THE SOUTHEAST ALASKA MITIGATION FUND

In-Lieu Fee Compensatory Mitigation Program

Program Instrument

Submitted by:

The Southeast Alaska Watershed Coalition

Prepared
By
Jessica Kayser Forster
Southeast Alaska Watershed Coalition

With technical assistance from
Brad Ryan: Southeast Alaska Watershed Coalition, Aquatic Resource Restoration and Science
Karen Johnson: TNC, Virginia Aquatic Resources Trust Fund ILF Program Manager
Scott Harris: Southeast Alaska Watershed Coalition Aquatic Resource Restoration and Science
Steve Paustian: Sitka Hydro, Stream Science and Restoration

August 2017

SOUTHEAST ALASKA
WATERSHED COALITION
CONNECT - INFORM - PARTICIPATE

Table of Contents

ACRONYMS AND ABBREVIATIONS	
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
CWA	Clean Water Act
FU	Functional Unit
HGM	Hydrogeomorphic Method
HUC	Hydrologic Unit Code
ILF	In-Lieu Fee
IRT	Interagency Review Team
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
RGL	Regulatory Guidance Letter
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife
WESPAK-se	Wetland Ecosystem Services Protocol Alaska, Southeast
WCM	Wetland Credit Method
RCT	Restoration Cost Tool
SAMF	Southeast Alaska Mitigation Fund
SCM	Stream Credit Method
SIRT	Statewide Interagency Review Team

B. INTRODUCTION

U.S. Army Corps of Engineers (USACE) approval of this instrument constitutes the regulatory approval required for the Southeast Alaska Watershed Coalition (SAWC) Southeast Alaska Mitigation Fund (SAMF) In-Lieu Fee Program to be used to provide compensatory mitigation for Department of the Army (DA) permits pursuant to 33 CFR 332.8(a)(1). This instrument is not a contract between the Sponsor or Property Owner and USACE or any other agency of the federal government. Any dispute arising under this instrument will not give rise to any claim by the Sponsor or Property Owner for monetary damages despite any other provision or statement in the instrument to the contrary.

This instrument refers to the development of an in-lieu fee (ILF) program that will offer third-party compensatory mitigation for permitted impacts regulated under Section 404 of the Clean Water Act, and Section 10 of the Rivers and Harbors Act of 1899. The ILF program name is The Southeast Alaska Mitigation Fund (SAMF). The Southeast Alaska Watershed Coalition (SAWC), an Alaskan non-profit community-based natural resource management coalition, will sponsor this program.

C. PROGRAM GOAL

The primary goal of the SAMF program is to provide third-party compensatory mitigation for permitted impacts regulated under Section 404 of the Clean Water Act, and Section 10 of the Rivers and Harbors Act of 1899 within Southeast Alaska.

The SAMF program will serve as one option available to permittees to provide compensatory mitigation for those unavoidable impacts to jurisdictional waters when the USACE has determined compensatory mitigation is required. This may include restoration, enhancement, and/or establishment of wetlands, streams and other aquatic resource on either private and/or public lands.

D. IN-LIEU FEE PROGRAM INSTRUMENT COMPONENTS

1.0 PROGRAM SERVICE AREA

(*The ILF program service area is described in more detail in the Compensation Planning Framework section Appendices F. 1.0-3.0)*

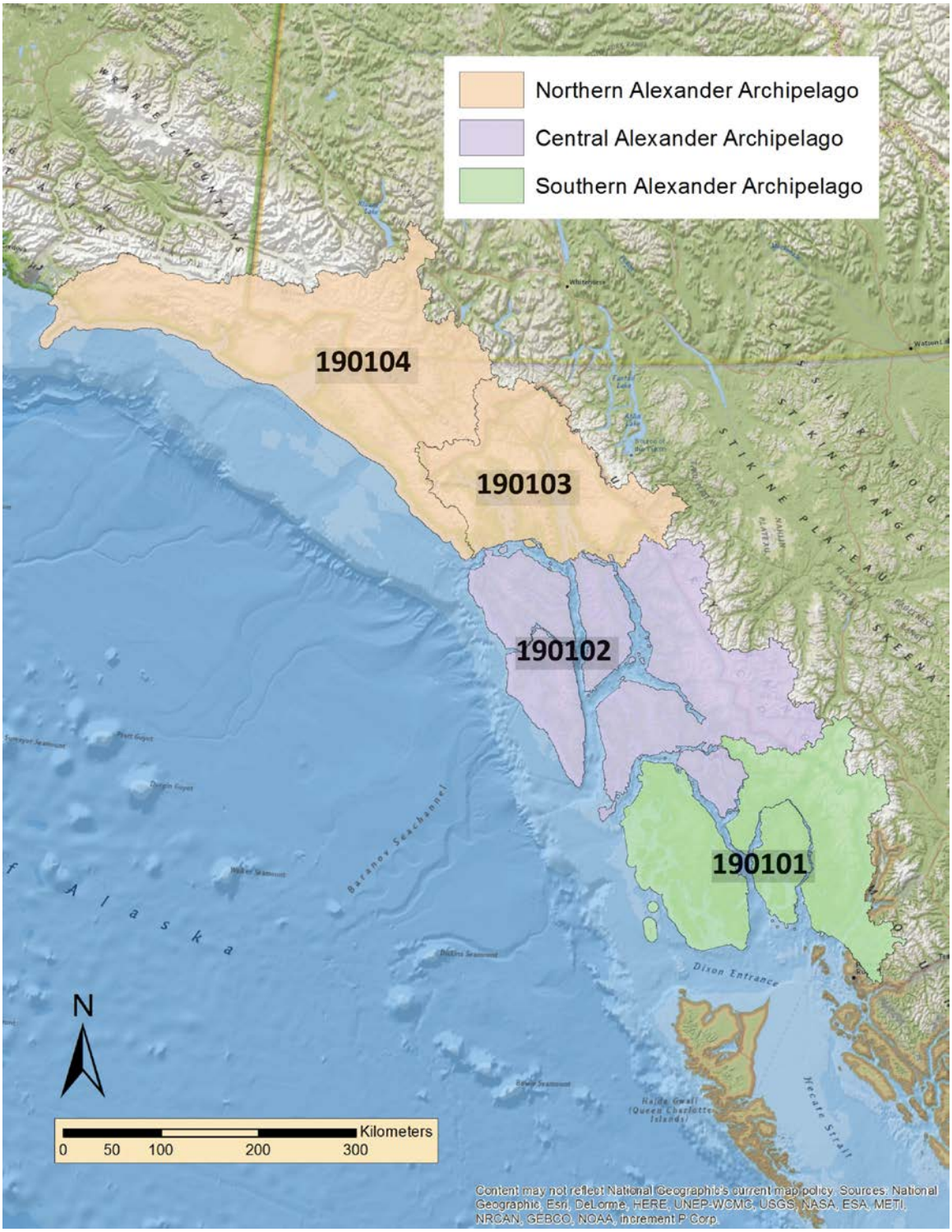
The Southeast Alaska Mitigation Fund's ILF operational area is the SAWC existing area of focus, which is Southeast Alaska. The operational area will be divided into three service areas established in consideration of 6-digit USGS Hydrologic Unit Codes (HUC) (Figure 1). The three service areas will be the Southern Alexander Archipelago (HUC 190101); the Central Alexander Archipelago (HUC 190102); and the Northern Alexander Archipelago (HUC 190103) combined with the Yakutat-Bering HUC 190104, excluding Canada.

Southeast Alaska is rural in nature and has a limited number of readily available restoration sites. Moreover, permit data indicates the majority of impacts that occur in Southeast Alaska are small in size (less than 2 acres)1. Therefore, economic viability of the SAMF program was considered in the establishment of the three service areas. It is necessary for SAMF to have the ability to consolidate funds generated from small sales of advance credits within each of the three service areas in order to target the limited number of readily available restoration sites within each service area. This will allow the SAMF program to target ecologically significant aquatic resources and functions, choose mitigation projects that have less uncertainty and risk associated with project success, and reduce temporal loss.

SAWC's prioritization strategy for selecting and implementing compensatory mitigations sites within a service area is a two-step process. The first step is to identify top priority watersheds within each service area based on existing assessments and other resources. Focusing on a 10-digit hydrologic unit basis will identify the top priority watersheds within each service area. This is congruent with the USFS Tongass National Forest Watershed Condition Framework. The second step is to identify potential mitigation sites within these watersheds that could be implemented to generate credits. Greater detail on this process is available in the Compensation Planning Frameworks for each service area.
Section F, Appendices 1.0-3.0.

1 Permit Data provided by the USACE, Alaska District. October 2014.

Figure 1: The Map of the Southeast Alaska Mitigation Fund's three service areas (the Southern Alexander Archipelago, Central Alexander Archipelago, and the Northern Alexander Archipelago combined with the Yakutat-Bering HUCs. Including the 6 digit HUC number associated with each service area. These boundaries are watershed boundaries not geopolitical boundaries. The program does not operate in Canada.



2.0 ACCOUNTING PROCEDURES

§332.8 (d)(6)(ii)(B) of the Final Rule requires the ILF program sponsor to establish and maintain an ILF program account. The term "accounting procedures" is not explicitly defined in the Final Rule, but generally refers to the system for tracking credit production, credit transactions and financial transaction between SAMF and permittees.

Upon USACE approval of SAMF, SAWC will create a separate ILF program account before any fees are accepted. The purpose of this account is to track the fees accepted and disbursed for the purpose of providing aquatic resource mitigation. SAWC, as the ILF Sponsor, will maintain the SAMF program account with a financial institution that is a member of the Federal Deposit Insurance Corporation (FDIC). The ILF payments received will be deposited in the ILF program account. The program account will collect deposits from the sale of credits, and will be used only for expenses such as land acquisition, project planning and design, construction, plant materials, labor, legal fees, monitoring, and remediation or adaptive management activities, as well as administration of the in-lieu fee program. All interest earned on this account will be used to support the SAMF program (see section 9- Program Account).

SAWC shall account for the funds held in accordance with generally accepted accounting principles and provide the USACE and the IRT with an itemized annual statement that includes one program account, 4 sub-accounts and individual ledgers for each mitigation project §332.8(i)(3). Credits and financial transactions will not only be tracked on a programmatic basis, but also for each individual project §332.8(p)(2).

Section 9 of the instrument includes a description of the in-lieu fee program account: how the program account operates as well as an explanation of the system for tracking the production of credits, credit transactions, and financial transactions between SAWC and permittees.

3.0 PROVISION STATING LEGAL RESPONSIBILITY FOR COMPENSATORY MITIGATION

§332.8 (d)(6)(ii)(C) of the Final Rule requires a provision stating that legal responsibility for providing compensatory mitigation lies with the sponsor once a permittee secures credits from the sponsor.

Acceptance of a payment into SAMF is an acknowledgement that SAWC, and not the permittee, is responsible for satisfying the compensatory mitigation requirements of the Section 404 or Section 10 permit. SAWC will issue documentation to both the permittee and the USACE for each project that uses SAMF for compensatory mitigation purposes. This documentation, in the form of a signed letter on SAWC letterhead, shall include the permit number, permittee name, permit site location, and a statement indicating the number and resource type of credits that have been secured from SAMF (Exhibit 1.0 and 3.0).

The transfer of mitigation liability to SAWC including, but not limited to, the identification and selection of sites, property rights acquisition, mitigation plan design and development, construction, monitoring, site-protection, and long-term management and maintenance of the required mitigation, occurs upon the USACE's receipt of the acceptance documentation (See Credit Sale Letter and Receipt of Payment, Appendix 4) from SAWC.

4.0 DEFAULT AND CLOSURE PROVISIONS

Default:

Compliance: The sponsor is responsible for complying with the terms of this instrument. If the District Engineer (DE) determines, as a result of review of annual reports on the operation of the in-lieu fee program, that it is not performing in compliance with this instrument the DE will take appropriate action. This action may include suspension of credit sales to ensure compliance with this in-lieu fee program instrument.

Compensatory Mitigation Deficit: If the DE determines that there is a compensatory mitigation deficit in a specific service area by the third growing season after the first advance credit in that service area is sold, and determines that it would not be in the public interest to allow the sponsor additional time to plan and implement an in-lieu fee project, the DE must direct the sponsor to disburse funds from the in-lieu fee program accounts to provide alternative compensatory mitigation to fulfill those compensation obligations.

Suspension and Termination: If the DE determines that this program is not meeting performance standards or complying with the terms of this instrument, appropriate action will be taken. Such actions may include, but are not limited to, suspending credit sales, adaptive management, decreasing available credits, utilizing financial assurances, and terminating the instrument.

Notwithstanding the foregoing, any delay or failure of the sponsor to comply with the terms of this instrument or any mitigation project shall not constitute a default if and to the extent that such delay or failure is primarily caused by any act, event or conditions beyond the sponsor's reasonable control which significantly adversely affect the sponsor's ability to perform its obligations hereunder. Such acts, events or conditions may include: (i) acts of God, such as earthquake, fire, landslide, other natural disaster; (ii) condemnation or other taking by any governmental body or corporate entity with eminent domain authority (or voluntary sale under threat of eminent domain); (iii) change in applicable federal or state law, regulation or court decision affecting USACE jurisdiction, which affects compensation for permitted impacts to waters of the U.S. and state waters. If the performance of, and compliance with, the terms of this instrument or any mitigation project are affected to a material extent by any such act, event, or condition, the sponsor shall give written notice to the DE as soon as is reasonably practicable. The DE shall have sole reasonable discretion to determine whether such an act, event, or condition qualifies under this paragraph as being out of the sponsor's control and whether or not it shall constitute a material default.

Although the sponsor shall not be responsible for events beyond the sponsor's reasonable control as described above, the DE may require that the sponsor use remaining contingency funds to remediate or restore adverse impacts to a mitigation site resulting from such events.

Closure:

The Sponsor or the USACE, acting independently or in concert, may force closure or terminate this Instrument within 60 days of written notification to the other party. In the event that the SAMF In-Lieu Fee Program operated by the Sponsor is terminated, the Sponsor is responsible for providing to the USACE and IRT reports detailing credit/debit and fee ledger balances, as well as status reports for all compensatory mitigation projects. The Sponsor will remain responsible for fulfilling any outstanding or pre-existing project obligations including the successful completion of ongoing compensatory mitigation projects, relevant maintenance and monitoring, reporting, and long-term management requirements. The Sponsor will remain responsible, with funding from program accounts, for fulfilling these obligations or ensuring the transfer of long-term management and maintenance of all mitigation lands to a separate party approved by the USACE.

Funds remaining in the program accounts after the above obligations are satisfied must continue to be used for the restoration, enhancement, and/or establishment of aquatic resources and associated upland buffers. Any expenditure of these remaining funds requires IRT review and USACE approval. If the SAMF Program has outstanding mitigation obligations at the time of closure which it is unable to fulfill, the USACE, in consultation with the IRT, will direct the Sponsor to 1) use these funds to provide further restoration, enhancement and/or establishment activities, 2) secure credits from another source of third party mitigation, or 3) disburse funds to another entity such as a governmental or non-profit natural resource management entity willing to undertake further compensation activities.

5.0 REPORTING PROTOCOLS

§332.8 (d)(6)(ii)(E) of the Final Rule requires the instrument to include reporting protocols. The in-lieu fee sponsor has four reporting requirements:

2. Monitoring reports, on a schedule and for a period as defined by project-specific mitigation plans;
3. Credit transaction notification;
4. An annual program report summarizing activity from the program account (financial and credit accounting); and
5. An annual financial assurance and long-term management funding report.
6. An audit by an independent entity every five years

Monitoring reports

Monitoring is required of all compensatory mitigation projects to determine whether performance standards are being met and whether additional measures are necessary to ensure that each compensatory mitigation project accomplishes its objectives. If SAWC fails to submit reports within the deadlines outlined in the mitigation plan(s), SAWC may be subject to any compliance and/or enforcement action at the discretion of the USACE (see Section 4.0, Default and Closure).

Monitoring will occur in accordance with § 332.6. Project-specific mitigation plans will detail the parameters to be monitored, the length of the monitoring period, the dates that the reports must be submitted, the party responsible for conducting the monitoring, and the frequency for submitting monitoring reports to the USACE. The level of detail and substance of the reports must be commensurate with the scale and scope of the compensatory mitigation project. The USACE will provide monitoring reports as required by §332.6(c)(3).

Credit Transaction Notification

Section 3.0 (Provisions Stating Legal Liability) establishes the terms by which the legal responsibility for compensation requirements is transferred from the permittee to SAWC. These terms require SAWC to submit a Credit Sale Letter and Receipt of Payment (See Exhibit 3.0) to the USACE. The document must be signed and dated by SAWC and the permittee. The process for requesting, purchasing, and verifying credit sale with the USACE is outlined in Section 8.0 of this document. The Credit Availability and Reservation Letter and the Credit Sale Letter and Receipt of Payment outline specific information required. See Exhibits, 1.0 and 3.0.

SAWC will submit the signed and dated Credit Sale Letter and Receipt of Payment to the USACE within 30 days of the SAMF program receiving the complete fee from the permittee. A copy of each Credit Sale Letter and Receipt of Payment will be retained in SAWC's administrative ledgers and accounting records for SAMF.

Prior to submitting a signed and dated Credit Sale Letter and Receipt of Payment to the USACE, SAWC will issue a Credit Availability and Reservation Letter to the permittee to supplement the permit application. The Credit Availability and Reservation Letter will be a contractual agreement between SAWC and the permittee stating that the agreed upon credits will be reserved for 120-days. If the time period lapses and the credits have not been purchased, the credits will no longer be reserved for the Applicant and may be allocated to other customers.

Annual program report

SAWC must submit an annual program report with ledgers for each individual mitigation project [required under §332.8(p)(2)] to the USACE and the IRT. The annual ledger report must be submitted no later than January 31 of the following year, or the next business day if that date falls on a federal or state holiday or on a weekend.

The annual program report must include the following information:

- All income received, disbursements and interest earned by the program account for the program by recourse type

- A list of all permits for which SAMF program funds were accepted by individual service area (each 6-digit HUC), including
- The USACE permit number (and/or state permit number)
- The location of the authorized impacts
- The amount of authorized impacts
- The amount of required compensatory mitigation
- The amount paid to MFP
- The date the funds were received from the permittee
- A description of SAMF program expenditures from the account (i.e., the costs of land acquisition, planning, construction, monitoring, maintenance, contingencies, adaptive management, and administration) for the program by location
- Credit ledger reporting, also by individual service area, including: The balance of advance credits and released credits at the end of the report period for the program
- All additions and subtractions of credits
- Other changes in credibility (e.g., additional credits released, credit sales suspended, etc.)
- Any other information required by the DE

The DE may audit the records pertaining to the program account at any time; however, it is the intent of the DE to perform a routine audit every 3-5 years. All books, accounts, reports, files, and other records relating to the in-lieu fee program account shall be made available at reasonable times for inspection and audit by the DE.

Financial assurances and long-term management funding report

Financial assurances are those funds or other resource that SAWC must provide to ensure that if a compensation project fails to meet its performance standards or if SAWC ceases to exist, funds are available to guarantee the project will be successfully completed. These funds differ from those set aside to support long-term management and stewardship activities. Long-term management funding ensures resources are available for management after performance standards are met and help ensure the project is sustainable. SAWC will submit an annual report for financial assurances and for long-term management to the USACE and the IRT. These reports will include:

ii. Beginning and ending balances of the individual project account providing funds for financial assurance and long-term management;
iii. Deposits into and any withdrawals from the individual project accounts providing funds for financial assurance and long-term management;
iv. Information on the amount of required financial assurances and the status of those assurances, including their potential expiration for each individual project.
v. Investment portfolio of funds

In accordance with regulations at § 332.3(n)(5), the bonding company or financial institution providing financial assurance for SAWC shall notify the USACE at least 120 days in advance of any planned termination or revocation of financial assurances.

6.0 COMPENSATION PLANNING FRAMEWORK (See Appendix 1.0-3.0)

7.0 INITIAL ALLOCATION AND RATIONALE OF ADVANCE CREDITS AND CREDIT RELEASE SCHEDULE

§332.8(d)(6)(iv)(B) of the Final Rule requires the number of advance credits authorized for an ILF program to be specified in the instrument by individual service area. The instrument must also contain a schedule for the fulfillment of advance credit sales.

Advance Credits Request and Rationale:

Upon approval of the instrument, SAWC is permitted to sell advance credits in the amount indicated in the chart below. The number of advance credits available for sale is specified and tracked in the SAMF program account by aquatic resource type.

SAWC used the following information to determine the number of advance credits to include in this program: (1) The compensation planning framework (which includes a history of permitted impacts throughout the program service areas); (2) SAWC's past performance for implementing aquatic resource restoration, establishment, and/or enhancement activities in the proposed service areas and other areas; (3) The availability of and number of credits generated by known potential mitigation projects; and (4) The projected financing necessary to begin planning and implementation of in-lieu fee projects. The goal is to ensure that SAWC does not sell more advance credits than it can reasonably deliver in the time frame specified in § 332.8(n)(4), generally 3 years.

SAWC is requesting a total of 54 wetland functional acre advance credits and 1850 stream functional linear foot advance credits for the combined three service areas. In determining the number of advance credits per service area, shown in Table 1, SAWC considered the anticipated and identified mitigation opportunities for each service area. The wetland mitigation sites that SAWC has identified generate approximately 4-8 functional acre credits per site and the stream mitigation sites generate between 200-400 functional linear feet credits per site. During an IRT meeting dated August 18th, 2016 SAWC provided two mitigation site examples that demonstrated this potential credit generation. Therefore, SAWC has requested sufficient advance credits to initiate either two smaller projects or one larger project every 2 years in each service area.

The advance credits for SAMF will be divided into three service areas as outlined in the table below

Table 1: Advance Credit by service area and resource type.

Service Area	Wetland Credits (functional acre)	Stream Credits (functional linear foot)
Southern Alexander Archipelago	18	700
Central Alexander Archipelago	18	450
Northern Alexander Archipelago/Gulf of Alaska	18	700

For each service area, once all the advance credits have been sold, no more advance credits may be sold until an equivalent number of credits have been released.
When SAMF has met all mitigation obligations of advance credit sales, any remaining monies that were paid into SAMF through those sales may be used to establish additional mitigation sites, in advance of a mitigation liability.

As sponsor of SAMF and program manager for the day-to-day operation of the SAMF program, SAWC will determine how many credits are available for purchase at any given time and will retain the right to deny sale of advance or released credits to applicants based on the following considerations:

Credit Release Schedule:

Each SAMF mitigation site will have a credit release schedule that outlines the timing and amount of credit release upon meeting certain milestones. Credit release schedules and associated milestones will vary by project and by mitigation type (e.g., restoration, enhancement, and establishment). In all cases, the SAMF program will secure in-lieu fee project sites and conduct initial physical and biological improvements, including land acquisition when applicable, by the third full growing season after the first advance credit is sold.

As a general guidance, credit release for restoration, enhancement and/or creation projects will occur as follows:

- 15% of credits are released upon approval of a mitigation project plan, which establishes protection placed on real property at the compensatory mitigation project site, and issuance of USACE permits;

- 35% of credits are released upon completion of physical and biological improvements at the mitigation site;

- 50% of credits are released incrementally as performance standards are achieved and project milestones are met;

The actual number of credits available for consideration to be released at any given point during or after implementation of a mitigation project will be determined through site monitoring and reporting. In order for credits to be released, the sponsor will follow the procedure as described in §332.8(o)(9) of the Final Rule.

8.0 METHODOLOGY FOR DETERMINING PROJECT SPECIFIC CREDITS AND FEES

While a method for calculating credits is required in the ILF program instrument, the number of credits a specific mitigation site generates be determined during the instrument modification for site additions pursuant to §332.8(g)(1) of the Final Rule. The total of potential credits a mitigation site produces is an estimated amount that may vary depending on the site's actual performance.

There is neither a wetland nor a stream credit generation method - for restoration, enhancement, or creation- in Southeast Alaska. Additionally, the U.S. Army Corps of Engineers (USACE) Alaska District has only very recently established agency guidance for calculating aquatic resource credits for mitigation sites and debits at the permitted impact sites. The SAMF methods described in this document utilize this new guidance (USACE 2016).

SAWC has collaborated with organizational partners, including the IRT, the Southeast Alaska Land Trust (SEAL Trust), The Nature Conservancy Virginia Chapter - Virginia ILF program, Herrera LLC, Sitka Hydro Science LLC, Paul Adamus, and CH2M HILL to develop this process for calculating wetland and stream credit methods at SAMF mitigation sites. In particular, SEAL Trust and the City and Borough of Juneau (CBJ) have invested financial resources to develop and test the function-based wetland assessment tool that the wetland credit-debit method utilizes.

Appendix 5 describes the wetland credit-debit method (WCDM) and the stream credit-debit method (SCDM) for the Southeast Alaska Mitigation Fund In-Lieu Fee mitigation program. The SAMF ILF Program will sell both wetland credits and stream credits.

A credit represents the ecological lift of aquatic function(s) at either a wetland or a stream site following a mitigation action (creation, restoration, and/or enhancement). Credit calculations are based on the difference (Δ) between ecological function(s) at the site following the mitigation action (projected conditions) and the existing site conditions:

$$\Delta = \textit{With Mitigation} - \textit{Current Condition}$$

A debit represents the ecological loss of aquatic function(s) following a permitted impact to an aquatic resource. Debit calculations reflect the difference, or Delta (), between the baseline (Current Condition) of the assessment area and the anticipated condition (With Impact) of the assessment area after the authorized discharge has occurred:

$$\Delta = \textit{Current Condition} - \textit{With Impact}$$

The WCDM is based on the *Wetland Ecological Services Protocol for Alaska-Southeast* (WESPAK-SE) Version 2 (Adamus 2015), which outlines a method to calculate the gain of function that would result from a wetland mitigation activity. Each gain of function equates to a proportional number of credits generated at a site. The SCDM is primarily drawn from *A Function-Based Framework for Stream Assessment & Restoration Projects* (Harman et al. 2012) and amended to utilize aspects of the USDA Forest Service Tier II Stream Survey Protocol (USDA 2001).

Credits will be tracked by USACE RIBITS and in the Credit Ledger Template (Exhibit 3.0) by aquatic resource type and area and/or linear footage of the mitigation site.
Each credit type has an associated fee. SAMF credit fees are discussed in the instrument's draft fee schedule.

Draft Fee Schedule:

In accordance with the Final Rule, SAWC will set the fee schedule. However, the USACE will evaluate the fees to ensure that they satisfy the requirements listed in §332.8 (o)(ii). SAWC will establish fees for advance credits based on known costs associated with identified mitigation projects. Therefore, fees will vary over time and between service areas. Establishing fees based on known costs associated with identified mitigation projects will: 1) Provide transparency to permittees purchasing advanced credits; and 2) Provide USACE confidence that the cost per unit of credit is sufficient and includes the expected costs associated with projects.

Because there is no standardized credit price in SAMF's service areas, SAWC will determine the price of a credit and the internal procedures for selling credits. Credit fees for SAMF projects have been and will be determined based on full cost accounting, which includes an analysis of the expected cost associated with the restoration, enhancement and/or establishment of aquatic resources and associated riparian areas and upland buffers in the service area.

The costs included in this analysis are those related to land acquisition or easement, project planning and design, construction, plant materials, labor, legal fees, monitoring, remediation or adaptive management activities, program administration, contingency costs appropriate to the stage of project planning, including uncertainties in construction and real estate expenses, the resources necessary for the long-term management and protection of the in-lieu fee project, and financial assurances that are expected to be necessary to ensure successful completion of in-lieu fee projects.

The information currently available to mitigation sponsors regarding cost is compiled from past stream and wetland restoration sites. The data is insufficient to determine a set of credit prices in advance of assessing the costs associated with an identified mitigation site.

Each year, SAWC will provide a credit price range for wetland and stream credit. This range is based on the initial analysis of past restoration sites in Southeast AK. However the exact credit price will be determined on the costs associated to carry out specific mitigation sites that have

been identified prior to the selling of any advance credits. Therefore it will be necessary for permittees to contact SAMF staff to receive an exact credit price at the time when they are interested in purchasing credits.

Resource type	Wetland	Stream
Price per credit	$20,000-$60,000	$500-$10,000

Once SAWC has established SAMF and has completed a portfolio of ILF projects, true costs will become certain and SAWC will have improved information to determine accurate credit prices that could be determined in advance of identifying a known mitigation site. Additionally, future mitigation bankers will establish restoration, enhancement and creation mitigation sites. Those project outcomes will also provide the USACE and SAWC with detailed information on ILF program costs, which will increase certainty and ability to project credit prices.

Credit Availability and Cost:

A permittee may propose to use the SAMF program to satisfy part or all of its compensatory mitigation obligations. If a permittee chooses to use SAMF, it must contact SAWC for a statement of credit availability and cost per credit type. SAWC will provide said statement within 30 days. SAWC makes no guarantee that credits will be available for purchase to fulfill all or part of a permittee's compensatory mitigation obligations.

Authorization to sell credits to satisfy a permittee's compensatory mitigation requirements is contingent on compliance with all of the terms of the instrument, including amendments and modifications to the instrument as well as approval from the USACE.

Process for Requesting Credits:

The process for requesting credits from SAMF is briefly outlined as follows:

- Applicant contacts SAWC for credit availability;
- If credits are available, SAWC will issue a Credit Availability and Reservation Letter with a specific payment deadline (see Section G. Exhibits);
- Applicant submits Credit Availability and Reservation Letter with permit documents to the USACE program manager;
- When the applicant is ready to purchase mitigation credits, SAWC and the applicant complete a Credit Sale Letter and Receipt of Payment reflecting any changes since the initial request and the final mitigation requirements of the permit;
- SAWC issues acknowledgement of payment and assumes liability for impacts and mitigation requirements. SAWC submits a Credit Sale Letter and Receipt of Payment (see Exhibits) to the USACE within 30 days of receiving the letter and payment from the Applicant.

9.0 DESCRIPTION OF IN-LIEU FEE PROGRAM ACCOUNT

§332.8 (d)(6)(iv)(D) of the Final Rule requires the instrument to include a description of the in-lieu fee program account. Language requirements for establishment of the program account are provided in Section 2.0. This section describes how the program account operates.

Upon approval of SAMF, SAWC will create and maintain distinct and separate accounting — hereinafter referred to as the ILF program account — of revenues and expenses, all financial transactions, and asset management associated with SAMF. Only credit fees and any interest earned from those fees will be used to contribute to the ILF program account. Those funds will be used for the selection, design, acquisition, implementation, monitoring, management and protection of SAMF ILF projects and allowable SAMF administrative costs associated with administration of the ILF program. Mitigation funds accepted from permittees into SAMF will be kept in an entirely separate account from funds accepted by SAWC from other entities and for other purposes.

SAWC will have a single ILF account with sub-accounts by service area. Mitigation projects will be categorized by service area. Upon the sale of the first advance credits the following sub-accounts for each service area will be established under the ILF program account:

- An administration account,
- A mitigation account,
- A contingency account, and
- A long-term management account.

Except as otherwise approved by the USACE, non-expended funds from credit sales will be held in federally-insured, interest-bearing financial instruments that may include, but are not limited to, checking accounts, money markets, and certificates of deposit at a financial institution(s) that is a member of the Federal Deposit Insurance Corporation (FDIC). All interest and earnings from the program account will remain in that account for the purpose of providing compensatory mitigation for impacts to waters of the U.S. Interest earnings from the entire program account will be spent at the discretion of SAWC for the purpose of compensatory mitigation and can be directed to any of the four sub-accounts: program administration account, mitigation account, contingency account, or long-term management account.

i) Administration Account:

The administration account will be used to administer the overall SAMF program. The administration account will not exceed 15% of the total program account at any time and will be funded initially by deposits of 10% of credit sales fees and 15% of any interest accumulated in all program accounts. This account will be used to pay for program administrative duties not directly attributable to approved mitigation projects, including but not limited to:

a. Staff time and employment expenses; Audit prep, travel associated with programmatic audit, correspondence and meetings with IRT and other regulatory agencies- including negotiation of modifications to this instrument;

b. Office expenses; rent, computer equipment, and office equipment and supplies related to program administration, phone, Internet, and other communications expenses;

c. Ledger Management; fee and credit accounting;

d. Reporting;
e. Programmatic audit;
f. Bank fees associated with operation of the program.

ii) Mitigation Project Account:

The mitigation project account will hold mitigation project establishment funds (fees) from initial credit sales. Mitigation project expenses will be disbursed from this account to approved mitigation projects.

Mitigation projects will be funded directly by transfer from the mitigation account once compensatory mitigation project plans have been approved by the USACE. All funds within the mitigation accounts will be restricted to implementation and operation of their respective compensatory mitigation projects, but may be used for any of the below expenses incurred by the project during the implementation phase.

Each approved compensatory mitigation project budget will be tracked in the mitigation account. The mitigation project budget, upon approval of the compensatory mitigation project plan, is expected to have sufficient funds to cover all anticipated project-specific expenses. The fees in this account will be used to carry out all stages of compensatory mitigation projects; preliminary project identification leading to site selection and credit generation; compensatory mitigation project plan development; land acquisition or protection; planning and design; project implementation; project management, monitoring and maintenance activities; site specific legal services; and other activities and expenses directly attributable to a specific compensatory mitigation project.

iii) Contingency Account:

A contingency account will be established to cover contingencies related to project implementation or implementation of adaptive management plans for established compensatory mitigation projects. These monies are financial assurance and are required, unless determined not necessary, by 2008 Final Rule. These funds will only be used during the implementation and monitoring phases and will not be used to support sites that have achieved their performance standards and are in the long-term management phase. The contingency fund will be a single fund available to support any project in the implementation or monitoring phase. Additional financial assurances such as performance bonds, escrow accounts, casualty insurance letters, etc. will be determined on a site-by-site basis by the USACE in consultation with SAWC. If additional financial assurances are required, the USACE District Engineer will determine the required amount in consultation with SAWC. The determination must be based on the size and complexity of the compensatory mitigation project, the degree of completion of the project at the time of project approval, the likelihood of success, the past performance of SAWC, as well as, any other factors the DE deems appropriate.

iv) Long-Term Management Account:

SAMF will maintain a long-term management account. The long-term management account will be held in reserve to fund the long-term management of compensatory mitigation sites. Long-term management entails management of mitigation sites after performance standards have been achieved and the specified monitoring period has closed as well as the management of the funding mechanisms and disbursement procedures.

A long-term management plan[2] will be submitted along with the site-specific mitigation plan. It will act as a stand along document once the site is closed and will include information pertaining to the long-term endowment of the site, the site protection instrument, the specific long-term management actions, the identification of the long-term manager if not SAWC, and the tasks and contractual actions associated with disbursement procedures when SAWC is not the designated long-term manager.

Long-term financing mechanisms may include non-wasting endowments, trusts, contractual arrangements with future responsible parties, and other appropriate financial instruments.

Site management will abide by the principles of adaptive management, which serves as a guide for revising long-term management tasks and implementing measures to address both foreseeable and unforeseen circumstances that adversely affect mitigation success. Such measures may entail remediation and changes to the long-term management plan in the event of a major disturbance or enforcement of protection terms. If changes to the long-term management plan need to occur due to unforeseen obstacles, SAWC will work in consultation with the USACE to make amendments to plan.

Ledgers

SAWC will maintain two ledgers: one to track mitigation fees and expenditures, and a second to track debits and credits. Both ledgers will be organized by the SAMF service areas (6-digit HUC) and the two will be related to each other. The ledgers will be used to track the source of funding for compensatory mitigation projects as well as where and how fees are collected from credit sales are spent.

1. Fee Ledger

The fee ledger will track all income (mitigation fees collected from advance or released credit sales and any interest earned) and expenditures from the program. The fee ledger will show the following:

For each mitigation project:

- USACE project name (POA number and waterway)
- Credit fee amount
- List of expenditures by task categories covering all aspects of implementing mitigation receiving projects (e.g., administrative costs specific to the project, acquisition of property and protections, design and permitting, construction, monitoring, and long-term maintenance and management)

For each service area: Deposits and expenditures from the SAMF administration account:

[2] The USACE, Alaska District has an example Long Term Management Plan that was provided to SAWC November 2016. SAWC will utilize the template provide by the USACE

- Deposits from each USACE project (POA number and waterway) into each account (administration, mitigation, contingency & long-term management); In addition, interest income for each account
- Expenditures for each compensatory mitigation project from each account (administration, mitigation, contingency & long-term management)

Fee ledgers will be provided to the USACE in annual accounting reports by January 31of the following year for approval by the USACE. Reports will include detailed summaries of program account deposits and disbursements for each ILF project made over the previous fiscal year (January 1-December 31). The USACE may review program account records with 14 days written notice. When so requested, SAWC will provide access to all books, accounts, reports, files, and other records relating to the program account.

2. Credit Ledger

SAWC will maintain a credit ledger to account for all credit transactions including issuance of advance credits, the sale of advance or released credits to permit applicants, and the release of credits. The credit ledger template is shown in Exhibit 2.0.

SAWC will compile an annual credit ledger report for the USACE that will include the beginning and ending balance of advance and released credits, permitted impacts by resource type (wetland and streams) for which the ILF program will offset compensatory mitigation requirements, all additions and subtractions of credits and any other changes in credit availability. The ledger will contain basic information about each impact site for which the ILF program is providing mitigation and about each compensatory mitigation project, including the amount of compensation being provided by each mitigation method and aquatic resource type. Debits and credits will be associated with unique identifiers in the accounting system and ledger. For permitted impact debits, the unique identifier will be the USACE project name for the project. For compensatory mitigation project credits, the unique identifiers will be a unique project name and/or number issued for each compensatory mitigation project.

10.0 LONG-TERM OWNERSHIP ARRANGEMENTS

SAWC will consider mitigation projects on both private and public lands. Private properties with existing conservation easements or equivalent protections as well as lands held and protected by state, federal, tribal, or other entities in the public trust present opportunities to maximize cost-efficiency as land costs often comprise one of the largest component costs of a mitigation project.

Mitigation sites on private land will be protected by a long-term protection document, which may include a real-estate instrument, deed restriction or other legal instruments/arrangements approved by the USACE, as required under 33 CFR 332.7. SAWC intends to partner with statewide and regional land trust entities that can hold a conservation easement or fee title to property on which mitigation is conducted, as well as other land owners, both public and private, who have the authority to hold legal instruments that dictate land and resource use.

SAWC will develop a long-term management plan[3] for each mitigation site. This plan will be stated in the site-specific mitigation plan and approved by the USACE. Each long-term management plan will address site maintenance and protection, identify the party responsible for long-term management, and describe the mechanism(s) for financing long-term management activities. If necessary, the plan will also describe how the responsibility and funding for long-term management will be transferred to another entity.

SAWC has several legal mechanisms whereby approved compensatory mitigation properties could receive long-term protection and management. These include, but are not limited to:

- Partnership with a land trust to execute and hold a conservation easement on certain properties with willing public or private landowners;
- Partnership with a property owner that holds a conservation easement or deed restriction;
- Partnership with public agency upon agreeing to preserve and protect mitigation sites under a resource management plan.

In these instances, a site protection mechanism (e.g., conservation easement, resource management plan, etc.) would be established to preserve the site as a natural area in perpetuity. The contents of the applicable mechanism would affirm the long-term management strategy outlined in the mitigation plan and clarify responsibilities for each of the parties involved. Under SAMF, each project mitigation plan or site protection mechanism would clearly describe the conservation values being protected and the permitted/prohibited uses/activities for each project site.

Regardless of the legal mechanism protecting the mitigation site, SAWC or an identified partner in the project mitigation plan will be responsible for long-term management of the site. The long-term management strategy will include the following components:

1. Periodic review of specific needs for long-term sustainability of the project's benefits to the site and the surrounding watershed.

2. A plan to monitor and maintain the site that ensures project sustainability.

3. A long-term protection mechanism that has been approved by the DE.

4. When necessary, a stewardship management agreement. Mitigation projects may be conducted by SAWC on lands protected by easements held by a separate land trust entity. SAWC may either continue to assume responsibility for long-term management or delegate monitoring and/or management responsibilities to that land trust entity. However, it may be most advantageous or necessary to transfer responsibility for long-term management to a third party, e.g. where property owners request that a single entity hold the easement and provide long-term management. Prior to transferring such

[3] The USACE, Alaska District has an example Long Term Management Plan that was provided to SAWC November 2016. SAWC will utilize the template provide by the USACE

responsibility, a stewardship management agreement that describes how the third party will implement long-term management will be presented to the USACE. Any such transfer of responsibility shall not occur without approval from the USACE.

SAWC may assign its long-term management responsibilities for one or more of the SAMF mitigation sites to a third-party assignee, which will then serve as long-term steward in place of the sponsor. The identity of the assignee and the terms of the long-term management agreement between the SAWC and the assignee must be approved by the USACE following consultation with the IRT, in advance of assignment.

SAWC or a SAWC partner who has agreed to assume responsibility for the long-term management of a mitigation site may hold the long-term management funds, following approval by the USACE.

SAWC will remain responsible for complying with the provisions of this instrument throughout the operational life of the program, regardless of the ownership status of the underlying real property where mitigation sites are located, unless those responsibilities have been re-assigned. SAWC may transfer ownership of all or a portion of the mitigation sites' real property interest to another party, provided the USACE expressly approves the transfer in writing.

Upon execution of a long-term management agreement and the transfer within the long-term management account of the amount deemed necessary for that site, and upon meeting all performance standards for a given site, SAWC shall be relieved of all further long-term management responsibilities associated with the site for which responsibilities have been transferred, unless otherwise stated in the long-term management agreement.

11.0 FINANCIAL ARRANGMENTS FOR LONG-TERM MANAGEMENT

SAMF will maintain a long-term management account (see above). The long-term management account will be held in reserve to fund long-term management of compensatory mitigation sites. Long-term management entails management of mitigation sites after performance standards have been achieved as well as management of the funding mechanisms.

Funds in the long-term management account are available for any SAMF mitigation site, unless transferred by SAWC to another approved entity, given certain conditions (e.g., the long-term management account is used only for those sites where all credits have been released to satisfy those advance credits that have been sold or transferred). The long-term management account will be funded by the credit fees associated with mitigation sites. Long-term financing mechanisms may include non-wasting endowments, trusts, contractual arrangements with future responsible parties, and other appropriate financial instruments. SAWC will invest funds based on standards set in the long-term management agreement for each project. A report on investments will be in the program ledgers.

E. SIGNATURE PAGE

IN WITNESS WHEREOF, the parties hereto have executed this In-Lieu Fee Program Instrument on the date herein below last written.

PARTIES:

By the Sponsor:

_____ _____

SAWC Board President
Southeast Alaska Watershed Coalition

Date

By the United States Army Corps of Engineers:

_____ _____

David S. Hobbie
Regional Regulatory Chief
Alaska District

Date

[Revise signatory page as necessary to include all Parties signing]

F. APPENDIX

1.0 SAMF Compensation Planning Framework for the Southern Alexander Archipelago (HUC 190101)

The Southern Alexander Archipelago compensation-planning framework explains how SAMF will use a watershed approach to select, secure and implement aquatic resource restoration, enhancement, and/or establishment in the service area that encompasses the Southern Alexander Archipelago.

a. The geographic service area

This service area consists of a single 6-digit HUC, the Southern Alexander Archipelago (HUC # 190101) excluding Canada. The Southern Alexander Archipelago encompasses approximately 13,592 square miles in Southeast Alaska. It includes all the biogeographic provinces within the Prince of Wales Island Complex sub-region, the Revilla Island/Cleveland Peninsula province, and the North and South Misty Fjords provinces. This service area is dominated by rounded mountains and hills, which provide a more gentle topography than the other service areas. Much of Southeast Alaska's karst lands occur in this service area on Prince of Wales Island, Kosciusko Island, Dall Island, Heceta Island, and Revillagigedo Island. A large portion of the mainland is protected within the Misty Fjords National Monument Wilderness.

b. A description of the threats to aquatic resources in the service area

This service area, particularly Prince of Wales Island, has been and continues to be impacted by timber harvest activities. Timber harvest, commercial fishing, and recreation/tourism have primarily driven development in the Southern Archipelago. Mining also has played a role in the past, and is still a component of the current economy. Many of the rural communities rely on subsistence fishing and hunting.

Future community and resource developments in this service area are likely to be similar to that which has occurred in the past. SAWC does not anticipate new types of development activities to produce unique or unusual impacts on aquatic resources not already experienced in Southeast Alaska. Thus, the types of historic impacts to aquatic resources discussed below are also those that are likely to occur in the future. An exception is the potential future development of one or more ocean kinetics (tidal) projects, which could lead to impacts to submarine and/or near-shore aquatic resources.

Urbanization

The U.S. Census Bureau defines two classifications of urban areas: an *urbanized area* is a densely settled area with a population of 50,000 or more, and an *urbanized cluster* is a densely settled area with a population between 2,500 and 50,000. All other areas are considered rural.

This service area contains 12 communities including Metlakatla, which is the only community in Alaska that is classified as an Indian Reservation under federal law. Ketchikan is the only community within this service area considered to be an urbanized cluster. The Ketchikan Gateway Borough Comprehensive Plan 2020 outlines the Borough's plan for future growth and

development. In this plan, the Borough has policies to support the location of hatcheries and seafood processors within the Borough, the development of the timber industry, the expansion of shipyard and repair facilities for deep-water vessels, the development of the existing port, and the growth of the tourism industry including the cruise ship and ecotourism sectors.

Craig, on Prince of Wales Island, is the second largest community in this service area and is the only rural community besides Metlakatla with a population over 1,000. The City of Craig's 2000 Comprehensive Plan outlines several areas for development of marine transportation including North Cove, South Cove, and False Island. False Island has also been slated for industrial development. The Crab Bay tidelands are called out as an area that will be protected. Other community priorities that will require mitigation include improving recreational opportunities, building and improving community facilities and construction of transportation infrastructure.

Timber Harvest

The timber industry is a major economic contributor in this service area. There are seven active mills, all on Prince of Wales Island. Two mills are in Craig and five are in Thorne Bay. The Viking Lumber Company in Craig is the largest mill in the region. Commercial sources of timber in this service area include the Tongass National Forest lands, the Southeast State Forest and other state lands identified in the Central/Southern Southeast Area Plan and the Prince of Wales Island Area Plan, Alaska Mental Health Trust Authority Forest Assets, and Native Corporation lands (Sealaska Corporation; Cape Fox Corporation; Shaan-Seet, Inc.; Kavilco, Inc.; Haida Corporation; and Klawock Heenya Corporation). Prince of Wales Island is currently at greatest risk of potential threats to aquatic resources from continued logging activities.

About 1,653 square miles of Tongass National Forest lands in this service area are designated for timber production. This is about 18 percent of Tongass lands within the Southern Alexander Archipelago. There is one proposed timber harvest on Tongass National Forest lands in this service area. The proposed Big Thorne Project includes harvest of 6,186 old growth forest and thinning of 2,299 acres of young growth forest, construction of 46.1 miles of new road and reconstruction of 36.6 miles of existing road.

The Southeast State Forest is a relatively new state forest that was established in 2010. It encompasses 48,472 acres of land located in southern Southeast Alaska. Most of the Southeast State Forest land occurs on Prince of Wales Island, with other parcels on Gravina, Heceta, Kosciusko, Revillagigedo, and Tuxekan Islands as well as on the mainland. Timber sales on state lands are offered on a five-year schedule. The current Five Year Forest Management Schedule goes through 2019.

The Alaska Mental Health Trust Authority has Forest Assets near Thorne Bay and Ketchikan. The Thorne Bay asset has 2,925 net operable acres.

Native Corporation surface rights in this service area are shown in Table 1. Sealaska Corporation has large timber holdings in this service area.

Table 1. Surface rights/ownership of Native Corporations within the service area. Estimated area calculated using the Surface Ownership Map Service data layer provided by U.S. Forest Service in ArcGIS.

Corporation	Estimated Area (square miles)
Sealaska Corp	428.03
Cape Fox Corporation	34.93
Klukwan Inc.	36.13
Kootznoowoo Inc.	33.39
Shaan-Seet, Inc.	35.46
Kavilco, Inc.	35.96
Haida Corporation	31.46
Klawock Heenya Corporation	0.02

Transportation

In Southeast Alaska, the transportation infrastructure includes paved and unpaved roads, ferry terminal facilities, float plane docks, airports/airstrips, and small boat harbors. Communities in Southeast Alaska rely heavily on air and marine transportation, as most communities are not connected by road systems. Hyder provides the only road connection to mainland Canada within the Southern Alexander Archipelago service area.

This Southern Archipelago has the following existing transportation infrastructure:

- Approximately 4,851 miles of road, of which approximately 466 miles have been decommissioned;
- 109 bridges;
- 5 ferry terminals;
- 19 airports, including:
  - 2 standard airports;
  - 16 seaplane bases; and
  - 1other/unclassified airports;
- 35 harbors

Road mileage was estimated from the transportation map server provided by the U.S. Forest Service. Other transportation facilities were estimated from the transportation facilities data layer provided by the Alaska Department of Transportation and Public Facilities (DOT&PF) using ArcGIS.

State transportation infrastructure is maintained by DOT&PF and local transportation infrastructure by local governments. The U.S. Forest Service also maintains roads on the Tongass National Forest.

The DOT&PF Alaska Statewide Transportation Improvement Program (STIP) is the state's four-year program for transportation infrastructure preservation and development. Projects in the STIP have partial or full federal funding and are likely to be implemented in the planning period. The STIP planning period used was 2013 - 2015.

The DOT&PF Southeast Alaska Transportation Plan (SATP) identifies transportation needs within Southeast Alaska and recommends transportation infrastructure projects to address those

needs. Local governments also have transportation infrastructure priorities outlined in a local transportation plan or a comprehensive plan.

This service area has 22 transportation infrastructure projects programmed in the current STIP, most of which (12) are concentrated in Ketchikan. This trend will likely continue in the future, given that Ketchikan is the major hub for this service area.

The majority of these projects consist of rehabilitating existing infrastructure within the existing footprint, which limits impacts on adjacent resources. However, some improvements to existing highway infrastructure include widening or realigning road surfaces. In addition, some of the ferry terminal upgrades will require fill and placement of structures outside of the existing footprint. Such reconstruction projects will require mitigation.

The Gravina Access project is intended to provide a transportation link between Revilliagigedo Island and Gravina Island. Currently, DOT&PF is looking at a variety of alternatives to provide access. There is also proposed new road infrastructure funded with state monies. The Ketchikan Shelter Cove Road project will construct 11 miles of new road from the end of Harriet Hunt Road to Shelter Cove Road on Carroll Inlet.

Two new proposed ferry terminal projects are in the current STIP for this service area. The Metlakatla/Annette Bay Ferry Terminal project will construct a new Alaska Marine Highway System (AMHS) ferry terminal to provide a Ketchikan – Metlakatla ferry service. A second new ferry terminal is proposed along the South Tongass Highway in Ketchikan that would be used for the Ketchikan – Metlakatla ferry service as well.

The status of DOT&PF projects in pre-construction and construction can be found in the Project Status Reports, which are available online at http://dot.alaska.gov/sereg/projects/index.shtml

Local governments in this service area are prioritizing gravel road resurfacing, widening shoulders, construction, and rehabilitation of non-motorized transportation infrastructure (sidewalks and bike paths). Some local governments are preparing for community growth by prioritizing extension of local road systems or construction of new roads to undeveloped lands as well as expansion of or upgrades to local ports and harbors.

Hydroelectric Power/ Alternative Energy Facilities

In Southeast Alaska, hydropower is currently the largest and most important producer of electricity from a renewable energy source. According to the Juneau Economic Development Council (JEDC) Southeast Alaska Economic Asset Map (2011), communities served by hydropower have some of the least expensive electricity rates in the state. With increased interest in replacing expensive fossil-fuel-powered generation with renewable energy resources, hydropower capacity will continue to expand. The Alaskan U.S. Senator Lisa Murkowski is sponsoring the Hydropower Improvement Act.

Ketchikan, Metlakatla, Hyder, Craig, Klawock, Hollis, Hydaburg, Thorne Bay and Kasaan are the only communities currently served by existing hydroelectric facilities. Electrical transmission lines create a sub-regional grid connecting the Prince of Wales Island communities (Craig, Klawock, Hollis, Hydaburg, Thorne Bay and Kasaan). Ketchikan is connected to the sub-regional grid with Petersburg and Wrangell (outside of this service area).

The Nature Conservancy developed an inventory of hydropower sites and power lines, both existing and proposed, from information obtained from the Alaska Industrial Development and Export Authority (AIDEA). This inventory, available through the Southeast Alaska GIS Library, identified 10 proposed hydroelectric facilities. Hydroelectric projects in this service area include new construction, expansion of existing facilities, and other projects in support of hydroelectric power facilities.

Mining

Southeast Alaska has extensive mineral resources. The region's mineral deposits include gold, silver, lead, zinc, copper, molybdenum, platinum, limestone, marble, uranium, and rare earth minerals. There are also rock, sand and gravel resources for use in construction. In 2014, mining comprised 5 percent of the region's economy. According to the U.S. Geological Survey, Alaska Resource Data File, approximately 130 mineral occurrences, 327 prospects and 63 mines are located in this service area. Mineral occurrences are those unexplored occurrences of minerals of economic interest. Prospects are sites where some development works has occurred. Mines are sites with current and past production.

Many mining claims never become fully operational mines, and it is difficult to predict which claims will eventually become operational. The current high price of metals is encouraging additional mineral exploration at or near existing mines, as well as re-opening historic mining sites. Mining activity in the Southeast region is largely contingent on worldwide demand and the price of silver, gold or base metal commodities. At this time the demand for metal resources continues to grow across the world.

In addition to mining for metals and rare earth elements, mining for gravel and sand is also a common activity in the region. Gravel and sand are usually mined from major river floodplains, talus slopes, glacial moraines, and beach deposits.

Within the Southern Alexander Archipelago service area, mining exploration is primarily occurring on Prince of Wales Island. Projects in the advanced stages of exploration within this service area include:

- Bokan Mountain Project on southern Prince of Wales Island: a well-funded development-phase mining venture focused on establishing rare metal resource with near-term production potential. Ucore is conducting the exploration of 30sq km.
- Niblack Prospect on Prince of Wales Island: a gold rich copper-lead-zinc prospect that is in advanced exploration by Niblack Mining Company.
- Poorman Prospect, Prince of Wales Island is being explored for magnetite (iron ore) by Eagle Industrial.

- Admiral Calder Calcium Carbonite Mine on Prince of Wales Island was owned by Sealaska but was purchased in 2005 by Tri-Valley. The mine is currently in care and maintenance status until a customer base is established.

Tourism

The largest component of the tourism industry is the cruise ship industry. The number of cruise ship passengers in Southeast Alaska increased by 14 percent between 2010 and 2013; it is anticipated that a new cruise ship passenger record will be reached in 2016 (Southeast Conference, 2014). Ketchikan is the only community in this service area capable of receiving cruise ships, and is a primary port for the cruise ship industry. According to the Juneau Economic Development Council (JEDC) Southeast Alaska Economic Asset Map (2011), Ketchikan saw a 45 percent increase in the numbers of cruise ship passengers between 2000 and 2010.

In addition to cruise ship passengers, Southeast Alaska accommodates 230,000 independent travelers. Independent travelers are drawn to the region for "nature-based" tourism. Residents also travel throughout the region to enjoy recreational opportunities (JEDC, 2011).

Nature-based tourism is particularly popular on Prince of Wales Island, bringing average revenue of $2,600 per person. Ketchikan receives the second highest number of visitors to the Tongass National Forest, with flightseeing and remote-setting nature tours being the most popular activities (JEDC, 2011). New remote tourism lodges or developments to satisfy potential demand for ecotourism niche markets in the future could cause localized impacts to aquatic resources.

Aquaculture

Currently, salmon hatcheries for fish stock enhancement dominate the aquaculture industry in Southeast Alaska, and the footprint of this coastal infrastructure has been in place for decades. According to the Alaska Department of Fish and Game (http://www.adfg.alaska.gov/static/fishing/PDFs/hatcheries/se_hatch.pdf), there are six salmon hatcheries in this service area: two on Prince of Wales Island; two in Ketchikan; one in Neets Bay near Ketchikan; and one near Metlakatla. No new fish hatcheries are currently slated for Southeast Alaska. Freshwater aquaculture and the farming of marine finfish are prohibited in Alaska state waters. Although offshore fish farming has received some attention at the federal level in recent years, no current efforts are underway off Alaska.

Mariculture and aquaculture are relatively new to Southeast Alaska and have potential for expansion. Shellfish aquaculture projects potentially could occur anywhere in Southeast Alaska where growing, tending, and harvesting conditions for shellfish are favorable. Marine shellfish operations culturing oysters and clams are likely to increase as technology improves, shellfish farms become more profitable, and people are drawn to the remote lifestyle where few other economic opportunities exist. This service area has the most concentration of aquatic farms in Southeast Alaska. There are 32 shellfish farms, three shellfish nurseries, and one shellfish

hatchery. The Alaska Department of Natural Resources is offering over-the-counter lease sites for aquatic farms in 27 areas within this service area.

There are 14 seafood-processing plants in this service area: eight in Ketchikan; three in Craig; and one each in Klawock, Metlakatla and Hyder. According to the Juneau Economic Development Council (JEDC) Southeast Alaska Economic Asset Map (2011), the combined 2009 seafood production for Ketchikan and Craig totaled 49,571,989 lbs. of product valued at $104,023,080. The other communities kept their numbers confidential. The existing infrastructure in place for processing may not have capacity to absorb future increase in hatcheries or aquaculture sites. These expansions could require mitigation.

Under SAMF, the ILF program sponsor will help to offset impacts resulting from these threats by mitigating specific types of aquatic resources, including wetlands, streams, shorelines, floodplain areas, upland buffers, and riparian zones. It is the long-term goal for the ILF program sponsor to carry out a wide spectrum of mitigation methods to maintain and improve the quantity and quality of aquatic resources in the services area.

SAWC will work with mitigation partners who share expertise to complete compensatory mitigation activities in each Service Area. The mitigation projects carried out under the SAMF program, as well as, mitigation projects that have already been prioritized strive to be self-sustaining with attainable ecological performance standards, and use restoration techniques that have documented success.

SAWC used past restoration efforts, expertise of the mitigation fund partners and the *Aquatic Habitat Rehabilitation, Enhancement, and Mitigation in Juneau Alaska: Inventory and Case Studies* (Hudson, Seifert 2012) to inform the list of possible mitigation project types to be carried out.

The types of projects listed below have been supported by natural resource managers and carried out by SAWC and mitigation fund project partners. In addition, there is information pertaining to project design and monitoring for these types of mitigation projects. Resource managers agree that there is enough scientific research and information, as well as expertise and experience in this region, to carry out the following types of mitigation projects. In general, the program sponsor will pursue the following types of mitigation projects:

1. **Stream bank bioengineered stabilization**
2. **Stream channel creation or reconfiguration**
3. **Plant/enhance riparian vegetation**
4. **Flood plain restoration/reconnection**
5. **Wetland restoration, enhancement and establishment**
6. **Fish habitat restoration and/or enhancement (e.g. instream structures)**
7. **Fish passage restoration and/or enhancement**

Each mitigation site will have a detailed mitigation plan. These mitigation plans will outline specifically the techniques that will be used to carry out each type of mitigation. In this way, the IRT, other agencies, interested and/or concerned stakeholders and members of the general public

will be able to provide input to SAWC on project site design, implementation and ecological performance standards.

c. An analysis of historic aquatic resource loss in the service area

To date there is no publicly available in-depth database documenting cumulative aquatic resource loss across Southeast Alaska. This type of data collection and analysis has not been conducted by any natural resource agency or conservation organization working in the region. In Southeast Alaska, the City and Borough of Juneau, though is not within this service area boundary, is the only community in Southeast Alaska that has an estimate of wetland impacts.

Historical data within this service area that documents aquatic resource loss includes: the Tongass National Forest Watershed Condition Framework (USFS, 2012), the USACE permitted impact data and the *Conservation Assessment and Resource Synthesis for The Coastal Forests and Mountains Ecoregion in Southeast Alaska (TNC/Audubon 2011)*- which indicates that Prince of Wales Island has only 59 percent of original habitat remaining intact, and the highest cumulative risk to biodiversity and ecosystem values.

The strongest data supporting the need for SAMF is the USACE CWA Section 404 permitted impact data. 33 CFR 332.3(a)(2) states in pertinent part that "Restoration should generally be the first option considered because the likelihood of success is greater and the impacts to potentially ecologically important uplands are reduced compared to establishment, and the potential gains in terms of aquatic resource functions are greater, compared to enhancement and preservation." Preservation does not result in a gain of aquatic resource area or functions. SAWC believes that there is definitely a need for restoration in Alaska since the majority of compensatory mitigation has been preservation.

These three sources demonstrate that there has been loss to aquatic resources within this service area and specific watersheds have already been prioritized for restoration (see section e. of this Compensation Planning Framework).

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

Much of the habitat values on the mainland within this service area are largely intact, in part due to the protection status of lands within the service area. Approximately 9,022 sq. mi. of this service area is within the Tongass National Forest (estimated from the USFS Land Use Designations data layer using ArcGIS). Approximately 40 percent (3,630.9 sq. mi.) of Tongass National Forest lands within this service area are classified as Wilderness Land Use Designations (LUDs). Most of this (3,337.5 sq. miles) is within the Misty Fjords National Monument Wilderness located on the mainland and part of Revillagigedo Island. Tongass land within Wilderness LUDs constitutes nearly 27 percent of this service area. Another 34.5 percent (3,108.45 sq. mi.) of Tongass Nation Forest lands are classified within Natural Setting LUDs. These areas constitute nearly 23 percent of this service area.

According to the *Conservation Assessment and Resource Synthesis for the Coastal Forests and Mountains Ecoregion in Southeastern Alaska and the Tongass National Forest* produced by The Nature Conservancy in partnership with The Audubon Society, the mainland within the Misty Fjords National Monument Wilderness retains 95 to 100 percent of their habitat values for focal species. The Cleveland Peninsula, while not a part of the Misty Fjords National Monument Wilderness, is also largely intact and has substantial ecological values. Much of the remaining areas have been largely impacted by historic timber harvest activities. Prince of Wales Island and Revillagigedo Island have a long history of timber harvest and high grading of large tree stands. The Hecata, San Juan Bautista, Suemez, Long Islands, and portions of Dall Island have all been intensively high graded.

As part of the Forest Service National Watershed Condition Framework, 12 core indicators were evaluated to classify watershed conditions across the Tongass National Forest in 2011. The indicators include attributes of aquatic habitat conditions (e.g., riparian harvest, roads in riparian areas, fragmented habitat due to culverts blocking fish passage). *[Note: Additional information and references on the national Watershed Condition Framework is at http://www.fs.fed.us/publications/watershed/.]* The watershed condition ratings, along with use and aquatic value criteria, led to a designation of priority watersheds for restoration focus.

Section e. of this compensation planning framework outlines the 12 digit HUC watersheds that have been prioritized for aquatic resource restoration, enhancement, and establishment. A confidential list of potential mitigation projects within these watersheds has been submitted to the USACE.

Localized degradation and loss of aquatic resources has occurred near communities and mine sites within the service area. The Alaska Department of Environmental Conservation (DEC) has identified eight impaired waterbodies in this service area, seven of which are on Prince of Wales Island and Ward Cove near Ketchikan.

This service area has nearly 28,518 miles of stream (Table 4). The USFS Region 10 *Channel Type User Guide* provides a method for categorizing a watershed's stream network into basic fluvial process groups. Fluvial process groups help reveal interrelationships between the landscape, erosion and depositional processes, channel morphology, and fish and riparian habitat. About 20 percent of the stream miles within this service area have not been classified in a process group. High gradient contained channels are by far the most common, contributing nearly 50 percent of the total stream miles in the service area. Moderate gradient mixed control channels were the second most common, contributing only about 6 percent of the total stream miles.

Table 2: Estimated miles of stream by process group within the service area. Estimated miles calculated using the SEAK Hydro Stream Process Groups data layer in ArcGIS.

Stream Process Group	Estimated stream length (miles)
Alluvial Fan	418.51
Estuarine	194.88
Floodplain	1,355.18
Glacial	512.94
Lake	1,620.00
High Gradient Contained	13,976.83
Moderate Gradient Contained	1,482.99
Moderate Gradient Mixed Control	1,793.62
Low Gradient Contained	198.80
Palustrine	814.37
Other	430.38
Unknown	5,719.85
Total	28,518.35

In total, the Southern Alexander Archipelago includes approximately 2,418 miles of anadromous streams and 55 square miles of anadromous lakes (estimated from the 2015 Anadromous Waters Catalog datalayer using ArcGIS). While this is only 9.5 percent of the reported total length of streams, some channel types (e.g. high gradient contained channels) have gradient and stream flow barriers that make them inaccessible to anadromous fish and, therefore, do not provide significant fish habitat. Unuk River is one of the highest producing watersheds in the region and is capable of supporting all salmon species. Anan Creek on the Cleveland Peninsula is one of the five most productive watersheds for pink salmon in the region and its watershed is protected by State of Alaska legislation.

The Southern Alexander Archipelago contains approximately 3,134 square miles of wetlands (Table 5).

Table 3: Estimated area of wetland types within the service area. Estimated area calculated using the National Wetland Inventory data layer in ArcGIS.

Wetland Type	Estimated Wetland Area (square miles)
Estuarine/Marine	148.75
Freshwater Emergent	632.05
Freshwater Forest/Shrub	2,132.00
Freshwater Pond	39.19
Lake	153.32
Riverine	27.83
Other	0.68
Total	3,133.82

Local, intact aquatic resources provide valuable services as fish and wildlife habitat, open space, recreation sites, (drinking) water quality protection, and flood control. These aquatic resources greatly enhance the human use and aesthetics of communities throughout the Southern Alexander Archipelago.

Coastal Marine Habitats

The ShoreZone system provides a detailed inventory of geomorphic and biological features of coastal areas in Alaska. This service area has approximately 7,417 miles of coastline mapped in the ShoreZone system (Table 6). This coastline includes the Southeast Alaska coastal areas of Craig, Misty Fjords and small portions of the Stikine as outlined in the Alaska ShoreZone Coastal Habitat Mapping Protocol.

Table 4: Estimated miles of coastline by coastal types within the service area. Estimated miles calculated using the ShoreZone data layer in ArcGIS. Modified from Table A-14 in the Alaska ShoreZone Coastal Habitat Mapping Protocol. Biological exposure categories were combined to estimate the mileage for each coastal type.

Dominant Structuring Process	Substrate Mobility	Coastal Type	Coastline (miles) by HUC
Wave Energy	Immobile	Rock, Rock & Sediment, or Sediment	1,372.37
	Partially Mobile	Rock & Sediment, or Sediment	5,111.67
	Mobile	Sediment	71.41
Fluvial/Estuarine		Estuary	762.09
Current Energy		Current-dominated	66.11
Glacial		Glacier	0.00
Anthropogenic		Impermeable	1.68
		Permeable	31.49
Total			7,416.82

The Stikine bioarea within the Southern Alexander Archipelago is limited to the Coronation and Warren Islands and northwest Prince of Wales Island. The Stikine bioarea is influenced by glacial, silty water and consists of a diversity of habitat types with moderate to low wave exposures. The Southeast Alaska – Craig bioarea includes the islands in southern Southeast Alaska including areas around Ketchikan, Prince of Wales Island, Dall Island, and southern Coronation Island. The Craig bioarea is characterized by a fully marine coast that has high species diversity and habitat. The Misty Fjords bioarea is located along the southern mainland and the west coast of Revillagigedo Island, which is characterized by a fjord landscape with bedrock-dominated coastline subject to low wave exposure. This bioarea has low species diversity.

On average, the Southern Alexander Archipelago has moderate biodiversity (average for HUC is 6.1 on a scale of 0 – 13; estimated from the coastal biodiversity index datalayer produced by The Nature Conservancy using ArcGIS). Areas with higher biodiversity (index of 6 or higher) include the western coasts of Heceta Island, Kosciusko Island, Suemez Island, and Dall Island; the northern coast of Prince of Wales Island; and the southwest coasts of Gravina, Annette and Duke Islands. The Southern Alexander Archipelago also has the second highest total coastline dominated by anthropogenic structures in the region at 33 miles.

Estuaries and mudflats are high-value habitat but are relatively rare within the region: mudflats are less than 1% and estuaries are 14% of the shoreline. According to the ShoreZone data, this service area has the second highest fluvial/estuarine coastline at 762 miles. However, according to the *Conservation Assessment and Resource Synthesis for The Coastal Forests and Mountains Ecoregion in Southeast Alaska (TNC/Audubon 2011)*, this service area did not include any of the 10 largest estuaries in the region. The four largest estuaries in the Southern Alexander Archipelago are ranked in the top 50 largest estuaries in the region: the Salmon (ranked #34), Unuk (ranked #44), the Chickamin (ranked #48) and the Crab (ranked #49).

Throughout Southeast Alaska, the marine shoreline supports abundant populations of shellfish, fish, and wildlife in a complex mosaic of geophysical and biological features where uplands, freshwater, estuarine, and marine environments interface (Schoen and Dovochin 2007). These combined features support primary productivity from plankton, algae, kelp, eelgrass and marsh grass; shellfish production from Dungeness crab, clams and shrimp; fish production from herring, flatfish, rockfish and salmon; and a diverse ecosystem that includes many species of marine birds and marine mammals. The communities of Southeast Alaska rely on these coastal resources to support significant components of their economies dependent on subsistence, sport and commercial fishing, hatcheries, tourism, recreation, and wildlife viewing.

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

Generally this service area has been impacted significantly by historic timber practices and the road infrastructure constructed to support the timber industry. Within this service area the majority of watershed assessments and identified restoration and enhancement projects are on Prince of Wales Island and within the Ketchikan Misty Fjords Ranger District, Tongass National Forest. Watershed assessments conducted within this service area (See list section F) commonly find that though the watersheds hold high potential to have high functioning aquatic resources and be quality habitat for the five species of salmon, as well as other freshwater fishes, the lack of large old growth trees in the are has diminished the amount of habitat and have drastically changed the sedimentation regimes- resulting in landslides from upland areas and erosions of historical road development (2008, TNC).

Aquatic resource restoration and enhancement goals for wetlands and streams in this service area include- road decommissioning, reconnection of stream channels to the floodplain and wetland habitats, stream channel reconstruction and large-woody debris structural treatments to maintain channel stability and improve fish habitat conditions revegetation of stream banks, riparian thinning, and culvert replacement.

The SAMF program will utilize the following restoration and enhancement actions to mitigate for current and future impacts within this service area; stream bank bioengineered stabilization, stream channel creation or reconfiguration, plant/enhance riparian vegetation, flood plain restoration/reconnection, fish habitat restoration and/or enhancement (e.g. instream structures), fish passage restoration and/or enhancement

The following watersheds have been prioritized by federal and state agencies, as well as, regional NGO's and local organizations. The majority of listed watersheds have multiple restoration and enhancement opportunities and have been identified in a regionally relevant and scientifically validated watershed assessment.

Confidential supporting information, in accordance with 33 CFR 332.8(n)(2), lists specific potential projects within these watersheds with the type and location of aquatic resources to be restored has been submitted to the Army Corps of Engineers, Alaska District.

- Big Salt Lake-Frontal Shinaku Inlet
- Shinaku Creek

- San Alberto Bay-Frontal Ursua Channel
- 190101031402
- Trocadero Bay-Frontal Bucareli Bay
- Port Refugio-Frontal Ulloa Channel
- Bucareli Bay-Frontal Pacific Ocean
- Hetta Inlet-Frontal Cordova Bay
- Alder Cove-Frontal Cordova Bay
- Dunbar Inlet-Frontal Tlevak Strait
- Lake Seclusion-Frontal Kaigani Strait
- Kassa Inlet-Frontal Cordova Bay
- Klakas Inlet-Frontal Cordova Bay
- Coning Inlet-Frontal Cordova Bay
- Meares Island-Frontal Meares Passage
- Port Bazan-Frontal Pacific Ocean
- Berg Bay-Frontal Blake Channel
- Outlet North Fork Bradfield River
- Headwaters East Fork Bradfield River
- Outlet East Fork Bradfield River
- Mount Tyee-Bradfield River
- Bradfield Canal-Frontal Ernest Sound
- Frosty Creek
- Deer Island-Frontal Ernest Sound
- Emerald Bay-Frontal Ernest Sound
- Meyers Stream-Frontal Clarence Strait
- Bell Arm-Frontal Behm Canal
- Wolverine Creek
- Granite Creek
- Wadding Cove-Frontal Behm Canal
- Helm Bay-Frontal Behm Canal
- Wilson Arm-Frontal Smeaton Bay
- Fish Creek-Salmon River

In addition, the DEC has identified eight impaired waterbodies in this service area, seven of which are on Prince of Wales Island and Ward Cove near Ketchikan. The Prince of Wales impaired waters include four unnamed creeks that drain into Sweetwater Lake near Coffman Cove; Thorne Bay near the community of Thorne Bay; Salt Chuck Bay near a historic copper mine; and Fubar Creek between Klawock and Hydaburg.

Neither SAWC nor its partners have funded conceptual designs for the initial list of projects identified in SAWC's preliminary assessment of the service area. Therefore, the exact amount of linear feet of stream and/or acres of wetland restoration, enhancement and creation projects in this service area is difficult to summarize. However, the USFS has identified an estimated potential 102 miles of stream restoration and enhancement and 2700 acres of riparian wetland restoration and enhancement and 129 miles of estimated potential access to fish habitat via

culvert remediation and stream habitat restoration. Based on a summarization of past aquatic resource restoration, enhancement and enhancement projects in this service area- over a 3yr period- 26.95 miles of stream and have been restored and 181 acres of wetlands.

f. A prioritization strategy for selecting and implementing compensatory mitigation activities

This section provides an overview of how the program sponsor has selected and prioritized an initial list of potential mitigation sites. This section also provides an overview of how SAWC will select and prioritize sites in the future under this instrument. The compensatory mitigation activities that will be carried out are stream and wetland restoration, enhancement and establishment. Confidential supporting information, in accordance with 33 CFR 332.8(n)(2), of specific activities has been submitted to the USACE.

SAWC has developed a prioritization and site selection strategy that is based on a watershed approach that is specific to Southeast Alaska. SAWC works to ensure each mitigation site meets the requirements of the Final Rule. SAWC's prioritization strategy for selecting and implementing compensatory mitigation sites was a two-step process. The first step was to identify top priority watersheds within the service area using a watershed approach based on existing assessments and other sources. The second step was to identify potential mitigation sites that could be efficiently implemented to generate credits and improve watershed conditions.

SAWC has carried out an initial prioritization effort by utilizing the following methodology. The results of this prioritization effort are the list of watersheds and waterbodies listed in the above section of the CPF (section e.)

The following provides an overview of how SAWC has selected and prioritized sites (as described in confidential supporting information, in accordance with 33 CFR 332.8(n)(2) and it also provides as overview of how SAWC will select and prioritize sites in the future under this instrument.

To accomplish the first step --*identify top priority watersheds within the service area based on ecological assessments and other sources* — SAWC will rely on documentation- that has been developed by resource managers and agencies, conservation and environmental science not for profit organizations and local governments- to identify top priority watershed within this larger service area. These resources have utilized a watershed approach to identify and prioritize smaller watersheds within this 6 Digit HUC service area.

- *The Watershed Condition Framework*. The USFS recently identified priority watersheds for restoration in the Tongass National Forest using its national Watershed Condition Framework. The framework includes a strategic planning outline and includes six key steps: 1) Classify Watershed Condition; 2) Prioritize Watersheds for Restoration; 3) Develop Watershed Restoration Action Plans; 4) Implement Integrated Suites of Projects; 5) Track Restoration Accomplishments; 6) Verify and Monitor Accomplishments. http://www.fs.fed.us/publications/watershed/

- *A Conservation Assessment and Resource Synthesis for The Coastal Forests and Mountains Ecoregion in Southeast Alaska (TNC/Audubon 2011).* The assessment includes a map

gallery of GIS products; a ranking of ecological values among watersheds throughout the region in a watershed matrix; and a GIS database that provides a common inventory of ecosystem and habitat values that encompass lands throughout Southeastern Alaska. http://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/alaska/seak/era/cfm/Pages/default.aspx

- *Ecological Forest Restoration in the Tongass National Forest (TWS/SEAWEAD Assessment 2012).*
- USFS Region 10 *Channel Type User Guide (Paustian et al 1992, updated 2010)*
- *Alaska's Anadromous Waters Catalog (ADF&G)* http://www.adfg.alaska.gov/sf/SARR/AWC/
- *Fish Passage Culvert Inventory (ADF&G and USFS) http://www.adfg.alaska.gov/index.cfm?adfg=fishpassage.database*
- *Southeast Alaska Impaired Waterbodies (DEC)* http://dec.alaska.gov/water/index.htm
- *ShoreZone* http://alaskafisheries.noaa.gov/shorezone/default.htm
- Total Maximum Daily Loads (TMDLs) for:
    - Thorne Bay – Wood Residues (2007)
    - Ward Cove – Biochemical Oxygen Demand (1994), and Residue and Dissolved Oxygen (2007)
- Local watershed plans/assessments including but not limited to:
    - Dog Salmon Creek Watershed Assessment Report (2008)
    - Forest and Freshwater Restoration Priorities (2008)
    - Kasaan Bay Watershed Management Plan (2005)
    - Klawock Watershed Assessment and Restoration Plan (2002)
    - Hetta and Eek Lake Habitat Mapping (2013)
    - Prince of Wales Island Unified Watershed Assessment (2014)

To accomplish the second step — *identify potential mitigation sites that can be efficiently implemented to generate credits and improve watershed conditions within the guidelines of the Final Rule* —

SAWC endorses the following prioritization strategy for the SAMF because of its step-wise approach to ensuring that each project meets the requirements of the Final Rule, and that sponsor and project partners have the capacity to carry out the technical aspects and provide stewardship actions over the long term.

The SAMF Site Selection Decision-making Factors consist of the following six elements:

1. **Potential to Meet the SAMF Goals**
2. **Project Appropriateness within a Watershed Context**
3. **Readiness/Feasibility**
4. **Project Lead Capacity**
5. **Cost Effectiveness**
6. **Other Benefits**

These six elements are explained below:

1. Potential to Meet SAMF Goals: Assesses the extent to which the potential mitigation project meets the core program requirements *to restore, enhance, or establish aquatic resources that have been prioritized using a watershed approach, best available science and/or by the USACE*. All project sites must be protected with an appropriate site protection mechanism. Considerations include:

a) The sustainability of the proposed conservation action (restoration, enhancement, and/or establishment.

b) The degree to which the mitigation project offsets the functional benefits of impacted aquatic resources identified as a priority in the biophysical region.

c) The proximity of the mitigation project to impacted resources in the watershed.

d) Inclusion of upland areas, where necessary to ensure the long-term viability of aquatic resources.

e) The functional lift to be provided by the mitigation project (e.g., proposed improvement in habitat quality, contribution to functioning biological systems, water quality, etc.)

f) Other specific conservation objectives developed for each biophysical region or watershed, as described in watershed plans, municipal management plans, and statewide conservation objectives, as long as those objectives support third-party compensatory mitigation for permitted impacts regulated under Section 404 of the Clean Water Act, and Section 10 of the Rivers and Harbors Act of 1899.

2. Project Appropriateness within a Watershed Context: Assesses the extent to which the location of the potential mitigation project meets the core program requirement *to consider the location of a potential project relative to focus areas for land conservation or habitat preservation identified by a state agency, or other regional or municipal plans*.

Considerations include:

a) Presence within or proximity to habitat areas of statewide conservation significance or other natural resource priority areas.

b) Presence within or proximity to public or private conservation lands to maintain and preserve habitat connectivity.

c) Presence of natural resources of significant value and/or rarity within the project site boundaries

3. Project Readiness/Feasibility: Assesses the extent to which the potential mitigation project 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 the requirements stated in the Final Rule and the goals of SAMF*. Considerations include:

a) Documentation of landowner willingness to participate in a proposed project, including conveying a conservation easement or fee title, with conservation covenants, to the property (for projects not on public or private conservation lands).

b) Soundness of the technical approach presented in a conceptual plan for the proposed project.

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

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

e) Completeness and feasibility of long-term stewardship and monitoring plan.

f) Potential for adverse impacts (such as flooding or habitat loss) associated with the project.

g) Conformance with any applicable USACE and state mitigation policy, guidance and permitting requirements, including appropriate financial assurances for various construction activity.

4. Long Term Management Feasibility: Assesses the extent to which the potential mitigation project meets the core program requirement *to provide for long-term management and/or stewardship by a responsible state or federal resource agency, or conservation organization. Considerations include:*

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

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

c) 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).

5. Cost Effectiveness: Assesses the extent to which the potential mitigation project meets the program requirement *to represent an efficient use of funds expended given the condition, location and relative appraised values of properties. Considerations include:*

a) Clarity and detail of budget submitted to SAWC.

b) Sufficiency of funds available in the applicable biophysical region including matching funds if necessary.

c) Potential to develop a substantial number of credits in a biophysical region where there is a robust demand for the credit type.

6. Social Benefits: Assesses the potential for a mitigation project to support recreational access, scenic enhancements, economic activity, or other contributions to the community or region where the project is located. Review applicable watershed plans to identify objectives that could be accomplished within the scope of a mitigation project and/or identify opportunities to improve the productivity of rare or highly valued fish and/or wildlife species.

g. An explanation of how any preservation objectives identified above satisfy the criteria for use of preservation in 33 CFR 332.3(h)

At this time the SAMF does not have a programmatic goal to perform preservation as a form of compensatory mitigation.

h. A description of any public and private stakeholder involvement in plan development and implementation, including, coordination with federal, state, tribal and local aquatic resource management and regulatory authorities

SAWC will ensure there is both public and private stakeholder involvement throughout the entire process from mitigation site selection to the long-term management of the sites. Based on the extensive needs assessments conducted by SAWC over the past three years, there is no *one* organization, agency, and/or environmental consultant operating in Southeast Alaska that understands the requirements listed in the Final Rule *and* holds the experience and expertise to conduct all stages of restoration, enhancement and/or establishment projects from site selection to long-term monitoring.

SAWC developed a *Draft* Prospectus, which is not required under the Final Rule, in order to build knowledge and awareness of SAWC staff, advisory board, board of directors, and IRT members. SAWC has incorporated feedback, concerns, and questions into the prospectus, draft instrument and instrument. In addition, over the past three years, SAWC has organized significant outreach and public education opportunities in order to understand better the diverse spectrum of stakeholder perspectives of aquatic resource mitigation and what strategies and processes a third-party mitigation program provider should consider in order to respond to the unique aquatic resource mitigation challenges and opportunities that exist throughout Southeast Alaska. SAWC has reached over 300 southeast Alaskan natural resource professionals through the following events:

- *Scoping Discussion: Wetland and Aquatic Resource Mitigation*, Juneau AK, October 21, 2011. 43 participants; including 5 USACE staff and 20 other agency staffer. Presenters: USACE, FS and USFWS Staff and WA mitigation experts. (SAWC, 2011).
- *Clean Water Act Section 404 Program and Identifying and Planning for Mitigation in Your Community*, Public Meeting with Borough, Tribes, Local Agency Staffers, Petersburg AK, October 17, 2011.
- *Clean Water Act Section 404 Program and Identifying and Planning for Mitigation in Your Community*, Public Meeting with Borough, Tribes, Local Agency Staffers, Wrangell AK, October 18, 2011.
- *Introduction to Wetland Functional Assessments and Delineations to support Permitting Process*, Haines AK, August 12, 2011. Trainers: USACE Staff.
- American Water Resources Association, Alaska Section 2012 Annual Conference. Juneau AK, March 2012. *Developing a Third Party Aquatic Resource Mitigation Program and the Need for Science to Inform Credible Mitigation in Southeast Alaska.*
- *Wetland Functional Assessment Training: WESPAK-SE*, Haines AK, September 20, 2012. Trainer: Dr. Paul Adamus.

- Partnering with Chilkoot Indian Association to support the development of a Wetland Management Plan with the Tribe and Haines Borough. Haines AK, January 1, 2013- 2016.
- *Southeast Alaska Watershed Symposium*, Juneau AK, November 2013. Partner: Southeast Alaska Fish Habitat Partner
- *The Southeast Alaska Mitigation Fund- Mitigation Planning in Your Community*, Public meetings with Borough, Tribes, Local Agency staffers, Community Members. February 2015- November 2015
    - Juneau AK, Wrangell AK, Ketchikan AK, Sitka AK, Klawock AK, Kake AK, Hoonah AK
- *Southeast Alaska Stream and Watershed Restoration Training*, Craig, AK, May 2016. Trainers: US Forest Service Restoration Cadre from Oregon.
- *Planning for Compensatory Mitigation*, Haines AK, September 2016. Chilkoot Indian Village

In an effort to enlist other potentially interested parties in the Southeast Alaska region, SAWC will continue to conduct outreach to Southeast community land use/planning officials, non-profit organizations, tribes, municipalities, landowners, native corporation land managers, and other resource and real estate professionals.

SAMF intends to have a similar structure to successful ILF programs in Washington, Oregon, New Hampshire, Virginia and Maine. These ILF programs invest in and capitalize on the expertise of organizations and consultants operating in the program service area to conduct various elements of the mitigation projects (See Exhibits 4.0 for more information on public and private stakeholder involvement in the SAMF ILF program).

SAWC invites questions or comments and provides a link to the SAWC website (www.alaskawatershedcoalition.org) for the public and agencies alike to review draft documents and provide comments to the USACE Chair and the IRT during the public review process.

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

See section 10.0 of this document.

j. A strategy for periodic evaluation and reporting on the progress of the program in achieving SAMF goals and objectives, including a process for revising the planning framework as necessary

SAWC will annually report to the USACE and the IRT on credits sold and offsets gained through compensatory mitigation projects under SAMF. SAWC will be obligated to submit an annual report that will document in-lieu fees received and disbursed from its ILF program

account, income generated through investments, and expenditures for compensatory mitigation projects and administrative costs. SAWC also anticipates meeting regularly with the USACE in consultation with the IRT to concertedly evaluate any or all aspects of the program, including the planning framework.

As part of these overall evaluations, SAWC would examine its efforts in achieving the previously identified goals and objectives of the SAWC ILF program. At that time this framework and other documents associated with the SAWC ILF can be reviewed.

2.0 SAMF Compensation Planning Framework for the Central Alexander Archipelago (HUC 190102)

The Central Alexander Archipelago compensation planning framework explains how SAMF will use a watershed approach to select, secure and implement aquatic resource restoration, enhancement, and/or establishment in the service area that encompasses the Central Alexander Archipelago.

a. The geographic service area, including a watershed-based rationale for the delineation of the service area

This service area consists of a single 6-digit HUC, the Central Alexander Archipelago (HUC# 190102) excluding Canada. The Central Alexander Archipelago encompasses approximately 16,497 square miles in Southeast Alaska, and includes Chichagof, Baranof, Kupreanof, Mitkof, Kuiu, Wrangell, Etolin, and Zarembo Islands as well as a portion of the mainland extending from Taku Inlet to Bradfield Canal.

This area includes several biogeographic provinces. Chichagof, Baranof, and Admiralty Islands as well as the mainland are dominated by rugged, mountainous terrain. The mainland is dominated by glacial physiography. Kupreanof, Mitkof, Kuiu, Wrangell, Etolin, and Zarembo Islands have higher proportions of lower relief landforms (hills, lowlands, coastal). Portions of Chichagof, Admiralty, and Kuiu Islands have distinctive karst landforms.

Relatively small, coastal watersheds that support pink and chum salmon dominate the Central Alexander Archipelago service area. The exceptions are the Taku and Stikine Rivers, which are among the most productive salmon watersheds in the region, supporting all six salmonid species. These large mainland rivers, in addition to the Central Alexander Archipelago's complex topography and shallow bathymetry, have contributed to the area's high estuary values.

b. A description of the threats to aquatic resources in the service area

This service area, particularly East Chichagof, Baranof, Etolin, Zarembo, Wrangell, Kupreanof and Mitkof Islands have had the greatest declines from original habitat conditions. Timber harvest has been and continues to have the greatest impact on aquatic resources. Many of these islands are at risk of cumulative adverse effects on ecosystem values.

Future community and resource developments in this service area are likely to be similar to those that have occurred in the past. SAWC does not anticipate unfamiliar development activities to occur that would have unique or unusual impacts on aquatic resources not already experienced in

Southeast Alaska. Thus, the types of historic impacts to aquatic resources discussed below are also those that may occur in the future. One exception to this might be the future development of one or more ocean kinetics (tidal) projects in Southeast Alaska, which could lead to potential impacts to submarine and/or near shore aquatic resources heretofore not experienced in Southeast Alaska.

Urbanization

The U.S. Census Bureau defines two types of urban areas: an *urbanized area* as a densely settled area with a population of 50,000 or more, and an *urbanized cluster* is a densely settled area with a population between 2,500 and 50,000. All other areas are considered rural.

This service area encompasses 10 communities. Sitka is the only community within this service area considered to be an urbanized cluster. Sitka's 2007 Comprehensive Plan outlines the community's plan for future growth and development. According to the comprehensive plan, one of the primary opportunities for the community's growth is the re-development of the Sawmill Cove Industrial Park, including a multi-use dock to accommodate fisheries and cruise ships. Commercial and industrial growth is anticipated to continue in the industrial park. Another opportunity is expanding into the independent tourism sector and shore-based excursions. Development of lodges is anticipated on the islands in Sitka Sound. Residential growth is anticipated along Sawmill Creek Road, the Indian River valley, and the University of Alaska South Benchlands. Sitka is also hoping to make the community more accessible via construction of new roads and/or expanded ferry service.

Petersburg and Wrangell are the second and third largest communities in this service area in terms of population. The Draft 2015 Petersburg Borough Comprehensive Plan indicates that there are prospects for expansion of shore-based fish processing and related marine support services in the Scow Bay area and growth in tourism-related businesses such as lodging, dining and shopping. Petersburg is also interested in encouraging timber harvest and timber associated milling, processing and timber products as well as supporting emerging markets such as seaweed farming, soil composting, and producing fertilizers from fish waste. In terms of residential growth, the Draft 2015 Comprehensive Plan prioritizes identifying locations where construction of new roads could provide access to buildable land for new housing developments. According to Wrangell's 2010 Comprehensive Plan, community priorities include a new boat harbor, boat launch and associated parking for Wrangell East, regional solid waste facility, new industrial park, and affordable senior housing.

Timber Harvest

The timber industry is a major economic contributor in this service area. Commercial sources of timber in this service area include the Tongass National Forest, Alaska Mental Health Trust Authority Forest Assets, and Native Corporations (Sealaska Corporation; Kootznoowoo Inc.; Huna Totem Corporation; Kake Tribal Corporation; and Shee Atika Inc.). There are four active mills- two in Hoonah and two in Petersburg.

Several areas encompassed within this service area have experienced high rates of timber harvest compared to the rest of the region. This includes East Chichagof Island, Kupreanof and Mitkof Islands, and Etolin and Zarembo Islands. Within this service area, the Petersburg and Wrangell areas, and northeastern Chichagof Island are currently at greatest risk of potential threats to aquatic resources from continued logging activities.

Timber harvest within this service area occurs on Tongass National Forest lands, state lands identified in the Central/Southern Southeast Area Plan, Alaska Mental Health Trust Forest Assets, and Native Corporation land.

Approximately12, 098 square miles of this service area are within the Tongass National Forest, of which nearly 2,003 square miles is currently designated for timber production (estimated from the USFS Land Use Designations datalayer using ArcGIS). There are five proposed timber harvest projects on Tongass National Forest lands in this service area. These are:

- Navy Timber Sale: includes harvest of 1,252 acres of commercial forest land on Etolin Island, construction of 0.6 miles of new road and 2.7 miles of temporary road, and reconstruction of 0.8 miles of road.
- Mitkof Island: harvest of 4,117 acres of National Forest System Land, construction of 1.3 miles of new road, 4.7 miles of temporary road and reconditioning 4.5 miles of existing road.
- Wrangell Island Project: includes harvest of 4,500 acres. This project is currently in scoping phase.
- Sitka Young Growth: includes harvest of 340 acres of young growth forest on False Island and Corner Bay areas. This project is under analysis.
- Boom Chain Timber Sale: harvest of 60 acres using existing roads. This project is under analysis.

Timber sales on State land are offered on a five-year schedule. The current Five-Year Forest Management Schedule goes through 2019. This includes state lands on Mitkof, Kupreanof, and Wrangell Islands.

The Alaska Mental Health Trust Authority has Forest Assets near Sitka, Petersburg, and Wrangell. The Sitka assets include 685 net operable acres. The Petersburg assets are in two separate blocks with a total of 2,868 net operable acres. The Wrangell assets are also in two separate blocks with a total of 255 net operable acres.

Native Corporation surface rights in this service area are shown in Table 1.

Table 1. Surface rights/ownership of Native Corporations within the service area. Estimated area calculated using the Surface Ownership map service data layer provided by U.S. Forest Service in ArcGIS.

Corporation	Estimated Area (square miles)
Sealaska Corp	137.82
Goldbelt Inc.	53.34
Kootznoowoo Inc.	11.76
Huna Totem Corporation	36.00
Kake Tribal Corporation	38.04
Shee Atika Inc.	40.91
Haida Corp.	0.10
Cook Inlet Region Inc.	0.01

Transportation

In the Central Alexander Archipelago service area, the transportation infrastructure includes paved and unpaved roads, ferry terminal facilities, float plane docks, airports/airstrips, and small boat harbors. Communities rely heavily on air and marine transportation, as most communities are not connected by road systems.

This service area has the following existing transportation infrastructure:

- Approximately 3,357 miles of road, of which approximately 673 miles have been decommissioned;
- 34 bridges;
- 9 ferry terminals;
- 16 airports; this includes:
    - 5 standard airports;
    - 8 seaplane bases; and
    - 3 other/unclassified airports;
- 34 harbors

Road mileage was estimated from the transportation map server provided by the U.S. Forest Service and the other transportation facilities were estimated from the transportation facilities datalayer provided by the Alaska Department of Transportation and Public Facilities (DOT&PF) using ArcGIS.

Transportation infrastructure is maintained by the DOT&PF for state facilities and by local governments for the local facilities. The U.S. Forest Service also maintains roads on the Tongass National Forest.

The DOT&PF Alaska Statewide Transportation Improvement Program (STIP) is the State's four-year program for transportation infrastructure preservation and development. Projects in the STIP have partial or full federal funding and are likely to be implemented in the planning period. The STIP planning period used was 2013 - 2015.

The DOT&PF Southeast Alaska Transportation Plan (SATP) identifies transportation needs and recommends transportation infrastructure projects to address those needs. Local governments also have transportation infrastructure priorities outlined in a local transportation plan or a comprehensive plan.

This service area has 14 transportation infrastructure projects programmed in the current STIP. Sitka and Petersburg has the highest concentration of projects in the service area.
The majority of these projects consist of rehabilitating existing infrastructure within the existing footprint, which limits impacts on adjacent resources. However, some improvements to existing highway infrastructure include widening or realigning road surfaces, which could impact adjacent resources. In addition, some of the ferry terminal upgrades would require fill and placement of structures outside of the existing footprint. Such reconstruction projects would require mitigation.

The status of DOT&PF projects in pre-construction and construction can be found in the project status reports, which are available online at http://dot.alaska.gov/sereg/projects/index.shtml

There are three proposed new road infrastructure projects in this service area programmed in the current STIP. These are: 1) Katlian Bay Road Construction, near Sitka, which will construct 9 miles of new road starting at the end of Halibut Point Road going into National Forest lands to provide access to recreational and subsistence resources as well as a material source for development purposes; 2) Kake Access, which will construct 27 miles of new road (single lane, unpaved) and improve 26 miles of existing logging roads to provide access to the north end of Kupreanof Island and Petersburg, via a shuttle ferry service. Kake Access is also listed as a priority in the current SATP; 3) Mid-Region Access (Bradfield Road) is intended to connect Ketchikan (outside this service area), Wrangell and Petersburg to the Cassiar Highway in Canada. A reconnaissance study has been completed by the DOT&PF. This would require between 110 and 175 miles of road as well as a deep-water port, depending on the selected build alternative

New infrastructure improvements recommended in the SATP for communities in this service area include the following: 1) construction of a new airport in Angoon; and 2) construction of a new road from Sitka to Warm Spring Bay with a new ferry terminal in Warm Spring Bay.

Local governments in this service area are prioritizing gravel road resurfacing, widening shoulders, construction, and rehabilitation of non-motorized transportation infrastructure (sidewalks and bike paths). Some local governments are preparing for community growth by prioritizing extension of local road systems or construction of new roads to undeveloped lands.

Hydroelectric Power/ Alternative Energy Facilities
In Alaska, hydropower is currently the largest and most important producer of electricity from a renewable energy source. According to the Juneau Economic Development Council (JEDC) Southeast Alaska Economic Asset Map (2011), communities served by hydropower have some of the least expensive electricity rates in the state. With increased interest in replacing expensive fossil-fuel-powered generation with renewable energy resources, hydropower capacity will

continue to expand. The Alaskan U.S. Senator Lisa Murkowski is sponsoring the Hydropower Improvement Act.

Sitka, Petersburg, Wrangell, Pelican and Port Alexander are the only communities in this service area currently served by hydroelectric facilities. Electrical transmission lines create a sub-regional grid connecting Petersburg, Wrangell and Ketchikan (outside of this service area). The Nature Conservancy developed an inventory of hydropower sites and power lines, both existing and proposed, from information obtained from Alaska Industrial Development and Export Authority (AIDEA). This inventory, available through the Southeast Alaska GIS Library, identified 29 proposed hydroelectric facilities.

Mining

Southeast Alaska has extensive mineral resources. The region's mineral deposits include gold, silver, lead, zinc, copper, molybdenum, platinum, limestone, marble, uranium, and rare earth minerals. There are also rock, sand and gravel resources for use in construction. In 2014, mining comprised 5 percent of the region's economy.

According to the U.S. Geological Survey, Alaska Resource Data File, Southeast Alaska has approximately 96 mineral occurrences, 263 prospects and 44 mines. Mineral occurrences are those unexplored occurrences of minerals of economic interest. Prospects are sites where some development works has occurred. Mines are sites with current and past production.

Many mining claims never become fully operational mines, and it is difficult to predict which claims will eventually become operational. The current high price of metals is encouraging additional mineral exploration at or near existing mines, as well as re-opening historic mining sites. Mining activity in the Southeast region is largely contingent on worldwide demand and the price of silver, gold or base metal commodities. At this time the demand for metal resources continues to grow across the world.

In addition to mining for metals and rare earth elements, mining for gravel and sand is also a common activity in the region. Gravel and sand are usually mined from major river floodplains, talus slopes, glacial moraines, and beach deposits.

Significant mineral deposits in this service area include Yakobi Island and Hirst Chichagof on Chichagof Island, and Woewodski and Zarembo Prospects, near Petersburg and Wrangell.

Tourism

The largest component of the tourism industry is the cruise ship industry. The number of cruise ship passengers in Southeast Alaska increased by 14 percent between 2010 and 2013, and it is anticipated that a new cruise ship passenger record will be reached in 2016 (Southeast Conference, 2014).

In the Central Alexander Archipelago service area, Sitka, Petersburg, Wrangell and Hoonah/Icy Strait Point currently have facilities capable of receiving cruise ships.

Independent travelers looking for nature-based adventures or authentic Alaskan experiences are drawn to communities like those on Chichagof Island as well as Petersburg and Wrangell. The Wrangell and Sitka Ranger Districts are the top two districts for the recorded hours spent recreating on Tongass National Forest lands. Wrangell District's most popular activities were guided recreation such as canoeing and hiking. The Sitka District's most popular activities were freshwater fishing, camping and brown bear hunting.

Aquaculture

Currently, salmon hatcheries for fish stock enhancement dominate the aquaculture industry in Southeast Alaska, and the footprint of this coastal infrastructure has been in place for decades. This service area has the highest concentration of salmon hatcheries.

According to the Alaska Department of Fish and Game (http://www.adfg.alaska.gov/static/fishing/PDFs/hatcheries/se_hatch.pdf), there are 10 salmon hatcheries within this service area: one at Snettisham, near Juneau; one at Hidden Falls near Sitka; three in Sitka; two near Port Alexander; one near Kake; one at Crystal Lake near Petersburg; and one at Burnett Inlet near Wrangell.

Mariculture and aquaculture are relatively new to Southeast Alaska and have potential for expansion. Shellfish aquaculture projects potentially could occur anywhere in Southeast Alaska where growing, tending, and harvesting conditions for shellfish are favorable. Marine shellfish operations like culturing oysters and clams are likely to increase as technology improves, shellfish farms become more profitable, and people are drawn to the remote lifestyle where few other economic opportunities exist. In this service area there are eight active shellfish farms: one near Hoonah, one near Angoon, two near Sitka, two near Kake, and two near Hobart Bay. The Department of Natural Resources is offering over-the-counter lease sites for aquatic farms in 14 locations within this service area.

There are 21 seafood processing plants in this service area: eight in Petersburg; six in Sitka; three in Wrangell; and one each in Elfin Cove, Hoonah, Kake, and Pelican. According to the Juneau Economic Development Council (JEDC) Southeast Alaska Economic Asset Map (2011), the combined 2009 seafood production for the seafood processing plants in Sitka, Petersburg, and Wrangell totaled 99,408,169 lbs. of product, valued at $192,910,956. Most of the processing plants within this service area did not report on their seafood production or value.

Under SAMF, the ILF program sponsor will help to offset impacts resulting from these threats by mitigating specific types of aquatic resources, including wetlands, streams, shorelines, floodplain areas, upland buffers, and riparian zones. It is the long-term goal for the ILF program sponsor to carry out a wide spectrum of mitigation methods to maintain and improve the quantity and quality of aquatic resources in the services area.

SAWC will work with mitigation partners who share expertise to complete compensatory mitigation activities in each Service Area. The mitigation projects carried out under the SAMF program, as well as, mitigation projects that have already been prioritized strive to be self-sustaining with attainable ecological performance standards, and utilize restoration techniques that have documented success.

SAWC used past restoration efforts, the expertise held by mitigation fund partners, and the *Aquatic Habitat Rehabilitation, Enhancement, and Mitigation in Juneau Alaska: Inventory and Case Studies* (Hudson, Seifert 2012) to inform the list of possible mitigation project types to be carried out.

The types of projects listed below have been supported by natural resource managers and carried out by SAWC and mitigation fund project partners. In addition, there is information pertaining to project design and monitoring for these types of mitigation projects. Resource managers agree that there is enough scientific research and information, as well as expertise and experience in this region, to carry out the following types of mitigation projects. In general, the program sponsor will pursue the following types of mitigation projects:

1. **Stream bank bioengineered stabilization**
2. **Stream channel creation or reconfiguration**
3. **Plant/enhance riparian vegetation**
4. **Flood plain restoration/reconnection**
5. **Wetland restoration, enhancement and establishment**
6. **Fish habitat restoration and/or enhancement (e.g. instream structures)**
7. **Fish passage restoration and/or enhancement**

Each mitigation site will have a detailed mitigation plan. These mitigation plans will outline specifically the techniques that will be used to carry out each type of mitigation. In this way, the IRT, other agencies, interested and/or concerned stakeholders and members of the general public will be able to provide input to SAWC on project site design, implementation and ecological performance standards.

c. An analysis of historic aquatic resource loss in the service area(s)

To date there is no publicly available in-depth database that shows the cumulative aquatic resource loss across Southeast Alaska. This type of data collection and analysis has not been conducted by any natural resource agency and/or conservation organization working in the region. In Southeast Alaska, the City and Borough of Juneau, though is not within this service area boundary, is the only community in Southeast Alaska that has an estimate of wetland impacts.

Historic data within this service area that documents aquatic resource loss includes: the Tongass National Forest Watershed Condition Framework, the USACE 404 permitted impact data, the *Conservation Assessment and Resource Synthesis for The Coastal Forests and Mountains Ecoregion in Southeast Alaska (TNC/Audubon 2011)*- which indicates that Kupreanof and Mitkof Islands have 72.5 percent of original habitat remaining intact. These two islands have the highest cumulative risk for loss of biodiversity and ecosystem values in the service area. East Baranof and East Chichagof Islands, while only having 63.5 and 72 percent, respectively, of their

original habitat values are indicated to have the second highest cumulative risk for loss of ecosystem values.

The strongest data supporting the need for SAMF is the USACE CWA Section 404 permitted impact data. 33 CFR 332.3(a)(2) states in pertinent part that "Restoration should generally be the first option considered because the likelihood of success is greater and the impacts to potentially ecologically important uplands are reduced compared to establishment, and the potential gains in terms of aquatic resource functions are greater, compared to enhancement and preservation." Preservation does not result in a gain of aquatic resource area or functions. SAWC believes that there is definitely a need for restoration in Alaska since the majority of compensatory mitigation has been preservation.

These three sources demonstrate that there has been loss to aquatic resources within this service area and specific watersheds have already been prioritized for restoration (see section e. of this Compensation Planning Framework).

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

The conditions in the Central Alexander Archipelago service area are varied. Much of Admiralty Island, West Chichagof Island, and large portions of the mainland are largely intact. This is primarily due to protection status of the land.

Approximately 12,098 sq. mi. of this service area is within the Tongass National Forest (estimated from the USFS Land Use Designations datalayer using ArcGIS). About 38 percent of Tongass National Forest lands within this service area are classified in Wilderness Land Use Designations (LUDs). This includes the Kootznoowoo Wilderness (~1,565 sq. mi.), Tracy Arm – Fords Terror Wilderness (~1,014 sq. mi.), and Stikine - LeConte Wilderness (~687 sq. mi.). Another 36 percent of Tongass Nation Forest lands are classified within Natural Setting LUDs (4,378 sq. mi.).

Much of the Central Alexander Archipelago service area has been impacted by historic logging activities. Early logging activities on East Chichagof Island and Baranof Island focused on valley bottom riparian forests, with these areas having some of the most intensive high grading of large trees in Southeast Alaska. On Mitkof and eastern Kupreanof Islands, the target was even-aged wind forest on exposed upland, southerly slopes.

As part of the Forest Service National Watershed Condition Framework, twelve core indicators were evaluated to classify watershed condition across the Tongass National Forest in 2011. The indicators include aquatic habitat condition attributes (e.g., riparian harvest, roads in riparian areas, fragmented habitat due to culverts blocking fish passage). *[Note: Additional information and references on the national Watershed Condition Framework is at http://www.fs.fed.us/publications/watershed/.]* The watershed condition ratings, along with use and aquatic value criteria, led to the designation of priority watersheds for restoration focus.

Section e. of this compensation planning framework outlines the 12 digit HUC watersheds that have been prioritized for aquatic resource restoration, enhancement, and establishment. A

confidential list of potential mitigation projects within these watersheds has been submitted to the USACE.

Localized degradation and loss of aquatic resources has occurred near communities and mine sites within the service area. The Alaska Department of Environmental Conservation (DEC) has identified six impaired waterbodies in this service area: Katlian River, Granite Creek, Silver Bay, and Herring Cove near Sitka; East Point Fredrick near Hoonah; and Klag Bay near Chichagof. Silver Bay, Herring Cover, and East Point Fredrick were former log transfer facilities; Klag Bay is impaired due to historic mining operations; Granite Creek is being impacted by gravel mining operations and material storage.

The Central Alexander Archipelago has approximately 24,187 miles of streams (Table 4). The USFS Region 10 *Channel Type User Guide* provides a method for categorizing a watershed's stream network into basic fluvial process groups. Fluvial process groups help understand the interrelationship between the landscape, erosion and depositional processes, channel morphology, and fish and riparian habitat. High gradient contained channels are by far the most common, contributing nearly 60 percent of the total stream miles in the service area. Moderate gradient mixed control channels are the second most common, but contribute only about 9 percent of the total stream miles. Moderate gradient contained channels and floodplain channels were a significant proportion of channel types on the all the islands. The mainland has a greater proportion of glacial channels. Palustrine channels are a significant proportion of channel types in the Stikine watershed.

Table 2: Estimated miles of stream by process group within the service area. Estimated miles calculated using the SEAK Hydro Stream Process Groups data layer in ArcGIS.

Stream Process Group	Estimated stream length (miles)
Alluvial Fan	876.26
Estuarine	499.34
Floodplain	1,843.00
Glacial	504.05
Lake	809.76
High Gradient Contained	14,292.00
Moderate Gradient Contained	1,510.40
Moderate Gradient Mixed Control	2,184.30
Low Gradient Contained	274.98
Palustrine	796.90
Other	595.87
Unknown	6.50
Total	24,186.84

In addition, this service area has two of the most highly productive, diverse anadromous waterbodies in the region: the Taku and Stikine Rivers. In total, this service area includes approximately 2,762 miles of anadromous streams and 30 square miles of anadromous lakes (estimated from the 2015 Anadromous Waters Catalog datalayer using ArcGIS). While this is only 11 percent of the reported total length of streams, some channel types (e.g. high gradient

contained channels) have gradient and stream flow barriers that make them inaccessible to anadromous fish and, therefore, do not provide significant fish habitat.

This service area contains nearly 3,551 square miles of wetlands (Table 5).

Table 3: Estimated area of wetland types within the service area. Estimated area calculated using the National Wetland Inventory data layer in ArcGIS.

Wetland Type	Estimated Wetland Area (square miles)
Estuarine/Marine	329.98
Freshwater Emergent	826.50
Freshwater Forest/Shrub	2,198.33
Freshwater Pond	28.49
Lake	119.74
Riverine	42.83
Other	5.34
Total	3,551.21

Local, intact aquatic resources provide valuable services such as fish and wildlife habitat, open space, recreation sites, (drinking) water quality protection, and flood control that contribute significantly to the human use and aesthetics of communities in this service area.

Coastal Marine Habitats

The ShoreZone system provides a detailed inventory of geomorphic and biological features of coastal areas. This service area has approximately 8,362 miles of coastline mapped in the ShoreZone system (Table 6). This coastline includes the Southeast Alaska coastal areas of Sitka and the Stikine, as well as smaller portions of the Icy Strait and Lynn Canal bioareas as outlined in the Alaska ShoreZone Coastal Habitat Mapping Protocol.

Table 4: Estimated miles of coastline by coastal types within the service area. Estimated miles calculated using the ShoreZone data layer in ArcGIS. Modified from Table A-14 in the Alaska ShoreZone Coastal Habitat Mapping Protocol. Biological exposure categories were combined to estimate the mileage for each coastal type.

Dominant Structuring Process	Substrate Mobility	Coastal Type	Coastline (miles) by HUC
Wave Energy	Immobile	Rock, Rock & Sediment, or Sediment	1,589.65
	Partially Mobile	Rock & Sediment, or Sediment	5,102.78
	Mobile	Sediment	225.85
Fluvial/Estuarine		Estuary	1,331.08
Current Energy		Current-dominated	63.56
Glacial		Glacier	1.42
Anthropogenic		Impermeable	1.46
		Permeable	46.53
Total			8,362.33

The Sitka coastal bioarea includes the western coasts of the Chichagof and Baranof Islands. A fully marine coast with diverse species and habitat types characterizes this bioarea. The Stikine bioarea is the largest in the Central Alexander Archipelago. It encompasses the eastern coasts of

Chichagof and Baranof Islands, Admiralty Island, Kuiu Islands, Kupreanof Island, Wrangell Island, Etolin Island and a portion of the mainland coast. Glacial, silty water and diverse habitat types characterize this bioarea.

The Icy Strait and Lynn Canal bioareas within the Central Alexander Archipelago are limited to the northern coast of Chichagof Island and Admiralty Island. The Icy Strait bioarea coastline is dominated by low to moderate wave-exposed coastlines influenced by glacial waters with wide, sediment-dominated beaches and fringing salt marshes as common coastal habitats. Lynn Canal is characterized by a fjord landscape dominated by bedrock and a dense Blue Mussel bioband.

The Central Alexander Archipelago has an average biodiversity index of 5.81 on a scale of 0 – 13 (estimated from the coastal biodiversity index datalayer produced by The Nature Conservancy using ArcGIS). Areas with higher biodiversity (index of 6 or higher) include the eastern coastline of Chichagof and Baranof Islands, nearly the entire Admiralty Island coastline, and the western coast of Kuiu Island. The Central Alexander Archipelago has the highest total coastline dominated by anthropogenic structures in the region at nearly 48 miles.

Estuaries and mudflats are high-value habitat but are relatively rare within the region: mudflats are less than 1% and estuaries are 14% of the shoreline. According to the ShoreZone data, this service area has the largest amount of fluvial/estuarine coastline when compared to the Southern Alexander Archipelago (HUC # 190101) and Gulf of Alaska/Northern Alexander Archipelago (HUCs# 190104 and 190103 respectively). According to the *Conservation Assessment and Resource Synthesis for The Coastal Forests and Mountains Ecoregion in Southeast Alaska (TNC/Audubon 2011),* this service area has high estuary values due to the complex topography, shallow bathymetry, and the presence of large mainland rivers. This service area has five of the 10 largest estuaries in the region: Stikine River (ranked #1 at 21,737 acres), Duncan (ranked #3 at 9,446 acres), Rocky Pass (ranked #5 at 5,823 acres), Taku River (Ranked #8 at 4518 acres) and the Gambler (ranked #10 at 3,009 acres). This service area also includes 26 other estuaries that rank in the top 50 largest estuaries.

Throughout Southeast Alaska, the marine shoreline supports abundant populations of shellfish, fish, and wildlife in a complex mosaic of geophysical and biological features where uplands, freshwater, estuarine, and marine environments interface (Schoen and Dovochin 2007). These combined features support primary productivity from plankton, algae, kelp, eelgrass and marsh grass; shellfish production from Dungeness crab, clams and shrimp; fish production from herring, flatfish, rockfish and salmon; and a diverse ecosystem that includes many species of marine birds and marine mammals. The communities of Southeast Alaska rely on these coastal resources to support significant components of their economies dependent on subsistence, sport and commercial fishing, hatcheries, tourism, recreation, and wildlife viewing.

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

Generally this service area has been impacted significantly by historic timber practices and the road infrastructure constructed to support the timber industry. Within this service area there have also been impacts from community development, transportation and energy infrastructure and mining. Watershed assessments conducted within this service area (See list section F) that have identified priority restoration areas find that watersheds have high concentrations of ecological values but have sustained substantial road construction, logging, and community development activities (2015, Audubon).

Aquatic resource restoration and enhancement goals for wetlands and streams in this service area include- road decommissioning, reconnection of stream channels to the floodplain and wetland habitats, stream channel reconstruction and large-woody debris structural treatments to maintain channel stability and improve fish habitat conditions, revegetation of stream banks, riparian thinning, culvert replacement and wetland enhancement and creation.

The SAMF program will utilize the following restoration and enhancement actions to mitigate for current and future impacts within this service area; stream bank bioengineered stabilization, stream channel creation or reconfiguration, plant/enhance riparian vegetation, flood plain restoration/reconnection, fish habitat restoration and/or enhancement (e.g. instream structures), fish passage restoration and/or enhancement

SAWC conducted an initial watershed approach assessment by analyzing the watershed assessments (see section f. below)- within this service area- that have been carried out by federal and state agencies, as well as, regional NGO's and local organizations. The majority of listed watersheds have multiple restoration and enhancement opportunities and have been identified in a regionally relevant and scientifically validated watershed assessment.

Confidential supporting information, in accordance with 33 CFR 332.8(n)(2), lists specific potential projects within these watersheds with the type and location of aquatic resources to be restored has been submitted to the Army Corps of Engineers, Alaska District.

- Fish Bay-Frontal Peril Strait
- Saint John Baptist Bay-Frontal Neva Strait
- Sukoi Inlet-Frontal Salisbury Sound
- Gilmer Bay-Frontal Pacific Ocean
- Iris Meadows
- Shelikof Bay-Frontal Pacific Ocean
- 190102121001-Annahootz Mountain
- Mount Rosenberg-Frontal Nakwasina Passage
- Nakwasina Sound-Frontal Olga Strait
- Sukoi Inlet-Frontal Krestof Sound
- Krestof Sound-Frontal Sitka Sound
- Salmon Creek-Frontal Silver Bay
- Sawmill Creek
- Deep Inlet-Frontal Eastern Channel
- Eastern Channel-Frontal Sitka Sound
- Katlian River
- Katlian Bay-Frontal Sitka Sound

- Redoubt Lake
- Redoubt Bay-Frontal Sitka Sound
- Sitka Sound-Frontal Pacific Ocean

In addition to this list, DEC has identified six impaired waterbodies in this service area: Katlian River, Granite Creek, Silver Bay, and Herring Cove near Sitka; East Point Fredrick near Hoonah; and Klag Bay near Chichagof, Silver Bay, Herring Cover, and East Point Fredrick. Klag Bay is impaired due to historic mining operations; Granite Creek is being impacted by gravel mining operations and material storage.

Neither SAWC nor its partners have funded conceptual designs for the initial list of projects identified in SAWC's preliminary assessment of the service area. Therefore, the exact amount of linear feet of stream and/or acres of wetland restoration, enhancement and creation projects in this service area is difficult to summarize. However, the USFS has identified an estimated potential 119 miles of stream restoration and enhancement and 3172 acres of riparian wetland restoration and enhancement and 123 miles of estimated potential access to fish habitat via culvert remediation and stream habitat restoration. Based on a summarization of past aquatic resource restoration, enhancement and creation projects in this service area over a 3yr period 31.18 miles of stream and have been restored and 220 acres of wetlands.

f. A prioritization strategy for selecting and implementing compensatory mitigation activities

This section provides an overview of how the program sponsor has selected and prioritized an initial list of potential mitigation sites. This section also provides an overview of how SAWC will select and prioritize sites in the future under this instrument. The compensatory mitigation activities that will be carried out are stream and wetland restoration, enhancement and establishment. Confidential supporting in formation, in accordance with 33 CFR 332.8(n)(2), of specific activities has been submitted to the USACE.

SAWC has developed a prioritization and site selection strategy that is based on a watershed approach that is specific to Southeast Alaska. SAWC works to ensure each mitigation site meets the requirements of the Final Rule. SAWC's prioritization strategy for selecting and implementing compensatory mitigation sites was a two-step process. The first step was to identify top priority watersheds within the service area using a watershed approach based on existing assessments and other sources. The second step was to identify potential mitigation sites that could be efficiently implemented to generate credits and improve watershed conditions.

An initial prioritization effort has been carried out by SAWC- in which the following methodology was followed. The results of this prioritization effort are the list of watersheds listed in the above section of the CPF (section e.). This list of mitigation activities submitted to the USACE will occur within these prioritized watersheds.

The following provides an overview of how SAWC has selected and prioritized sites (as described in confidential supporting information, in accordance with 33 CFR 332.8(n)(2)) and it

also provides an overview of how SAWC will select and prioritize sites in the future under this instrument.

To accomplish the first step --*identify top priority watersheds within the service area based on ecological assessments and other sources* — SAWC will rely on documentation- that has been developed by resource managers and agencies, conservation and environmental science not for profit organizations and local governments- to identify top priority watershed within this larger service area. These resources have utilized a watershed approach to identify and prioritize smaller watersheds within this 6 Digit HUC service area. *The Watershed Condition Framework*. The USFS recently identified priority watersheds for restoration in the Tongass National Forest using its national watershed condition framework. The framework includes a strategic planning outline and includes six key steps: 1) Classify Watershed Condition; 2) Prioritize Watersheds for Restoration; 3) Develop Watershed Restoration Action Plans; 4) Implement Integrated Suites of Projects; 5) Track Restoration Accomplishments; 6) Verify and Monitor Accomplishments. http://www.fs.fed.us/publications/watershed/

- *A Conservation Assessment and Resource Synthesis for The Coastal Forests and Mountains Ecoregion in Southeast Alaska (TNC/Audubon 2011).* The assessment includes a map gallery of GIS products; a ranking of ecological values among watersheds throughout the region in watershed matrix; and a GIS database that provides a common inventory of ecosystem and habitat values that encompass lands throughout Southeastern Alaska. http://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/alaska/seak/era/cfm/Pages/default.aspx
- *Ecological Forest Restoration in the Tongass National Forest (TWS/SEAWEAD Assessment 2012).*
- USFS Region 10 *Channel Type User Guide (Paustian et al 1992, updated 2010)*
- *Alaska's Anadromous Waters Catalog (ADF&G)* http://www.adfg.alaska.gov/sf/SARR/AWC/
- *Fish Passage Culvert Inventory (ADF&G and USFS) http://www.adfg.alaska.gov/index.cfm?adfg=fishpassage.database*
- *Southeast Alaska Impaired Waterbodies (DEC)* http://dec.alaska.gov/water/index.htm
- *ShoreZone* http://alaskafisheries.noaa.gov/shorezone/default.htm
- Total Maximum Daily Loads (TMDLs) for:
    - Granite Creek near Sitka – Sediment and Turbidity (2002)
    - Herring Cove near Sitka – Residues (1999)
    - Klag Bay near Sitka – Toxic and Other Deleterious Substances (2009)
    - Silver Bay near Sitka – Residues and Toxic Substances (2003)
    - Swan Lake near Sitka – Debris and Solid Waste (2000)
- Local watershed plans/assessments including but not limited to:
    - Watershed Restoration Priorities: A Strategic Plan for the Sitka Community Use Area (2013)
    - Little Gunnuk Creek Summary Report (2008)
    - Katlian Watershed Assessment (2003)

To accomplish the second step — *identify potential mitigation sites that can be efficiently implemented to generate credits and improve watershed conditions within the guidelines of the Final Rule*.

SAWC endorses this prioritization strategy for the SAMF because of its step-wise approach to ensuring that each project meets the requirements of the Final Rule, and that sponsor and project partners have the capacity to carry out the technical aspects and provide stewardship actions over the long term.

The SAMF Site Selection Decision-making Factors consist of the following six elements:

- **Potential to Meet the SAMF Goals**
- **Project Appropriateness within a Watershed Context Project Readiness/Feasibility**
- **Project Lead Capacity**
- **Cost Effectiveness**
- **Other Benefits**

These six elements are explained below:

1. Potential to Meet SAMF Goals: Assesses the extent to which the potential mitigation project meets the core program *requirements to restore, enhance, or establish aquatic resources that have been prioritized using a watershed approach, best available science and/or by USACE.* All project sites must be protected with an appropriate site protection mechanism. Considerations include:

a) The sustainability of the proposed conservation action (restoration, enhancement, and/or establishment):

b) The degree to which the mitigation project offsets the functional benefits of impacted aquatic resources identified as a priority in the biophysical region:

c) Inclusion of upland areas- where necessary to ensure the long-term viability of aquatic resources:

d) The functional lift to be provided by the mitigation project (e.g., proposed improvement in habitat quality, contribution to functioning biological systems, water quality, etc.):

e) Other specific conservation objectives developed for each biophysical region or watershed, as described in watershed plans, municipal management plans, statewide conservation objectives, as long as those objectives support third-party compensatory mitigation for permitted impacts regulated under Section 404 of the Clean Water Act, and Section 10 of the Rivers and Harbors Act of 1899.

2. Project Appropriateness within a Watershed Context Project: Assesses the extent to which the potential mitigation project meets the core program requirement *to consider the location of a potential project relative to focus areas for land conservation or habitat preservation identified by a state agency, or other regional or municipal plans.*

Considerations include:

a) Presence within or proximity to habitat areas of statewide conservation significance or other natural resource priority areas;

b) Presence within or proximity to public or private conservation lands to maintain and preserve habitat connectivity;

c) Presence of natural resources of significant value and/or rarity within the project site boundaries.

3. Project Readiness/Feasibility: Assesses the extent to which the potential mitigation project 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 the requirements stated in the Final Rule and the goals of SAMF*.

Considerations include:

a) Documentation of landowner willingness to participate in the proposed project, including conveying a conservation easement or fee title, with conservation covenants, to the property (for projects not on public or private conservation lands);

b) Soundness of the technical approach presented in conceptual plan for the proposed project;

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

d) Likelihood that the proposed actions will achieve the anticipated ecological benefits and results;

e) Completeness and feasibility of long-term stewardship and monitoring plan;

f) Potential for adverse impacts (such as flooding or habitat loss) associated with the project;

g) Conformance with any applicable USACE and state mitigation policy, guidance and/or permitting requirements, including appropriate financial assurances for various construction activity.

4. Long Term Management Feasibility: Assesses the extent to which the potential mitigation project meets the core program requirement *to provide for long-term management and/or stewardship by a responsible state or federal resource agency, or conservation organization.*

Considerations include:

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

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

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

5. Cost Effectiveness: Assesses the extent to which the potential mitigation project meets the program requirement *that a project represent an efficient use of funds expended given the condition, location and relative appraised values of properties.* Considerations include:

a) Clarity and detail of budget submitted to SAWC;

b) Sufficiency of funds available in the applicable biophysical region including matching funds if necessary;

c) Potential to develop a substantial number of credits in a biophysical region where there is a robust demand for the credit type.

6. Social Benefits: Assesses the potential for a mitigation project to support recreational access, scenic enhancements, economic activity, or other contributions to the community or region where the project is located. Review applicable watershed plans to identify objectives that could be accomplished within the scope of a mitigation project and/or identify opportunities to improve the productivity of rare or highly valued fish and/or wildlife species

g. An explanation of how any preservation objectives identified above satisfy the criteria for use of preservation in 33 CFR 332.3(h)

At this time the SAMF does not have a programmatic goal to perform preservation as a form of compensatory mitigation.

h. A description of any public and private stakeholder involvement in plan development and implementation including coordination with federal, state, tribal and local aquatic resource management and regulatory authorities

SAWC will ensure there is both public and private stakeholder involvement throughout the entire process from mitigation site selection to the long-term management of the sites. Based on the extensive needs assessments conducted by SAWC over the past three years, there is no *one* organization, agency, and/or environmental consultant operating in Southeast Alaska that understands the requirements listed in the Final Rule *and* holds the experience and expertise to conduct all stages of restoration, enhancement and/or establishment projects from site selection to long-term monitoring.

SAWC developed a *draft* Prospectus, which is not required under the Final Rule, in order to build knowledge and awareness of SAWC staff, advisory board, board of directors, and IRT members. SAWC has incorporated feedback, concerns, and questions into the prospectus, draft instrument and instrument. In addition, over the past three years, SAWC has organized significant outreach and public education opportunities in order to understand better the diverse spectrum of stakeholder perspectives of aquatic resource mitigation and what strategies and processes a third-party mitigation program provider should consider in order to respond to the unique aquatic resource mitigation challenges and opportunities that exist throughout Southeast Alaska. SAWC has reached over 300 southeast Alaskan natural resource professionals through the following events:

1. *Scoping Discussion: Wetland and Aquatic Resource Mitigation*, Juneau AK October 21, 2011. 43 participants; including 5 USACE staff and 20 other agency staffer. Presenters: USACE, FS and USFWS Staff and WA mitigation experts. (SAWC, 2011).

2. *Clean Water Act Section 404 Program and Identifying and Planning for Mitigation in Your Community,* Public Meeting with Borough, Tribes, Local Agency Staffers, Petersburg AK, October 17 2011.

3. *Clean Water Act Section 404 Program and Identifying and Planning for Mitigation in Your Community,* Public Meeting with Borough, Tribes, Local Agency Staffers, Wrangell AK, October 18 2011.

4. *Introduction to Wetland Functional Assessments and Delineations to support Permitting Process,* Haines AK, August 12, 2011. Trainers: USACE Staff

5. American Water Resources Association, Alaska Section 2012 Annual Conference. Juneau AK March 2012. *Developing a Third Party Aquatic Resource Mitigation Program and the Need for Science to Inform Credible Mitigation in Southeast Alaska.*

6. *Wetland Functional Assessment Training: WESPAK-SE,* Haines AK September 20 2012. Trainer: Dr. Paul Adamus

7. Partnering with Chilkoot Indian Association to support the development of a Wetland Management Plan with the Tribe and Haines Borough. Haines AK, January 1, 2013- 2016.

8. *Southeast Alaska Watershed Symposium,* Juneau AK, November 2013. Partner: Southeast Alaska Fish Habitat Partnership

9. *The Southeast Alaska Mitigation Fund- Mitigation Planning in Your Community,* Public meetings with Borough, Tribes, Local Agency staffers, Community Members. February 2015- November 2015

    - Juneau AK, Wrangell AK, Ketchikan AK, Sitka AK, Klawock AK, Kake AK, Hoonah AK

10. *Southeast Alaska Stream and Watershed Restoration Training,* Craig, AK, May 2016. Trainers: US Forest Service Restoration Cadre from Oregon.

11. *Planning for Compensatory Mitigation,* Haines AK, September 2016. Chilkoot Indian Village

In an effort to enlist other potentially interested parties in the Southeast Alaska region, SAWC will continue to conduct outreach to Southeast community land use/planning officials, non-profit organizations, tribes, municipalities, landowners, native corporation land managers, and other resource and real estate professionals.

SAMF intends to have a similar structure to successful ILF programs in Washington, Oregon, New Hampshire and Maine. These ILF programs invest in and capitalize on the expertise of organizations operating in the program service area to conduct various elements of the mitigation projects (See Appendix 4.0 for more information on public and private stakeholder involvement in the SAMF ILF program).

SAWC invites questions or comments and provides a link to the SAWC website (www.alaskawatershedcoalition.org) for the public and agencies alike to review draft documents and provide comments to the USACE Chair and IRT during the public review process.

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

See section 10.0 of this document.

j. A strategy for periodic evaluation and reporting on the progress of the program in achieving SAMF goals and objectives, including a process for revising the planning framework as necessary

SAWC will annually report to the USACE and the IRT on credits sold and offsets gained through compensatory mitigation projects under SAMF. SAWC will be obligated to submit an annual report that will document in-lieu fees received and disbursed from its ILF program account, income generated through investments, and expenditures for compensatory mitigation projects and administrative costs. SAWC also anticipates meeting regularly with the USACE in consultation with the IRT to concertedly evaluate any or all aspects of the program.

As part of these overall evaluations, SAWC would examine its efforts in achieving the previously identified goals and objectives of the SAWC ILF program. At that time this framework and other documents associated with this ILF can be reviewed.

3.0 SAMF Compensation Planning Framework for the Northern Alexander Archipelago (HUC 1901030) and the Gulf of Alaska (HUC 190104)

The Northern Alexander Archipelago and the Gulf of Alaska compensation planning framework (CPF) explains how SAMF will use a watershed approach to select, secure and implement aquatic resource restoration, enhancement, and/or establishment in the service area that encompasses the Northern Alexander Archipelago combined with the Gulf of Alaska. Information about aquatic resources in the service area is fairly limited, especially in the Gulf of Alaska- HUC 190104.

a. The geographic service area, including a watershed-based rationale for the delineation of the service area

The U.S. Geological Service identifies two 6-digit Hydrologic Unit Codes (HUCs) within the service area (190103 Northern Alexander Archipelago and 190104 Gulf of Alaska) shown in Figure 1, excluding Canada. Together, these HUCs encompass approximately 20,955 square miles in Southeast Alaska. The Northern Alexander Archipelago and Gulf of Alaska are grouped into a single service area to accommodate the compensatory mitigation needs of this area. These HUCs encompass biogeographic provinces within the northern mainland sub-region. While climatic conditions and ecosystems may vary throughout the service area, these areas have similar ecological conditions. This service area is dominated by active glacial and recently de-

glaciated physiography. Watersheds in this service area have generally had little impacts from forest harvest practices, as productive old growth forest is limited. Due to this, watersheds, particularly in the northern part of this service area are largely intact in terms of forest/vegetative cover. In addition, some of the most highly productive, diverse anadromous waterbodies are located in this service area. This includes several systems near Yakutat and the Chilkat River near Haines. However, with the largest population center in Southeast Alaska (Juneau) and multiple potential development projects, this area has seen and will continue to see many development impacts to aquatic resources from urbanization and transportation.

b. A description of the threats to aquatic resources in the service area

Future community and resource developments in this service area are likely to be similar to those that have occurred in the past. SAWC does not anticipate unfamiliar development activities to occur that would have unique or unusual impacts on aquatic resources not already experienced in Southeast Alaska. One exception to this is the future development of one or more ocean kinetics (tidal) projects in Southeast Alaska, which could lead to potential impacts to submarine and/or near shore aquatic resources heretofore not yet experienced in Southeast Alaska.

The U.S. Census Bureau defines two types of urban areas: an *urbanized area* is a densely settled area with a population of 50,000 or more, and an *urbanized cluster* is a densely settled area with a population between 2,500 and 50,000. All other areas are considered rural.

Juneau, the state capitol, is the only community in this service area with sufficient population to be considered an urbanized cluster and the population is projected to grow through 2032. The City and Borough of Juneau (CBJ) adopted a wetland management plan in 1992 to inform decisions regarding protection and development of wetlands. The current version was revised and reprinted in 1997, and is accessible online at: http://www.juneau.org/cddftp/documents/ENTIREDOCUMENT_000.pdf.

Since the implementation of this plan the majority of the lowest priority wetlands have been developed and the CBJ is currently revising their wetland plan to update existing surveys and classifications and expand into developing areas. All new growth areas are outlined in the CBJ comprehensive plan. Juneau also has five impaired waterbodies that are impaired wholly or in part due to urban run-off.

The population in the Haines Borough is projected to grow through 2032 and the Haines Borough 2025 Comprehensive Plan outlines the community's plan for future growth and development. Haines is anticipating residential development and utility expansion, revitalizing the downtown business district, and developing a "Public Campus." The Haines Borough is planning a harbor expansion project that will impact several acres of aquatic resource. DOT&PF is expected to begin construction on the Haines Highway. The stream and wetland compensatory mitigation required for this project is extensive. In addition, there is mineral exploration and mining within the Haines Borough with plans for expansion.

The population of the Municipality of Skagway is projected to grow through 2027. Skagway's 2020 Comprehensive Plan outlines the community's priority projects including a new/renovated water treatment plant; small boat harbor improvements; expanded recreational facility; senior

housing complex; port expansion for trans-shipment; and upgrades to the White Pass & Yukon Route Railroad.

The City of Gustavus' 2005 Strategic Plan outlines several projects in which the community identifies as priorities. This includes replacing the dock with a deep port for ferry and freight service; building a new boat harbor/marina; constructing a multipurpose community building; constructing a rifle/archery range; creating a public campground; building bike paths; and relocating the landfill and including sewage disposal, hazardous waste, and scrap metal storage.

The City and Borough of Yakutat is projected to have a steady decline through 2042. However, the CBY's 2010 Comprehensive Plan includes goals and policies to develop new infrastructure to allow for community growth. New infrastructure priorities include facilities to support seafood processing, commercial fishing and mariculture; sand and gravel extraction; dock facilities; access to and within the Western Borough for a variety of resource development activities; alternative energy sources including tidal/wave energy and biomass electrical generation; recreation and tourism; public utilities and services; and transportation.

Timber Harvest

This service area has had relatively low rates of timber harvest in the past. Commercial sources in this service area include the Tongass National Forest, the Haines State Forest, Alaska Mental Health Trust Authority Forest Assets, University timberlands, and Native Corporations (Sealaska Corporation; Chugach Alaska Corporation; Yak-Tat Kwaan, Inc.; Klukwan, Inc.; and Goldbelt, Inc.).

Currently, there are no planned timber sales on Tongass National Forest Lands within this service area. The Haines State Forest has 42,000 of its 260,000-acre multiuse state forest designated for timber harvest. The Haines State Forest timber sales are offered on a five-year schedule. The current Five Year Forest Management Schedule goes through 2018. The annual allowable harvest for the Haines State Forest is 5.88 million board feet.

The Alaska Mental Health Trust Authority Forest Assets are located near Camp Yakataga and Haines. The Camp Yakataga assets include 4,940 net operable acres. The Haines assets are in three separate blocks with a total of 308 net operable acres. Most of the harvest of University timberlands has focused on the Cape Yakataga area and averages from 10 to 25 million board feet.

Native Corporation surface rights in this service area are shown in Table 1. Yakutat and Yak-Tat Kwaan Village Corporation are exploring biomass energy that would require timber harvest of Corporation lands.

Table 1: Surface rights/ownership of Native Corporations within the service area. Estimated area calculated using the Surface Ownership Map Service data layer provided by U.S. Forest Service in ArcGIS.

Corporation	Estimated Area (square miles)
Sealaska Corp	1.08
Chugach Alaska Corp	72.10
Yak-Tat Kwaan, Inc	35.90
Klukwan, Inc	---
Goldbelt, Inc.	4.73

Transportation

In Southeast Alaska, the transportation infrastructure includes paved and unpaved roads, ferry terminal facilities, float plane docks, airports/airstrips, and small boat harbors. Communities in Southeast rely heavily on air and marine transportation, as most communities are not connected by road systems. Haines and Skagway provide the only road connection to mainland Alaska and Canada.

The Northern Alexander Archipelago service area has the following existing transportation infrastructure:
Approximately 655 miles of road, of which approximately 112 miles have been decommissioned;

- 103 bridges;
- 7 ferry terminals;
- 18 airports; this includes:
  - 4 standard airports;
  - 6 seaplane bases; and
  - 8 other/unclassified airports;
- 20 harbors

Road mileage was estimated from the transportation map server provided by the U.S. Forest Service and the other transportation facilities were estimated from the transportation facilities datalayer provided by the Alaska Department of Transportation and Public Facilities (DOT&PF) using ArcGIS.

Transportation infrastructure is maintained by the DOT&PF for state facilities and by local governments for local facilities. The U.S. Forest Service also maintains roads on the Tongass National Forest.

The DOT&PF Alaska Statewide Transportation Improvement Program (STIP) is the State's four-year program for transportation infrastructure preservation and development. Projects in the STIP have partial or full federal funding and are likely to be implemented in the planning period. The STIP planning period used was 2013 - 2015.

The DOT&PF Southeast Alaska Transportation Plan (SATP) identifies transportation needs and recommends transportation infrastructure projects to address those needs. Infrastructure projects

recommended in the SATP may or may not be developed in the future. Local governments also have transportation infrastructure priorities outlined in a local transportation plan or a comprehensive plan.

The Gulf of Alaska-Northern Alexander Archipelago service area has 39 transportation infrastructure projects programmed in the current STIP, most of which (27) are concentrated in Juneau. This trend will likely continue in the future, given the population and the extent of the road system in these communities.

The majority of these projects consist of rehabilitating existing infrastructure within the existing footprint, which limits impacts on adjacent resources. However, some improvements to existing highway infrastructure include widening or realigning road surfaces, which could impact adjacent resources. In addition, some of the ferry terminal upgrades would require fill and placement of structures outside of the existing footprint. Such reconstruction projects could require mitigation.

Juneau Access is the only proposed new road infrastructure project proposed by the DOT&PF in this service area. Juneau Access is not only programmed in the STIP but was also identified as a priority in the 2014 SATP. Juneau Access would require construction of 50.6 miles of new road and a ferry terminal near Katzehin River.

The status of DOT&PF projects in pre-construction and construction can be found in the project status reports, which are available online at http://dot.alaska.gov/sereg/projects/index.shtml

Local governments in this service area are prioritizing gravel road resurfacing, widening shoulders, construction and rehabilitation of non-motorized transportation infrastructure (sidewalks and bike paths). Some local governments are also prioritizing extension of local road systems or constructing new roads to undeveloped lands to allow for community growth. Expansion or upgrades of local ports and harbors is also a priority.

Hydroelectric Power/ Alternative Energy Facilities

In Alaska, hydropower is currently the largest and most important producer of electricity from a renewable energy source. According to the Juneau Economic Development Council (JEDC) Southeast Alaska Economic Asset Map (2011), communities served by hydropower have some of the least expensive electricity rates in the state. With increased interest in replacing expensive fossil-fuel-powered generation with renewable energy resources, hydropower capacity will continue to expand. The Alaskan U.S. Senator Lisa Murkowski is sponsoring the Hydropower Improvement Act.

All communities in this service area, with the exception of Yakutat, are currently served by existing hydroelectric facilities. There are 8 existing hydroelectric facilities in this service area. Electrical transmission lines connect sub-regional grids in Haines and Skagway, and Juneau and Greens Creek Mine on Admiralty Island (outside of this service area). However, there is still potential to increase hydroelectric capacity. The Nature Conservancy developed an inventory of

existing and proposed hydropower sites and power lines from information obtained from Alaska Industrial Development and Export Authority (AIDEA). This inventory, available through the Southeast Alaska GIS Library, identified 14 proposed hydroelectric facilities in this service area.

What follows is a description of some of these potential projects that could be seeking 404 permits to offset unavoidable impacts to aquatic resources:

- West Creek, Skagway:
- Goat Lake Hydro (Connelly Lake), Haines: this is a small glacial fed lake that is being studied as a hydroelectric source
- Walker Lake, Haines:

Biomass energy, geothermal and tidal/wave energy are other alternate energy sources that are being considered in this service area. Yakutat and Haines are noted in the Southeast Alaska Economic Asset Map (JEDC, 2011) as exploring biomass energy as an option. Yakutat was also noted to be considering near shore wave generators.

Mining

Southeast Alaska has extensive mineral resources. The region's mineral deposits include gold, silver, lead, zinc, copper, molybdenum, platinum, limestone, marble, uranium, and rare earth minerals. There are also rock, sand and gravel resources for use in construction. In 2014, mining comprised 5 percent of the region's economy.

The mining industry plays a role in the economy of this service area. Mining exploration is primarily occurring in the Porcupine District near Haines and Kensington Mine near Juneau. According to the U.S. Geological Survey, Alaska Resource Data File, approximately 141 mineral occurrences, 194 prospects and 85mines in this service area. Mineral occurrences are those unexplored occurrences of minerals of economic interest. Prospects are sites where some development works has occurred. Mines are sites with current and past production.

Many mining claims never become fully operational mines, and it is difficult to predict which claims will eventually become operational. The current high price of metals is encouraging additional mineral exploration at or near existing mines, as well as re-opening historic mining sites. Mining activity in the Southeast region is largely contingent on worldwide demand and the price of silver, gold or base metal commodities. At this time the demand for metal resources continues to grow across the world.

In addition to mining for metals and rare earth elements, mining for gravel and sand is also a common activity in the region. Gravel and sand are usually mined from major river floodplains, talus slopes, glacial moraines, and beach deposits. For example there is currently active gravel and sand mining in the Skagway River in Skagway and Lemon Creek in Juneau.

Projects listed here are those in the advance stages of exploration through fully operational mines. Even companies with operational mines are conducting exploratory operations on their properties.

- Palmer Project, Haines. This mineral exploration operation is located near Haines Alaska. Mining exploration is occurring on a contiguous block of land encompassing 340 federal unpatented mining claims and extending across approximately 9,200 acres. In 2013, a large Japanese smelting company, invested 2 million dollars to support Constantine's 2014 field season. This enabled Constantine to bolsters its mineral exploration and mine development activities. The company is currently seeking a 404 permit and will continue to need mitigation to offset its impacts to aquatic resources

- Greens Creek Project, Admiralty Island: This is one of the largest producing silver mines in the world. Exploration efforts are ongoing along the highly prospective 27-square-mile land package. Greens Creek is actively seeking a 404 permit and is having difficulty finding available and appropriate mitigation credits to meet its unavoidable impacts.

- Kensington/Jualin: The Kensington underground gold mine and associated milling facilities are located within the Berners Bay Mining District on the east side of the Lynn Canal about 45 miles north-northwest of Juneau, Alaska. The project is wholly owned and operated by Coeur Alaska, Inc. The two adjoining claims account for over 10,000 acres.

- Herbert Gold Project: this project is located near the Herbert Glacier in Juneau, Alaska. This project is in the exploration phase.

Tourism

Juneau, Haines, Skagway, and Gustavus depend on tourism as a major component of their economies. The largest component of the tourism industry is the cruise ship industry. Juneau, Haines, and Skagway are all cruise ship destinations with Skagway alone receiving nearly a million passengers a year. Cruise ships do not dock in Gustavus, but they do travel into Glacier Bay.

The number of cruise ship passengers in Southeast Alaska increased by 14 percent between 2010 and 2013, and it is anticipated that a new cruise ship passenger record will be reached in 2016 (Southeast Conference, 2014). According to the Juneau Economic Development Council (JEDC) Southeast Alaska Economic Asset Map (2011), between 2000 and 2010 Juneau and Skagway had a 37 and 24 percent increase in cruise ship passengers, respectively, while Haines had an 83 percent decrease.

The infrastructure necessary to accommodate the ships and the growing number of shore-based excursions are likely to impact aquatic resources that will require mitigation. Skagway is currently in the planning stages of a port expansion to accommodate cruise ships and mineral exportation.

In addition to cruise ship passengers, Southeast Alaska accommodates 230,000 independent travelers. In 2010, the number of independent travelers increased by 2 percent in Juneau. Independent travelers are drawn to the region for nature-based tourism. Residents also travel

throughout the region to enjoy recreational opportunities (JEDC, 2011). New remote tourism lodges or developments to satisfy potential demand for ecotourism niche markets in the future could cause localized impacts to aquatic resources.

Aquaculture

Currently, salmon hatcheries for fish stock enhancement dominate the aquaculture industry in Southeast Alaska, and the footprint of this coastal infrastructure has been in place for decades. According to the Alaska Department of Fish and Game (http://www.adfg.alaska.gov/static/fishing/PDFs/hatcheries/se_hatch.pdf), there are two salmon hatchery facilities in Juneau (Macaulay and Sheep Creek) managed by Douglas Island Pink and Chum, Inc. (DIPAC).

Mariculture and aquaculture are relatively new to Southeast Alaska and have potential for expansion. Shellfish aquaculture projects potentially could occur anywhere in Southeast Alaska where growing, tending, and harvesting conditions for shellfish are favorable. Marine shellfish operations like culturing oysters and clams are likely to increase as technology improves, shellfish farms become more profitable, and people are drawn to the remote lifestyle where few other economic opportunities exist. In this service area there are shellfish farms in Yakutat and in Berner's Bay near Juneau.

There are 18 seafood processing plants in this service area: ten in Juneau; three in Haines; three in Yakutat; one in Gustavus; and one in Excursion Inlet, near Gustavus. According to the Juneau Economic Development Council (JEDC) Southeast Alaska Economic Asset Map (2011), the combined 2009 seafood production for Juneau, Haines and Yakutat totaled 17,769,988 lbs. of product, valued at $51,434,244. The existing infrastructure in place for processing may have some capacity to absorb future increase in hatchery or aquaculture production within the service area.

Under SAMF, the ILF program sponsor will help to offset impacts resulting from these threats by mitigating specific types of aquatic resources, including wetlands, streams, shorelines, floodplain areas, upland buffers, and riparian zones. It is the long-term goal for the ILF program sponsor to carry out a wide spectrum of mitigation methods to maintain and improve the quantity and quality of aquatic resources in the services area.

SAWC will work with mitigation partners who share expertise to complete compensatory mitigation activities in each Service Area. The mitigation projects carried out under the SAMF program, as well as, mitigation projects that have already been prioritized strive to be self-sustaining with attainable ecological performance standards, and use restoration techniques that have documented success.

SAWC used past restoration efforts, expertise held by the mitigation fund partners and the *Aquatic Habitat Rehabilitation, Enhancement, and Mitigation in Juneau Alaska: Inventory and Case Studies* (Hudson, Seifert 2012) to inform the list of possible mitigation project types to be carried out.

The types of projects listed below have been supported by natural resource managers and carried out by SAWC and mitigation fund project partners. In addition, there is information pertaining to project design and monitoring for these types of mitigation projects. Resource managers agree

that there is enough scientific research and information, as well as expertise and experience in this region, to carry out the following types of mitigation projects. In general, the program sponsor will pursue the following types of mitigation projects:

1. **Stream bank bioengineered stabilization**
2. **Stream channel creation or reconfiguration**
3. **Plant/enhance riparian vegetation**
4. **Flood plain restoration/reconnection**
5. **Wetland restoration, enhancement and establishment**
6. **Fish habitat restoration and/or enhancement (e.g. instream structures)**
7. **Fish passage restoration and/or enhancement**

Each mitigation site will have a detailed mitigation plan. These mitigation plans will outline specifically the techniques that will be used to carry out each type of mitigation. In this way, the IRT, other agencies, interested and/or concerned stakeholders and members of the general public will be able to provide input to SAWC on project site design, implementation and ecological performance standards.

c. An analysis of historic aquatic resource loss in the service area(s)

To date there is no publicly available in-depth database that shows the cumulative aquatic resource loss across Southeast Alaska. This type of data collection and analysis has not been conducted by any natural resource agency and/or conservation organization working in the region. Juneau is the only community that has an estimate on wetland loss that has resulted from community development. According to Adamus Resource Assessment, Inc. (1987), approximately 33 percent of Juneau's wetlands (those present in 1948) were filled by 1984 for an annual wetland loss rate of 0.9 percent per year. However, Juneau is the largest community in the region and experienced rapid growth in the 1960s and 1970s. Therefore, this is not likely representative of the service area as a whole.

Some of the most complete documentation of historic aquatic resource loss data within this service area includes: the Tongass National Forest Watershed Condition Framework (USFS, 2012), the USACE permitted impact data and the *Conservation Assessment and Resource Synthesis for The Coastal Forests and Mountains Ecoregion in Southeast Alaska (TNC/Audubon 2011).*

The strongest data supporting the need for SAMF is the USACE CWA Section 404 permitted impact data. 33 CFR 332.3(a)(2) states in pertinent part that "Restoration should generally be the first option considered because the likelihood of success is greater and the impacts to potentially ecologically important uplands are reduced compared to establishment, and the potential gains in terms of aquatic resource functions are greater, compared to enhancement and preservation." Preservation does not result in a gain of aquatic resource area or functions.

SAWC believes that there is definitely a need for restoration in Alaska since the majority of compensatory mitigation has been preservation.

These three sources demonstrate that there has been loss to aquatic resources within this service area.

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

Much of the habitat values of this service area remain largely intact, in part, due to the protection status of lands within the service area. Approximately 86 percent of Tongass National Forest lands within this service area are classified in Wilderness and Natural Setting Land Use Designations (LUDs). This includes the Russell Fjord Wilderness (~545 sq. mi.), Endicott River Wilderness (~147 sq. mi.), and half of the Pleasant/Lemusurier/Inian Islands Wilderness (~19 sq. mi.). Other protected lands in this service area include a portion of the Wrangell-Saint Elias Wilderness (~3,596 sq. mi.), Glacier Bay National Park and Preserve (3.3 million acres, or ~5,156.25 sq. mi.) and the Chilkat Bald Eagle Preserve. These areas constitute nearly 63 percent of this service area.

As part of the Forest Service National Watershed Condition Framework, twelve core indicators were evaluated to classify watershed condition across the Tongass National Forest in 2011. The indicators include aquatic habitat condition attributes (e.g., riparian harvest, roads in riparian areas, fragmented habitat due to culverts blocking fish passage). *[Note: Additional information and references on the national Watershed Condition Framework is at http://www.fs.fed.us/publications/watershed/.]*

Section e. of this compensation planning framework outlines the 12 digit HUC watersheds that have been prioritized for aquatic resource restoration, enhancement, and establishment. A confidential list of potential mitigation projects within these watersheds has been submitted to the USACE.

Localized degradation and loss of aquatic resources has occurred near communities and mine sites within the service area and many development projects are moving forward. The Alaska Department of Environmental Conservation (DEC) has identified seven impaired waterbodies in this service area: Pederson Hill Creek, Duck Creek, Jordan Creek, Lemon Creek and Vanderbilt Creek in Juneau; and Skagway Harbor and Pullen Creek in Skagway.

This service area has nearly 15,800 miles of stream (Table 4). The USFS Region 10 *Channel Type User Guide* provides a method for categorizing a stream network in a watershed into basic fluvial process groups. Fluvial process groups help understand the interrelationship between the landscape, erosion and depositional processes, channel morphology, and fish and riparian habitat. More than half of the stream miles in this service area have not be categorized. Of those that have been characterized, the most common channel process groups are High Gradient Contained, Lake, Palustrine and Floodplain channels.

Table 2: Estimated miles of stream by process group within the service area. Estimated miles calculated using the SEAK Hydro Stream Process Groups data layer in ArcGIS.

Stream Process Group	Estimated stream length (miles)		
	HUC 190104	HUC 190103	Total
Alluvial Fan	27.44	153.63	181.07
Estuarine	65.23	34.98	100.2
Floodplain	912.93	262.38	1,175.31
Glacial	192.03	258.45	450.48
Lake	1,024.71	578.29	1,603.00
High Gradient Contained	534.20	1,813.33	2,347.53
Moderate Gradient Contained	33.10	177.90	211.00
Moderate Gradient Mixed Control	34.55	163.46	198.01
Low Gradient Contained	---	13.93	13.93
Palustrine	1,045.22	148.59	1,193.81
Other	10.01	96.61	106.62
Unknown	4,148.30	4,066.88	8,215.18
Total	8,027.70	7,768.44	15,796.14

In addition, this service area has the most highly productive, diverse anadromous waterbodies. Several systems near Yakutat, including the Tatshenshini River and Situk River; and the Chilkat River near Haines are among the top producers of salmon in the region. In total, this service area includes approximately 2,770 miles of anadromous streams and 65 square miles of anadromous lakes (estimated from the 2015 Anadromous Waters Catalog datalayer using ArcGIS). While this is only 17.5 percent of the reported total length of streams, some channel types (e.g. high gradient contained channels) have gradient and stream flow barriers that make them inaccessible to anadromous fish and, therefore, do not provide significant fish habitat.

This service area contains approximately 1,084 square miles of wetlands (Table 5). Juneau is the only community that has data on wetland loss that has resulted from community development. According to Adamus Resource Assessment, Inc. (1987), approximately 33 percent of Juneau's wetlands (those present in 1948) were filled by 1984 for an annual loss rate of 0.9 percent per year.

Table 3: Estimated area of wetland types within the service area. Estimated area calculated using the National Wetland Inventory data layer in ArcGIS.

Wetland Type	Estimated Wetland Area (square miles)	
	HUC 190104	HUC 190103
Estuarine/Marine	59.84	82.47
Freshwater Emergent	176.88	79.55
Freshwater Forest/Shrub	158.83	217.63
Freshwater Pond	9.84	10.00
Lake	102.19	41.94
Riverine	54.92	88.36
Other	1.51	--
Total	564.01	519.95

Local, intact aquatic resources provide valuable services such as fish and wildlife habitat, open space, recreation sites, (drinking) water quality protection, and flood control that enhance human use and aesthetics of a community.

Coastal Marine Habitats

The Gulf of Alaska/Northern Alexander Archipelago has approximately 2,221 miles of marine shoreline. The coastal marine habitats within this service area include approximately 33 square miles of upper intertidal habitat above mean high water, 117 square miles of intertidal habitat, and 3,292 square miles of saltwater habitat (estimated from the SEAK Hydro Intertidal Areas datalayer provided by the Southeast Alaska GIS Library, using ArcGIS). The total estuarine/marine wetlands in Table 6 nearly equal the combined intertidal areas.

The ShoreZone system provides a detailed inventory of geomorphic and biological features of coastal areas. This service area has approximately 2,105 miles of coastline mapped in the ShoreZone system, which does not include shoreline of Glacier Bay (Table 6). This coastline includes the Southeast Alaska coastal areas of Yakutat, Icy Strait, and Lynn Canal, as outlined in the Alaska ShoreZone Coastal Habitat Mapping Protocol.

Table 4: Estimated miles of coastline by coastal types within the service area. Estimated miles calculated using the ShoreZone data layer in ArcGIS. Modified from Table A-14 in the Alaska ShoreZone Coastal Habitat Mapping Protocol. Biological exposure categories were combined to estimate the mileage for each coastal type.

Dominant Structuring Process	Substrate Mobility	Coastal Type	Coastline (miles) by HUC		
			190103	190104	Total
Wave Energy	Immobile	Rock, Rock & Sediment, or Sediment	115.47	100.08	215.55
	Partially Mobile	Rock & Sediment, or Sediment	526.07	440.74	966.81
	Mobile	Sediment	46.69	390.74	437.43
Fluvial/Estuarine		Estuary	196.80	239.12	435.98
Current Energy		Current-dominated	0.56	1.24	1.80
Glacial		Glacier	3.29	13.27	16.56
Anthropogenic		Impermeable	1.40	0.04	1.44
		Permeable	28.06	1.63	29.69
		Total	918.40	1186.86	2105.26

The Yakutat bioarea, located entirely within the Gulf of Alaska (HUC 190104), is characterized by an exposed, west-facing coastline that is dominated by mobile, high energy sediment beaches. This coastal bioarea has the largest portion of coastline influenced by glacial processes and the least amount of shoreline dominated by anthropogenic structures in the region. On average, this area has a low biodiversity index (average for HUC is 3.18 on a scale of 0 – 13; estimated from the Coastal Biodiversity Index datalayer produced by The Nature Conservancy using ArcGIS). Areas with higher biodiversity (index of 6 or higher) include the coast in and around Yakutat, the Russel and Nunatak Fiords, Lituya Bay, and the coast between Graves Harbor and Palma Bay within Glacier Bay National Park.

The Icy Strait and Lynn Canal bioareas are located entirely within the Northern Alexander Archipelago (HUC 190103). The Icy Strait bioarea coastline is dominated by low to moderate wave exposed coastlines influenced by glacial waters with wide, sediment-dominated beaches and fringing salt marshes as common coastal habitats. The Lynn Canal is characterized by a fjord landscape dominated by bedrock and a dense Blue Mussel bioband. On average, this area has a low biodiversity index (average for HUC is 4.78 on a scale of 0 – 13; estimated from the Coastal Biodiversity Index datalayer produced by the Nature Conservancy using ArcGIS). Areas with higher biodiversity (index of 6 or higher) include the Chilkoot Inlet coast in and around Haines, Berner's Bay and portions of lower Lynn Canal near the tip of Admiralty Island, and Excursion Inlet.

Estuaries and mudflats are high-value habitat but are relatively rare within the region: mudflats are less than 1% and estuaries are 14% of the shoreline. According to the ShoreZone data, this service area has the least fluvial/estuarine coastline when compared to the Southern and Central Alexander Archipelago (HUCs 190102 and 190101 respectively), although estuaries comprise a larger proportion of the mapped coastline in this service area at 21 percent. According to the *Conservation Assessment and Resource Synthesis for The Coastal Forests and Mountains Ecoregion in Southeast Alaska (TNC/Audubon 2011*, this service area has five of the 10 largest

estuaries in the region: Dangerous River (ranked #2 at 13,859 acres), Dry Bay (ranked #4 at 6,811 acres), Gustavus (ranked #6 at 4662 acres), Chilkat River (Ranked #7 at 4518 acres) and the Mendenhall (ranked #9, acreage not provided).

Throughout Southeast Alaska, the marine shoreline supports abundant populations of shellfish, fish, and wildlife in a complex mosaic of geophysical and biological features where uplands, freshwater, estuarine, and marine environments interface (Schoen and Dovochin 2007). These combined features support primary productivity from plankton, algae, kelp, eelgrass and marsh grass; shellfish production from Dungeness crab, clams and shrimp; fish production from herring, flatfish, rockfish and salmon; and a diverse ecosystem that includes many species of marine birds and marine mammals. The communities of Southeast Alaska rely on these coastal resources to support significant components of their economies dependent on subsistence, sport and commercial fishing, hatcheries, tourism, recreation, and wildlife viewing.

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

Generally this service area has not been as impacted by historic timber practices and the road infrastructure constructed to support the timber industry as Southern and Central Service Areas. Unlike SAMF's other two service areas- where the majority of restoration projects have been identified by the USFS and its partners- local organizations and the USFWS have taken a lead with doing watershed assessments and identifying possible restoration, enhancement and creation projects. Watershed assessments conducted within this service area (See list section F) commonly find that though the watersheds hold high potential to have high functioning aquatic resources and be quality habitat for the five species of salmon, as well as other freshwater fishes, impacts from community development, transportation infrastructure, mining and hydropower have diminished the amount of aquatic habitat.

Aquatic resource restoration and enhancement goals for wetlands and streams in this service area include- stream channel reconstruction and large-woody debris structural treatments to maintain channel stability and improve fish habitat conditions, revegetation of stream banks, culvert replacement, and wetland enhancement and creation.

The SAMF program will utilize the following restoration and enhancement actions to mitigate for current and future impacts within this service area; stream bank bioengineered stabilization, stream channel creation or reconfiguration, plant/enhance riparian vegetation, flood plain restoration/reconnection, fish habitat restoration and/or enhancement (e.g. instream structures), fish passage restoration and/or enhancement, and wetland restoration, enhancement and creation.

The following watersheds have been prioritized by federal and state agencies, as well as, regional NGO's and local organizations. The majority of listed watersheds have multiple restoration and enhancement opportunities and have been identified in a regionally relevant and scientifically validated watershed assessment.

Confidential supporting information, in accordance with 33 CFR 332.8(n)(2), lists specific potential projects within these watersheds with the type and location of aquatic resources to be restored has been submitted to the Army Corps of Engineers, Alaska District.

Fish Creek, Douglas, Juneau

Peterson Hill, Juneau

Jordan Creek, Juneau

Vanderbilt Creek, Juneau

Allison Pond, Juneau

Chilkat River, Haines

Mudd Bay, Haines

Southeast Alaska State Fair Property, Haines

Porcupine Pond, Haines

Haines Highway- Seven Mile, Haines

Haines Townsite- Haines

Pullen Creek, Skagway

Outlet Endicott River

Lower Lace River

Cowee Creek

Mendenhall River

Yang-Webster Peak

Fish Creek

Beardslee River-Frontal Lynn Canal

Ansley Island-Frontal Icy Strait

Yakutat Bay-Frontal Gulf of Alaska

Upper Ahrnklin River

Antlen River

Middle Ahrnklin River

Seal Creek

Situk River

Ustay River-Akwe River

Tawah Creek

Lost River

Neither SAWC nor its partners have funded conceptual designs for the initial list of projects identified in SAWC's preliminary assessment of the service area. Therefore, the exact amount of linear feet of stream and/or acres of wetland restoration, enhancement and creation projects in this service area is difficult to summarize. However, the USFS has identified an estimated potential 4 miles of stream restoration and enhancement and 94 acres of riparian wetland restoration and enhancement and 6 miles of estimated potential access to fish habitat via culvert remediation and stream habitat restoration. The Takshanuk Watershed Council, Taiya Inlet Watershed Council and the Juneau Watershed Partnership have listed priority mitigation projects for this service area, that include, both wetland and stream restoration, enhancement and establishment.

f. A prioritization strategy for selecting and implementing compensatory mitigation activities

This section provides an overview of how the program sponsor has selected and prioritized an initial list of potential mitigation sites. This section also provides an overview of how SAWC will select and prioritize sites in the future under this instrument. The compensatory mitigation activities that will be carried out are stream and wetland restoration, enhancement and establishment. Confidential supporting information, in accordance with 33 CFR 332.8(n)(2), of specific activities has been submitted to the USACE.

SAWC has developed a prioritization and site selection strategy that is based on a watershed approach that is specific to Southeast Alaska. SAWC works to ensure each mitigation site meets the requirements of the Final Rule. SAWC's prioritization strategy for selecting and implementing compensatory mitigation sites was a two-step process. The first step was to identify top priority watersheds within the service area using a watershed approach based on existing assessments and other sources. The second step was to identify potential mitigation sites that could be efficiently implemented to generate credits and improve watershed conditions.

SAWC has carried out an initial prioritization effort by utilizing the following methodology. The results of this prioritization effort are the list of watersheds and waterbodies listed in the above section of the CPF (section e.)

The following provides an overview of how SAWC has selected and prioritized sites (as described in confidential supporting information, in accordance with 33 CFR 332.8(n)(2)) and it also provides an overview of how SAWC will select and prioritize sites in the future under this instrument.

To accomplish the first step --*identify top priority watersheds within the service area based on ecological assessments and other sources* — SAWC will rely on documentation- that has been developed by resource managers and agencies, conservation and environmental science not for profit organizations and local governments- to identify top priority watershed within this larger service area. These resources have utilized a watershed approach to identify and

- *The Watershed Condition Framework.* The USFS recently identified priority watersheds for restoration in the Tongass National Forest using its national Watershed Condition Framework. The framework includes a strategic planning outline and includes six key steps: 1) Classify Watershed Condition; 2) Prioritize Watersheds for Restoration; 3)

Develop Watershed Restoration Action Plans; 4) Implement Integrated Suites of Projects; 5) Track Restoration Accomplishments; 6) Verify and Monitor Accomplishments. http://www.fs.fed.us/publications/watershed/

- *A Conservation Assessment and Resource Synthesis for The Coastal Forests and Mountains Ecoregion in Southeast Alaska (TNC/Audubon 2011).* The assessment includes a Map Gallery of GIS products; a ranking of ecological values among watersheds throughout the region in Watershed Matrix; and a GIS database that provides a common inventory of ecosystem and habitat values that encompass lands throughout Southeastern Alaska. http://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/alaska/seak/era/cfm/Pages/default.aspx
- *Ecological Forest Restoration in the Tongass National Forest (TWS/SEAWEAD Assessment 2012).*
- USFS Region 10 *Channel Type User Guide (Paustian et al 1992, updated 2010)*
- *Alaska's Anadromous Waters Catalog (ADF&G)* http://www.adfg.alaska.gov/sf/SARR/AWC/
- *Fish Passage Culvert Inventory (ADF&G and USFS)* *http://www.adfg.alaska.gov/index.cfm?adfg=fishpassage.database*
- *Southeast Alaska Impaired Waterbodies (DEC)* http://dec.alaska.gov/water/index.htm
- *ShoreZone* http://alaskafisheries.noaa.gov/shorezone/default.htm
- Local watershed plans/assessments including but not limited to:
    - *Pullen Creek Action Plan*
    - *Taiya Inlet Stream Condition Assessment*
    - *Haines Area Fish Passage Inventory*
    - *Restoration, Enhancement and Mitigation Projects for Juneau's Watersheds*
    - *The Peterson Hill Creek Watershed Mapping and Conservation Plan*
    - *Auke Lake Watershed Assessment*
    - *Vanderbilt Creek Watershed Recovery and Management Plan*
    - *Jordan Creek Urban Hydrography Mapping and Stormwater Management Plan*

To accomplish the second step — *identify potential mitigation sites that can be efficiently implemented to generate credits and improve watershed conditions within the guidelines of the Final Rule*.

The SAMF Site Selection Decision-making Factors consist of the following six elements:

- **Potential to Meet the SAMF Goals**
- **Project Appropriateness within a Watershed Context**
- **Project Readiness/Feasibility**
- **Project Lead Capacity**

- **Cost Effectiveness**
- **Other Benefits**

These six elements are explained below:

1. Potential to Meet SAMF Goals: Assesses the extent to which the potential mitigation project meets the core program requirements *to restore, enhance, or establish aquatic resources that have been prioritized using a watershed approach, best available science and/or by USACE.* All project sites must be protected with an appropriate site protection mechanism. Considerations include:

a) The sustainability of the proposed conservation action (restoration, enhancement, and/or establishment);

b) The degree to which the mitigation project offsets the functional benefits of impacted aquatic resources identified as a priority in the biophysical region;

c) The proximity of the mitigation project to impacted resources in the watershed;

d) Inclusion of upland areas, where necessary to ensure the long-term viability of aquatic resources;

e) The functional lift to be provided by the mitigation project (e.g., proposed improvement in habitat quality, contribution to functioning biological systems, water quality, etc.);

f) Other specific conservation objectives developed for each biophysical region or watershed, as described in watershed plans, municipal management plans, statewide conservation objectives as long as those objectives support third-party compensatory mitigation for permitted impacts regulated under Section 404 of the Clean Water Act, and Section 10 of the Rivers and Harbors Act of 1899.

2. Project Appropriateness within a Watershed Context: Assesses the extent to which the potential mitigation project meets the core program requirement *to consider the location of a potential project relative to focus areas for land conservation or habitat preservation identified by a state agency, or other regional or municipal plans.*

Considerations include:

1. Presence within or proximity to habitat areas of statewide conservation significance or other natural resource priority areas;
2. Presence within or proximity to public or private conservation lands to maintain and preserve habitat connectivity;
3. Presence of natural resources of significant value and/or rarity within the project site boundaries.

3. Project Readiness/Feasibility: Assesses the extent to which the potential mitigation project 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 the requirements stated in the Final Rule and the goals of SAMF*. Considerations include:

a) Documentation of landowner willingness to participate in the proposed project, including conveying a conservation easement or fee title, with conservation covenants, to the property (for projects not on public or private conservation lands);

b) Soundness of the technical approach presented in conceptual plan for the proposed project;

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

d) Likelihood that the proposed actions will achieve the anticipated ecological benefits and results;

e) Completeness and feasibility of long-term stewardship and monitoring plan;

f) Potential for adverse impacts (such as flooding or habitat loss) associated with the project;

g) Conformance with any applicable USACE and state mitigation policy, guidance and permitting requirements, including appropriate financial assurances for various construction activity;

4. Long Term Management Feasibility: Assesses the extent to which the potential mitigation project meets the core program requirement *to provide for long-term management and/or stewardship by a responsible state or federal resource agency, or conservation organization.* Considerations include:

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

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

c) 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).

5. Cost Effectiveness: Assesses the extent to which the potential mitigation project meets the program requirement *that a project represent an efficient use of funds expended given the condition, location and relative appraised values of properties.* Considerations include:

a) Clarity and detail of budget submitted to SAWC;

b) Sufficiency of funds available in the applicable biophysical region including matching funds if necessary;

c) Potential to develop a substantial number of credits in a biophysical region where there is a robust demand for the credit type.

6. Social Benefits: Assesses the potential for a mitigation project to support recreational access, scenic enhancements, economic activity, or other contributions to the community or region where the project is located. Review applicable watershed plans to identify objectives that could

be accomplished within the scope of a mitigation project and/or identify opportunities to improve the productivity of rare or highly valued fish and/or wildlife species

g. An explanation of how any preservation objectives identified above satisfy the criteria for use of preservation in 33 CFR 332.3(h)

At this time the SAMF does not have a programmatic goal to perform preservation as a form of compensatory mitigation.

h. A description of any public and private stakeholder involvement in plan development and implementation, including coordination with federal, state, tribal and local aquatic resource management and regulatory authorities

SAWC will ensure there is both public and private stakeholder involvement throughout the entire process from mitigation site selection to the long-term management of the sites. Based on the extensive needs assessments conducted by SAWC over the past three years, there is no *one* organization, agency, and/or environmental consultant operating in Southeast Alaska that understands the requirements listed in the Final Rule *and* holds the experience and expertise to conduct all stages of restoration, enhancement and/or establishment projects from site selection to long-term monitoring.

SAWC developed a *draft* Prospectus, which is not required under the Final Rule, in order to build knowledge and awareness of SAWC staff, advisory board, board of directors, and IRT members. SAWC has incorporated feedback, concerns, and questions into the Prospectus, Draft Instrument and Instrument. In addition, over the past three years, SAWC has organized significant outreach and public education opportunities in order to understand better the diverse spectrum of stakeholder perspectives of aquatic resource mitigation and what strategies and processes a third-party mitigation program provider should consider in order to respond to the unique aquatic resource mitigation challenges and opportunities that exist throughout Southeast Alaska. SAWC has reached over 300 southeast Alaskan natural resource professionals through the following events:

- *Scoping Discussion: Wetland and Aquatic Resource Mitigation*, October 21^{s}, 2011, Juneau Alaska. 43 participants; including 5 USACE staff and 20 other agency staffer. Presenters: USACE, FS and USFWS Staff and WA mitigation experts. (SAWC, 2011).
- *Clean Water Act Section 404 Program and Identifying and Planning for Mitigation in Your Community*, Public Meeting with Borough, Tribes, Local Agency Staffers, Petersburg AK, October 17, 2011.
- *Clean Water Act Section 404 Program and Identifying and Planning for Mitigation in Your Community*, Public Meeting with Borough, Tribes, Local Agency Staffers, Wrangell AK, October 18, 2011.

- *Introduction to Wetland Functional Assessments and Delineations to support Permitting Process*, Haines AK, August 12, 2011. Trainers: USACE Staff
- American Water Resources Association, Alaska Section 2012 Annual Conference. Juneau March 2012. *Developing a Third Party Aquatic Resource Mitigation Program and the Need for Science to Inform Credible Mitigation in Southeast Alaska.*
- *Wetland Functional Assessment Training: WESPAK-SE,* Haines AK September 20, 2012. Trainer: Dr. Paul Adamus
- Partnering with Chilkoot Indian Association to support the development of a Wetland Management Plan with the Tribe and Haines Borough. Haines AK. January 1, 2013- 2016.
- *Southeast Alaska Watershed Symposium*, Juneau AK, November 2013. Partner: Southeast Alaska Fish Habitat Partnership.
- *The Southeast Alaska Mitigation Fund- Mitigation Planning in Your Community*, Public meetings with Borough, Tribes, Local Agency staffers, Community Members. February 2015- November 2015
    - Juneau AK, Wrangell AK, Ketchikan AK, Sitka AK, Klawock AK, Kake AK, Hoonah AK
- *Southeast Alaska Stream and Watershed Restoration Training,* Craig, AK, May 2016. Trainers: US Forest Service Restoration Cadre from Oregon.
- *Planning for Compensatory Mitigation,* Haines AK, September 2016. Chilkoot Indian Village

In an effort to enlist other potentially interested parties in the Southeast Alaska region, SAWC will continue to conduct outreach to Southeast community land use/planning officials, non-profit organizations, tribes, municipalities, landowners, native corporation land managers, and other resource and real estate professionals.

SAMF intends to have a similar structure to successful ILF programs in Washington, Oregon, New Hampshire and Maine. These ILF programs invest in and capitalize on the expertise of organizations operating in the program service area to conduct various elements of the mitigation projects (See Appendix 4.0 for more information on public and private stakeholder involvement in the SAMF ILF program).

SAWC invites questions or comments and provides a link to the SAWC website (www.alaskawatershedcoalition.org) for the public and agencies alike to review draft documents and provide comments to the USACE Chair and the IRT during the public review process.

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

See section 10.0 of this document.

j. A strategy for periodic evaluation and reporting on the progress of the program in achieving SAMF goals and objectives, including a process for revising the planning framework as necessary

SAWC will annually report to the USACE and the IRT on credits sold and offsets gained through compensatory mitigation projects under SAMF. SAWC will be obligated to submit an annual report that will document in-lieu fees received and disbursed from its ILF program account, income generated through investments, and expenditures for compensatory mitigation projects and administrative costs. SAWC also anticipates meeting regularly with the USACE in consultation with the IRT to concertedly evaluate any or all aspects of the program.

As part of these overall evaluations, SAWC would examine its efforts in achieving the previously identified goals and objectives of the SAWC ILF program. At that time this framework and other documents associated with this ILF can be reviewed.

4.0 SAMF Restoration Cost Tool (RCT)

Restoration Cost Tool for Southeast Alaska In-Lieu Fee Compensatory Mitigation Program

-- A First Approximation, August 31, 2013—
By Steve J Paustian, Sitka Hydro Science LLC

This report was developed for the *Southeast Alaska Watershed Coalition (SAWC)* as a component of the *In-Lieu Fee Program Instrument*. *Sitka Hydro Science LLC* was tasked with developing a *Restoration Cost Tool (RCT)* database for Southeast Alaska by compiling information on wetland restoration projects completed between 2008 and 2012. The RCT will provide:

1. Necessary information for SAWC to develop a method for determining mitigation costs, draft fee schedule and mitigation instrument credit values based on the actual costs to provide the required mitigation.

2. Support to SAWC for transparency and efficacy in explaining the determination of cost for each mitigation project to the public, resource agencies, Section 404 permit applicants and the regulated public in Southeast Alaska.

3. A method to inform regulatory agencies, SAWC, and the regulated public of the true cost of aquatic resource mitigation. If used up-front in project planning and permitting this database will support informed resource mitigation.

The USACE Final Rule for *Compensatory Mitigation for Losses of Aquatic Resources* mandates that cost of mitigation credits incorporates a “full-cost accounting”- all of the costs association with the restoration, establishment, enhancement, and/or preservation of aquatic resources-approach (Final Rule 2008).

The RCT database incorporates these elements in the restoration cost breakdown columns. Most of the initial data submitted for recent restoration projects in Southeast Alaska only included a total cost. More detailed cost information was available for three large restoration projects, specifically the Klawock River estuary restoration, and the Sitkoh River and Twelvemile Creek watershed scale restoration projects. It is interesting to note that costs for planning, permitting/NEPA and design activities for these projects ranged between 18% and 25% of total project cost. Restoration practitioners should be encouraged to track expenditures for current and future restoration projects using the RCT cost categories.

Another key objective of this effort was to compile a representative sampling of recent restoration projects across six of the 8-digit Hydrologic Units that encompass the majority of

Southeast Alaska watershed. This objective was only partly met. The current version of the RCT only includes an adequate sample for selected activities in the *Sitka, Prince of Wales Island, Juneau-Lynn Canal and Petersburg-Wrangell* (PSG-WRG) Hydrologic Units. It is not advisable to use the current RCT to analyze geographic variability associated with project costs.

In addition, it was hoped that a broad array of restoration activities within several wetland types would be represented. A good sample of projects associated with riparian vegetation improvement, and stream habitat and stream channel restoration projects were compiled. However, only a few road mitigation and culvert fish barrier removal projects are tallied, and only one intertidal wetland (estuary) restoration project was submitted. Given the limitations of the current data set, the current version of the RCT contains insufficient detail for the goal of defining a fee schedule and credit values for several types of restoration activities.

Monitoring cost information was obtained for only a handful of restoration activities. Monitoring costs generally represent less than 5% of the total cost for most restoration work and, in most instances, focused on initial post project implementation monitoring. The Twelvemile Creek project has a relatively large annual monitoring budget ($155,000). The ongoing restoration effectiveness monitoring pilot project for Twelve mile Creek is a cooperative effort with the PNF Research Station to develop more efficient and meaningful monitoring techniques for aquatic restoration projects.

Riparian Vegetation Improvements. A number of riparian vegetation improvement projects are represented in the RCT data. These projects are USFS sponsored projects, many of which involved NGO partners. Riparian restoration efforts incorporated young growth thinning, silvicultural prescriptions designed to mitigate the long term effects of streamside timber harvest — from the 1960s and 1970s — with the objective of more quickly restoring young growth riparian timber stands to a condition that mimics old growth forest riparian functions. The average cost per acre for the riparian rehabilitation data set is $578 with a cost range between $412 and $866 per acre. Average thinning contract bids for the region average about $350 per acre. The additional costs — approximately $225 per acre — are associated with project planning, contract administration and monitoring. Several of the smaller riparian thinning projects were implemented by Forest Service employees rather than contract tree thinners. Forest Service "force account" thinning was often employed for more complex thinning prescriptions associated with non-contiguous, heterogeneous riparian stands. Contract thinning costs for complex thinning prescriptions can be much higher than average cost per acre as illustrated by the Traitors Creek project at $866 per acre. The contract thinning option was more commonly utilized for larger and more homogenous conifer stands, using standard tree spacing prescription.

Riparian restoration associated with planting native vegetation is significantly more costly than silvicultural thinning treatments as illustrated by four planting projects in Juneau. Native tree and shrub planting cost averaged nearly $68,000 per acre (ranging from $3,857 to $95,000 per acre treated).

Stream Habitat Improvements. A representative sample of stream restoration projects is incorporated into the current RCT framework. These projects include an array of small stream restoration projects and two projects conducted in large, main stem channels. Outcomes for

stream restoration activities are typically measured by the length of the treated stream segment and number of habitat structures constructed. For purposes of the RCT we utilize a metric of "net aquatic area improved" as a means to normalize treatment cost data between large and small streams. Aquatic habitat area is calculated by multiplying the length of the treated stream segment in feet by approximate channel width in feet. Average cost of all stream restoration activities is \$1.26 per ft^2 with a low of \$0.38 per ft^2 for Sitkoh River and a high value of \$2.61 per ft^2 for a habitat restoration on two small tributaries to Twelvemile Creek (Note: The Jordan Creek sediment removal project was considered to be an outlier due to the very short stream segment treated — 450 linear ft. — resulting in a cost per square foot of \$18.78).

The cost of collecting and staging restoration material at treatment sites are key factors influencing large-scale stream restoration costs. The cost of the Sitkoh River habitat improvement work was artificially low because surplus logs were available from a commercial thinning project, thus greatly reducing the cost of wood collection and transport for this project. Conversely, the more costly (\$2.26 per ft^2) Twelvemile Creek restoration project required helicopter transport of logs and whole trees to construct engineered log jam structures. It is interesting to note that unit costs also varied significantly for small stream, hand crew projects. Cost variability may be due to the number or density of constructed habitat structures and on-site availability of materials (rocks and logs) needed for construction.

Road and Stream Crossing Improvements. Three road storage and decommissioning projects from the Staney Creek, Twelvemile Creek and Margaret Creek watershed restoration efforts are included in the RCT data. Road rehabilitation activities typically cover a range of treatment measures including road fill stabilization, surface drainage controls such as water bars and removal of stream crossing structures including culverts that are barriers to fish passage. It is extremely difficult to define generic measures to characterize project benefits associated with sediment mitigation and runoff attenuation. However, aquatic habitat improvements attributed to fish barrier culvert removal is summarized in the RCT data set.

The Twelvemile road decommission project that used blasting methods to remove stream crossing structures (log and CMP culverts) on abandoned road segments, is very cost effective at \$0.19 per ft^2 of aquatic habitat restored. The Staney Creek road storage project involved use of heavy equipment to construct drainage and erosion control structures, as well as removal of problem culverts, represents a more typical forest road mitigation approach. Aquatic habitat restoration outcomes associated with the Staney road storage project cost approximately \$1.09 per ft^2.

Cost of replacing fish barrier culverts with fish friendly stream crossing structures averaged \$2.63 per ft^2 (ranging from \$0.65 to \$5.53). The cost of culvert replacement on average is twice as costly as in-stream habitat structures, based on unit area of aquatic habitat improved.

Intertidal/Coastal Restoration. The Klawock estuary project conducted by The Nature Conservancy and other local stakeholders is the only project submitted that focused on coastal wetland restoration concerns. Objectives of this project were to improve wetland functions for

intertidal habitat and to improve salmon migration patterns in this critically important estuary. Habitat improvement measures were not included in this version of the RCT; however, future monitoring results will hopefully provide insights into measures to characterize benefits associated with these types of projects.

Watershed Scale Restoration Case Studies. The USACE Final Rule for the ILF program emphasizes a watershed approach in developing and executing mitigation plans. The RCT framework for Southeast Alaska incorporates information from two recent US Forest Service watershed scale restorations — Sitkoh River and Twelvemile Creek — highlighted below.

Both Sitkoh River and Twelvemile Creek have been designated as "Priority Watersheds" for restoration by the Tongass Forest Supervisor. "Priority Watershed" designation is an outcome of a national watershed condition assessment program initiated by the Forest Service in 2007. Several factors contributed to watershed health concerns in Sitkoh River and Twelvemile Creek. Both watersheds had extensive valley bottom riparian harvest from 1960s-70s era logging. Lack of streamside buffer areas and logjam clearing activity directly impacted aquatic habitat in these watersheds. The legacy of early logging practices also severely limits the potential for large wood recruitment, which is critical in maintaining essential pool and cover habitat for salmon and other aquatic biota. In addition to reduced riparian function, road drainage and culvert fish passage issues associated with legacy logging roads have contributed to deteriorating watershed health. The high density of roads in the Twelvemile Creek watershed indicated potential concerns with surface runoff and sediment attenuation.

Watershed Restoration Plans were developed to provide a comprehensive framework for mitigation and restoration activities in these two watersheds. The plans identified "essential restoration projects" that are needed to get Sitkoh River and Twelvemile Creek on a trajectory toward a fully functional watershed condition. Within the last five years, most essential restoration projects have been completed in these watersheds and are summarized in the RCT spreadsheet for these two projects. Both projects have a similar scope and scale; however, the Twelvemile restoration effort was more costly. Total cost of the Sitkoh project $787,000 while Twelvemile Creek's total cost is close to $1,420,000. Sitkoh is in an isolated location without a maintained road network, which tends to drive up mobilization costs for a large-scale restoration project. Twelvemile Creek is located on the extensive Prince of Wales road network, which is connected by ferry service to the hub city of Ketchikan. However, the main factor driving the relatively high cost of Twelvemile restoration stemmed from the cost of tree collection and transport of logs via helicopter to staging areas adjacent to the main stem stream channel. In contrast, the trees used to construct engineered logjams for the Sitkoh project were obtained from a commercial thinning project along with mature conifers obtained near the treatment sites. Logs for the Sitkoh project were transported to treatment sites using ground-based equipment only.

The cost of planning, permitting/NEPA, and design components constitutes around 25% of the total cost for both projects. These are complex undertakings involving numerous stakeholders and collaborators. The Sitkoh project garnered substantial grant funding and in-kind contributions from several partners including: Alaska Sustainable Salmon Fund, Sitka Conservation Society and Trout Unlimited. Twelvemile Creek had an even higher level of

partner involvement and funding from The Nature Conservancy, National Forest Foundation, and the National Fish and Wildlife Foundation.

In both watersheds, over 60% of streamside (or riparian) conifer stands were subjected to clearcut harvest in the flood plain bottomlands. Riparian young growth forest thinning treatments (225 acres in Sitkoh and 76 acres in Twelvemile) represent a long-term investment in improved riparian/riverine function with a primary goal of restoring large wood recruitment potential from riparian areas associated with key salmon habitat. Stream habitat improvement and channel reconfiguration treatments were a central focus of both watershed restoration plans. Primary restoration objectives included channel and flood plain stabilization, and construction of engineered logjam habitat structures along approximately 2 miles of main-stem flood plain channels. An equivalent amount of salmon habitat improvements was attributed to restoration outcomes each of these two watersheds. The Sitkoh watershed had fewer road related concerns. Most unneeded road segments were restored prior to development of a Watershed Restoration Plan. The Twelvemile Creek restoration plan, however, identified 15 miles of upland and flood plain road segments needing restoration due to surface drainage, erosion/sedimentation and fish passage concerns.

Conclusions and Recommendations. This version of the Restoration Cost Tool (RCT) provides preliminary cost data needed to develop a mitigation fee schedule for Southeast Alaska aquatic restoration projects (Table 2). Although the RCT incorporates only a limited set of data for recent restoration projects, it does provide a realistic and transparent picture of cost breakdowns associated with key project components. With additional data input for cost and project accomplishments, the RCT framework is expected to meet all objectives defined for this facet of the Southeast Alaska Mitigation Fund Prospectus.

Follow-up work should include:

1. Restoration partners should commit to tracking future projects expenditures using the *Restoration Cost Breakdown* categories in the RCT.
2. Restoration partners should also put more emphasis on compiling information on restoration project results and outcomes including the basic *Treatment Measures* in the RCT. They should also consider developing a more in-depth catalog of restoration results similar to the reporting framework for Sustainable Salmon Fund projects.
3. Additional large stream habitat restoration information should be incorporated into the RCT, including Harris River and Saginaw Creek project data.
4. Additional data from numerous culvert replacement, road storage and decommission projects completed on federal, state and private forest lands over the last five years should be collected
5. The RCT data is heavily skewed to Riparian/Riverine areas. The database should be expanded to include restoration projects associated with Freshwater Forest, Freshwater Non-Forest, and Coastal wetland types.

Table 2. Restoration Cost Tool

				Restoration Cost Breakdown							Restoration Treatment Measure				Net Aquatic Area Improved Aquatic Habitat (ft2)
HUC	Project	Activity	Wetland Type	Land Aq.	Permitting /NEPA	Planning/ Design	Materials	Construct/ Inspection	Monitoring	Total Cost	# structures	Length (ft)	Length (mi)	Area (ac)	
Sitka	Stikoh R.	Riparian Veg. improvement	Riparian/Riverine		$8,400	$13,900		$69,000	$3,840	*$95,140*				150	
Sitka	Stikoh R.	Riparian Veg. improvement	Riparian/Riverine		$3,500	$5,800		$26,250	$1,600	*$37,150*				75	
Sitka	Stikoh R. mainstem	Stream Habitat improvement	Riparian/Riverine		$21,000	$34,800		$173,000	$9,600	*$238,400*	10		1.6		633,000
Sitka	Stikoh R.	Stream channel reconfiguratio	Riparian/Riverine		$33,600	$55,680		$271,000	$15,360	*$375,640*	6		0.38		
Sitka	Stikoh R.	Flood plain restoration	Riparian/Riverine		$3,500	$5,800		$30,000	$1,600	*$40,900*				10	
	Project Total									**$787,230**					
Sitka	Starrigaven CK.	Riparian Veg. improvement	Riparian/Riverine							**$10,662**				15	
Sitka	Fish Bay Ck Thinning (FY10)	Riparian Veg. improvement	Riparian/Riverine							**$58,200**				101	
Sitka	Duffield Ck Thinning (FY10)	Riparian Veg. improvement	Riparian/Riverine							**$116,500**				233	
Sitka	Nakwasina Ck tribs (FY11)	Stream Habitat improvement	Riparian/Riverine							**$37,646**			0.5		26,400
POW	Tincum Ck culvert replacement,	Culvert Replacement to improv	Riparian/Riverine		$ 4,000	$ 24,000	$ 11,000	$ 40,000		**$79,000**	1		0.35		18,480
POW	Klawock R.	Estuary restoration	Intertidal/Coastal		$130,000	$92,000	$157,000	$835,000	$10,000	**$1,224,000**					
POW	Staney CK. Tribs (FY11)	Stream Habitat improvement	Riparian/Riverine							**$57,700**			0.5		26,400
POW	Staney CK. Thinning (FY09)	Riparian Veg. improvement	Riparian/Riverine							**$20,600**				53	
POW	Staney Ck legacy roads (FY10)	Culvert fish passage improv.	Riparian/Riverine							**$49,000**			10.4		45,000
POW	6000 Road culvert replacement	Culvert Replacement to improv	Riparian/Riverine		$ 4,000	$ 26,000	$ 18,000	$ 55,000		**$103,000**	2		0.5		26,400
POW	Harris River Subdivision Rd	Culvert Replacement to improv	Riparian/Riverine		$ 6,000	$ 35,000	$ 60,000	$ 45,000		**$146,000**	2		0.5		26,400
POW	W. Thorne R. riparian thinning	Riparian Veg. improvement	Riparian/Riverine							**$18,770**				28	
POW	Twelvemile Ck tribs	Stream Habitat improvement	Riparian/Riverine		$29,000	$25,000		$10,000	$5,000	*$69,000*			0.5		26,400
POW	Twelvemile Ck mainstem I & II	Stream Habitat improvement	Riparian/Riverine		$150,000	$150,000	$139,000	$605,000	$150,000	*$1,194,000*			1.5		528,000
POW	Twelvemile Ck flood plain	Flood plain restoration	Riparian/Riverine					$50,000		*$50,000*			0.5	24	
POW	Twelvemile Ck riparian	Riparian Veg. improvement	Riparian/Riverine					$51,500		*$51,500*				76	
POW	Twelvemile Ck road stored.	Stormwater/sediment atten.	Freshwater Forest					$46,500		*$46,500*	38		7		
POW	Twelvemile Ck road decom.	Stormwater/sediment atten.	Freshwater Forest					$8,500		*$8,500*	16		5.2		45,000
	Project Total									**$1,419,500**					
PSB-WRG	Kadake Ck tribs (FY10)	Stream Habitat improvement	Riparian/Riverine							**$27,600**	19		0.4		21,120
PSB-WRG	Burn Ck (FY12)	Stream Habitat improvement	Riparian/Riverine							**$11,324**			0.3		15,840
PSB-WRG	N. Kuiu thinning (FY12)	Riparian Veg. improvement	Riparian/Riverine							**$22,240**				54	
PSB-WRG	N. Kuiu thinning (FY11)	Riparian Veg. improvement	Riparian/Riverine							**$13,900**				22	
PSB-WRG	Browns Ck (FY11)	Stream Habitat improvement	Riparian/Riverine							**$25,000**			1		52,800
PSB-WRG	Zarembo Is thinning (FY11)	Riparian Veg. improvement	Riparian/Riverine							**$24,000**				47	
Ketchikan	Margaret Ck Legacy Roads	Culvert fish passage improv.	Riparian/Riverine							**$300,000**	69		25		32,000
Ketchikan	Traitors Ck Thinning	Riparian Veg. improvement	Riparian/Riverine							**$26,000**				30	
Juneau	Duck Creek- Nancy St Pond	Wetland enhancement	Freshwater non forest	$ 137,000	$ 6,000	$ 30,000	$ 43,000	$ 220,000	$ 2,000	**$438,000**	1			7	
Juneau	Duck Creek- Valley Driveway	Culvert Replacement to improv	Freshwater non forest		$ 4,000	$ 15,000	$ 9,000	$ 24,000		**$52,000**	1		1.5		79,200
Juneau	Jordan Creek sediment removal	Channel re-configuration	Riparian/Riverine		$ 6,000	$ 55,000	$ 8,000	$ 100,000		**$169,000**		450			9,000
Juneau	Duck Creek	Riparian Veg improv (planting)	Riparian/Riverine			$ 200		$ 2,500		**$2,700**				0.7	
Juneau	Mendenhall River	Riparian Veg improv (planting)	Riparian/Riverine		$ 100	$ 200	$ 3,000	$ 8,000		**$11,300**				0.14	
Juneau	Jordan Creek	Riparian Veg improv (planting)	Riparian/Riverine			$ 250	$ 1,500	$ 3,000		**$4,750**				0.05	
Juneau	Mendenhall River	Invasive Plant Control	Riparian/Riverine					$ 325		**$325**				4.3	
Juneau	Jordan Creek	Riparian Veg improv (planting)	Riparian/Riverine			$ 200	$ 6,000	$ 3,000		**$9,200**				0.1	
Juneau	Duck Creek	Invasive Plant Control	Freshwater non-forest		$ 50	$ 300	$ 100	$ 500		**$950**				0.2	
Chilkat-Skag	Muskrat Ck	Culvert Replacement to improv	Riparian/Riverine		$ 4,000	$ 15,000	$ 9,000	$ 22,000	$ 3,000	**$53,000**	1		0.5		26,400
Chilkat-Skag	Pullen Creek	Culvert Replacement to improv	Riparian/Riverine		$ 250	$ 3,500	$ 13,000	$ 27,000		**$43,750**	1				7,920
Chilkat-Skag	Pullen Creek	Channel re-configuration	Riparian/Riverine		$ 250	$ 2,500	$ 500	$ 22,500		**$25,750**	1				7,920
Chilkat-Skag	Cannery Creek	Culvert Replacement to improv	Riparian/Riverine		$ 300	$ 16,000	$ 43,000	$ 34,000		**$93,300**	1				41,000
Yakutat	Ankau Ck road	Culvert Replacement to improv	Freshwater non forest		$ 4,000	$ 31,000	$ 20,000	$ 44,000		**$99,000**	2		0.5		26,400
Yakutat	Forelands Road Decom.	Stormwater/sediment atten.	Freshwater forest		$ -	$ 15,000		$ 50,000		**$65,000**			2.6		
Gustavus	Rink Creek Tributary	Culvert Replacement to improv	Riparian/Riverine		$ 400	$ 15,000	$ 16,000	$ 12,000		**$43,400**	1				34,000

5.0 SAMF Stream and Wetland Credit Debit Method

For a complete copy of the SAMF's Stream and Wetland Credit Debit Method please visit SAWC's website and or contact SAWC program manager.

Wetland and Stream Credit-Debit Methods Southeast Alaska Mitigation Fund

Version 2.0
October 2016

The Southeast Alaska Mitigation Fund is
an in-lieu fee aquatic resources mitigation program
sponsored by the;

Southeast Alaska Watershed Coalition
PO Box 1992
Wrangell, AK 99929
alaskawatershedcoalition.org

Table of Contents

Attachments

Attachment A: Tier II Reference Metrics by Channel Process Group and Channel Type (Tucker and Caouett 2008)

Tables

Figure

Acronyms and Abbreviations

ADFG	Alaska Department of Fish and Game
AWC	Anadromous Waters Catalog
CBJ	City and Borough of Juneau
ILF	In-lieu fee
IRT	Inter-agency Review Team
RIBITS	Regulatory In lieu fee and Bank Information Tracking System
SAMF	Southeast Alaska Mitigation Fund
SAWC	Southeast Alaska Watershed Coalition
SCDM	Stream Credit Debit Method
SEAL Trust	Southeast Alaska Land Trust
TWC	Takshanuk Watershed Council
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFS	U.S.D.A Forest Service
WESPAK-SE	Wetland Ecosystem Service Protocol – Southeast Alaska
WCDM	Wetland Credit Debit Method

1. Introduction

This document describes the wetland credit debit method (WCDM) and the stream credit debit method (SCDM) for the Southeast Alaska Mitigation Fund (SAMF) In Lieu Fee (ILF) mitigation program. SAMF offers third-party compensatory mitigation options for permitted impacts regulated under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. The SAMF ILF Program will sell both non-tidal wetland credits and stream credits.
A credit (also referred to as a unit of functional gain) represents the ecological lift of aquatic function/s at either a wetland or stream site following a mitigation action (creation, restoration, and/or enhancement). Credit calculations are based on the difference between ecological function/s at the site following the mitigation action (projected conditions) and the existing site conditions:

$$\Delta = \textit{projected conditions (after mitigation)} - \textit{existing conditions}$$

A debit (also referred to as a unit of functional loss) represents the ecological loss of aquatic function/s following a permitted impact to an aquatic resource. Debit calculations are based on the difference between the ecological function/s of the existing site and the condition following the impact (projected conditions):

$$\Delta = \textit{existing conditions} - \textit{projected conditions (after impact)}$$

The SAMF method then applies the factors or time lag, risk, areal/linear extent.
There is neither a wetland nor a stream credit generation method - for restoration, enhancement, or creation- in Southeast Alaska. Additionally, the U.S. Army Corps of Engineers (USACE) Alaska District has only very recently established agency guidance for calculating aquatic resource credits for mitigation sites and debits at the permitted impact sites. SAMF's methods described in this document utilizes this new guidance (USACE 2016). The Southeast Alaska Watershed Coalition (SAWC) has collaborated with organizational partners, including SAWC's Inter-Agency Review Team (IRT), Southeast Alaska Land Trust (SEAL Trust), The Nature Conservancy Virginia Chapter - Virginia ILF program, Herrera LLC, Sitka Hydro Science LLC, Paul Adamus, and CH2M Hill to develop this process for calculating wetland and stream credit methods at SAMF mitigation sites.

These wetland and stream credit debit calculation methods utilize the best available science - peer-reviewed, regionally specific assessment tools and datasets in Southeast Alaska. These methods meet the requirements of the 2008 Federal Rule on compensatory mitigation. They incorporate USACE, IRT comments and recommendations and glean the most appropriate resources and guidance from other USACE Districts across the country.

The SAMF credit debit calculation methods adopt the adaptive management approach. In other words, refinements to the SAMF methods are anticipated and will be amended through a modification of the instrument once SAWC has evaluated the application of these methods upon program approval and the implementation of compensatory mitigation. The WCDM is based on the *Wetland Ecological Services Protocol for Alaska-Southeast* (WESPAK-SE) version 2 (Adamus 2015), to represent the gain or loss of function that would result from a permitted

impact and/or wetland mitigation activity. Each gain or loss of function equates to a proportional number of credits and/or debits generated at a site. The WCDM utilizes components of SEAL Trust (CH2M Hill 2016) proposed credit debit method based upon WESPAK-SE, as well as the Alaska District Credit Debit Methodology Version 1.0 (USACE 2016). The SCDM is primarily drawn from *A Function-Based Framework for Stream Assessment & Restoration Projects* (Harman et al. 2012) and amended to utilize aspects of the USDA Forest Service Tier II Stream Survey Protocol (USDA 2001).

Credits are tracked using the Regulatory In lieu fee and Bank Information Tracking System (RIBITS) and SAWC's administrative procedures utilizing the Credit Ledger Template (Exhibit 2.0). Credits are specified by aquatic resource type- wetland or stream- and represent functional area and/or linear footage.

Each credit type has an associated fee. SAMF credit fees are discussed in the Instrument's "Draft Fee Schedule"- Section 8.0 Methodology for Determining Project Specific Credits and Fees. The remainder of this section will describe in detail how wetland and stream credits will be generated under the SAMF program using the WCDM and SCDM.

2. Overview - Wetland Credit Debit Method

The purpose of the wetland credit debit calculation method (WCDM) is to calculate wetland credits at SAMF mitigation sites, and wetland debit at USACE permitted sites.

The three primary goals of the SAMF wetland credit-debit method are:

1) Provide SAMF with the ability to generate mitigation credits for restoration, enhancement, and/or creation of wetlands.
2) Establish a regionally relevant mitigation credit generation method that is function based and utilizes Dr. Paul Adamus' Wetland Ecosystem Service Protocol-Southeast Alaska (Adamus 2015).
3) Maximize transparency and efficiency when comparing the debits at the permitted impact site to the credits at the SAMF mitigation site.

2.1 Assessment tool: WESPAK-SE

The SAMF uses the Wetland Ecosystem Service Protocol – Southeast Alaska (WESPAK-SE) version 2 as the tool for the WCDM. WESPAK-SE is a standardized method for conducting rapid assessments of wetland functions and values. WESPAK-SE has been under development for several years by Dr. Paul Adamus, the Southeast Alaska Land Trust (SEAL Trust), and the City and Borough of Juneau. It is the same tool that SEAL Trust will use for their preservation-based in-lieu fee program in Southeast Alaska. WESPAK-SE is a regionally specific (for southeast Alaska) adaptation of the Oregon Rapid Assessment Protocol, which has been used by USACE Portland District since 2009 for all wetlands permitting and mitigation. WESPAK-SE has been tested for repeatability in southeast Alaska and uses data from statistically sampled calibration sites (119 sites for non-tidal wetlands) to calculate scores. A description of how calibration sites are used to calculate scores is provided in the next section.

WESPAK-SE consists of a user manual, Microsoft Excel spreadsheet forms for conducting field and office-based assessments, and Microsoft Excel spreadsheets that calculate individual and group scores. The WESPAK-SE assessment comprises approximately one-half day collecting and assessing GIS and existing information, and an additional approximate one-half day assessing conditions in the field. The WESPAK-SE assessor answers various subjective questions that are used by models in WESPAK-SE to calculate 18 ecosystem function scores and 19 ecosystem value scores (Table 2-1). The WESPAK-SE manual provides a description of functions and values. The SAMF method uses all 18-function scores and 2 of the value scores. All 18 function scores have a corresponding value score, except "carbon sequestration (CS)". The 2 value scores used by the SAMF method are the only value scores that do not have a corresponding function score. Therefore, the SAMF method prioritizes functional lift over value lift, as defined by WESPAK-SE.

The SAMF method utilizes 20 individual function and value scores calculated by WESPAK-SE. Each function and value score is further organized into 7 group functions and values to reflect ecological and societal relationships (Table 2-1). These group functions and values are used as the basis for the subsequent calculation of credits and debits.

Group functions and values	Individual functions and values and (codes)	Function Score	Value Score
1. Hydrologic	1. Surface water storage (WS)	Yes*	Yes
2. Water quality	2. Carbon sequestration (CS)	Yes*	No
	3. Nitrate removal and retention (NR)	Yes*	Yes
	4. Phosphorous retention (PR)	Yes*	Yes
	- Sediment and toxicant retention and stabilization (SR)	Yes*	Yes
3. Aquatic support	- Aquatic Invertebrate Habitat (INV)	Yes*	Yes
	- Organic Nutrient Export (OE)	Yes*	Yes
	- Stream Flow Support (SFS)	Yes*	Yes
	- Streamwater Cooling (WC)	Yes*	Yes
	- Streamwater Warming (WW)	Yes*	Yes
4. Fish	- Anadromous Fish Habitat (FA)	Yes*	Yes
	- Resident Fish Habitat (FR)	Yes*	Yes
5. Aquatic habitat	- Amphibian Habitat (AM)	Yes*	Yes
	- Waterbird Feeding Habitat (WBF)	Yes*	Yes
	- Waterbird Nesting Habitat (WBN)	Yes*	Yes
6. Terrestrial habitat	- Native Plant Habitat (PH)	Yes*	Yes
	- Pollinator Habitat (POL)	Yes*	Yes
	- Songbird, Raptor & Mammal Habitat (SBM)	Yes*	Yes
7. Social	- Public Use (PU)	No	Yes*
	- Subsistence (Subsis)	No	Yes*

Table 2-1. Individual functions and values calculated by WESPAK-SE for non-tidal wetlands, and their groupings. Items marked with an asterisk (*) are used by the SAMF WCDM described in this document.

2.2 Credits: Non-tidal Wetlands

Summary:
The final output from the SAMF WCDM is the number of wetland credits generated at a compensatory mitigation site. The process involves assessing individual functions and values (using the tool described above) for both existing and projected conditions at a mitigation site, organizing these functions and values into thematic groups, "rolling-up" these group scores, calculating the differences (between existing and projected group scores), and then applying the factors of time lag, risk, and areal extent.

Step 1 Conduct a WESPAK-SE assessment of existing conditions on the mitigation site
Step 2 Roll-up existing group scores
Step 3 Conduct a WESPAK-SE assessment of projected conditions on the mitigation site
Step 4 Roll-up projected group scores
Step 5 Calculate net functional gain based upon the differences between projected and existing group scores
Step 6 Apply factors of time lag, risk, and areal extent to calculate credits

Detailed Description:

Step 1 Conduct a WESPAK-SE assessment of existing conditions on the mitigation site

Perform a WESKPAK-SE assessment on the mitigation site. This assessment will produce raw scores for all of the individual functions and values shown in Table 2-1. WESPAK-SE will also calculate normalized scores. The normalization calculation uses data from the 119 non-tidal wetland calibration sites. The following excerpt from the WESPAK-SE manual (Adamus 2015) explains the justification for normalizing:

> *Normalizing helps address the question, "How does this wetland compare with a large set of others in the study region?" In that sense, normalized scores are like percentiles. Normalization is necessary because, although each WESPAK-SE scoring model has a theoretical minimum score of 0 and a maximum of 10, the actual range across all the wetlands for any given function was often found to be narrower. Thus, to facilitate more neutral comparisons among functions, all raw scores were converted mathematically to place them on the 0 to 10 scale. This means that, among the 119 non-tidal wetlands that were assessed, the wetland with the highest raw score for a given function was given a normalized score of 10, and the wetland with the lowest raw score for a given function was given a normalized score 0, and wetlands with raw scores in between were given normalized scores proportional to the highest and lowest scoring wetlands.*

The formula for the normalization process is:

$$\text{normalized score} = \frac{\text{raw score for this wetland} - \text{minimum score for all 119 reference wetlands}}{\text{maximum score for all 119 reference wetlands} - \text{minimum score for all 119 reference wetlands}}$$

If a raw score turns out to be higher than the maximum score for the calibration sites, that score is set to 10. Similarly, if a raw score turns out to be lower than the minimum score for the calibration sites, that score is set to 0. Table 2-2 shows a scoring sheet of existing individual functions and values calculated by WESPAK-SE for the Porcupine Pond mitigation site in Haines, Alaska. This wetland restoration site, described in Appendix A, has been identified by the Takshanuk Watershed Council (TWC), as a potential mitigation project. TWC is a community-based non-profit watershed council operating in Haines AK.

Individual functions and values and (codes)	Raw function score	Raw value score	Normalized function score	Normalized value score
1. Surface water storage (WS)	4.11		3.32	
2. Carbon sequestration (CS)	2.65		0.00	
3. Nitrate removal and retention (NR)	3.99		0.00	
4. Phosphorous retention (PR)	2.75		0.00	
1) Sediment and toxicant retention and stabilization (SR)	4.25		2.68	
2) Aquatic Invertebrate Habitat (INV)	3.06		0.52	
3) Organic Nutrient Export (OE)	3.41		4.93	
4) Stream Flow Support (SFS)	1.64		1.97	
5) Streamwater Cooling (WC)	3.24		3.24	
6) Streamwater Warming (WW)	6.50		6.50	
7) Anadromous Fish Habitat (FA)	2.52		3.29	
8) Resident Fish Habitat (FR)	5.18		7.17	
9) Amphibian Habitat (AM)	4.34		1.95	
10) Waterbird Feeding Habitat (WBF)	4.12		5.68	
11) Waterbird Nesting Habitat (WBN)	4.93		7.12	
12) Native Plant Habitat (PH)	4.22		1.58	
13) Pollinator Habitat (POL)	1.45		1.35	
14) Songbird, Raptor & Mammal Habitat (SBM)	6.95		8.58	
15) Public Use (PU)		1.58		1.44
16) Subsistence (Subsis)		5.00		5.00

Table 2-2. Existing individual functions and values calculated by WESPAK-SE for the Porcupine Pond site (see Appendix A).

Step 2 Roll-up existing group scores

The 20 individual scores are then organized into the 6 group function and one group value scores as shown in Tables 2-1 and 2-3. The group scores are not a simple average. Group scores are organized using the formula below to provide extra weight to the highest individual score in each group.

$$\text{Group function score} = \frac{\text{average of all individual function scores in that group} + \text{maximum individual function score in that group}}{2}$$

$$\text{Group value score} = \frac{\text{average of all individual value scores in that group} + \text{maximum individual value score in that group}}{2}$$

Group scores are then normalized using group scores for the 119 non-tidal calibration sites following the same procedure described in Step 1. This is done to be consistent with converting the calculated group scores to the 0 to 10 scoring scale. The normalized group scores are shown in Table 2-3. The WESPAK-SE and the SAMF WCDM calculators perform all calculations. The WCDM calculator is shown in Appendix A for the Porcupine Pond mitigation site.

Step 3 Conduct a WESPAK-SE assessment of projected conditions on the mitigation site

Repeat the WESPAK-SE assessment on the mitigation site. This time, use best professional judgment to project wetland conditions after completion of the mitigation activities. Mitigation activities include the restoration or enhancement of existing wetlands, or the creation of new wetlands.

This assessment of projected conditions should be done only after completion of the design of the mitigation activities, and consideration should be made for that design. Ideally, the mitigation design will utilize the results from the WESPAK_SE assessment of existing conditions to identify functions that are most likely to be lifted from mitigation activities.

Step 4 Roll-up projected group scores

Repeat Step 2 for the projected scores calculated in Step 3. Table 2-3 shows the normalized group scores for the existing and projected mitigation site conditions.

Step 5 Calculate net functional gain based upon the differences between projected and existing group scores

The functional gain per acre for each of the 7 groups shown in Table 2-3 is the difference between the projected and existing group scores. The net functional gain per acre for the mitigation site is the sum of the 7 group functional gains.

Groups	Existing group score	Projected group score	Functional gain per acre
Hydrologic (WS)	2.43	2.40	**0.00**
Water Quality (CS, NR, PR, SR)	0.00	0.00	**0.00**
Aquatic Support (INV, OE, SFS, WC, WW)	4.31	4.26	**0.00**
Fish (FA, FR)	8.21	10.00	**1.79**
Aquatic Habitat (AM, WBF, WBN)	6.37	7.97	**1.60**
Terrestrial Habitat (PH, POL, SBM)	7.10	9.63	**2.53**
Social (PU, Subsis)	4.15	4.68	**0.53**
		Net functional gain per acre	**6.38**

Table 2-3. WCDM functional gain worksheet. All scores on this sheet are normalized. The existing group scores are from the Porcupine Pond site and the projected scores are based upon a conceptual restoration design for the Porcupine Pond site. The codes in parentheses () indicate the individual functions that contribute to that group score. Functional gain is the difference between the projected and existing group score. The net functional gain per acre is the sum of the group gains.

Step 6 Apply factors of time lag, risk, and areal extent to calculate credits

The factors of time lag and risk, and guidance for assigning scores, are described in the 2016 guidance document from the USACE Alaska District (USACE 2016). From this document:

> *… time lag means the period of time (in years) between credit release and when the assessment area has achieved the outcome that was scored using an appropriate functional or conditional assessment method.*
>
> *… risk should be evaluated to account for the degree of uncertainty that the proposed conditions will be achieved, resulting in a reduction of aquatic resource function of the mitigation assessment area.*

Both time lag and risk are assessed for each mitigation project, and final scores will be verified by the USACE in consultation with the IRT. Assignment of the single risk score should consider the credit release schedule and the ecological performance standards for the site. The time lag and risk scores are shown in Table 2-4.

Year	Time lag factor
<= 1	1.0000
2	1.0170
3	1.0341
4	1.0518
5	1.0696
6-10	1.0876
11-15	1.1805
16-20	1.2805
21-25	1.3873
26-30	1.5015
31-35	1.6233
36-40	1.7532
41-45	1.8917
46-50	2.0485
51-55	2.1962
> 55	2.3292

	None			Moderate			High		
Risk factor	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00

Table 2-4. Time lag and risk factor tables (from USACE 2016)

The net functional gain per acre calculated in Step 5 is based on the normalized 0 to 10 scores used by WESPAK-SE. Because the time lag and risk factors apply for scores between 0 and 1, the net functional gain per acre calculated in Step 5 is divided by 10. The following formulas are then used:

$$\text{Adjusted net functional gain per acre} = \frac{\text{net functional gain per acre} / 10}{\text{time lag} * \text{risk}}$$

Credits = adjusted net functional gain per acre * projected site acres

2.3 Debits: Non-tidal Wetlands

The debit side of the WCDM is identical to the credit side, with the following exceptions: 1) the existing and projected scores are for the permitted impact site, 2) there are no factors of time lag and risk applied to the calculation, and 3) the final debit is based upon the difference between the existing and projected scores. In other words, the final formula is reversed to recognize that the projected score for the permitted site will represent a loss in ecological function.

Summary:

Step 1 Conduct a WESPAK-SE assessment of existing conditions on the permitted site
Step 2 Roll-up existing group scores
Step 3 Conduct a WESPAK-SE assessment of projected conditions on the permitted site
Step 4 Roll-up projected group scores
Step 5 Calculate net functional loss based upon the differences between existing and projected group scores
Step 6 Apply areal extent to calculate debits

Detailed Description:

Step 1 Conduct a WESPAK-SE assessment of existing conditions on the permitted site

Perform a WESKPAK-SE assessment on the site that is permitted for impacts. This assessment will produce raw scores for all of the individual functions and values shown in Table 2-1. WESPAK-SE will also calculate normalized scores as described above in the credit calculation method.

As in the credit method above, if a raw score turns out to be higher than the maximum score for the calibration sites, that score is set to 10. Similarly, if a raw score turns out to be lower than the minimum score for the calibration sites, that score is set to 0.

Step 2 Roll-up existing group scores

The 20 individual scores are then organized into the 6-group function and 1-group value scores as shown in Table 2-1. The group scores are not a simple average. Group scores are organized in a manner to provide extra weight to the highest individual score in each group by using the following formulas:

$$\text{Group function score} = \frac{\text{average of all individual function scores in that group} + \text{maximum individual function score in that group}}{2}$$

$$\text{Group value score} = \frac{\text{average of all individual value scores in that group} + \text{maximum individual value score in that group}}{2}$$

Group scores are then normalized using group scores for the 119 non-tidal calibration sites following the same procedure described in Step 1. This is done to be consistent with converting the calculated group scores to the 0 to 10 scoring scale. Up to this point in the SAMF method, the WESPAK-SE and SAMF calculators perform all calculations.

Step 3 Conduct a WESPAK-SE assessment of projected conditions (after impact/construction has occurred) on the permitted site

Repeat the WESPAK-SE assessment on the permitted site. This time, use best professional judgment to project wetland conditions that will exist after the permitted impact.

Step 4 Roll-up projected group scores

Repeat Step 2 for the projected scores calculated in Step 3. Table 2-5 shows the normalized group scores for the existing and projected mitigation site conditions.

Step 5 Calculate net functional loss based upon the differences between existing and projected group scores

The functional loss per acre for each of the 7 groups shown in Table 2-5 is the difference between the existing and projected group scores. The net functional loss per acre for the permitted site is the sum of the 7 group functional losses.

Groups	Existing group score	Projected group score	Functional loss per acre
Hydrologic (WS)	2.01	0.69	**1.32**
Water Quality (CS, NR, PR, SR)	3.50	2.01	**1.49**
Aquatic Support (INV, OE, SFS, WC, WW)	6.29	3.50	**2.79**
Fish (FA, FR)	4.51	0.00	**4.51**
Aquatic Habitat (AM, WBF, WBN)	3.28	2.50	**0.78**
Terrestrial Habitat (PH, POL, SBM)	4.59	4.59	**0.00**
Social (PU, Subsis)	7.63	7.00	**0.63**
		Net functional loss per acre	**11.52**

Table 2-5. WCDM functional loss worksheet. All scores on this sheet are normalized. All scores are for a hypothetical permitted site and permitted activities. The codes in parentheses () indicate the individual functions that contribute to that group score. Functional loss is the difference between the existing and projected group score. Net functional loss per acre is the sum of the group losses.

Step 6 Apply areal extent to calculate debits

Debits are calculated as follows:
Debits = net functional loss per acre * acres

3. Overview - Stream Credit Debit Method

The purpose of the stream credit debit calculation method (SCDM) is to calculate stream credit generations at SAMF mitigation sites, and debit generations at USACE permitted sites.

The three primary goals of the SAMF SCDM are:

- Provide SAMF with the ability to generate mitigation credits for restoration and/or enhancement of streams.
- Establish a regionally-relevant, function-based, mitigation credit calculation method.
- Maximize transparency and efficiency when comparing the debits at the permitted impact site to the credits at the SAMF mitigation site.

The SAMF SCDM closely follows the concepts and methods of *A Function-Based Framework for Stream Assessment & Restoration Projects* (Harman et al. 2012), hereafter referred to as the Harman method. The use of this framework has been strongly encouraged by the IRT. The foundation of the Harman method is the arrangement of key stream functions in a hierarchical framework, shown in Figure 3-1. Each of these key stream functions is supported by the function/s below it. Harman et al. (2012) provides detailed descriptions of each functional level. This conceptual framework is useful for assessing functional change based on permitted actions or mitigation, as well as for developing site-specific restoration, enhancement and establishment goals. If a restoration project has a goal to lift a specific function- the function below should be addressed. For example, a project that addresses a fish passage problem would provide fish access to additional habitat and provide a biological functional lift. However, if the underlying functions were either compromised or not addressed in project design, then there would be higher risk of not achieving overall project goals.

The Harman method utilizes a suite of field-based tools and reference condition data gleaned from peer-reviewed literature to assess specific stream metrics (e.g. *width to depth ratio*). The critical step in this method is to select assessment tools and reference data that are relevant to the ecology and landscape of, and the types of impact and mitigation activities that will occur in southeast Alaska. This methodology targets low to moderate gradient, forested streams and rivers that are susceptible to development impacts, and typically have the highest value riparian and aquatic resources in the region.

The SAMF SCDM does not assess conditions for all of the Harman function levels shown in Figure 3-1. The SCDM only assesses conditions for the 3 function levels shown in Table 3-1, where regionally-relevant assessment tools already exist or can be reasonably developed. However, the SCDM provides enough flexibility to incorporate additional tools (by modification).

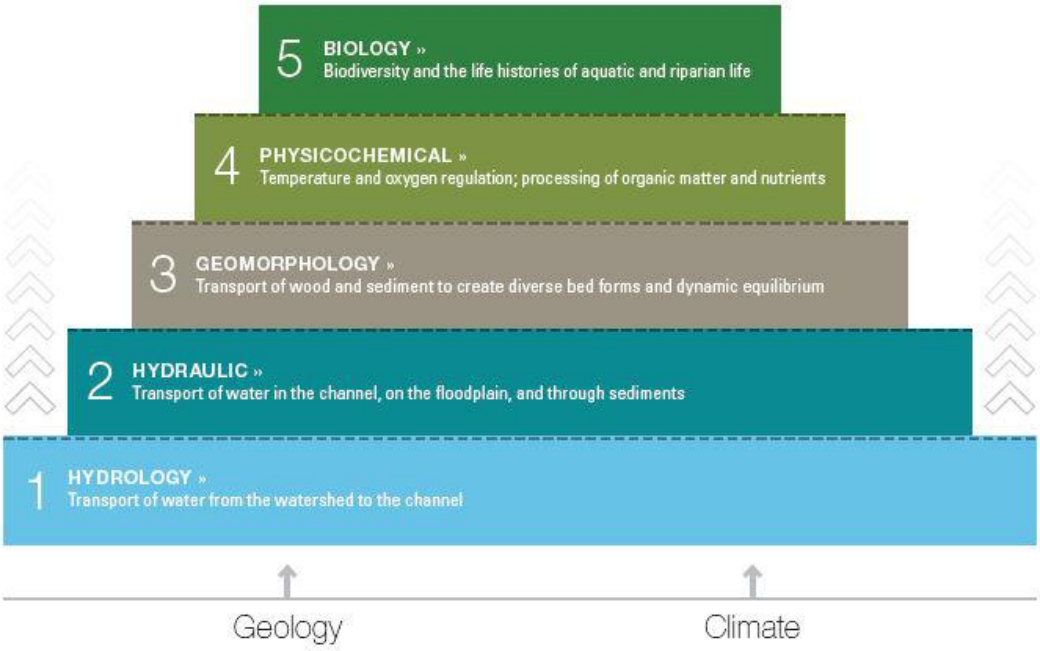


Figure 3-1. Hierarchical framework of stream functions, as described in *A Function-Based Framework for Stream Assessment & Restoration Projects*. Figure from Harman et al 2012.

Table 3-1 lists the metrics and the tools for assessing each function. A score between 0 and 1 is assigned to each metric based on how that metric (the field value measured at the site) compares to the reference data. The 0 to 1 scoring system is based upon Harman (2016) and is consistent with the USACE Alaska District guidance (USACE 2016). The SCDM then averages the individual metric scores into 6 grouped function parameters, calculates a functional gain (credits) or loss (debits) for each group, sums these gains or losses for a net gain or loss, then applies the factors of time lag, risk, and linear extent to calculate final credits or debits. Table 3-1 shows how metrics, grouped function parameters, and function levels are organized.

In the context of the SAMF SCDM, the Harman method provides a framework to calculate a quantitative difference (functional gain for mitigation or functional loss for permitted impact) between an existing stream condition and a projected future stream condition. The projected stream condition is based on the future condition after the permitted impact (functional loss) or mitigation action (functional gain) occurs.

Stream function pyramid level	Grouped function parameter	Metric (code)	Assessment tool and reference data
Hydraulic	Floodplain connectivity	Bank to height ratio (BHR)	Harman et. al 2012 *sensu* Rosgen 1996
		Width to depth ratio (WDR)	USFS Tier II
Geomorphology	Bed form diversity	Pool per km (PPK)	USFS Tier II
		Pool spacing (PS)	USFS Tier II
		Pool depth ratio (PDR)	USFS Tier II
	Channel stability	Streambank veg (BkV)	Riparian PFC/ Wetland HGM
		Streambank condition (BkC)	
	Woody debris	Key wood per meter (KWD)	USFS Tier II
	Off-channel habitat	Spatial extent of off-channel fish habitat (OCH)	
Biology	Fish Habitat	Species presence (FS)	AK Hydro GIS data base
	Riparian forest condition index	Right Bank (RCR)	USFS Riparian Strategy (2014)
		Left Bank (RCL)	

Table3-1. Stream functions, metrics, and assessment tools used in the SAMF SCDM. "USFS Tier II" refers to the *USFS Alaska Region Aquatic Habitat Management Handbook* 2001.

3.1 Assessment tools and scoring:

Table 3-1 lists the assessment tools and reference data used to calculate individual stream metrics. Each functional parameter, associated metric and rating scheme are outlined below. The accompanying SAMF-SCDM Calculation Excel Worksheet is the primary tool used to calculate total functional gain or loss scores for the survey reach.

3.1.1 Hydraulic Function- Floodplain Connectivity

The metrics of *bank-to-height ratio* and *width-to-depth ratio* are standard hydrological assessment parameters (Rosgen 1996). Values for these metrics are categorized as functioning, functioning at risk, or not functioning based on reference conditions defined by Harman et al (2012), and Tucker and Caoutte (2008).

Table 3-2 shows how these parameter values are used to score both *bank-to-height ratio* and *width-to-depth ratio* for the SAMF SCDM. For example, if the value of *bank-to-height ratio* measured at the mitigation site is 1.6, the SAMF SCDM score of 0.0 will be entered in the SCDM calculator.

Depending on specific site conditions, field measurements used to calculate *bank-to height ratio* (BHR) and *width-to-depth ratio* (WDR) can be time consuming, and are subject to observer variation. Roper (2008) conducted a series of independent channel geomorphic surveys of 12 streams in northwest Oregon. He found a high degree of observer variation in measurement of *bankfull depth* a key element of *bank-to-height ratio*. Harman recommends using regional curves (stream geomorphic metrics derived from catchment area) as a point of reference for determining *bankfull depth* elevations; however regional curves for stream geometry are not defined for southeast Alaska. In circumstances where accurate measurement of BHR is difficult to obtain, investigators may default to using *width-to-depth ratio* (WDR) for rating the floodplain connectivity parameter. Additional visual evidence of vertical channel instability may also be apparent and should be considered when rating *floodplain connectivity* (see *channel stability* discussion section 3.1.2).

	Metric	**Not functioning**	**Functioning at risk**	**Functioning**
Field metric	Bank-to-height ratio (BHR)	> 1.5	1.3 to 1.5	1.0 to 1.2
	Width-to-depth ratio (WDR) For FP, AF channel types	<15	15 to 20	>20
	Width-to-depth ratio (WDR) for MM, MC, LC channel types	<10	10 to 15	>15
SAMF SCDM score		0.0	0.3	0.85

Table 3-2. Field metrics and associated SAMF SCDM scores for bank-to-height ratio and width to depth ratio. Adapted from Harman et al. (2012) and Tucker and Caoutte (2008). "Channel type" refers to stream geomorphic classes described for southeast Alaska (Paustian et al, 1992/2010)

3.1.2 Geomorphology- Bedform Diversity, Woody Debris, Channel Stability and Off Channel Habitat.

SCDM *Bedform Diversity and Woody Debris*

The Forest Service Alaska Region, Aquatic Habitat Handbook describes detailed protocols and standard techniques for assessing aquatic stream habitats in coastal Alaska (USFS 2001). These techniques are consistent with core standards for the National Forest System and are based upon published literature. Additionally, a regional database of reference conditions was developed using these protocols for multiple stream *channel types*, for both disturbed and undisturbed channels (Tucker and Caouette 2008). The reference conditions used for the SAMF SCDM are for undisturbed channels.

The Aquatic Habitat Handbook adopts a hierarchical approach for habitat surveys, from a coarse or superficial level of detail to highly detailed. Each level of detail is described as a tier, and each tier has increasing levels of sophistication in measurements and analysis. The SAMF SCDM utilizes the "Tier II" assessment level (and this document will hereafter utilize this more regionally-recognized term).

The reference data for Tier II metrics are organized in percentiles. Tucker and Caouette (2008) suggest a qualitative interpretation for each metric and percentile range, based on the fact that the desirable condition for some metrics will be near the reference condition mean, while for others it may depart from the mean. Percentile values by channel type for all reference metrics are displayed in Attachment A.

Table 3-2 shows interpretations for *bedform diversity* (pool metrics) and *woody debris*, and how the percentile values are converted to a score between 0 and 1 for the SAMF SCDM. For example, if the field value of key woody debris per meter measured at the mitigation site is below the 25th percentile for that specific channel type, the SCDM score of 0.1 will be assigned. At this point, the scores are assigned as a discrete variable. The USFS Tongass National Forest continues to collect reference site information. As the density of data increases, the SAMF SCDM scoring method may be modified at a future date to assign continuous variables between 0 and 1.

Metric		**Percentiles**		
		< 25th	**> 25th and < 75th**	**> 75th**
Pools per kilometer	Interpretation	Fair	Good	Excellent
	SCDM score	0.1	0.5	0.9
Pool spacing	Interpretation	Excellent	Good	Fair
	SCDM score	0.9	0.5	0.1
Pool depth ratio	Interpretation	Fair	Good	Excellent
	SCDM score	0.1	0.5	0.9
Key wood per meter	Interpretation	Fair	Good	Excellent
	SCDM score	0.1	0.5	0.9

Table 3-3. Scores assigned to SCDM metrics base upon USFS Tier II reference data. Qualitative interpretations are from Tucker and Caouette (2008).

Natural channels are constantly adjusting to sediment loads, changes in stream flow and variety of other perturbations. With the exception of bedrock control channel segments, stream bank erosion and bank building processes are at work in a type of dynamic equilibrium. Stream bank instability is manifested by accelerated rates of bank erosion commonly associated with channel widening or channel down cutting.

Causes of stream bank instability in southeast Alaska include: major flood events and sediment pulses from mass wasting events (natural or management induced landslides), and a wide array of human activities -- fishing access, trail construction, docks, boat launches, power boat wakes, stream crossing structures, placer and gravel mining operations, water intakes, dams and diversions—that can result in chronic impacts to aquatic and riparian habitat function and condition.

SCDM Channel Stability

The SCDM *Channel Stability* Parameter incorporates two metrics: 1) *Stream Bank Vegetation Index* (BkV)-- streamside vegetation and the associated organic root mat is the most important factor resisting erosion from high stream flows-- and 2) *Stream Bank Condition Index* (BkC)-- the stream bank condition index provides more visual cues for diagnosing accelerated channel widening or down cutting--.

These metrics are patterned after the Riparian-Wetland Proper Function and Condition Methodology (PFC)[4] developed by the BLM National Riparian Service Team (Prichard et. al., 1998) --adapted by the Forest Service to the Alaska Region, and the HGM Wetland Functional Assessment Guidebook (Powell et. al., 2003). SCDM channel stability ratings rely heavily on descriptive criteria, as the applicability of readily obtainable numerical reference criteria is limited. A disturbance threshold of 15%, (adopted from the Forest Service, Alaska Region Soil Quality Standards, 2006), is used as a point of reference to help discriminate between functioning at risk and not functioning conditions for channel stability.

Bank stability observations should correlate to some degree with *bank to height ratio* (BHR) and *width to depth ratio* (WDR) hydraulic metrics described above in section 3.3.1 and 3.3.2.

[4] PFC is structured as a yes/no checklist of key riparian and aquatic functions. The SCDM protocol has adopted selected elements of the PFC methodology. These indicators were calibrated using Harman's: 0 (Not Functioning) to 1 (Proper Functioning) rating scale.

Stream Bank Vegetation Index BkV:

- Proper Functioning: rating = 0.9

  Streambanks have dense, nearly continuous cover of native forb, riparian shrub and tree species. Tree cover is dominated by mature Sitka spruce and western hemlock with some red alder inclusions. The banks have a diverse riparian shrub community including: willow, salmon berry, stink currant, thimbleberry, devils club and Sitka alder. Vegetation exhibits high vigor with adequate numbers of seedlings and young plants to insure replacement and recovery of streambank cover. Streambank soils have substantial tree and shrub root masses capable of withstanding high flows.

II. Functioning at Risk: rating = 0.5

More than 85% of the streambank has a continuous cover of native vegetation and intact organic mat. Streamside tree cover is dominated by young growth conifer, Sitka alder or cottonwood stands that have less extensive root masses to resist streambank erosion than old growth conifer forest. Riparian shrub communities have low diversity or reduced vigor. Vegetation provides bank stability in the short term, but lack of future recruitment puts the stream at risk of bank instability due to lack of large wood and adequate root masses to maintain streambanks.

III. Not Functioning: rating = 0.1

More than 15% of streambanks lacks vegetation cover or intact organic soil mat. There is a lack of tree and shrub species with adequate root mass to stabilize streambanks. There are few healthy seedlings or young plants to insure recovery of native plant cover.

Stream Bank Condition Index BkC:

I. Proper Functioning: rating = 0.9

Raw banks are mostly evident only at stream meander bends. In unconfined channels (FP, AF and MM Process Groups), *width to depth ratio* (WDR) is within the functional range for the channel type. *Bank to height ratio* is usually less than 1.2. Overhanging banks supported by dense root masses are common. Tops of point bars are starting to be colonized by vegetation.

In confined channels (LC and MC Process Groups), banks are predominantly bedrock or boulder size material with little evidence of channel side slope erosion.

II. Functioning at Risk: rating = 0.5

In unconfined alluvial channel segments bank erosion (vertical stream banks) occurs on straight reaches between meanders. Bank slumping and false banks are evident in up to 15% of the study reach. Low WDR (<50th percentile) indicates

some vertical instability. High WDR (>50th percentile) indicates a degree of lateral channel instability. Tops of point bars are un-vegetated. Presence of medial gravel bars indicates excessive sediment loading.

In confined channels eroding channel side slopes are evident in up to 15% of the study reach.

III. Not Functioning: rating = 0.1
Unconfined alluvial channel segments (FP, AF and MM Process Groups) lack well defined stream banks (plate shaped channel cross-section typical of alluvial outwash deposition zones). *Width to depth ratio* (WDR) for actively widening channels is typically in non-functional (>75th percentile) range for the Channel Type. The stream has evidence of active channel head cutting and exhibits a very high degree of vertical instability. Channels are incised with high vertical banks and very low WDR in the non-functional range (<25th percentile).

In confined channels (LC and MC Process Groups) steep, eroding channel side slopes are evident in over 15% of the study reach. Mass wasting erosion from channel side slopes is a significant sediment contributor to the stream.

SCDM <u>off-channel habitat (OCH)</u>

The *off-channel habitat* (OCH) parameter focuses on floodplain features with perennial or intermittent surface water transmission from adjacent flood plain channels. These side-channels, sloughs and small ponds are linked to main stem channel segments during periods of high water, over-bank flooding or thru hyporheic, ground water exchange. Regional studies (USFS 1995) have shown that these features provide important seasonal fish habitat. Side channels associated with Glacial Outwash channels often contain the most important salmonid habitat in glacial runoff systems (Thedinga et.al., 1988), and present the most viable enhancement and restoration opportunities in glacial rivers such as the Chilkat River.

The SCDM *off- channel habitat* ratings assess small floodplain water bodies that may support seasonal salmonid rearing habitat. Ponds (greater than 1 acre) or lakes should not be rated using the WESPAK-SE wetland assessment protocol.

Small off-channel water bodies, particularly in less extensive flood plain land forms, are not typically represented in existing regional hydrography. Therefore, spatial metrics for this parameter must be determined in the field.

I. Proper Functioning : rating = 0.9
Side channel features have an identifiable surface connection to a perennial main stem or tributary stream channel. The *bank-to-height ratio* for the main stem channel segment is typically in the proper functioning (1.0 to 1.2) range. Surface water usually persists in small ponds or sloughs during periods of normal runoff. Scour pools are evident below flood plain obstructions such as beaver dams and large wood accumulations. Recent beaver activity may be evident. Side channel substrate

includes freshly deposited alluvial material (gravels and sand). Evidence of juvenile or adult fish utilization may also be present.

II. Functioning at Risk: rating = 0.5

Only indistinct surface connection to main stem channel can be found. The *bank-to-height ratio* for the main stem channel segment is most likely in the functional at risk (1.3 to 1.5) range. Water transmission is dominantly via over bank flooding or seasonally elevated groundwater. Features are often dry during normal flow conditions in adjacent stream channels. Substrate is fine textured alluvium and organic litter. Portions of the side-channel bed are being colonized by herbaceous vegetation.

III. Not Functioning: rating = 0.1

Side channels likely retain water only during major flood events. There is little evidence of surface water flow or deposition of alluvial sediment. Most of the channel bed has been colonized by shrubs and trees. The *bank-to-height ratio* for the adjacent main stem channel segment is in the not functional (>1.5) range.

3.1.3 Biology

SCDM fish presence (FS)

The *fish presence* (FS) parameter under the SCDM biology function evaluates utilization of salmonid habitat within the survey reach. The primary reference for this metric is the Alaska Hydrography (AK Hydro)[5]. *AK Hydro* is a compilation of the most detailed and comprehensive GIS surface water mapping in southeast Alaska. Information cataloged in *AK Hydro* includes: freshwater fish species utilization and habitat suitability survey data from multiple sources; the State of Alaska Anadromous Fish Catalog (ADFG 2016); stream geomorphology classification attributes, (USFS, 1992); as well as map delineations for stream networks, lakes, ponds, natural fish barriers, engineered fish passes, dams, and stream gaging stations.

AK Hydro hydrography and associated attributes does not address all conditions that may affect fish habitat utilization within a survey stream reach. Therefore the SCDM methodology incorporates criteria for evaluating local in-stream structures that may restrict fish passage and migration. Small (low-head) hydro power or water diversion structures can reduce or prevent fish access to upstream habitat. However, stream crossing culverts are the most common instream structures that present a significant concern for fish migration in the region. A comprehensive inventory of 1500 culvert crossing on the Tongass National Forest determined that a third of these culverts do not meet State of Alaska fish passage standards (USFS 2014b). This study also developed general criteria for culvert characteristics that "can be assumed to restrict juvenile fish migration" (juvenile salmonids have the most restrictive requirements for upstream migration):

I. Culvert span is less than 50% of the channel width.

II. Culvert outlet is perched more than 4 inches.

[5] AK Hydro information and data can be accessed thru The southeast Alaska GIS Library, http:/seakgis.alaska.edu

III. More than 10% of the culvert inlet is blocked by sediment or woody debris.

IV. Non-embedded culverts, with a span less than 48" and grade at more than 1%.

V. Non-embedded culverts, with a span greater than 48" and grade at more than 2%.

A detailed assessment of fish passage conditions associated with an instream structure or obstruction may be warranted in some circumstances.

To score the *species presence* metric in Table 3-1, use the following rubric:

I. Proper Function: rating =0.85

AK Hydro maps or field observations indicated that the survey reach is being utilized by resident and/or anadromous salmonids. No artificial fish migration barriers are affecting the survey reach.

II. Functioning at Risk: rating = 0.5

The survey reach contains suitable salmonid habitat, however, man-made structures likely restrict fish access for some species or life stages.

III. Not Functioning: rating = 0

The survey reach contains **no suitable** salmonid habitat or man-made structures are completely blocking fish access to the site.

SCDM riparian forest condition (RC)

The SCDM *riparian forest condition* (RC) parameter is less channel centric than the other indicators in this methodology. The riparian forest rating considers the entire riparian influence area, which can be quite extensive for many of the larger unconfined channel types in SE Alaska. This parameter is especially important because riparian areas influence a wide array of ecological processes including flood water detention, surface/ground water exchanges, erosion and sedimentation rates, woody debris recruitment, and radiation/heat transfer (Naiman et. al., 1992, Gregory et. al., 1991).

AFHA (1995) defined a minimum riparian area width for southeast Alaska streams as one site potential tree height measured horizontally from the edge of the stream channel. This distance is 150' for most alluvial channels in SE Alaska. Estimates of riparian area extent range between 200' to 300' based on measurements from numerous riparian transects for FP Process Group streams across the region. These riparian width measurements, determined from observation of riparian soil types and plant communities, also correlate closely with projections of flood prone width.

Riparian condition (RC) ratings should be assessed for the entire length of the survey reach for both sides of the channel. Condition scores for the *right bank* (RCR) and *left bank* (RCL) are measured independently and then averaged to determine of overall rating. Surveys should be conducted from the channel margins out to a distance of at least 150' for small unconfined and all confined channel types. The riparian zone assessment area should be extended out to a distance of 300' from both streambanks for large unconfined FP channels.

Reference conditions for rating riparian forest condition are taken from the Tongass NF Young Growth Management Strategy (USFS, 2014a). "Desired condition" criteria were defined from vegetation inventories of late-seral stage riparian forest communities across the region. In general, these riparian forests have 60 to 125 trees per acre with diameters between 18" and 36" and basal area per acre ranging from 245 to 365 square feet.

Riparian reference conditions are tailored to the different fluvial geomorphic surfaces that are common in these areas : 1) Low flood plain is a terrace slightly above bank full elevation that is flood by 1 to 5 year events; 2) High flood plain is a higher elevation terrace that is infrequently flooded by large, >5 year recurrence interval runoff events; 3) Relic channels are flood plain depressions disconnected from active stream channels that are affected by a high ground water table; 4) Alluvial fans are broad sediment deposition areas that form where a mountain slope tributary channel intersects the valley bottom. Descriptions of old growth riparian stand characteristics for each of these discrete geomorphic surfaces are outlined in the following Table 3-4.

Table 3-4. Riparian Plant Association Characteristics for Alluvial Geomorphic Surfaces from: Tongass NF Young Growth Strategy (2014).

Geomorphic surface	Dominant (PA)	Dominant Overstory species (% cover)	Dominant Understory species (% cover range)	BA (sq. ft2)/acre	DBH (in)
Low floodplain (Tonowek or younger alluvial soils) well drained	Sitka spruce/ Red alder (PA 350)	10% Western hemlock 26% Sitka spruce 30% Red Alder	Salmonberry (39%) Devil's club (10%) Stink currant (6%) Blueberry (3%)	350	22
	Sitka spruce/Salmonberry (PA 380), Sitka spruce salmonberry/devil's club (PA 335)	38 % Sitka spruce 21% Western hemlock	Salmonberry (30 to 50%) Blueberry (4 to 10 %) Devil's club (4 to 30%)	320	31
Relic channels (poorly drained)	Sitka spruce/devil's club/skunk cabbage (PA 340)	32% Sitka spruce 27% Western hemlock	Blueberry (23 %) Devil's club (21%) Bunchberry (10%) Skunk cabbage (8%)	320	31
High floodplain) (Tuxekan soils) older more stable alluvial soils, well drained	Sitka spruce/blueberry (PA 310)	31% Sitka spruce 35% Western hemlock	Blueberry (25%) Rusty menziesia (4%) Red Huckleberry 4%	390	36
Alluvial fans well drained	Sitka spruce/devil's club (PA 330)	27% Western hemlock 33% Sitka spruce	Tall blueberry (8%) Salmonberry (5%) Devil's club (27%)	305	41

The condition of second growth or young growth riparian stands is an important consideration in evaluating riparian health in SE Alaska. Inventories from the Tongass NF estimate that prior to 2000, shows that a total of 24,000 acres of riparian forest has been affected by timber harvesting activities (this harvest figure excludes State, Native Corporation and private land holdings). Altered riparian function in "young growth" (or "2nd growth") riparian conifer stands associated with loss of LWD recruitment, is a key concern for maintenance of aquatic habitat health (Bryant 1985 and Murphy and Koski 1989).

Young growth, silvicultural treatments designed to increase conifer growth rates, including release of conifers in alder dominated stands, replanting conifer seedling, importing large wood to provide germination sites for conifers and thinning dense conifer regeneration have

shown promise for accelerating the recovery of riparian areas affected by timber harvest. Although treatments results vary based on stand history and local site conditions, riparian restoration treatments can result in significant progress in moving young growth stands toward attainment of "desired conditions" (as much as 50% reduction in time required to reach desired future condition).

I. Proper Functioning : rating = 1.0

Riparian zone stand and understory characteristics for the relevant geomorphic surface reflect desired conditions described above in Table 3-4. No more than 15% of the riparian zone area[6] has been impacted by wind throw, tree harvest, skid trails or road construction.

II. Functioning at Risk: rating = 0.5

Late seral stage, old growth riparian communities occupy at least 50% of the riparian zone area, however a significant portion of the riparian stand has been affected by timber harvest, extensive wind throw or disease. Young growth areas are trending toward recovery to desired conditions.

III. Not Functioning / Condition Improving: rating = 0.25

Less than 50% of the riparian zone vegetation meets criteria for desired condition. However, young growth riparian forest growth rate, structure and species composition indicate a trend toward recovery of riparian function and desired condition in the foreseeable future.

IV. Not Functioning: rating =0.1

Only small remnants of old growth riparian forest remain in the riparian zone. Riparian forest recovery has stagnated due to conifer suppression by alder, shrubs or other conifers. Conifer stocking is low and conifer recruitment is poor due to soil disturbance and/ or frequent flooding. Disturbance vegetation communities ---alder, salmonberry and/ or non-native species-- are well outside the desired reference conditions (Table 3-4) and those conditions are likely to persist in the long term (50+yrs) without active restoration treatments. Permanent development activities within the riparian zone will prevent natural recovery of riparian function.

3.2 Credits: Streams

Summary:

The final output from the SAMF SCDM is total credits generated based upon a mitigation action. Existing and projected metric scores are organized as shown in Table 3-4. The projected score represents the condition following the mitigation action. The process then involves averaging the

[6] Landwehr (2006) recommended a 15% threshold of concern for maintaining riparian area integrity based on monitoring results of stream riparian buffer condition across southeast Alaska.

metric scores into group parameter scores, calculating functional gain as the difference between the projected and existing group scores, then applying the factors of time lag, risk, and linear extent to calculate credits.

Step 1 Assess stream metrics for the existing conditions on the mitigation site
Step 2 Calculate existing group function parameter scores
Step 3 Assess stream metrics for the projected conditions following the mitigation action
Step 4 Calculate projected group function parameter scores
Step 5 Calculate net functional gain based upon the differences between projected and existing group function parameter scores
Step 6 Apply factors of time lag, risk, and linear extent to calculate credits

Detailed Description:

Step 1 Assess stream metrics for the existing conditions on the mitigation site

Using the assessment tools described in this document, assess the metrics in Table 3-1 for the current condition at the mitigation site. Utilize the reference condition data to assign a SAMF SCDM score (a score between 0 and 1) to each metric.

Step 2 Calculate existing group function parameter scores

Individual metric scores are averaged to create the group function parameters scores. These are simple averages. For example, the group function parameter score for "floodplain connectivity" is the average of the scores for bank to height ratio and width to depth ratio. Only the metrics that were measured in the field are used to calculate the averages.

Step 3 Assess stream metrics for the projected conditions following the mitigation action

Repeat the assessments of Step 1 on the mitigation site. This time, use best professional judgement to project stream conditions after completion of the mitigation action. The assessment of projected conditions should be done only after completion of the restoration or enhancement design, and consideration should be made for that design. The results from the assessments of the existing conditions will be useful for identifying functions most likely to be lifted from mitigation activities. Table 3-4 shows existing and projected metric scores for the Pat Creek mitigation site and restoration design. Pat Creek has been identified as a high priority for restoration by the community of Wrangell and SAWC.

Group function parameter	Metric (code)	Existing score	Projected score
Floodplain connectivity	Bank to height ratio (BHR)	NA	NA
	Width to depth ratio (WDR)	0.5	0.5
Bed form diversity	Pool per km (PPK)	0.5	0.5
	Pool spacing (PS)	0.5	0.5

	Pool max depth ratio (PDR)	0.5	0.9
Channel stability	Bank erosion or channel stability index (BEI)	NA	NA
Woody debris	Key wood per meter (KWD)	0.1	0.5
Riparian forest condition index (RI)	Right Bank Condition (RBC)	NA	NA
	Left Bank Condition (LBC)		
Fish	Species presence (FS)	0.85	0.85
Off-channel fish habitat	m^2 of off-channel fish habitat (OCH)	NA	NA

Table 3-5. Existing and projected metric scores for the Pat Creek mitigation site and design. NA indicates metrics that were not measured at this site.

Step 4 Calculate projected group function parameter scores

Repeat Step 2 for the projected group function parameters. Table 3-5 shows both the existing and projected group function parameter scores for the mitigation site.

Step 5 Calculate net functional gain based upon the differences between projected and existing group function parameter scores

The functional gain per foot for each of the 6 group function parameters shown in Table 3-5 is the difference between the projected and existing group scores. The net functional gain per foot for the mitigation site is the sum of the 6 group functional gains.

Group function parameter	Existing score	Projected score	Functional gain per foot
Floodplain connectivity (BHR, ER, WDR)	0.50	0.50	**0.00**
Bed form diversity (PPK, PS, PDR)	0.50	0.63	**0.13**
Channel stability (BEI)	NA	NA	
Woody debris (KWD)	0.10	0.50	**0.40**
Fish (FS)	0.85	0.85	**0.00**
Riparian forest condition index (RI)	NA	NA	
Off-channel fish habitat (OCH)	NA	NA	
Net functional gain per foot			**0.53**

Table 3-6... SCDM functional gain worksheet. Scores are for the Pat Creek mitigation site and restoration design. The codes in parentheses () indicate the individual metrics that contribute to that group score. Functional gain is the

difference between the projected and existing group score. The net functional gain per acre is the sum of the group gains.

Step 6 Apply factors of time lag, risk, and linear extent to calculate credits

The factors of time lag and risk for the SCDM are identical to time lag and risk for the WCDM, described earlier in this document.

Both time lag and risk are assessed for each mitigation project, and final scores will be verified by the USACE in consultation with the IRT. Assignment of the single risk score should consider the credit release schedule and the ecological performance standards for the site. The time lag and risk scores are shown in Table 2-4.

The following formulas are then used:

$$\text{Adjusted net functional gain per foot} = \frac{\text{net functional gain per foot}}{\text{time lag} * \text{risk}}$$

Credits = adjusted net functional gain per foot * projected reach length

The use of the linear extent of the *projected site* in the final calculation addresses the possibility that the projected and existing site lengths may be different.

3.3 Debits: Streams

The intention of the SAMF SCDM is to calculate debits with the same methodology as the credit calculation method described above. For the debit calculation, all assessments would occur on the stream reaches permitted for impact. The projected metrics are assessed considering the conditions following the permitted impact.

To calculate debits, adjust the above methodology as follows:

1. Step 5: Functional gain now refers to functional loss and the functional loss per foot formula is the difference between the existing (current) and projected (after impact) group function parameter scores.
2. Step 6: Do not apply a time factor nor a risk factor, because they do not apply for debit calculations

4. Adaptive Management and Site Protection

Because third party mitigation in the form of restoration is a new practice to Alaska, the state of knowledge on appropriate credit debit methods for restoration, enhancement and establishment of aquatic resources is constantly evolving and improving. Regulatory guidance has changed and will continue to change as well as best available science and practices. Adaptive management, also known as adaptive learning is an important component of the SAMF wetland and stream credit-debit calculation methods. SAWC is proposing to use this credit debit method approach until the Alaska District USACE approves an official wetland and/or stream credit method for the SAMF's service areas and/or if new and pertinent knowledge of general and regionally specific ecosystem science is developed. Refinements to the SAMF method are anticipated and will be amended through a modification of the instrument.

Additionally, flexibility was designed into the SAMF credit-debit calculation methods to explore the options of incorporating scaling or weighting factors. These options can be incorporated at a future time once the IRT and statewide inter-agency review team have established policies regarding scaling and weighting of certain functions and values. For example, scaling factors that could be considered for incorporation that have been suggested by or are being used by ILF programs throughout the United States:

5. Societal priorities based upon values of aquatic resources in addition to ecological functions
6. Stressors on ecosystem function or integrity
7. Priorities for functional changes to anadromous fish, other critical species, or habitat
8. Climate change refugium
9. Upland and riparian buffers
10. Specific mitigation activities

All mitigation projects conducted by the SAMF will include additional site protection measures. Site protection will help ensure the longevity of the mitigation investment.

5. References

Adamus, P. 2015. *Manual for Wetland Ecosystem Services Protocol for Southeast Alaska (WESPAK-SE). Version 2*. March 2015. Report to Southeast Alaska Land Trust and US Fish and Wildlife Service, Juneau, AK.

Alaska Department of Fish and Game. 2016. *Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes*. https://www.adfg.alaska.gov/sf/SARR/AWC/

Bryant, M.D. 1985. *Changes 30 Years After Logging in Large Woody Debris, and Its Use by Salmonids.* In Proceeding: Riparian Ecosystems and their Management. Tuscon AZ, April 16-18, 1985.

CH2M Hill. 2016. *Credit-Debit Method for In-Lieu Fee Mitigation of Aquatic Resources in Southeast Alaska, Version 3*. Prepared for Southeast Alaska Land Trust, Juneau, Alaska. March 29, 2016.

Gregory, S.V., F.J. Swanson, W.A. McKee and K.W. Cummins. 1991. An Ecosystem Perspective of Riparian Zones-focus on links between land and water. BioScience 41: 540-551.

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

Harman, W. 2016. *Quantifying the functional lift of stream restoration projects*. Webinar presentation hosted by the Environmental Law Institute January 13, 2016. Downloaded April 22, 2016 from http://www.eli.org/events/lieu-fee-mitigation-training-webinar-functional-assessments-crediting

Landwehr, D.J. 2006. *Reasonable Assurance of Windfirmness Guidelines*. Technical Report, Tongass National Forest, Ketchikan AK.

Murphy, M. L., and K V. Koski. 1989. *Input and Depletion of Woody Debris in Alaskan streams and Implications for Streamside Management*. North American Journal of Fisheries Management 9: 127-436.

Naiman, R.J.,T.J.Beechie, L.E.Benda, D.R. Berg, P.A. Bission, L.H. MacDonald, M.D> O'Connor, P.L. Olson, and E.A. Steel. 1992. *Fundamental Elements of Ecologically Healthy Watersheds in the Pacific Northwest Coastal Ecoregion*. Pgs. 127-188 in R.J. Naiman, editor. Watershed Management, Balancing Sustainability and Environmental Change. Springer-Verlag. New York Inc. 542p.

Paustian, S. J., 1992/2010. *A Channel Type Users Guide for the Tongass National Forest, Southeast Alaska.* Technical Paper 26 (revised 2010) , U.S. Department of Agriculture, Forest Service, Alaska Region, Juneau.

Powell J., D. D'Amore, R. Thompson, T. Brock, P. Huberth, B. Bigelow, and M.T. Walter. 2003. *Wetland Functional Assessment Guidebook.* State of Alaska, Department of Environmental Conservation, Juneau AK.

Prichard, D., J. Anderson, C. Correll, J. Fogg, K. Gebhardt, R. Krapf, S. Leonard, B, Mitchell, and J. Staats. 1988. Riparian Area Management: *A User Guide to Assessing Proper Functioning Condition and Supporting Science for Lotic Areas*. TR 1737-15. Bureau of Land Management, National Applied Resource Sciences Center, Denver, CO. 136pp.

Roper B.B., J.M. Buffington, E. Archer, C. Moyer, and M. Ward. 2008. *The Role of Observer Variation in Determining Rosgen Stream Types in Northeastern Oregon Mountain Streams.* Journal of the American Water Resources Association, Vol. 44, N0. 2, p417.

Rosgen, D.L. 1996. Applied River Morphology. Wildland Hydrology Books. Pagosa Springs, Colorado.

Rosgen, D.L. 2001. *A Stream Channel Stability Assessment Methodology*. Proceedings of the Federal Interagency Sediment Conference. Reno, Nevada. II:18-26

Thedinga J.F., M.L. Murphy, and K.V. Koski. 1988. *Seasonal Habitat Utilization by Juvenil Salmon in the Lower Taku River, Southeast Alaska*. National Marine Fisheries Service, Auke Bay Laboratory, Juneau AK.

Tucker, E. and Caouette, J. 2008. *Statistical Analysis of Aquatic Habitat Variables in the Tongass National Forest*. USDA Forest Service and The Nature Conservancy.

USACE. 2016. *Alaska District: Credit Debit Methodology, Version 1.0.* US Army Corps of Engineers, Alaska District. SPN-2016-00187_21Sep2016. Downloaded from http://www.poa.usace.army.mil/Missions/Regulatory/Special-Public-Notices/

USACE. 2007. *Unified Stream Methodology, for use in Virginia*. US Army Corps of Engineers, Norfolk District.

U.S. Forest Service, 1995. *Report to Congress, Anadromous Fish Habitat Assessment*. U.S.D.A Forest Service, Pacific Northwest Research Station, Alaska Region, R10-MB-279.

U.S. Forest Service, 2001. *FSH 2090.21 - Aquatic Habitat Management Handbook*. U.S. Department of Agriculture, Forest Service, Alaska Region, Juneau AK.

U.S. Forest Service, 2006. *FSM 2554 –Region 10 Soil Quality Standards*. U.S. Department of Agriculture, Forest Service, Alaska Region, Juneau.

U.S. Forest Service, 2014a. *Tongass National Forest Young-Growth Management Guidelines for Stands with a Riparian Management Objective*. U.S. Department of Agriculture, Forest Service, Ketchikan, AK.

U.S. Forest Service, 2014b. Tongass National Forest Monitoring and Evaluation Report*: Streams and Fish Habitat; Fish Passage*. U.S. Department of Agriculture, Forest Service, Ketchikan, AK.

G. EXHIBITS
1.0 SAMF Credit Availability and Reservation Letter

SOUTHEAST ALASKA WATERSHED COALITION
CONNECT - INFORM - PARTICIPATE

PO Box 1992
Wrangell, AK 99929
info@sawcak.org
alaskawatershedcoalition.org
907.205.4028

SOUTHEAST ALASKA MITIGATION FUND- IN LIEU FEE MITIGATION PROGRAM

CREDIT AVAILABILITY AND RESERVATION LETTER

Date

Applicant Name
Applicant Address

Re: Project Name

Dear *Applicant Name,*

This letter confirms that the Southeast Alaska Watershed Coalition (SAWC) has *stream and/or wetland* mitigation credits available for the *applicant project name* to purchase in the *appropriate HUC*. SAWC will reserve *number and type of credits* in this watershed at a coast of *$xx,xxx.xx* per credit, for a period of 120-days from the date of this letter specifically for the *project name*. After that time, the *applicant name* may request an extension of this reservation, but there is no guarantee of availability beyond this date. If SAWC approves the extension, a new Letter of Credit Availability and Reservation will be issued.

This letter does not document payment for impacts. SAWC does not assume liability for the above mentioned impacts through this correspondence.

A Credit Availability Voucher accompanies this letter.

When the applicant is ready to submit payment for the above mentioned credits, please submit a completed Final Credit Sale Letter along with the payment written out to the "Southeast Alaska Watershed Coalition, SAMF program". Mail both the form and the check to *SAMF program manager* at the address shown in the above letterhead.

Sincerely,

Mitigation Program Manager

2.0 SAMF Credit Ledger Template

SAMF Project Credit Ledger Template

Payer Phone#	Project Name	Applicant	Locality	6-Digit HUC	Date of SAWC Letter sent (Receipt)	Wetland Type (Cowardin)	Stream Type (Cowardin)	Wetland Debits	Wetland Credit Requirement	Stream Debits	Stream Credit Requirement

Payment Record											
Check #	Wetland payment	Stream Payment		Date	Advanced Credits Wetland	Advanced Credits Stream	Released Credits Wetland	Released Credits Stream			

3.0 SAMF Credit Sale Letter and Receipt of Payment

SOUTHEAST ALASKA WATERSHED COALITION
CONNECT - INFORM - PARTICIPATE

PO Box 1992
Wrangell, AK 99929
info@sawcak.org
alaskawatershedcoalition.org
907.205.4028

Southeast Alaska Mitigation Fund In Lieu Fee Mitigation Program

CREDIT SALE LETTER AND RECEIPT OF PAYMENT

Applicant Name
Address

Subject: Statement of Sale for_____Wetland Mitigation Credits and/or _____Stream Mitigation Credits from the SAMF (project name) to (permittee name).

Date

This letter confirms that the sale of (#of credits) credits of (resource type – *wetland or stream*) and (# of credits) credits of (resource type- *wetland or stream*). These credits are being used as compensatory mitigation for (# of acres/linear feet) acres/linear feet of impact in the (HUC) as authorized by DA permit (DA permit number)

By selling credits to the permitte above, SAWC under the Southeast Alaska Mitigation Fund In Lieu Fee program is the party responsible for fulfilling the compensatory mitigation aspect for the permit(s) listed here within.

Sincerely,

Southeast Alaska Mitigation Fund
Program Manager

RECEIPT OF PAYMENT

Southeast Alaska Mitigation Fund In Lieu Fee Program			
Service Area:			
HUC:			
Permit No:		**Permittee:**	
Project:		**Project Manager:**	
Location:		**Date**	
Waterway:			
Cowardin Wetland Credits			
System	**Subsystem**	**Acreage Impacted**	**# of Credits**
Estuarine	**Subtidal**		
Palustrine			
Riverine			
Lauctrine	**Lake-Littoral**		
	Lake Limnetic		
		Total Wetland Credits	
Stream Credits			
System		**Linear Ft Impacted**	**# of Credits**
Instream			
Riparian			
		Total Stream Credits	

4.0 SAMF Stakeholder Involvement

Throughout Southeast Alaska conservation organizations, state and local agencies, tribes and municipalities collaborate to identify, plan, and execute watershed protection, restoration and enhancement projects that meet salmon recovery, ecosystem conservation, water quality improvement and other federally- and state-mandated and local natural resource management objectives. These largely grant-funded collaborative efforts have a successful track record restoring the impacts to aquatic resources in both rural and urban communities. The main objective of SAMF is to support and bolster these successful collaborations in a mitigation context. SAWC will work with mitigation fund partners and mitigation fund service providers to implement the mitigation plans for each mitigation site**.**

Mitigation fund partners are those organizations, local, state and federal agencies, tribes, and municipalities that have the capacity and experience administrating and/or acting as a project manager for aquatic resource restoration, enhancement, establishment, and preservation within the 8 digit HUC's that occur within the program service area. Mitigation fund partners will be considered by SAWC and the IRT, with final approval by the USACE, to provide project management and/or long term monitoring activities that are carried out under SAMF.

The program sponsor has identified "local" mitigation fund partners and "regional" mitigation fund partners. A list of qualifications for each partner can be found in the Appendices. Local partners operate within a specific 8-digit HUC, where regional partners offer their services across Southeast Alaska. In order to be considered a mitigation fund partner, SAWC must receive a statement of qualifications and an explanation of how the services being offered will support the operations of the ILF program. The list of qualifications for these entities will be made available on the SAWC website and will be presented to the IRT on a yearly basis as updates and changes are made annually to the list by the program manager.

Mitigation fund technical service providers are those entities that provide technical services that support the mitigation of aquatic resources throughout Alaska and the greater Pacific Northwest region. These entities will provide contractual services to conduct specific elements of mitigation projects. This list does not include all of the potential service providers, however, it does identify the expertise that exists and is available to SAWC and mitigation fund partners to draw upon to ensure successful mitigation. Similar to the list of mitigation fund partners, SAWC will keep a list of potential service provides that will be made it available to the IRT on a yearly basis as the program manager makes updates and changes annually to the list. When instrument is signed, SAWC will begin to focus program resources towards the 8-digit HUC watersheds within the service area where the coalition has established mitigation fund partners. In addition, the type of projects the program carries out will match the experience and expertise of the mitigation fund partners and technical service providers.

Listed below are the local and regional mitigation fund partners and technical service providers that SAWC has established relationships with at the time this instrument was being developed. These entities have vetted the Southeast Alaska Mitigation Fund and have the capacity and expertise to support mitigation activities under the ILF program. In the table below, the *Watershed of Operation* column is the 8-digit HUC watershed within the service where SAMF will focus its mitigation activities at the onset of the program. Please see the service area map in Appendix A to reference specific HUC names and locations. Again, this list is not a comprehensive list of all potential partners and contractors operating in the region. The technical service providers listed below have provided SAWC mitigation fund partners with technical expertise to accomplish various elements of habitat restoration activities and/or have been contracted by SAWC to support in the development of the Southeast Alaska Mitigation Fund.

Mitigation Fund Partner List

Organization and Name of Restoration Contact	Expertise	Watershed of Operation 6 Digit HUCS
Local Partners		
City and Borough of Yakutat	Aquatic resource restoration project management, watershed research and assessment, wetland delineations	Northern Alexander Archipelago and Gulf of Alaska
Takshuanuk Watershed Council	Aquatic resource restoration project management, watershed research and assessment, wetland functional assessments	Northern Alexander Archipelago and Gulf of Alaska
Sitka Conservation Society	Aquatic resource restoration project management, watershed research and assessment, watershed prioritization	Central Alexander Archipelago
Juneau Watershed Partnership	Aquatic resource restoration project management and assessment	Northern Alexander Archipelago and Gulf of Alaska
The Nature Conservancy Alaska	Aquatic resource restoration project management, watershed research and assessment, site prioritization	Southern Alexander Archipelago
Regional Partners		
The Nature Conservancy, Alaska	Aquatic resource restoration project management, watershed research and assessment, site prioritization	Southeast Alaska Region
The Southeast Alaska Land Trust	Aquatic resource mitigation in the form of preservation	Southeast Alaska Region
Trout Unlimited, Alaska	Project funding acquisition, pre-project implementation coordination. Contract development and awards	Southeast Alaska Region
United States Fish and Wildlife Service, Coastal Program	Aquatic resource mitigation, specifically Fish Passage, assessment	Southeast Alaska Region
United States National Forest, Tongass National Forest	Aquatic resource mitigation, watershed research and assessment, watershed	Southeast Alaska Region

	inventory and prioritization	

Mitigation Fund Technical Service Provider

Contractual Service Provider and Point of Contact	Expertise	Region(s) of Service
Herrera Integrated Environmental and Engineering Services	Fish passage, bank stabilization, engineering, design and on-site construction management assistance	Pacific North West and Alaska
DowlHKM	Hydrologic analyses, fish passage design, flood hazard analysis, permitting	Alaska
Waterman Mitigation Partners	Permitting mitigation projects including site selection, permit support, design coordination, site monitoring and maintenance	Washington, Oregon and Southeast Alaska
Ecological Land Services	Wetland delineations, Functional assessments, mitigation banking, wetland establishment, land and easement acquisition	Washington, Southeast Alaska
Interfluve	Wetland establishment/enhancement, design, construction oversight, mitigation planning, fish passage design	Pacific Northwest, Alaska
CH2MILL	Instrument development, mitigation crediting consultation	Pacific Northwest, Alaska
Sitka Hydro	Stream Restoration	Southeast Alaska
Please note: there are other identified contractors who work with mitigation fund partners on a regular basis throughout the service areas. These contractors are listed in the "Statement of Qualifications" of the Mitigation Fund Partners.		

In addition to the watershed expertise listed above SAWC has developed specific organizational partnerships with The Nature Conservancy (TNC) and the Southeast Alaska Fish Habitat Partnership (SEAKFHP), in order to, enhance and facilitate the flow of relevant and scientifically based information and services regarding aquatic resource management and mitigation throughout the programs entire program. SAWC will utilize the expertise within its mitigation fund partners to support the identification of mitigation sites and ensure mitigation plans are equipped with the best available science.

H. LITERATURE REVIEW:

ARMF (Aquatic Resource Mitigation Fund). 2011 *New Hampshire Department of Environmental Services*

Audubon. 2016 Ecolgocial Atlas of Southeast Alaska

AWI (Alaska Wetlands Initiative: Summary Report). 1994 . *EPA, USACE, USFWS, National Marine Fisheries Service*

CWA (Clean Water Act). 1990 Memorandum of Agreement Between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation Under the Clean Water Act Section 404(b)(1) Guidelines (February 6, 1990)

CWA (Clean Water Act) (33 USC 1251 et seq.)

Compensating for Wetland Losses Under the Clean Water Act. 2001. *The National Academies*

Compensatory Mitigation for Losses of Aquatic Resources (33 CFR Part 332; 40 CFR Part 230).

EL (Environmental Laboratory). 1987. Corps of Engineers Wetlands Delineation Manual Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

ELI (Environmental Law Institute). 2002. Banks and fees: The status of off-site wetland mitigation in the United States. Environmental Law Institute, Washington, D.C.

ELI (Environmental Law Institute). 2006. The Status and Character of In-Lieu Fee Mitigation in the United States. Washington, D.C.

ELI (Environmental Law Institute). 2009 In-Lieu Fee Mitigation: Model Instrument Language and Resources.

EO (Executive Order) No. 11990 (Protection of Wetlands)

EO (Executive Order) No. 11988 (Floodplains Management)

ESA (Endangered Species Act) (16 USC 1531 et seq.)

Federal Guidance for the Establishment, Use, and Operation of Mitigation Banks (60 FR 58605-58614, November 28, 1995)

Final Rule. 2008 Compensatory Mitigation Rule, Federal Register/Vol. 73, No. 70/Thursday, April 10, 2008/Rules and Regulation. Preamble.

Fish and Wildlife Coordination Act (16 USC 661 et seq.)

Fish and Wildlife Service Mitigation Policy (46 FR 7644-7663, 1981)

Guidelines for the Specification of Disposal Sites for Dredged and Fill Material (40 CFR 230)

Hudson and Steifert. 2011. REM Report. *Juneau Watershed Partnership and USFWS*

KCDNRP (*King County Department of Natural Resources and Park)* 2011 King County Mitigation Reserves Program In-Lieu Fee Program Instrument.

MILFP (Maine In-Lieu Fee Program). 2011

Magnuson-Stevens Act (16 USC 1801 et seq.)

MSILF (Montana Statewide In-Lieu Fee Program). 2001 *Montana Department of Environmental Quality and Trout Unlimited – Montana Waters Project*

National Environmental Policy Act (42 USC 4321 et seq.)

National Historic Preservation Act (16 USC 470)

Nichols, J., K. Schroeder, B. Frenette, J. Williams, A. Crupi, K.Smikrud. 2013. A

User Guide for Perfomring Stream Habitat Surveys in Southeast Alaska. ADF&G, Speical Publication No. 13-04, Anchorage.
NRC (National Research Council). 2001. Compensating for wetland losses under the Clean Water Act. National Academy Press, Washington, D.C.
NRC (National Research Council). 2002. Riparian areas: functions and strategies for management. National Academy Press, Washington, D.C.
OILF (Oregon In-Lieu Fee Program). 2010 *Oregon Department of State Lands*
Paustian, S. 1992 Channel Type User Guide for the Tongass National Forest, Southeast Alaksa.. USDA Forest Service, R10-TP-26
Paustian, S. 2004. Development and Implementation of a Riparian Conservation Staregy for the Tongass Nation Forest.
PSP (Puget Sound Partnership) 2010 In Lieu Fee Prospectus.
Regulatory Program of the U.S. Army Corps of Engineers (33 CFR 320-332)
SEALTRUST (Southeast Alaska Land Trust In-Lieu Fee Program). 2011 *Southeast Alaska Land Trust*
ShoreZone SE Summary Report. 2011. *Prepared for the Nature Conservency*
USM (Unified Stream Methodology for use in Virginia). 2007 U.S. Army Corps of Engineers, Norfolk District Virginia Department of Environmental Quality. January 2007.
USACE. 2016. *Alaska District: Credit Debit Methodology, Version 1.0.* US Army Corps of Engineers, Alaska District. SPN-2016-00187_21Sep2016. Downloaded from http://www.poa.usace.army.mil/Missions/Regulatory/Special-Public-Notices/
USDA (United States Department of Agriculture). 2001 Alaska Region Aquatic Habitat Management Book. USDA Forest Service. FSH 2090.21. R-10 Amendment 2090.21-2001-1.
WSDOE (Washington State Department of Ecology. 1997 Washington State Wetland Identification and Delineation Manual. 1996, rev. 1997. Olympia, WA. Pub. No. 96-94.
WSDOE (Washington Department of Ecology), 2005. Washington State Wetland Rating System for Western Washington. Olympia, WA. Report Pub. No. 04-06-025.
WSDOE (Washington Department of Ecology). 2006 US Army Corps of Engineers Seattle District and Environmental Protection Agency Region 10. March 2006. Guidance on Wetland Mitigation in Washington State, Part 1. Agency Policies and Guidance. Report Pub. No. 06-06-011A.
WSDOE (Washington Department of Ecology). 2006 US Army Corps of Engineers Seattle District and Environmental Protection Agency Region 10. 2006. Guidance on wetland mitigation in Washington State. Part 2. Guidelines for developing wetland mitigation plans and proposals. Olympia, WA. Report Pub. No. 06-06-011A.