23] North Carolina Department of Environment and Natural Resources. "North Carolina Department of Environment and Natural Resources' Ecosystem Enhancement Program In-Lieu Fee Instrument." July 28, 2010.
[24] The Nature Conservancy of Virginia. "Virginia Aquatic Resources Trust Fund Instrument." July 15, 2011.
[25] North Carolina Ecosystem Enhancement Program. "Watershed Planning." http://www.nceep.net/pages/lwplanning.htm. (Last visited September 8, 2011).

Mississippi defers describing threats to site-specific mitigation plans.[26] For example:

- TNC VARTF provides detailed assessments of the conservation status of various habitat- or species-based conservation targets for each of its service areas. These detailed assessments often include qualitative descriptions of threats facing particular habitats or species, and sometimes cite quantitative scientific data regarding these habitat or species.[27] Following habitat- or species-specific threats, TNC VARTF provides a list of general threats to the aquatic resources throughout the service area.[28]
- Oregon DSL provides qualitative, and occasionally quantitative, discussion of aquatic resource threats, which are sometimes detailed by individual wetland habitat types, in all of its identified priority watersheds. DSL discusses these threats at the river basin and watershed levels, and when subwatershed assessments are readily available, at the subwatershed level.[29]
- DU Mississippi provides detailed descriptions of threats to "water and air quality, habitat for wildlife, riverine fish, mussels and other organisms, and flood storage"[30] over both of the program's service areas in the Mississippi Alluvial Valley.

[26] Bowie, Laura. Personal Communication. June 15, 2011.

[27] For example, in the Tennessee River service area, for Endemic Cumberlandian Freshwater Mussels & Associated Assemblage, TNC VARTF's CPF cites, "Another rising concern is the possible threat to aquatic species from contaminant loads bound to sediments or interstitial waters, but very little data exists. A study by the USGS National Water Quality Assessment Program identified elevated levels of polycyclic aromatic hydrocarbons in the Clinch River, from unknown sources (Hampson et al., 2000)." The Nature Conservancy of Virginia. "The Nature Conservancy's Watershed Approach to Compensation Planning for the Virginia Aquatic Restoration Trust Fund." December 2009.

[28] For example, in the Tennessee River service area, TNC VARTF's CPF lists "Incompatible grazing practices; Incompatible forestry practices; Incompatible active mining practices; Legacy mining practices; Invasive, non-native pests and pathogens; Invasive, non-native plant species; Incompatible development; Accidental toxic spills; Incompatible oil and gas extraction; Incompatible crop production practices; Inadequate waste water treatment/management; Energy transmission corridors; Acid deposition; Global climate change (air temperature extremes); Fire suppression; and Recreational activities." The Nature Conservancy of Virginia. "The Nature Conservancy's Watershed Approach to Compensation Planning for the Virginia Aquatic Restoration Trust Fund." December 2009.

[29] For example, in its description of threats in the North Coast River Basin, Oregon DSL's CPF notes, "Major wetland conservation issues in the North Coast Basin include conversion and fragmentation of tidal and floodplain wetlands, and loss and degradation of sand dune systems and riparian areas." Within the North Coast River Basin, in the Lower Columbia watershed, the Oregon DSL CPF states that "[n]early two-thirds of the shallow marshes and side channels along the lower Columbia have been converted to other uses, primarily farm and pastureland but also, more recently, hybrid cottonwood plantations." Finally, within the Lower Columbia watershed, in the Skipanon subwatershed, the Oregon DSL CPF reports that "[w]hile wetland and grassland features dominate current land cover in the urban growth boundary, historic and continued development on the floodplain and filling/modification of wetlands are of concern. Of particular interest are loss of fish and wildlife habitat, water quality, hydrologic effects (decreased flood water storage and groundwater recharge), and aesthetic quality functions. Many wetlands are diked and disconnected from the stream." Oregon Department of State Lands. "Statewide Fee-in-Lieu Instrument." July 10, 2008.

[30] Ducks Unlimited, Inc. "Mississippi Delta In-Lieu Fee Program Instrument." October 4, 2010.

- **Offsetting threats:** Four of the six CPFs (Oregon DSL, DU Vermont, TNC VARTF, and DU Mississippi) describe how compensation projects will offset specific threats identified by the program in their CPF document. For example:
  - Oregon DSL's CPF provides recommendations for offsetting identified aquatic resource threats within some river basins, all watersheds, and where subwatershed assessments are available, within subwatersheds.[31] Similarly, DU Vermont provides compensation actions that address aquatic resource threats at the service area scale, and where more geographically specific pre-existing assessments are available, within smaller watersheds.
  - After its detailed descriptions of threats to "water and air quality, habitat for wildlife, riverine fish, mussels and other organisms, and flood storage"[32] in the Mississippi Alluvial Valley, DU Mississippi provides a description of how compensation projects will address threats to these ecosystem functions, habitats, or species. These descriptions may be as detailed as citing wetland sediment retention rates for the region and relating them to improvements in water quality, habitat, or species populations, or as general as asserting that "all work completed under [the DU Mississippi ILF program] should directly benefit [the Louisiana Black Bear]."[33]
  - NCEEP conducts detailed local watershed plans (LWPs) in some HUC-14s that outline specific suggestions for offsetting aquatic resource threats. Two central results of LWPs are development of a project atlas and a watershed management plan that "identify projects and management strategies that address identified stressors and have the best opportunity for bringing about functional improvement to the watershed."[34]
- **Methods for characterizing threats:** Methods used to characterize aquatic resource threats are described in detail by TNC VARTF and NCEEP. Other programs primarily rely on existing watershed assessments developed by government, non-profit, and private sources to characterize threats in their program area, and

[31] In the Oregon DSL CPF, broader activities to offset threats are identified for some river basins. For example, for the Willamette Basin: "Conservation issues include a simplified channel (including the disconnection of the river from its floodplain); declining habitat complexity; and declines in water quality. The Oregon Biodiversity Project has identified oak savannas and woodlands, wetlands, and bottomland hardwood forests as broad-scale conservation priorities based on an assessment of historical changes and current management status." Activities to offset threats, which are often more specific, are identified for all priority watersheds. For example, for the Lower Willamette watershed: "Limiting factors are primarily the result of urbanization… Restoration activities identified pertinent to the FIL program are to improve stormwater management to restore water quality and reduce quantities of stormwater runoff entering rivers, and to improve the Willamette River's connection to it current and historic floodplain." Finally, when subwatershed assessments are available, Oregon DSL cites these to provide further specificity for offsetting aquatic resource threats. For example, in the Young's Bay subwatershed in Oregon's Lower Columbia watershed: "FIL projects in this watershed should focus on restoration of estuarine wetlands for anadromous fish habitat; and streamside wetlands to provide water storage and delay, thermoregulation, and anadromous fish habitat support functions." Oregon Department of State Lands. "Statewide Fee-in-Lieu Instrument." July 10, 2008.

[32] Ducks Unlimited, Inc. "Mississippi Delta In-Lieu Fee Program Instrument." October 4, 2010.

[33] Ibid.

[34] North Carolina Ecosystem Enhancement Program. "Local Watershed Planning Manual." Draft. March 9, 2011.

accordingly do not develop their own methodologies for identifying aquatic resource threats.

- **Data used to identify and describe threats:** DU Mississippi is the only ILF to cite numeric, regional scientific data quantifying the effect of wetland restoration on water quality (sedimentation), while other programs generally simply note that compensatory wetlands will improve water quality.[35] DU Mississippi provides similar data on terrestrial uptake of carbon dioxide in bottomland hardwood forests as a quantitative indicator of the potential for air quality remediation from compensation sites. Information used by DU Mississippi to evaluate elements 2-4 is based on existing data from scientific literature, species conservation plans, and uncited sources. NCEEP and TNC VARTF are the most comprehensive in terms of their data gathering efforts.
    - NCEEP engages in watershed planning efforts that involve compiling detailed state and local GIS datasets and water quality monitoring data in addition to windshield surveys.
    - TNC VARTF carries out ecoregional assessments of viability and biological integrity based on evaluations of the size, condition, and landscape context of particular populations in order to understand "current and imminent threats" to biodiversity. TNC VARTF also engages in a conservation action planning process in which teams of experts rank the scope, severity, contribution, and irreversibility of each threat. The process includes consideration of spatially-explicit data on land cover, impervious cover, roads, dams, managed and conservation lands, and point source pollution in addition to Virginia-specific data sources that include the Virginia Commonwealth University INteractive STream Assessment Resource (INSTAR) database (data on fish and macroinvertibrate assemblages, instream habitat, and stream health assessment data), the Virginia Department of Environmental Quality (VDEQ) 303(d) waters list, VDEQ biological monitoring data, the Department of Game and Inland Fisheries (DGIF) threatened and endangered waters list, DGIF aquatic species inventory data, and Department of Conservation and Recreation Division of Natural Heritage (DNH) aquatic species inventory data. Furthermore, TNC interviews aquatic resource managers and academics to obtain otherwise unavailable data on local conditions, such as stocking, channelization, invasive species, non-point pollution, dam operation, and local water withdrawals.
- By forecasting mitigation needs, two CPFs (NCEEP and Oregon DSL) describe future threats in service areas. For example:
    - NCEEP uses Transportation Improvement Project data to forecast future secondary and cumulative impacts, and in its River Basin Restoration Priority reports (RBRPs) presents population growth projections as an indicator of future development impacts.

[35] For example, the Oregon DSL CPF notes that "Wetland functions that should be targeted are…sediment stabilization and phosphorus retention, nitrogen removal, …" Oregon Department of State Lands. "Statewide Fee-in-Lieu Instrument." July 10, 2008.

- Oregon DSL describes trends in population growth across priority watersheds as an indicator of future impacts in these areas.

Element III: An analysis of historic aquatic resource loss in the service area(s).

- Four of the six CPFs (Oregon DSL, DU Vermont, DU Mississippi, and TNC VARTF) address historic resource loss in the form of an analysis or present results from an analysis in the CPF document. NCEEP discusses methods for analyzing historic aquatic resource loss in its CPF and provides the results of these analyses in RBRPs or in LWPs on its website, while LTMCP Mississippi defers analyzing historic aquatic resource loss to site-specific mitigation plans.
  - **Qualitative analysis:** Four of these five instruments (Oregon DSL, DU Vermont, DU Mississippi, and TNC VARTF) address historic resource loss in the form of a qualitative analysis, or present results from a qualitative analysis in the CPF document.
    - In one service area, for example, DU Vermont states, "Since the mid-1800s, significant alterations, such as dam construction, logging, farming, deforestation, dredging, and river straightening have altered water quality, and wildlife habitat, and led to significant loss of floodplain functions."[36]
    - For the Willamette Valley, Oregon DSL documents that "[h]istorically, the Willamette was the key feature in a broad floodplain of sloughs, wetlands, and bottomland forests surrounded by an open valley dominated by prairie and savanna vegetation. Since European settlement, the valley has undergone extensive urban, suburban and agricultural development, and today its ecosystem is highly altered and fragmented."[37]
    - TNC VARTF's CPF document provides detailed analyses of the different aquatic resource habitat types and rare and declining species' conservation status in each of its service areas; these habitat or species analyses sometimes include qualitative historical trends.
  - **Quantitative analysis:** These four instruments (DU Mississippi, DU Vermont, Oregon DSL, and TNC VARTF) also present quantitative analysis, or the results of quantitative analysis, of historic aquatic resource losses. For example:
    - Oregon DSL cites a table of "major classifications of permitted wetland impacts"[38] for some of its priority HUC-6s or HUC-8s that includes the percent acreage of permitted wetland losses by HGM and Cowardin class.
    - DU Vermont quantifies historic losses by displaying pie charts of land use change statistics over 200 years within its Connecticut River watershed service area.
    - DU Mississippi provides the results of a quantitative analysis of aquatic resource losses and describes the components of the statistical analysis underlying this result in its CPF: "The MSD-ILFP encompasses approximately 4,654,863 acres, of which 998,665 acres remain in bottomland hardwood forested condition (Ducks Unlimited Forest Cover Change Detection Report, 2002). Hence, assuming the entire service area

[36] Ducks Unlimited. "Vermont In-lieu Fee Program." December 7, 2010.
[37] Oregon Department of State Lands. "Statewide Fee-in-Lieu Instrument." July 10, 2008.
[38] Ibid.

was once bottomland forest, 3,656,161 acres of forest cover have been lost..."[39]

- TNC VARTF's CPF document provides detailed analyses of the different aquatic resource habitat types and notable faunal and floral species' conservation status in each of its service areas; these habitat or species analyses sometimes include quantitative data on historical trends. For example, for oyster reef ecosystems in the Chesapeake Bay service area, TNC VARTF's CPF notes that "[t]he historic footprint of oyster reefs in the Chesapeake was likely between 200,000 and 400,000 acres; today fewer than 20,000 acres are likely functional. As recently as 100 years ago, they were so massive that they posed a navigational hazard to ships. However, populations are suffering as a result of disease, habitat destruction and over-harvesting and are estimated to exist at only 1% of historic levels."[40]

- **Methods for analysis:** DU Mississippi, NCEEP, and TNC VARTF describe methods for analyzing historic aquatic resource loss, though only DU Mississippi and TNC VARTF present the results of their analysis in their CPF documents (see examples above). NCEEP does, however, provide detailed, historic aquatic resource data by river basin and HUC-8, and for certain local HUC-14s, on its website.[41] In developing LWPs, NCEEP explains that its analysis will examine "trends in water quality data and land use to assess the aquatic resource loss"[42] based on existing monitoring data as well as updated land use data that are compared with historical datasets. The ecoregional assessment method discussed by TNC VARTF describes how viability and biological integrity are evaluated "considering both the current condition and the impact of historic threats."[43] DU Mississippi also briefly explains its methodology for analyzing historic aquatic resource losses to bottomland hardwood forested wetlands, as described above.

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[39] Ducks Unlimited, Inc. "Mississippi Delta In-Lieu Fee Program Instrument." October 4, 2010.

[40] The Nature Conservancy of Virginia. "The Nature Conservancy's Watershed Approach to Compensation Planning for the Virginia Aquatic Restoration Trust Fund." December 2009.

[41] Some RBRPs contain quantitative analysis of historic aquatic resource loss. For example, from the French Broad 2009 RBRP: "Agricultural land is in decline and developed land is on the rise; from 1982 to 1997, cultivated cropland declined by 38% and pasture declined by 8%, but urban and built-up land increased by 85% (NCDWQ, 2005)." North Carolina Ecosystem Enhancement Program. "French Broad River Basin Restoration Priorities." 2009. http://www.nceep.net/services/restplans/French_Broad_RBRP_15july09.pdf. (Last visited September 8, 2011).

Similar quantitative statistics on historic aquatic resource loss may be included in NCEEP's LWPs; for example, from the Mud Creek LWP: "There was a loss of 25% of farmland between 1987 and 1997, and much of this land is being converted to residential land." Qualitative descriptions of historic aquatic resource loss may also be present in LWPs: "Channelization, or the straightening of streams, was a common practice in the Mud Creek watershed to improve drainage and increase valuable floodplain areas for farming." North Carolina Ecosystem Enhancement Program. "Watershed Restoration Plan for the Mud Creek Watershed." 2003. http://www.nceep.net/services/lwps/Mud_Creek/Mud_Creek_Plan_2003.pdf. (Last visited September 8, 2011).

[42] Oregon Department of State Lands. "Statewide Fee-in-Lieu Instrument." July 10, 2008.

[43] The Nature Conservancy of Virginia. "Virginia Aquatic Resources Trust Fund Instrument." July 15, 2011.

- **Data sources:** In analyzing historic resource loss, the CPFs draw upon several existing data sources. NCEEP compares historic and current land use data from local Soil and Water Conservation Districts, the National Resource Conservation Service, and county governments. NCEEP also uses data collected and reported by the NC Natural Heritage Program, NC Wildlife Resources Commission (e.g., NC Wildlife Action Plan) and NC Department of Transportation. DU Mississippi calculated total remaining forest using the DU Forest Cover Change Detection Report (used to find historic loss by assuming entire area was previously forested) while DU Vermont uses a figure from Brown 2009[44] that includes a map showing land use change over the past 200 years within the Connecticut River watershed. TNC VARTF uses the same data sources to assess historic aquatic resource losses in each service area as it does to assess aquatic resource threats (see discussion in element two).

Element IV: An analysis of current aquatic resource conditions in the service area(s), supported by an appropriate level of field documentation.

- An analysis of current aquatic resource conditions, or the results of such an analysis, is presented in four CPFs (Oregon DSL, DU Vermont, DU Mississippi, and TNC VARTF). NCEEP discusses methods for ascertaining current aquatic resource conditions in its CPF and provides the results of these analyses on its website, while LTMCP Mississippi defers analyzing current aquatic resource conditions to site-specific mitigation plans.
  - **Qualitative analysis:** Four CPFs (Oregon DSL, DU Vermont, DU Mississippi, and TNC VARTF) provide a qualitative analysis, or the results of a qualitative analysis of current aquatic resource conditions. These qualitative analyses vary in specificity and include discussions of a number of factors affecting current aquatic resource condition, including land use composition of a watershed, aquatic resource types in a watershed, water quality, hydrology, or species viability. For example:
    - Oregon DSL states that one watershed "includ[es] some of the most diverse and healthiest aquatic ecosystems in the state" and lists "limiting factors,"[45] such as flow modifications, temperature, nutrients, and water quality.
    - TNC VARTF provides specific qualitative analyses for aquatic resource habitat types and rare and declining species in each service area.[46]
  - **Quantitative analysis:** Four CPFs (Oregon DSL, DU Vermont, DU Mississippi, and TNC VARTF) provide a quantitative analysis, or cite statistics resulting from quantitative analysis of current aquatic resource conditions. For example, DU Vermont quotes from reports issued by the Vermont Agency of Natural

[44] Brown RA, Editor. 2009. Where the great river rises: an atlas of the Connecticut River Watershed in Vermont and New Hampshire. Dartmouth College Press, Hanover, New Hampshire, USA.
[45] Oregon Department of State Lands. "Statewide Fee-in-Lieu Instrument." July 10, 2008.
[46] For instance, in a discussion of alluvial floodplain and swamp forests in its Middle James River service area, TNC VARTF notes that "most extant occurrences are severely degraded due to clearing for pastures, development, aesthetic purposes, and infestation by invasive plant species." The Nature Conservancy of Virginia. "The Nature Conservancy's Watershed Approach to Compensation Planning for the Virginia Aquatic Restoration Trust Fund." December 2009.

Resources, while DU Mississippi cites research on non-point source pollution from Mississippi State University.[47]

- **Methods for analysis:** Three CPFs (DU Mississippi, NCEEP, and TNC VARTF) describe methods for analyzing current aquatic resource conditions, though only DU Mississippi and TNC VARTF present the results of this analysis in their CPFs.
    - NCEEP implements an approach that involves qualitative and quantitative analysis of aquatic resource condition and makes the information available on its website.[48] For all river basins in the state, NCEEP provides a broad overview of the current condition of water quality, hydrology, and habitat functions.[49] NCEEP's methodology in LWPs for select HUC-14s includes analyzing existing data for gaps, designing monitoring plans to address those gaps, summarizing all of the data to understand current conditions, and running watershed models.[50]
    - TNC VARTF uses ecoregional assessments that consider both "current condition and impact[s] of historic threats."[51] Current conditions are also assessed during the conservation planning process in which ranks are developed to measure key ecological attributes of conservation targets.
    - The DU Mississippi CPF also provides a brief description of its methodology for analyzing current aquatic resource conditions, noting that it overlaid maps of land that is frequently flooded and cleared.
- **Field documentation:** NCEEP and TNC VARTF actively obtain their own field data to support analysis of current aquatic resource conditions. NCEEP synthesizes field data with existing data to fill data gaps and provide a comprehensive understanding of watershed stressors, particularly in select HUC-14s with LWPs. TNC VARTF utilizes field documentation to support its analyses, which is sometimes gathered by TNC's staff, but generally obtained secondhand by soliciting field data from local experts (examples of these data sources are listed for element two above). In contrast, the field documentation underlying descriptions of current conditions for DU Mississippi,

[47] Manley, S.W. 1999. *Ecological and Agricultural Values of Winter-Flooded Ricefields in Mississippi*. PhD dissertation, Mississippi State University.

[48] North Carolina Ecosystem Enhancement Program. "Watershed Planning." http://www.nceep.net/pages/lwplanning.htm. (Last visited September 8, 2011).

[49] For example, in the Tar-Pamlico 2010 draft RBRP, NCEEP reports that "[t]he Tar-Pamlico River Basin offers an array of assets, especially noteworthy are its large forested tracts and conservation areas. Arguably, the most important priority here is to promote projects that reestablish riparian buffers and corridors of substantial width to improve connectivity of these protected areas. Agricultural impacts are also prevalent throughout the lower basin, including nonpoint source runoff and hydrologic modification. Projects that address agricultural runoff are important here. The watershed will also benefit from stream restoration projects that reestablish more natural pattern, hydrology and habitat, especially in heavily ditched headwater areas. Additionally, the lower part of the basin has an abundance of diverse marsh habitats along an extensive shoreline. Wetland and marsh restoration projects, as well as shoreline stabilization are high priorities for areas prone to erosion from natural exposure or from heavy boat traffic." North Carolina Ecosystem Enhancement Program. "Tar-Pamlico River Basin Restoration Priorities." Draft. October 2010. http://www.nceep.net/services/lwps/Tar-Pamlico/DRAFT-RBRP-Tar-Pamlico-20101112.pdf. (Last visited September 8, 2011).

[50] North Carolina Ecosystem Enhancement Program. "Local Watershed Planning Manual." Draft. March 9, 2011.

[51] The Nature Conservancy of Virginia. "The Nature Conservancy's Watershed Approach to Compensation Planning for the Virginia Aquatic Restoration Trust Fund." December 2009.

DU Vermont, and Oregon DSL is primarily derived from existing sources such as watershed planning and water quality reports.

Element V: A statement of aquatic resource goals and objectives for each service area, including a description of the general amounts, types and locations of aquatic resources the program will seek to provide.

- **Statement of goals and objectives:** Two CPFs (DU Vermont and Oregon DSL) provide sets of goals for each service area, one (DU Mississippi) details goals and objectives that apply uniformly to all service areas, and one (TNC VARTF) sets goals on an ecoregional basis across multiple service areas.[52] Specific goals and objectives for NCEEP and LTMCP Mississippi are not listed in the programs' CPFs. LTMCP Mississippi defers determination of objectives and goals to project-specific mitigation plans. NCEEP's provides goals and objectives for aquatic resources at the river basin, HUC-8, and select HUC-14 levels on the program's webpage.
- **Aquatic resource amounts:** The CPFs for TNC VARTF, DU Mississippi, and Oregon DSL discuss the amounts of aquatic resources that these programs have prioritized for compensation sites. These aquatic resource amounts are generally presented as the wetland acreage or stream length of priority locations for compensation projects, and the consistency and detail with which CPFs present the size of priority conservation sites varies considerably.
    - TNC VARTF presents the size of priority conservation sites most consistently and thoroughly. This information is presented as a table for each service area listing the acreage or stream miles for each priority conservation area identified through TNC's conservation action planning process.
    - DU Mississippi uses two models to identify priority aquatic resources; the Wetland Restoration Suitability Index developed by Ducks Unlimited identifies 312,907 acres of high and medium-high suitability wetland restoration sites, and the Forest Breeding Bird Decision Support Model developed by the Lower Mississippi Valley Joint Venture identifies 1,073,865 acres of medium- to high-priority for restoration of forest-breeding bird habitat. The highest priority lands for DU Mississippi activities, which are identified by combining results of both models, total 101,711 acres.
    - Oregon DSL identifies "conservation opportunity areas"[53] based on the Oregon Conservation Strategy; these areas occasionally include acreage or other size statistics for targeted aquatic resources.
- Although NCEEP does not describe amounts of aquatic resources in its CPF, the project atlases that this ILF produces in some HUC-14s appear to provide the most detailed amounts of aquatic resources that the program will seek to provide of any of

[52] While TNC determines priority conservation areas on an ecoregional basis, the maps of these priority conservation areas are presented by service area in its CPF. The Nature Conservancy of Virginia. "The Nature Conservancy's Watershed Approach to Compensation Planning for the Virginia Aquatic Restoration Trust Fund." December 2009.

[53] Oregon Department of State Lands. "Statewide Fee-in-Lieu Instrument." July 10, 2008.

the ILFs assessed.[54] Project atlases detail the amount of wetland (acreage) or stream (linear feet) compensation types (preservation, creation, enhancement, or restoration) that should be pursued at a number of priority mitigation sites in a subwatershed.[55]

- **Aquatic resource locations:** None of the CPFs describe specific, pre-identified site locations at which the program will definitely pursue aquatic resource compensation. All instruments describe a process or criteria that will be applied to select mitigation sites (LTMCP Mississippi doing so using solely on the basis of "selection criteria" common template language). Oregon DSL, TNC VARTF, and DU Mississippi narrow down potential areas of the landscape for site selection without identifying specific project area boundaries.
    - Oregon DSL selects "priority watersheds,"[56] areas in which restoration activities are likely to be targeted. For several of these priority watersheds, Oregon DSL further identifies site-specific "conservation opportunity areas"[57] that have been identified by the Oregon Conservation Strategy as particularly suitable for wetland conservation and restoration.
    - DU Mississippi provides output from its prioritization models that map 101,711 acres across its service areas that represent the highest priority areas for wetland restoration (more detail above).
    - TNC VARTF provides a portfolio of priority conservation areas for each service area that "captures places that contain the ecological systems, communities and species we want to effectively conserve, or priority conservation areas."[58] However, these areas do not "define the places where all strategies need to be implemented" or "provide accurate boundaries for protected area design, or for maintaining corridors and functional landscapes."[59] TNC VARTF provides a map of each service area showing the locations of priority conservation areas.
- As described above, NCEEP provides specific, potential locations for different types of aquatic resource projects in project atlases that are produced in select HUC-14s.
- **Aquatic resource types:** Four CPFs (Oregon DSL, DU Vermont, DU Mississippi, and TNC VARTF) describe types of aquatic resources that will be provided. However, each does so very differently. For example:
    - Oregon DSL addresses aquatic resource types using function-based wetland classifications; for each priority watershed the CPF lists "priority

[54] Project atlases are available on the NCEEP watershed planning webpage. See: North Carolina Ecosystem Enhancement Program. "Watershed Planning." http://www.nceep.net/pages/lwplanning.htm. (Last visited September 8, 2011).
[55] For example, the project atlas for the Little Alamance, Travis, and Tickle Creek watersheds recommends 67.47 ac floodplain preservation, 7.22 ac wetland, and 12,945 linear stream feet of streambank restoration for one potential compensation site. See: North Carolina Ecosystem Enhancement Program. "Little Alamance, Travis, & Tickle Creek Watersheds Report & Project Atlas: An Ecosystem Enhancement Program Funded Local Watershed Plan Phase III." November 2008. http://www.nceep.net/services/lwps/Little_Alamance/LATT_FinalWatershedPlan.pdf. (Last visited September 8, 2011).
[56] Oregon Department of State Lands. "Statewide Fee-in-Lieu Instrument." July 10, 2008.
[57] Ibid.
[58] The Nature Conservancy of Virginia. "The Nature Conservancy's Watershed Approach to Compensation Planning for the Virginia Aquatic Restoration Trust Fund." December 2009.
[59] Ibid.

wetland ecological systems"[60] as well as percent permitted impacts by HGM and Cowardin class.
    - TNC VARTF also denotes specific types of aquatic resource habitats or species as conservation targets, although this CPF does not specify the classification system it uses.
    - DU Mississippi aims only to restore "bottomland hardwood forest."[61]
    - DU Vermont is less descriptive with its typologies, listing very general aquatic resource types as restoration targets for each watershed.
    - NCEEP, though it does not provide any information on specific targeted aquatic resource types in its CPF, notes in RBRPs or LWPs that it will pursue compensation projects in broad categories of aquatic resource types (e.g., riverine wetlands, headwater streams, or in-stream and riparian habitat).

Element VI: A prioritization strategy for selecting and implementing compensatory mitigation activities.

- **Two-step prioritization strategies:** Three CPFs (NCEEP, Oregon DSL, and LTMCP Mississippi) describe a two-step approach to prioritization with the first step consisting of prioritization at the landscape scale (e.g., identifying priority watersheds) and the second consisting of prioritization of individual project sites within the area prioritized in the first step.
    - In the first step, two CPFs (NCEEP and LTMCP Mississippi) describe a process for selecting priority subwatersheds. Oregon DSL prioritizes more coarsely, selecting priority watersheds (HUC-8) or basins (HUC-6) for compensatory mitigation projects.
    - In the second step, two CPFs (Oregon DSL and LTMCP Mississippi) establish common criteria that will be used to select specific project sites. These two CPFs both note that the following factors will be evaluated in prioritizing among potential compensation sites: 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. NCEEP identifies specific compensation sites through a watershed planning process that that compares and prioritizes potential compensation sites based on "watershed uplift, feasibility (project constraints, size), and stakeholder input."[62]
- **Single-step prioritization strategies:** Three CPFs discuss only a single step for prioritizing compensatory mitigation activities (DU Mississippi, TNC VARTF, and DU Vermont). DU Vermont uses restoration and preservation inputs to rank potential project areas on a site-by-site basis, although the CPF does not describe the methodology used to select these initial potential project sites. DU Vermont also draws from the common project selection criteria used by Oregon DSL and LTMCP

[60] Oregon Department of State Lands. "Statewide Fee-in-Lieu Instrument." July 10, 2008.
[61] Ducks Unlimited, Inc. "Mississippi Delta In-Lieu Fee Program Instrument." October 4, 2010.
[62] North Carolina Department of Environment and Natural Resources. "North Carolina Department of Environment and Natural Resources' Ecosystem Enhancement Program In-Lieu Fee Instrument." July 28, 2010.

Mississippi, including the ability of the project to meet multiple objectives and to support regional conservation initiatives. DU Mississippi combines the output of two models, one for "restoration suitability"[63] and the other for wildlife habitat, to visualize "swaths"[64] of restoration priority areas across the landscape, while TNC VARTF develops a portfolio of priority aquatic ecological systems based on its conservation action planning process, which includes assessment of current conditions, representativeness goals, and connectivity goals. Among these latter landscape-scale approaches, the CPFs are unclear what approaches are next applied to select individual sites.

- **Prioritizing stream mitigation:** Five CPFs (NCEEP, DU Vermont, Oregon DSL, TNC VARTF and LTMCP Mississippi) undertake prioritization for stream mitigation. NCEEP explicitly mentions prioritization for stream mitigation as part of the prioritization strategy included in its watershed planning effort and TNC VARTF includes stream aquatic systems in its lists of Ecoregional Conservation Priority Areas. The other three CPFs (DU Vermont, Oregon DSL, and LTMCP Mississippi) state that stream mitigation is a goal, but these CPFs are less explicit about the incorporation of stream compensation sites in their prioritization strategies. A list of selection criteria for aquatic resources that is used by all three of these instruments and is drawn from a common template for each presumably includes stream mitigation across all three of these CPFs.
- Three of the six CPFs (DU Mississippi, Oregon DSL, and TNC VARTF) apply their prioritization strategy in addition to describing it, identifying key areas within their service areas in which to focus mitigation activities. In select HUC-14s with completed LWPs, NCEEP provides project atlases describing the potential wetland or stream compensatory mitigation opportunities at particular sites.

Element VII: An explanation of how any preservation objectives identified in paragraph (c)(2)(v) of this section and addressed in the prioritization strategy in paragraph (c)(2)(vi) satisfy the criteria for use of preservation in section 332.3(h).

- Two programs that do not indicate plans to utilize preservation in element five, (NCEEP and LTMCP Mississippi) nonetheless restate the criteria for use of preservation from §332.3(h) and note their intention to apply these criteria to site selection for compensatory mitigation sites. In the past, NCEEP has linked identified compensatory mitigation opportunities for preservation to specific watershed- or subwatershed-level objectives in the RBRPs or LWPs that it provides on its website.
- Two instruments (DU Mississippi and TNC VARTF) do appear to state specific preservation objectives for element five but do not address how the §332.3(h) criteria are satisfied by these specific objectives. DU Mississippi states specific objectives that apply to preservation but does not relate these objectives to §332.3(h) criteria. TNC VARTF argues that their approach to setting ecoregional goals aligns with two criteria listed in §332.3(h) of the rule but does not relate the §332.3(h) criteria to the specific objectives discussed for each of its service areas.

[63] Ducks Unlimited, Inc. "Mississippi Delta In-Lieu Fee Program Instrument." October 4, 2010.
[64] Ibid.

- Oregon DSL notes particular circumstances when preservation may be used to generate credits in its instrument, noting, for example, that preservation may be used when it supports significant populations of rare flora or fauna. Oregon DSL does not address the §332.3(h) criteria for preservation.
- DU Vermont discusses a wide range of preservation objectives in addressing element seven, stating for instance that "preservation actions will be targeted at the habitat level which will correspond with the goals for managing Vermont's Species of Greatest Conservation Need (Vermont Wildlife Action Plan; Vermont DEC 2005) and reducing current habitat problems."[65] Preservation objectives are also discussed when the instrument details criteria for locating preservation sites (e.g., address limiting factors in a watershed, support state wildlife actions plans, reduce fragmentation, etc.) and describes how DU's conservation principles relate to preservation. In addition to listing these objectives, DU Vermont also lists the §332.3(h) preservation criteria, though it does not explain how these criteria are satisfied by the program's preservation objectives.

Element VIII: 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.

- Four instruments (DU Vermont, NCEEP, TNC VARTF and LTMCP Mississippi) list groups that their programs collaborate with and discuss the purpose of collaboration (e.g., to "identify stream and wetland mitigation opportunities"[66]).

Element IX: A description of the long-term protection and management strategies for activities conducted by the in-lieu fee program sponsor.

- Four of the six instruments (LTMCP Mississippi, DU Mississippi, DU Vermont, and Oregon DSL) provide discussions of long-term management that use common language. They state requirements for transfer to a long-term steward, discuss what will be included in long-term management plans (e.g., anticipated needs, costs, funding mechanisms) and state Corps responsibilities at the end of the contract period.
- NCEEP's instrument discusses transferability between stewards, in addition to naming a specific long-term steward to be used and providing details about that steward's long-term management responsibilities.
- TNC VARTF's instrument states requirements for modifying long-term management plans, minimum provisions for these plans (e.g., periodic patrols, monitoring site structural condition), and reporting requirements for the long-term steward.
- Five of the six instruments (LTMCP Mississippi, DU Mississippi, DU Vermont, Oregon DSL, and TNC VARTF) discuss protection mechanisms, discussing how real estate instruments will be applied for long-term protection. Two instruments (Oregon DSL and DU Mississippi) also discuss who can hold easements and what the easements will ensure. LTMCP Mississippi includes a discussion of monitoring responsibilities and describes the contents of monitoring reports.

[65] Ducks Unlimited. "Vermont In-lieu Fee Program." December 7, 2010.
[66] Ibid.

Element X: A strategy for periodic evaluation and reporting on the progress of the program in achieving the goals and objectives in (c)(2)(v) of this section, including a process for revising the planning framework as necessary.

- **Periodic evaluation and reporting on progress in achieving goals and objectives:** Three CPFs (NCEEP, TNC VARTF, and DU Vermont) discuss strategies that will be used for tracking progress in terms of achieving goals and objectives. Of these, the strategies described by NCEEP and TNC VARTF most thoroughly address this requirement by assessing achievement of goals at multiple scales. NCEEP mentions that it tracks progress toward meeting watershed goals and individual project goals and TNC VARTF describes the measures it applies to measure the conservation status of ecoregions and priority conservation areas in addition to its efforts to measure the effectiveness of individual projects that address specific conservation targets.[67] DU Vermont mentions that it uses individual project reports to track achievement of goals. This first part of element ten is not addressed for two instruments (Oregon DSL and DU Mississippi). It is incompletely addressed for one instrument (LTMCP Mississippi), which states the frequency with which reports "on the progress of program implementation"[68] will be produced, but does not relate these progress reports to its goals and objectives.
- **Process for revising the CPF:** This second part of element ten is only addressed for LTMCP Mississippi. However, this CPF does not discuss how achievement of goals and objectives is connected with CPF revision.

Element XI: Any other information deemed necessary for effective compensation planning by the district engineer.

- Only DU Vermont included an element eleven. However, it was used as a conclusion ("Element XI: Conclusion"), briefly restating the mission of Ducks Unlimited and reviewing how DU Vermont will operate their ILF.

[67] Conservation targets include TNC VARTF's §332.8(c)(2)(v) goals and objectives.
[68] Land Trust for the Mississippi Coastal Plain. "The Coastal Mississippi In-Lieu Fee Program." January 2010.