Alternatives Report

Sitka Seaplane Base Master Plan

DRAFT

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1.0 Seaplane Base Master Plan Overview

The City and Borough of Sitka is developing a Seaplane Base Master Plan that will be used as a guideline for relocating and upgrading the seaplane base on Japonski Island. The plan is intended to meet the parking demand and facility requirements for 20 years. The plan development process will be used to select a preferred location for an upgraded seaplane base and to seek federal funding for the new facility. The existing seaplane float is in poor condition and is not large enough to meet current needs. In addition, there are safety concerns with the present location and conflicts with other adjacent uses. The master plan process encompasses two phases: (1) analysis of the conditions and needs of seaplane facilities in Sitka (HDR 2002), and (2) development and evaluation of alternatives that will resolve the identified issues and meet future seaplane needs in the community.

1.2 Condition and Needs Assessment Report

The first phase of planning concluded with the development of a report documenting the condition of the existing seaplane base facilities and the need for seaplane base improvements, forecasting future demand, and determining the seaplane base facility requirements. The inventory of existing conditions was based on an onsite inspection of the seaplane base, published data, and the public involvement efforts made during the first phase of the plan. The results of that phase of work are contained in a separate document entitled *Sitka Seaplane Base Master Plan Condition and Needs Assessment Report* (HDR 2002).

1.3 Alternatives Scoping Report

The second phase of planning entailed developing and evaluating alternatives for relocation of the Sitka Seaplane facility. This present report describes the preliminary alternatives that were considered. These 12 alternatives were evaluated for their ability to accommodate the anticipated seaplane demand and to resolve the safety and capacity deficiencies that have been identified at the existing seaplane base. Each alternative was also evaluated for compliance with applicable Federal Aviation Administration (FAA) requirements. The seaplane facility requirements are based on the FAA planning criteria presented in Advisory Circular (AC) 150/5395-1, Seaplane Bases. The report identifies areas where a future seaplane base could be developed, and concludes with a series of alternative development options for the Sitka Seaplane Base with cost estimates.

2.0 Facility Requirements Summary

This section presents a summary of the facility requirements and conditions needed to provide a safe and efficient seaplane base and operating area in Sitka that will meet the forecast demand for the next 20 years. The following elements are summarized in this report: future demand, water operating area characteristics, shoreside facilities, upland facilities, and the seaplane base design concept.

2.1 Future Demand

Based on the information analyzed during the first phase, the moderate growth scenario is the recommended base for planning. The moderate growth scenario represents the most realistic estimate of existing and future based aircraft demand. Under the moderate growth scenario, the Sitka Seaplane Base should accommodate the following:

- A short-term (5-year) forecast of 13 slips.
- An intermediate-term (10-year) forecast of 14 slips.
- A long-term (20-year) forecast of 15 slips.

2.2 Water Operating Area Characteristics

The water operating area is that part of the seaplane base used or intended to be used for the landing and takeoff of aircraft, as well as taxiing, turning, and maneuvering of aircraft on the water surface. The area needs to have sufficient size and water characteristics to allow the safe operation of aircraft during all phases of flight. The following characteristics are recommended (see AC 150/5395-1, Seaplane Bases):

- **Sufficient Size**—The existing water operating area dimensions (4,000 feet by 200 feet) are sufficient and should be used for planning the upgraded seaplane base.

- **Slow Currents**—Landing and takeoff areas in locations where the currents are less than 3.5 mph are preferable. Locations where the currents exceed 7.0 mph should be avoided.

- **Sufficient Water Level**—The minimum depth for seaplane operation is 3 feet, although 6 feet is preferable.

- **Safe from Wave Action**—Locations where large swells occur or are frequently created by vessels should be avoided.

- **Debris Free Area**—Areas subject to excessive debris or to debris over extended periods of time should be avoided.

- **Safe Maneuvering Space**—Ample maneuvering and turning areas should be provided, considering boats, prevailing winds, and currents.

- **Sheltered Moorage**—A sheltered mooring or anchorage area, protected from winds and currents, is recommended. A cove, small bay, or other protected area is ideal.

- **Safe Bottom Conditions**—A facility should be free of bottom hazards. Objects that project from the bottom and constitute a hazard should be removed. If this is impractical, the objects should be conspicuously marked to alert users to their presence.

- **Free from Wildlife Attractants**—To the extent practicable, the distance between the seaplane base's aircraft movement areas, loading ramps, or aircraft parking areas and a wildlife attractant should be 5,000 feet for

facilities serving piston-powered aircraft. The FAA recommends against new development projects that would increase the number of aircraft operations or that would accommodate larger or faster aircraft near putrescible-waste disposal operations (such as the seafood processing outfalls located in Sitka Channel).

- **Operational Flexibility**—An unmarked water lane or water operating area is normally the choice of seaplane pilots and is recommended.

- **Prevailing Winds**—If a water lane is designated, it should be aligned to provide maximum wind coverage.

- **Approach and Departure Paths**—The approach and departure paths should be clear of established shipping or boating lanes and airspace hazards. An over-water approach or departure is preferable to an approach-departure path over populated areas, beaches, and shore developments.

2.3 Shoreside Facilities

- **Floating Dock**—Because of the large tidal variation at Sitka, a floating seaplane dock that provides slips with individual ramps and an associated gangway designed to accommodate a 19-foot variation is the recommended design.

- **Haul-out Ramp**—The most recent airport master plan (DOT&PF 1999) for the Sitka Rocky Gutierrez Airport recommends development of a haul-out at the eastern end of the airport. An additional haul-out ramp at the seaplane facility is not recommended.

- **Gangways**—A gangway of sufficient length and width should be provided to permit easy walking and the passage of baggage carts. The gangway should meet all requirements contained in the accessibility guidelines of the Americans with Disabilities Act (42 USC 126, Section 12101 et seq.). A short pier is recommended to connect the gangway with the seaplane float.

2.4 Upland Facilities

- **Lease Lots**—Lease lot development is not essential to the functioning of the seaplane base and is not recommended for short-term development. There could, however, be demand for up to three lease lots beyond the 20-year planning horizon.

- **Administration Building**—Administration facilities are not recommended for short-term development.

- **Access**—Vehicle access to the seaplane base should be by an all-weather road (paved or gravel) with adequate width (a 24-foot-wide road consisting of two 12-foot lanes plus 2-foot shoulders on either side).

- **Parking Areas**—Up to 18 parking spaces should be provided for seaplane pilots and commercial users.

2.5 Seaplane Facility Design Concept

A number of site-specific design concepts are possible. Layout and design elements will be used to enhance the locational attributes of each site to further protect based aircraft from wind and wave activity and to facilitate ingress and egress of the seaplanes into parking positions. Based on the facility requirements analysis, the design should have the following characteristics.

- Piers: 20 feet wide
- Gangway: 12 feet x 170 feet with a maximum 12% grade at low tide
- Docks wide enough to accommodate tie down lines, pedestrian traffic and a drive-down for a pickup sized vehicle.
- Parking lot space, per vehicle: 9 feet by 18.5 feet
- Seaplane tie down ramps: 18 feet square
- Docked Seaplane Wingtip to Wingtip Separation Distance: 10 feet

3.0 Alternatives Development Process

The alternatives development, and subsequent analysis, was accomplished in four primary steps.

1. Site Identification
2. Fatal Flaw Screening
3. Conceptual Layouts and Evaluation
4. Preferred Alternative Recommendation

3.1 Step 1 – Site Identification

The first step was to identify a list of potential locations that might possess the necessary physical, environmental, and locational attributes with the potential for seaplane base development. The following list of sites (Figures 1 and 2) was developed through discussions with pilots and city officials, field reconnaissance, and research.

- Charcoal Island shore
- Jamestown Bay
- Sawmill Cove
- Herring Cove
- Starrigavan Bay
- Thomsen Harbor/Turnaround area
- Sitka Rock Gutierrez Airport lagoon
- Safe Harbor
- Work float site
- Mt. Edgecumbe site
- Southeast Alaska Regional Health Consortium (SEARHC) cove site
- Existing seaplane base site

Figure 1
Location Map

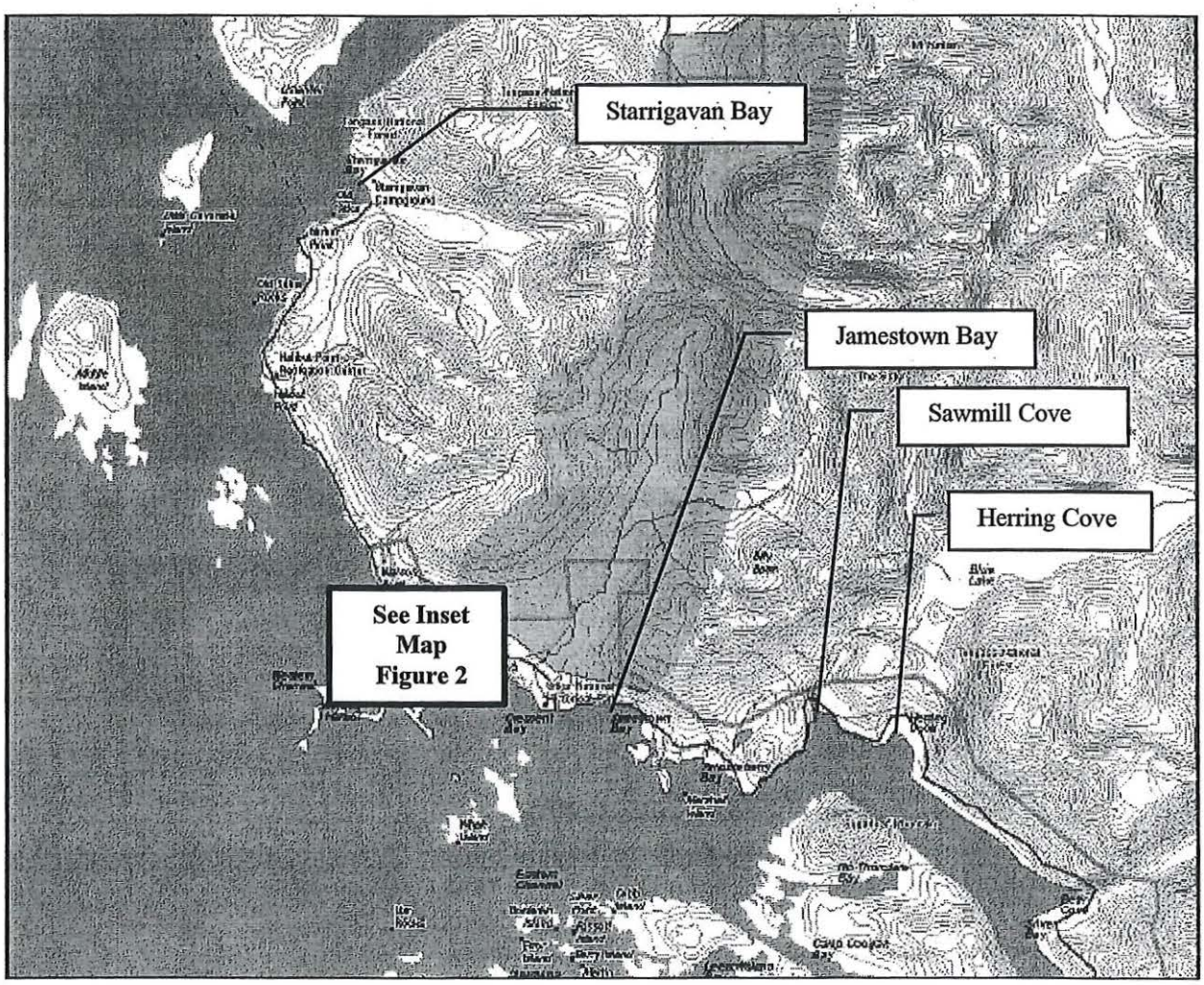
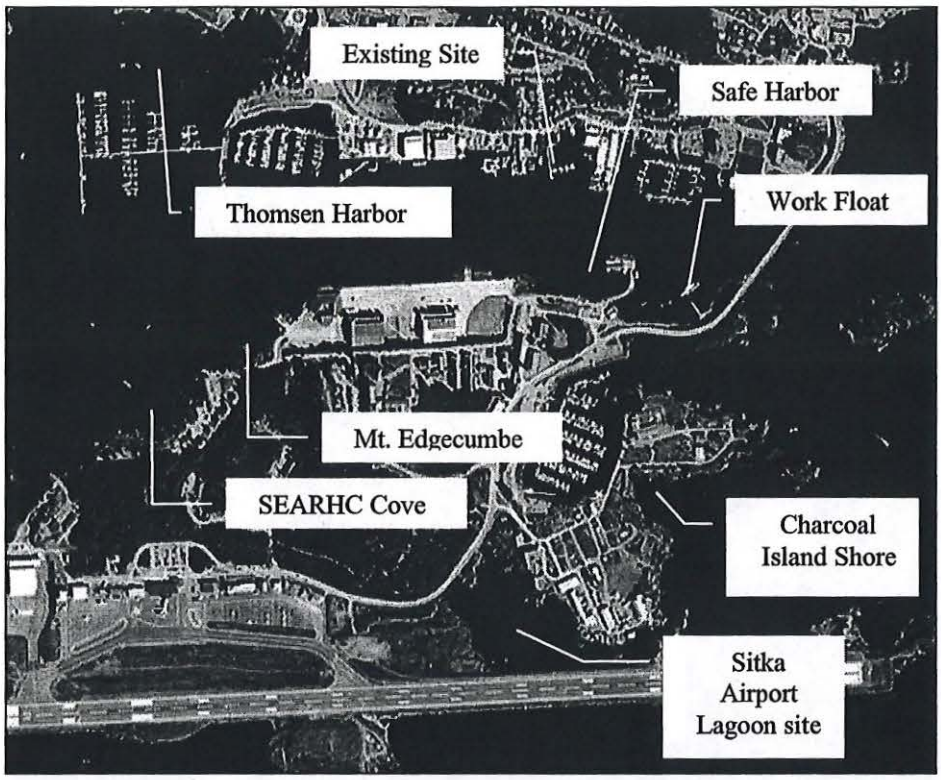


Figure 2
Location Inset



3.2 Step 2 – Fatal Flaw Screening

The second step was to evaluate the identified sites and narrow the list to those that do not have fatal flaws. Fatal flaws are obvious site characteristics that make the site unreasonable from a safety, environmental, or capacity perspective. The sites were considered for their ability to safely accommodate seaplane base facilities and operations, and were compared against the FAA planning criteria found in the seaplane base advisory circular (AC 150/5395-1).

Herring Cove, at the foot of Bear Mountain (4,000 feet), faces severe topographical constraints.

3.2.1 Topography

Sitka is located in an extremely mountainous area of coastal Alaska. Mountains on Baranof Island in the vicinity of Sitka rise from sea level to over 4,000 feet. The fiord conditions of Silver Bay (Sawmill and Herring coves) typify the extreme elevation changes experienced along the coast of Baranof Island.

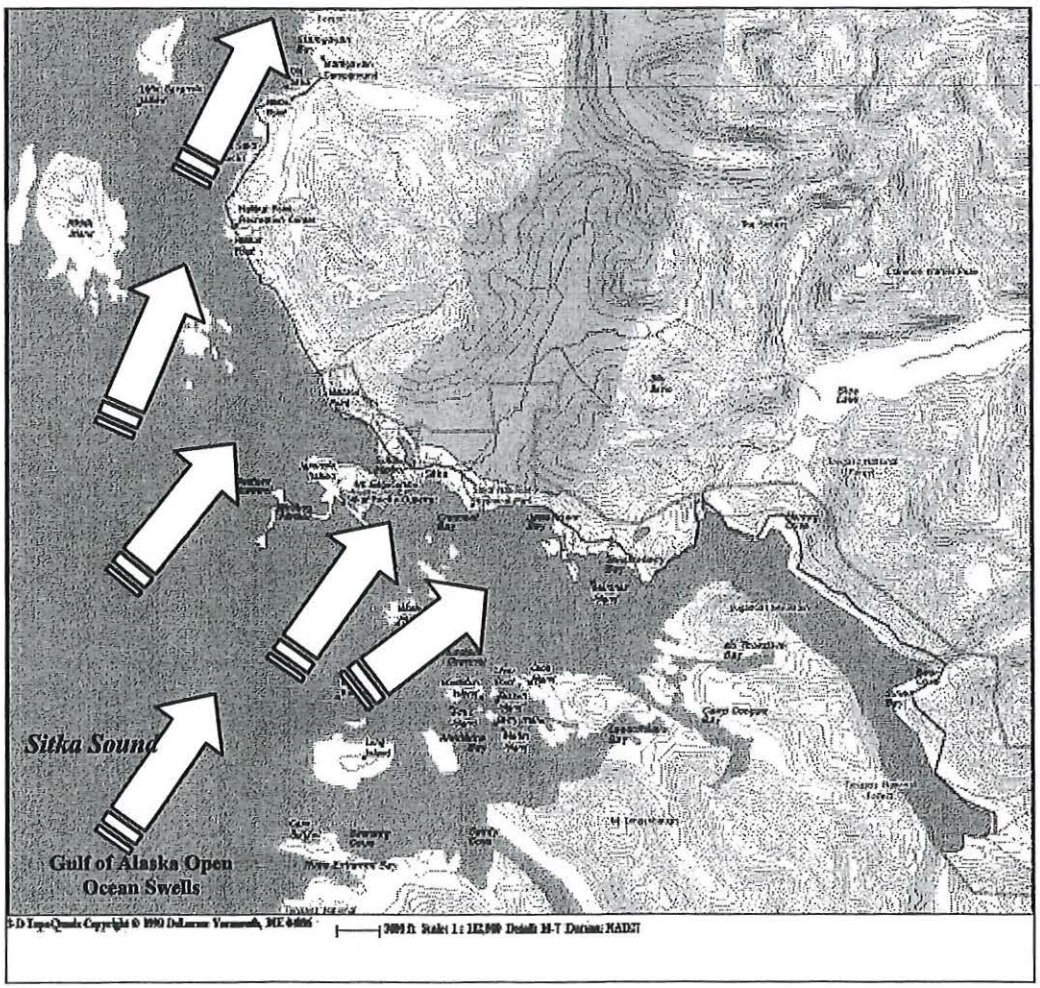
Topography is a crucial limiting factor affecting the location of aviation facilities. Airports and seaplane

bases are required to have sufficient airspace in the vicinity of their operating areas to allow safe operations. Federal Aviation Regulation Part 77 (see 49 CFR 77 and 14 CFR Part 77) establishes the standards and notification requirements for objects affecting navigable airspace. This regulation applies to terrain, permanent or temporary construction (or alteration), or any object of natural growth that penetrates the airspace surrounding an airport or seaplane operating area.

3.2.2 Weather Conditions Analysis

Finding a site protected from wind and waves proved to be the most challenging aspect of the site selection process. Sitka, which is located on Sitka Sound, is exposed to the North Pacific Ocean and Gulf of Alaska with few islands or reefs to protect it or absorb wave energy (Figure 3). Sea swells and open ocean conditions make any unprotected site less than desirable for seaplane base facilities and normal seaplane operations. This limits the potential for seaplane base development to only a few locations that have adequate protection. Unlike the more protected, Inland Passage areas of Southeast Alaska, Sitka is also directly exposed to storms from the Gulf of Alaska. For this reason, finding a location where the seaplane base and its operating area is protected from the wind is also a concern.

Figure 3
Wave Conditions



There is currently only one meteorological station near Sitka. An automated weather observation site operated and maintained by the FAA is located approximately halfway down the southwest edge of the runway for Sitka Rock Gutierrez Airport. The automated equipment records hourly data on wind speed and wind direction. Wind speed and direction data were acquired for a period of five years (1996 through 2001) and used to generate a color-coded wind rose (Figure 4) for Sitka. The wind rose was overlaid onto base maps for each of the proposed sites to evaluate their exposure to prevailing wind patterns (see, also, Appendix A). Micro-climate predictions, based on topography and local knowledge, were also evaluated to estimate the appropriateness of each location relative to wind conditions. The following weather analysis was confirmed by local pilots who felt quite strongly that there is no reasonably protected location outside of the harbor for a seaplane facility.

Figure 4
Wind Rose for Sitka, Alaska

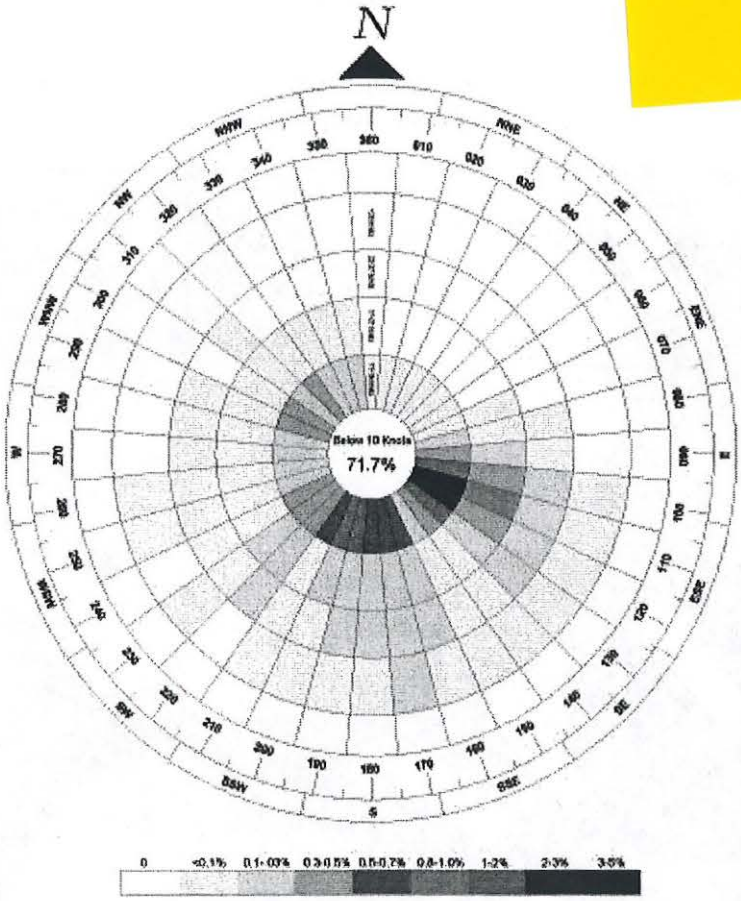


Figure 4 shows the frequency of the winds by direction and speed on a 360° compass. Lighter colors indicate less frequent winds and darker colors indicate more frequent winds. Wind speed increases as the colors move farther from the center of the wind rose. Winds recorded below 10 knots are not shown in Figure 4, but account for 71.7%

of the total winds recorded. Winds below 10 knots have not been shown to negatively impact aircraft operations.

For the remaining winds (those above 10 knots), the recorded data indicate that approximately 16% come from the southeast quadrant (90° to 180°). Winds from the southwest quadrant (180° to 270°) account for 4.3%, and easterly winds (~79° to ~101°) account for 2.3% of the total. Winds coming from the northwest (~282° to ~350°) account for 2.45% of the total, whereas westerly winds (~259° to ~281°) account for only 0.65%. Less than 0.7% of the winds were recorded as coming from the north or northeast quadrant. Few winds come from the north or northwest quadrants.

The wind rose analysis indicates that the prevailing winds come from the south and southeast and that the strongest winds come from the southeast. Sites without good protection from these directions would not offer the necessary shelter and were deemed unsafe for based seaplanes and operations.

The primary reason for excluding sites from the list developed in Step 1 was the lack of protection from large sea swells and waves originating in the North Pacific Ocean and the Gulf of Alaska, and inadequate protection from winds generated by large Pacific storms (Figures 3 and 4). Such conditions make most of the sites that were eliminated unsafe for seaplane base facilities or seaplane operations.

3.2.3 Fatally Flawed Locations

The following sites were considered, but were rejected as fatally flawed for weather concerns due to wind and waves—particularly when coupled with other upland constraints such as topography and land use (Charcoal Island, Jamestown Bay, Sawmill Cove, Herring Cove, and Starrigavan Bay). The remaining locations (Thompsen Harbor/ Turnaround area, existing seaplane base site, Japonski airport lagoon, and the Work Float site) showed some promise for offering the protection from wind and waves needed for safe seaplane base operations but were fatally flawed for other reasons. Primarily, these areas showed promise, but were located either within Sitka Harbor or at the main airport. Three of the areas were deemed to have fatal flaws because they lacked sufficient space to provide a safe operating environment and a seaplane base would conflict with other uses of the upland and water environment. The bullets following each site description summarize the justification for excluding the site.

Charcoal Island Shore

Charcoal Island forms the southeast portion of the Sitka Rocky Gutierrez Airport (Figure 5). The airport master plan currently proposes a seaplane haul-out ramp along this shoreline. The shoreline also has a number of small coves and these were considered for potential seaplane base development. Because the area is unprotected from the strongest and most prevalent winds coming from the southeast, a seaplane base would be unsafe without breakwater protection. Swells from Sitka Sound that consistently come through Middle Channel would also make the water operating area unsafe. Identified problems with the site include:

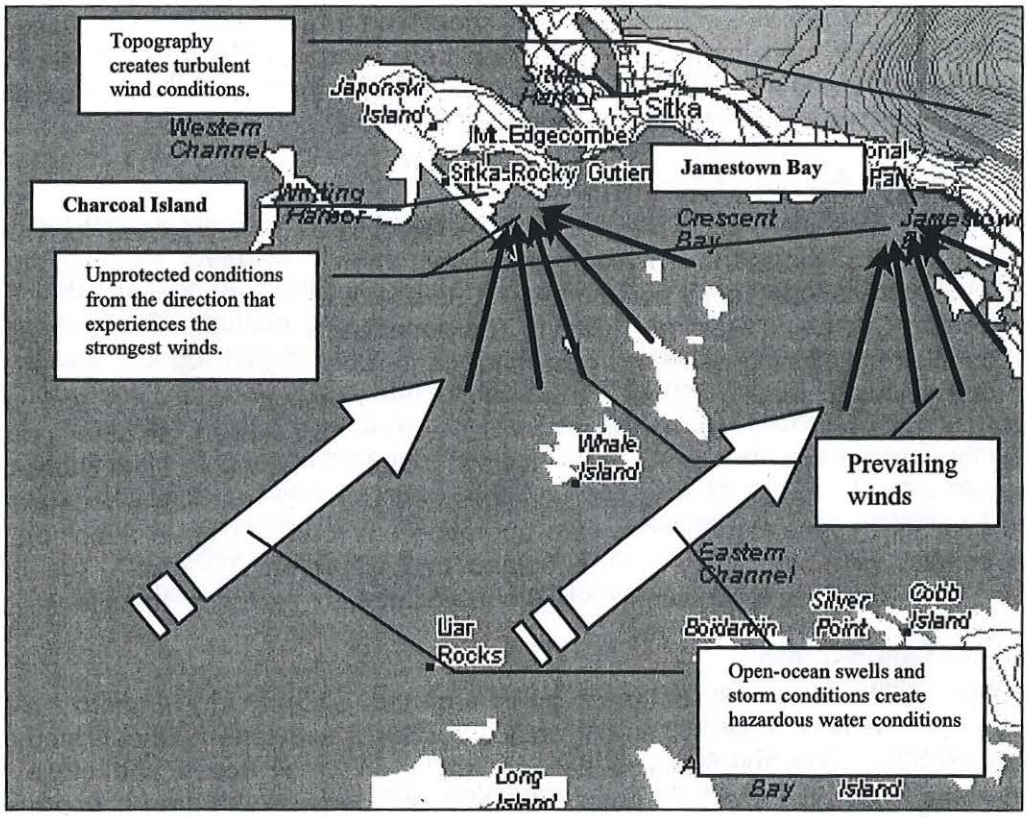
- Significant wave, sea swell, and wind energy.
- Long taxi into Sitka Channel.

Jamestown Bay

Jamestown Bay was the site of a former seaplane base operation more than 35 years ago. In the intervening time, a considerable amount of residential development has occurred adjacent to and overlooking the bay. The area is only semi-protected and suffers from exposure to ocean swells and turbulent wind conditions (Figure 5). Identified problems with the site include:

- Turbulent wind due to surrounding topography.
- Large number of downwind takeoffs.
- Significant exposure to southwest swells.
- High level of small and large boat traffic.
- Upland area mostly residential.

Figure 5
Charcoal Island and Jamestown Bay Site Analysis

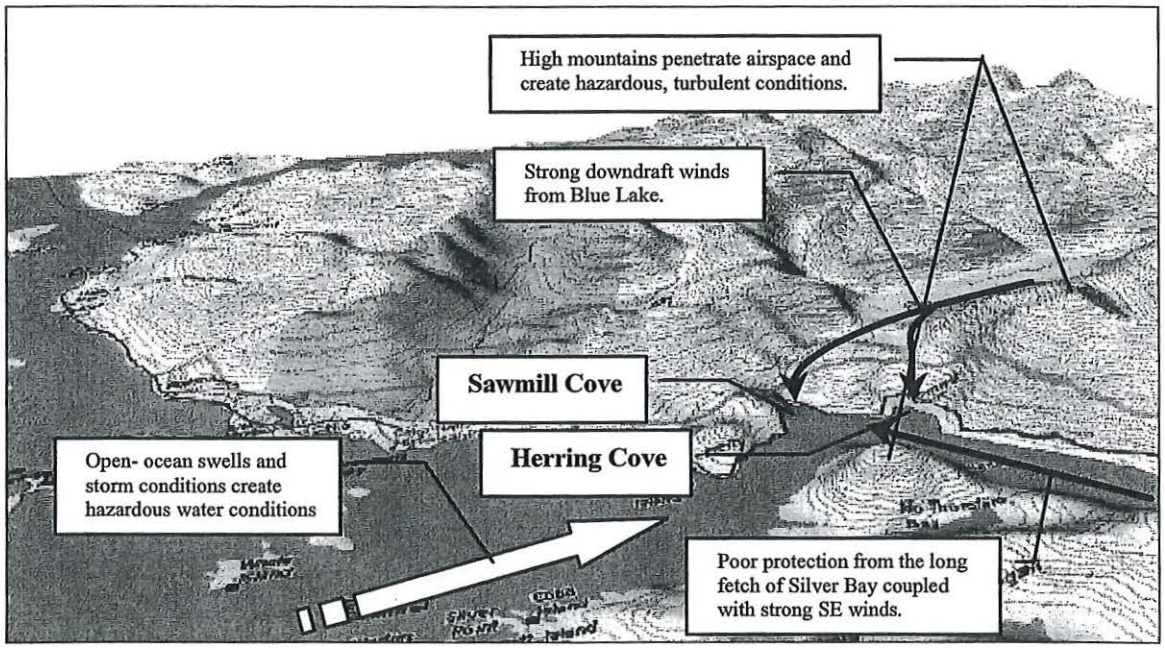


Sawmill Cove and Herring Cove

Sawmill and Herring coves are located on Silver Bay east of Sitka (Figure 6). The alignment of Eastern Channel funnels ocean swells up into the bay. Silver Bay is well aligned with the prevailing winds, but the long, unprotected fetch generates wind-driven waves of considerable size. The Sawmill Cove and Herring Cove sites are located at the confluence of these systems. In addition, mountainous terrain exacerbates the winds, creating turbulent conditions and considerable funneling of winds out of the Blue Lake area. The mountains also create safety hazards as airspace penetrations. Identified problems with these sites include:

- Long fetch of Silver Bay with direct access to the open ocean via Eastern Channel.
- Large wind chop from prevailing winds.
- Strong and turbulent winds from Blue Lake.
- Topography limits during cloudy or foggy conditions.
- Too far from town for seaplane pilots and the community.

Figure 6
Sawmill Cove and Herring Cove Site Analysis

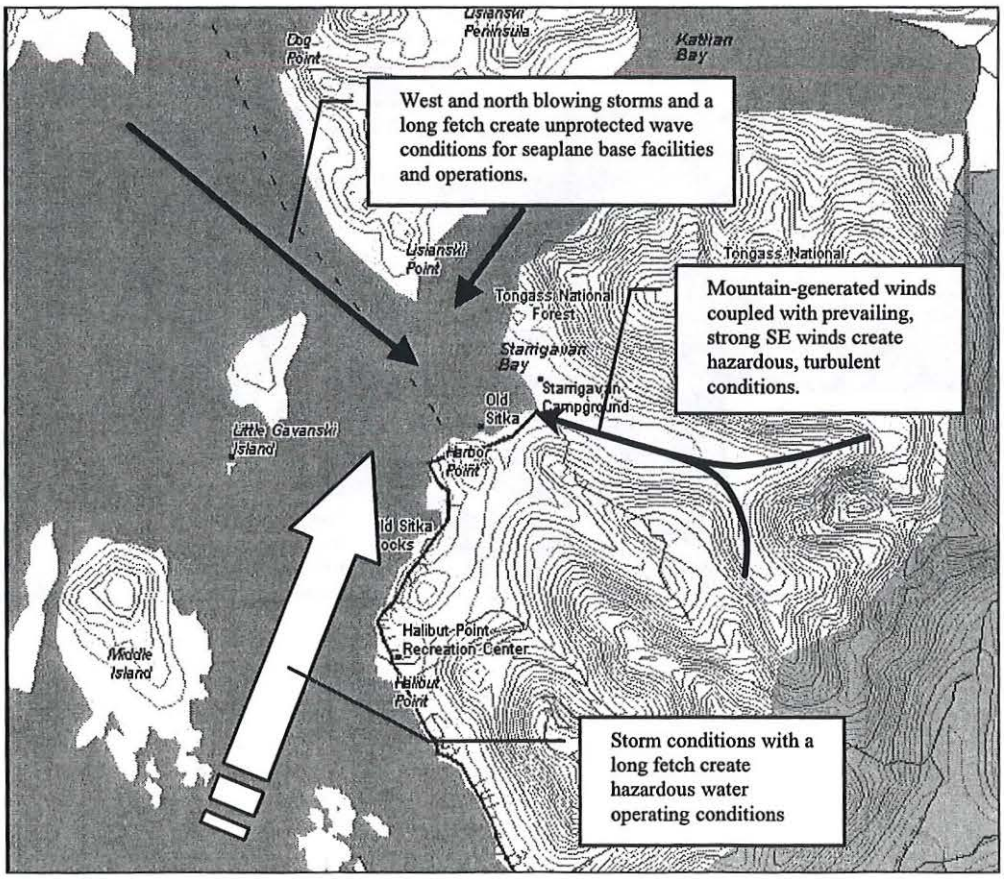


Starrigavan Bay

Starrigavan Bay is located north of Sitka. The state ferry dock, a small-boat launch ramp, campground, and industrial-container shipping dock are located adjacent to the bay. No breakwater protection is available and seaplane facilities would be subject to northerly and westerly winds with no protection from waves (Figure 7). The proposed water operating area is subject to ocean swells and long fetches of water from several directions, which create choppy conditions from wind-driven waves. The upland area holds little capacity for parking or other development. Identified problems with the site include:

- No protection from open-ocean swells.
- Large wind chop from southeast, north, and west winds.
- Water typically choppy and rough.
- Huge wakes from large boats and ferry.
- No room for upland development.
- High level of salmon and waterfowl use.
- Too far from town for seaplane pilots and the community.

Figure 7
Starrigavan Bay Site Analysis

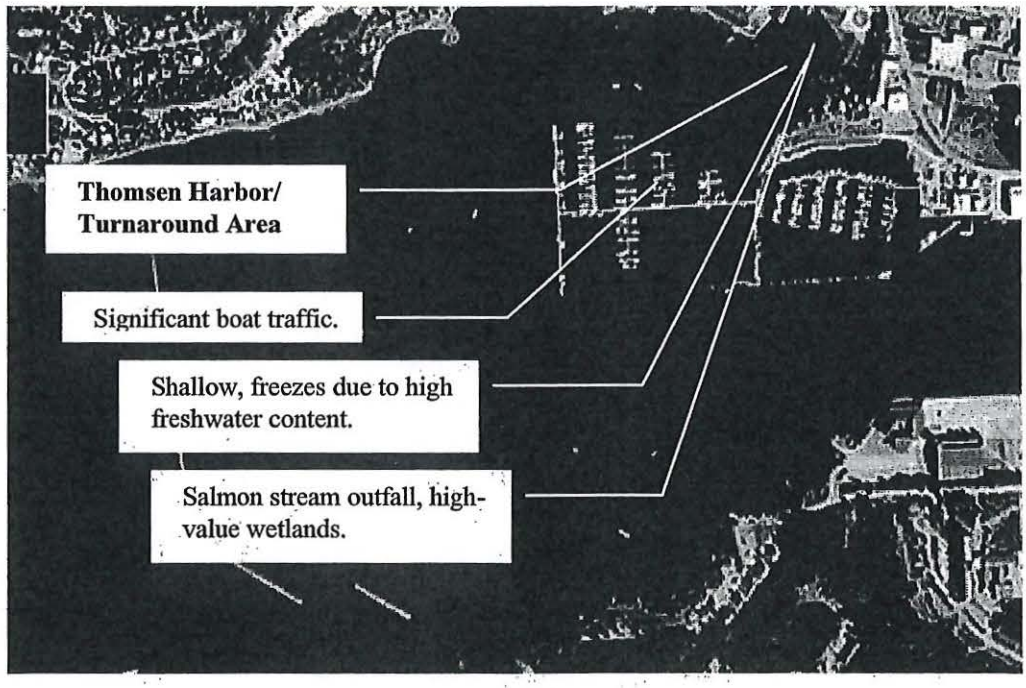


Thomsen Harbor Area

The Thomsen Harbor/Turnaround area was suggested because it offers a well-protected location behind the breakwater of the Western Anchorage (Figure 8). The area is already extremely congested with small boat traffic from Thomsen Harbor. At low tides, the taxi lane into the area becomes extremely narrow and floatplanes would need to share it with a considerable number of boats. Also, the area is the mouth of an anadromous stream with important intertidal habitat and high-value wetlands. The freshwater from the stream frequently causes the area to freeze in winter. Identified problems with the site include:

- Constrained by a large boat harbor and shallow water.
- Insufficient space at low tide to safely accommodate the passage of seaplanes and boats without significant dredging.
- Salmon run in the vicinity.
- Would need cost-prohibitive dredging and development.
- High-value wetlands in the intertidal area.
- Freezing due to freshwater concentration from the anadromous stream.
- High level of boat traffic.
- Possible strong local opposition to upland development for seaplane facilities.

Figure 8
Thomsen Harbor Site Analysis

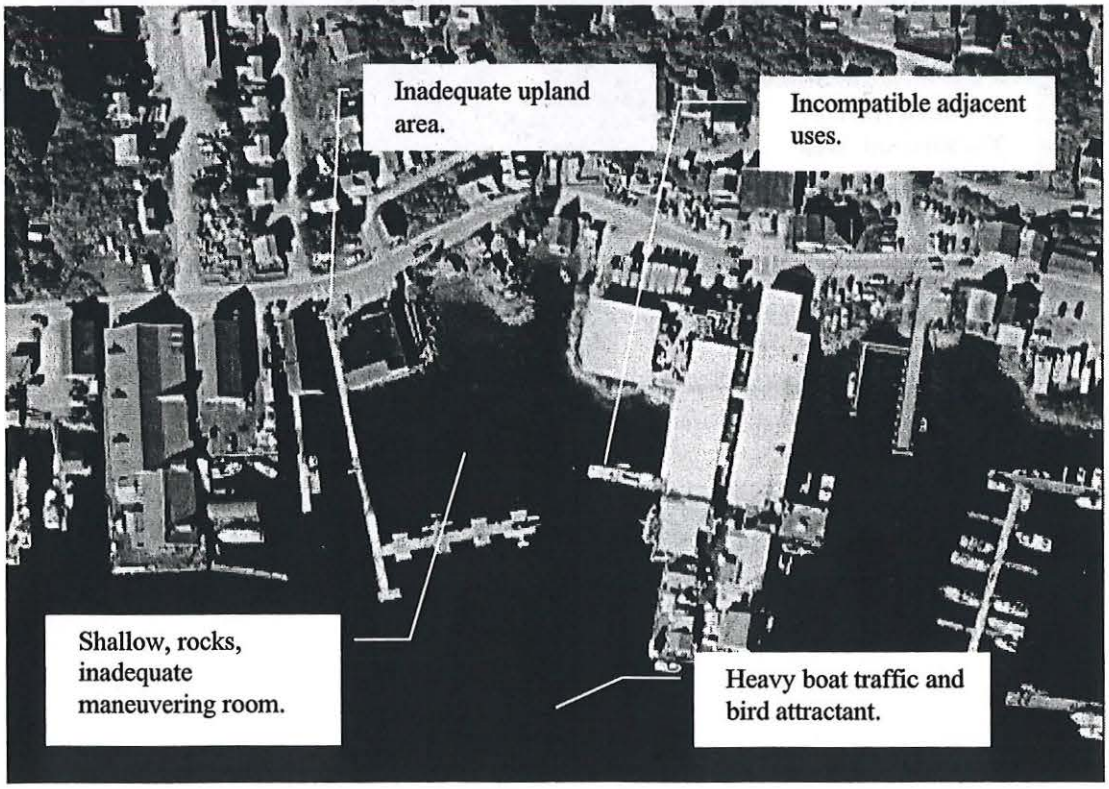


Existing Seaplane Base Site

In response to comments from pilots indicating the existing site is the most protected from winds of any site considered (Figure 9), it was also evaluated for expansion potential. The existing site is severely constrained and has minimal area for expansion either in tideland or upland areas. There is not enough room at the existing location to safely provide ramp space to meet the forecast increase in use and development. Because the site also conflicts with adjacent uses, it would be extremely difficult to solve the existing safety issues and upgrade the seaplane base. As documented in the *Sitka Seaplane Base Master Plan Condition and Needs Assessment Report* (HDR 2002), the site suffers from a number of problems that have prompted the desire to relocate the seaplane base. Identified problems with the site include:

- Rocks and boulders under the water.
- Heavy bird attractant at the adjacent fish processing plant.
- Significant fishing and boat traffic.
- Inadequate size for safe maneuvering room.
- No expansion room to meet existing and forecast demand.
- No upland area for parking.
- Small expansion area available only in other developed land.
- Narrow wingtip clearances between seaplanes.

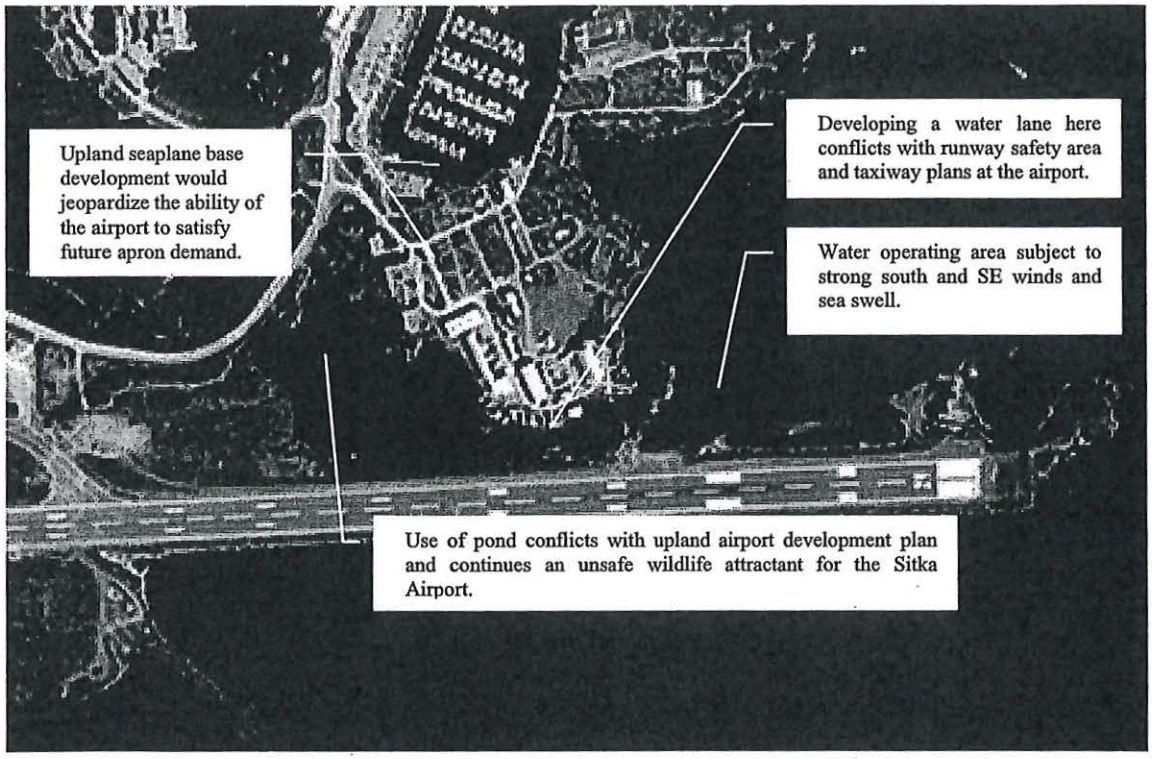
Figure 9
Existing Seaplane Base Site Analysis



Japonski Airport Lagoon Site

This site is located in the lagoon formed in between Japonski and Charcoal islands and the runway of the Sitka Rocky Gutierrez Airport (Figure 10). This site would require the use of land set aside for future expansion of the Sitka airport. For this site to be feasible, a channel would need to be blasted in the western end of Charcoal Island to create a 200-foot-wide sea-lane. The airport's runway embankment would serve to protect the sea-lane and intercept the prevailing sea swells. After the runway embankment is extended for the new safety area at the airport, there would be a total of between 3,400 and 3,800 feet of protected sea-lane.

Figure 10
Japonski Airport Lagoon Site Analysis



The site is considered fatally flawed because it conflicts significantly with the airport master plan for Sitka Rocky Gutierrez Airport (DOT&PF 1999). Development would conflict significantly with planned improvements at the airport, including runway safety areas, a proposed parallel taxiway, and needed apron expansion. Using these areas for seaplane base development would affect the ability of the airport to accommodate future demand and comply with FAA regulations and recommendations.

In addition, the lagoon is a large safety hazard for the airport because it is a major wildlife attractant. Plans are currently under review for filling in the lagoon to improve airport safety and protect the aircraft operating at the airport. Safety for both wheeled and floatplanes would be compromised if the seaplane base were located in the lagoon because the major wildlife attractant would not be removed. Sea swells coming through Middle Channel would decrease the safety of a landing and takeoff area adjacent to the seaplane base. Identified problems with the site include:

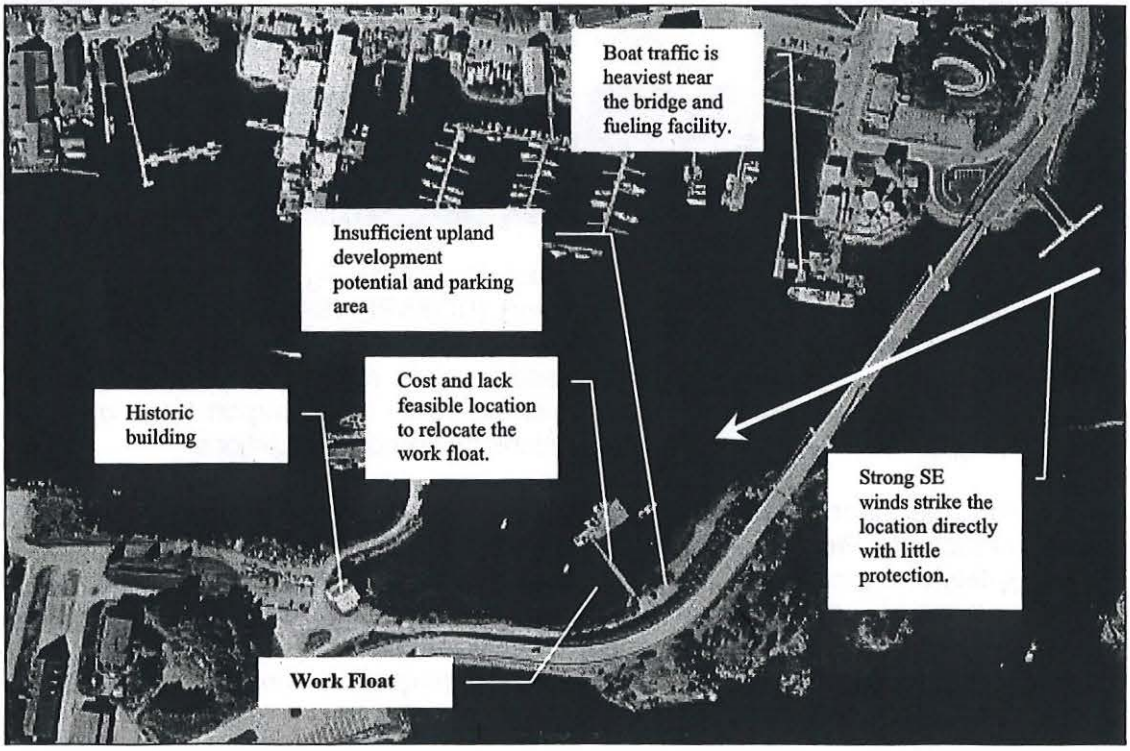
- Incompatible with 1999 Sitka Rocky Gutierrez Airport Master Plan.
- Safety problem of the wildlife hazard posed by the lagoon.
- Wind exposure.
- Sea-lane only partially protected from sea swells and larger waves.
- Expense of blasting the sea-lane channel.
- No breakwater protection for eastern side of sea-lane.

Work Float Site

This site is located along Airport Road between the U.S. Coast Guard dock and the western end of O'Connell Bridge, on the southeast side of Japonski Island (Figure 11). Located near the mouth of the channel across from the fueling facility, the area is one of the more congested and traveled areas of the harbor. The site is relatively unprotected from strong prevailing southeast winds. Sandwiched between the road embankment and the water, seaplane facilities would have little to no upland development area for parking or other needs. Identified problems with the site include:

- Not well protected from wind.
- Cost and lack of a feasible location to relocate the work float.
- Seaplanes in close proximity to U.S. Coast Guard vessels and dock.
- Difficult to control access to the storage area and dock.
- Heavy boat traffic at the fueling facility and at the mouth of the harbor under the bridge.
- Insufficient upland parking area and development potential.

Figure 11
Work Float Site Analysis



3.3 Step 3 – Conceptual Layouts and Evaluation

The third step involved preparing conceptual engineering layouts for the remaining sites to determine if they would be feasible, relative to the facility requirements for the seaplane base in Sitka. Included in the discussion of each site is an identification of the pros and cons associated with each of these sites as compared against key FAA siting criteria and facility requirements. The following sites were identified as having the potential for providing an improved operating area and location for developing a seaplane base:

- Safe Harbor Site
- Mt. Edgecumbe Site
- SEARHC Cove Site

These sites are considered reasonable and should be further evaluated under the National Environmental Policy Act, if such analysis becomes required. It should be noted, however, that none of these sites meet the minimum FAA recommended distance from wildlife attractants.

3.3.1 Alternative 1 – Safe Harbor Site

Alternative 1 proposes development of a new seaplane facility at Safe Harbor. Safe Harbor was the location of the airport ferry dock prior to the construction of O'Connell Bridge. The relocated seaplane base facility (Layout 1) would be on Japonski Island, directly across Sitka Channel from the existing seaplane base and between the U.S. Coast Guard dock and University of Alaska property.

This area of Sitka Channel provides improved seaplane maneuvering room as compared with the existing facility and is large enough to accommodate safe taxiing and turning movements into the facility. Dredging and construction of a seawall are proposed as a means of tightening its position as close as possible to the shoreline to keep it out of Sitka Channel. This would protect the facility from boat traffic. The U.S. Coast Guard dock would further protect the takeoff and landing area from swell, waves, and wind coming up the channel. Japonski Island protects the area from open-ocean wave action and the site provides a relatively sheltered moorage area from local winds. Nautical charts indicate that there are submerged piles in this location which would likely need to be removed. The dredging and seawall construction would also ensure that the bottom is free of hazards and that sufficient water depth is maintained at the full tidal range.

It is expected that a seaplane base at Safe Harbor would continue to use the FAA-designated landing and takeoff area along the centerline of Sitka Channel. This lane is well aligned for the prevailing winds, but bird hazards associated with the landing and takeoff area would remain. If the facility were to be relocated to the Safe Harbor site, bird hazard mitigation measures recommended in the Wildlife Hazard Assessment report prepared for the Sitka Rocky Gutierrez Master Plan (DOT&PF 1999) should be implemented. The takeoff and landing lane should be marked on all charts because the lane is split by O'Connell Bridge (an obstruction) at its southeastern end. Taxiing under the bridge would continue to be required for approach and departure operations in that direction. Access to the new facility would be along Seward Avenue. The area

proposed for vehicle parking is currently used for that purpose, along with the storage of miscellaneous fishing and marine equipment.

The upland area adjacent to this site is zoned as "Public" land (see Appendix B) and is owned by the State of Alaska, Department of Education. The State of Alaska also owns and manages the tidelands. Nearby land uses include the U.S. Coast Guard dock, the University of Alaska, Southeast campus, and Mt. Edgecumbe High School dormitories. Access and upland development of parking facilities would require acquisition of land from the Department of Education. Noise would be the primary impact to the upland properties. Because takeoffs and landings would occur on the same water operating area and in an identical manner as the existing conditions, no noticeable change in noise conditions is anticipated. Zoning and ownership maps for Japonski Island are contained in Appendix B.

The location of Alternative 1 would be close to the wildlife attractant created by the fish processing waste outfalls in Sitka Channel. Safe Harbor is approximately 600 feet from the processing facility itself. The Alternative 1 site might be an improvement over the existing seaplane facility, in that the birds tend to gather at the processing plant, which is directly adjacent to it.

According to the 1999 Wildlife Hazard Assessment (WHA) for the Sitka Rocky Gutierrez Airport, Sitka Channel frequently attracts large numbers of gulls and smaller numbers of diving ducks and bald eagles. Outfall pipes discharge waste into the bottom of Sitka channel approximately 200 yards from the docking area of the processors. Seafood wastes consist mainly of water with chunks of fish waste that have been ground to one-half inch in size. Some fish wastes (those that are probably high in oils) float to the surface, where it becomes available to scavenging birds such as gulls. Fish waste from seafood processing activities located along the channel appears to be the primary attractant for gulls. Waste in the area includes fish remains resulting from sport fishing activity as well as that discharged from underwater outfall pipes, dockside transfers, and cleaning operations. Large flocks of mixed gull species feeding directly above the seafood waste outfall pipes of Seafood Producers Cold Storage and Sitka Sound Seafoods were recorded during the WHA.

The WHA reports that a meeting was held with two of the seafood processors to inform them of the problem. Several possible remedies were discussed, including night dumping and a possible increase in fish waste composting. The WHA recommends further study to understand the relationship between the discharge of seafood wastes and seabird movements in the area.

The estimated cost of Alternative 1 is $4,700,000. Please note that this is a planning estimate only. Details of the cost estimate are contained in Appendix C.

Advantages	*Disadvantages*
▪ Sufficient upland area to develop vehicle parking. ▪ Nearby U.S. Coast Guard dock provides some protection from sea swells, wind, and waves. ▪ Can be easily accessed from the existing road system. ▪ Least constrained future landside development of the three alternatives.	▪ Seaplane operations (noise) remain in Sitka Channel. ▪ More exposed to prevailing winds and wave action than the existing site. ▪ Seaplanes operations in close proximity to the U.S. Coast Guard vessels and dock. ▪ Operations still in a relatively congested boat traffic area. ▪ No substantially increased distance from wildlife.

3.3.2 Alternative 2 – Mt. Edgecumbe Site

Alternative 2 explores relocating the new seaplane facility to the northern end of Japonski Island (Layout 2) in the cove adjacent to the Mt. Edgecumbe High School (MEHS) at a seaplane ramp formerly used by the U.S. Navy.

This site is adjacent to a wider open area of the harbor known as the Western Anchorage. The Western Anchorage provides a significant improvement over the existing location for providing maneuvering room to accommodate safe taxiing and turning movements into the facility. The area would also increase pilot flexibility for choosing the direction and location for take off and landing to take advantage of wind conditions or to avoid hazards such as birds and boats. The site is approximately 2,000 feet from the main concentration of birds in Sitka Channel

The Alternative 2 site provides a relatively sheltered moorage area. Japonski Island and breakwaters forming the harbor protect the site from open-ocean wind and wave action. Sea swells have been a problem at Thomsen Harbor and could be a concern at the Mt. Edgecumbe site. However, a project for expansion of the harbor breakwaters is being prepared. This project would add 150 feet to the smaller, near-shore breakwater and 200 feet to the larger, central-channel breakwater. Such additions would further reduce wave activity for seaplane facilities and seaplane operations. Dredging and construction of a seawall are proposed as a means of moving the moorage area close to shore to take advantage of the sheltering effect of the slight cove offered by the location. These activities would also ensure that the bottom is free of hazards and that there would be sufficient water depth at the full tidal range.

A question has been raised about the lack of protection from west and north winds at this site. West and north winds, particularly during winter storms, would be a concern and wind damage to planes during these events is a possibility. Analysis of the wind data, however, indicates that such events are not common. South and southeast winds are not only the prevailing winds, they are also consistently the strongest winds experienced in Sitka.

The site is adjacent to the main school buildings of Mt. Edgecumbe High School. The State of Alaska, Department of Education, and the Southeast Alaska Regional Health Consortium own the upland area above the site, which is zoned as "Public" land. The

tidelands are owned and managed by the State of Alaska, Department of Natural Resources. Appendix B contains the zoning and ownership maps.

A primary concern with this alternative is noise. Idling and taxiing seaplanes would be in relatively close proximity to the school, but landing and takeoff operations would not occur as consistently in Sitka Channel as presently occurs. This may actually reduce noise effects at the school. The school is at the north end of the channel and experiences considerable noise from northbound departures and southbound arrivals to the current seaplane base. Southbound departures are also conducted by back-taxiing in front of the high school to the north end of the harbor. If the seaplane base were relocated, northbound departures would likely start at the seaplane base and occur in a direction taking them away from the high school. Because pilots tend to land as close to the seaplane base as possible, and with prevailing winds from the south and southeast, most landings would have an approach path from the north over the Western Anchorage, with landing occurring before the noise would affect the school.

This site is accessible from Seward Avenue. Parking could occur in the existing parking lot behind the high school or could be developed in an undeveloped upland area across Seward Avenue. Land would need to be acquired form the Sitka School District to develop the recommended parking spaces. The existing cement seaplane launch ramp could be used for minor maintenance or airplane fueling.

The site and operating area is within 5,000 feet of known wildlife attractants (the fish waste outfalls). Pilots may choose to operate out of the Western Anchorage near the new facility rather than in Sitka Channel, which could potentially reduce the bird strike hazard.

Advantages	*Disadvantages*
▪ Most seaplane operations in the Western Anchorage, not in Sitka Channel, increasing flexibility and reducing congestion in the channel. ▪ Well protected from south and SE winds. ▪ Would increase the separation from the primary source of bird attraction to 2,000 feet. ▪ Potential use of the existing ramp for light maintenance and fueling.	▪ Aircraft noise more audible near residential and institutional areas, but quieter in Sitka Channel. ▪ More exposure of dock location to wind and wave action than the existing site. ▪ Concern over north and west winds. ▪ Insufficient upland area available for future seaplane base development. ▪ The cove has a ramp owned by Mt. Edgecumbe High School; the school has been unsupportive to having seaplanes near the school in the past.

The estimated cost of Alternative 2 is $5,500,000. This is a planning estimate only. Details of this cost estimate are contained in Appendix C.

3.3.3 Alternative 3 – SEARHC Cove Site

Alternative 3 would develop a seaplane facility on the northern end of Japonski Island in the cove adjacent 1210 Seward Avenue, behind the SEARHC clinic, daycare, and staff residential buildings (Layout 3).

Similar to Alternative 2, this site is adjacent to the area of the harbor known as the Western Anchorage, which would provide sufficient maneuvering room to accommodate safe taxiing and turning movements into the proposed facility. Like Alternative 2, the area would also increase pilot flexibility and choice of take off and landing directions to take advantage of wind conditions or to avoid bird and boat hazards.

Like the other two alternatives, this location provides a relatively sheltered moorage area. The concerns about sea swells, west and north winds, and the breakwater improvements discussed above for Alternative 2 apply to this alternative as well. The land ownership issues are also the same. Currently, only one of the homes along this segment of the shoreline is occupied.

For this alternative, access would be aligned near the end of Seward Avenue, where there is currently a cul-de-sac. From the cul-de-sac leading down to the high-tide line, there is approximately a 20-foot drop in elevation. Based upon acceptable grades of 10% for vehicle access, the elevation difference could force the seaplane base further out into the harbor. However, with the tidelands sloping gradually away at approximately a 2-3% grade, this increased distance from shore would already be required to accommodate the low-tide water levels. Parking would be developed behind or adjacent to the existing residential homes. Land would need to be acquired from the Sitka School District or SEARHC, depending on the specific design configuration of the vehicle parking area.

With development of this alternative, noise would increase in the area from taxiing planes and idling aircraft engines. As with Alternative 2, northbound departures would likely start at the seaplane base and occur in a direction away from the residential properties. With prevailing winds from the south and southeast, and because pilots tend to land as close to the seaplane base as possible, most landings would have an approach path from the north over the Western Anchorage. Landings would occur before the noise affected properties near the seaplane base.

The site is approximately 3,500 feet from the primary fish processing facility. Because many operations would move to the west end of the harbor, they would occur even farther from the primary bird attractant in Sitka Channel than the other alternatives.

Advantages	*Disadvantages*
▪ Most seaplane operations in the Western Anchorage, not in the Sitka Channel. ▪ The seaplane dock size not constrained by the surrounding land. ▪ May be the best location operationally. ▪ Reduces proximity to the primary bird hazard in Sitka channel. ▪ increases separation from the primary source of bird attraction to 3,500 feet.	▪ Dock location exposed to more sea swells as they come in between the breakwater and Japonski Island. ▪ Seaplane operations very close to the SEARHC clinic and residential areas. ▪ Insufficient upland area for seaplane base development. ▪ Very shallow coves, with a fairly far waterline retreat during low tide. ▪ Increased road traffic on the road next to the SEARHC hospital. ▪ More seaplane noise for land uses at the north end of Japonski Island.

The estimated cost of Alternative 3 is $5,500,000. This is only a planning estimate; for more details, see Appendix C.

3.4 Step 4 – Preferred Alternative Recommendation

The fourth step involves identification of a preferred location and conceptual layout for advancement in the master plan. The ultimate selection of a preferred alternative will be made after the public has had an opportunity to evaluate and discuss the various options.

None of the alternatives presented meet the minimum FAA recommended distance between wildlife attractants and a seaplane facility. The lack of available land without topographical constraints and lack shelter from open ocean waves and wind confines the study area for a new seaplane facility to those inside the harbor. The existing seaplane facility represents the least desirable location regarding proximity to a known wildlife attractant. All of the proposed relocation sites presented in this report increase separation from the attractant, but not sufficiently to be in compliance with FAA recommendations.

Alternative 1 provides the shortest separation from the wildlife attractants in Sitka Channel and keeps seaplane operations in a congested, narrow part of the harbor. Alternatives 2 and 3 increase the separation from wildlife attractants and increase operational flexibility and maneuvering room for seaplane operations.
The three alternatives were the only feasible sites of those identified offering protection from Gulf of Alaska wave action. Alternatives 2 and 3 appear to be the most sheltered from the prevailing wind direction, which is also the direction of the strongest winds. Storm winds from the north and west could result in aircraft damage. Alternative 1 appears to offer better protection for north and west winds.

Each of the alternatives requires the acquisition of land from the State of Alaska, Department of Education, or SEARHC. Depending on the ultimate location and layout, land could be required from both entities.

The following table summarizes the analysis of the three alternatives.

	Alternative 1	**Alternative 2**	**Alternative 3**
Wind	Well protected.	Moderately well protected. North and west winds are a concern.	Moderately well protected. North and west winds are a concern.
Waves	Well protected.	Well protected after breakwater expansion.	Well protected after breakwater expansion.
Upland Ownership	Department of Education.	Department of Education/SEARHC.	Department of Education/SEARHC.
Land Use	U.S. Coast Guard Dock & University of Alaska, Southeast.	Adjacent to Mt. Edgecumbe High School.	Adjacent to SEARHC housing.
Bird Hazard	600 feet from the primary hazard source.	2,000 feet from the primary hazard source.	3,500 feet from the primary hazard source.

	Alternative 1	**Alternative 2**	**Alternative 3**
Operations	Heavy boat traffic.	Minor boat traffic, increased flexibility for operating.	Minor boat traffic, increased flexibility for operating.
Cost	$4,700,000	$5,500,000	$5,500,000