

**Compensation Planning Framework
For the
Southeast Alaska Land Trust
In-lieu Fee Program**

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Prepared by the
Southeast Alaska Land Trust

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I. Executive Summary

This Compensation Planning Framework describes Southeast Alaska's high-value aquatic resources, their historic and projected losses due to unavoidable impacts from community improvements and resource developments. It also describes Southeast Alaska Land Trust's (SEAL Trust) role as an agent of the U.S. Army Corps of Engineers (Corps) in the mitigation of development impacts through the Trust's land conservation and preservation efforts in Southeast Alaska. In response to 2008 Federal regulations, SEAL Trust prepared this Framework as part of an update and modification of its existing (1998) legal agreement with the Corps under which the Trust accepts mitigation fees from permittees and uses the fees to preserve high-value lands by working with willing landowners.

This Framework focuses on the Southeast Alaska region which extends about 500 miles from the Canadian border (south of Ketchikan) northwest to Yakutat Bay and about 120 miles from the mainland west to islands of the Alexander Archipelago, and encompasses about 22 million acres. The high precipitation of the temperate rainforest and coastal topography yield productive forested and emergent estuarine wetlands that have inevitably experienced some losses because people and their activities are also found along the coastline of Southeast Alaska. In general, impacts to aquatic resources in Southeast Alaska are locally concentrated in towns, along roads radiating from the towns, and also where timber harvest, transfer or milling has occurred. With resource industries (timber, mining, tourism, fishing) competing on a global scale and declining population projections, it is anticipated that the Southeast Alaska region will experience relatively modest wetlands loss in the future primarily due to localized community redevelopment and the occasional resource development or intra-regional transportation/hydro power and transmission/ project.

Under its updated in-lieu fee (ILF) Program, SEAL Trust will continue to work with the Corps, an Interagency Review Team of resource managers, Southeast communities, willing landowners, local watershed groups, Native corporations, realtors and resource/land professionals, and other interested parties to identify, prioritize and purchase properties with high-value aquatic resources. SEAL Trust's ILF Program objectives are:

1. Preserve valuable aquatic habitats that provide important functions and support the ecological health and sustainability of a watershed, through the acquisition of properties (fee simple title) or property rights (conservation easement). As a secondary focus and as opportunities arise, SEAL Trust may also work in partnerships on the restoration, enhancement, or creation of valuable wetlands.
2. Working with willing landowners, acquire valuable aquatic habitats where imminent development would lead to a loss of those habitats, impair the overall ecological health of a watershed, or conflict with community land use goals.
3. Identify and acquire properties to meet compensatory mitigation obligations under Corps permitting in an efficient and timely manner, so that SEAL Trust's role as an ILF Program sponsor helps reduce conflicts between conservation and development, facilitates regulatory action and permitted development, and yields effective and high-quality preservation.

4. Where appropriate, consolidate fees from smaller, individual projects to provide mitigation through larger properties with greater ecological value.
5. Seek properties adjacent to or within Southeast communities or remote “gems” (often private land originally platted as homesteads in the early-mid 1900s) that provide functions similar to the impacted area which is typically the accessible, low-gradient and high-value shorelines (mudflats and estuaries).
6. Provide public benefit by directing mitigation resources toward the preservation of high-value habitats that also offer open space, passive recreation, drinking water protection, and other services to Southeast Alaska communities.
7. Develop a mitigation site selection process that is ecologically based and relies on the best available information.
8. Work efficiently and in a transparent manner with the Interagency Review Team to implement mitigation projects.
9. Provide an efficient and timely accounting of in-lieu fees and mitigation projects.
10. Provide long-term and permanent protection of valuable aquatic habitats on acquired properties through SEAL Trust’s legal instruments and stewardship of properties we retain or properties transferred to a public land management agency.

Properties are selected for mitigation using several criteria including:

- aquatic resource types, ranked for high-value and scarcity;
- site location and timing, with an emphasis on selections in watersheds near the permitted impacts or in the same general sub-region;
- federal regulatory requirements which direct a watershed approach; and
- SEAL Trust’s mission and national land trust standards and practices.

The process for selecting specific properties will rely on available resource information, best professional judgment of resource and land managers, and on-site field assessments to the extent feasible. Before SEAL Trust can purchase fee simple land or a conservation easement with the in-lieu fees, its proposed mitigation projects must be approved by the Corps, following a review by the Interagency Review Team of resource managers. The properties are protected for the long term through several legal mechanisms and SEAL Trust’s ongoing stewardship efforts.

II. Introduction

This Compensation Planning Framework, prepared by the Southeast Alaska Land Trust (SEAL Trust), is based on a requirement established in a federal rule established in June 2008 by the U.S. Army Corps of Engineers (Corps) and the Environmental Protection Agency (EPA) [The Compensatory Mitigation for Losses of Aquatic Resources Rule 33 CFR Part 332 and 40 CFR Part 230]. The 2008 Mitigation Rule governs compensation for unavoidable impacts to aquatic resources from activities permitted by the Corps under Section 404 of the Federal Water Pollution Control Act of 1972 (the “Clean Water Act”) and Sections 9 and 10 of the Rivers and Harbors Act of 1899 (Table 1).

Table 1. Corps Permitted Activities Subject to the Compensatory Mitigation Rule 33 CFR 332.¹

Corps Permit	Permitted Activities Covered by the Compensatory Mitigation Rule
Sect. 9, Rivers & Harbors Act of 1899	Dams and dikes.
Sect. 10, Rivers & Harbors Act of 1899	Construction, excavation, or deposition of materials in, over, or under navigable waters of the U.S. Includes piers, wharfs, breakwaters, bulkheads, jetties, weirs, transmission lines and dredging or disposal of dredged material, or excavation, filling, or other modifications to navigable waters.
Sect. 404, Clean Water Act	Discharge of dredged or fill material into waters of the U.S.

Under the longstanding Corps permitting process, a proposed activity must first avoid and minimize impacts that affect aquatic resources, but when impacts are unavoidable then compensatory mitigation is calculated (typically in acreage) and required in the Corps permit. While permittees often do avoid and minimize impacts, the predominant coastal location of communities and the wet nature of the limited, buildable land in Southeast Alaska frequently result in unavoidable impacts to aquatic resources. Within this permitting context, SEAL Trust has had a formal agreement with the Corps since 1998 to serve as an in-lieu fee program whereby the Corps established a fee paid to SEAL Trust in lieu of a permittee undertaking their own mitigation project (e.g., restoring damaged wetlands or protecting intact wetlands). Simply put, permittees paid SEAL Trust a fee instead of performing the mitigation work themselves and would then proceed with their development project (e.g., commercial fill, airport, harbor or road construction; urban development, mine, etc). According to its overall mission of preserving high-value resource habitats for successive generations, SEAL Trust has used the in-lieu fees to acquire conservation easements or fee-simple title property in the Southeast Alaska region.

¹ Certain activities affecting aquatic resources in Southeast Alaska do not fall under the Corps’ jurisdiction, particularly timber harvest and associated road construction (33 CFR 323.4, Part 330 Appendix A, 325). However, these activities contribute to the cumulative impacts to aquatic resources throughout Southeast Alaska and are briefly considered in this compensation planning framework.

Currently, the Corps analyzes the impacts to aquatic resource functions (e.g., flood control, water quality, fish rearing habitat, etc.) and calculates the amount of compensatory mitigation (typically in acreage) required in a Department of Army (DA) permit. The new 2008 Mitigation Rule provides more specific, nationwide regulatory guidance to all in-lieu fee program sponsors, such as SEAL Trust, who now determine the amount of a permittee's in-lieu fee. The in-lieu fee is based on the real estate market and is used by SEAL Trust to purchase sufficient acreage in conservation easements or fee-simple properties to satisfy the compensatory mitigation required by the Corps in the DA permit.

The geographic extent of the 2008 Mitigation Rule focuses on the "waters of the United States" which include the territorial seas (i.e., ocean waters within three nautical miles of the coastline), tidal waters that rise and fall in a predictable and measurable cycle, and non-tidal waters. These waters include current or historic navigable waters, lakes, ponds, rivers, streams and their associated tributaries, mudflats, sand flats, salt marshes, estuaries, sloughs, wet meadows (bogs and fens), and forested wetlands in Southeast Alaska. (See Appendix A for 33 CFR 328 definitions of waters of the U.S.).

In accordance with the 2008 Mitigation Rule, this Framework identifies the service area of Southeast Alaska, describes the present condition of aquatic resources in Southeast Alaska, identifies historic losses and potential threats to those resources (due to urbanization, local and regional transportation infrastructure, resource development, etc.), and describes how the SEAL Trust in-lieu fee program (ILF Program) will use permittee-provided fees to protect aquatic resources on vulnerable land parcels to offset impacts to aquatic functions and services throughout the service area. Further, the Framework describes SEAL Trust's goals and objectives under the ILF Program, a strategy for prioritizing the selection and implementation of the ILF Program projects, and long-term protection and management strategies for properties SEAL Trust undertakes as an ILF Program sponsor. This document also explains how the ILF Program sponsor activities undertaken by SEAL Trust satisfy regulatory criteria for use of in-lieu fees for preservation activities. This Framework is a component of SEAL Trust's overall ILF Program which also includes a legal agreement with the Corps ("instrument") that contains additional details on the operation of the ILF Program.

III. Service Area

Mitigation Rule: 33 CFR 332.8 (c)(2)(i) – the geographic service area, including a watershed-based rationale for the delineation of each service area.

The service area for the SEAL Trust ILF Program is the organization's existing area of focus throughout Southeast Alaska. Common usage describes Southeast Alaska as a coastal ecosystem located between 55 and 60 degrees latitude, extending about 500 miles from the Canadian border (south of Ketchikan) northwest to Yakutat Bay and roughly 120 miles in width. Southeast Alaska encompasses about 22 million acres. Within this vast region, SEAL Trust is relying on existing delineations which are defined by watersheds to gather aquatic resource information and provide its ILF Program services. These identifications of watersheds assist in framing a regional analysis that complements the 2008 Mitigation Rule's focus on compensatory mitigation on a watershed basis.

The entire state of Alaska is divided into six sub-regions based on major watersheds, as delineated by the U.S. Geological Service (Figure 1) with designated 4-digit Hydrologic Unit Codes (HUCs) 1901 through 1906. Southeast Alaska (HUC 1901) is further divided into twelve 8-digit HUCs with each representing a group of related watersheds (Table 2 and Figure 1). The SEAL Trust ILF Program service area is most of sub-region 1901, and includes all watersheds east of Icy Bay. The USGS water resources data available for Southeast Alaska is organized and accessible according to the HUC delineation system.

Table 2. Watershed Hydrologic Unit Codes and Names in Southeast Alaska (U.S. Geological Survey).

<u>Watershed Code</u>	<u>HUC Name</u>
<i>Southern SE (01)</i>	
19 01 01 01	Southeast Mainland
19 01 01 02	Prince of Wales
19 01 01 03	Ketchikan
<i>Central SE (02)</i>	
19 01 02 01	Mainland
19 01 02 02	Kuiu-Kupreanof-Mitkof-Etolin-Zarembo-Wrangell
19 01 02 03	Baranof-Chichagof Islands
19 01 02 04	Admiralty Island
<i>Northern SE (03)</i>	
19 01 03 01	Lynn Canal
19 01 03 02	Glacier Bay
19 01 03 03	Chilkat-Skagway Rivers
<i>Forelands(04)</i>	
19 01 04 01*	Yakutat Bay
19 01 04 02**	Bering Glacier

* Only a portion of this HUC east of Icy Bay is included in the SEAL Trust service area.

** This HUC, located west of Icy Bay, is not included in the SEAL Trust service area.



Figure 1. Southeast Alaska Hydrologic Unit Codes (National Resource Conservation Service; www.ak.nrcs.usds.gov/technical/southeasternhucs.html)

Another watershed-based delineation for Southeast Alaska was developed by the U.S. Forest Service (Forest Service) for its Tongass Land and Resource Management Plan (1997; 2008). The Forest Service identifies 22 biogeographic provinces comprised of groups of watersheds. Within the biogeographic provinces across the entire Southeast Alaska region, the Forest Service further identifies 926 Value Comparison Units which are distinct geographic areas that generally encompass a drainage basin (watershed) with one or more large stream system and include estuaries and adjacent marine habitats associated with the terrestrial drainage systems.

Efforts under the auspices of The Nature Conservancy and Audubon Alaska build on the Forest Service’s biogeographic provinces and identify about 1030 watersheds within the entire Southeast Alaska region (Schoen and Dovichin 2007). This work summarizes existing science and provides watershed-scale information in a GIS format that SEALTrust can use to inform its preservation activities throughout the service area (Figure 2). Also, the 22 biogeographic provinces are combined into five sub-regional groupings of neighboring provinces, based on



Figure 2. Biogeographic provinces were used to measure the geographic distribution of conservation representation throughout the islands and mainland of Southeast Alaska.

climate, physiography, and plant distribution. SEAL Trust believes the biogeographic provinces and groupings will provide a useful perspective and information base in instances where a mitigation project might be selected in a watershed within a larger than local scale but still within a general area. SEAL Trust intends to record its project-specific preservation actions using both the USGS HUC and biogeographic province nomenclature.

IV. Aquatic Resources of Southeast Alaska

Mitigation Rule: 33 CFR 332.8(c)(2)(iv) An analysis of current aquatic resource conditions in the service area(s), supported by an appropriate level of field documentation;

This analysis of the current conditions of aquatic resources in Southeast Alaska is based on a review of region-wide or local publications and online information sources (including NOAA Fisheries, Environmental Protection Agency, U.S. Forest Service, Alaska Department of Fish and Game, and Juneau Watershed Partnership). Given the size of the service area, SEAL Trust did not perform site-specific field documentation for this Compensation Planning Framework.

Southeast Alaska is a collection of thousands of islands and a comparatively narrow band of mountainous mainland. The archipelago lies between the coastal mountain ranges of western North America and the North Pacific Ocean and contains the world's largest temperate rainforest. The region is characterized by a maritime climate, moderated by warm ocean currents from the south, and is dominated by heavy precipitation and cool, overcast conditions year-round. At lower elevations in the southern end of the region, nearly all of the 50 to 200 inches of annual precipitation falls as rain, whereas in the north and at higher elevations snow is typical in winter. This abundant precipitation maintains vast rainforests, extensive wetlands, innumerable streams, rivers, lakes, ponds, estuaries, and large ice fields and glaciers. Southeast Alaska encompasses an astounding 1,030 watersheds (Schoen and Dovichin 2007).

Southeast Alaska Land Cover

The Tongass National Forest, which covers approximately 78 percent of the service area, supports approximately 4,000,000 acres of wetlands (USFS 2008, p. 3-43); other landowners may support another 880,000 acres of wetlands (assuming similar ratios of uplands and wetlands). The terrestrial landscape is dominated by rainforest and muskegs (*Sphagnum* bogs) in the lower elevations, with alpine meadows, tundra, and glaciers at higher elevations. In some areas along the mainland, glaciated landscapes extend from sea level to the mountaintops, which reach to 18,000 feet at Mount St. Elias at the northwestern edge of the service area.

Vegetation and land cover statistics for Southeast Alaska are shown in Table 3. In summary, forests cover just over half of the landscape of Southeast Alaska (51 percent), ice/glaciers and rock about one-third (30 percent), non-forested upland (non-wetland) vegetation about one-seventh (15 percent), and non-forested waters of the U.S. (wetlands/meadows, lakes, stream, rivers, and marine shorelines) cover the remaining 4 percent. Clearly, the non-forested freshwater and coastal wetlands that provide important ecological functions are not abundant in Southeast Alaska and are worthy of protection and mitigation.

Table 3. Vegetation and Land Cover Classes for Southeast Alaska across all Land Ownerships (Albert and Schoen 2007)

Land Cover	Acres	Percent
Forest (including forested wetlands)		
Productive Old Growth	5,807,155	26.5
Clear-cut and 2 nd growth	786,285	3.6
Other Forests	4,498,746	20.5
Non-forest Upland		
Alpine tundra	544,293	2.5
Slide zone	808,010	3.7
Shrub land	961,977	4.4
Herbaceous meadow	22,280	0.1
Other nonforest	1,059,347	4.8
Freshwater wetlands		
Muskeg meadow	261,579	1.2
Emergent wetlands	47,630	0.2
Lake	204,547	0.9
River bars and channels	199,082	0.9
Coastal Cover/Wetlands		
Algal bed (marine)	82,370	0.4
Rocky shore	38,703	0.2
Salt marsh	33,458	0.2
Sand/gravel beach	5,795	0.0
Tide flat	12,577	0.1
Unconsolidated sediments	111,824	0.5
Unvegetated		
Ice and snow	3,596,244	16.4
Unvegetated	2,999,016	13.7
Urban	9,831	0.0
Total	21,891,885	100.0

Freshwater Wetland Types, Functions and Services

Ecological and societal services provided by forested wetlands include water storage, filtration, and release; wildlife habitat; timber production; recreation; and carbon sequestration. *Sphagnum*-dominated bogs store, release, and filter water, store carbon, and provide wildlife habitat. Sedge-dominated fens typically have higher rates of photosynthesis than bogs, and therefore store more carbon while storing, filtering, and releasing water. The fens also provide feeding and nesting habitat for many wildlife species. Streams, lakes and ponds provide fish and wildlife habitat and water supply for human and wildlife needs. The Tongass National Forest encompasses 45,000 miles of known streams and more than 20,000 lakes and ponds. Of this vast freshwater habitat, about 10,800 miles (25%) of streams and 4,100 (21%) of lakes and ponds are documented anadromous fish habitat (Schoen and Dovichin 2007, Ch 9.5). The Alaska Department of Fish and Game's Catalog of Waters Important for the Spawning, Rearing, and

Migration of Anadromous Fishes identifies numerous salmon streams throughout Southeast Alaska, and the Forest Service identifies these as Class 1 anadromous and high-value resident fish streams.

Local, intact aquatic resources also provide valuable services as open space, recreation sites, (drinking) water quality protection, and flood control that enhance the human livability and aesthetics of a community. The functions and services are subject to unavoidable impacts when the Corps issues permits for projects that clear, drain, and fill wetlands as communities grow or redevelop and transportation or resource developments occur throughout Southeast Alaska.

Coastal Marine Habitats

Southeast Alaska has approximately 30,000 km (18,000 mi) of marine shoreline that 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 Divochin 2007). These combined features support primary productivity from plankton, algae, kelps, eelgrasses and marsh grasses; 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.

Coastal areas in the Southeast Alaska region are noted for their value as bird habitat. Under the auspices of the Birdlife International and Audubon organizations, several coastal areas in Southeast Alaska are identified as Important Bird Areas in recognition of their significance as essential breeding, rearing, wintering, or resting habitat for migratory birds (www.audubon.org/iba):

<u>Important Bird Area</u>	<u>Nearby Community/Sub-region</u>
Berners Bay	Juneau
Blacksand Spit	Yakutat
Chilkat Bald Eagle Preserve	Haines
Forrester Island	Outer Prince of Wales Island
Icy Bay	Yakutat
Mendenhall Wetlands	Juneau
Port Snettisham	Juneau

Similarly, the North American Bird Conservation Initiative – a forum of government agencies, private organizations and bird initiatives working jointly on bird conservation – provides information on a few areas identified as important to shorebirds in Southeast Alaska: Yakutat Forelands, Mendenhall Wetlands, and the Stikine River delta (Andres and Gill 2000).

The ShoreZone coastal habitat mapping and classification system, consisting of geo-referenced aerial imagery collected for the interpretation and integration of geological and biological features, characterizes the intertidal and nearshore environments of Southeast Alaska. About one-third (13,536 km) of Southeast Alaska has been mapped by ShoreZone through 2008, with

most of the remaining shoreline imaged and additional mapping underway. The shorelines mapped to date are generally located in northern Southeast (Yakutat to Icy Strait, Lynn Canal to Tracy Arm, northern Chichagof Island to Sitka) and southern Southeast (Revillagigedo Is., Misty Fjords, to Canadian border, southeastern and western Prince of Wales Island).

The ShoreZone system maps the occurrence of common organisms as distinct biological features along the shoreline and nearshore areas (Appendix B). Some features, such as eelgrass and kelp beds, are considered high value because of the primary productivity, structure and spawning/rearing habitat these provide for shellfish, fish and wildlife of ecological, subsistence, sport, commercial and cultural importance. These high-value habitats occur in less than 25% (eelgrass) and less than 33% (kelp beds) of the shoreline mapped to date.

The ShoreZone project also classifies larger scale features such as mudflats, estuaries and man-modified shoreline (i.e., shoreline altered by bridges, docks, fill, etc). Mudflats and estuaries are considered high-value habitat, while man-modified shorelines offer less valuable habitat. Mudflats are important for many species of shellfish and flatfish and are critical to migrating shorebirds. Estuaries are nursery areas for many fish species, including juvenile salmon out-migrating from freshwater to the ocean. These high-value coastal habitats are relatively rare: mudflats being less than 1% and estuaries less than 15% of the shoreline mapped to date. Human modifications occupy less than 1% of the mapped shoreline. Man-modified shorelines in the northern Southeast 2004-05 survey areas occupy slightly more linear kilometers than mudflats, whereas comparatively less man-modified shoreline is evident in the southern Southeast 2006 survey area (Table 4).

Table 4. Coastal Feature Occurrence in Southeast Alaska 2004-2005 and 2006 ShoreZone Project Areas (NMFS 2006, 2008)

Coastal Feature	Data Year	Total Km Mapped	Percent of Project Area Mapped	Percent of Total Km Mapped to Date
Mudflats	2004-2005	58	0.9	0.8
	2006	50	0.7	
Estuaries	2004-2005	1,194	19.1	14.6
	2006	789	10.8	
Man-Modified	2004-2005	61	1.0	0.7
	2006	36	0.5	

The mudflats and estuarine habitats provide accessible, low-gradient shorelines, and many Southeast Alaska communities with their development pressures or old-time homesteads are located near these valuable habitats. As the ShoreZone project proceeds, it will provide SEALTrust with enhanced and readily accessible information about high-value coastal habitats and a tool to help identify opportunities for preservation throughout the service area.

V. Historic Aquatic Resource Loss

Mitigation Rule: 33 CFR 332.8(c)(2)(iii): an analysis of historic aquatic resource loss in the service area.

The high precipitation of the temperate rainforest and flat coastal topography yield productive forested and emergent estuarine wetlands that have inevitably experienced some losses because people and their activities are also found along the coastline of Southeast Alaska. In general, impacts to aquatic resources in Southeast Alaska are locally concentrated in towns, along roads radiating from the towns, and also where timber harvest, transfer or milling has occurred. To a lesser extent, impacts occurred at isolated cannery or mine sites occupied along the coast in the early decades of the 20th century and at modern-day seafood processing, mining, and a few tourism-related sites found in the region. Hydropower sites with associated transmission lines have also impacted aquatic resources in locations throughout the region. Human activities and impacts historically occurred primarily along the coastline where flat and buildable land, fish-bearing marine and freshwaters, and access to relatively inexpensive marine transportation are found.

In Southeast Alaska towns, miles of marine shoreline are developed and stabilized; forested and scrub-shrub wetlands are replaced by roads, buildings, and other impervious surfaces; streams are channelized and impacted by road crossings, fill and runoff; and floodplains and wetlands are developed for residences and commercial sites. Urban shoreline alteration may disrupt nearshore primary productivity by blocking sunlight, altering water circulation patterns, and converting fine sediment shallows to rocky deep water shoreline, as in the case of rip rap fill. While not regulated under the Corps authority and not a primary focus of this Framework, additional human activities impact aquatic resources through stormwater runoff leading to chemical and biological pollutants, stream bank erosion, increased sediment loads, and water temperature changes; the disposal of poorly treated wastewater (sewage, detergents, chlorine, etc.) into the groundwater and the nearshore marine waters; and the introduction of invasive plants or aquatic organisms.

Unavoidable impacts to aquatic resources have also occurred in Southeast Alaska as a consequence of regional transportation and resource development over the years. Along the coastline, ferry terminals, harbors, airports, roads, timber transport and milling sites, submarine power landfalls, mining and seafood processing sites have impacted nearshore, intertidal and upland aquatic habitats through permanent shoreline alterations (fill, piling, wharves, etc.), bridge and culvert placement, wetland fill, estuarine/riparian alterations (fill, vegetation removal, etc), and waste and wastewater discharge to fresh and marine waters (increased turbidity, lowered dissolved oxygen levels, seafood waste as nuisance food source, and smothering of benthic communities, etc.) (NMFS 2005b). Ongoing maintenance activities at transportation facilities can lead to pollution of adjacent fresh and salt water habitats through runoff containing pollutants from herbicides, hydrocarbons, deicers, and other toxic chemicals. These non-point source impacts, however, are typically regulated through stormwater management plans and are not covered in Corps-permitted compensatory mitigation.

Hydropower installations such as dams or lake taps can cause impacts to riverine and shoreline resources by blocking up- and downstream migrations of anadromous fish such as salmon, reducing flows in bypass reaches or from water diversion structures, and reducing sediment transport in river systems. There can also be direct, unavoidable impacts to adjacent wetlands from dam, penstock, and powerhouse construction and to wetlands, streams, and shorelines from transmission line construction.

Early construction of inland local, intra-regional and timber harvest-associated roads and highways also resulted in negative impacts through improper placement of culverts that impede fish migration; riparian vegetation loss (with associated hydrologic changes, erosion and sedimentation, reduced invertebrate and other nutrient input, and reduced cover for juvenile and adult salmon and their food sources); destabilized terrain and landslides; and wetlands fill or drainage alterations. Timber harvest can also alter forested wetland functions such as flood flow moderation, groundwater recharge and discharge, nutrient pathways, water quality protection, and wildlife and fish habitat (USFS 2008) and resulted in past impacts in the region. Best management practices developed at the Federal and State levels in recent years have reduced impacts to aquatic resources, but residual impacts persist in areas logged decades ago.

To a considerable extent, human activities in population centers, at transportation facilities, and the various resource development sectors have similar impacts on aquatic resources. The remainder of this section presents available information about the extent of impacts to aquatic resources in Southeast Alaska.

Urbanization

Impacts from urbanization are concentrated in the vicinity of the 30-plus communities of Southeast Alaska, particularly the larger towns of Juneau, Ketchikan, Sitka, Petersburg and Wrangell (see map in Appendix C). These communities range from small villages of a few families to Juneau, the regional hub with approximately 31,000 people. As previously noted, about 60 miles, or less than 1 percent, of the shoreline mapped to date has been altered by humans, with an additional 100 miles likely impacted along the two-thirds of the Southeast Alaska coastline yet to be mapped under the ShoreZone project. While the amount of human alteration along the vast coastline is small, much of it occurs within communities where developments have reduced the beneficial functions, services and productivity of streams, muskeg wetlands, forested wetlands, estuaries, mudflats and coastal wetlands. An estimated 9,800 acres of natural habitat (primarily rainforest, muskeg wetlands, and marine shorelines) have been converted by urbanization to largely impervious surfaces (Albert and Schoen 2007). Anadromous fish appear to be especially vulnerable to the amount of impervious cover in a watershed. In a study in the Pacific Northwest, coho salmon were seldom found in watersheds with 10 to 15 percent impervious cover (Luchetti & Feurstenburg 1993).

The Alaska Department of Environmental Conservation (ADEC) conducts ongoing assessments and monitoring throughout the state of certain waterbodies identified as having "impaired" water quality, and the department periodically reports on their status (ADEC, 2008). The ADEC list, in general, reflects community or regulatory agency motivation to address various pollution sources impairing water quality and is not considered an exhaustive catalog of troubled waterbodies statewide. In the early-mid 1990s, several urban streams were identified as impaired waters in Southeast Alaska because of urban and road runoff, land development, gravel mining, failing septic tanks, debris, or landfill: Juneau's Duck, Jordan, Lemon, Pederson Hill, and Vanderbilt Creeks; Haines' Sawmill Creek; Sitka's Wrinklneck Creek/Swan Lake and Granite Creek; and Petersburg's Hammer Slough. Subsequent planning, cleanup, restoration, and local land use actions have improved several of these urban streams so that some or all the original water quality impairments has been reduced or eliminated at Sawmill Creek, Wrinklneck Creek, Granite Creek, and Hammer Slough. State regulatory plans are in place and some improvements have also occurred in Juneau's urban streams, but they remain impaired for various water quality

concerns (low dissolved oxygen, residues, fecal coliform bacteria, turbidity, or sediment). It is likely that additional, unlisted streams in other Southeast communities face similar water quality concerns because of urban development and may receive additional attention in the future.

Timber Harvest, Associated Roads, and Log Transfer, Storage and Processing Facilities

While not generally regulated by the Corps Section 404 permit program, historic timber harvest and associated road construction are briefly discussed in this Framework in order to present a more complete picture of development impacts to aquatic resources throughout the service area. In recent decades, log transfer, storage, and processing facilities have come under Corps and EPA permitting and are discussed below. See the *Transportation* subsection below for estimates of logging and urban road miles and density.

Approximately 767,000 acres of productive forest have been harvested across Southeast Alaska since 1954 (i.e., about 3% of the service area landmass). About 59 percent of the timber harvest occurred on National Forest land and 41 percent on private and state land (USFS 2008, p. 3-350). These harvests are spread across the service area, from Icy Bay in the north to Prince of Wales Island in the south, but some areas of more productive forest were intensively harvested. Other areas are protected as congressionally designated wilderness, or administratively designated roadless or recreation areas. The most intensively logged areas are in the following biogeographic provinces: the North and South Prince of Wales Island, East Chichagof Island, Kupreanof/Mitkof Islands, and Revilla Island/Cleveland Peninsula (USFS 2008, App. E). The ADEC (2008) lists Fubar Creek (Prince of Wales Island), Katlian and Nakwasina Rivers (Baranof Island) as impaired waterbodies due to increased sediment and turbidity as a result of riparian timber harvest, and associated roads or upstream landslides.

Salmon streams where large organic material (logs, branches, and leaves) was mechanically removed as part of a misguided stream restoration effort in the 1970s and 1980s have been very slow to recover the water temperatures, cover characteristics, and nutrient webs necessary for fish habitat. Habitat restoration is expensive, time consuming, and slow, and funds are often lacking especially in remote locations where logging roads are no longer usable. Currently, federal economic stimulus funds, totaling nearly \$5 million, are directed to four Tongass National Forest projects to decommission over 100 miles of roads which have altered natural drainage patterns and damaged wetlands and to replace or remove several deficient bridges and hundreds of culverts in order to reconnect about 370 salmon stream crossings (USFS 2009).

Other timber related activities include the construction and operation of log transfer facilities (LTFs) and log storage areas, the former operation of regional pulp mills closed in the 1990s, and some nearshore remediation work. About 116 LTFs currently exist on the Tongass National Forest. These facilities came under Corps 404 or EPA's Clean Water Act wastewater permitting in recent decades, and significant regulatory oversight has reduced their impacts (NMFS 2005). ADEC (2008) identifies 18 Southeast coastal "impaired" waterbodies where now inactive LTFs and storage areas led to bark and woody debris accumulations that covered and smothered marine benthic communities, created anoxic environments, and otherwise altered the nearshore habitat. Most of these logging facilities, originally listed as impaired in the 1990s after heavy use during the 1960s-1980s, have experienced substantial recovery of the nearshore environment (i.e., reduced or minimal area of bark/debris accumulation) according to dive surveys in 2000-2007 and have been removed from the State's impaired waters list. The following logging related

waterbodies remain listed by the State as impaired: Ward Cove (former pulp mill site near Ketchikan), East Port Frederick, (Chichagof Is.), Herring Cove and Silver Bay (Sitka), and Thorne Bay (Prince of Wales Is.). An estimated 2 acres of impact to marine benthic habitat, on average, occurred at LTFs in the past, but many current timber sale contracts require logs to be directly loaded onto barges and greatly reduce bark and debris entering in the water (USFS 2008).

Transportation

Road Construction. About 5,000 miles of roads occur in the Tongass National Forest, approximately 1,000 of which are on wetlands, including 11 miles in estuaries (USFS 2008, p. 3-45). Because of the decrease in timber production, road construction in the Tongass averaged less than 30 miles annually during the period 1997-2005. Nearly 4,000 miles of roads occur on non-Forest Service (i.e., other federal, State of Alaska, and private) lands. The NMFS (1996) recommends road densities below 2 linear miles per square mile to maintain properly functioning watersheds for coastal salmon. Road density averages 0.19 linear miles per square mile on the Tongass National Forest, whereas lands managed for timber harvest have intermediate road densities, often between 1 and 2 linear miles per square mile. Much higher road densities occur on non-Forest Service lands (i.e., 2.27 linear miles per square mile), with the highest road densities found in urban areas on roads constructed primarily by the Alaska Department of Transportation and Public Facilities (DOTPF) or local municipalities. Wilderness areas, national parks (e.g., Glacier Bay National Park and Preserve), and national monuments (e.g., Misty Fiords and Admiralty Island), and lands designated by the Forest Service for remote recreation represent large, roadless landscapes that contribute to an overall low road density (0.31 linear miles per square mile) across the SEALTrust service area (USFS 2008, p. 3-49).

Airports, Commercial Harbors, and Ferry Terminals. These facilities provide the backbone of intra-regional transportation in Southeast Alaska, with many dating from the 1950s and 1960s or earlier. Twelve communities have airports, and the State maintains 30-plus public seaplane floats throughout the region. The Alaska Marine Highway System has ferry terminals in all major communities, and the Inter-Island Ferry Authority provides service between Ketchikan and Hollis, on Prince of Wales Island. In general, these facilities have been located in and near Southeast communities with associated road access.

Other Coastal Development

Seafood Processing. The remains of old seafood canneries from the early 20th Century can be found throughout Southeast Alaska, with associated wharves, fill, and mechanical debris dotting the coastline. From the first two canneries built in 1878, numbers increased to 30 canneries operating by 1900 and 65 operating by 1924 (Schoen and Dovichin 2007). Intensified fish harvesting led to a serious decline in the salmon fisheries by mid-century and cannery operations declined. Most of these aging structures are in advanced stage of decay, but fill has permanently altered the shoreline and adjacent wetlands while in some cases hydrocarbon wastes and chemicals may continue to release low-level pollution. Today, about 25 seafood processing plants exist throughout the region, with most in or adjacent to communities (Craig, Excursion Inlet, Haines, Hoonah, Juneau, Kake, Ketchikan, Metlakatla, Pelican, Petersburg, Sitka, and Wrangell). With the exception of fairly new Craig, Haines, and Juneau (Auke Nu) seafood

facilities, these seafood plants have been in place for some time with substantial shoreline alteration (fill, wharves, and shoreline armoring).

Currently, seafood processing plants are regulated under the Clean Water Act NPDES permitting by federal and state resource agencies to limit the impacts of waste and wastewater discharges from the plants and fishing vessels on aquatic resources. Increased State (ADEC) and federal (EPA) regulatory attention in recent years has led to better seafood plant handling of their wastes, EPA penalties and fines, and some ongoing compliance issues. The Tongass Narrows offshore of Ketchikan is the only Southeast waterbody listed by ADEC (in 2002) as impaired because of nearshore seafood processing wastes accumulations adjacent to seafood processing plants exceeding their permitted deposition area (ADEC 2008).

Mining. Mining activity in Southeast Alaska dates from the early decades of the 20th century, and the decaying remains and wastes of these small coastal mine sites (wharves, fill, mechanical debris, tailing piles, etc.) can be found throughout the region. Larger mine activities occurred in the Juneau area until World War II, while the Skagway Harbor operated as an ore transshipment port for Canadian Yukon mines in more recent decades. Mining-related activities include exploration drilling, road building, site preparation, surface and underground mining, milling, tailings disposal, waste management, decommissioning or reclamation, and mine abandonment (NMFS 2005b).

Three waterbodies (Skagway Harbor and Pullen Creek in Skagway and Klag Bay on west Chichagof Island) are listed by the ADEC (2008) as impaired waters because of metals pollution from mining activities. The EPA recently recommended the Salt Chuck Mine, operated on Prince of Wales Island into the 1940s, as a superfund site needing cleanup because of arsenic and heavy metal contamination from waste rock disposal in Kasaan Bay (Juneau Empire, 2009). Active mine sites today are fairly limited, with the Greens Creek Mine (Admiralty Island) in operation, Kensington Mine (mainland, north of Berners Bay) in development, and a handful of sites being explored in 2008 or 2009: Bokan Mountain (Ketchikan), Niblack Mine (SE Prince of Wales Island), Palmer project (Haines), CJ project and Mount Andrew project (Prince of Wales Island), Geohedral project (Yakutat), and airborne surveys of Duke Island near Ketchikan (Szumigala and Hughes 2009). Exploratory mine sites can be limited to helicopter-supported, upland drill sites or barge-supported coastal sites, such as the Niblack Project with a permitted 5.5 acre footprint including intertidal landing and barge camp site.

Hydropower. Hydropower production has a long history in Southeast Alaska, with over 30 developed water power sites (mostly for industrial operations) in place in 1908 (Alaska Energy Authority 2009). In recent decades, hydropower energy installations have resulted in some unavoidable impacts to aquatic habitats (riverine, coastal and forested wetlands, estuarine) from dam, penstock, powerhouse, or associated road and submarine cable or transmission line construction activities. About 25 existing large and small hydropower sites serve communities in Southeast Alaska (Appendix D). The Southeast Intertie Project, an intra-region power grid, consists of existing and proposed connections via above-ground and submarine transmission lines primarily from the relatively large hydropower sites (dams) supplying power to Juneau, Ketchikan, Sitka, Wrangell, and Petersburg to some smaller communities or mine sites otherwise reliant on diesel-fired power generation. For example, a high-voltage power line and a submarine cable constructed in 2006 extend Snettisham hydropower from west Douglas Island under Stephens Passage to service the Greens Creek Mine on Admiralty Island. The transmission line

clearing impacted some forested wetlands, while the submarine cable landfall occurred at cobble-boulder beaches. To date, much of the interagency attention has focused on hydropower project impacts to anadromous fish and reduced sediment transport in river systems. In 2006, however, SEALTrust received an in-lieu fee as compensatory mitigation for an intertidal fill in the Lake Dorothy Hydro project FERC (Federal Energy Regulatory Commission) licensing.

Tourism. To a limited extent, remote sites have also been developed for resort fishing lodges or as a tourism destination. One example is the Icy Strait Point development opened in 2004 on Huna Totem Native Corporation lands at the 1930s-vintage Hoonah Packing Company Cannery at Pt. Sophia on northern Chichagof Island. Elfin Cove, a tiny unincorporated community also on northern Chichagof Island, experienced private development of several fishing lodges in the 1990s with only minimal State oversight of wastewater systems. Elfin Cove has been nominated for a State assessment due to potential concerns about water quality, but is currently ranked as a lower priority by State regulatory agencies (ADEC 2008).

In general, aquatic resource functions have been affected most intensively within and around the larger communities of Southeast Alaska and at heavily utilized areas of timber production. The landscapes around many medium or small-sized Southeast communities are dominated by altered habitat resulting from past timber harvest and impacted by roads built primarily to facilitate that timber harvest. Away from urban centers and timber production areas, long reaches of wild shoreline and large areas of pristine rainforest, alpine tundra, and ice fields occur. The SEAL Trust ILF Program intends to compensate for unavoidable impacts to aquatic resources that are most likely to occur primarily in the areas of concentrated human development and at the occasional remote site development for hydropower, mining, tourism activities, and intra-region hydropower sites, power transmission lines and highways.

VI. Potential Future Threats to Aquatic Resources

Mitigation Rule: 33 CFR 332.8(c)(2)(ii) A description of the threats to aquatic resources in the service area, including how the ILF program will help offset impacts resulting from those threats.

From a regional perspective, the potential future threats that aquatic resources face depend on the extent that resource development (timber harvest, mining, energy, and small-scale activities), intraregional highway and power transmission, and community redevelopment or expansion occur. In general, future community and resource developments in Southeast Alaska -- and the associated, unavoidable impacts to aquatic resources -- are likely to be similar to those that have occurred in the past. We do 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 in the previous section are also those that may occur in the future, although the extent, severity and duration of future impacts may be minimized as a result of improved scientific knowledge, enhanced developer cooperation, increased community land use planning, and targeted regulatory actions. 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, nearshore aquatic resources heretofore not experienced in Southeast Alaska (see subsection Hydrokinetics (Ocean Projects)).

For this compensation planning framework, potential threats to aquatic resources from larger-scale (known or likely) development or projects are summarized by activity types (urbanization, timber harvest, transportation, and energy/hydropower and regional power transmission lines). Individual projects in the larger urban areas, which can cumulatively have permanent and localized impacts, are considered under the urbanization discussion. Smaller-scale or localized threats from remote projects (e.g., mining, tourism, aquaculture, etc.) are briefly noted but not analyzed in depth because of their size, less certain status, or because they are not likely to occur in significant numbers. Although important because of localized impacts, the cumulative impacts of smaller-scale or dispersed projects are harder to characterize on a regional basis. Non-point source threats, such as marine debris or the spread of invasive, non-native species, are briefly considered but SEAL Trust would likely only address these when considering a specific property as a potential mitigation project.

As in the section on historic aquatic resource losses, we include discussion of some future activities not regulated by the U.S. Army Corps of Engineers. These threats contribute to the cumulative effects to aquatic resources in the service area, and knowledge about their location and impacts can help to focus SEAL Trust's attention on preservation opportunities on private lands in particular watersheds, areas, or aquatic habitats. Where opportunities arise and make sense, in-lieu fees may be used to protect aquatic resources on lands adjacent to non-regulated development activities such as timber harvest or associated road construction. See the Prioritization Scheme for Selecting and Implementing Projects section for further information.

Resource development in the region will be driven by economic feasibility measured against global markets. For example, Southeast Alaska timber activity will likely occur at modest levels sufficient to supply specialty, local and niche markets because world economics point toward less expensive sources for large-scale timber production (Schoen and Dovichin 2007). As noted previously a few mine prospects are being explored, but mining economics can be brutal and result in shelved projects such as the Tulsequah Chief Mine project in the Canadian portion of the Taku River watershed demonstrated in early 2009. Remote hydropower, tourism, and aquaculture sites are likely to be developed as energy economics, public funding, and global or niche markets dictate.

Larger-Scale Projects

Urbanization

Because of the relative remoteness of Southeast communities and the high proportion of federal and state public lands throughout the region, the effects of urbanization in Southeast Alaska will likely remain localized. A prime driver of community expansion is population growth which is actually projected to decline in all Southeast Alaska census areas except Juneau over the next 20 years (Alaska Department of Labor, 2007). Significant population *declines* are projected for the Haines Borough (30%), Ketchikan Gateway Borough (16%), Prince of Wales Island/Outer Ketchikan area (29%), Skagway-Hoonah-Angoon area (36%), and Wrangell-Petersburg area (16%). The regional population of about 70,000 may decline 7% to about 65,000, while Juneau's population is anticipated to increase a modest 5% to about 32,000 during the period 2006-2030, in part due to intra-regional migration from smaller communities.

In the region as a whole and at the individual community level, future public funding is likely to focus primarily on the rehabilitation and maintenance of existing roads, streets, water/sewer utilities, docks/harbors, airports and public buildings, rather than substantial new construction of public infrastructure as occurred in past decades. The economic vitality of communities will largely determine the amount of private capital invested in new homes, commercial buildings, etc. in the future. According to the latest figures, the 2006 per capita personal income in Southeast census areas is comparable to or slightly higher than the Alaska statewide average, with the exception of the Prince of Wales/Outer Ketchikan area. As a whole, the Southeast region is forecasted to lose about 350 jobs in 2009, which is not particularly large by historical standards, but preliminary employment figures show 555 fewer jobs August 2009 (year-to-year) for the Southeast region (Alaska Department of Labor and Workforce Development, September 2009). As noted by the AK Dept. of Labor/Workforce Development (January 2009), ~~the~~ loss of about 1% of the total job count isn't a significant departure from the long-term trend for the region." Looking forward, fairly stable government and fishing employment provide the regional economy some insulation from external events affecting the other two engines of the Southeast economy – tourism and mining. With the exception of the Kensington Mine, no major resource developments are forecasted that would fuel significant growth in the Southeast economy or population in the foreseeable future.

To the extent Southeast communities expand or are renewed in the future, there is likely to be an increase in impervious surfaces (new/rehabilitated roads, building roofs, bridges, and parking lots) and continued loss of riparian, wetland and shoreline habitat and vegetation. In addition to the unavoidable impacts to aquatic resources, other valuable functions (open space, recreation, drinking water protection) may be compromised and diminish a community's aesthetics or livability. The SEAL Trust has a practice of working within individual Southeast communities to help develop solutions that preserve functioning aquatic resources as well as protect these less tangible but important community values. As the regional in-lieu fee program sponsor, SEAL Trust will continue to focus first at the community level to identify compensatory mitigation projects that ameliorate local aquatic resource losses from a community's renewal or expansion. If local preservation opportunities are not available in a timely manner, SEAL Trust intends to look farther afield in adjacent biogeographic provinces for properties that may preserve important aquatic resources.

Transportation

Airport Construction or Expansion

Airport reconstruction and expansion activities are likely to occur at the 12 existing airports located near the larger Southeast communities, although activities could also occur on a much smaller scale near remote mine sites, energy projects, or at the existing 30-plus public seaplane floats. The Southeast Alaska Transportation Plan (Alaska DOTPF 2004) identifies one new airport (Angoon) and two new public seaplane floats (Edna Bay, Kosciusko Island and Naukati, Prince of Wales Island). The Airport Improvement Program Project Schedule (2008-2010), funded by the Federal Aviation Administration, includes airport expansion projects underway or now completed in Gustavus, Hoonah, Juneau, Ketchikan, Petersburg, Sitka, and Wrangell. The Southeast Region Airport System Plan (Alaska DOTPF, 2008) identifies future airport projects on State or local funding lists or plans for Haines, Kake, and Klawock.

In this region characterized by high mountains and high precipitation, airports require development of wetlands - the large, flat and open places. The scale of unavoidable impacts from airport expansion projects can be significant, such as the permanent loss of fish and marine biota habitat from tidal fill at Sitka's airport and of high-value fish and bird habitat from wetland fill at Juneau's airport. Seal Trust provided mitigation alternatives for Juneau's airport and has proposed a mitigation project for Sitka's airport. As noted above, Angoon is slated for a new airport, and the currently proposed alternative sites will impact varying amounts of aquatic resources (wetlands, anadromous streams, eelgrass beds). SEAL Trust is monitoring the NEPA process underway for the Angoon airport and may be involved in the discussions of compensatory mitigation likely to be required under the project's Section 404 permitting. To be clear, the Corps (in consultation with federal resource managers) would determine the amount of compensatory mitigation required, whereas SEAL Trust would identify the cost to replace aquatic resource losses under the 2008 Mitigation Rule. If SEAL Trust were to receive the in-lieu fees for the Angoon airport project compensatory mitigation, we would first look for private properties in the Angoon area and elsewhere on Admiralty Island or private inholdings in the Admiralty Island National Monument that might satisfy the compensatory mitigation for the Angoon airport project.

Surface Transportation: Commercial Harbors & Ferry Terminals

Because many of Southeast Alaska's harbors and some ferry terminals have aging infrastructure, projects addressing maintenance, upgrades and reconfiguration (e.g., for new ferry designs) can be expected in the future (Alaska DOTPF 2008). Existing commercial harbors and ferry terminals are generally located in or near population centers, and most are likely to remain so. The Southeast Alaska Transportation Plan (SATP) (Alaska DOTPF 2004) proposes a few new ferry terminals over the near term (10 years) and long term (20 years), coupled with new highway segments and greater use of smaller, more efficient ferries and shuttles as aging mainline ferries are replaced. In July 2009, the Alaska DOTPF initiated planning to update the 2004 SATP and makes planning assumptions that 1) limited funding (\$25 million/year) will be available for new terminals and extended/new roads throughout the entire Southeast Alaska region and 2) there will be continued public pressure for additional road connections and shortened ferry routes, where practical. The scoping process identifies the near-term development of the Katzeihin River terminal near Skagway, long-term potential for a new ferry terminal at Warm Spring Bay (Baranof Is.) and new end- or front-loading facilities at existing ferry terminals. The Alaska DOTPF Draft Statewide Transportation Improvement Program (STIP) document (August 2009) identifies specific, near-term projects for surface transportation (ferries, ferry terminals, and roads) under traditional Federal Highway Administration funding during the next four years (2010-2013). The Haines, Hoonah and Skagway ferry terminals are listed for upgrades and modifications during this period.

Commercial harbors, barge facilities, small-boat harbors and associated shoreline development are typically owned and maintained by municipalities or private corporations, rather than the Alaska DOTPF. In recent years, local harbors have relied on relatively modest municipal funding for improvements. However a new funding source provides some Southeast communities with significant help in overhauling, upgrading, and expanding their commercial waterfront. As a result of a 2006 initiative, the state now collects about \$45-50 million each year in taxes on cruise ship passengers disembarking in Alaska ports, and much of this money is distributed to Southeast Alaska communities through the State's annual capital budget for local facilities

supporting cruise ship traffic and passengers. In the current fiscal year (FY 2010), several Southeast communities received funding for commercial waterfront projects, which (to date) are primarily geared toward rehabilitation of commercial docks generally within the original shoreline footprint.

The rehabilitation of these aging shoreline transportation facilities will lead to some unavoidable impacts to marine and intertidal aquatic resources. Given the limited private ownership of undeveloped shoreline in the region and the high cost of waterfront property, loss of shoreline habitat to waterfront development will present a challenge for in-kind compensatory mitigation. SEAL Trust intends to continue its efforts at outreach to Southeast communities to identify high-value coastal properties for public ownership and/or access, and will actively seek to identify willing landowners of such suitable properties. Regular review of real estate listings in the region is another way to proactively identify potential properties.

Surface Transportation: Highway Construction

As in recent years, most highway projects in the foreseeable future will focus on rehabilitation, maintenance, repaving, realignment, etc, of existing highways, rather than construction of new highways in the Southeast region. The above-mentioned Draft STIP (August 2009), released for public comment by Alaska DOTPF, identifies highway reconstruction, widening, and rehabilitation projects for Haines, Juneau, Ketchikan, Hyder, Sitka, Kake, Petersburg, and Wrangell during the 2010-2013 period. The 2009 federal economic stimulus funding was directed to several Southeast transportation projects that were already designed and ready to go. For example, a Hoonah Ferry Terminal upgrade and expansion project will fill about 1.6 acres of adjacent shoreline to accommodate a new terminal, storage, and parking, while the offshore mooring will be upgraded to accommodate a greater variety of ferries. As the permittee, the Alaska DOTPF sometimes provides its own Section 404 compensatory mitigation projects but may also rely on SEAL Trust through payment of in-lieu fees, as it has done in the past.

In addition, the Southeast Alaska Transportation Plan July 2009 Update scoping document identifies three near-term, new highway projects:

- Juneau Access (about 58 miles - Echo Cove to Katzechin River, currently in litigation),
- Kupreanof Highway (about 60 miles - Kake to Petersburg, received Alaska FY 2010 funding and is in reconnaissance with the NEPA process anticipated to begin in 2010), and
- Revillagigedo Highway (about 12 miles - Ketchikan to Shelter Cove, funded under the 2008 State transportation bond initiative and preliminary engineering is underway).

Depending on the outcome of the update process and availability of highway funding long term, the SATP July 2009 Update also identifies the following potential future highway additions:

- Baranof Island (Sitka to Warm Spring Bay),
- Chichagof Island (Pelican - Hoonah Road),
- Kupreanof Highway expansion (Kake to Totem Bay),
- North Prince of Wales Island Highway expansion to Red Bay,
- highway connections to shuttle ferries between Ketchikan and Wrangell, Petersburg and the Cassiar Highway in British Columbia, and
- a Mid-region Access to the continental highway system via British Columbia (Bradfield Road).

If developed, these large, remote projects could result in substantial, unavoidable loss of freshwater and marine aquatic resource functions due to large amounts of fill, bridge crossings, culvert placements; introduction of invasive, non-native plants and aquatic organisms, and water pollution from pollutant runoff. As occurred during the Section 404 permitting of the Juneau Access, SEAL Trust will track these regional highway projects as they may develop and cooperate with Alaska DOTPF, the Corps and other IRT regulatory agencies in the compensatory mitigation process when requested.

Energy/Utility Projects

The Alaska Energy Authority prepared the Renewable Energy Atlas of Alaska (2007) which examines potential alternative energy for the Southeast region, and the Alaska Energy Plan (2009) which explores alternative energy potential for each Alaska community. In the Southeast region, the primary energy source as an alternative to diesel generation will continue to be hydroelectric power. According to the Atlas, other potential energy resources, either in specific communities or once economic hydropower sites and intra-regional transmission lines are constructed, include:

- geothermal (Baranof Island and the mainland north of Ketchikan and east of Petersburg),
- tidal (North Inian pass and South Passage (Icy Strait), and a few other sites with less potential (South Inian Pass, Sergius Narrows, Kootznahoo Inlet, Wrangell Narrows (Turn Point, South Ledge, and Spike Rock), and Prince of Wales Is. (Tonowek Narrows and Tlevak Narrows)),
- wind (fair to good potential but at remote mainland sites (Glacier Bay, north of Juneau, and central SE), and
- biomass potential primarily from sawmill wood waste throughout the region.

Hydropower and Power Transmission Lines

The Alaska Renewable Energy Fund, established by the Alaska Legislature in 2008 and administered by the Alaska Energy Authority (AEA), provides a new source of funding to Southeast municipalities and utilities for power projects in the region. Appendix D identifies 25 proposed sites near enough to communities and screened by AEA's hydroelectric technical team in 2008 as having hydropower potential. Significant Alaska Renewable Energy funding in 2009 and 2010 supports work ranging from feasibility/reconnaissance studies to construction on several of these potential hydro sites.

Appendix D also identifies existing and proposed power transmission lines as part of the long-range Southeast Intertie Project which seeks to provide relatively inexpensive and renewable hydropower among Southeast communities through reliable transmission line interconnections as state or federal funding is secured. Separate from the Alaska Renewable Energy Fund source, other state funds in FY2010 are directed at the Kake-Petersburg Intertie and a northern segment of the Prince of Wales Intertie (Coffman Cove-Naukati). The Kake-Petersburg Intertie is expected to generally follow the same route as the North Kupreanof Highway (Kake-Petersburg) and use the routes of old Forest Service logging roads to the extent practicable. These intra-regional transmission lines can impact wetland, riverine, and shoreline aquatic resources over substantial distances. For example, The Kake-Petersburg Intertie Study Update (D. Hittle & Associates 2009) estimates that the approximately 60-mile northern route would disturb

vegetation on nearly 1,400 acres, including 300 acres of forested muskeg, and cross 32 anadromous fish (Class 1) streams and 22 resident fish (Class 2) streams.

Hydropower installations and power transmission lines (dams, lake taps, and associated penstock, powerhouse and transmission line construction) can lead to aquatic resource impacts if they block up- and downstream fish migration or reduce flows in bypass reaches and diversion structures, reduce sediment transport in rivers, and alter wetlands, streams, or marine shorelines. In the near future, SEAL Trust anticipates monitoring the NEPA process for the Kake-Petersburg Intertie transmission line, which is slated to begin in 2010 and may be coupled with the Northern Kupreanof Highway NEPA process. As the regional ILF Program sponsor, SEAL Trust may be in a position to accept fees in lieu of mitigation for these developments and then proceed to secure conservation easements or properties to help offset unavoidable impacts.

Other Energy Projects

Hydrokinetic (Ocean) Projects. As noted above, a few sites in Southeast Alaska have some potential for tidal energy. According to August 2009 FERC records, one hydrokinetic (tidal power) preliminary permit was issued for the Angoon Tidal Power 2.0 megawatt (MW) project in Kootznahoo Inlet. A second preliminary permit is pending for the 0.4 MW Port Frederick Tidal Power in North and South Bights of Port Frederick near Hoonah. Neither project received State Renewable Energy funding in 2009 or 2010.²

Such ocean kinetics power projects may create impacts to aquatic resources through disturbance to the seabed and shoreline and associated benthic or intertidal communities, noise, and alteration of nutrient and sediment transport that affects the physical or chemical makeup and may diminish biological productivity, and pose an entanglement threat to marine mammals. Excavation for and placement of structures or submarine cables in nearshore locations could affect species movement and migration, and these activities might invoke Section 10 Corps permitting if navigation were affected. The landfall for submarine power cables would alter the shoreline through trenching, clearing and placement of upland power station infrastructure.

Geothermal – No larger-scale geothermal projects are currently under consideration in Southeast Alaska, whereas small-scale ground source heat pump projects received State Renewable Energy funding in 2009 and a project to install geothermal coils in an intertidal area in Tee Harbor near Juneau was reviewed for permitting. The new Juneau Aquatic Center and Juneau Airport expansion include ground source heat systems, but these energy projects will not create additional impacts as they occur within the existing building footprint.

Communication Cables

Placement and maintenance of underwater communication cables have the potential to physically disturb benthic invertebrate and fish habitats. The ILF compensatory mitigation would likely

² Another firm, Alaska Tidal Energy Company, had three FERC preliminary permits issued in 2007 for tidal projects in Icy Passage and Icy Strait, Gastineau Channel, and Wrangell Narrows. However, these tidal project permits no longer appear on FERC's list, perhaps reflecting the company's lack of success in attaining State Renewable Energy funding in 2009 for its application to examine tidal feasibility near Gustavus, Angoon, and Wrangell. Another project seeking State funding in 2009 (unsuccessfully) was submitted by Yakutat Power utility for a wave energy conversion study.

primarily focus on landfall impacts along the shoreline. To the extent practicable, communication cables could be placed adjacent to power transmission cables for joint maintenance and security capabilities.

Timber Harvest & Forest Restoration

New timber road construction is currently anticipated to be less than 30 miles per year on average (USFS TLMP 2008 Revision EIS). Prince of Wales Island, the Petersburg and Wrangell areas, and northeastern Chichagof Island are currently at greatest risk of potential threats to aquatic resources from continued logging activities.

Smaller-Scale or Remote Projects

Mining. The 2009 exploratory mining activity is comparable to that of 2008, despite difficulties companies have had obtaining financing for base metals work during the current economic recession. The exploratory project which appears to be the most advanced of the Southeast prospects is the Niblack project on southeast Prince of Wales Island (Szumigala, personal communication). Also, Geohedral LLC recently estimated that the nearly 60,000 acres of claims it holds and is exploring on Forest Service lands near Yakutat could yield nearly 35 million ounces of gold (Juneau Empire, 2009). Future mining activity in the Southeast region is largely contingent on worldwide demand and the pricing of gold or base metal commodities. While not subject to Corps mitigation, some Canadian mine prospects along the Stikine River (Galore Mine) and Unuk River (Kerr-Sulphurets-Mitchell) could have downstream water quality impacts in Southeast Alaska.

Mine prospects that lead to development typically involve Corps 404 permitting of remote sites on federal lands, where adjacent private land available for compensatory mitigation projects would be scarce. The SEAL Trust would endeavor to find properties in the vicinity of the development but realistically will have to look farther afield to find property with comparable aquatic resources for preservation.

Tourism. New remote tourism lodges or developments to satisfy potential demand for ecotourism niche markets in the future could cause localized impacts to aquatic resources. For example, Sealaska Native Corporation is seeking federal legislation to complete its Alaska Native Claims Settlement Lands selections, including some remote coastal sites for small-scale tourism.

Seafood Processing. Most existing seafood processing facilities in Southeast Alaska are operational today, although a few in Hoonah, Kake, and Pelican have experienced periods of inactivity in recent years. Only three new facilities (Haines, Auke Nu (Juneau), and Craig) have begun operations in recent years. Additional new seafood processing facilities are not anticipated in the Southeast region.

Aquaculture. Aquaculture is the breeding, rearing, and harvesting of plants and animals in all aquatic environments, including ponds, rivers, lakes, and near- and off-shore ocean areas. 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. No new fish hatcheries are 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. Marine algae (seaweed) cultivation has been conducted experimentally and may have potential in Southeast Alaska (Walker, personal communication).

Shellfish aquaculture projects potentially could occur anywhere in Southeast Alaska where growing, tending, and harvesting conditions 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. Current demand exceeds supply for Alaska farmed shellfish products (primarily oysters) and is leading to a surge in aquatic farming lease applications primarily in Southeast Alaska under the 2009 State biennial solicitation (Cynthia Pring-Ham, personal communication). Current aquatic farm leases and 2009 lease applications are centered primarily on Prince of Wales Island in southern Southeast Alaska. In addition, the State has identified 42 sites in coastal Southeast Alaska that are available as potential shellfish farm locations through its over-the-counter lease program. However, shellfish farms in Southeast Alaska leave little footprint on the shoreline as the floating operations generally do not entail shore-based structures.

General Non-point Source Impacts on Aquatic Resources. While generally not mitigated within Section 404 permitting and a compensatory framework such as SEAL Trust's which focuses on aquatic resource preservation, certain non-point source pollution would receive some attention as we considered potential mitigation projects. Initial investigations of prospective properties would look for invasive non-native species and marine debris in addition to hazardous contaminants as part of a field-based environmental assessment. Invasive, non-native plant and animals, once introduced into an area, can rapidly cause environmental harm because they typically have no natural predators, reproduce quickly, form monocultures by out-competing native species, and alter natural habitat conditions. Invasive species on the west coast of North America or already in Alaska have the potential to disrupt the functions and integrity of Southeast Alaska's aquatic environment. If an invasive species were identified on a prospective property, SEAL Trust would be inclined to look elsewhere unless other overriding conservation values supported the property purchase. In that case, SEAL Trust might undertake eradication efforts to remove the invasive species and anticipate a vigilant monitoring/management protocol. Similarly, marine debris at a prospective coastal mitigation project site would be assessed during an initial field investigation. If the property was otherwise deemed valuable habitat for preservation, SEAL Trust may pursue cleanup of shoreline debris, as it poses an ongoing threat to fish, birds, marine mammals, and other animals.

With a general understanding of historic loss and future threats to aquatic resources, we now turn our attention to SEAL Trust goals and objectives as an ILF program sponsor.

VII. Aquatic Resource Goals and Objectives

Mitigation Rule: 33 CFR 332.8(c)(2)(v) A statement of aquatic goals and objectives for each service area, including a description of the general amounts, types, and locations of aquatic resources the program will seek to provide.

The SEAL Trust's objectives for its ILF program in Southeast Alaska are:

1. Preserve valuable aquatic habitats that provide important functions and support the ecological health and sustainability of a watershed, through the acquisition of properties (fee simple title) or property rights (conservation easement). As a secondary focus and as opportunities arise, SEAL Trust may also work in partnerships on the restoration, enhancement, or creation of valuable wetlands.
2. Acquire valuable aquatic habitats where imminent development would lead to a loss of those habitats, impair the overall ecological health of a watershed, and conflict with community land use goals.
3. Identify and acquire properties to meet compensatory mitigation obligations in an efficient and timely manner, so that SEAL Trust's role as the ILF program sponsor in Southeast Alaska helps reduce conflicts between conservation and development, facilitates regulatory action and permitted development, and yields effective and high-quality preservation.
4. Use scale efficiencies to aggregate the impacts from smaller, individual projects within the service area into mitigation through larger properties with greater ecological value.
5. Seek properties adjacent to or within Southeast communities or remote "gems" (often private land originally platted as homesteads in the early-mid 1900s) that provide functions similar to the impacted area which is typically the accessible, low-gradient and high-value shorelines (mudflats and estuaries).
6. Provide public benefit by directing mitigation resources toward the preservation of high-value habitats that also offer open space, passive recreation, drinking water protection, and other services to Southeast communities.
7. Develop a mitigation site selection process that is ecologically based and relies on the best available information.
8. Work efficiently and in a transparent manner with the Interagency Review Team to implement mitigation projects.
9. Provide an efficient and timely accounting of in-lieu fees and mitigation projects.
10. Provide long-term and permanent protection of valuable aquatic habitats on acquired properties through SEAL Trust's legal instruments and stewardship on properties we retain or properties transferred to a local or state land management agency.

Within the context of the Corps jurisdiction over activities in the waters of the U.S. (as defined in 33 CFR 328.3; Appendix A) and the 2008 Mitigation Rule focus on watershed-based mitigation, SEAL Trust will direct its ILF Program efforts on the following aquatic resource types (and associated upland buffers), ranked according to their high-value functions and relative scarcity in Southeast Alaska:

1. tidally influenced: sloughs, salt marshes, and estuaries;
2. tidally influenced: mudflats, sand flats, other beach types and tidelands;

3. non-tidal: freshwater lakes, ponds, streams, rivers and their tributaries;
4. non-tidal: wet meadows (bogs and fens); and
5. non-tidal: forested wetlands.

Throughout Southeast Alaska, coastal watersheds that could experience future Corps-permitted impacts contain the freshwater and marine features above. Estimates of the acreage in these types were previously provided in Table 3. Further, Table 4 provides estimates of the extent of high-value mudflats and estuaries found along the coastline of Southeast Alaska. While the territorial seas (ocean waters within 3 miles of shoreline) are also considered waters of the U.S. under Corps permitting jurisdiction, SEAL Trust does not anticipate having the ability to acquire ocean habitats for in-kind mitigation. If compensatory mitigation is required for a permitted activity in these nearshore waters, SEAL Trust intends to seek approval for out-of-kind mitigation projects, unless some unforeseen in-kind mitigation opportunity arises. Given the relative scarcity of private property and the human land use patterns in Southeast Alaska, available waterfront real estate (types #1 and 2 above) is often characterized by relatively small parcels, developed property, and high real estate costs.

The SEALTrust recognizes that its ILF Program, as an agent for identifying and preserving valuable resource lands to offset Section 404 permitted impacts to aquatic resources, must effectively operate within the context of the Southeast Alaska region as a whole. Multiple land ownership, management systems, and conservation goals create a mosaic of priorities, goal and objectives within which SEALTrust will strategically carry out its ILF Program.

Landownership in Southeast Alaska provides a defining background to regional goals and objectives with respect to aquatic resources (Figure 3). Nearly 92% of lands is owned by the federal government, with preservation objectives (Glacier Bay National Park 12.5% and Tongass National Forest wilderness areas 30%) or multiple use objectives (non-wilderness Tongass National Forest 47% and BLM 2%). State of Alaska public lands (4.5%) are primarily open to multiple uses, but this acreage also includes Alaska Mental Health Trust lands that are primarily managed for profit through land sales or development. The remaining lands (less than 4% of the total) are owned primarily by ANCSA Native Corporations (2.7%), with a small portion owned by municipalities and less than 1% privately owned. These properties fall under an array of land use goals and objectives. SEAL Trust's ILF Program efforts will focus on lands that meet SEAL Trust's goals and objectives and will primarily draw from the roughly 186,000 acres of privately owned lands in Southeast Alaska. To the extent practicable, SEAL Trust will also investigate opportunities on Mental Health Trust lands, although previous efforts in the Ketchikan area met with mixed success.

Key landowners and regional players have differently scaled but complementary conservation approaches in Southeast Alaska:

A Watershed in a Local Scale: The major landowners at a local scale include municipalities and ANCSA Native Corporations. As part of its organizational mission, SEALTrust seeks to work with communities to select preservation lands. Through land use planning, individual Southeast communities may have identified public or private lands that would fulfill or augment their protected open space needs, water supply protection interests, or other community land use protection goals. To date, Native Corporations have held onto their ANCSA lands as legacy property, with no opportunity for SEALTrust ILF acquisition of lands through purchase or

conservation easement. However, land protection that could support Native objectives on Corporation lands may present opportunities in the future.³

Regional Scale: The Forest Service, in the Tongass Land Management Plan (TLMP 2008), identifies various sized conservation areas, watershed, and sub-watershed scaled reserves, and habitat patches for protection in the 17 million-acre Tongass National Forest. As noted previously, the TLMP identifies 926 Value Comparison Units (VCUs) in both timber development and protected areas, and which generally encompass a drainage basin (watershed) with one or more large stream system and associated estuaries and adjacent marine habitats. Congressional designations also protect about 6.5 million acres as wilderness areas, and another 2.7 million acres are protected in national parks and preserves. In keeping with its overall ILF Program objectives, SEAL Trust will work with federal management agencies to identify watershed properties that offer high-value compensatory mitigation and occur adjacent to the lands owned and managed for conservation by the U.S. Forest Service, Bureau of Land Management, and National Park Service.

The State of Alaska's several land use plans in Southeast Alaska also provide general guidance on its approach to its public lands: Prince of Wales Island Area Plan (1998, 2008), Central/Southern Southeast Area Plan (2000), Northern Southeast Area Plan (2002), Juneau State Area Plan (1993), Haines State Forest Management Plan (2002), and Chilkat Bald Eagle Preserve Management Plan (2002). SEAL Trust can use these plans as an information source and sub-regional tool when investigating potential properties for preservation.

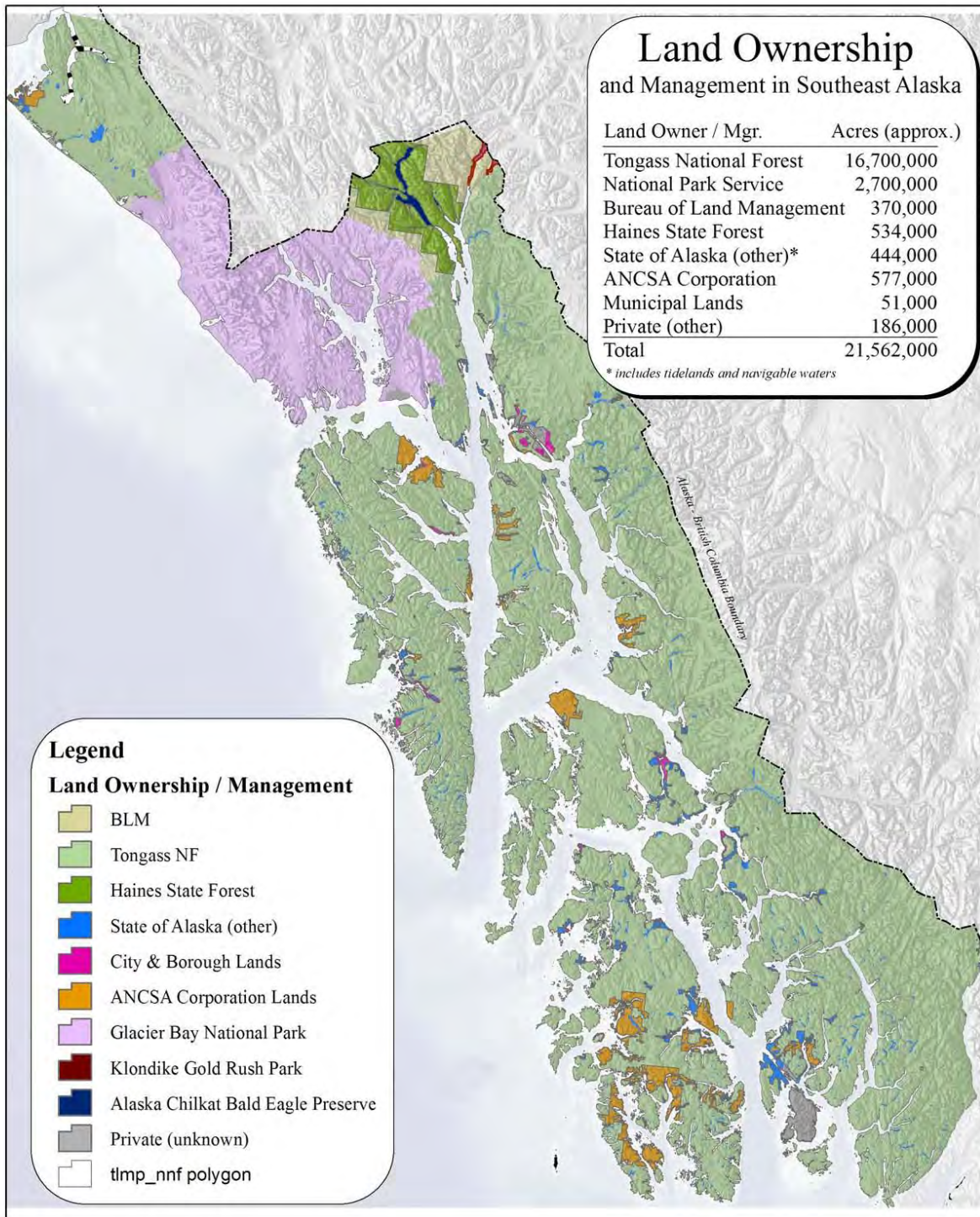
In The Coastal Forests & Mountains Ecoregion in Southeastern Alaska and the Tongass National Forest, Schoen and Dovichin (2007) suggest that the Forest Service conservation approach for the Tongass National Forest should be refined to protect some remaining intact, high-value watersheds in forest development areas, rather than rely primarily on protecting smaller habitat patches within these VCUs/watersheds. Further, they propose that instead of evenly distributing timber cutting and road building throughout a development area, the Forest Service should concentrate impacts to minimize fragmentation of habitat. From a regional perspective, some of these watersheds have experienced substantial timber activity but still retain core areas of biological value that should be protected as timber production continues under the Forest Service's "integrated management" approach.

Within an analytical framework of the 22 biogeographic provinces of Southeast Alaska (Figure 2), Schoen and Dovichin (2007) rank the provinces for regional conservation goals based on their evaluation of high-value ecological systems (large-tree forests and estuaries) and focal species (salmon, brown and black bears, Sitka black-tailed deer, and marbled murrelet). SEAL Trust will consider these rankings and supporting data among the factors noted for mitigation project evaluation. The objective of this analysis has been to provide an additional tool for resource agencies and organizations to use in their conservation actions:

- Relative biological value - assesses the contribution each biogeographic province provides to the region-wide distribution of the focal species and high-value ecological systems. The top five ranked provinces are the: North Prince of Wales Island, Admiralty

³ In September 2009, Alaska U.S. Senator Mark Begich introduced S. 1673. This legislation would allow Alaska Native Corporations to voluntarily place permanent conservation easements on their land and receive a federal tax credit, as currently is allowed for farmers and ranchers.

Figure 3. Land Ownership and Management in Southeast Alaska (Schoen and Dovichin 2007)



Island, E. Chichagof Island, Revilla Island/Cleveland Peninsula, and Stikine River/Mainland.

- Ecological condition – examines changes to the habitat conditions of the focal species and high-value ecological systems because of past development impacts. The provinces that experienced the most change are: North Prince of Wales Island, E. Baranof Island, E. Chichagof Island, Etolin/Zarembo/Wrangell Islands, and Kupreanof/Mitkof Islands.
- Conservation status – estimates the degree of conservation afforded under all protections for focal species and high-value ecological systems. The provinces with the least conservation protection are: Chilkat River Complex, Kupreanof/Mitkof Island, North Prince of Wales Island, Etolin/Zarembo/Wrangell Islands, and E. Chichagof Island.
- Cumulative ecological risk to biodiversity and ecosystem values – estimates the combined effects of past development and future change, based on current management designations and landownership, on the focal species and high-value ecological systems. The provinces with the greatest ecological risk are: Chilkat River Complex, North Prince of Wales Island, Kupreanof/Mitkof Islands, Etolin/Zarembo/Wrangell Islands, and E. Chichagof Island.

Global Scale: Preservation is also focused on the biological diversity and ecological integrity of the temperate rainforest that extends from northern California through Southeast Alaska - the most intact temperate rainforest in the world. The northern portion in Southeast Alaska contains most of the pristine lands and intact watersheds within this global-scale rainforest. Schoen and Dovichin (2007) provide a large-scale and integrated conservation strategy, and argue that high-value watershed-scale protection will maintain the natural range of forest types, minimize habitat fragmentation, reduce logging road and highway impacts, and maintain ecosystem integrity throughout the region. One of their overarching goals is the protection of geographically dispersed landscapes of sufficient size to maintain the overall ecological integrity and productivity in Southeast Alaska, recognizing that the region's ecosystems are naturally fragmented by steep glacial terrain and isolated both within islands and from the North America continent by mountains and ice fields along the coastal mountain range (Cook et al. 2001).

VIII. Strategy for Selecting and Implementing Mitigation Projects

EPA/Corps Guidance: the rule emphasizes that the process of selecting a location for compensation should be driven by assessments of watershed needs and how specific wetland restoration and protection projects can best address those needs.

Within the regional landownership patterns, the SEALTrust ILF Program will work with the IRT and communities to identify compensatory mitigation projects with high-value aquatic resources worthy of permanent protection. In all cases, land availability will fundamentally depend on willing private landowners as essential partners interested in preservation actions or fee simple sales. The criteria used to identify and select potential mitigation projects can be subdivided into four main categories.

Aquatic Resource Type and Scarcity

SEAL Trust will seek properties that preserve aquatic resources (and their associated upland buffers) according to the following ranking that reflects both their high-value functions and relative scarcity in Southeast Alaska:

1. sloughs, salt marshes, and estuaries;
2. mudflats, sand flats, other beach types and tidelands;
3. freshwater lakes, ponds, streams, rivers and their tributaries;
4. wet meadows (bogs and fens); and
5. forested wetlands

Other considerations:

- 6- Given the limited field-based wetlands data for the region, SEAL Trust will seek input on potential properties and rely on the best professional judgment and knowledge of IRT members and other resource managers who are familiar with Southeast Alaska's aquatic resources.
- 7- An opportunity may arise where SEAL Trust could partner with another entity and facilitate the restoration, enhancement or creation of high-value or scarce aquatic resources as a compensatory mitigation project.

Project Site Location and Timing

SEAL Trust will work with willing landowners to acquire properties with high-value aquatic resources in a timely and efficient manner. The following sequence will be followed:

- 1- First, SEAL Trust will focus on land available for conservation acquisition within the impacted watershed and local area. Local land use/comprehensive plans, watershed plans, topographic and GIS maps, aerial photography, real estate listings, etc. will be examined to help identify properties adjacent to or near the impacted site which would provide additional valuable services that offer public benefits to the affected community. SEAL Trust will also respond to inquiries from willing landowners in the local area or approach landowners of high-value aquatic habitat to gauge their interest.
- 2- If suitable properties are unavailable in the watershed/local area within a reasonable timeframe, SEAL Trust will look for properties in other threatened or high-value watersheds within the same biogeographic province, including property within or adjacent to lands/watersheds identified as having value/s by others such as in State land use plans, USFS Tongass Land Management Plan, or other regional assessments (e.g., see the largely intact, "conservation priority watersheds" encompassing the highest ecological values in each biogeographic province in Appendix E).
- 3- Finally, SEAL Trust would look for willing landowners and properties in watersheds in adjacent biogeographic provinces within the same sub-regional grouping (see Figure 2).

Other location and timing considerations:

- 4- To the extent practicable and within a reasonable timeframe, SEAL Trust will seek ecologically suitable properties within the same general sub-region of Southeast Alaska (northern, central or southern) where the impact authorized under a Corps permit occurs.
- 5- In-lieu fees may be consolidated in order to accumulate sufficient funds to purchase fee-simple land or conservation easements and/or to acquire larger properties with greater ecological value.

6- SEAL Trust will concentrate on not only the 186,000 acres of private property in Southeast Alaska, but also will seek Alaska Mental Health Trust lands or conservation easements on Native Corporation lands if the opportunities arise.

Project addresses Regulatory Requirements

Within the context of Corps permitting activities and compensatory mitigation, SEAL Trust will seek properties that satisfy the following requirements in the 2008 Mitigation Rule:

1- Watershed Approach to Mitigation (33 CFR 332.3 (c)). In Southeast Alaska where watershed management plans are typically unavailable, information that does exist on a watershed's condition and needs will be analyzed as potential mitigation projects are identified. The scope of analysis will be commensurate with the scale of the permitted impacts and the size and scale of the mitigation project. The information examined may include:

- trends in habitat loss and development impacts,
- presence of sensitive species,
- site conditions that favor or hinder success,
- chronic environmental problems such as flooding or poor water quality,
- project ecological suitability,
- hydrology, soils, other physical and chemical characteristics,
- aquatic habitat diversity and connectivity and other landscape scale functions,
- adjacent land uses and watershed plans,
- reasonably foreseeable effects the project would have on important species,
- anticipated land use changes,
- local or regional goals for the protection of particular habitat types or functions, and
- the potential for chemical contamination of the aquatic resources.

2- Mitigation Type: In-kind mitigation (i.e., a resource of a similar structural and functional type to the impacted resource) is preferred. However, the Corps can authorize out-of-kind mitigation (i.e., a resource of a different structural and functional type from the impacted resource). (33 CFR 332.3 (e))

3- Preservation Activities: The project complies with certain criteria in order to provide compensatory mitigation through preservation (33 CFR 332.3(h)):

- (i) resources provide important physical, chemical, or biological functions;
- (ii) resources contribute significantly to ecological sustainability of the watershed, based on appropriate quantitative assessment tools where available;
- (iii) Corps determines that preservation is appropriate and practicable;
- (iv) resources are under threat of destruction or adverse modification; and
- (v) preserved property will be permanently protected through an appropriate real estate or legal instrument.

Other considerations:

4- Strategically, SEAL Trust considers most private land in Southeast Alaska to be "threatened with development" because of its scarcity. Rather than just taking a reactive approach chasing after economic development in the region, SEAL Trust will look prospectively for high-value resource properties before development is proposed. SEAL Trust will not simply pursue lands

already slated for project development, where the organization might be viewed as obstructionist or would be purchasing land at the highest development value. With this prospective approach, SEAL Trust may help to redirect or modify the impacts of necessary development in valuable watersheds.

5- The permit applicant and Corps are responsible for establishing the types and values of aquatic resources lost. To the extent practicable and appropriate, SEAL Trust would participate in early inter-agency discussions of mitigation for Corps permitting of large projects to understand the values and types of aquatic resources being lost.

6- SEAL Trust will seek properties that provide the aquatic resource functions lacking or under stress in the impacted watershed or other local watersheds.

7- SEAL Trust will seek to identify properties available for mitigation by expanding its working knowledge of real estate activity, local zoning, and Southeast Alaska development trends and needs. In an ongoing basis, SEAL Trust would implement this through a regular review of real estate publications and websites, outreach to realtors and others familiar with Southeast properties, review of community/state land use and federal management plans, periodic review of State/federal funding actions, and the analysis of lands records.

SEAL Trust Mission and National Land Trust Standards and Practices

SEAL Trust is a federally-recognized 501(c)(3) non-profit organization and an affiliated member of the national Land Trust Alliance. As such, the Trust is obligated to conduct its land and conservation easement acquisitions in accordance with the Trust's mission and national standards and practices. When selecting a mitigation project, SEAL Trust will not only satisfy the 2008 Mitigation Rule but also conduct its ILF Program in the following manner:

1-SEAL Trust will ensure that a mitigation project meets the organization's mission that highlights community and landowners: *The Southeast Alaska Land Trust cooperates with communities and landowners to ensure that vital natural areas remain in place for the well being of each generation.*

2- A property must have one or more conservation values: important fish, wildlife, vegetation or other ecological values; borders on or affects the integrity of sensitive or ecologically important habitat; significant cultural, historic, educational, recreational, or scientific values; adjacent to an existing protected area of lands under protective conservation easements; and open space for the public's scenic enjoyment.

3- A property must be of sufficient size and character that its conservation resources are likely to remain intact, even if adjacent properties are developed.

4- A property satisfies project-specific selection criteria when established by the SEAL Trust Board of Directors.⁴

⁴ For example, the SEAL Trust Board of Directors in 2008 adopted a tiered approach to the acquisition of properties to fulfill its compensatory mitigation obligations for the Juneau International Airport Project (COE POA-1981-320-M22), as follows:

1st Priority: accreted lands around the Mendenhall Wetlands State Game Refuge (MWSGR),

2nd Priority: lands in watersheds feeding into the MWSGR,

3rd Priority: other properties along the Juneau road system, and

4th Priority: important regional priority properties.

5- In cases where the landowner intends to make a tax-deductible donation of a conservation easement on their property, SEAL Trust will ensure that the Trust's actions on the property transaction are conducted in accordance with Internal Revenue Service requirements (26 US Code 170(h)).

6- SEAL Trust must incorporate and record necessary documentation for acquired properties to satisfy national land trust standards & practices and ensure protection in perpetuity.

Other considerations:

7- Several factors may preclude SEAL Trust involvement in a particular property as a mitigation project: the conservation easement would be unusually difficult to enforce, a property is small and there is little likelihood of adjacent lands being protected, or a landowner insists on provisions in the conservation easement that would diminish the conservation value of the property.

Process for Project Selection and Implementation

Using the above mitigation project criteria, SEAL Trust will follow the selection and implementation process required in the 2008 Mitigation Rule. However, given the size of the Southeast Alaska service area and the relative paucity of in-depth data on aquatic resources, use of the professional judgment of SEAL Trust staff in conjunction with the IRT members and other resource specialists and land managers is anticipated to initially screen prospective properties. Using the collective resource managers' professional knowledge, we could also assess potential properties on the basis of their similarities (aquatic resource type, reference species, etc.) to other known aquatic resources of high value. If a potential property satisfies an informal, initial consideration by the Corps and IRT, SEAL Trust would proceed to more fully investigate its attributes and preservation potential.

At this juncture, SEAL Trust would prepare a mitigation plan for each proposed property at a level of detail commensurate with the scale and scope of the impacts (33 CFR 332.4(c)). This documentation effort would be augmented with existing SEAL Trust "due diligence" practices as a land trust organization for property selection, acquisition or conservation easement execution. SEAL Trust routinely investigates a property's ecological characteristics and values, hazardous wastes/pollution-free assessment, historical land records, and negotiates conservation easement language with the landowner for preservation in perpetuity.

A property's mitigation plan would be treated as a modification to the SEAL Trust ILF Program instrument (i.e., the legal agreement with the Corps) and would be subject to review by the IRT and approval by the Corps in accordance with 33 CFR 332.8(g). SEAL Trust anticipates that the Corps would routinely treat individual mitigation project sites under the streamlined 60-day review process in 33 CFR 332.8(g)(2). SEAL Trust will help organize meetings with the Corps and IRT members to discuss potential mitigation project plans as part of this review and approval process. To the extent practicable and timely, SEAL Trust will attempt to "batch" the Corps/IRT review of proposed mitigation projects for efficiency and to facilitate the overall goals of aquatic resource compensatory mitigation in the region.

Once a mitigation plan is approved by the Corps, SEAL Trust will proceed to implement the mitigation project through acquisition of fee simple land or a conservation easement, or as a partner on projects restoring, enhancing or creating aquatic resources as opportunities arise.

SEAL Trust will document associated transaction costs as part of its annual ILF Program Account report to the Corps and IRT (33 CFR 332.8(i)). The compensatory mitigation credits obtained for each mitigation project will also be reported annually in the ledger account (33 CFR 332.8(q)).

As a final note regarding the process of selecting mitigation projects, SEAL Trust's experience with properties acquired in the past ten years provides a reasonable picture of the kinds of properties where landowners were willing to commit their property to conservation protections in the region. These properties with SEAL Trust conservation easements in place include:

- old homesteads along the coast or river systems (e.g., Farragut Estuary north of Petersburg, Hilda Creek on west Douglas Island in Juneau area, and a property with a conservation easement nearing completion on the Chilkoot River in Haines area);
- lands adjacent to municipal, state or federal parks or natural areas (e.g., Hilda Creek on west Douglas Island and the Strawberry Creek & Herbert River/Amalga Meadows in Juneau area); and
- other private or public lands within or adjacent to towns (e.g., the City of Kake's Gunnuk Creek watershed providing protection to municipal water supply, and the Jensen-Olsen Arboretum historic/cultural site near Juneau).

SEAL Trust's experience suggests that: 1) some larger-sized properties can be identified for preservation, albeit generally not located in town centers, 2) properties acquired may need to be relatively large in order to provide sufficient protection of aquatic resource habitats and functions, and 3) SEAL Trust is likely to consolidate smaller-sized compensatory mitigation obligations in the future to assemble the financial resources necessary to acquire larger or more expensive coastal properties.

IX. Preservation Objectives

Mitigation Rule: 33 CFR 332.8(c)(2)(vii) An explanation of how preservation objectives identified in paragraph (c)(2)(v) of this section and addressed in the prioritization strategy in paragraph (c)(2)(vi) satisfy the criteria for use of preservation in 33 CFR 332.3(h);

33 CFR 332.3(h) Preservation. (1) Preservation may be used to provide compensatory mitigation for activities authorized by DA permits when all the following criteria are met: (i) the resources to be preserved provide important physical, chemical, or biological functions for the watershed; (ii) The resources to be preserved contribute significantly to the ecological sustainability of the watershed. In determining the contribution of those resources to the ecological sustainability of the watershed, the district engineer must use appropriate quantitative assessment tools, where available; (iii) Preservation is determined by the district engineer to be appropriate and practicable; (iv) The resources are under threat of destruction or adverse modifications; and (v) The preserved site will be permanently protected through an appropriate real estate or other legal instrument (e.g., easement or title transfer to state resource agency or land trust).

The criteria established in this 2008 Mitigation Rule for use of preservation are satisfied by the aforementioned ILF Program objectives (Section VII) and the strategy for selecting and implementing mitigation projects (Section VIII), as follows:

- 33 CFR 332.3(h)(i and ii): SEAL Trust will document the important physical, biological, and chemical functions and their significance to the ecological suitability of a particular

watershed, relying on available data, best professional judgment, and on-site observation and assessment.

- 33 CFR 332.3(h)(ii): As part of its overall ILF program, SEAL Trust will continue to work with the IRT and strive to identify a common understanding about appropriate quantitative wetlands assessment/credits-debits tools that make sense for the typical coastal Southeast Alaska wetland types encountered (e.g., estuarine emergent and forested wetlands). This collaborative effort will yield benefits for SEAL Trust, Corps, the IRT, other regional resource and land professionals, and developers on how to apply the 2008 Mitigation Rule to Southeast Alaska wetlands as permit applicants seek compensatory mitigation options and as SEAL Trust acquires mitigation properties that help ecologically sustain aquatic resources in the region.
- 33 CFR 332.3(h)(iii): SEAL Trust anticipates that the Corps will continue to view preservation as appropriate and practicable in the Southeast Alaska service area;
- 33 CFR 332.3(h)(iv): SEAL Trust considers most private land to be threatened with development because of its scarcity. As previously noted, SEAL Trust intends to not only react to proposed development pressures, but also look prospectively for properties to help redirect or modify development impacts on valuable watersheds through preservation.
- 33 CFR 332.3(h)(v): As a routine matter and based on its longstanding practice, SEAL Trust will work with willing landowners to establish permanent conservation easements that preserve high-value aquatic resources and functions in perpetuity.

SEAL Trust views itself as a cooperating agent and catalyst that can help developers and agencies identify solutions that meet preservation goals and development needs within or adjacent to a particular watershed. As outlined in the 2008 Mitigation Rule, specifically 33 CFR 332.3(j)(2) and (j)(3), SEAL Trust is also available to collaborate on other federally-funded aquatic resource conservation projects or meet the conservation obligations under other federal requirements in order to maximize the overall ecological health and sustainability of watersheds and aquatic resources in Southeast Alaska.

X. Stakeholder Involvement and Coordination

Mitigation Rule: 33 CFR 332.8(c)(2)(viii) a description of any public and private stakeholder involvement in plan development and implementation, including, where appropriate, coordination with federal, state, tribal, and local aquatic resource management and regulatory authorities.

Mitigation Rule 33 CFR 332.8(b): IRT review of documentation (prospectus, instrument, and other appropriate documents) for establishment & management of ILF program. The compensation planning framework is a component of the ILF program sponsor's instrument. IRT comments to the Corps. The Corps and IRT should use a watershed approach to the extent practicable in reviewing proposed ILF program.

The primary stakeholders involved with this Framework are the members of the Interagency Review Team (IRT) which has a review and advisory role to the Corps on the approvability of SEAL Trust's In-Lieu Fee Program modification under the 2008 Mitigation Rule. The IRT is chaired by the Corps-Juneau Field Office and includes US Fish and Wildlife Service, Environmental Protection Agency, NOAA Fisheries, and appropriate State, local, and native agencies with land/resource management authority. The regulatory agencies have a direct interest

in ensuring that there is a credible and effective ILF Program sponsor for Southeast Alaska. For example, SEAL Trust has had a good working relationship with the IRT (comprised of the abovementioned agencies, ADFG, and the City & Borough of Juneau) on compensatory mitigation for the Juneau International Airport Project (POA 1981-320-M22). According to the 2008 Mitigation Rule, another federal agency that could be involved with the IRT is the Juneau-based Natural Resources Conservation Service/USDA, and the Alaska Department of Environmental Conservation may participate in the future.

In an effort to explain our ILF Program and the current review to other potentially interested parties in the Southeast Alaska region, SEAL Trust intends to conduct an outreach to Southeast community land use/planning officials, organizations (e.g., watershed councils, resource groups, and Southeast Conference), Native Corporation land managers, and other resource and real estate professionals (see Appendix F. Public Outreach). We invite their questions or comments and provide a link to the SEAL Trust website (www.southeastalaskalandtrust.org) if they want to review our draft documents and provide comments to the Corps during the public review process.

One goal is to explain the existing SEAL Trust ILF agreement with the Corps, our ILF Program actions to date, and SEAL Trust's role in regional aquatic resource conservation, community land use planning and actions, and future resource development on private and public lands. Another public outreach goal is to alert people to the purpose of this compensatory planning framework and SEAL Trust's updated ILF program within the context of the Corps' substantial strengthening of mitigation requirements for wetland losses under the 2008 Mitigation Rule. As a region, we live on wet terrain and the Corps' attention to aquatic resources has important implications for how we use the land and resources to sustain our communities. As an ongoing outreach effort, SEAL Trust intends to identify opportunities where it may be able to make a presentation or have an exhibitor booth to describe SEAL Trust's ILF Program and its involvement in Corps compensatory mitigation in the Southeast Alaska region.

XI. Long-term Protection and Management Strategies

Mitigation Rule: 33 CFR 332.8(c)(2)(ix) a description of the long-term protection and management strategies for activities conducted by the ILF program sponsor.

SEAL Trust has several legal mechanisms whereby its ILF Program compensatory mitigation properties would receive long-term protection and management:

- SEAL Trust executes and holds a conservation easement on certain properties with willing public or private landowners.
- SEAL Trust retains ownership of a property obtained through fee simple purchase.
- SEAL Trust donates a property acquired through fee simple purchase to an appropriate public agency with deed restrictions (per 2008 Mitigation Rule 33 CFR 332.7(a)).

Under the ILF Program, the management plan or terms of a project-specific conservation easement would clearly describe the conservation values being protected and the permitted/prohibited uses/activities for each property. As with all properties or conservation easements held by the Trust, we intend to perform regular stewardship monitoring of ILF

mitigation project sites with onsite observations, reporting, and enforcement actions, as appropriate. In accordance with 33 CFR 332.6, the mitigation plan for each mitigation site identifies the specific monitoring required and the overall ILF Program legal instrument between the Corps and SEAL Trust requires reporting of our monitoring actions. To the extent that SEAL Trust participates in mitigation projects that restore, enhance or construct aquatic habitats, long-term monitoring of the site would provide for continued protection.

XII. Periodic Evaluation and Reporting

Mitigation Rule: 33 CFR 332.8(c)(2)(x) a strategy for periodic evaluation and reporting on the progress of the program in achieving the goals and objectives in paragraph (c)(2)(v) of this section, including a process for revising the planning framework as necessary;

SEAL Trust will be obligated to provide an annual accounting to the Corps and the IRT in the form of a credits-debits ledger it will maintain to quantify and account for permit-specific aquatic resource losses and the Trust's offsets gained through compensatory mitigation preservation projects. SEAL Trust anticipates that it will meet regularly with the Corps and IRT as the ILF Program matures. Also, SEAL Trust will be obligated to submit an annual report on the in-lieu fees received and disbursed from its ILF Program Account, income generated through investments, and expenditures for compensatory mitigation projects and administrative costs.

In general, SEAL Trust does not see major changes in the Southeast Alaska economy in the foreseeable future that would drive a significantly different outlook for community or resource development in the region. With this outlook, we do not anticipate the need for a revision to this Compensation Planning Framework for a number of years. Nevertheless, as specific mitigation projects are investigated, SEAL Trust will use up-to-date resource information that is readily available to assess the conservation values of a property.

SEAL Trust staff and Board of Directors intend to evaluate its ILF program as part of periodic reviews of its land trust responsibilities and strategic planning, but certainly will wait until SEAL Trust, the IRT, other interested parties, and permittees gain some experience with the 2008 Mitigation Rules and the parties' roles in compensatory mitigation in the Southeast Alaska region. As part of this overall evaluation, SEAL Trust would examine its efforts in achieving the previously identified goals and objectives of the Trust's ILF Program (see Aquatic Resource Goals and Objectives section). As a component of SEAL Trust's ILF Program, the legal instrument between SEAL Trust and the Corps identifies a streamlined process that will be routinely used to incorporate specific mitigation projects into the overall ILF Program.

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Appendix A: Definitions of Waters of the United States (33 CFR 328)

Title 33: Navigation and Navigable Waters; [PART 328—DEFINITION OF WATERS OF THE UNITED STATES](#) § 328.3 Definitions.

For the purpose of this regulation these terms are defined as follows:

(a) The term *waters of the United States* means

(1) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

(2) All interstate waters including interstate wetlands;

(3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:

(i) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or

(ii) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

(iii) Which are used or could be used for industrial purpose by industries in interstate commerce;

(4) All impoundments of waters otherwise defined as waters of the United States under the definition;

(5) Tributaries of waters identified in paragraphs (a) (1) through (4) of this section;

(6) The territorial seas;

(7) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) (1) through (6) of this section.

(8) Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other Federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States.

(b) The term *wetlands* means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

(c) The term *adjacent* means bordering, contiguous, or neighboring. Wetlands separated from other waters of the United States by man-made dikes or barriers, natural river berms, beach dunes and the like are ~~adjacent~~ wetlands.”

(d) The term *high tide line* means the line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm.

(e) The term *ordinary high water mark* means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

(f) The term *tidal waters* means those waters that rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by hydrologic, wind, or other effects.

[51 FR 41250, Nov. 13, 1986, as amended at 58 FR 45036, Aug. 25, 1993]

Appendix B: ShoreZone Mapping of Coastal Marine Habitat in Southeast Alaska

The ShoreZone coastal habitat mapping and classification breaks down the coastal fringe perpendicular to the shore as the supra-tidal, upper to mid-intertidal and lower intertidal to nearshore subtidal zones. These zones are further interpreted by biobands, or common organisms that form distinct and recognizable horizontal features of the coastal fringe. Some biobands that occur in the mid- intertidal, lower intertidal and nearshore subtidal, such as eelgrass and kelp beds, are considered of high value because of the primary productivity, structure and spawning/rearing habitat these species provide to shellfish, fish and wildlife of subsistence, sport, commercial and cultural significance.

Tables B1 and B2 show the occurrence of biobands for the one-third of Southeast Alaska shoreline mapped, by continuous, patchy and total kilometers, and by percent of the area mapped during the 2004-05 and 2006 projects. These data show that high-value habitat such as eelgrass occurs in less than one-quarter of the linear shoreline (eelgrass makes up 20% for the 2004-2005 survey and 23% of the 2006 survey). Similarly, high-value large kelp habitats (giant kelp and bull kelp) occur in less than one-third of the shoreline: 19% of the 2004-2005 survey and 32% of the 2006 survey.

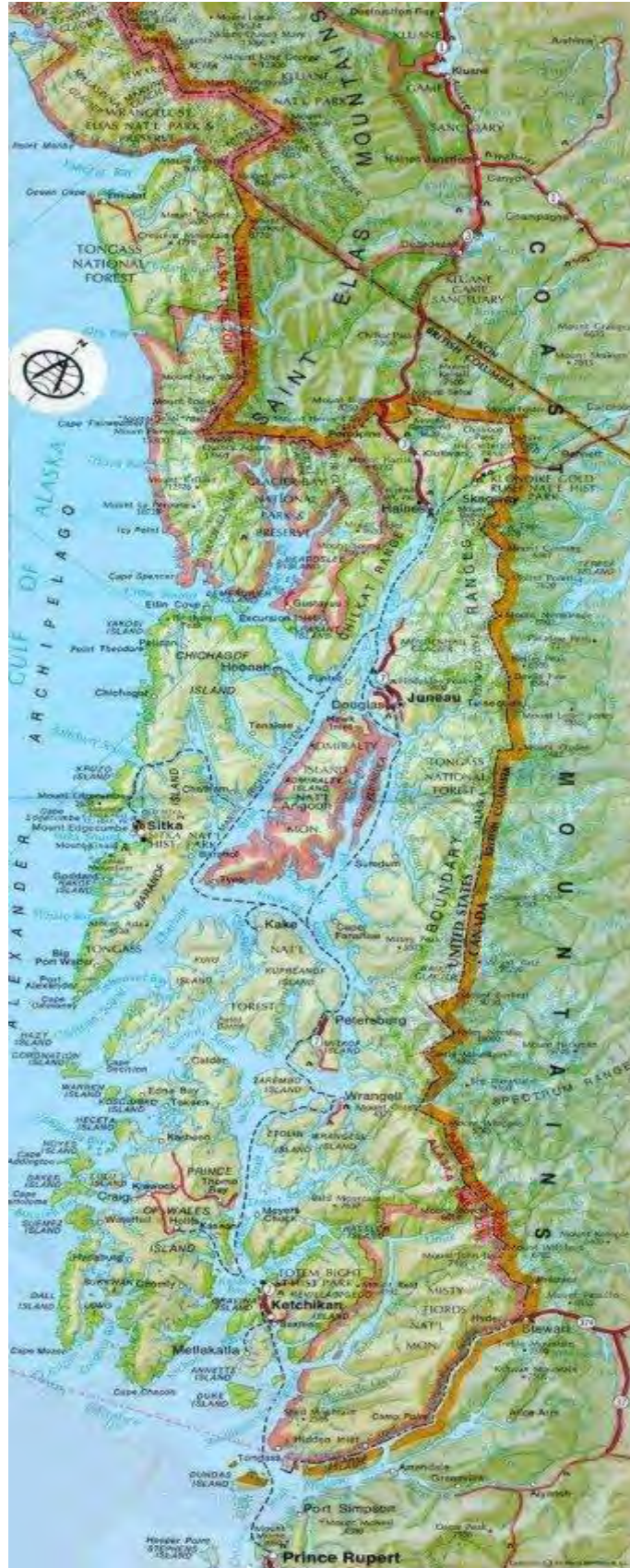
Table B1. Bioband Occurrence Mapped in the Southeast Alaska 2004-2005 ShoreZone Project Area (NMFS 2006)

Bioband Names	Code	Continuous		Patchy		Total (km)	% of Mapped
		(km)	%	(km)	%		
<i>Dune Grass</i>	GRA	2,365	38%	984	16%	3,349	54%
<i>Sedges</i>	SED	754	12%	482	8%	1,235	20%
<i>Marsh grasses & herbs</i>	PUC	1,114	18%	933	15%	2,047	33%
<i>Barnacle</i>	BAR	2,802	45%	1,109	18%	3,911	62%
<i>Rockweed</i>	FUC	1,619	26%	1,496	24%	3,115	50%
<i>Green Algae</i>	ULV	1,066	17%	1,504	24%	2,570	41%
<i>Blue Mussels</i>	BMU	914	15%	886	14%	1,800	29%
<i>Bleached Red Algae</i>	HAL	149	2%	199	3%	348	6%
<i>Red Algae</i>	RED	1,448	23%	630	10%	2,078	33%
<i>Surfgrass</i>	SUR	74	1%	117	2%	192	3%
<i>Alaria</i>	ALA	1,000	16%	453	7%	1,453	23%
<i>Soft Brown Kelps</i>	SBR	1,033	17%	779	12%	1,812	29%
<i>Dark Brown Kelps</i>	CHB	402	6%	148	2%	551	9%
<i>Eelgrass</i>	ZOS	767	12%	506	8%	1,274	20%
<i>Dragon Kelp</i>	ALF	190	3%	123	2%	313	5%
<i>Macrocystis</i>	MAC	420	7%	164	3%	584	9%
<i>Bull Kelp</i>	NER	359	6%	271	4%	629	10%

Table B2. Bioband Occurrence Mapped in the Southeast Alaska 2006 ShoreZone Project Area (NMFS 2008)

Bioband Names	Code	Continuous		Patchy		Total (km)	% of Mapped
		(km)	%	(km)	%		
Dune Grass	GRA	786	11	1,424	20	2,210	31
Sedges	SED	244	3	366	5	610	8
Salt Marsh	PUC	1,692	23	1,590	22	3,282	45
Barnacle	BAR	5,149	71	1,709	24	6,858	95
Rockweed	FUC	4,892	67	1,804	25	6,696	92
Green Algae	ULV	4,196	58	1,990	27	6,186	85
Blue Mussel	BMU	608	8	728	10	1,336	18
California Mussel	MUS	2	<1	80	1	82	<2
Bleached Red Algae	HAL	147	2	362	5	509	7
Red Algae	RED	2,569	35	1,334	18	3,903	53
Alaria	ALA	525	7	674	9	1,199	16
Soft Brown Kelps	SBR	2,699	37	1,754	24	4,453	61
Dark Brown Kelps	CHB	624	9	308	4	932	13
Surfgrass	SUR	58	1	345	5	403	6
Eelgrass	ZOS	637	9	1,002	14	1,639	23
Urchin Barrens	URC	233	3	266	4	499	7
Giant Kelp	MAC	917	13	282	4	1,199	17
Bull Kelp	NER	600	8	507	7	1,107	15

Appendix C. Southeast Alaska Region and Communities



Appendix D: Existing Hydropower Facilities, Potential Hydro Sites, and Transmission Lines in Southeast Alaska

Location	Existing Hydro Power Site	Potential Hydro Power Site *	Local or Inter-community Transmission Line
Angoon		Thayer Lake	Thayer Lake to Angoon
Coffman Cove			Coffman Cove- Naukati Intertie (2009 funding)
Craig	Black Bear Lake		Prince of Wales Island (POW) Intertie
Craig	South Fork Black Bear		
Elfin Cove		Crooked Creek/ Jim's Lake	
Gustavus	Falls Creek ** (under construction)		
Haines	Goat Lake		Shared via Haines- Skagway Intertie (submarine cable)
Haines		Dayebas Creek	
Haines		Upper Chilkoot/Connelly Lake	
Hollis			POW Intertie
Hoonah		Gartina Creek	Hoonah-Hawk Inlet Intertie (proposed)
Hoonah		Water Supply Creek	
Hoonah		Elephant Falls	
Hydaburg		Reynolds Creek **	POW Intertie
Juneau	Dorothy Lake		
Juneau		Sheep Creek	
Juneau	Salmon Creek		
Juneau	Snettisham		Juneau-Hawk Inlet (Greens Creek Mine)
Juneau	Gold Creek		
Juneau	Annex Creek		
Kasaan			POW Intertie
Kake		Cathedral Falls Creek	Kake-Petersburg Intertie (2009 funding)
Ketchikan	Swan Lake		Swan-Tyee Intertie (2009 completion)
Ketchikan	Silvis		
Ketchikan	Ketchikan Lakes		
Ketchikan	Beaver Falls		
Ketchikan		Whitman Lake **	
Ketchikan		Mahoney Lake	

Klawock			POW Intertie
Klukwan		Walker Creek	
Metlakatla	Chester Lake		
Metlakatla	Purple Lake	Purple Lake rehab	
Metlakatla		Triangle (aka Hassler) Lake	Metlakatla-Ketchikan Intertie (proposed)
Pelican	Pelican Creek		Hoonah-Pelican (potential)
Petersburg	Blind Slough/Crystal Creek		Swan-Tyee Intertie (2009 completion)
Petersburg		Anita Lake	Kake-Petersburg Intertie (2009 funding)
Petersburg		Ruth Lake/ Delta Creek **	
Petersburg		Scenery Lake	
Petersburg		Virginia Lake (Mill Creek)	
Sitka	Blue Lake	Blue Lake expansion	
Sitka	Green Lake		
Sitka		Carbon Lake	
Sitka		Takatz Lake **	
Skagway	Goat Lake		Shared via Haines-Skagway Intertie (submarine cable)
Skagway	Kasidaya Creek		Shared w/ Haines
Skagway	Dewey Lakes		Shared w/ Haines
Skagway		West Creek	
Skagway		Burro Creek ***	
Tenakee		Indian River	Hoonah-Tenakee (potential)
Thorne Bay			POW Intertie
Whale Pass		Neck Lake ***	
Wrangell	Tyee Lake		Swan-Tyee Intertie
Wrangell		Sunrise Lake (Woronofski)	

Sources: Alaska Energy Authority (2008) and U.S. Forest Service (2008)

* Sites evaluated and screened by a Hydroelectric Technical Team (Alaska Energy Authority) in 2008 and considered to have potential.

** Feasibility, reconnaissance, or engineering design work funded by the Alaska Energy Authority under the Alaska Renewable Energy Fund in FY2009 or FY2010.

*** Additional sites not screened by AEA, but feasibility work funded in FY2009 or FY2010.

Appendix E. Conservation Priority Watersheds in the Biogeographic Provinces of Southeast Alaska

TABLE 2. Conservation Priority Watersheds for combined focal species and ecological systems based on the Marxan spatial optimization tool parameterized with emphasis on intact watersheds (refer to Conservation Area Design Map, Fig 2).

Biogeographic Province	Watershed Name ^a	VCU	Administrative protection (%)	Development Lands ^b (%)	Acres
East Chichagof Island	Chicken Cr	1960	100.0%	0.0%	21,436
	Poison Cove	2790	13.4%	85.9%	7,151
	Crab Bay	2320	14.6%	85.3%	11,017
	Goose Flats	2260	14.2%	85.8%	23,111
	Ushk Bay	2810	15.6%	80.3%	21,284
	Broad Island	2460	17.1%	82.8%	16,848
	Saltry Bay	2310	14.2%	85.8%	18,353
	Long Bay	2280	36.4%	63.6%	19,178
	Deep Bay	2800	12.8%	82.5%	18,180
	Seal Bay	2290	20.2%	79.8%	21,905
	Little Basket Bay	2400	19.0%	81.0%	10,155
	Whip Station	2210	90.7%	9.4%	4,546
Neka Bay	2010	22.0%	78.1%	39,557	
East Baranof Island	Saook Bay	2940	13.2%	86.8%	23,839
	Lake Eva	2950	99.7%	0.3%	12,395
	Deadman Reach	2890	47.4%	52.6%	8,125
	Kelp Bay - South Arm	3140	100.0%	0.0%	35,118
	Kelp Bay - Middle Arm	2980	51.7%	48.3%	27,746
West Baranof Island	Sitka Sound - Aleutkina Bay	3200	97.2%	2.8%	7,627
	Kruzof I. - Sea Lion Cove	3050	70.2%	29.9%	10,960
	Krestof Sound	3090	90.3%	9.7%	8,963
	Redoubt Lake	3500	95.3%	3.2%	28,147
	Deep Inlet	3220	100.0%	0.0%	6,954
	Salmon Lake	3230	13.6%	86.4%	7,663
	Fish Bay	2870	96.4%	3.6%	41,305
	Big Bear / Baby Bear	2880	17.6%	67.9%	7,141
	Kruzof I. - Mount Edgecumbe	3080	92.5%	7.5%	53,550
	Nakwasina Passage	3000	57.8%	42.2%	19,899
	Sukoi Inlet / N. Krestof	3030	39.6%	60.4%	18,138
Big Bay	3490	92.9%	5.7%	9,414	
Kuiu Island	Reid Bay	4160	17.6%	81.5%	16,043
	Kuiu - Salt Lagoon	4180	38.2%	61.7%	9,634
	Security Bay	4000	43.6%	54.6%	28,775
	Howard Cove	4100	99.9%	0.0%	12,752
	Kingsmill Point	4010	100.0%	0.0%	13,286
	Bay of Pillars	4030	99.8%	0.2%	29,886
	No Name Bay	4170	38.0%	61.9%	10,009

^a Watersheds with >85% designated within legislatively protected areas are not shown.

^b Development lands include areas available for timber harvest under the 1997 TLMP as well as private or other lands lacking administrative protection or conservation buffers.

TABLE 2 (cont.). Conservation Priority Watersheds for combined focal species and ecological systems based on the Marxan spatial optimization tool parameterized with emphasis on intact watersheds (refer to Conservation Area Design Map, Fig 2).

Biogeographic Province	Watershed Name ^a	VCU	Administrative protection (%)	Development Lands ^b (%)	Acres
Kupreanof and Mitkof Islands	Lower Castle River	4350	58.6%	41.4%	32,318
	Rocky Pass	4280	92.9%	7.1%	48,412
	Lake Kushneahin	4310	19.8%	80.2%	22,500
	Colp Lake	4460	18.2%	81.6%	11,290
	Totem Bay	4320	16.4%	83.6%	42,544
	Big John Bay	4270	94.4%	5.6%	25,152
	Upper Castle River	4360	15.1%	84.9%	21,248
	Duncan Bay	4380	26.1%	73.9%	27,447
	Lovelace Cr	4300	19.7%	80.3%	14,563
	Towers Arm	4400	27.4%	72.0%	26,813
	Irish Lakes	4290	16.7%	83.3%	54,647
	Woewodski Island	4480	19.0%	78.4%	24,863
	Blind Slough	4510	83.1%	16.9%	9,614
Etolin / Zarembo / Wrangell Is.	Kunk Lake	4630	99.6%	0.4%	11,141
	Burnett Bay	4680	24.8%	75.2%	23,197
	Woronkofski Island	4610	9.4%	90.6%	14,532
	Streets Lake	4660	94.2%	5.9%	17,336
	Thoms Lake	4790	49.6%	45.5%	25,061
	Southwest Cove	4710	16.8%	83.0%	8,674
	Chichagof Pass	4620	18.7%	81.4%	16,290
	Mosman Inlet	4670	16.3%	83.8%	24,798
Revilla Is. / Cleveland Pen.	Union Bay	7090	99.2%	0.8%	14,642
	Port Stewart	7190	21.8%	78.2%	22,580
	Helm Bay	7160	98.5%	1.5%	17,079
	West Gravina Island	7620	79.8%	20.2%	8,792
	Yes Bay	7240	100.0%	0.0%	42,926
	Moser Bay	7430	19.0%	81.0%	14,044
	Spaceous Bay	7220	28.2%	71.8%	31,347
	Bostwick Inlet	7630	16.0%	84.0%	19,905
	SW Cleveland Peninsula	7120	53.1%	46.9%	14,584
	Vixen Inlet	7200	29.8%	70.2%	24,859
	Granite Cr CP	7170	38.9%	61.1%	10,280
	Deer Island	5250	28.4%	71.7%	9,329
	Behm Narrows	7310	99.9%	0.1%	19,765
	SW Cleveland Peninsula	7130	96.7%	3.3%	9,498
	Smugglers Cove	7150	98.5%	1.6%	13,920
	Emerald Bay	7210	67.1%	32.9%	8,011
	Swan Lake	7450	89.8%	10.1%	23,744

^a Watersheds with >85% designated within legislatively protected areas are not shown.

^b Development lands include areas available for timber harvest under the 1997 TLMP as well as private or other lands lacking administrative protection or conservation buffers.

TABLE 2 (cont.). Conservation Priority Watersheds for combined focal species and ecological systems based on the Marxan spatial optimization tool parameterized with emphasis on intact watersheds (refer to Conservation Area Design Map, Fig 2).

Biogeographic Province	Watershed Name ^a	VCU	Administrative protection (%)	Development Lands ^b (%)	Acres
Revilla Is. /	Bell Arm	7280	100.0%	0.0%	12,917
Cleveland Pen.	Orchard Creek	7340	91.0%	8.9%	32,858
(continued)	Hickman Pt	7230	100.0%	0.0%	6,850
	Cannery Creek	7100	17.5%	82.5%	5,412
	California Cove	7580	96.5%	3.6%	11,594
	Betton Island	8641	91.8%	8.2%	5,432
	Duke Island	7670	99.7%	0.3%	39,263
	SE Thorne Arm	7600	17.4%	82.5%	11,127
	Reflection Lake	7270	100.0%	0.0%	11,117
	Upper Vixen	7180	26.2%	73.8%	11,850
	Sunny Bay	5260	20.4%	79.6%	17,659
North Prince of Wales	Cholmondeley Sound (West Arm)	6740	20.0%	80.0%	19,901
	Waterfall	6310	58.9%	41.1%	16,284
	Barns Lake	5520	48.6%	51.4%	9,695
	Sarkar Lakes	5541	100.0%	0.0%	24,949
	S. Honker Divide	5750	68.1%	31.9%	18,306
	Salt Lake Bay	5920	95.3%	4.7%	14,655
	NW Sukkwann Is	6710	55.0%	45.0%	22,844
	Whale Passage	5510	43.6%	56.4%	13,312
	Center Peak	5760	99.6%	0.4%	15,292
	McKenzie Inlet	6180	49.5%	50.5%	17,365
	S Sukkwann Is	6700	47.8%	52.2%	16,850
	Sweetwater Lake	5730	43.2%	56.8%	25,939
	Sunny Cove, Cholmondeley Sound	6750	36.5%	63.5%	6,570
	Lower Thorne River	5971	82.5%	17.5%	3,455
	Sukkwann Strait	6720	81.4%	18.6%	28,633
	Thorne River Falls	5780	49.5%	50.6%	6,411
	Tracodero Bay	6250	27.8%	72.2%	31,290
	Clover Bay	6170	76.0%	24.0%	14,207
	North Honker Divide	5740	78.7%	21.4%	26,681
	Cristoval Channel	5930	46.3%	53.7%	16,237
	Calder Bay	5311	23.0%	77.0%	15,907
	Port Estrella	6300	12.3%	87.7%	17,209
	Mt Francis	5410	65.0%	35.1%	6,059
	Davidson	5470	18.5%	81.5%	3,171
	Soda Bay	6320	9.6%	90.4%	14,470
	Nossuk Bay	5910	13.7%	86.3%	8,849
	Baird Peak	5820	13.8%	86.3%	4,124
	Trollers Cove	6150	24.0%	76.0%	10,012
	Control Lake / Upper Thorne	5960	76.3%	23.7%	12,602

^a Watersheds with >85% designated within legislatively protected areas are not shown.

^b Development lands include areas available for timber harvest under the 1997 TLMP as well as private or other lands lacking administrative protection or conservation buffers.

TABLE 2 (cont.). Conservation Priority Watersheds for combined focal species and ecological systems based on the Marxan spatial optimization tool parameterized with emphasis on intact watersheds (refer to Conservation Area Design Map, Fig 2).

Biogeographic Province	Watershed Name ^a	VCU	Administrative protection (%)	Development Lands ^b (%)	Acres
South Prince of Wales	S Arm Moira Sound	6920	20.6%	78.9%	23,699
	Nutkwa Inlet	6850	7.7%	92.0%	18,158
	Kassa Inlet	6890	48.1%	50.0%	10,636
	Mabel Bay	6880	16.0%	84.0%	8,167
	Hidden Bay	6950	100.0%	0.0%	4,844
	Nichols Bay	7040	99.3%	0.0%	17,270
	Stone Rock Bay	7020	100.0%	0.0%	9,339
	Ingraham Bay	6940	43.5%	56.5%	6,200
Outside Islands	Port Santa Cruz	6340	28.1%	71.9%	11,631
	San Fernando - S	6280	100.0%	0.0%	9,960
	Port Refugio	6350	17.8%	82.3%	9,085
Dall / Long Islands	Bobs Bay	6390	16.8%	83.2%	6,081
	Essoway Lake	6590	97.1%	2.9%	14,136
	Waterfall Bay	6480	99.1%	0.9%	7,209
	McLeod Bay	6660	85.0%	15.0%	3,440
	Devil Cove	6460	61.9%	38.1%	7,120
	Hook Arm	6410	66.6%	33.4%	4,621
	Port Bazan	6560	32.8%	67.2%	14,908
	Datzkoo Hbr	6630	88.5%	11.5%	3,616
	Sea Otter Hbr	6420	77.6%	22.4%	7,105
	Welcome Cove	6470	100.0%	0.0%	3,634
	Mearns Passage	6370	18.3%	81.7%	6,035
	Driver Bay	6400	40.5%	59.6%	3,079
	Gold Hbr	6510	95.3%	4.7%	5,469
	Fisherman Cove	6440	48.2%	51.8%	3,445
Lynn Canal / Mainland	Cowee Creek	230	10.6%	89.4%	26,936
	Pt. Couverden	1170	16.4%	83.6%	11,184
	Earth Station	1150	100.0%	0.0%	8,389
	Eagle / Herbert River	260	98.2%	1.8%	38,786
	Lincoln / Shelter Island	1240	32.8%	56.6%	8,084
	St. James Bay	1110	50.3%	39.5%	23,335
	Nun Mountain	1120	88.0%	11.9%	22,228
	Echo Cove	250	12.7%	65.9%	12,821
	Katzehin River	90	100.0%	0.0%	55,631
	Gilkey River	150	99.9%	0.0%	42,279
	Antler River	140	100.0%	0.0%	28,649
	Sullivan Mountain	950	19.9%	80.1%	16,303
	Dayebas Creek	80	100.0%	0.0%	10,907
	Pt. Danger	1080	9.0%	91.0%	3,633
	William Henry Bay	1070	61.4%	38.0%	7,488
	West Sullivan	970	17.1%	82.9%	6,659

^a Watersheds with >85% designated within legislatively protected areas are not shown.

^b Development lands include areas available for timber harvest under the 1997 TLMP as well as private or other lands lacking administrative protection or conservation buffers.

TABLE 2 (cont.). Conservation Priority Watersheds for combined focal species and ecological systems based on the Marxan spatial optimization tool parameterized with emphasis on intact watersheds (refer to Conservation Area Design Map, Fig 2).

Biogeographic Province	Watershed Name ^a	VCU	Administrative protection (%)	Development Lands ^b (%)	Acres
Taku Mainland	Taku River	460	97.6%	2.4%	111,669
	Port Houghton Salt Chnck	790	27.5%	72.5%	42,519
	Port Houghton - Robert Is.	820	12.6%	86.6%	13,185
	Sandborn Canal	840	39.3%	60.7%	17,437
	Gilbert Bay	570	59.6%	40.4%	28,037
	Slocum Inlet	510	14.4%	85.6%	16,525
	Dry Bay	690	14.8%	85.2%	12,416
	Pt. Houghton - Dalgren	830	12.2%	87.8%	10,785
	Williams Cove	641	100.0%	0.0%	7,600
	Port Snettisham	550	28.8%	71.2%	22,293
	Limestone Inlet	530	100.0%	0.0%	9,960
	Taku Inlet	410	24.4%	75.6%	33,010
	Taku Harbor	520	9.4%	90.6%	6,950
	Sand Bay	680	10.3%	89.7%	8,227
Heigs Peak	560	48.0%	52.0%	12,520	
Stikine	Farugut Bay - S. Arm	900	94.6%	5.4%	27,851
Mainland	Marsha Peak	5010	9.2%	90.8%	28,180
	Madan Bay	5040	11.1%	88.9%	16,722
	Little Lake Eagle	5190	99.9%	0.1%	44,197
	Tom Creek	5100	70.6%	29.5%	27,274
	Cat Cr	870	12.1%	87.9%	14,029
	Marten Lake	5090	100.0%	0.1%	14,603
	N Arm Farugut Bay	890	14.2%	85.9%	17,299
	Virginia Lake	5020	13.0%	86.5%	30,947
	Blake Channel	5050	35.3%	64.8%	26,293
	Dry Bay-Grand Point	4830	5.3%	94.7%	10,737
	Oerns Creek	5080	100.0%	0.1%	13,590
Aaron Creek	5030	99.9%	0.1%	45,572	
Chilkat River Complex	Takhin River	Non-TNF	0.0%	100.0%	79,562
	Ferebee River	Non-TNF	0.0%	100.0%	57,711
	Davidson Glacier	Non-TNF	4.8%	95.2%	45,518
	Chilkat River	Non-TNF	32.6%	67.4%	80,645
	Upper Chilkat River	Non-TNF	11.5%	88.5%	67,752
	Garrison Glacier	Non-TNF	0.0%	100.0%	34,661
	Chilkoot River	Non-TNF	2.2%	97.8%	95,029
Taiya River	Non-TNF	0.0%	91.9%	124,725	
Yakutat	Ahrnklin River (estuary)	3710	99.8%	0.0%	7,264
Forelands	Ahrnklin River	3720	99.6%	0.4%	64,228
	Khantaak Islands	3680	25.5%	74.4%	4,015

^a Watersheds with >85% designated within legislatively protected areas are not shown.

^b Development lands include areas available for timber harvest under the 1997 TLMP as well as private or other lands lacking administrative protection or conservation buffers.

Appendix F. Public Outreach

As part of the revision and updating of its in-lieu fee Program, SEAL Trust intends to conduct an outreach effort to parties that may have an interest in the Trust's compensatory mitigation efforts and the conservation of high-value aquatic resources in the Southeast Alaska service area. The following is a preliminary list of community officials, Native corporations, watershed councils, resource and real estate professionals, and other organizations within the Southeast Alaska region.

- **Southeast Communities** – the planning/lands officials who handle permitting, economic development, and municipal land management.
- **Native Corporations** – the land manager personnel of the native village corporations, Sealaska Corporation, and organized village councils and associations.
- **Watershed Councils in Southeast Alaska**
 - Juneau Watershed Partnership
 - Klawock Watershed Council
 - Kasaan Bay Watershed Council
 - Taiya Inlet Watershed Council (Skagway)
 - Takshanuk Watershed Council (Haines)
- **Resource and Real Estate Professionals**
 - Real estate agency owners/brokers
 - Environmental/engineering consultants
 - Southeast Conference
 - Resource/environmental organizations

SEAL Trust intends to send a letter at the beginning of the formal public review under the 2008 Mitigation Rule introducing the trust and its accomplishments, briefly explaining the in-lieu fee program and compensatory mitigation in plain English, directing people to the Trust's website where the Compensation Planning Framework and in-lieu fee Program Account draft documents will be posted, and encourage them to call or send an email if they have questions or comments.

Under the 2008 Mitigation Rule, the Corps of Engineers, in conjunction with an Interagency Review Team, conducts a public review and comment process of SEAL Trust's draft Framework and ILF Program Account. Following this public process, SEAL Trust works with the Corps and IRT to address remaining issues and to modify its existing legal agreement (~~–instrument~~) that specifies responsibilities and duties of the Corps (regulatory agency) and SEAL Trust (ILF Program sponsor).