Atlantic Salmon Restoration and Conservation Program

©Kelsey Taylor, Atlantic Salmon Federation

In-Lieu Fee Instrument

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ATLANTIC SALMON RESTORATION AND CONSERVATION PROGRAM IN-LIEU FEE INSTRUMENT

This In-Lieu Fee Program Instrument ("Instrument") for the Atlantic Salmon Restoration and Conservation In-Lieu Fee Program ("ASRCP" or "Program") is established by the United States Army Corps of Engineers ("USACE") and the United States Fish and Wildlife Service ("USFWS"), in agreement with the Maine Department of Marine Resources ("MDMR"), as the Program Sponsor ("Sponsor"), regarding the establishment, use, operation, and maintenance of the Program.

RECITALS:

1. Mitigating adverse impacts to aquatic resources, including estuarine, marine, and fresh water resources, is an integral part of the Clean Water Act ("CWA") and the Rivers and Harbors Act ("RHA"). In general, mitigation is a sequential process of avoiding adverse impacts to resources, minimizing impacts that cannot practicably be avoided, and then compensating for those impacts that cannot be further minimized. Governmental agencies administering resource protection regulations may require appropriate and practicable Compensatory Mitigation as a condition of their permit approvals and authorizations.

2. There are various alternatives available to satisfy Compensatory Mitigation requirements, including mitigation banks, in-lieu fee programs, and permittee-responsible mitigation projects. An in-lieu fee ("ILF") program is a program involving the restoration, establishment, enhancement, and/or preservation of resources through funds paid to the sponsor to satisfy Compensatory Mitigation requirements of permitting agencies.

3. The USACE generally requires mitigation to offset unavoidable adverse impacts under Section 404 of the CWA and Section 10 of the ACT. The USACE and the USEPA have issued regulations, known as the 2008 Final Rule on Compensatory Mitigation for Losses of Aquatic Resources (33 CFR Parts 325 and 332; 40 CFR Part 230)("2008 Compensatory Mitigation Rule"). The 2008 Compensatory Mitigation Rule sets forth (among other things) requirements governing the establishment, use, operation and maintenance of in-lieu fee programs as a means of providing Compensatory Mitigation for unavoidable adverse impacts to wetlands, streams and other aquatic resources authorized by Section 404 of the CWA and Section 10 of the RHA.

4. The United States Fish and Wildlife Service ("USFWS") promotes the conservation of species under its jurisdiction and the habitats upon which they depend under the Endangered Species Act ("ESA"). Other federal agencies share in that responsibility as outlined in the ESA. As relevant here, federal agencies are required, to: 1) "utilize their authorities . . . by carrying out programs for the conservation of endangered species" in consultation with the Secretary of the Interior. *16 U.S.C. § 1536(a)(1)*; and 2) in "consultation" with USFWS, to "insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species" or to "result in the destruction or adverse modification of habitat of such species" that has been designated as "critical." *16 U.S.C. § 1536(a)(2)*. When an agency determines

that its action may affect a listed species or critical habitat, the action agency must engage in formal consultation with the USFWS. That process culminates with USFWS issuing a biological opinion ("BiOp") which among other things, identifies and exempts the manner and extent of incidental take, determines if the action will jeopardize the species' existence or adversely modify critical habitat, and if not, sets out reasonable and prudent measures for the action agency to implement. *16 U.S.C. § 1536(b)*; 50 C.F.R. *§ 402.14*.

5. On January 23, 2017, the USFWS issued a programmatic BiOp to the Federal Highway Administration (FHWA) and the USACE.
6. This Instrument sets forth the manner in which the Atlantic Salmon Restoration and Conservation In-Lieu Fee Program will serve to satisfy requirements set forth in the USACE 2008 Compensatory Mitigation Rule and/or the ESA.
7. The Instrument, pursuant to *16 U.S.C. § 1536(a)(1)* is also intended to serve as a mitigation component of the FHWA and USACE's program to conserve Atlantic salmon, and is consistent with program description and terms of the January 23, 2017, BiOp.

AGREEMENT:

NOW, THEREFORE, in consideration of the foregoing Recitals, the Parties hereby agree as follows:

I. Purpose, Background, Objectives and Authorities

A. Introduction

A variety of permitted activities, including road and bridge maintenance and construction, have the potential to impact aquatic resources used by the Gulf of Maine Distinct Population Segment ("DPS") of Atlantic salmon (referenced as "In-Stream Impacts" in this Instrument). Mitigation for such In-Stream Impacts may be required. The Maine Atlantic Salmon Restoration and Conservation Program provides permit applicants and other project proponents with an option for Compensatory Mitigation for such In-Stream Impacts after proper mitigation sequencing. This Instrument establishes the guidelines, responsibilities, and standards for the administration of the Program, and establishes the MDMR as the Sponsor of the Program.

B. Purpose

The Program has been created as a means for permit applicants and other project proponents to meet USACE requirements for Compensatory Mitigation to offset In-Stream Impacts for projects permitted under Section 404 of the CWA and Section 10 of the RHA, with a focus on providing recovery and conservation measures for Atlantic salmon in accordance with Section 7(a)(1) of the ESA. The Program may be used for In-Stream Impacts for projects permitted by the USACE under the CWA and RHA, consistent with the BiOp where USFWS and NMFS do not require mitigation.

C. Background

The Gulf of Maine DPS of Atlantic salmon was listed as endangered on November 17, 2000, and expanded on June 19, 2009 to encompass all anadromous Atlantic salmon in a freshwater range covering the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River. The DPS includes all associated conservation hatchery populations used to supplement natural populations. At the time of listing, there were at least eight rivers in the geographic range of the DPS known to still support wild Atlantic salmon populations (Dennys, East Machias, Machias, Pleasant, Narraguagus, Penobscot, Ducktrap and Sheepscot rivers), though populations continue to show a declining trend. The DPS range includes 87 watersheds within the State of Maine. Of these, 45 have been designated as critical habitat. Of the remaining 42 watersheds, many include biologically suitable habitat for Atlantic salmon, though many of these areas are currently unoccupied or inaccessible. In 2014, total adult returns to the eight rivers still supporting wild Atlantic salmon populations within the DPS were estimated to be less than 500 individuals, with approximately 375 of those returning to the Penobscot River watershed (NOAA 2015). The Program Area for the ASRCP encompasses the expanded DPS and is set forth on Exhibit A to this Instrument.

The Atlantic salmon is an anadromous fish, typically spending 2-3 years in freshwater, migrating to the ocean where it also spends 2-3 years, and returning to its natal river to spawn. Suitable spawning habitat consists of coarse substrate (gravel or rubble) in areas of moving water. Eggs incubate slowly due to cold winter water temperatures, hatch in March or April and become fry. Fry remain buried in the gravel for about six weeks. The fry emerge from the gravel about mid-May and start feeding on plankton and small invertebrates. Emergent fry quickly disperse from the redd, a depression in the gravel substrate where eggs are deposited. Maturing from fry, juveniles then develop parr marks along their sides and enter the parr stage. Parr habitat (often called "nursery habitat") is typically riffle areas characterized by adequate cover (gravel and rubble up to 20 cm), moderate water depth (10-60 cm) and moderate to fast water flow (30-90 cm/sec) (NMFS-USFWS 2005).

Salmon parr spend two to three years in the freshwater environment then undergo a physiological transformation called smoltification that prepares them for life in a marine habitat. Atlantic salmon leave Maine rivers in the spring and reach Newfoundland and Labrador by mid-summer. They spend their first winter at sea in the area of the Labrador Sea south of Greenland. After the first winter at sea, a small percentage returns to Maine while the majority spend a second year at sea, feeding off the southwest or (to a much lesser extent) southeast coast of Greenland. Some Maine salmon are also found in waters along the Labrador coast. After a second winter in the Labrador Sea, most Maine salmon return to rivers in Maine, with a small number returning the following year as three sea winter (3SW) fish (NMFS-USFWS 2005).

The habitat within the range of the DPS is generally characterized as being free-flowing, medium gradient, cool in-water temperature and suitable for spawning in gravel substrate areas. Most is known about the watershed structure, available Atlantic salmon habitat, and abundance of Atlantic salmon stocks at various life stages for the seven largest salmon rivers with remnant Atlantic salmon populations. There is less known about the habitat of smaller rivers within the historic range of the DPS.

Among the numerous factors that led to the endangered designation for the Gulf of Maine DPS of Atlantic salmon were the following:

- Critically low adult returns make the DPS especially vulnerable and susceptible to threats
- Continued low marine survival rates for U.S. stocks of Atlantic salmon
- Excessive or unregulated water withdrawal
- Loss of aquatic connectivity due to dams and poorly designed culverts
- Multiple factors that are likely affecting the quality of freshwater habitat in the DPS
- Continuation of the commercial fishery in Greenland
- The threat of disease to the DPS from Infectious Salmon Anemia (ISA) and Salmon Swimbladder Sarcoma (SSS)
- Increased likelihood of predation because of low numbers of returning adults and increases in some predators
- Existing aquaculture practices, including the use of European Atlantic salmon, pose ecological and genetic risks

D. Need for Program

Mitigation is required to offset an adversely affected resource function with a function of equal or greater value. The goals of mitigation are to achieve no net loss of the resource and to offset the loss of aquatic resource functions lost through permitting to the extent appropriate and practicable. Studies of compensatory wetland mitigation across the country generally demonstrate that less than 50 percent of mitigation sites are successful in achieving their performance standards and intended goals (National Research Council 2001). Furthermore, they fail to effectively replace lost or damaged resources, habitats, and functions (National Research Council 2001). These studies identify several common flaws, including inappropriate site selection, project design without a landscape or watershed context, poor planning and implementation of projects, lack of oversight, maintenance, and follow-through, and insufficient long-term management and monitoring.

In-lieu fee programs consolidate Compensatory Mitigation projects and resources to target more ecologically significant functions and prioritize efforts on a landscape or watershed scale. ILF programs consistently include scientific analysis, planning, implementation, and monitoring for each project and the structure of an ILF program generally facilitates improved site selection and mitigation plan development, and provides scientific expertise and financial assurances that translate into a reduction in uncertainty for project success. Although in-lieu fee programs initially served as a way to mitigate wetland impacts, the principles also apply to aquatic species and In-Stream Impacts.

E. Objectives

Objectives of the ASRCP include, but are not limited to, providing Compensatory Mitigation to offset In-Stream Impacts to aquatic resources in the State of Maine, with a focus on restoring and conserving federally-listed Atlantic salmon and Atlantic salmon habitat. The specific goals and objectives of the ASRCP are as follows:

a. Provide an alternative to permittee-responsible Compensatory Mitigation that will mitigate for unavoidable In-Stream Impacts regulated under CWA Section 404 and RHA Section 10 while also aiding in the success of recovery efforts for the Gulf of Maine DPS Atlantic salmon population, protected under the ESA, and/or restore Atlantic salmon habitat functions and services lost through permitted impacts;

b. Substantially increase the extent and quality of restoration, enhancement, creation, and preservation of protected Atlantic salmon natural resources over that typically achieved by permittee-responsible mitigation for activities that impact Atlantic salmon and their habitat;

c. Reduce the extent of cumulative adverse impacts to aquatic resources that are considered protected Atlantic salmon habitat under the ESA;

d. Provide permit applicants and other project proponents greater flexibility in compensating for adverse impacts to Atlantic salmon; and

e. Achieve ecological success on a regional basis by directing ILF funds to projects that benefit federally protected Atlantic salmon and their habitat that are appropriate to the geographic service area, and by integrating ILF projects with other conservation activities whenever possible.

F. Authorities

This Instrument is entered into under the authorities of the CWA, RHA and ESA. USACE has permitting authority for In-Stream Impacts under Section 404 of the CWA and Section 10 of the RHA Act Through this program the Corps is exercising its Section 7(a)(1) planning responsibilities to contribute to the recovery of the listed species. The FHWA, USACE, MTA, and MaineDOT proposed the use of this Instrument in describing the transportation program covered by USFWS's January 23, 2017, BiOp but use of this program is not limited to projects covered by the BiOp.

The Program is authorized under and shall be operated in accordance with the 2008 Compensatory Mitigation Rule and following the principles of the BiOp, with funds generated from the ASRCP being used solely to preserve, create, enhance, and/or restore in-stream Atlantic salmon habitat and to preserve riparian buffers.

II. Definitions

Capitalized terms used in this Instrument and in the Exhibits are defined, for purposes of his Program, as set forth below.

1. "2008 Compensatory Mitigation Rule" has the meaning set forth in Recital 3.

2. "Administrative Fee" has the meaning set forth in Section IV.G.4.

3. "Advance Credits" means Credits of the Program that are available for Transfer by the Sponsor prior to being Fulfilled in accordance with an approved Mitigation Plan. The number of Advance Credits which may be granted to the Sponsor under the Program is set forth in Exhibit C to this Instrument.

4. "Approval Committee" or "AC" is term for the Interagency Review Team.

5. "ASRCP" or "Program" means the Maine Atlantic Salmon Restoration and Conservation Program.

6. "CFR" means Code of Federal Regulations.

7. "Compensatory Mitigation" means the restoration, reestablishment, rehabilitation, establishment, enhancement or preservation of aquatic resources for the purposes of offsetting unavoidable impacts that remain after applying all appropriate and practicable avoidance and minimization measures.

8. "Compensation Planning Framework" includes information on the Service Areas; analysis of threats, historic losses, and current conditions of the resources; the goals and objectives; a procedure used to select, secure, and implement ILF Mitigation Projects including a prioritization strategy; a description of stakeholder involvement; and a description of preservation requirements. The Compensation Planning Framework for the ASRCP is attached as Exhibit F to this Instrument.

9. "Clean Water Act" or "CWA" means the Clean Water Act, 33 U.S.C. §§1251 *et seq.*

10. "Closure" means the process of closing the Program in accordance with Section IV.F.5.

11. "Credit" means the functional or area measure or other suitable metric used under the Program to represent the accrual or attainment of aquatic functions at a Compensatory Mitigation site, based on the resources restored, established, enhanced or preserved. Credits are developed under the Program through the approval and implementation of ILF Mitigation Projects.

12. "Credit Release" means an action by the IRT to make specified Credits available for Transfer pursuant to this Instrument.

13. "Credit Release Schedule" means the schedule set forth in a Mitigation Plan for releasing Credits developed from the implementation of the ILF Mitigation Project.

14. "Default" means a failure by the Sponsor to provide required Compensatory Mitigation in accordance with the terms of this Instrument.

15. "Division" has the meaning set forth in Section IV.D.1.

16. "DPS" has the meaning set forth in Section I.A.

17. "Effective Date" has the meaning set forth in Section IV.C.

18. "Endangered Species Act" or "ESA" means the Endangered Species Act of 1973, 16 U.S.C. §§1531 et seq.

19. "Fulfill" or "Fulfillment" means the Sponsor's matching of a Released Credit with an Advance Credit, as notified in writing to the IRT, which results in the fulfillment of the Sponsor's obligation and liability to provide Compensatory Mitigation with respect to each Advance Credit under this Instrument.

20. "Fulfilled Credit" means an Advance Credit for which the obligation to provide Compensatory Mitigation has been achieved through the pairing of it with a Released Credit from an ILF Mitigation Project.

21. "GAAP" has the meaning set forth in Section IV.F.2.

22. "GIS" means Geographic Information Systems.

23. "GOM" means Gulf of Maine.

24. "HUC" means Hydrologic Unit Code.

25. "ILF Mitigation Project" means a Compensatory Mitigation project submitted to the Program, including the real property where such project will be constructed, monitored, maintained, managed, and permanently protected.

26. "ILF" has the meaning set forth in Recital 2.

27. "In-Stream Impacts" has the meaning set forth in Section I.A.

28. "Interagency Review Team" or "IRT" means the interagency group of federal, state, and/or local regulatory and resource agency representatives that reviews documentation for, provides oversight over, and approves matters related to the establishment, operation, and management of the Program, consisting, at a minimum, of USACE, USFWS, NMFS and USEPA. In this document, the Interagency Review Team is hereinafter called the "Approval Committee" or "AC".

29. "IRT Co-Chairs" has the meaning set forth in Section IV.E.

30. "MDEP" means the Maine Department of Environmental Protection.

31. "MDIFW" means the Maine Department of Inland Fisheries and Wildlife.

32. "MDMR" means the Maine Department of Marine Resources, the Sponsor of the Program.

33. "MDOT" means the Maine Department of Transportation.

34. "Mitigation Plan" means the document for each ILF Mitigation Project as required by the 2008 Compensatory Mitigation Rule.

35. "NMFS" has the meaning set forth in the introductory paragraph.

36. "NOAA" means the National Oceanic and Atmospheric Administration.

37. "Parties" means the parties to this Instrument, consisting of USACE and USFWS with MDMR as the Sponsor.

38. "Permitting Agency" means a regulatory or resource agency with authority and responsibility for issuing or approving permits or other authorizations for projects that have In-Stream Impacts for which Compensatory Mitigation may be provided by the Program. USACE is usually the Permitting Agency under this Instrument but other federal agencies authorizing work that adversely impacts Atlantic salmon habitat could also use the program after consultation with the USFWS.

39. "Program Account" has the meaning set forth in Section IV.G.4.

40. "Program Administrator" has the meaning set forth in Section IV.D.2.

41. "Program Area" means the geographic limits of the Program, as set forth on Exhibit A.

42. "Released Credits" means Credits that have been produced by the Sponsor's actual implementation of a specific ILF Mitigation Project, and have been authorized for Transfer by the AC Co-Chairs, after consultation with the AC, in accordance with the applicable Credit Release Schedule.

43. "Review Committee" has the meaning set forth in Section V.A.

44. "Rivers and Harbors Act" or "RHA" means the Rivers and Harbors Act of 1899, 33 U.S.C. §§401 *et seq*.

45. "RIBITS" means the Regulatory In-lieu Fee and Bank Information Tracking System.

46. "Service Areas" means the Service Areas established for the Program, as set forth on Exhibit B.

47. "SHRU" has the meaning set forth in Section IV.F.1.

48. "Sponsor" has the meaning set forth in the introductory paragraph.

49. "Sub-Account" has the meaning set forth in Section IV.F.2.

50. "Transfer" means the use, sale, or conveyance of Credits by the Sponsor; "Transferred" has a corresponding meaning.

51. "USACE" has the meaning set forth in the introductory paragraph.

52. "USEPA" has the meaning set forth in the introductory paragraph.

53. "USFWS" has the meaning set forth in the introductory paragraph.

III. Stipulations

A. Disclaimer

This Instrument is not intended to limit the authority of any Party to fulfill its statutory or regulatory responsibilities or to otherwise limit the powers afforded to any Party by applicable law.

B. Exhibits

The following Exhibits are attached to and incorporated by this reference into this Instrument:

Exhibit A: Program Area
Exhibit B: Service Areas
Exhibit C: Debit and Credit Information and Procedure
Exhibit D: Program Account and Fee Schedule
Exhibit E: Ledgers
Exhibit F: Compensation Planning Framework
Exhibit G: Addresses for Notice
Exhibit H: Approved ILF Mitigation Projects [*To be completed as ILF Mitigation Projects are approved*]

IV. Program Establishment, Operation and Required Elements

A. Overview

The Program provides an option to permit applicants/project proponents and Permitting Agencies to provide mitigation for unavoidable In-Stream Impacts to Atlantic salmon and their habitat. Under the Program, the preferred option for public and private environmental permit applicants is to purchase Credits instead of performing permittee-responsible mitigation for unavoidable impacts. The cost of each Credit is based on "full cost accounting," meaning that permittees/project proponents will pay the costs to fully and successfully compensate for permitted impacts. Proof of payment to the Sponsor is required before permitted impacts can occur.

Credit sale proceeds will be used to implement ILF Mitigation Projects at prioritized locations that provide environmental improvement within the Service Area where the impacts occur. ILF Mitigation Projects will be selected based on an analysis of their ability to compensate for impacts and provide significant and broad ecological benefits.

Current federal, state, and local regulatory requirements to select the least damaging practicable alternatives to avoid and minimize impacts before allowing compensation remain unchanged. ILF Mitigation Projects will be designed and constructed to ensure success and managed in perpetuity to support ecological functions. Every dollar deposited into the Program Account will be tracked by listing each deposit in the Annual Report. The performance of the Program will be monitored and reported. Any deficiencies will be corrected or adaptively managed.

B. Framework and Program Scope

The Program Area for the ASRCP encompasses the expanded DPS of Atlantic salmon and is depicted on Exhibit A to this Instrument. This Instrument establishes three (3) geographic Service Areas that are described in Section IV.F.1 and depicted in Exhibit B, and described in detail in Element 1 of the Compensation Planning Framework set forth in Exhibit F.

This Instrument establishes one (1) Credit type, to effectively compensate for permitted In-Stream Impacts, and the framework for an implementation process for the sale of Credits; receipt and accounting of funds from Credit sales within each Service Area; and a decision-making process for the deployment of such funds for ILF Mitigation Projects involving project identification, prioritization, development, selection, and execution.

C. Effective Date

The Program is effective ("Effective Date") as of the latest Party signature in Section VII, Execution. The Sponsor may establish the Program Account and begin Advance Credit sales only after all Parties sign the Instrument.

D. Technical Feasibility

1. Sponsor Qualifications and Responsibilities

The MDMR serves as the Sponsor for the Program. MDMR was established to conserve and develop marine and estuarine resources; to conduct and sponsor scientific research; to promote and develop the Maine coastal fishing industries; to advise and cooperate with local, state, and federal officials concerning activities in coastal waters; and to implement, administer, and enforce the laws and regulations necessary for these purposes (Maine Title 12, Chapter 603 §6021).

MDMR oversees the Division of Sea-Run Fisheries and Habitat ("Division"). Its mission is to protect, conserve, restore, manage and enhance diadromous fish populations and their habitat in all waters of the State; to secure a sustainable recreational fishery for diadromous species; and to conduct and coordinate projects involving research, planning, management, restoration or propagation of diadromous fishes. Atlantic salmon are a species of management concern for the Division.

The Division leads or participates in numerous efforts and projects related to Atlantic salmon, including streamside and instream incubation, thermal habitat and water quality monitoring in Atlantic salmon rivers, parr studies, and participation in the Atlantic Salmon Recovery Framework. The Framework is a partnership among state, tribal, and federal resource agencies working together to identify and implement management actions with the greatest potential to further the recovery of Atlantic salmon. Other participating entities include NMFS, USFWS and the Penobscot Indian Nation.

The Sponsor has full responsibility for ensuring the success of ILF Mitigation Projects and the Program in accordance with this Instrument, the 2008 Compensatory Mitigation Rule and the project description in the January 23, 2017, BiOp issued by USFWS to the FHWA and USACE. The Sponsor is responsible for the fulfillment of the following roles required of a program sponsor in 33 CFR §332.8:

- Prioritize, identify, and select ILF Mitigation Projects;
- Acquire sites for ILF Mitigation Projects;*
- Attain AC approval for Mitigation Plans and expenditures from the Program Account;
- Design, obtain any relevant permits for, and oversee construction of ILF Mitigation Projects;*
- Monitor, maintain, and manage ILF Mitigation Projects;*
- Ensure the success of Compensatory Mitigation for which Credits have been sold;
- Hold and manage funds collected by the Program;
- Maintain accounting and Credit ledgers, tracking all fees collected and expenditures;
- Maintain sufficient funds for the long-term management of ILF Mitigation Projects; and
- Report annually on the progress and status of the Program, including financial accounting reports, Credit transaction reports, ILF Mitigation Project monitoring and progress toward success, status of long term management endowment account, amount of mitigation provided for authorized impacts/Credits sold, and any changes in land ownership or transfers of long term management responsibilities.

If the Sponsor grants funds to third-party recipients to complete ILF Mitigation Projects, the obligations marked with asterisks ordinarily will be performed by the recipients and the Sponsor will be responsible for ensuring the recipients properly fulfill these obligations. The Sponsor will be required to seek approval from and provide notice to the Parties before contracting out any of its responsibilities under the program.

2. Program Administrator Responsibilities

The MDMR as Sponsor may, but is not required to, enter a contractual relationship with a third party program administrator ("Program Administrator") to allocate to the Program Administrator certain responsibilities required of the Sponsor, including:

- Hold and manage funds collected by the Program;
- Maintain accounting and Credit ledgers, tracking all fees collected and expenditures;
- Attain AC approval for Mitigation Plans and expenditures from the Program Account; and
- Report annually on the progress and status of the Program, including financial accounting reports, Credit transaction reports, ILF Mitigation Project monitoring and progress toward success, status of long term management endowment account, amount of mitigation provided for authorized impacts/Credits sold, and any changes in land ownership or transfers of long term management responsibilities.

If these responsibilities are not allocated contractually to a third party Program Administrator, they are responsibilities of MDMR as the Sponsor.

E. Approval Committee

The Approval Committee (AC) is comprised of representatives of USFWS, NMFS, and the USACE, at a minimum. Other members may include representatives of the Penobscot Nation and Maine Department of Environmental Protection, for example. The AC co-chairs are the USACE Regulatory Division Chief and the USFWS Complex Manager ("AC Co-Chairs"). The AC Co-Chairs determine the AC membership. The Program Sponsor shall provide administrative support for the AC and shall be responsible for all retention of records of AC proceedings. The primary role of the AC is to assist the AC Co-Chairs in the final approval of ILF Mitigation Project selection.

The AC shall meet as necessary at such times and places as determined by the AC Co-Chairs. The AC shall determine its own rules and order of business and shall provide for keeping a record of its proceedings. This record of the AC meetings shall be maintained at the offices of the Sponsor and shall be made available to the public upon request consistent with applicable laws governing record releases and withholdings.

All decisions by the AC Co-Chairs, assisted by the AC, to grant approval to a proposed ILF Mitigation Project, including but not limited to the number of Credits awarded to the ILF Mitigation Project, shall be documented in writing and signed by the AC Co-Chairs presiding at the meeting approving the ILF Mitigation Project. The written decision to accept an ILF Mitigation Project proposal constitutes approval for the expenditure of funds on that ILF Mitigation Project by the Program Sponsor.

Should a vote by the AC result in tie:

1. Regardless of the nature of the vote, if the USFWS and USACE Co-Chairs agree on the outcome, that shall be the decision.
2. If the vote is on whether to fund a project, and the USFWS and USACE Co-Charis disagree on the outcome, the project will not be funded.
3. If the vote concerns something other than project funding, and the USFWS and USACE Co-Chairs disagree on the outcome, the AC will further discuss. If the tie cannot be resolved, the AC Co-Chairs will meet separately to discuss and come to a resolution.

F. Elements Required by 33 C.F.R. §332.8(d)(6)(ii)

1. Geographic Service Areas

This Instrument establishes three (3) geographic Service Areas that correspond to the three (3) Salmon Habitat Recovery Units ("SHRUs") within the Gulf of Maine DPS designated by the USFWS and NMFS. The three SHRUs are further depicted in Exhibit B, and described in detail in Element 1 of the Compensation Planning Framework set forth in Exhibit F.

2. Accounting Procedures

Upon establishment of the Program, the Sponsor will establish a dedicated Program Account and at least one sub-account ("Sub-Account") for each Service Area in accordance with the 2008 Compensatory Mitigation Rule and Exhibit D. All funds generated by Credit sales will be deposited into the Program Account and tracked comprehensively in the Sponsor's accounting systems and allocated to the appropriate Service Area.

These systems shall be established so that the Sponsor at all times can ascertain (a) the balance of any Service Area Sub-Account; (b) deposits into the Service Area Sub-Account during any period; (3) disbursements from the Service Area Sub-Account during any period; and (d) investment earnings accrued to the Service Area Sub-Account.

The Sponsor shall apply generally accepted accounting principles ("GAAP") to the Program Account. The Sponsor's conformance with GAAP shall be audited on an ongoing basis as part of the Sponsor's annual independent financial audit.

3. Sponsor Assumption of Legal Responsibility

Under the Program, the responsibility to provide Compensatory Mitigation remains with a permittee/project proponent unless and until the appropriate number of Credits are purchased by such permittee/project proponent from the Program through a Credit Transfer. Once a permittee/project proponent purchases Credits from the Program through a Credit Transfer, the legal responsibility for providing Compensatory Mitigation with respect to those Credits in accordance with this Instrument transfers to the Sponsor.

a. The transfer of legal responsibility for Compensatory Mitigation from a permittee/project proponent to the Sponsor hereunder is established when all of the following have occurred:

   i. This Instrument has been executed by the Parties.

   ii. Written authorization from the applicable Permitting Agency that the permittee/project proponent is eligible to fulfill its Compensatory Mitigation obligation through purchase of Credits from the Program is received by the Sponsor, along with written indication of the specific number of Credits the permittee/project proponent must purchase for those purposes.

   iii. Payment for the Credits by the permittee/project proponent is tendered and the Sponsor delivers to the AC and the permittee an executed transaction receipt that indicates the number of Credits sold and fees paid and the date of the payment.

b. The satisfaction of Sponsor's legal responsibility for providing the required Compensatory Mitigation is established through the generation of Released Credits in an amount equal to or greater than the number of Transferred Advance Credits, thereby Fulfilling its obligations as set forth in this Instrument.

c. The Sponsor will retain responsibility for required Compensatory Mitigation for which Credits are sold from the Program until one of the following has occurred:

   i. The Advance Credits associated with the Compensatory Mitigation have been Fulfilled through application of Released Credits, and any long-term management obligations of the ILF Mitigation Project associated with applied Released Credits have been transferred to an AC-approved entity;

ii. The Compensatory Mitigation obligation has been transferred to an AC-approved third party (i.e., purchase of credits from a mitigation bank); or

iii. Closure of the Program occurs in accordance with this Instrument.

d. Notwithstanding any other provision of this Instrument, to the maximum extent permitted by law, the Sponsor's maximum financial obligation and liability for the Program, including providing Compensatory Mitigation thereunder, is at all times limited to the funds in the Program Account.

4. Default Provisions

a. Determination of Default. The AC may make a determination of Default by the Sponsor only after (i) written notice of the potential Default has been provided by one of the AC Co-Chairs to the Sponsor and all AC members; (ii) the Sponsor has been afforded a period of not less than ninety (90) days to remedy (or, if not capable of being remedied within ninety (90) days, then to begin remedying) the circumstances forming the basis for the potential Default; and (iii) the Sponsor and the AC have engaged in a good faith effort to resolve the issues forming the basis for the potential Default through reasonable means, including but not limited to meeting and conferring in good faith to determine the appropriate action(s) that could be taken by the Sponsor to remedy the applicable deficiencies, performance failures, or other issues. Any determination by the IRT that a Default has occurred must be communicated immediately to the Sponsor and to all IRT members.

b. Remedies for Default. If after meeting and conferring as required under Section IV.F.4.a, the potential Default cannot be remedied, the IRT may make a determination of Default as provided in Section IV.F.4.a. Thereafter, the IRT and the Program Sponsor shall agree upon a remedial action that is mutually acceptable to the Sponsor and the IRT and/or the Sponsor shall complete Closure of the Program in accordance with Section IV.F.5.

5. Closure Provisions

a. Closure may occur at the election of either the Sponsor or the AC after ninety (90) days' advance written notice to the other Parties.

b. Closure is effected when the notice required by Section IV.F.5.a has been provided and the Sponsor has fulfilled its legal responsibility to provide any remaining required Compensatory Mitigation for which Advance Credits have been Transferred, including all associated monitoring and reporting requirements, through one or more of the following options:

i. If no ILF Mitigation Projects are in development at the time the written notice of Closure is transmitted, through the transfer of all funds then existing in the Program Account to the closest mitigation bank or other entity acceptable to the AC. Under this option, final Closure will be deemed to have occurred on the date of transfer of such funds by the Sponsor.

ii. If one or more ILF Mitigation Projects are in development at the time the written notice of Closure is transmitted, through completion of those ILF Mitigation Projects to the extent achievable with funds on deposit in the Program Account, and subsequent transfer of all funds then remaining in the Program Account to the closest mitigation bank or other entity acceptable to the AC. Under this option, final Closure will be deemed to have occurred on the later of (x) the date of transfer of such funds by the Sponsor and (y) the date the last ILF Mitigation Project is completed (to the extent achievable with funds on deposit in the Program Account).

iii. If one or more ILF Mitigation Projects are in development at the time the written notice of Closure is transmitted, through transfer of the ILF Mitigation Project development agreements and all related rights and responsibilities pertaining to those ILF Mitigation Projects (including but not limited to the budgeted funds for such ILF Mitigation Project existing in the Program Account), to another entity or entities acceptable to the AC and subsequent transfer of all funds then remaining in the Program Account to the closest mitigation bank or other entity acceptable to the AC. Under this option, final Closure will be deemed to have occurred on the later of (x) the date of transfer of such funds by the Sponsor and (y) the date the development agreements and all related rights and responsibilities of the last ILF Mitigation Project are transferred to a third party acceptable to the AC.

6. Withdrawal

An AC Member may withdraw from participation in the Program and this Instrument after ninety (90) days' advance written notice to the other Parties.

7. Reporting

The Sponsor will provide annual reports to the AC in accordance with requirements contained at 33 CFR §332.8(q). Annual reports will be based on calendar years, and will contain a program account of deposits and withdrawals and updates on the progress of each SHRU and ILF Mitigation Project implementation. The reports will be submitted not later than June 30 of the year following the reporting year. Each annual report will provide an overview of the Atlantic salmon resources that were lost and the ILF Mitigation Projects that were funded. It also will summarize the successes and the challenges, and suggestions for improvements to the Program for the following year. For restoration, creation and enhancement ILF Mitigation Projects that may take several years to complete, the Sponsor will summarize monitoring reports and the results of the work during the reporting period.

Every five (5) years, the Sponsor will produce a status and trends report summarizing the previous five (5) years. This report will examine the goals for each SHRU and discuss how well the ILF Mitigation Projects furthered those goals. Every ten (10) years or as funds allow, the Sponsor and others will reexamine and update the Compensation Planning Framework, including working with a broad range of stakeholders.

8. Other Information

The Sponsor will provide to the AC such other information as maybe reasonably requested by the AC from time to time.

G. Elements Required by 33 C.F.R. §332.8(d)(6)(iv)

1. Compensation Planning Framework

The Compensation Planning Framework established under this Instrument is set forth in Exhibit F and includes the following elements:

a. Geographic Service Areas

b. Description of Threats to Atlantic Salmon

c. Analysis of Historic Aquatic Resource Loss

d. Analysis of Current Aquatic Resource Conditions

e. Statement of Goals and Objectives

f. Prioritization Strategy for Selecting and Implementing Mitigation Projects

g. Qualification of Preservation Actions

h. Description of Public and Private Stakeholder Involvement

i. Description of Long Term Protection and Management Strategies

j. Strategy for Periodic Evaluation and Reporting on Program Progress

2. Establishment and Use of Credits, Fees, and Credit Accounting

a. Advance Credits. On the Effective Date, this Instrument shall operate to automatically grant to the Sponsor Advance Credits in each Service Area as set forth in Exhibit C. The number of Advance Credits that are approved for Transfer was developed in coordination with the AC and is based on (i) the percentage of the projected mitigation opportunities within the Service Area, as outlined in the Compensation Planning Framework, (ii) the Sponsor's past performance for implementing aquatic resource restoration, establishment, enhancement and/or preservation activities in the Service Area or other areas, and (iii) the projected financing necessary to begin planning and implementation of ILF Mitigation Projects.

Once the Sponsor has sold all of its Advance Credits in a Service Area, no additional Advance Credits may be sold until Released Credits have been generated in accordance with the approved Credit Release Schedule outlined in a Mitigation Plan. Each Released Credit will fulfill the Advance Credit by offsetting the mitigation obligation of an Advance Credit as set forth in Section V.B.2. As the mitigation obligations associated with Advance Credits are fulfilled, an equivalent number of Advance Credits may be made available for Transfer.

Unless agreed otherwise by the AC, the Sponsor shall complete land acquisition and initial physical and biological improvements with respect to an ILF Mitigation Project by the third full growing season after the Transfer of Advance Credits. Development of Released Credits to Fulfill the mitigation obligation of the Advance Credits occurs through achieving the performance standards in the Mitigation Plan, according to the applicable Credit Release Schedule. If the Sponsor fails to meet these deadlines, the AC may make a determination that more time is needed to plan and implement the applicable ILF Mitigation Project in accordance with 33 CFR §332.8(n)(4).

b. Use of Credits. In accordance with the provisions of this Instrument, Advance Credits and, to the extent they are developed and not used to Fulfill Advance Credits, Released Credits, are available for Transfer by the Sponsor to satisfy Compensatory Mitigation requirements in accordance with all applicable requirements for permits or recommendations issued by the relevant Permitting Agency. The Permitting Agency will determine the number of Credits that must or should be purchased by a permittee/project proponent to satisfy its Compensatory Mitigation obligation. The AC Co-Chairs, in consultation with the AC, will determine the number of Released Credits that each ILF Mitigation Project generates as it is completed, based on the achievement of applicable performance standards as reflected in the ILF Mitigation Project's Credit Release Schedule.

Each Mitigation Plan approved by the AC Co-Chairs, in consultation with the AC, will include the method for determining the Released Credits to be generated by the individual ILF Project, in accordance with the methodology described in Section IV.G.3 and Exhibit C. Over time, projects may generate more credits in a Service Area than have been purchased from the Advanced Credit pool. As they are released, "excess" credits are "banked", meaning that there are credits available for sale to entities which require the use of Released Credits rather than Advanced Credits. One example of such an entity is the Corps of Engineers Civil Works Program. Each Mitigation Plan approved by the AC Co-Chairs, in consultation with the AC, will include a Credit Release Schedule linked to the achievement of Performance Standards. As milestones in an individual ILF Mitigation Project's Credit Release Schedule are reached, the ILF Mitigation Project will be deemed (as confirmed in writing by the AC Co-Chairs, after consultation with the AC) to have generated Released Credits. Generation of Released Credits shall require: (i) approval by the AC Co-Chairs, in consultation with the AC, of the Mitigation Plan, (ii) achievement of the applicable milestone(s) in the Credit Release Schedule, (iii) submittal of a request for Credit Release to the AC, along with documentation substantiating achievement of the criteria for release to occur, and (iv) written confirmation of Credit Release from the AC Co-Chairs, after consultation with the AC. If an ILF Mitigation Project does not achieve performance-based milestones, the AC Co-Chairs will coordinate with the Sponsor to modify the Credit Release Schedule and provide written notice of any such modification to the Sponsor.

c. Fees. The Sponsor shall be responsible for establishing the ASRCP Fee Schedule for Credits to be sold under the Program in accordance with the 2008 Compensatory Mitigation Rule. The 2008 Compensatory Mitigation Rule provides in 33 CFR §332.8(o)(5)(ii) that the cost per Credit must represent full-cost accounting: "For in-lieu fee programs, the cost per unit of credit must include the expected costs associated with the restoration, establishment, enhancement and/or preservation of aquatic resources in that service area. These 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, long term stewardship, and remediation or adaptive management activities, as well as administration of the in-lieu fee program."

The initial ASRCP Fee Schedule is set forth in Exhibit C.

d. Transfer of Credits. Credits may be Transferred only in conjunction with a permit, certification or other authorization or approval issued by a Permitting Agency, involving In-stream Impacts. The responsibility to provide Compensatory Mitigation remains with the permittee/project proponent unless and until Credits are Transferred from the Program.

Each Permitting Agency will make its own respective decisions about the most appropriate Compensatory Mitigation on a case-by-case basis, during evaluation of the permit application or other request for authorization for a proposed project. This Instrument does not guarantee that the use of Credits for specific permitted activities will be accepted by the Permitting Agency, and authority for approving use of the Program for Compensatory Mitigation lies with each Permitting Agency, in its sole discretion, for In-Stream Impacts subject to the jurisdiction of the Permitting Agency.

If the relevant Permitting Agency determines that the purchase of Credits from the Program is appropriate Compensatory Mitigation, the permittee/project proponent may contact the Sponsor to seek to secure the necessary amount of Credits, as set forth in the permittee's/project proponent's permit conditions.

Upon Transfer of Credits, the Sponsor shall enter the pertinent Transfer information into RIBITS.

3. Methodology for Determining ILF Mitigation Project Credits

For each specific ILF Mitigation Project proposed by the Sponsor to the AC, the AC Co-Chairs, in consultation with the AC, shall evaluate the expected aquatic resource benefits of such project in accordance with Exhibit C and then determine the appropriate ILF Mitigation Project-specific Released Credits that will be allocated to such ILF Mitigation Project. The AC also will establish the Credit Release Schedule for the ILF Mitigation Project. Costs of the ILF Mitigation Project development will be fully calculated and allocated from the Program Account.

4. Program Account

The Sponsor will establish a financial account dedicated to the Program ("Program Account") in accordance with Exhibit D.

A percentage of funds received from the Transfer of each Advance Credit may be assessed and collected by the Sponsor as an administrative and program management fee ("Administrative Fee") for administering the Program. The percentage of funds to be assessed and collected by the Sponsor from the Transfer of each Credit is set forth in Exhibit D.

5. Disbursements for ILF Mitigation Projects

Disbursements from the Program Account may be made only upon receipt of written authorization (may be transmitted electronically) from the AC Co-Chairs, after consultation with the AC, except for the Administrative Fee, which may be deducted by the Sponsor at the time proceeds from Credit sales are received.

Each ILF Mitigation Project will be developed and implemented in accordance with a Mitigation Plan, which will include a detailed budget, which should include a contingency of at least 10% for ILF Mitigation Projects involving construction and a set dollar amount for preservation-only projects. Each ILF Mitigation Project will be submitted to the AC for approval. Approval by the AC Co-Chairs, after consultation with the AC, of a Mitigation Plan that includes a budget will constitute approval for disbursement of funds from the Program Account in accordance with the budget.

The Sponsor may enter into contracts or agreements with third parties for the development, implementation, and/or long-term stewardship of individual ILF Mitigation Projects. Third parties performing work to implement ILF Mitigation Projects will be paid with funds from the applicable Service Area Sub-Account in accordance with approved Mitigation Plans and associated budgets. The Sponsor shall pay third parties for performance of ILF Projects in accordance with the terms of the contracts or other agreements governing such performance. Increases in an AC-approved budget for an ILF Mitigation Project generally will not be approved unless additional Credits are generated. Any increase in an AC-approved budget must be approved by the AC Co-Chairs, after consultation with the AC, before such increase shall become effective and before funds from the Program Account may be used to pay such increase. Generally, such increases will be approved only if additional credits will be generated.

Each Service Area Sub-Account may be charged for reasonable and appropriate expenses associated with the fee acquisition of land and/or conservation easements, design and implementation of mitigation projects, including monitoring and remediation, long-term stewardship of projects and contingency funds as determined appropriate. These expenses shall be included in the overall cost of each ILF Mitigation Project. Specific expenses associated with implementing an ILF Mitigation Project, including the purchase price of land, payment for a conservation easement, construction activities, appraisals, closing costs, and establishment of vegetation as well as the cost of long-term stewardship of n ILF Mitigation Project may be debited from the Service Area Sub-Account and paid to the Sponsor or third party ILF Mitigation Project implementer, and, in the case of stewardship funding, to the entity responsible for the long-term management of the ILF Mitigation Project and monitoring of a permanent easement. For ILF Mitigation Projects involving construction or other work that would occur after site acquisition, financial assurances must be provided by the Sponsor or third party ILF Mitigation Project implementer or a percentage of the Project Account allocation for the ILF Mitigation Project will be held in abeyance until the AC Co-Chairs, after consultation with the AC, determine the ILF Mitigation Project is successful following monitoring and any needed remediation.

6. Long-term Management and Maintenance of ILF Mitigation Projects

ILF Mitigation Projects will be designed, to the maximum extent practicable, to be self-sustaining once performance standards have been achieved. The Sponsor will ensure that ILF Mitigation Projects are maintained and managed to protect their long-term viability and functionality.

Following the performance period (i.e., regulatory monitoring period) and release of all Credits, ILF Mitigation Projects will be managed in accordance with long-term stewardship guidelines. A long-term maintenance and management plan will be submitted to the AC for approval prior to final Credit release. The Sponsor may, and upon the request of the AC will, establish a separate or Sub-Account for Program Account funds dedicated to the long-term management and maintenance of ILF Mitigation Projects.

V. ILF Mitigation Project Selection and Operation

There is a wealth of existing guidance to help identify ILF Mitigation Projects that are financially and functionally feasible, and that will provide the greatest ecological benefits. These include NOAA's 2009 Critical Habitat rule, the Atlantic salmon recovery plan, ongoing field research, GIS analyses, and watershed-based conservation efforts by non-profit groups and state agencies.

Current species recovery strategies have employed a watershed-based approach. In 2009, NOAA-NMFS used HUC 10 (level 5) watersheds to identify specific areas to designate as Critical Habitat. The HUC 10 level provides a framework to reasonably aggregate occupied river, stream, lake, and estuary habitats that contain the physical and biological features essential to the conservation of the species. Many Atlantic salmon populations within the GOM DPS are currently managed at the HUC 10 watershed scale, which corresponds well to Atlantic salmon biology and life history characteristics (NOAA 2009).

NOAA-NMFS established a geographic framework represented by the three Service Areas, each of which is an aggregate of several watersheds. This framework is intended to ensure that viable populations are established across the major geographic regions within the DPS, that threats are addressed effectively across the DPS, and to provide protection from demographic and environmental variation (USFWS and NOAA-Fisheries, 2016). A total of 87 HUC10 watersheds define the geographic area of the GOM DPS, which corresponds to the historical range of the species.

The 2016 Atlantic Salmon Draft Recovery Plan includes a description of site-specific management actions necessary to conserve the species, based on ecological and biological requirements of Atlantic salmon in the expanded GOM DPS, as well as current threats and conservation accomplishments that impact long-term species viability.

One of the main objectives of the Program is to provide mitigation for In-Stream Impacts that result in greater ecological benefit than could be achieved through permittee-responsible mitigation. The Program aims to achieve "no net loss" of functions within each Service Area. Therefore, ILF

Mitigation Projects will be prioritized in accordance with the Compensation Planning Framework based on their ability to further species recovery goals within each Service Area.

A. ILF Mitigation Project Review Committee

The Sponsor shall establish and maintain an ASRCP Mitigation Project Review Committee ("Review Committee") comprised of representatives from USFWS, NMFS, MDIFW, MDMR and, if applicable, the Program Administrator. In addition, two (2) seats will be made available on staggered three (3)-year terms to representatives from other quasi-government or non-governmental organizations. The Program Administrator's seat on the Review Committee shall be nonvoting. The Review Committee shall be chaired by the Sponsor.

The Review Committee shall meet twice a year, or as otherwise necessary, to review potential ILF Mitigation Projects. The Review Committee shall determine its own rules and order of business and shall provide for keeping a record of its proceedings. This record of the Review Committee meetings shall be a public record maintained at the offices of the Sponsor open for inspection at the request of Sponsor, the AC, or one or both of the AC Co-Chairs.

The Review Committee will evaluate proposed ILF Mitigation Projects based on site suitability, likelihood of ILF Mitigation Project success, maximizing the environmental benefit of Program Account funds expended, relative value of the natural resource type(s) involved, and, in the case of preservation, the relative threat of development of the proposed ILF Mitigation Project site, as described in more detail in the Compensation Planning Framework.

B. ILF Mitigation Project Approval and Implementation

Proposed ILF Mitigation Projects recommended by the Review Committee will be forwarded by the Sponsor to the AC for consideration by the AC in accordance with the 2008 Compensatory Mitigation Rule.

The Sponsor will be responsible for ensuring the design, permitting, construction, monitoring and maintenance of ILF Mitigation Projects are appropriate and performed in accordance with the respective Mitigation Plans during the regulatory performance period, as required of a program sponsor in 33 CFR §332.8.

1. Mitigation Plan

The Sponsor will ensure that a Mitigation Plan and site design for each ILF Mitigation Project selected by the Review Committee and approved by the AC Co-Chairs, after consultation with the AC, are produced. All Mitigation Plans will meet the requirements specified in the 2008 Compensatory Mitigation Rule and will contain the following elements:

a. Goals and Objectives: A description of the resource type(s) and amount(s) that will be provided, the functions targeted, the method of compensation, and the manner in which the resource functions of the ILF Mitigation Project will address the needs of the watershed.

b. Site Selection: A description of the factors considered during the site selection process.

c. Site Protection Instrument: A description of the legal arrangements and instrument that will ensure the long-term protection of the ILF Mitigation Project site.

d. Baseline Site Information: A description of the ecological characteristics of the proposed ILF Mitigation Project site.

e. Credit Release Schedule: A schedule for making Credits generated by the ILF Mitigation Project available for Transfer, consistent with Section V.B.3.

f. Mitigation Work Plan: Detailed written specifications and work descriptions for the ILF Mitigation Project.

g. Maintenance Plan: A description and schedule of maintenance requirements to ensure the continued viability of the resource once initial construction is completed.

h. Performance Standards: Ecological and measurable standards that will be used to determine whether the ILF Mitigation Project is achieving its objectives.

i. Monitoring Requirements: A description of parameters to be monitored in order to determine if the ILF Mitigation Project is on track to meet performance standards and if adaptive management is needed. A schedule for monitoring and reporting on monitoring results will also be included.

j. Long-term Management Plan: A description of how the ILF Mitigation Project will be managed after achievement of performance standards to ensure the long-term sustainability of the resource, including long-term financing mechanisms and the party responsible for long-term management.

k. Adaptive Management Plan: A management strategy to address unforeseen changes in site conditions or other components of the ILF Mitigation Project, including the party or parties responsible for implementing adaptive management measures. The adaptive management plan will guide decisions for revising mitigation plans and implementing measures to address both foreseeable and unforeseen circumstances that adversely affect the ILF Mitigation Project's success.

l. Financial Assurances: A description of financial assurances that will be provided and how they are sufficient to ensure a high level of confidence that the ILF Mitigation Project will be successfully completed, in accordance with its performance standards. If there are no financial assurances, the payment schedule will be set to ensure the work and monitoring are completed before reimbursement funding is released.

m. Other information, such as:

    i. Nearby mitigation or restoration projects and how the ILF Mitigation Project may compliment them.

ii. Adjacent land uses and potential effects of adjacent land uses on the ILF Mitigation Project.

iii. Other information as identified by the AC as necessary for inclusion in the Mitigation Plan.

2. Fulfillment of Advance Credits

Advance Credits sold will be Fulfilled by ILF Mitigation Projects submitted to and approved by the AC Co-Chairs, after consultation with the AC.

3. Credit Release

Credit Releases for ILF Mitigation Projects must be approved by the USACE district engineer in coordination with the AC Co-Chairs. For Credits to be released, the Sponsor will submit documentation to the district engineer and AC Co-Chairs demonstrating that the appropriate milestones for Credit Release have been achieved and requesting the release. The AC Co-Chairs will provide copies of this documentation to the AC members for review and comment in accordance with 33 CFR §332.8(o)(9).

The district engineer and AC Co-chair may determine that a site visit is necessary prior to the release of credits.

Credits will be released as approved ILF Mitigation Projects are completed by the Sponsor, in accordance with the following schedule, which may be modified with approval from the AC:

a. Preservation:

100% of Credits upon receipt of the signed and recorded preservation document, evidence that the non-wasting endowment has been established or receipt of a letter from the long-term steward stating that an endowment is not required to provide the long-term management as outlined in the long-term management agreement, and a long-term management agreement approved by the Sponsor and AC Co-Chairs, after consultation with the AC, and signed by the long-term steward and fee owner (if different).

b. Restoration/Creation/Enhancement (Rehabilitation) with Associated Preservation:

100% of the preservation-related Credits upon receipt of the signed and recorded preservation document and a long-term management agreement approved by the Sponsor and AC Co-Chairs, after consultation with the AC, and signed by the long-term steward and fee owner (if different).

100% of the construction-related Credits upon completion of construction and approval of the work by the Sponsor, receipt of all required inspection and initial monitoring reports, and the Sponsor determine the ILF Mitigation Project is successful in meeting the goals and performance measures and the AC concurs with the Credit Release.

c. Restoration/Creation/Enhancement (Rehabilitation) without Associated Preservation:

100% of the Credits upon completion of construction and approval of the work by the Sponsor, receipt of all required inspection and initial monitoring reports, and the Sponsor determines the ILF Mitigation Project is successful in meeting the goals and performance measures and the AC concurs with the Credit Release.

If, at any step in the Credit Release Schedule for any type of ILF Mitigation Project, it is determined through monitoring that performance standards are not being met, the Sponsor, in consultation with the AC, shall identify appropriate adaptive management and/or contingency measures and devise a plan for implementation.

C. Project Implementation

Upon the approval of a Mitigation Plan and Credit Release Schedule by the AC Co-Chairs, after consultation with the AC, the Sponsor has spending authorization to initiate implementation of the ILF Mitigation Project. As appropriate based on the ILF Mitigation Project approved, the Sponsor will oversee contract development, select a qualified construction contractor, and perform construction management and oversight. As necessary, the construction process will include routine inspections, special inspections, pre-construction site review meetings, post-construction meetings, and compliance reporting as necessary.

D. Monitoring and Maintenance

Monitoring will require qualitative and quantitative assessments of physical, chemical and biological characteristics of the ILF Mitigation Project as appropriate, using scientifically appropriate analytical methods. The purpose of monitoring is to determine the level of compliance with ecological performance standards established in the Mitigation Plan for the ILF Mitigation Project. In addition, the monitoring data will help identify problems that may trigger maintenance activity, contingency plans, remedial action, or adaptive management measures.

Monitored parameters depend in large part on the type, scale and scope of an ILF Mitigation Project (e.g., effectiveness of fish passage at the project).

As necessary, the Sponsor will coordinate with land managers and appropriate contractors to outline maintenance protocols for each ILF Mitigation Project.

E. Adaptive Management and Contingency Planning

Once ILF Mitigation Projects are installed, they will be adaptively managed by the Sponsor in response to the outcome of regular and routine maintenance and monitoring events. If any monitoring data reveal that an ILF Mitigation Project is failing in whole or in part, the Sponsor will determine whether conditions can be remedied through maintenance activities. If the failure is beyond the scope of routine maintenance, the Sponsor will submit a contingency plan to the AC. Once approved by the AC Co-Chairs, after consultation with the AC, the contingency plan will be implemented and will replace the approved Mitigation Plan. If the failure is substantial, the Sponsor will extend the maintenance and monitoring period for the ILF Mitigation Project and/or the Credit Release Schedule may be adjusted.

VI. Other Provisions

A. Modification and Amendment of Instrument and Exhibits

1. Instrument. This Instrument may be amended or modified only with the written approval of the Parties, and shall be fully set forth in a separate document signed by all Parties that shall be appended to this Instrument. All Instrument modifications, including but not limited to Mitigation Plan approvals, must be effected in accordance with the instrument modification process set forth in the 2008 Compensatory Mitigation Rule, including, as applicable, the streamlined review process set forth therein. Any amendment effective date will be the date of the last signature.

2. Exhibits. Exhibits to this Instrument may be amended or modified only with the written approval of the Parties, and shall be fully set forth in a separate document signed by all Parties that shall be appended to this Instrument. Exhibit modifications shall not be required to be effected in accordance with the instrument modification process set forth in the 2008 Compensatory Mitigation Rule except to the extent specifically required by the 2008 Compensatory Mitigation Rule or by the AC Co-Chairs.

B. Controlling Language

The Parties intend the provisions of this Instrument and each of the documents incorporated by reference into it to be consistent with each other, and for each document to be binding in accordance with its terms. To the fullest extent possible, these documents shall be interpreted in a manner that avoids or limits any conflict between or among them. However, if and to the extent that specific language in this Instrument conflicts with specific language in any document that is incorporated into this Instrument by reference, the specific language of the Instrument shall be controlling.

C. Entire Agreement

This Instrument, including all Exhibits, appendices, schedules, and agreements referred to in this Instrument, constitute the final, complete, and exclusive statement of the terms of the agreement between and among the Parties pertaining to the Program, and supersede all prior and contemporaneous discussions, negotiations, understandings or agreements of the Parties. No other agreement, statement, or promise made by the Parties, or to any employee, officer, or agent of the Parties, which is not contained in this Instrument, is binding or valid. No alteration or variation of this Instrument is valid or binding unless amended in writing in accordance with the Instrument. Each Party acknowledges that neither it, nor anyone acting on its behalf, has made any representation, inducement, promise, or agreement, oral or otherwise, that is not embodied herein.

D. Reasonableness and Good Faith

Except as specifically limited elsewhere in this Instrument, whenever this Instrument requires a Party to give its consent or approval to any action by the other Party, such consent or approval will not be unreasonably withheld or delayed. If a Party disagrees with any determination covered by this provision and requests the reasons for that determination, the determining Party will furnish its reasons in writing and in reasonable detail within thirty (30) days of receipt the request.

E. Successors and Assigns

This Instrument and each of its covenants and conditions are binding on, and are for the benefit of, the Parties and their respective successors and assigns, subject to the limitations on transfer set forth herein. The Sponsor will have the right to assign or otherwise transfer the Program at any time, provided that the Sponsor is in full compliance with all requirements of this Instrument and receives the prior written approval of the AC Co-Chairs, in consultation with the AC. Prior to assignment, transfer, sale, or conveyance, the Program Sponsor will provide to each member of the AC written assurance from the proposed replacement sponsor confirming the replacement sponsor's intent to assume and perform all of the responsibilities and obligations of the Sponsor under this Instrument. Any such assignment, sale, transfer or conveyance made without the prior written approval of the AC Co-Chairs may, at the discretion of the AC, result in the termination of this Instrument according to the Closure provisions in Section IV.F.5 of this Instrument.

F. Partial Invalidity

If a court of competent jurisdiction finds that any term or provision of this Instrument is invalid or unenforceable, in whole or in part, the validity and enforceability of the remaining terms and provisions, or portions of them, are not affected unless an essential purpose of this Instrument is defeated by loss of the invalid or unenforceable provision.

G. Notices

The Parties will provide in writing any notice, demand, approval, request, or other communication that is required by this Instrument. Such communications are deemed given when delivered personally or:

- sent by receipt-confirmed facsimile;
- sent by receipt-confirmed electronic mail;
- sent by recognized overnight delivery service; or
- five (5) days after deposit in the U.S. mail, postage prepaid; and
- addressed as set forth in Exhibit G.

Any Party may change its notice address by giving notice of change of address to the other Party in the manner specified in this Section VI.G:

H. Counterparts

This Instrument may be executed in multiple counterparts, each of which will be deemed an original and all of which together will constitute a single executed instrument.

I. No Third-Party Beneficiaries

This Instrument does not create any third-party beneficiaries, and does not authorize any third-party actions, including, without limitation, suits for personal injuries, property damage, or enforcement. The duties, obligations, and responsibilities of the Parties to this Instrument with respect to third parties are as otherwise provided by law, as though this Instrument does not exist.

J. Availability of Funds

Implementation of this Instrument is subject to the requirements of the Anti-Deficiency Act, 31 U.S.C. § 1341, and the availability of appropriated funds. Neither the USACE nor the USFWS is required under this Instrument to expend any appropriated funds unless and until an authorized official affirmatively acts to commit to such expenditures as evidenced in writing.

K. No Partnerships

This Instrument does not make either Party an agent for, or the partner in a joint venture of, the other Party.

L. Governing Law

This Instrument is governed by, and construed in accordance with, the CWA, 33 U.S.C. §§1251 *et seq.*, the ESA, 16, U.S.C. §§1531 *et seq.*, and other applicable federal and state laws and regulations. However, nothing in this Instrument is intended, or is construed as, a waiver of sovereign immunity beyond that which has been granted by the United States legislature in applicable federal laws.

M. Headings and Captions

Any section or paragraph heading or caption contained in this Instrument is for convenience of reference only and does not affect the construction or interpretation of any provisions of this Instrument.

N. Right to Refuse Service

A determination by a Permitting Agency that a permittee/project proponent may use the Program to satisfy a Compensatory Mitigation obligation does not obligate the Sponsor to sell Credits to a permittee/project proponent or otherwise accept such Compensatory Mitigation obligation. The Sponsor reserves the right to refuse to sell Credits and/or to accept mitigation fee payments from any permittee/project proponent for any reason.

O. Provision of Legal Responsibility

USACE approval of this Instrument constitutes the regulatory approval required for the ASRCP to be used to provide compensatory mitigation for Department of the Army permits pursuant to 33 C.F.R. §332.8(a)(1). This Instrument is not a contract between the Sponsor and the Corps or any other agency of the federal government. Any dispute arising under this Instrument will not give rise to any claim for monetary damages by the Sponsor. This provision is controlling notwithstanding any other provision or statement in the Instrument to the contrary. Any changes to this provision need to be coordinated through U.S. Army Corps of Engineers New England District Headquarters.

VII. Execution

Each of the undersigned certifies that he or she has full authority to bind the Party that he or she represents for purposes of entering into this Instrument. This Instrument is deemed executed on the date of the last signature by the Parties.

[The remainder of this page intentionally is left blank.]

IN WITNESS WHEREOF, the Parties have executed this Instrument as follows:

U.S. ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT

By: ______________________ Date: 10SEP2018

Name: COL William M. Conde
Title: USACE, District Commander

U.S. FISH AND WILDLIFE SERVICE

By: ______________________ Date: ____________

Name:
Title:

MAINE DEPARTMENT OF MARINE RESOURCES, PROGRAM SPONSOR

By: ______________________ Date: ____________

Name:
Title:

EXHIBIT A

Program Area

Geographic range of the GOM DPS as defined in the 2000 and 2009 listing rules. (From Draft recovery plan for the Gulf of Maine Distinct Population Segment of Atlantic salmon (*Salmo salar*). USFWS-NOAA, 2016)

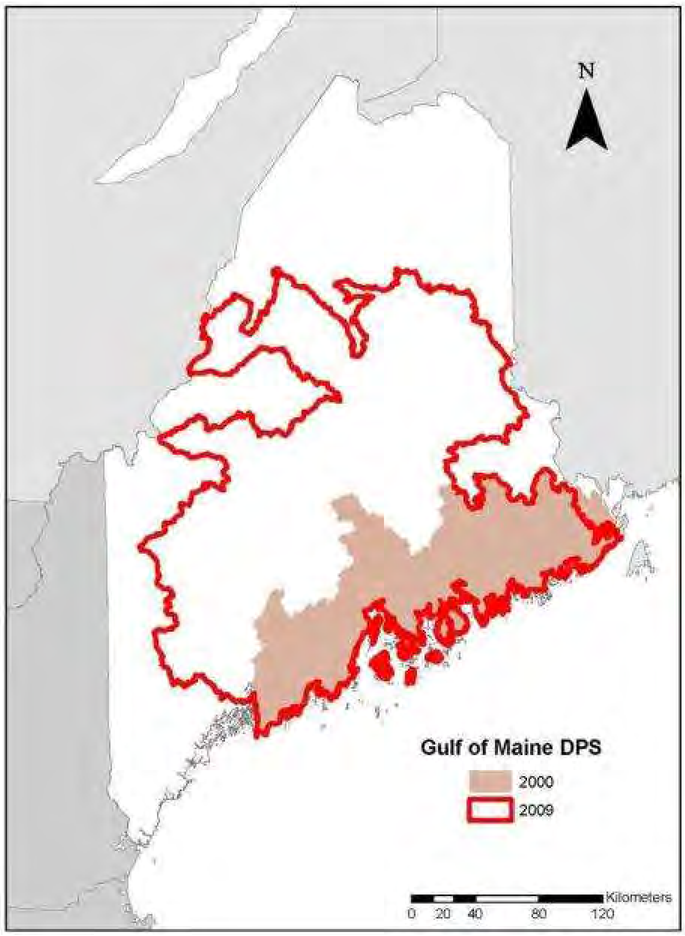


EXHIBIT B

Service Areas

SHRU boundaries as illustrated are consistent with 50 C.F.R. Part 226 Endangered and Threatened Species; Designation of Critical Habitat for Atlantic Salmon (*Salmo salar*) Gulf of Maine Distinct Population Segment; Final Rule published June 19, 2009 (74 Fed. Reg. 29300) https://www.gpo.gov/fdsys/pkg/FR-2009-06-19/pdf/E9-14268.pdf#page=2.

EXHIBIT C

Credit and Debit Information and Procedure

Initial Advance Credits

The following Advance Credits have been allocated to the ASRCP as of the Effective Date of the Instrument:

Service Area	Number of Advance Credits*
Merrymeeting Bay SHRU	1159
Penobscot Bay SHRU	1148
Downeast Coastal SHRU	334
Total Advance Credits	2641

* The number of advanced credits are equal to five percent of the habitat units required per SHRU for delisting as described in the recovery plan. Each SHRU has different numbers of habitat units necessary for recovery and delisting, therefore, the number of advanced credits per SHRU vary.

Initial ASRCP Fee Schedule

The initial prices for which Credits under the ASRCP will be sold are:

Service Area	**Initial Credit Price* Habitat Unit ($100\ m^2$)**	**Initial Credit Price m^2**	**Initial Credit Price ft^2**
Merrymeeting Bay SHRU	$4856	$48.56	$4.51
Penobscot Bay SHRU	$3408	$34.08	$3.17
Downeast Coastal SHRU	$6347	$63.47	$5.90

*The fee schedules for each SHRU is variable and based on The Conservation Fund - White Paper. Link: https://ribits.usace.army.mil/ribits_apex/f?p=107:378:12339898593628::NO::P378_PROGRAM_ID:2842

Method for Determining Debits and Credits:

The standard unit of measure used for in-lieu fee programs to quantify an impact is a "Debit." Lift at an ILF Mitigation Project is measured in "Credits."

The Credit/Debit calculation method to be used for the ASRCP was previously developed in collaboration with other natural resource agency stakeholders. The calculation method utilizes a database tool and GIS software (together referred to as the Credit/Debit Calculator) to help determine potential impacts from permittee activities and mitigation benefits from ILF Mitigation Projects within each Service Area.

The Credit/Debit Calculator will be used to assist the Permitting Agencies, the IRT and the Sponsor in the determination of Credits and Debits for Program activities. Each Debit is equal to one unit (1 unit = 100 square meters) of in-stream Atlantic salmon rearing and spawning habitat that may be impaired as a result of permitted impacts. Each Credit equates to one unit of Atlantic salmon habitat benefited by an ILF Mitigation Project through restoration, and to additional units of habitat to the extent the ILF Mitigation Project enhances, creates, and/or preserves Atlantic salmon habitat, in accordance with the table below. For road crossing or other blocking or disturbance projects over streams and rivers, the Credit and Debit calculations include the effects on upstream as well as proximal rearing and spawning habitat.

Key data sources utilized by the Credit/Debit Calculator include:

- Detailed stream crossing inventory of several thousand Maine road crossings, which identifies known and potential barriers to fish passage and estimates the number of units of Atlantic salmon rearing habitat made inaccessible by each barrier (Maine Stream Connectivity Work Group and Maine Office of GIS);
- Surveys of Atlantic salmon spawning and rearing habitat within the DPS (Maine Dept. of Marine Resources - Division of Sea Run Fisheries and Habitat);
- Potential Atlantic salmon juvenile rearing habitat estimated using a USFWS model (Wright et al 2008);
- Cost estimation models to assess the cost per lineal foot (including all aspects of project design, implementation, monitoring and maintenance) to provide stream crossing structures that provide full habitat access for Atlantic salmon across the three SHRU's (Evergreen Funding Consultants, 2003., Neeson *et al*, 2015, New England Environmental Finance Center, 2010).

Debits. Debits from applicant projects will be determined by the Permitting Agencies, pursuant to the applicable regulatory program. If all Permitting Agencies for an unavoidable impact agree that the Program is the most practicable way for the applicant to meet mitigation needs, then mitigation requirements must be quantified and approved prior to permit issuance, so the applicant can be advised of the number of Credits that must be acquired to offset the Debits determined by the Permitting Agencies. The Credit/Debit Calculator will provide the initial basis for quantifying Debits. However, the number of Debits may be adjusted by the relevant Permitting Agency(ies) for site-specific variables such as Critical Habitat presence or Biological Value ranking. When the price of credits for a project is less than

1.5 and greater than 1.0 of the calculated 1.2 BFW cost a Review Committee will be convened. The Committee will determine if a reduction in the ILF cost calculation based on the site-specific variables such as Critical Habitat presence or Biological Value ranking is warranted. The Committee will be developed by the Sponsor and composed of experts with knowledge of the specific project area.

Credits. The IRT will determine the number of Credits that will be generated from each ILF Mitigation Project, using the Credit/Debit Calculator to provide the initial basis for quantifying Credits. The number of Credits may be adjusted for site-specific variables such as Critical Habitat presence or Biological Value ranking.

The number of Credits generated for each unit (1 unit = 100 square meters) of Atlantic salmon habitat benefited by an ILF Mitigation Project will vary based on whether the ILF Mitigation Project benefits the habitat through restoration, creation, enhancement and/or preservation of Atlantic salmon habitat. ILF Mitigation Projects that benefit habitat through enhancement and preservation will require benefits to more units of habitat to generate each Credit than ILF Mitigation Projects that benefit habitat through restoration, as follows:

Resource	Restoration (re-establishment)	Creation (establishment)	Enhancement (rehabilitation)	Preservation (protection/ management)
Spawning and Rearing Habitat	1:1	N/A	3:1 to 10:1	20:1
Riparian Land	N/A	N/A	10:1 to 20:1	15:1 for upland; 20:1 for wetland
Habitat for Native Species Prey Buffer	20:1	N/A	20:1 to 40:1	40:1

The determination regarding the enhancement or preservation of riparian land qualification as a credit will be made on a case by case basis and must clearly demonstrate that the enhancementprotection of those areas is significant to the recovery of Atlantic salmon (e.g., area adjacent to prime spawning habitat with imminent threat of development).

The determination regarding native species prey buffering restoration, enhancement, or preservation qualification as a credit will be made on a case by case basis. Projects must demonstrate that the increased production of river herring or other co-evolved diadromous species through the proposed

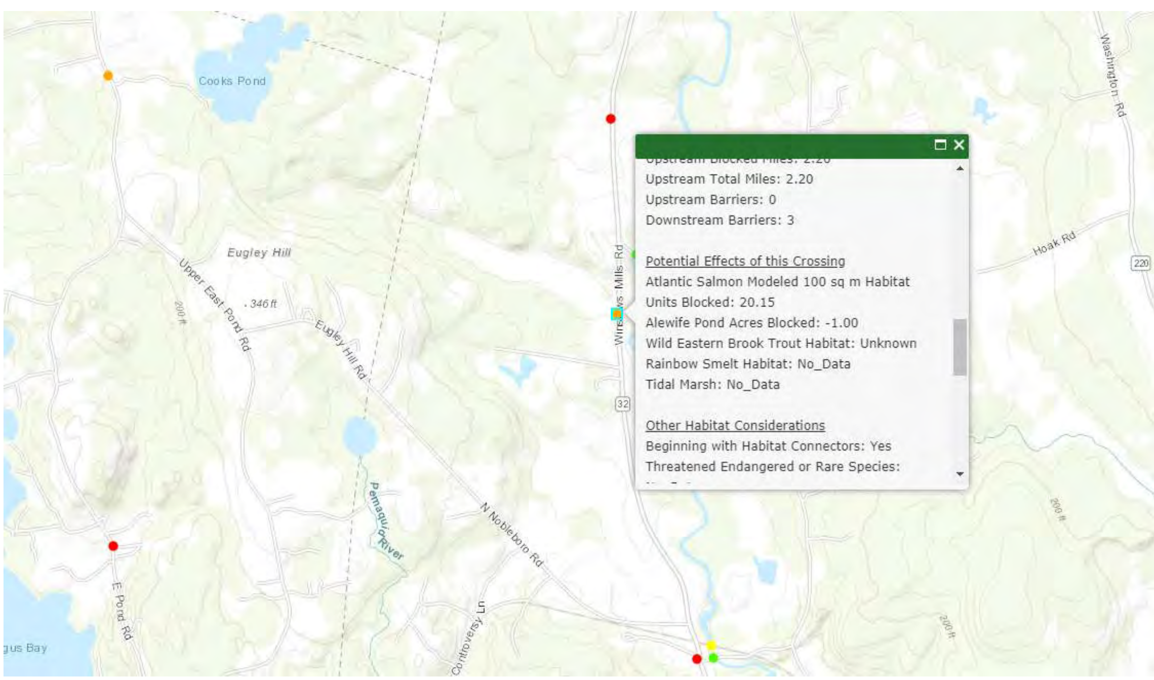
project will be present in the freshwater or estuary migratory sites of Atlantic salmon, providing benefits described in the final rule for the designation of Atlantic salmon critical habitat (74 FR 29299).

Sample Calculation of Credits from ILF Mitigation Project

An ILF Mitigation Project is proposed that involves a bridge replacement over Hoak Brook (streamview ID no. 14173). Hoak Bridge is a tributary to the Medomak River. The ILF Mitigation Project is located in the Merrymeeting Bay Salmon Habitat Recovery Unit (SHRU) and is designated critical habitat. There is no mapped or surveyed Atlantic salmon spawning habitat that will be affected by the Project.

The existing structure blocks upstream habitat access and by its design also directly impacts the immediate habitat under the bridge footprint. The new/replacement bridge/crossing will fully remove the upstream passage blockage by its design. Using the Maine Stream Habitat Viewer (figure below), the modeled upstream rearing habitat units can be retrieved. The Maine Stream Habitat Viewer shows that there are 20.15 habitat units upstream of this crossing. The crossing replacement is expected to affect 111.5 square meters (mean 3.7 meters width for 30.5 meters). This is 1.1 ATS habitat units.

Replacing Hoak Brook Bridge with a new bridge designed following stream simulation guidelines and achieving full passage will provide a credit of 21.15 ATS rearing habitat units.



Habitat Unit:

A habitat unit is defined as 100 square meters or 1076 square feet.

GIS-Based Atlantic Salmon Habitat Model:

A predictive Atlantic salmon habitat model was created to help inform the listing of critical habitat as well as information decisions on species stocking, barrier removal, and prioritizing restoration projects. The explanation of the values used to create the habitat model can be found in the attached Appendix A. Generally, the habitat model calculates the amount of habitat by multiplying the area of a stream (length x mean width) by the mean percentage of potential rearing habitat.

Upstream Habitat Units:

The Maine Stream Habitat Viewer calculates habitat units upstream of surveyed barriers and provides potential habitat units (link to habitat viewer below).

http://maine.gov/dmr/mcp/environment/streamviewer/index.htm

If the upstream habitat unit value has not yet been calculated, GIS can be used to perform the same calculation. The habitat model is available as a shapefile. Users are expected to be able to select all the stream extent upstream of a crossing represented by the habitat model. The User can then sum up the predicted values of habitat units to develop the total units affected.

If a stream is not mapped as perennial, the stream must be surveyed and a habitat unit number should be calculated from the survey. This field survey should be conducted in coordination with USFWS and the Sponsor.

GIS-Based Atlantic Salmon Habitat Model

Jed Wright [1], John Sweka [2], Alex Abbott [1], Tara Trinko[3]

Introduction

Fisheries management agencies have traditionally utilized field surveys to develop estimates of Atlantic salmon habitat in Maine rivers. While providing detailed information, field surveys are expensive to conduct and to-date cover only a small portion of the range of historic habitat of Atlantic salmon. A GIS-based habitat model was developed to predict the amount of Atlantic salmon rearing habitat in un-surveyed salmon rivers. The model was developed using data from habitat surveys conducted in the Machias, Sheepscot, Dennys, Sandy, Piscataquis, Mattawmkeag, and Soudabscook Rivers. The model uses reach slope derived from contour and digital elevation model (DEM) datasets, cumulative drainage area, and physiographic province to predict the total amount of rearing habitat within a reach. The variables included in the model explain 73% of the variation in rearing habitat. Maps and data from the model will help inform the proposed listing of critical habitats. This GIS based model will also be used for a variety of management activities including stocking, removing barriers, and prioritizing in-stream habitat restoration projects. The maps below show the extent of the area modeled by the project and detailed GIS output that is available from the model.

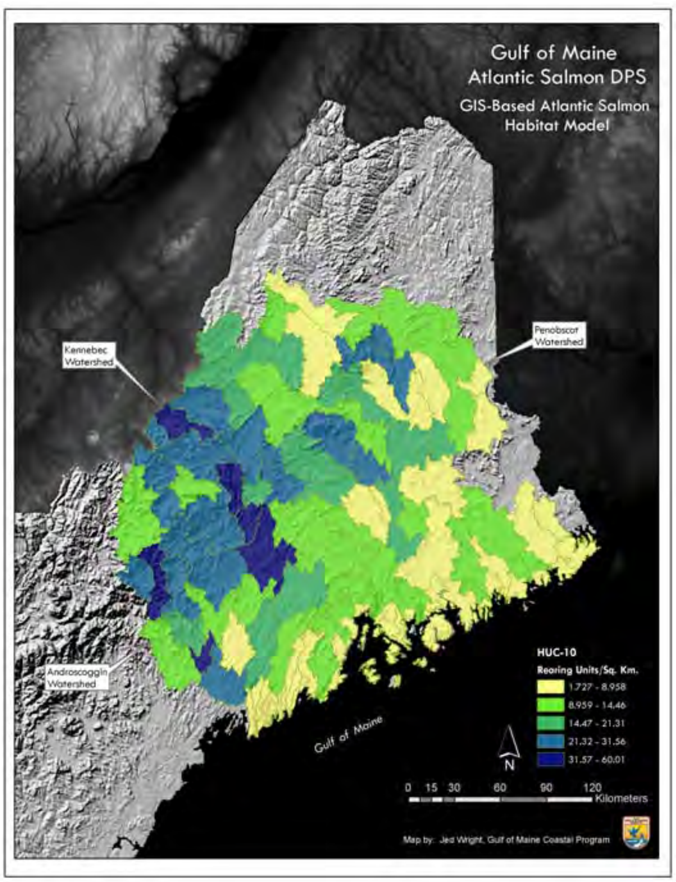


Figure 1: Extent of area included in GIS model.

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[1] U.S. Fish and Wildlife Service, Gulf of Maine Coastal Program
[2] U.S. Fish and Wildlife Service, Northeast Fishery Center
[3] NOAA Fisheries Service, Maine Field Station

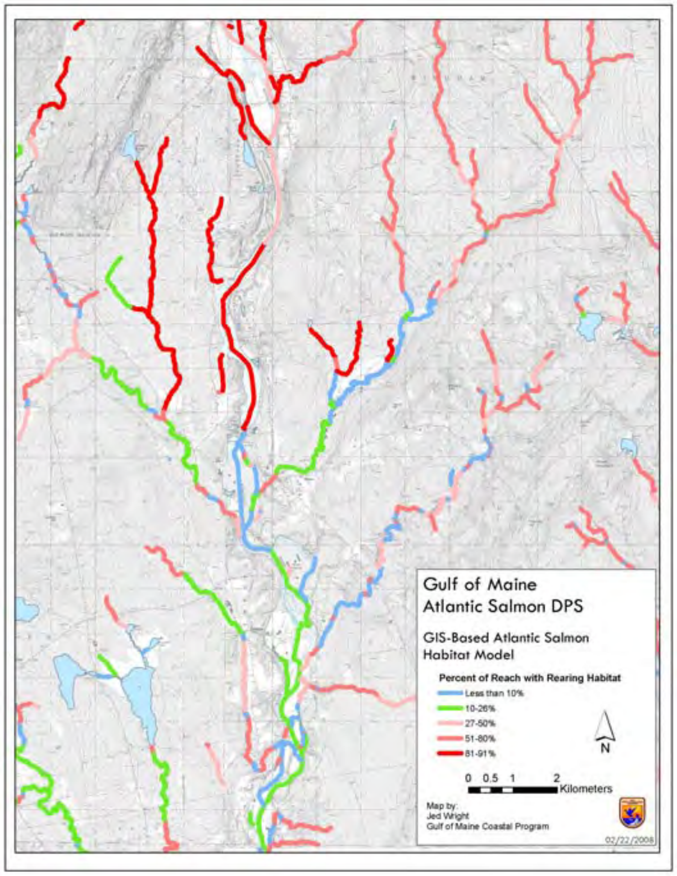

Figure 2: The GIS model predicts the amount of habitat within each stream reach.

Methods

<u>Stream Segment Selection Methods</u>

ArcGIS software version 9.2 (Environmental Systems Research Institute 2006) was used to process datasets used in the analysis. The National Hydrography High Resolution Dataset (NHDH) was used to identify potential habitat within the expanded Atlantic Salmon Gulf of Maine Distinct Population Segment (GOM-DPS). NHDH flowlines that were either perennial streams/rivers or that were located within 1:24,000 double line river segments were selected for use in the model. Selected stream and river reaches were then dissolved by GNIS-ID using the dissolve command in ArcTool Box. XTools Pro Version 5.0 was used to convert multipart selected stream segments to single parts and editing was conducted to remove short artificial path segments.

<u>Stream Segment Slope Determination</u>

Using the selected stream segments, XTools Pro was used to split the selected set of NHDH polylines with a 1:24,000 contour coverage. X Tools Pro was then used to create To and FROM endpoints from the newly split line segments. A spatial join was used to obtain an elevation value for the TO and FROM points from contour lines. In addition, a distance to the nearest contour line was calculated for each point. Hawth's Tools Version 3.27 was then used to obtain digital elevation model (DEM) elevation values to each TO and FROM point. DEM values were obtained from both 10 and 30 meter DEM datasets as a 10 meter DEM was not available for the entire study area. After values had been obtained from contour and DEM datasets, a final elevation was calculated for each point.

A point located within 1 meter of the nearest contour line was given a final elevation based on contour values. All remaining points were then coded with a final elevation of the corresponding DEM value, 10 meter values were used if available otherwise 30 meter DEM dataset values were used. Final elevations were calculated in meters.

TO and FROM points were joined by attribute back to corresponding selected NHDH stream segments based on either From ID or To ID and Object ID. The NHDH line was then coded with the FROM and TO elevation of the points. A field was added to NHD lines called "vertical" and a value was calculated as FROM elevation- TO Elevation. All lines were then examined for negative slopes and edited for errors. In addition, segments that intersected contour lines multiple times or segments that intersected contour lines and identical FROM and TO values were dissolved. Finally, a "slope" field was added to the selected NHD stream segments and calculated as (Vertical/ ShapeLength)*100 to give the percent slope. All data sets were edited to contain less than 5% negative or zero slopes as calculated by total stream length. All negative and zero slope values were removed from the data set for later regression analyses. A final processing step involved identifying reaches that were located in tidal river reaches. National Wetlands Inventory (NWI) datasets were used to select and delete reaches that were located in either in estuarine or riverine tidal areas. The final reach dataset included over 148,010 reaches.

Cumulative Drainage Area

The original dataset used to develop the habitat model used Arc Hydro for ArcGIS 9 (version 1.1) and both 10 and 30 meter DEMs to obtain a cumulative drainage area for the downstream end of each reach. Unfortunately, there was not enough processing time to create cumulative drainage areas for almost 150,000 points representing the downstream end of each potential habitat line segment. Instead, cumulative drainage area was calculated where possible for all segments using NHDPlus datasets (http://www.horizon-systems.com/nhdplus/index.php). NHDPlus provides a cumulative drainage area (as well as other attributes such as flow and Strahler stream order) for each reach through a tabular join (through the ComID field) to the flowlineattributesflow.dbf table.

Cumulative drainage area was calculated (in the CumDrnSqKM field) for each potential habitat segment where its original NHDH ReachCode matched the ReachCode of the NHDPlus lines. Each of the matching lines received a MatchCode of 1 for ease of identification throughout processing. All line segments were run through the FLoWs (Colorado State University; v. 9.2) Snap Points to Landscape Network Edges Pre-Processing tool using ArcGIS 9.2 software to assign a reach identifier (rid) and a distance ratio value (ratio) to the centroids of each potential habitat segment. FLoWs snaps each input point within a specified distance to the NHDPlus lines ("Network Edges"), and gives the ratio of the distance that point sits along the NHDPlus reach line from downstream to upstream. To avoid the large number of errors that can occur when the tool snaps points to the lines the downstream TO points were not used as inputs to the tool. Instead, the segments' centroids were substituted. There is a difference in distance between the TO points and the centroids of the same line segments and this process provides only the approximate ratio of the distance of each TO point along the original reach line. Yet, as there are normally several potential habitat line segments within each NHDPlus reach, this process provides a reasonable ratio of the distance for use in calculating cumulative drainage areas.

The next step was to assign catchment areas to each NHDPlus reach through a join to the NHDPlus catchment shapefile via the ComID field. The ratio calculated above was then used to calculate the segments' approximate catchment area, take its inverse, and subtract that from the CumDrnSqKM value for each segment with a MatchCode = 1, but not including any headwater stream segments with a ratio > 0.1 (these segments are generally in smaller catchments that receive the default cumulative drainage area value applied to other segments without matching NHDPlus reaches). A selection was made of all segments of MatchCode = 1 AND CumDrnSqKM = Catchment AND Ratio > 0.1, and all selected records had a new cumulative drainage area field, CumDrain2, calculated = -99 (No Data). The selection was then switched to its reciprocal, and values calculated using the formula:

CumDrain2 = CumDrnSqKM - (Ratio * Catchment)

Next, all records of MatchCode not equal to 1 were selected and calculated = -99. Finally, a new field, DA, was calculated to hold the value of cumulative drainage area in square miles.

Cumulative drainage area for all streams without matching NHDP ReachCodes (MatchCode = -99) were set at a fixed value of one square mile after calculation of sample drainage areas from various watersheds within the SHRUs.

<u>Reach Width</u>

A width for each stream reach was calculated using regional hydraulic geometry curves for Maine rivers based on Dudley (2004) and the cumulative drainage area obtained from the steps outlined above.

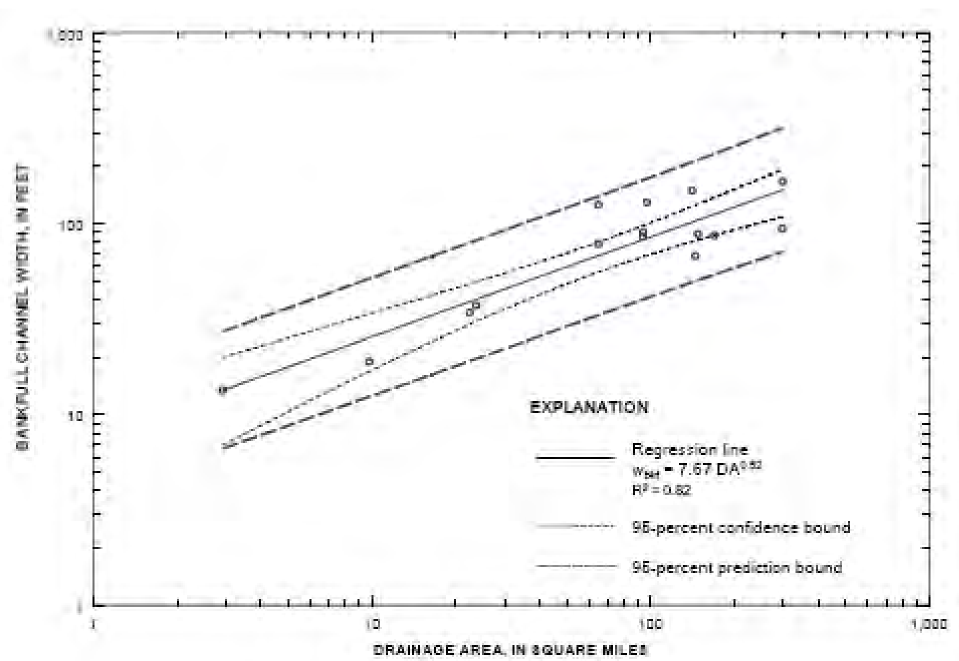

Figure 3: Regional relation of bankfull channel width to drainage area for rivers in coastal and central Maine. [wbkf, channel width associated with the bankfull streamflow; DA, drainage area; R2, fraction of variance explained by regression] (Dudley 2004).

A cursory analysis was undertaken to examine the relationship between predicted bankfull widths and widths measured in the field during habitat surveys. This examination showed that habitat widths were approximately 80% of predicted bankfull widths.

<u>Physiographic Provinces</u>

Maine Atlantic salmon rivers span a diverse set of geologies, climates and elevations. In order to account for these differences we incorporated a physiographic variable into the model. Each river reach was classified by physiographic divisions based on Fenneman, N.M., and Johnson, D.W. (1946).

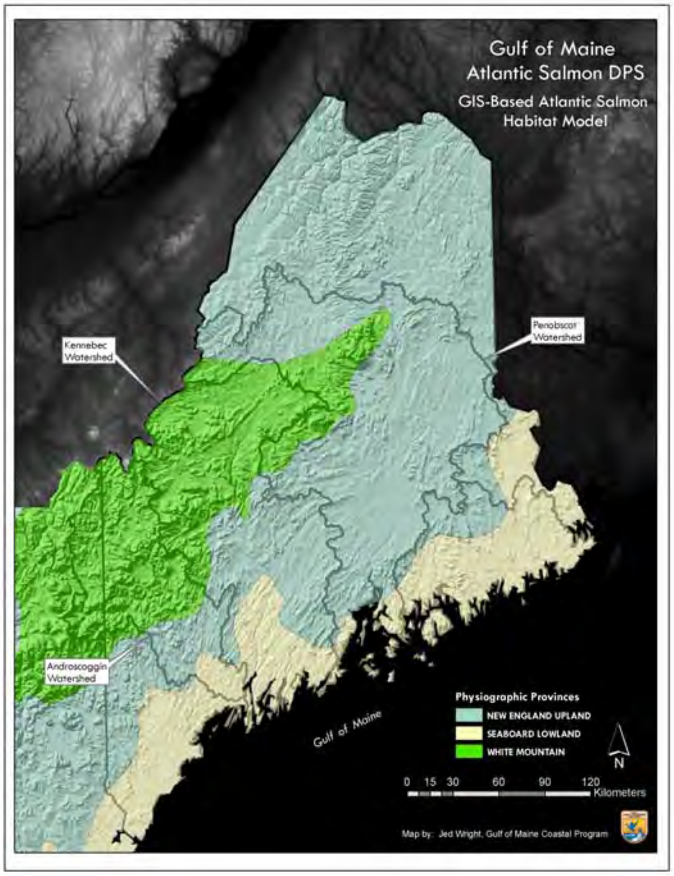

Figure 4: Physiographic provinces included in GIS model.

<u>Final Dataset</u>

The final dataset included the following variables:

Variable	Definition
Unique ID	A unique ID for each stream reach in the SHRU
Source	Elevation source (DEM or contour)
Physiographic Province	Physiographic province from Fenneman
HUC10_Code	USGS HUC 10 code
Length	Length of each reach in meter
Reach Slope	Slope calculated from vertical elevation and reach length
Cumulative Drainage Area	Drainage area in square meters at downstream end of reach
Width	80% of width calculated using regional hydraulic

	geometry curves and cumulative drainage area
Access	N if the reach was not historically accessible to salmon

Regression Tree Analysis

Regression tree analysis is a modern statistical technique that has advantages over classical multiple regression techniques in that there are no assumptions about the error structure of the data and is robust to highly correlated predictor variables (De' Atth and Fabricius 2000). The regression tree is constructed by repeatedly splitting the data into two mutually exclusive groups which are as homogeneous as possible. A group of data is referred to as a node and nodes are further split into additional nodes creating a graphical tree explaining the variability in the data. For numeric predictor variables, the values of a predictor are ranked and trial splits are made moving across all possible division points. The variance of the resulting nodes is calculated and the splitting point which results in the most homogeneous groups (minimized variance) is retained. This process is then repeated for each of the other predictor variables and the best split for any predictor variable is used to perform the actual split on the node. Thus, the optimal split on any given node may be performed by any one of the predictor variables. The regression tree process can result in an overly complex tree as resulting nodes are split further and further. Breiman et al. (1984) recommended *V*-fold cross-validation as a means to find the best single tree for description and predictive purposes.

The computer software DTREG® (Sherrod 2006) was used to build the regression tree describing the variation in percent rearing habitat within a stream reach. A total of 332 stream reaches were used in the analysis. Predictor variables included valley width cumulative drainage, reach slope, and physiographic province. An initial split based on physiographic province was specified in the model because of the apparent differences between streams of different physiographic provinces.

The optimal tree based on *V*-fold cross validation contained predictor variables of physiographic province, cumulative drainage area, and reach slope and explained 73% of the variation in percent rearing habitat (Figure 5). Valley width was dropped from the set of predictors because it provided little additional explanatory power. The final tree contained 12 terminal nodes. In general, there was a tendency for percent rearing habitat to increase with greater slope, but there was also an apparent interaction between reach slope and cumulative drainage area (Figure 5).

This model was then used to predict the percent rearing habitat and absolute amount of rearing habitat in 148,010 reaches throughout Maine rivers. Predictions of percent rearing habitat were made by running the data through the DTREG® software and assigning each reach to one of the terminal nodes of the regression tree. The absolute amount of habitat in a reach was estimated by multiplying the area (length x mean width) of the stream reach by the mean percent rearing habitat of the terminal node. The variance associated with the estimate of rearing habitat equaled the variance of the terminal node (Standard Deviation in Figure 5 squared) multiplied by the $area^2$ of the reach. The total rearing habitat within river basins was estimated by summing estimates of reach habitat and associated variances.

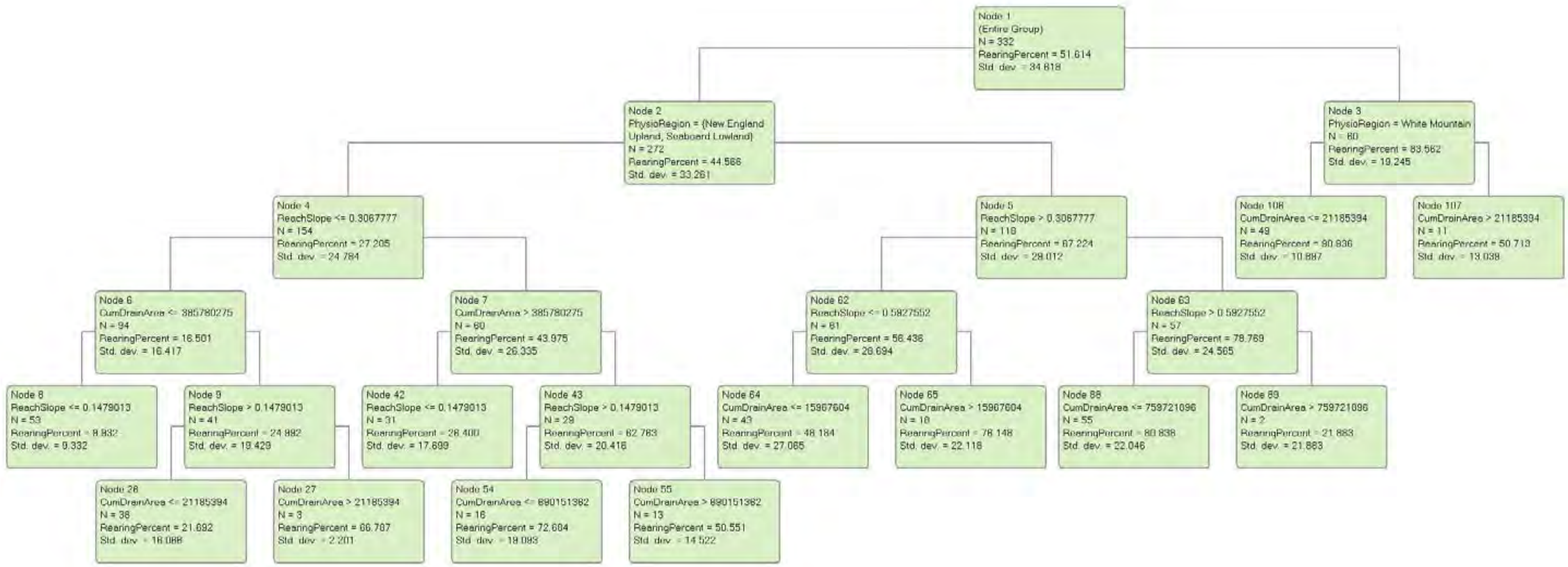

Figure 5: Regression tree model to predict the percent rearing habitat in a steam reach. The model explained 73% of the variation in percent rearing habitat from the 332 reaches used to create the model.

References:

Breiman et al. 1984. Classification and Regression Trees. Wadsworth & Brooks/Cole.

De'ath G, Fabricius KE (2000) Classification and regression trees: a powerful yet simple technique for the analysis of complex ecological data. Ecology 81 (11): 3178–3192

Dudley, Robert W. —Hydraulic-Geometry Relations for Rivers in Coastal and Central Maine—USGS Scientific Investigations Report 2004-5042

Fenneman, N.M. and Johnson, D.W. (1946). Physical Division of the United States. U.S. Geological Survey, scale 1:7,000,000. Available at http://tapestry.usgs.gov/physiogr/physio.html.

EXHIBIT D

Program Account

Program Account

As described in Section IV.G.4 of the Instrument, the Sponsor will establish a financial account dedicated to the Program (Program Account) for the management and administration of funds received from the Transfer of Credits and disbursed to provide Compensatory Mitigation under the Program.

The Program Account will be established at a financial institution that is a member of the Federal Deposit Insurance Corporation. The funds in the Program Account will be invested so as to maximize the safety of the principal amount held by the Sponsor. The Sponsor shall account for the funds so held in accordance with GAAP and will prepare an itemized annual statement that includes a list of the account(s) in operation, and, for each account, the beginning and ending annual balances, investment income earned, and authorized expenditures. The annual statement shall be made available to the public as part of the Annual Report submitted to the USACE.

All interest and earnings from the Program Account will remain in the account for the purpose of providing Compensatory Mitigation for In-Stream Impacts associated with the Transfer of Credits.

The Sponsor shall hold and invest proceeds from Credit sales in a manner consistent with the Sponsor's policies and procedures for the investment of its own funds. Day-to-day investment decisions for the Program Account (including any Sub-Accounts) may be made by the professional investment advisor or financial institution with which the Sponsor has established or will establish an investment advisory relationship. The Sponsor may rely on the advice of any such advisor, and may delegate day-to-day investment decision-making authority, consistent with applicable state and federal law, to such advisor with respect to management of the Program Account (or any Sub-Account). All interest and earnings from the Program Account will remain in the account for the purpose of providing Compensatory Mitigation pursuant to the Instrument.

Sub-Accounts will be established within the Program Account for specified purposes as directed or approved by the IRT. At a minimum, the Sponsor will establish a separate internal Sub-Account for each Service Area. Funds generated by Transfers of Credits will be deposited into the applicable Service Area Sub-Account and disbursed from such Service Area Sub-Account for the development and implementation of approved ILF Mitigation Projects within such Service Area. The Sponsor will credit each Service Area Sub-Account with its share of the net investment income earned.

The IRT may inspect and review Program Account records by providing at least thirty (30) days advance written notice to the Sponsor. When so requested, the Sponsor shall make available for inspection all books, accounts, reports, files, and other records relating to the Program Account.

The percentage of funds the Sponsor may assess and collect as an Administrative Fee from the proceeds from the Transfer of each Advance Credit is fifteen percent (15%).

Funds in the Program Account may be used only for the selection, design, acquisition, implementation, and management in ILF Mitigation Projects, except for the Administrative Fee to be paid to the Sponsor.

EXHIBIT E

Ledgers

The Sponsor will maintain two ledgers, one to track proceeds of Credit sales (mitigation fees) and expenditures (Program Account Ledger), and a second to track Debits and Credits (Credit Ledger). RIBITS will be used to track applicable portions of the ledgers, with additional supplemental information. Both ledgers will be organized by Service Area, and the two will be related to each other. The ledgers will be used to track the source of funding for ILF Mitigation Projects as well as where and how proceeds of Credit sales (mitigation fees) are spent. The Sponsor will compile an annual ledger report for the IRT that will include the Program Account Ledger and a Credit Ledger and be included in the Annual Report submitted to the USACE and USFWS.

Program Account Ledger

The Program Account Ledger will track all proceeds of Credit sales (mitigation fees) and expenditures within the Program. The Program Account Ledger will establish and maintain separate sub-ledgers for each Service Area. The ledger for each Service Area will clearly show the following:

A. Mitigation fee amounts and dates collected for each Credit sale

B. Deposits into and expenditures from the Program Account:

   1. Origin of deposits (permit number(s), location, permittee).
   2. Amount of deposits.
   3. Date of transactions.
   4. Expenditures (ILF Mitigation Project Name(s)).

Credit Ledger

The Credit Ledger for each Service Area will track Advance Credits and Released Credits that are sold, as well as Credits that will be released once ILF Mitigation Projects achieve performance standards. At no point will the ledger for any Service Area have a negative credit balance.

A. The Credit Ledger must include the following information.

   1. Beginning and ending balances of available Advance Credits and Released Credits for each Service Area.

2. Beginning and ending balances of Advance Credits and Released Credits sold for each Service Area.

3. Tracking of aquatic resource functions and services mitigated (Fulfilled Credits) within each Service Area.

4. All Released Credits including date of transactions.

5. All subtraction of Credits including permit numbers and date of transactions.

6. Any other changes in Credit availability (e.g., additional Credits released, Credit sales suspended).

B. The Credit Ledger will contain basic information about the projects for which Credits were sold and each ILF Mitigation Project.

EXHIBIT F

Compensation Planning Framework

Element 1: Geographic Service Areas

In 2009, NOAA-NMFS used HUC 10 (level 5) watersheds to identify specific areas to include as critical habitat because this scale accommodates the local adaptation and homing tendencies of Atlantic salmon. The HUC 10 level provides a framework to reasonably aggregate occupied river, stream, lake, and estuary habitats that contain the physical and biological features essential to the conservation of the species. Many Atlantic salmon populations within the GOM DPS are currently managed at the HUC 10 watershed scale, which corresponds well to Atlantic salmon biology and life history characteristics.

The strong homing characteristics of Atlantic salmon allow local breeding populations to become well adapted to a particular environment, while at the same time, limited straying does occur as a means to ensure population diversity and also allow for population expansion and recolonization of extirpated populations (USFWS/NOAA 2016). To accommodate these life history characteristics, NOAA-NMFS established a geographic framework represented by three Salmon Habitat Recovery Units, or SHRUs that "would be reasonably protective of these life history characteristics and to ensure that Atlantic salmon are widely distributed across the DPS to provide protection from demographic and environmental variation" (NOAA 2009). Each SHRU is an aggregate of several HUC10 watersheds. A total of 87 HUC 10 watersheds define the geographic area of the Gulf of Maine Distinct Population Segment, which corresponds to the historical range of the species.

The area served by the ASRCP includes all three SHRUs delineated and described in the "Biological valuation of Atlantic salmon habitat within the Gulf of Maine Distinct Population Segment" (NOAA 2009). The three SHRUs are Downeast Coastal, Merrymeeting Bay, and Penobscot Bay. These units respond to life history needs and the environmental variation associated with freshwater habitats. The three SHRUs are described below, with information excerpted from the NOAA-NMFS 2009 document. Each SHRU is a service area under the ASRCP Instrument.

Element 1.1 Downeast Coastal SHRU

<u>Geography</u>
The Downeast Coastal SHRU encompasses 14 HUC 10 watersheds covering approximately 1,852,549 acres within Washington and Hancock Counties in Eastern Maine. Within this SHRU there are several watersheds actively managed for Atlantic salmon including the Dennys, Machias, East Machias, Pleasant, Narraguagus, and Union rivers. As a complex, these rivers are typically small to moderate sized coastal drainages in the Laurentian Mixed Forest Province ecoregion (Bailey 1995). This commonality of zoogeographic classification makes coarse level descriptions of watersheds very similar between the

rivers. The watersheds of the Downeast Coastal SHRU are best known for containing five watersheds with extant Atlantic salmon populations.

Geology and climate

The surficial geology of Maine largely consists of sand, gravel and unconsolidated sediments transported and deposited by glaciers (Marvinney and Thompson 2000). The geology within the Downeast Coastal SHRU and the geology to the north and west can be separated by a line running from the Penobscot River near Winterport, ME northeast towards Topsfield, ME (Norumbega Fault). North and west of this line the rocks are mostly derived from former marine sediments with some rocks containing a fraction of carbonate minerals. The rocks south and east of this line (the vast majority of the Downeast Coastal SHRU) are derived from volcanic and more recent intrusive igneous rocks. These rocks differ in their chemistry (especially calcium, magnesium, aluminum, and iron) and resistance to erosion or dissolution (Surficial Geologic Map of Maine 1985) when compared to rocks north and west of this line. As a result of the geology within the Downeast Coastal SHRU, surface water chemistry may be affected in several ways. Rocks, such as those present south and east of the Norumbega fault, weather slowly and produce relatively fewer ions per unit time (i.e., less calcium, magnesium) under similar conditions of hydrology than those present north and west of the fault. In addition, the mantle of marine clay or wetland within the Downeast Coast SHRU may hydrologically isolate bedrock or till from weathering. Therefore, surface waters within this basin have naturally low concentrations of major cations derived from chemical weathering, and experience a relatively high influence of vegetation on ion and nutrient chemistry.

Climate in the Downeast Coastal SHRU exhibits four seasons with mild summers and cold winters. Average annual air temperatures across Maine range from 4 – 7.3^{o}C and average precipitation ranges from 95 – 112 cm/year (NOAA - National Climate Data Center). As a result, the Downeast Coastal SHRU lies within the Laurentian Mixed Forest ecoregion, which is described as transitional zone between broadleaf deciduous and boreal forest (Bailey 1995). The basin is largely characterized by rolling hills with forested stream valleys and a number of barren areas with ground cover typically consisting of shrubs, including blueberries. The headwaters are composed mostly of hills and ridges, with forests of spruce, fir, and hardwoods. (Dube and Jordan, 1982; Beland et al., 1982a; Fletcher et al., 1982; Baum and Jordan, 1982). Dissolved organic carbon originating from decomposing organic material on stream banks and within bogs discolor many of the rivers and streams within the basin (Fletcher et al., 1982; Dube and Jordan, 1982; Johnson and Kahl, 2005).

Hydrology

The Downeast Coastal SHRU is composed of six major watersheds that have substantial potential for Atlantic salmon production. The Downeast Coastal SHRU is heavily forested with low relief rolling topography. The relatively recent glacial activity of river systems along coastal Maine has resulted in stream beds that typically contain bedrock and large boulders (Dudley, 2004). Unlike alluvial systems in other regions of the U.S. that are largely unregulated with routinely adjusting meandering stream corridors and channel slopes according to the size of the drainage and the amount of water and sediment transported through the system, coastal Maine systems appear to be largely bedrock controlled limiting stream channel mobility and sediment transport (Dudley, 2004). Stream flows are typically largest in late winter (March – April) and spring (May – June) given the combination of melting snow, spring rains and saturated soils (Dudley, 2005; Johnson and Kahl, 2005). Stream flows recede throughout the summer as the snow pack melts and evapotranspiration increases, conveying flows that are dominated by surface runoff in the winter and spring to flows that are dominated by ground-water discharge (Dudley, 2005). During the fall, evapotranspiration decreases followed by an increase in precipitation and occasional hurricane related events that can result in high flows (Dudley, 2005). During the winter (December – February) stream flows are often low, as both precipitation and surface waters are frozen for extended periods (Dudley, 2005).

<u>Current population structure and land use</u>

Washington and Hancock County have a population of approximately 55,000 people with a density of roughly 32.6 persons per square mile. Over 90 percent of the population living within Washington and Hancock Counties is located within five miles of the coast (Downeast RCD). Machias (pop. 2,353) and Calais (pop. 3,447) are the two major population centers in Washington County. Ellsworth (pop. 6,456), Bucksport (pop. 4,908) and Bar Harbor (pop. 4,820) are the three major population centers in Hancock County (U.S. Census of Population and Housing, 2000).

Today, approximately 89 percent of the Downeast Coastal SHRU is forested and supports a large wood, paper, and lumber industry. However, there are no paper mills located within the Downeast Coastal SHRU. Downeast Maine is also known for its wild blueberries with approximately 16,192 ha of land in wild blueberries (USDA, 2002) supporting Maine as the world's largest producer of wild blueberries (Yarborough, 1998).

Element 1.2 Penobscot Bay SHRU

<u>Geography</u>

The Penobscot Bay Salmon Habitat Recovery Unit includes the entire Penobscot basin and extends west as far as, and includes the Ducktrap River watershed, and east as far as, and includes the Bagaduce River watershed. The Penobscot basin is the largest river basin in Maine and the second largest in New England. The river drains a 22,225,200 ha (22,252 km$^{2)}$) watershed, roughly one-quarter of the state's land area, that occupies sections of Aroostook, Hancock, Penobscot, Piscataquis, Somerset, Waldo, and Washington counties (Baum 1983).

Geology and climate

The Penobscot lies mostly within the Laurentian Mixed Forest ecoregion, which is described as a transitional zone between broadleaf deciduous and boreal forest (Bailey, 1995). Portions of the West Branch lie within the New England Mixed Forest ecoregion, which is primarily composed of a transitional forest between boreal spruce-fir to deciduous forest with vertical vegetation zonation (Bailey, 1995).

The geology of the Penobscot Bay SHRU, like the rest of Maine, is a variable mixture of landforms resulting from numerous mountain-building and glacial events. The Penobscot SHRU ranges from non-erosive granite and rhyolite mountains in the headwaters to flat, expansive glacial moraines that are interspersed with some of the longest eskers in the world (Caldwell, 1998). Consequently, channels of the Penobscot SHRU range from high gradient channels in the headwaters to low gradient channels dominated by fine sediment in the forested lowlands. Along the main tributaries of the lower Penobscot are extensive, flat areas where the ocean invaded the land after the glaciers retreated, forming a layer of marine silt and clay that became the bottom layers of today's bogs and fens (Davis and Anderson, 2001). Sunkhaze Meadows, Alton Bog, and Caribou Bog are examples.

The West Branch originates on the Maine-Quebec border near Sandy Bay Township and Penobscot Lake, in mountainous terrain 520-550 meters above sea level (Baum, 1983). The East Branch begins at East Branch Pond, northwest of Baxter State Park, in a lakefilled region 300 meters above sea level. The mainstem of the river begins at the confluence of the East and West Branches at Medway and flows to Stockton Springs/Castine, where it opens up into Penobscot Bay.

Hydrology

The Penobscot watershed is comprised of several sub-basins. Water flow in the Penobscot River basin varies seasonally, with high flows in early spring and late fall and low flows generally in the summer and early fall. The great extent of wetland in the Penobscot watershed (almost one-third of the watershed; Jackson *et al.,* 2005) soaks up water when it rains and slowly releases it to rivers and groundwater, with the ultimate effect of moderating fluctuations in the river's flow.

Flows are also regulated by numerous dams and impoundments, which have a combined capacity of about 1.5 billion m^3 (Stewart *et al.,* 2006). The U.S. Geological Survey (USGS) maintains monitoring stations on the lower Penobscot at Eddington and West Enfield. The 102-year average flow at West Enfield is 334 cubic meters per second (m^3/s); the highest flow on record was 4,333 m^3/s in May 1923. The lowest flow on record was 46.2 m^3/s in October 1905 (Stewart *et al.,* 2006). Average annual discharge of the Penobscot River near the point of tidal influence is 402 cubic meters per second (Jackson *et al.,* 2005).

Current population structure and land use

Today, most of the Penobscot SHRU is sparsely populated, with the greatest proportion of the population being south of Old Town. Bangor, the largest urban center in the watershed, has a population of approximately 32,000 (U.S. Census of Population and Housing, 2000). Development issues are likely to grow in importance as residential development is predicted to increase in over 121,400 ha of the Lower Penobscot watershed in the next few decades (Stein *et al.,* 2005).

Today, the Penobscot SHRU is over 90 percent forested, including forested wetlands which comprise approximately one third of the drainage (Jackson *et al.,* 2005). The upper Penobscot is predominantly spruce-fir forest and the lower is a mix of spruce-fir, pine, and maple-beech-birch stands (Bailey, 1995). The extensive private forests in northern portions of the drainage have experienced dramatic change in silvicultural harvest and ownership over the past two decades (Irland, 2000; McWilliams *et al.,* 2005). Silviculture techniques have shifted away from clear-cutting and land ownership has shifted from large industrial forest parcels to smaller fragmented ownership (e.g., Field *et al.,* 1994). Approximately five percent of the Penobscot is in agricultural use (Houtman, 1994). The 55,700 ha Kenduskeag Stream watershed is the most intensively farmed watershed in the Penobscot River basin. There are over 100 farms raising sheep, goats, dairy and beef cattle, and growing potatoes, beans, and other crops (PCSWCD 2005). Other agricultural land uses are along the eastern edge of the East Branch watershed in southern Aroostook County and the Piscataquis sub-basin.

Element 1.3 Merrymeeting Bay SHRU

Geography

The Merrymeeting Bay SHRU extends west as far as, and includes the Androscoggin River watershed, and east as far as, and includes the St. George River watershed. The Kennebec River, the largest watershed in the SHRU, flows 233 km from Moosehead Lake to Merrymeeting Bay where it joins with the Androscoggin River (Maine DEP, 1999) and flows another 32 km out to the Atlantic Ocean (Reed & Sage, 1975). The Kennebec watershed drains a land area of 3,771,520 acres, constituting approximately one-fifth of the total land area of Maine occupying much of Somerset and Kennebec County and portions of Franklin, Penobscot, Waldo, Sagadahoc, and Androscoggin Counties (MSPO, 1993).

The Androscoggin River flows 277 km from Umbagog Lake to Merrymeeting Bay, and drains approximately 2,208,000 acres (Maine DEP, 1999), occupying much of Oxford and Androscoggin Counties and portions of Kennebec, Franklin, and Cumberland Counties in Maine. The Androscoggin also occupies a portion of Coos County, New Hampshire.

The small coast drainages east of Small Point include the Sheepscot, Medomak and St. George Rivers. These drainages drain approximately 672,127 acres, or roughly 10 percent of the entire Merrymeeting Bay SHRU and occupy much of Knox and Lincoln Counties as well as portions of Waldo and Kennebec County.

Geology and climate

The Merrymeeting Bay SHRU south and east of a line extending from roughly Fryeburg to Livermore Falls and onward to Skowhegan lies within the Laurentian Mixed Forest ecoregion, which is described as a transitional zone between the broadleaf deciduous and boreal forests (Bailey, 1995). This region has moderately long winters with a frost-free season that lasts roughly 100 to 140 days, and moderate precipitation ranging from 61 to 115 cm a year (Bailey, 1995). Average annual precipitation in the Kennebec watershed is 106 cm. However there is a rain shadow from the White Mountains that affects the region from the Moosehead Lake watershed west to Jackman and the river corridor between Skowhegan and Waterville. In the rain shadow the average annual precipitation is below

97 cm (U.S. Fish & Wildlife Service, 1989). North and west of the line, the Merrymeeting Bay SHRU lies within the New England Mixed Forest ecoregion, which is primarily composed of a transitional forest between boreal spruce-fir to deciduous forest with vertical vegetation zonation (Bailey, 1995). The climate within this region can be characterized by well-defined summer maximum temperatures indicative of the dominating tropical air masses during the summer and winter minimum temperatures dominated by continental-polar air masses during the winter (Bailey, 1995). The average-frost free period for this region is approximately 100 days.

The geology of the Merrymeeting Bay SHRU is heterogeneous, including subcatchments that are typical and atypical of the GOM DPS. In general, Maine's landscape is a result of mountain building in the middle Devonian period followed by a long period of erosion and recent glaciation, and deposition of related deposits, which primarily include till and marine clay, with sand and gravel deposits in many of the valleys. More specifically, the Merrymeeting Bay SHRU is comprised of two general regions; highlands and lowlands. The upper portion of the Merrymeeting Bay SHRU, including the upper half of the Androscoggin Basin mostly north and west of Livermore Falls and the upper third of the Kennebec Basin mostly north and west of Bingham, is considered to be a high elevation (150 – 300 meters) mountainous region. This portion of the basin is comprised of the Appalachian Mountain belt, a region which borders the Atlantic Ocean. The bedrock of this region consists of a combination of gneiss and schist, and various granite plutons (Simplified Bedrock Geologic Map of Maine, 2002). The presence of these high elevation areas within the upper Kennebec and Androscoggin watersheds distinguishes the majority of the Merrymeeting Bay SHRU from much of the Penobscot and downeast Maine coastal basins. The high elevation areas of Maine are generally well-drained, resulting in lower dissolved organic carbon and low concentrations of dissolved aluminum. Dissolved organic carbon in surface waters plays several significant roles in water chemistry, causing lowered pH but adding buffering capacity at the ambient pH, increasing dissolved aluminum and iron, but reducing the toxic effects of much of the dissolved aluminum. Thus, dissolved organic carbon has both positive and negative effects on aquatic organisms (Steve Norton, Personal Communications, January 2008).

The "lowland" portion of the Merrymeeting Bay SHRU, including the Sheepscot, Medomak and St. George watersheds, consists of coastal lowlands that were depressed by the Laurentide ice sheet, which receded from the area about 15,000 to 10,000 thousand years ago. Following the retreat of the glacier margin, much of coastal Maine extending inland up to as much as about 100 miles from the present coast was submerged below sea level for up to a few thousand years (Caldwell, 1998). During that time, glacial marine silt and clay were deposited along many of the river valleys and lowlands of coastal Maine (Surficial Geologic Map of Maine, 2003). Today, much of Maine's coastal region has low relief with rolling hills (Bailey, 1995). Common features of the coastal region include moraines, drumlins, eskers, and outwash plains, all of which are typical features of the glaciated region (Bailey, 1995). Much of the bedrock geology throughout this lowland region is comprised of calcareous marine shale and calcareous gneiss and schists, as well as non-calcareous marine sandstone and slate (Simplified Bedrock Geologic Map of Maine, 2002). Bedrock throughout this area typically has a higher chemical weathering rate, and surface waters have higher calcium than in the granite dominated areas, and they dominate in the downeast Maine coastal basin and portions of the Appalachian Mountain belt in western Maine. The higher weathering rates and higher calcite concentrations within the bedrock material, in combination with the glacial marine clay, provide greater opportunity for phosphorous release, and thereby result in potentially more productive surface waters in the lower Kennebec and Androscoggin watersheds than those waters east of the Penobscot.

Hydrology

The Merrymeeting Bay SHRU includes two major basins - the Kennebec and Androscoggin, each of which has numerous sub-basins, and three major coastal watersheds outside of the Kennebec and Androscoggin basins, which include the Sheepscot, Medomak and St. George watersheds.

In the Kennebec basin, historically important tributaries for Atlantic salmon included the Dead River, Carrabasset River and Sandy River (Atkins and Foster, 1867), which are generally characterized as high elevation tributaries that are dominated by rapids, riffles and the occasional falls with a substrate composed of boulders, cobble, and gravel. The lower Kennebec tributaries, including Messalonskee Stream which flows out of the Belgrade Lakes, and the Sebasticook River, which incorporates China Lake, Unity Pond, Moose Lake and Sebasticook Lake, were less important for Atlantic salmon spawning and rearing, yet the Sebasticook drainage was considered first rate by Atkins and Foster (1867) for production of alewives and shad.

The Androscoggin River originates at Umbagog Lake near Errol, New Hampshire and flows roughly 260 km past several towns including, Rumford, Dixfield, Jay, Livermore Falls, and

Brunswick as well as the city of Lewiston-Auburn (Maine DEP, 1999). The upper portions of the Androscoggin, like the Kennebec, are high gradient. The Androscoggin River drops over 305 meters from its headwaters to where it meets the sea, with an average gradient of 3.9 meters per km. In the Androscoggin watershed, Rumford Falls was the upper extent of Atlantic salmon migration, while Lewiston Falls was believed to be the upper extent of alewife and shad migrations (Atkins and Foster, 1887). The Little Androscoggin River is the largest major sub-basin of the Androscoggin with historically important salmon habitat that was accessible as far up as Snow's Falls located 3.2 km outside of West Paris (Foster and Atkins, 1867). Prior to its damming, the Androscoggin River provided access to a large and diverse aquatic habitat for great numbers of diadromous and resident fish species (Foster and Atkins, 1867).

The Kennebec River itself originates at Moosehead Lake and falls about 312 meters over a distance of 193 km from its point of origin to Augusta, Maine, averaging a gradient of 4.1 meters per km (MSPO, 1993). Moosehead Lake has two outlets which form the beginnings of the Kennebec River: the East Outlet and West Outlet which converge at Indian Pond – the impoundment to the Harris Dam hydroelectric facility. With the exception of the Harris Dam impoundment, the upper third of the Kennebec River from Moosehead Lake to Wyman Dam is high gradient rocky riffles and rapids with intermittent pools, incorporating a section of river which is known as the Kennebec Gorge (MSPO, 1993). Foster and Atkins (1868) describe a set of falls with a 4.3 meter vertical drop that was roughly 232 km from where the Kennebec entered the sea, putting the fall in the vicinity of what is now Harris dam. Foster and Atkins (1868) believed that these falls represented the upper extent of the Atlantic salmon migration. Though the falls are approximately 0.6 meters shorter in height then Carratunk Falls (now the site of Williams Dam), the lack of a plunge pool below the falls prevented salmon from passing.

From Wyman Lake, the Kennebec River flows 13.5 km to Williams Dam in the town of Solon, Maine. Williams Dam sits on top of what was known as Carratunk Falls. Of the 13.5 km of river above Williams Dam, the lower 6.8 km make up a shallow impoundment ranging from 0.9 – 4.6 meters in depth in which flow characteristics are more similar to riverine environment rather than lacustrine environment due to its high flushing rate (MSPO, 1993). From Solon, the Kennebec River flows roughly 22.5 km to the Madison Dam – the first dam above the confluence of the Sandy River. The topography through this stretch becomes less hilly and the river channel becomes alluvial and braided with stretches of meandering deadwaters with intermittent gravel bars and associated riffles.

Downstream from the Madison Dam, the river become more or less a series of reservoirs as it passes through the Weston Dam, Shawmut Dam, Hydro-Kennebec Dam and Lockwood – the lower- most dam in the Kennebec River. From Lockwood, the Kennebec flows approximately 64 km into Merrymeeting bay where the Kennebec River converges with the Androscoggin River. This stretch of river consists of long stretches of deadwater with intermittent stretches of riffles created by sand and gravel deposits.

The Sheepscot and St. George Watersheds lie easterly of the Kennebec basin and can be generally characterized as low gradient rivers with deadwaters and shallow pools with intermittent stretches of low gradient riffles and runs.

Current population structure and land use

Most of the human population within the Merrymeeting Bay SHRU is found in the lower portions of the Androscoggin and Kennebec Basins. Major population centers include Lewiston/Auburn (combined population of ~28,000) along the Androscoggin River in Androscoggin County; and Augusta (pop. 18,500) and Waterville (pop. 15,600) found along the Kennebec River in Kennebec County (U.S. Census of Population and Housing, 2000). Moving north and west out of Kennebec and Androscoggin Counties, population densities decline significantly. Kennebec and Androscoggin Counties have population densities of approximately 52 and 85 persons per square km respectively; while Oxford, Franklin and Somerset Counties, to the north and west, have population densities of 10, 7 and 5 persons per square km.

Today roughly 85 to 90 percent of the Kennebec and Androscoggin basins are still in forest land with forest products still being an important component of the SHRUs economy (McWilliams *et al.,* 2003). The paper industry dominates the manufacturing sector of Maine's forest- based economy with nine pulp and paper mills across the state (North East State Foresters Association, 2007), of which four (not including one in New Hampshire) are found within the Merrymeeting Bay SHRU. Three paper mills are situated along the Androscoggin River in Berlin, New Hampshire, Rumford and Jay, Maine; and two are found along the Kennebec River in Madison and Skowhegan, Maine.

Element 2: Description of Threats to Atlantic Salmon

The following primary and secondary threats to Atlantic salmon, excerpted from the "Draft Recovery Plan for the Gulf of Maine Distinct Population Segment of Atlantic Salmon (*Salmo salar*)" (USFWS/NOAA 2016), are those upon which the 2009 federal endangered species listing for the expanded Atlantic salmon Gulf of Maine Distinct Population Segment was based (74 Fed. Reg. 29344 (June 19, 2009)), and which continue to affect its survival and recovery. Additionally, the new and emerging threats of road and stream crossings, and climate change are detailed below.

Dams

Dams significantly impede migration pathways and increase direct and indirect mortality of Atlantic salmon. Within the range of the GOM DPS, dams hinder access to much of the suitable habitat that was historically available, and hydroelectric turbines cause significant mortality to kelts and smolts as they migrate past dams on their journeys to the ocean. Dams also create impoundments that inundate formerly free-flowing rivers, reduce water quality, and change fish and other aquatic species' community composition;

delay migration of smolts and adults; change thermal regimes; alter natural flow regimes; and negatively affect diadromous fish upon which salmon depend.

Inadequate regulatory mechanisms related to dams

Inadequacy of regulatory mechanisms is a concern for both hydroelectric and non-hydroelectric dams within the GOM DPS in terms of providing fish passage necessary for Atlantic salmon survival. Many of the Federal Energy Regulatory Commission's (FERC) rulings and regulations and State policies and regulations have proved to be ineffective at producing the necessary fish passage, or have not been adopted. Most dams within the range of the DPS do not contribute to generation of electricity, are typically small, and do not have fish passage, and many are no longer fully functioning or in use. Overall, the inadequacy of existing regulatory mechanisms relating to dams is a significant threat to the GOM DPS.

Marine survival

Low marine survival continues to be one of the most important factors, for the continued low population number for the GOM DPS and for Atlantic salmon throughout the North Atlantic, despite significant reductions in commercial intercept fisheries. Marine survival is indexed by smolt return rates; a smolt return rate is the ratio of the number of adult returns produced by a smolt cohort to the number of outmigrating smolts (number of naturally reared smolts and/or the number of stocked hatchery smolts).

The 2009 listing rule also mentioned a number of secondary stressors that collectively threaten the continued existence of the GOM DPS of Atlantic salmon. These factors are summarized below.

Habitat Complexity

Some forest, agricultural, and other land use practices have reduced habitat complexity within the range of the GOM DPS of Atlantic salmon. Reduced habitat complexity acts as a stressor on the GOM DPS by reducing spaces for hiding from predators and increasing water temperature. Large wood and boulders are currently lacking from many rivers because of historical timber harvest practices. When present, large wood and boulders create and maintain a diverse variety of habitat types. Large trees were harvested from riparian areas; this reduced the supply of large wood to channels. In addition, any large wood and boulders that were in river channels were often removed in order to facilitate log drives. Historical forestry and agricultural practices were likely the cause of currently altered channel characteristics, such as width-to-depth ratios (i.e., channels are wider and shallower today than they were historically). Channels with large width-to-depth ratios tend to experience more rapid water temperature fluctuations, which are stressful for salmon, particularly in the summer when temperatures are warmer.

Water Quantity

Direct water withdrawals and groundwater withdrawals for crop irrigation and commercial and public use can directly impact Atlantic salmon habitat by depleting stream flow. Reduced stream flow can reduce the quantity of habitat, increase water temperature, and reduce dissolved oxygen. The cumulative effects of individual water withdrawal impacts on Maine rivers is poorly understood; however, it is known that adequate water supply and quality is essential to all life stages and life history behaviors of Atlantic salmon, including adult migration, spawning, fry emergence, and smolt emigration.

Water Quality

Maine's water quality classification system provides for different water quality standards for different classes of water. These standards were not developed specifically for Atlantic salmon, and the lower quality standard classes may not provide high enough water quality to protect all life stages of Atlantic salmon.

Fish Harvest

Intercept fisheries, by-catch in recreational fisheries, and poaching result in direct mortality or cause stress, thus reducing reproductive success and survival of Atlantic salmon. Although international commercial harvest has been highly restricted since 2002, this issue has reemerged as a growing concern (see New and Emerging Threats below). Recreational angling of many freshwater species occurs throughout the range of the GOM DPS, and the potential exists for the incidental capture and misidentification of both juvenile and adult Atlantic salmon. Direct or indirect mortality as a result of injury or stress may result even in fish that are released.

Disease Outbreaks

Disease outbreaks, whether occurring in the natural or hatchery environment, have the potential to cause negative population-wide effects. Atlantic salmon are susceptible to numerous bacterial, viral, and fungal diseases. Parasites can also affect salmon. Federally managed conservation hatcheries adhere to rigorous disease prevention protocols and management regulations designed to prevent the introduction of pathogens into the natural and hatchery environments; prevent and control, as necessary, disease outbreaks in hatchery populations; and prevent the inadvertent spread of pathogens between facilities and river systems.

Predation

The impact of predation on the GOM DPS is important because of the imbalance between the low numbers of adults returning to spawn and the increase in population sizes of both native and nonnative predators. Increased numbers of predators (e.g., river otters, piscivorous birds, and striped bass) combined with decreased abundance of alternative prey (prey buffering) have likely increased predation mortality on juvenile Atlantic salmon, especially at the smolt life stage.

Depleted Diadromous Communities

Damming rivers, thus preventing migration to former spawning grounds, was a major factor in the decline of Atlantic salmon, and much of the co-evolved suite of diadromous fish including alewife (*Alosa pseudoharengus*), American shad (Alosa sapidissima), blueback herring (*Alosa aestivalis*), rainbow smelt (*Osmerus mordax*), and sea lamprey (*Petromyzon marinus*). Many coevolved diadromous species have experienced dramatic declines throughout their ranges, and current abundance indices are fractions of historical levels. The dramatic decline in diadromous species has negative impacts on Atlantic salmon populations, including depletion of an alternative food source for predators of salmon, serving as food for juvenile and adult salmon, nutrient cycling, and habitat conditioning. These impacts may be contributing to decreased survival in lower river and estuarine areas; further, although the impacts do not occur in the open ocean, the demographic impact to the species occurs after smolt emigration, and is thus a component of the marine survival regime.

Artificial Propagation

The conservation hatchery programs at Craig Brook and Green Lake National Fish Hatcheries (CBNFH and GLNFH) are vital to preserving individual and composite genetic stocks until freshwater and marine conditions improve, allowing for greater abundance of wild salmon. Without hatchery production, the likelihood of imminent extinction would be substantially higher, and it is also important to know that hatchery salmon are protected as part of the GOM DPS. Nonetheless, inherent risks associated with the broodstock and stocking program for the DPS include domestication and loss of genetic variability, along with the potential for catastrophic loss due to the limited number of hatcheries maintaining GOM DPS Atlantic salmon. To mitigate these risks, a broodstock management plan has been implemented with the goal of maintaining genetic diversity throughout the hatchery management process, including estimating genetic diversity for each captive broodstock

Aquaculture

Concerns about aquaculture continue, including the risk of exposing native salmon to serious salmon pathogens and genetic and ecological risks. Although recent advances in containment and marking of aquaculture fish offer more control over the potential for negative impacts, they do not eliminate the risk aquaculture fish pose to wild Atlantic salmon.

Competition

Prior to 1800, the resident riverine fish communities in Maine were made up of native species. Today, Atlantic salmon coexist with a diverse array of nonnative resident fishes, including brown trout, largemouth bass, smallmouth bass, and northern pike. The range expansion of these nonnative species is of particular concern, because they often require similar resources and can exclude salmon from preferred habitats, reduce food availability, and increase predation.

New and Emerging Threats

In addition to the threats identified at the time of listing, the 2016 draft Recovery Plan provides additional information on two stressors causing growing concern due to their effects on Atlantic salmon in the Gulf of Maine:

<u>Road and Stream Crossings</u>
Together with dams, lack of access to suitable freshwater habitat due to road stream crossings has become a major concern with regard to recovery of the GOM DPS of Atlantic salmon. The amount of accessible freshwater habitat is a fraction of historical levels; this was initially caused by building dams and later by road stream crossings that created barriers to upstream migration. Fish passage barriers continue to prevent fish from reaching essential spawning and rearing habitat. These barriers also impair ecological complexity and increase the salmon's vulnerability to higher rates of extinction from demographic, environmental, and genetic stochasticity.

<u>Intercept Fisheries</u>
Commercial fisheries for Atlantic salmon within the United States have been closed since 1947; however, small but significant fisheries continue within the species' migratory corridor off the coast of Canada and Greenland. To effectively engage in issues requiring international collaboration, the United States maintains a presence at the North Atlantic Conservation Organization (NASCO) and International Conference for the Exploration of the Seas (ICES). The United States is a signatory to the "Convention for the Conservation of Salmon in the North Atlantic Ocean" which entered into force in October 1983, creating NASCO to ensure that the burden of Atlantic salmon conservation was shared by both States of Origin and Distant Water Countries. Intercept fisheries (adult fish captured in nets while in transit to or from their feeding grounds in the North Atlantic or on their feeding grounds in the North Atlantic) have posed a significant challenge to recovery of the GOM DPS. Among distance water fisheries, the West Greenland fishery intercepts the greatest number of U.S. origin fish. Other fisheries where U.S. origin fish are harvested include the St. Pierre and Miquelon fishery located off the coast of Newfoundland, and a subsistence fishery that occurs in Labrador, Canada.

<u>Climate Change</u>
At the time of listing in 2009, there was reasonable certainty that climate change was affecting Atlantic salmon in the GOM DPS (e.g., National Research Council, 2004; Fay, et al., 2006), but there was uncertainty about how and to what extent. Since listing, new and emerging science has led to a better understanding of climate change effects and its impact on salmon. Recent information indicates that climate change is having significant impacts on the habitats that Atlantic salmon depend on and, in turn, is affecting the overall survival and recovery of Atlantic salmon (Mills et al., 2013).

Briefly, climate change can affect all aspects of the salmon's life history by altering habitat features through increases in sea surface temperatures. Global averaged temperature combined with land and ocean surface temperatures show a warming trend. Although these temperature changes seem subtle, they are associated with changes in the seasonal cycles of phytoplankton, zooplankton, and fish populations in the marine environment (Greene & Pershing, 2007). Subtle increases in global temperature are also associated with changes in freshwater hydrologic regimes; and alterations in the timing and frequency of river ice flows (Dudley & Hodgkins 2002). All of these factors influence environmental cues that stimulate Atlantic salmon migration, spawning, and feeding activities. The ILF program will help offset a wide range of impacts resulting from the threats listed above. Element 5 below includes a list of potential mitigation project types that may be eligible for mitigation funding through the ASRCF, which respond directly to threats to Atlantic salmon and their habitat.

Element 3: Analysis of Historic Aquatic Resource Loss

The section below contains information sourced primarily from NOAA's 2009 Critical Habitat rule:

Atlantic salmon habitat

Today, only 8% of the habitat within the historical range of the DPS is fully accessible to Atlantic salmon (no artificial barrier between habitat and the ocean). Another 17% is considered accessible (includes areas where dam or culvert designs allow fish passage). 9% of the remaining 75% habitat is considered impeded (above a barrier that temporarily blocks or impairs passage) and 66% is considered completely inaccessible (NOAA 2015).

The Downeast Coastal SHRU once contained high quality Atlantic salmon habitat in quantities sufficient to support robust Atlantic salmon populations. Degradation of habitat and the construction of dams have diminished both habitat quality and availability. In the Downeast Coastal SHRU, there are approximately 61,400 units of historical spawning and rearing habitat for Atlantic salmon among approximately 6,039 km of rivers, lakes and streams. Of the 61,400 units of historical spawning and rearing habitat, approximately 53,400 units of habitat are considered to be currently occupied (NOAA 2009).

In the Penobscot SHRU, there are approximately 323,700 units of historically accessible spawning and rearing habitat for Atlantic salmon among approximately 17,440 km of rivers, lakes and streams. Of these, approximately 211,000 units of habitat are considered to be currently occupied (NOAA 2009).

In the Merrymeeting Bay SHRU, there are approximately 372,600 units of historically accessible spawning and rearing habitat for Atlantic salmon located among approximately 5,950 km of historically accessible rivers, lakes and streams. Approximately 136,000 units of habitat are considered to be currently occupied (NOAA 2009).

Dams and Other Barriers

Historically, dams were a major cause of the decline of Atlantic salmon runs in many Maine rivers and streams. Dams, along with degraded substrate and cover, water quality, water temperature, and biological communities have reduced the quality and quantity of habitat available to Atlantic salmon populations within the three SHRU's. As of 2015, a total of 460 dams existed within the DPS watersheds, including 245 in the Merrymeeting Bay SHRU, 139 in the Penobscot, and 76 in the Downeast Coastal recovery unit (NOAA 2015).

<u>Fisheries and fish introductions</u>

Introductions of non-indigenous species has significantly degraded habitat quality by altering predator/prey relationships. Historically, the geographic area encompassed by the three SHRUs was host to a variety of native resident and diadromous fish, including Atlantic salmon, alewives, blueback herring, American shad, sea lamprey, anadromous rainbow smelt, Atlantic sturgeon, shortnose sturgeon, American eel, white perch, Atlantic tomcod and striped bass (NOAA 2009).

Native resident species likely included brook trout, burbot, lake trout (togue), lake whitefish, brown bullhead, pumpkinseed sunfish, redbreast sunfish, and yellow perch; as well as numerous species of fish classified by Maine IF&W as "non-sportfish" which include numerous members of the family Cyprinidae (minnows), Catostomidae (suckers) and two species in the family Percidae (perch) – not including the yellow perch (NOAA 2009).

Today, much of Maine's waters are host to a variety of introduced and invasive species of fish. These include smallmouth bass, largemouth bass, landlocked salmon, brown trout, splake, rainbow trout, carp, white catfish, and several species of cyprinids have been introduced illegally or through accidental introductions often associated with the transport and release of live bait used for recreational fishing. Chain pickerel are native to portions of southern Maine, yet their range has been vastly expanded as these fish have been moved around to enhance angler opportunity (NOAA 2009).

Smallmouth bass, first introduced into Maine waters in 1868, are likely aggressive competitors as well as predators to Atlantic salmon as juvenile bass are found consistently in the same habitats as juvenile salmon feeding and utilizing space that would otherwise be utilized by parr. Largemouth bass, not native to New England, are believed to have been incidentally introduced into Maine in the late 1800s, and are also known to prey on Atlantic salmon. Brown trout were first introduced to Maine in 1885. They are likely responsible for reducing native fish populations, especially salmonids, through predation, displacement, and food competition. Splake were first introduced into Maine in 1958. Evidence of salmon smolt predation by adult splake has been documented in the Downeast Coastal SHRU. Landlocked salmon are native to only four river basins in Maine, but have since been introduced into many others. Because sea-run and landlocked Atlantic salmon are the same species (though differences in behavior and life history separate them from interbreeding), direct competition for food and space is inevitable when the fish are in the same area (NOAA 2009).

Element 4: Analysis of Current Aquatic Resource Conditions

This Element contains information sourced primarily from NOAA's 2009 Critical Habitat rule:

Element 4.1 Downeast Coastal SHRU

Atlantic salmon habitat

Of the 61,400 units of historical spawning and rearing habitat in the Downeast Coastal SHRU, approximately 53,400 units of habitat are considered to be currently occupied. The Machias, Narraguagus, and East Machias contain the highest quality habitat relative to other HUC 10's in the Downeast Coastal SHRU, and collectively account for approximately 40 percent of the spawning and rearing habitat in the Downeast Coastal SHRU.

Of the 53,400 occupied units within the Downeast Coastal SHRU NOAA-NMFS (2009) determined that these units were functionally equivalent to roughly 29,111 units of habitat, or approximately 47 percent of the estimated historical functional potential. "This estimate is based on the configuration of dams within the SHRU that limit migration and degradation of physical and biological features from land use activities which reduce the productivity of habitat within each HUC 10. For each SHRU 30,000 fully functional units of habitat are needed in order to achieve recovery objectives. Though the Downeast Coastal SHRU does not currently meet this objective, there is enough habitat within the occupied range that in a restored state (e.g. improved fish passage or improved habitat) would satisfy recovery objectives" (NOAA 2009).

Dams and barriers to fish passage

Today, most of the dams in the SHRU have either been removed or breached and no longer threaten salmon migration. The Stillwater Dam on the Narraguagus River and the Ellsworth and Graham Lake dams on the Union River are the only remaining dams in the six major salmon rivers located in the Downeast Coastal SHRU that obstruct a significant portion of their associated watershed from free migration of diadromous fish (NOAA 2009).

Other obstructions to passage, including poorly designed road crossings and culverts, remain a potential hindrance to salmon recovery. Improperly placed or designed culverts can create barriers to fish passage through hanging outfalls, increased water velocities or insufficient water velocity and quantity within the culvert. Poorly placed or undersized culverts (usually from road building and maintenance) can also hinder fish passage, thus reducing access to potential habitat.

Water Quality

In the Downeast Coastal SHRU, pH has been identified by many scientists as one of the leading water quality concerns for Atlantic salmon. Atlantic salmon smolts are particularly sensitive to low pH as it affects their ability to osmoregulate as smolts make the transition from the freshwater environment to the marine environment (McCormick *et al.,* 1998). In the Downeast Coastal SHRU, rivers are particularly vulnerable to episodic events of low pH from acidic precipitation because of the geography and geology which contributes to the large number of bogs in the region; reduces the flushing rate of rivers and streams; and reduces the weathering rate of the underlying bedrock (Johnson and Kahl, 2005).

The Senator George J. Mitchell Center for Environmental and Watershed Research at the University of Maine (GMC) and the Maine Atlantic Salmon Commission (MASC) conducted the most spatially extensive assessment of water chemistry in Maine salmon rivers in 2003 - 2004 to understand the spatial and seasonal patterns in water chemistry. The goal of the survey was to characterize the water quality of Maine salmon rivers by sampling water at multiple sites along the rivers on the same day. The surveys were repeated seasonally to determine the range of chemistry found in each river. All the samples were analyzed at the Watershed Research Laboratory of the Senator George J. Mitchell Center to eliminate differences in analytical techniques that arise among different workers and laboratories.

The results from survey were: 1) all rivers experienced depressed pH and acid neutralizing capacity (ANC) values associated with rain events that occurred in the day(s) immediately prior to the sampling; 2) watersheds to the west of the Penobscot River (i.e., Ducktrap River, Sheepscot River, Cove Brook, Marsh Stream, Kenduskeag River, and Sandy River) have higher pH, acid neutralizing capacity (ANC), and Ca and lower DOC and Aluminum than sites to the east of the Penobscot River (i.e., Union River, Tunk Stream, Narraguagus River, Pleasant River, Machias River, East Machias River, and Dennys River); 3) tributaries tend to have lower pH than mainstem sites; 4) summer baseflow sampling showed that all of the rivers, except Tunk Stream, had pH values favorable for salmon health for that time of year. The lower ANC and higher DOC make the eastern sites more susceptible to event-driven pH depressions than sites to the west of the Penobscot River. Spatial patterns that relate to surficial geology are recognizable within individual drainages" (NOAA 2009).

<u>Fisheries and fish introductions in the Downeast Coastal SHRU</u>

In the downeast coastal basin, chain pickerel, smallmouth bass, largemouth bass, brown trout and splake are non – native species that compete with Atlantic salmon as either predators or competitors. Chain pickerel have been found to be aggressive predators of Atlantic salmon smolts in the Narraguagus River and Penobscot Rivers where, at times, between 20 and 30 percent of pickerel have been found to contain smolts (Barr, 1962; and Van de Ende, 1993).

Element 4.2 Penobscot Bay SHRU

<u>Atlantic salmon habitat</u>

There are 323,700 units of historically accessible spawning and rearing habitat within the Penobscot Bay SHRU, of which approximately 211,000 units of habitat are considered to be currently occupied. The mainstem Penobscot has the highest biological value to the Penobscot SHRU because it provides a central migratory corridor for the entire Penobscot SHRU.

NOAA-NMFS (2009) determined that the 211,000 occupied units within the Penobscot are the equivalent of nearly 66,300 functional units or approximately 20 percent of the historical functional potential. "This estimate is based on the configuration of dams within the SHRU that limit migration and degradation of physical and biological features from land use activities which reduce the productivity of habitat within each HUC 10. For each SHRU, 30,000 fully functional units of habitat are needed in order to achieve recovery objectives for the GOM DPS. The combined quality and quantities of habitats available to

Atlantic salmon within the currently occupied areas in the Penobscot Bay SHRU currently meet this objective" (NOAA 2009).

Dams and diversions

As of 1997, FERC estimated that 27 percent of the habitat in the mainstem Penobscot was impounded by five dams between the head-of-tide and the confluence of the West and East Branches of the Penobscot in Medway. Dam removals and fish passage enhancements since that time have resulted in major increases in accessible habitat, though dams within the Penobscot Bay SHRU continue to be an impediment to self-sustaining Atlantic salmon populations.

In 2004, a settlement agreement between PPL Corporation, state and federal resource agencies, and six conservation groups allowed for the purchase of three out of the four lowermost large dams in the Penobscot SHRU. The agreement has since resulted in the removal of the Great Works Dam in 2012 and the Veazie Dam in 2013, as well as the construction of a natural bypass around the Howland Dam, the lowermost dam on the Piscataquis sub-basin. At the Milford Dam located above Great Works, a state-of-the-art fish passage facility was completed in 2014.

Fisheries and fish introductions in the Penobscot SHRU

Today, much of Maine's waters are host to a variety of introduced and invasive species of fish. Many species, including smallmouth bass, largemouth bass, brown trout, splake and rainbow trout have been introduced as part of an effort to enhance recreational fishing opportunities.

The current fish community in the Penobscot drainage has shifted from a historically diadromous fish dominated to a resident freshwater fish dominated system. Warm water species widespread throughout the basin are yellow perch, white perch, chain pickerel and smallmouth bass. Other species commonly found are red-breasted sunfish, white sucker, creek chub, common shiner, brown bullhead, American eel and sea lamprey. Non-indigenous fish introductions of warm water species have altered the fish community (NOAA 2009).

Element 4.3 Merrymeeting Bay SHRU

Atlantic salmon habitat

The mainstem Kennebec has the highest biological value to the Merrymeeting Bay SHRU because it provides the central migration conduit for much of the currently occupied habitat found in the Sandy River. The Sandy River has the greatest biological value for spawning and rearing habitat within the occupied range of the Merrymeeting Bay SHRU but is currently only accessible to adult salmon through a trap and truck program around the four lowermost dams.

Of the 372,600 units of historically accessible spawning and rearing habitat within the SHRU, approximately 136,000 units of habitat are considered to be currently occupied. The 136,000 occupied units within the Merrymeeting Bay SHRU represent nearly 40,000 functional equivalents of habitat or approximately 11 percent of the historical functional potential (NOAA 2009). "This estimate is based on the configuration of dams within the SHRU that limit migration and degradation of physical and biological features from land use activities which reduce the productivity of habitat within each HUC 10. For each

SHRU 30,000 fully functional units of habitat are needed in order to achieve recovery objectives. The combined quality and quantities of habitat available to Atlantic salmon within the currently occupied areas within the Merrymeeting Bay SHRU currently meet this objective" (NOAA 2009).

Dams

Both the Kennebec and Androscoggin watersheds are major hydropower producers. On the Androscoggin below Rumford (the upper extent of the range of Atlantic salmon), major hydro-power facilities include the upper and lower stations at the Rumford Falls project in Rumford; Riley/Jay/Livermore Projects in Jay, Riley and Livermore; Gulf Island/Deer Rips project in Lewiston-Auburn; Lewiston Falls project in Lewiston/Auburn; the Worumbo Project in Lisbon/Durham; Pejepscot in Topsham/Brunswick; and the Brunswick project in Brunswick/Topsham.

On the Kennebec River below Moosehead Lake, hydro-power facilities below the Moosehead Dam at Moosehead Lake include the Harris project in Township 1 Range 6; Wyman Project in Moscow/Pleasant Ridge Plantation; Williams Project in Embden and Solon; Abenaki Project in Anson and Madison; Weston Project in Skowhegan; Shawmut Project in Fairfield; Hydro-Kennebec and Lockwood both in Waterville and Winslow. Today, the lowermost project on the Kennebec is the Lockwood Project which currently operates a fish lift. From Lockwood, shad and alewives are released upstream whereas Atlantic salmon are most frequently transported to the Sandy River, which is free of dams.

Water quality

In addition to the dams within the Androscoggin, poor water quality within certain segments of the Androscoggin is of particular concern for fisheries restoration. The U.S. Environmental Protection Agency noted that two segments of the Androscoggin, including the lower four miles of the Gulf Island Dam impoundment and the Livermore Falls impoundment do not attain water quality standards for class C waters (EPA, 2005). The non-attainment status is caused by point source discharges upriver from the three paper mills located in Berlin, New Hampshire (Fraser Paper), Rumford, Maine (Mead WestVaco), and Jay, Maine (International Paper); five municipal point sources from locations in Berlin and Gorham, New Hampshire and Bethel, Rumford-Mexico, and Livermore Falls, Maine; and non-point source pollutant loads from land use activities, particularly that related to residential development, silviculture, and agriculture (EPA, 2005).

The Maine Department of Environmental Protection has four standards for classification of freshwater which are not classified as "great ponds". These are class AA, A, B, and C waters, in which class AA is the highest classification in which waters are considered to be "outstanding natural resources and which should be preserved because of their ecological, social, scenic or recreational importance"; and class C waters is the lowest classification in which class C waters "shall be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited…, navigation, and as a habitat for fish and other aquatic life." (State of Maine, Title 38 *§ 465*).

The Gulf Island Dam impoundment does not meet the Class C standards for dissolved oxygen (DO) concentration in the summer at depths of 30 to 80 feet. In addition to the pollution sources upstream from the dam, the dam itself contributes to non-attainment of DO criteria and algae growth by creating an environment of low water movement and low vertical mixing with the deeper water column (EPA, 2005).

The Livermore Falls impoundment does not attain the class C aquatic life criteria in which dissolved oxygen shall not fall below an instantaneous minimum of 5 ppm and 60 percent saturation, and a 30 day average long term minimum of 6.5 ppm (EPA, 2005).

Fisheries and fish introductions in the Merrymeeting Bay SHRU

Today, much of Maine's waters are host to a variety of introduced and invasive species of fish. Smallmouth bass were likely first introduced into the Merrymeeting Bay SHRU around 1869 when a contract was made with Livingston Stone of New Hampshire to deliver 15,000 black bass to several points throughout the State, which included the Cobbosseecontee Lake in Winthrop (Foster and Atkins, 1869). Largemouth bass were likely incidentally introduced into the Merrymeeting Bay SHRU alongside the planned smallmouth introductions around 1869. Landlocked salmon, although native to Maine, were not native to the Merrymeeting Bay SHRU. Landlocked salmon introductions may have first occurred in the Merrymeeting Bay SHRU around 1869 when 3,000 landlocked salmon of the Schoodic Lake strain were hatched out and raised at a hatchery in Alna along the Sheepscot River (Foster and Atkins, 1869). Brown trout, splake and rainbow trout have all been introduced as part of an effort to enhance recreational fishing opportunities (Page and Burr, 1991). Carp were introduced in ponds in the late 1800s for cultivation purposes and later likely escaped from these ponds into the tidal waters of the Scarborough and Kennebec Rivers (Lucas, 2001). White catfish, and several species of cyprinids have been introduced illegally or through accidental introductions often associated with the transport and release of live bait used for recreational fishing. Chain pickerel are native to portions of southern Maine, yet their range has been vastly expanded as these fish have been moved around to enhance angler opportunity.

Element 5: Statement of Goals and Objectives

The stated overarching goal of the USFWS-NOAA Atlantic salmon recovery program is "to improve the long-term population viability of the GOM DPS of Atlantic salmon to the point where it no longer requires the protections of the ESA and can be removed from the Federal List of Endangered Wildlife and Threatened Wildlife" (USFWS-NOAA 2016). Delisting objectives include:

- Maintaining self-sustaining, wild populations of Atlantic salmon within each SHRU;
- Ensuring access to sufficient suitable habitat in each SHRU for self-sustaining populations;
- Ensuring necessary and available management options for marine survival are in place;
- Reducing or eliminating individual and combined threats to the DPS.

The overall goal of the Compensation Planning Framework is to advance the conservation goals and objectives of ASRCP as outlined in the Instrument, which are in concert with those in the USFWS-NOAA 2016 Draft Recovery Plan. The major areas of action are designed to stop and reverse the downward population trends of the remnant eight wild Atlantic salmon populations and minimize the potential for human activities that result in the degradation or destruction of Atlantic salmon habitat essential to survival and recovery, including:

- Enhance connectivity between the ocean and suitable freshwater spawning and rearing habitats;
- Protect and restore freshwater and estuarine Atlantic salmon habitat;
- Minimize potential for take in freshwater, estuarine and marine fisheries;
- Reduce predation and competition on all life stages of Atlantic salmon;
- Reduce risks from commercial aquaculture operations;
- Conserve the genetic integrity of the DPS;
- Assess stock status of key life stages;
- Providing long-term protection for suitable salmon habitat and its buffers.

The ASRCP will fund projects in these key action areas to advance species conservation goals. The following is a list of potential projects that applicants may consider when developing proposals for funding under the ASRCF.

1. Remove, repair or improve fish passage at dams, fishways and weirs currently in place. The efficiency of existing fishways on DPS rivers may need modifications to adequately pass Atlantic salmon. MDMR's Division of Sea Run Fisheries, in cooperation with the state and federal agencies, has assessed the adequacy of existing fishways to provide up- and downstream passage for Atlantic salmon. Where identified, fishways should be repaired and maintained.

2. Identify and improve culverts or other road crossings that impede Atlantic salmon passage or co-occurring diadromous fish associated with salmon recovery. In addition to dams, poorly designed or failed stream crossings can restrict salmon migration. These structures can act as barriers to passage for salmon of varying lifestages by altering natural flow regimes and affecting water depth and velocity.

3. Secure long term protections for freshwater and estuarine habitats. Long-term protections for freshwater and estuarine habitats includes protecting of the riparian zone as well as ensuring adequate water quality and quantity in the DPS river watersheds.

4. Protect estuarine habitat used by Atlantic salmon. Activities that have the potential to adversely affect Atlantic salmon should be evaluated and potential adverse impacts minimized. Estuarine habitat is used by both outmigrating Atlantic salmon smolts and returning adult Atlantic salmon. Atlantic salmon smolts are particularly sensitive during their transition to saltwater. Adult salmon are known to hold in estuaries during periods of low-flow in rivers.

5. Restore degraded stream and estuarine salmon habitat. Many historical land and water use activities have altered, and in some cases destroyed, the habitat needed by Atlantic salmon for spawning, growth and migration. There are many habitat restoration needs and opportunities within the DPS. These include stream channel restoration, large wood installations and other adopted and proven techniques, enhancement of fish passage, riparian habitat restoration, bank stabilization, culvert repair and improved stream crossings. MDMR and other organizations may have information to identify, coordinate and implement necessary stream restoration activities. Habitat restoration opportunities in DPS rivers should be identified, catalogued and prioritized. Restoration projects should be implemented to restore degraded habitat and maximize production of juvenile salmon in Maine rivers.

6. Prepare and implement plans to reduce pollution. Pollution problems in DPS rivers are generally not attributable to a single point source but are due to cumulative effects of many sources within individual watersheds. Water quality in the DPS rivers is generally good. However, several non-point source and point source pollution problems exist.

7. Other projects not yet envisioned that demonstrate new or creative approaches to furthering the above stated goals and objectives of the ILF program.

Many mitigation priorities are common across the DPS range and are not specific to each SHRU. In other cases, guidance on SHRU-specific priorities will be sought through consultation with USFWS and NOAA, which will be developing SHRU-level workplans as part of the Atlantic salmon recovery program. Available ASRCF funding in each SHRU sub-account will be applied toward mitigation activities that respond to identified SHRU-specific priority actions.

Element 6: Prioritization Strategy for Selecting and Implementing ILF Mitigation Projects

ILF Mitigation Projects will be selected using a competitive award approach. Each year, public agencies, and non-profit conservation organizations will be invited to submit a letter of intent for eligible restoration and preservation projects in Maine. Letters of intent are summary in nature and designed to provide sufficient information to determine whether a proposed project meets ASRCP's core eligibility requirements. Letters of intent will be evaluated by the Sponsor and the co-chairs of the IRT. Applicants whose proposed ILF Mitigation Projects are determined to meet or exceed ASRCP's core requirements will be invited to submit full proposals. Regarding the proposed funds requested and the proposed work, the review team will consider the degree to which the project represents a *good return for the investment* (money, time) as well as whether the project work and cost estimates (tasks & budget) are reasonable for the expected outcomes, along with the amount and quality of proposed matching funds or services. Full proposals will be evaluated and ranked by the Review Committee using the prioritization criteria outlined below, which can be modified upon approval by Sponsor and the co-chairs of the IRT.

Potential Resource Benefit to Meet ASRCP Goals (30%). Assesses the extent to which the proposal maximizes benefits to Atlantic salmon and co-occurring diadromous species and meets the core program requirements that a mitigation project must restore, enhance, preserve, or create Atlantic salmon habitat and aquatic resources as functioning ecosystems that have been prioritized by ASRCP. Projects with greater benefits will receive higher scores. Considerations include:

a) The overall expected benefit to Atlantic salmon recovery and co-occurring diadromous species expected from the action.

b) The sustainability of the proposed conservation action (restoration, enhancement, preservation, creation) and the location within the SHRU affected and permanently protected.

c) The resource types to be restored, enhanced, preserved or created and the degree to which the proposed project replaces the functional benefits of impacted resources in the SHRU based on a functional assessment of the project.

d) Proximity of proposed project to impacted resources in the SHRU; proposed projects should be in the downstream Tier 1 habitat area.

e) Current and proposed condition of the project site, and "functional lift" provided by project (e.g., proposed change in habitat quality, contribution to functioning biological systems, water quality, level of degradation, etc.).

For preservation-only projects, the threat of degradation to the site in the next 20 years is a requirement.

Landscape Context (20%). Assesses the extent to which the proposal meets the core program requirement to consider the location of a potential project relative to statewide focus areas for land conservation or habitat preservation identified by a state or federal agency, or other regional or municipal plans. Considerations include:

a) Upstream and downstream passage and adjacent habitat quantity and quality.

b) Position on a priority list for salmon habitat protection and/or restoration developed by NOAA-NMFS, MDMR, or a salmon conservation organization.

c) Given ecological roles of river herring, lamprey, and other species to salmon recovery, expected co-occurrence and benefit to Atlantic salmon for projects adjacent to or upstream of salmon habitats.

Project Readiness/Feasibility (20%). Assesses the extent to which the proposal meets the core program requirement to demonstrate project readiness and likelihood of success, where success is defined by the ability of the project to meet ASRCP goals as stated in the proposal. Assesses the extent to which the proposal provides for long-term management and/or stewardship by a responsible state or federal agency or conservation organization. Considerations include:

a) Documentation of landowner willingness to participate in proposed project,

b) Level of project urgency (e.g., area of rapid development or on-going site degradation, other available funding with limited timing, option to purchase set to expire, economics of scale, etc.)

c) Degree to which proposal demonstrates understanding of ecosystem functions and processes and associated needs.

d) Soundness of the technical approach of the conceptual plan presented in the application.

e) Initial progress (e.g., planning, fundraising, contracting, site design, etc.).

f) Likelihood that the project will meet proposed schedule and/or required deadlines.

g) Likelihood that the proposed actions will achieve the anticipated ecological benefits and results.

h) Completeness and feasibility of long-term stewardship and monitoring plan, including endowment.

i) Potential for avoiding/minimizing adverse impacts (such as dewatering or habitat loss) associated with the project.

j) Conformance with appropriate financial assurances for any construction activity.

Project Sponsor Capacity (15%). Assesses the extent to which the proposal meets the core Program requirement to provide for long-term management and/or stewardship. Considerations include:

a) Presence of qualified, capable conservation entity willing to sponsor and/or maintain the project.

b) Level of support and involvement of other relevant agencies, organizations, and local community.

c) Degree to which project sponsor, and any associated partners, demonstrate the financial, administrative, and technical capacity to undertake and successfully complete the project.

d) Adequacy of long-term stewardship to ensure the project is sustainable over time and funding mechanism for the associated costs (e.g., endowment or trust).

e) Legal and financial standing of the project sponsor.

f) Quality and completeness of proposal materials.

Cost Effectiveness (10%). Assesses the extent to which the proposal meets the program requirement that a project represent an efficient use of funds expended. Considerations include:

a) Clarity and detail of budget submitted.

b) Sufficiency of funds available in the applicable SHRU.

c) Availability and source of matching funds necessary to complete the project.

Other Benefits (5%). Assesses the potential for this project to provide additional ecological benefits such as preservation of wetlands beyond those important to salmon, support recreational access, scenic enhancements, economic activity, job creation, or other contributions to "Quality of Place" in the town or region where the ILF Mitigation Project is located.

Proposal ranks are calculated out of potential total of 100 points, based on the percentages listed for each criterion. Final ASRCF allocation decisions are made by the IRT co-chairs, in consultation with the IRT.

Element 7: Qualification of Preservation Actions

The 2008 Compensatory Mitigation Rule requires that preservation objectives identified in Element 5 and addressed in the prioritization strategy in Element 6 above also satisfy the criteria for use of preservation. In the rule, preservation may be used to provide compensatory mitigation for activities when the following criteria are met:

(i) The resources to be preserved provide important physical, chemical, or biological functions for the watershed;

(ii) The resources to be preserved contribute significantly to the ecological sustainability of the watershed. In determining the contribution of those resources to the ecological sustainability of the watershed, the District Engineer must use appropriate quantitative assessment tools, where available;

(iii) Preservation is determined by the District Engineer to be appropriate and practicable;

(iv) The resources are under threat of destruction or adverse modifications; and

(v) The preserved site will be permanently protected through an appropriate real estate or other legal instrument (e.g., easement, title transfer to state resource agency or land trust).

“Securing long term protections for freshwater and estuarine habitats” is the preservation objective listed under Element 5 of the Compensation Planning Framework. This objective includes protection of the riparian zone as well as ensuring adequate water quality and quantity in the DPS river watersheds.

In the prioritization approach outlined in Element 6, the threat of degradation to a potential preservation site within the next 20 years, the importance of each project within a landscape context, the level of project urgency, and inclusion of upland areas sufficient to protect resource functions and ecological connectivity to other conservation areas are all considered. In addition, preservation projects will be prioritized based on landowner willingness to convey a conservation easement or fee title, with conservation covenants, to the property, and the adequacy of long-term stewardship to ensure the project is sustainable over time through an endowment or trust.

These stated considerations in Elements 5 and 6 help ensure that preservation actions will meet the applicable criteria.

Element 8: Description of Public and Private Stakeholder Involvement

The Sponsor, Maine Department of Marine Resources, has a long history of working with a variety of stakeholders in developing and implementing conservation plans and projects in the State of Maine. The ASRCP will be a continuation of that history of partner engagement.

The Sponsor has excellent working relationships with all of the agencies and stakeholder groups that will be involved with this program including the USACE, USFWS, NMFS, MDOT, non-profit conservation organizations and tribal governments.

Element 9: Description of Long Term Protection and Management Strategies

Each applicant that receives funds from the ASRCF shall be responsible for ensuring long-term protection of each ILF Mitigation Project through an appropriate protection mechanism as practicable. The IRT will be responsible for making sure that each applicant receiving funds has the needed legal status, experience and stewardship funds to ensure the long term protection and management of the ILF Mitigation Project site.

For preservation projects, permanent legal property protection instruments, such as conservation easements, will be held by entities such as Federal, Tribal, other State or local resource agencies, or non-profit conservation organizations. The protection mechanism shall assign long-term stewardship roles and responsibility for the project and will, to the extent practicable, prohibit incompatible uses that might otherwise jeopardize the objectives. Copies of such recorded instruments shall be maintained by the Sponsor and shall become part of the official project record. Each protection instrument shall contain a provision requiring notification to Sponsor if any action is taken to void or modify it. Such protection mechanisms should be in place prior to site closure or final credit release, as stipulated in each Mitigation Plan.

Sponsor and USFWS shall be granted "third party" enforcement rights on all conservation easements entered into as part of an approved Mitigation Plan funded by the ASRCF.

Element 10: Strategy for Periodic Evaluation and Reporting on Program Progress

The Sponsor will provide annual reports, based on calendar years, to the IRT with updates on the progress of each SHRU and ILF Mitigation Project implementation. The reports will be submitted to the co-chairs of the IRT not later than June 30 of the year following the reporting year. This report will provide an overview of what habitat units were lost and what ILF Mitigation Projects were funded. It will also summarize the successes and the challenges, and ways to improve the Program for next year. For restoration, creation and enhancement projects that may take several years to complete, the Sponsor will summarize monitoring reports and the results of the work. For preservation projects, evidence of the easement or other protection details need to be documented. The reports will also include the funds received, administrative fees withdrawn, interest earned, amounts disbursed and for which project, and balance available in each service area.

Every five years, the Sponsor will produce a status and trends report summarizing the previous five years. The document will examine the goals for each SHRU and discuss how well the ILF Mitigation Projects assisted with promoting those goals. Every ten years, or as funds allow, the Sponsor and others will reexamine and update the Compensation Planning Framework, including working with a broad range of stakeholders.

DRAFT 3/21/18

EXHIBIT G

Addresses for Notice

Notices provided to the Parties under the Program Instrument shall be provided in accordance with Section VI.G to the following names and addresses:

To USACE:

U.S. Army Corps of Engineers
New England District
Regulatory Division
Principal Contact: Ruth M. Ladd
696 Virginia Road
Concord, MA 01742-2751
(978) 318-8818
Email: Ruth.M.Ladd@usace.army.mil

To USFWS:

U.S. Fish and Wildlife Service
Maine Field Office
Principal Contact: Peter Lamothe
Maine Fish and Wildlife Complex
P.O. Box A
306 Hatchery Road
East Orland, ME 04431
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To Program Sponsor:

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